PROCEDURES GUIDELINES
AND
DESIGN REQUIREMENTS

Revised: September 2024

Marina Coast Water District
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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* (Procedures) 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. The Procedures were updated in 2007 and 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
District Engineer
920 2nd Avenue, Suite 1Marina, 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 (MCWD or 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

The applicant must apply for water and sewer service if the applicant or their agent is applying for a business license, a building permit, or seeking approval of any planning documents and maps from a land use agency. MCWD will determine if the proposed project requires one of the following:

- Residential Connection Form and Permit Application (available upon request);
- Commercial Connection Form and Permit Application (available upon request); or
- Enter into a Construction and Transfer of Water, Sewer, and Recycled Water Infrastructure Agreement (available upon request) with the District.

This includes all entities that may or may not propose structural improvements with or without an existing water meter or sewer lateral to its business, structure, or property. The applicant must complete all applicable forms and 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 preparation of the LAFCO application document and the payment of all applicable fees is the responsibility of the developer. As a minimum, the developer may anticipate the preparation of a complete legal description of the property to be annexed, and a property map. Please see Section 200 and Section 300 for further details. 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 may request a "Will Serve" letter from the District if required by the Authority Having Jurisdiction (AHJ) for processing Tentative Tract Maps, or development reviews, or other entity.

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 is for projects which are limited to a single lot, like the construction or modification of residential and/or commercial units, and the third 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 and Section 300. 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 first enter into a Marina Coast Water District Water, Sewer, and Recycled Water Infrastructure Agreement (Infrastructure Agreement). The Infrastructure Agreement consists of master plans for water, sanitary sewer, and recycled water improvements. The following provides some details regarding the Infrastructure Agreement, the improvement plan process, followed by construction and project closeout.

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 and Infrastructure Agreement.

To initiate preparation of the Infrastructure Agreement, the Developer must schedule a meeting with District staff to discuss the proposed project and comply with the requirements in Section 200.3.1. The Developer must provide MCWD planning documents for review and comment. Planning documents include, but are not limited to, Conceptual Improvement Plans, Subdivision Water, Sewer, and Recycled Water Master Plans, Authority Having Jurisdiction (AHJ) Planning Documents such as a Specific Plan, 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 designee. Regarding the Water, Sewer, and Recycled Water Master Plans, please see Section 300. The master plans shall comply with the District's design standards and receive approval from the District Engineer. The developer must enter into the Infrastructure Agreement prior to submitting its first plan check. The Infrastructure Agreement requires MCWD Board approval.

100.6.2 Improvement Plan Implementation

Improvement Plans shall be submitted within the terms and conditions of the executed Infrastructure Agreement. The Developer shall pay plan review fees and construction inspection fees when submitting the first improvement plan (See Section 200.3). The District Engineer or designee will review all water and sewer construction plans and specifications and may require revision, modifications, or redesign of any drawings, details or specifications submitted. If MCWD does not receive the required fees and plans within one year, the project must go through the Infrastructure Agreement process again.

100.6.3 First Plan Check

After the execution of the Infrastructure Agreement and fees paid, 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). 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.

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.

100.6.4 Submit Subsequent Plan Checks

For each subsequent plan check, the developer must submit the following: Previous District plan check, the revised construction drawings and specifications, and any additional material requested. All changes shall be clouded with a revision stamp. 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 each subsequent plan check within twenty (20) working days. 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.

100.6.5 Performance and Payment Surety

At the completion of the second plan check, the Developer shall submit a Performance and Payment Surety per the requirements found in the Infrastructure Agreement. The completed bond estimate will be sent to the applicant for execution. The Surety instrument is defined in the Infrastructure Agreement. The Surety instrument 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. 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 Surety until such time as the quantity of work to be done is finalized.

100.6.6 Final Plan Approval

After the plans are acceptable to the District staff and the Payment and Performance Surety is properly executed and endorsed, the plans will be signed per the conditions found in Section 300. Prior to final approval of the construction drawings, the developer must pay the outstanding balance for the plan check work.

100.6.7 District Signs Plan

The developer is required to obtain signatures from all other agencies prior to MCWD signing the plans. The approved plans 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. After the paper and digital copies of the plans 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 designee. **Construction must begin within one year of the approved water and/or sewer construction drawings**.

100.6.8 Construction Administration

The furnishing of materials and the 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. Before construction, the Contractor and its sub-contractors shall submit Insurance Certificates per the requirements found in the Infrastructure Agreement. During construction, the Developer and the Developer's Engineer of Record is responsible to review and approve, but not limited to the following: submittals, request for information, change order requests, quality control and quality assurance testing reports, and contractor as-builts. The Developer is responsible to assure MCWD reviews and approves proposed revisions to the approved plans prior to issuing to construction. When construction is complete, the Developer shall meet the requirements of Section 300 and the following prior to requesting Construction Acceptance:

- Developer's Engineer of Record shall sign and submit a conformance letter. The conformance letter should certify improvements are in substantial conformance to the approved plans and MCWD requirements; and
- The Developer and the Developer's Engineer of Record is responsible to complete a final quality control and quality assurance project review; and
- The Developer shall also submit a waiver and release of lien for all contracts associated with the Infrastructure Agreement.

100.6.9 Construction Acceptance

After receiving the Developer's request for Construction Acceptance, the District reviews the Developer's construction reports, plans, schedules. The District will also perform a final inspection. If the final inspection reveals multiple corrections, the District will postpone acceptance until the Developer completes its quality control and quality assurance effort. Once the District completes its final inspection, the Developer shall make all corrections needed. Following final inspection and corrective action work, the developer will be required to prepare the Bills of Sale, and Statements of Construction Cost, to provide for the Dedication of the facilities to the District. See Section 300 for further details.

The developer shall be responsible for any and all repairs or replacements required to the installed systems as required per the In-Tract Policy, Infrastructure Agreement, and in section 100.10 "Guarantees".

100.6.10 Record Drawings

Record drawings, signed by the Developer's Engineer of Record, shall be submitted in accordance with Section 300 along with CAD and PDF format as specified by the District Engineer.

100.6.11 Warrantees

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.

100.6.12 Dedication of Facilities

Upon completion and final inspection of all work, the applicant shall file a request at least ninety 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.

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. Please see the following for Single Lot Projects. Please refer to the Guidelines for design requirements, standard specifications, and standard plans.

100.7.1 Plan Check

After the plan review fees are paid, 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 Plan Check Requirements (See Section 300). Similar timeline and requirements apply to subsequent plan checks. For subsequent plan submittals, revisions shall be clouded with a revision stamp. 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. 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.

100.7.2 Final Plan Approval

After all plan checks are completed and the plans are acceptable per the Guidelines, MCWD will issue an acceptance letter. Prior to final approval of the construction drawings, the developer must pay the outstanding balance for the plan check work

100.7.3 Construction Administration

When the plans are approved, 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.

If MCWD does not inspect the project **within one year of the approved water and/or sewer construction drawings**, the permit is no longer effective. The developer is required resubmit MCWD applications and pay the required fees. The developer may need to update the water and/or sewer construction drawings if there is a change to MCWD requirements.

The installation of a development's domestic water, sewer and/or recycled water facilities will be the obligation of, and constructed at, the developer's expense. The developer shall be responsible for quality control and for all repairs or replacements required to the installed systems as required by MCWD requirements prior to requesting MCWD's Construction Acceptance.

Using the Construction Permit Application, the District will inspect the completed installation along with

fees and charges paid and, if satisfactory, the District Engineer or designee will notify Customer Services the project is ready for the water meter installation.

100.7.4 Record Drawings

Record drawings, signed by the Developer's Engineer of Record, shall be submitted in accordance with Section 300 along with CAD modeling format and PDF format as specified by the District Engineer.

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.

100.8.1 Plan Check

After the plan review fees are paid, 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 Plan Check Requirements (See Section 300). Similar timeline and requirements apply to subsequent plan checks. For subsequent plan submittals, revisions shall be clouded with a revision stamp. 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. 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.

100.8.2 Final Plan Approval

After all plan checks are completed and the plans are acceptable per the Guidelines, MCWD will issue an acceptance letter. Prior to final approval of the construction drawings, the developer must pay the outstanding balance for the plan check work.

100.8.3 Construction Administration

When the plans are approved, 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.

If MCWD does not inspect the project **within one year of the approved water and/or sewer construction drawings**, the permit is no longer effective. The developer is required resubmit MCWD applications and pay the required fees. The developer may need to update the water and/or sewer construction drawings if there is a change to MCWD requirements.

The installation of a development's domestic water, sewer and/or recycled water facilities will be the obligation of, and constructed at, the developer's expense. The developer shall be responsible for quality control and for all repairs or replacements required to the installed systems as required by MCWD requirements prior to requesting MCWD's Construction Acceptance.

Using the Construction Inspection Application, the District will inspect the completed installation along

with fees and charges paid and, if satisfactory, the District Engineer or designee will notify Customer Services the project is ready for the water meter installation.

100.8.4 Record Drawings

Record drawings, signed by the Developer's Engineer of Record, shall be submitted in accordance with Section 300 along with CAD modeling format and PDF format as specified by the District Engineer.

END OF SECTION

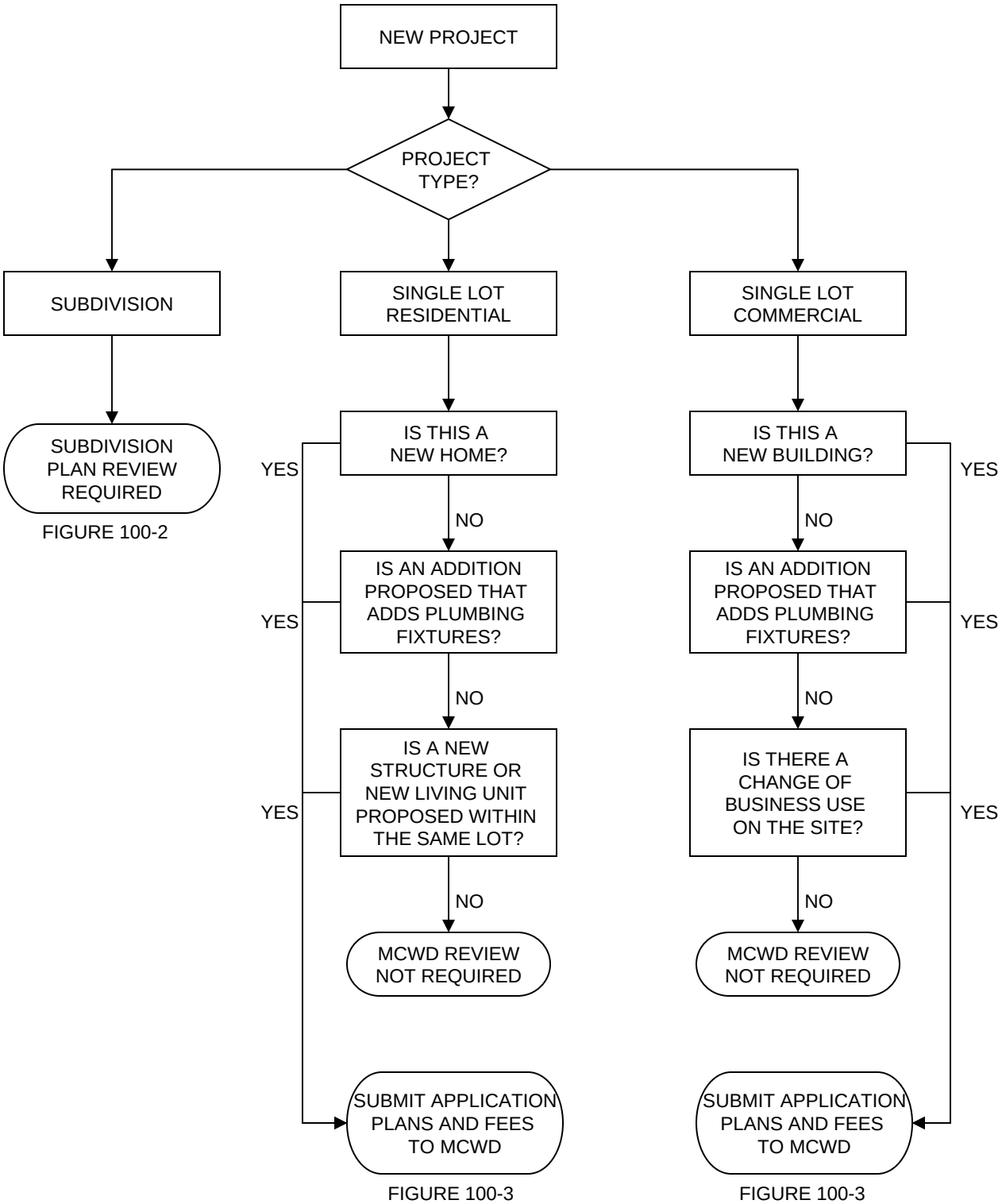


FIGURE 100-2

FIGURE 100-3

FIGURE 100-3

APPROVED BY DISTRICT ENGINEER DATE 10/2007	MARINA COAST WATER DISTRICT	**MARINA COAST WATER DISTRICT** **GENERAL APPLICATION PROCESSING FLOW CHART**	FIGURE 100-1 SHEET 1 OF 1

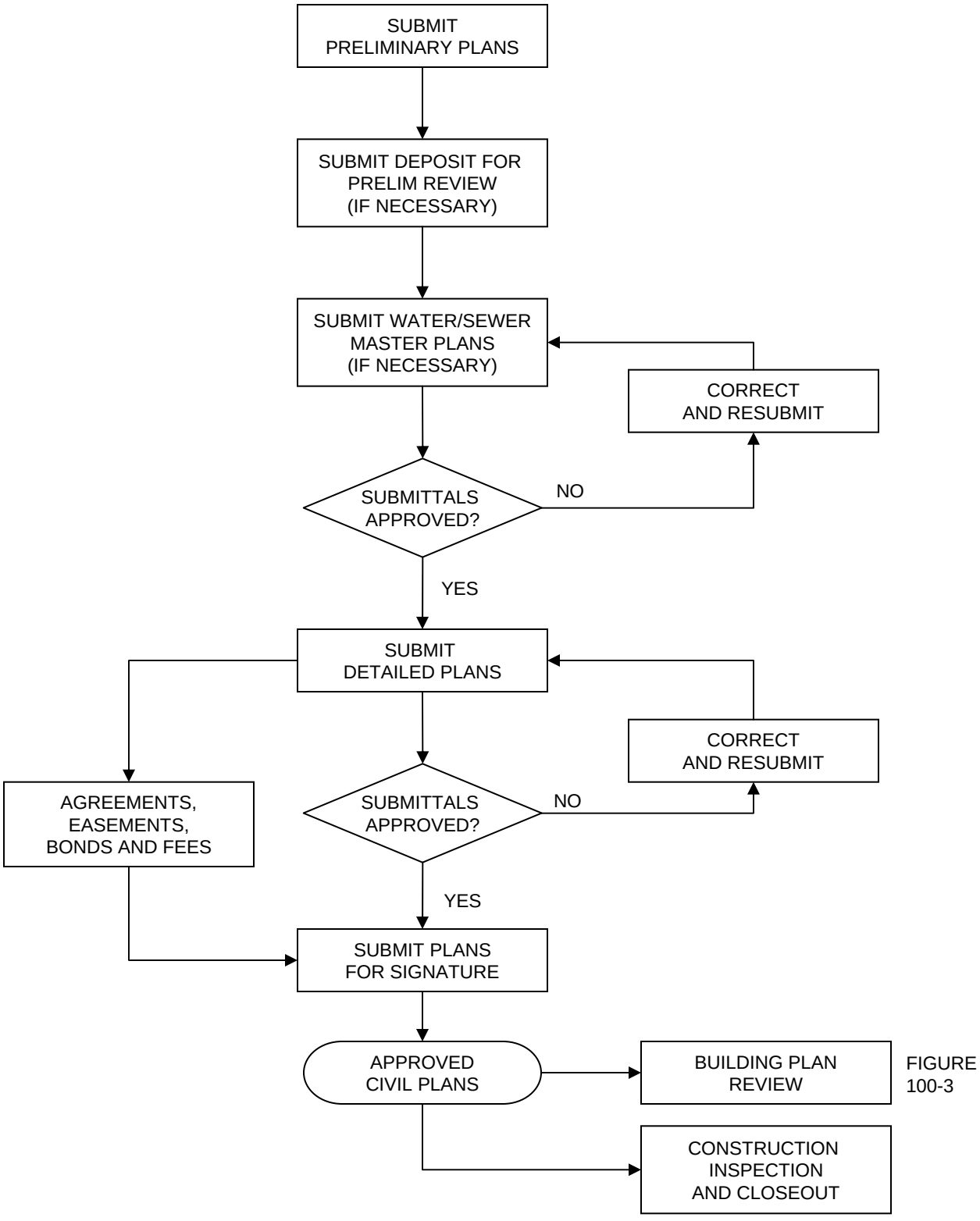


FIGURE 100-4

APPROVED BY DISTRICT ENGINEER DATE 10/2007	MARINA COAST WATER DISTRICT	**MARINA COAST WATER DISTRICT**	FIGURE 100-2
		SUBDIVISION PLAN REVIEW PROCESS	SHEET 1 OF 1

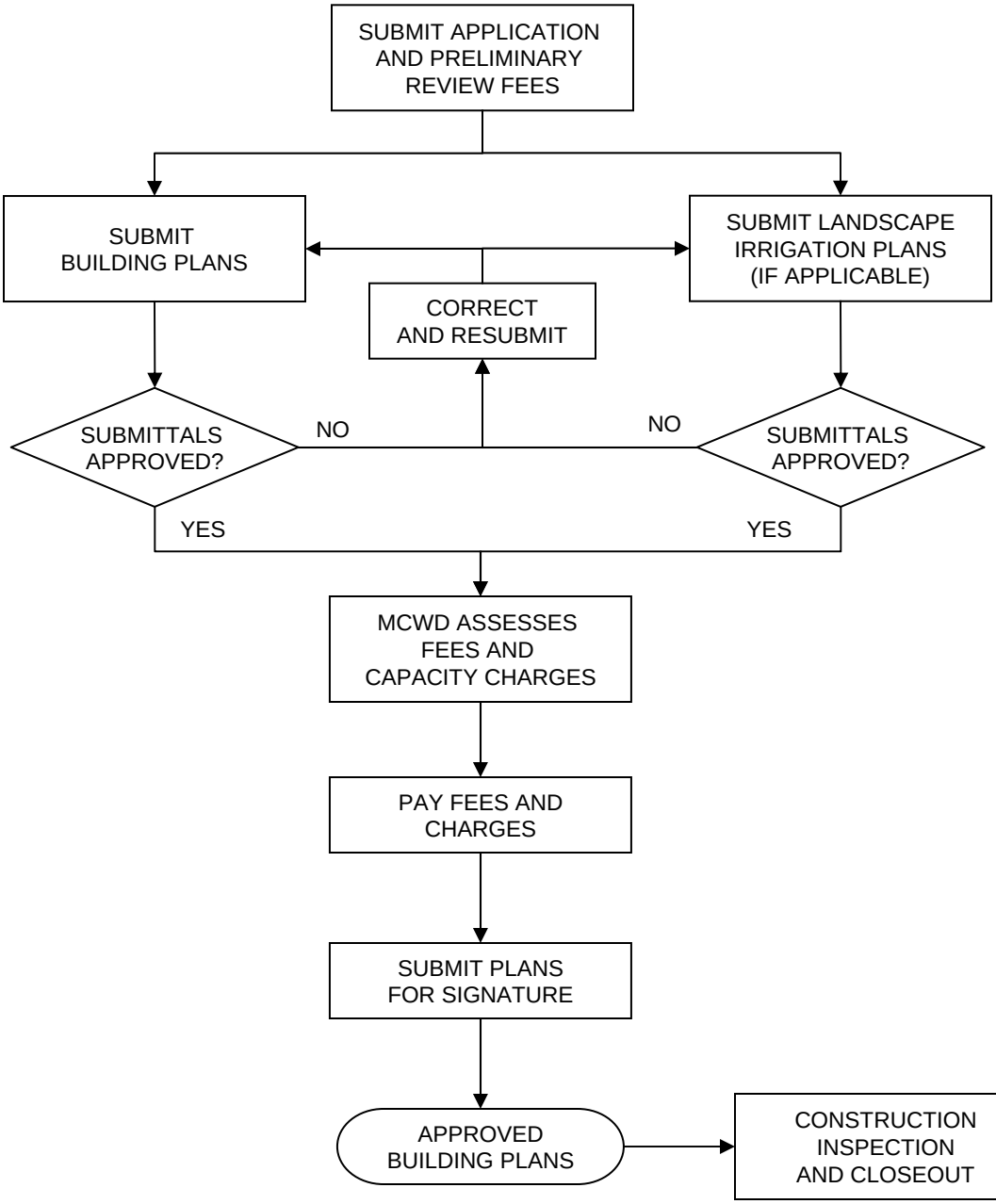
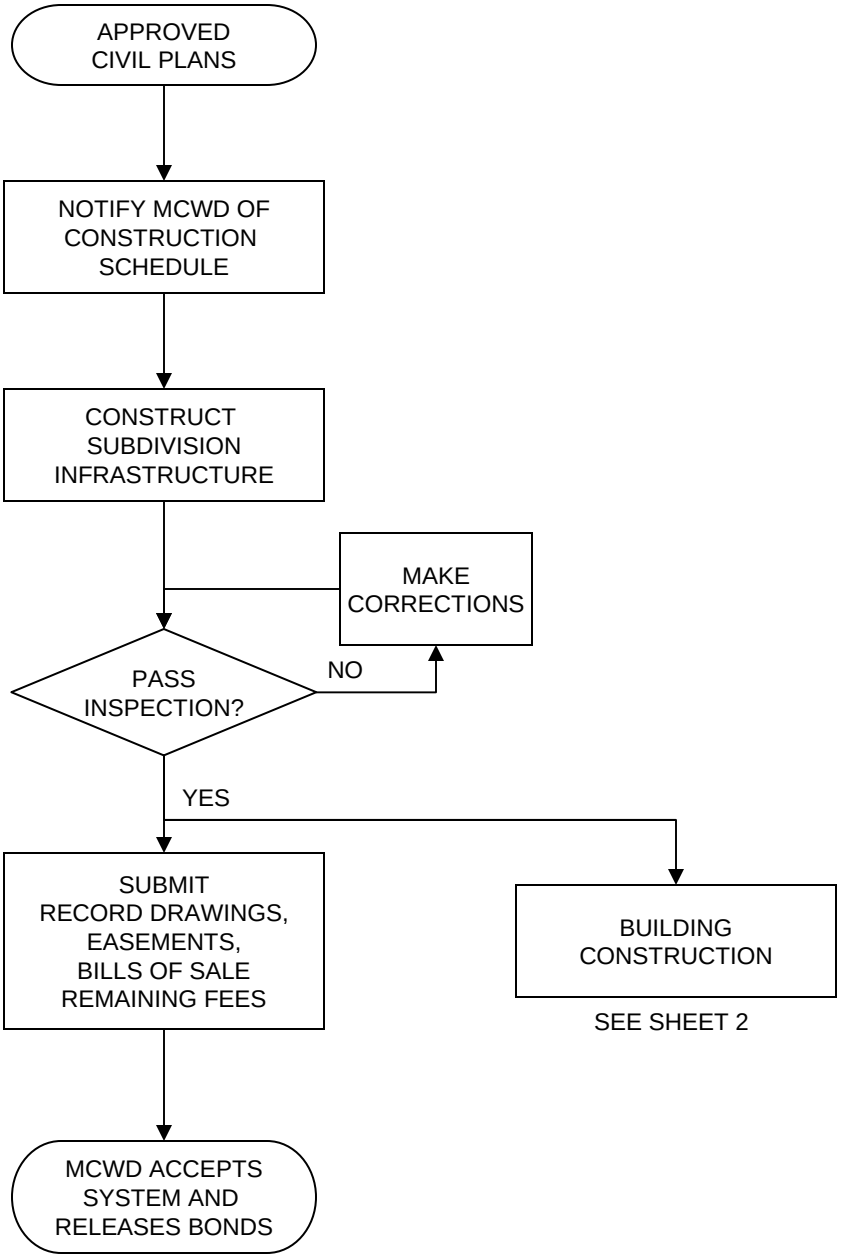
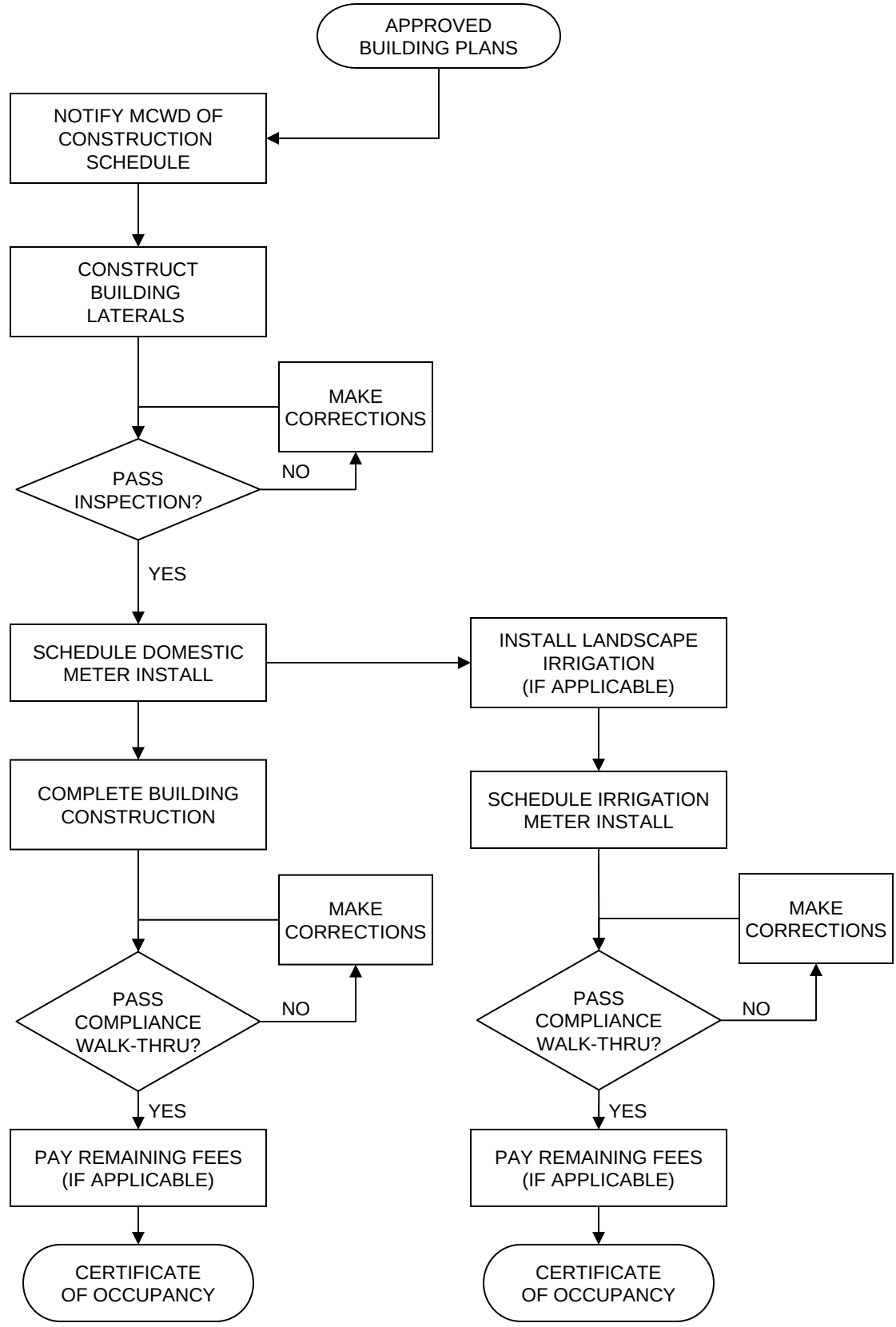


FIGURE 100-4

APPROVED BY DISTRICT ENGINEER DATE 10/2007		**MARINA COAST WATER DISTRICT**	FIGURE 100-3
		BUILDING PLAN REVIEW PROCESS	SHEET 1 OF 1



APPROVED BY DISTRICT ENGINEER DATE 10/2007		**MARINA COAST WATER DISTRICT**	FIGURE 100-4
		CONSTRUCTION INSPECTION AND CLOSEOUT PROCESS	SHEET 1 OF 2



APPROVED BY DISTRICT ENGINEER DATE 10/2007	MARINA COAST WATER DISTRICT	**MARINA COAST WATER DISTRICT** **CONSTRUCTION INSPECTION AND CLOSEOUT PROCESS**	FIGURE 100-4 SHEET 2 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 the MCWD Code Title 6 Water and Sewer Fees and Charges. The fees and charges are also summarized in the Adopted Marina Coast Water District Budget latest approved copy (available on District website). Plan check, Inspection, Permitting, and Processing fees shall be paid prior to the approval of the plans and installation of necessary infrastructure. Capacity Charge fees shall be paid prior to activating service. 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.

200.2 WATER AND SEWER RATES

These changes 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 and on the District website.

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, Construction Inspection, Meter Charges Fees

Plan review, construction inspection and meter charges/fees are performed per the Adopted Marina Coast Water District Budget, lasted approved copy, which is available online at www.mcwd.org. Please note the fees are minimum fees. The actual cost exceeding the minimum fee is added to the overall fee, if required.

200.4 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.

200.5 TEMPORARY WATER SERVICE PERMITS

Construction water is available after the Applicant submits a complete Temporary Water Service Application (available upon request) and complies with Section 300.19.5.

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

200.6 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; other non-residential structures; sub-division development; Multi-Family development; or modifications to existing structures. All proposed development may include the need to review conceptual or preliminary plans. This section outlines the submittal requirements for various plans. All plans shall be prepared and signed by a professional engineer licensed in the State of California.

300.2 SUBDIVISION MASTER PLANS

Subdivision Master Plans include the Concept Improvement Plans, the Subdivision Water, Sewer, and Recycled Water Master Plans. The Master Plan shall clearly show and identify all existing and proposed utilities.

300.2.1 Concept Plans

Concept Improvement Plans with water, sanitary sewer, and recycled water infrastructure are to be submitted to the District Engineer or designee by the applicant or the applicant's engineer. If the applicant is seeking a Tentative Map, the concept improvement plans shall be submitted 60 days prior to filing the Tentative Map.

300.2.2 Subdivision Water Master Plan

The District Engineer or 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 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. Geotechnical Report certified by a licensed geotechnical engineer in the State of California. Reports shall include geotechnical recommendations for MCWD facilities, pipes, valves, vaults, etc.
3. Existing transmission main locations and sizes.
4. Existing utilities, such as storm, electrical, gas, communication lines.
5. District’s design criteria (Section 400)
6. In-tract Hydraulic Model for potable and recycled systems in format acceptable to the District.
7. City and/or County fire flow requirements. The developer’s engineer shall obtain approval from the governing fire department for fire hydrant type, spacing and the proposed fire flows for the tentative water master plan.

8. 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.
9. Construction Phasing Plan, if applicable.
10. Any Predefined Marina Coast Water District Capital Improvement Projects which fall within, or adjacent to, the proposed project boundaries.

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

300.2.3 Subdivision Sewer Master Plan

Subdivision Sewer Master Plan Approval: The District Engineer or 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 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. Geotechnical Report certified by geotechnical engineer in the State of California. Reports shall include geotechnical recommendations for MCWD facilities, pipes, valves, vaults, etc.
3. Existing trunk sewer locations
4. District's design criteria (Section 500)
5. Slope and size of sewer collection mains and number of lots to be served
6. In-tract Hydraulic Model in format acceptable to the District.
7. 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.
8. Construction Phasing Plan, if applicable.
9. Any Predefined Marina Coast Water District Capital Improvement Projects which falls within, or adjacent to, the proposed project boundaries.

300.2.4 Recycled Water System Master Plan

See Section 600.

300.2.5 Landscape Irrigation Master Plan Information

See Section 700.

300.3 SUBDIVISION CONSTRUCTION PLANS

300.3.1 Improvement Plan Requirements

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

1. 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 service application, plan check fee and deposit.
2. Tract/Parcel Map showing easements and gross acreage
3. Boundary Survey and Topographic Map showing property information and easements, if any.
4. Provide existing condition map showing the existing public water/sewer/recycled water utility pipe servicing the property along with other existing utilities and improvements.
5. Improvement Plans showing structures, pavement, walkways, landscape (with tree location), fence, retaining walls, signs, parking lot lights, fire hydrants, etc. and as applicable.
6. Improvement Plans showing abandoned and proposed pipe and appurtenances for domestic water, fire, irrigation, and sanitary sewer connecting to the public utility system. Plans shall include job specific details, specifications, quantities, a submittal list and special inspection requirements. All pipe and related appurtenances shall conform to local and state code, including MCWD design requirements.
7. Improvement Plans shall show water/sewer/recycled water plans with project specific details and specifications.
8. Geotechnical recommendations for all District facilities. Geotechnical recommendations shall include foundation recommendations, construction material recommendations, compaction frequencies, etc.
9. All District facilities shall comply with Sections 300.6, 300.7. 300.8, and 300.9.
10. Engineer's quantity estimates for water, sewer and recycled water system. Each system shall be listed separately.
11. Sheet size shall be ARCH-D (24-inch by 36-inch), no exceptions.
12. Calculations to support all proposed pipe, valves, and meters, if not provided earlier.

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.

300.3.2 **Detailed Plan Requirements**

All plans submitted to the District Engineer or designee for plan checking and approval of domestic water, sewer and/or recycled water facilities will be submitted on Size D. 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." Other utilities - Recycled water mains – size, flow valves and existing facilities. Other proposed and existing utilities – such as underground power, underground communication, etc.
      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. Bench Mark; description and latest elevations

   F. City Engineer signature block

   G. Survey horizontal and vertical control

   H. Name, address, and phone number of engineering firm
   Name, address, and phone number. of developer
   Legal description of property (Tract/Lot, Parcel Map No.)

   I. Quantity estimates may appear on Title Sheet. Water, sewer and recycled water facilities to be called out separately. Labeled and not mixed together.

   J. Index of sheets

   K. Revision block

   L. General notes

   M. Utility, addresses, and phone numbers, including but not limited to - Gas, Telephone, Power, Cable T.V., Water, Sewer, and Storm Drain

N. 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. Geotechnical recommendations

   E. Geotechnical inspection and testing requirements, including testing frequency.

   F. Inspection Requirements

   G. Submittal Checklist

   H. Detail drawings

3. Plan and Profile Sheets:

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

   A. Scale: Horizontal 1-inch = 20-feet and Vertical 1-inch = 5-feet or as appropriate for the project upon approval of the District Engineer.

   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. The crossing elevations for water, sewer, recycled water system, storm drain, and other utilities, such as electrical and communication.

   G. Provide a key map on each sheet at a scale of 1-inch = 100 feet (as appropriate for the project).

   H. Provide letter of conformance from the geotechnical engineer that prepared the Geotechnical Report.

300.3.3 **Survey Datum**

Prepare drawings using the California Coordinate System of 1988 (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.

300.3.4 **CAD Requirements**

1. Drawings submitted to the District shall be prepared in AutoCAD Civil 3D, version 2020 or later. The drawings shall not be exported into another format. The District has the right to use such plans to enlarge, improve and maintain its system.

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	SSMH
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

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	

300.4 NON-RESIDENTIAL CONSTRUCTION PLANS

300.4.1 Improvement Plan Requirements

The Applicant/Engineer of Record shall submit the following items for a non-residential project first review:

1. 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 service application, plan check fee and deposit.
2. Show the existing public water/sewer/recycled water utility pipe servicing the property.
3. If new improvement plans require an extension of the existing publicly owned water, sewer, recycled water system, then require an extension of the existing publicly owned water, sewer, recycled water system, provide improvement plans per Section 300.6, 300.7, 300.8, and 300.9. Also include a geotechnical recommendation proposed District facilities.
4. Tract/Parcel Map, if revised
5. Boundary and topographic map showing property information and easements, if any.

6. Improvement Plans consisting of the following, as applicable: Demolition Map, Site Plan, Grading and Drainage Plan, Utility Plan, Erosion Control Plan.
7. Improvement Plans showing structures, pavement, walkways, landscape (with tree location), fence, retaining walls, signs, parking lot lights, fire hydrants, etc. and as applicable.
8. Improvement Plans showing abandoned and proposed pipe and appurtenances for domestic water, fire, irrigation, and sanitary sewer connecting to the public utility system. Plans shall include job specific details, specifications, quantities, a submittal list and special inspection requirements. All pipe and related appurtenances shall conform to local and state code, including MCWD design requirements.
9. Calculations to support all proposed pipe, valves, and meters.
10. Improvement Plans shall be approved by the AHJ for planning, public works, fire protection, and building.
11. Sheet size shall be ARCH-D (24-inch by 36-inch), no exceptions.

After the first plan check, District will return one red-lined set of the improvement plan. The returned sets will note any specific variations from the basic requirements. Applicant/Engineer shall return the District's red-line set.

300.5 SINGLE LOT CONSTRUCTION PLANS

300.5.1 Improvement Plan Requirements

The Applicant/Engineer of Record shall submit the following items for a single lot project first review:

1. 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 service application, plan check fee and deposit.
2. Show the existing public water/sewer/recycled water utility pipe servicing the property.
3. If new improvement plans require an extension of the existing publicly owned water, sewer, recycled water system, provide improvement plans per Section 300.6, 300.7, 300.8, and 300.9. Also include a geotechnical recommendation proposed District facilities.
4. Boundary and topographic map showing easements, if any.
5. Improvement Plans consisting of the following, as applicable: Demolition Map, Site Plan, Grading and Drainage plan, Utility Plan, Erosion Control Plan.
6. Improvement Plans showing structures, pavement, walkways, landscape (with tree location), fence, retaining walls, signs, parking lot lights, etc.
7. Improvement Plans showing abandoned and proposed pipe and appurtenances for domestic water, fire, irrigation, and sanitary sewer connecting to the public utility system. Plans shall include job specific details, specifications, quantities, a submittal list and special inspection requirements.
8. Calculations to support all proposed pipe, valves, and meters.

9. Improvement Plans shall be approved by the AHJ for planning, public works, fire protection, and building.

10. Sheet size shall be ARCH-D (24-inch by 36-inch), no exceptions.

After the first plan check, District will return one red-lined set of the improvement plan. The returned sets will note any specific variations from the basic requirements. Applicant/Engineer shall return the District's red-line set.

300.6 DISTRICT FACILITY REQUIREMENTS AND STANDARDS

300.6.1 Facilities

300.6.1.1 Domestic Water Facilities

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

300.6.1.2 Sanitary Sewer Facilities

See Section 500 and the MCWD Standard Plans and Specifications for detailed specifications regarding the design and construction of sanitary sewer facilities.

300.6.1.3 Recycled Water Facilities

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

300.6.1.4 Irrigation Water Facilities

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

300.6.2 Other Requirements

300.6.2.1 Cross Connection Control

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

300.6.2.2 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.

300.6.2.3 Grease Interceptors or Other Devices

A food service establishment or whenever more than 6 Fixture Units (EDU) is discharged into MCWD sewer conveyance system at a single point of connection from a private lateral or any other business discharging grease, oil or other similar material shall have an operable grease interceptor or other comparable device(s) as determined by the Engineer of Record and approved by the District Engineer.

The requirements for design, installation, and maintenance of grease interceptors, or other devices are found in Standard Specification Section 03463 Grease Interceptors. A properly sized interceptor shall be considered first, in conformity with the California Plumbing Code.

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 interceptor. Toilets, lavatories, and other sanitary fixtures shall not be connected to any 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.

300.7 ADMINISTRATIVE REQUIREMENTS

300.7.1 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.

300.7.2 EASEMENTS

MCWD infrastructure shall be placed on public right of way. MCWD infrastructure shall not be placed within private streets. In unavoidable and rare circumstances, MCWD infrastructure may be placed within a public utility easement.

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-five 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. Easements shall not encroach beyond this utility parallel line towards the lot structures.

Water and sewer infrastructure that is not provided with the required easements shall be consider privately owned and maintained by the Grantor of the easements.

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 registered prior to 1982 or Surveyor along with a completed "Grant of Easement to Marina Coast Water District" form, 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.

300.7.3 FINAL EASEMENTS (For MCWD Facilities)

300.7.3.1 Submittal

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

300.7.3.2 Verification

The developer's engineer, in coordination with the District's representative, will verify that the easements as listed in the easement documents remain valid. The Applicant/Engineer of Record will then submit the final easement documents and the final title report for recordation.

300.8 CONSTRUCTION PLAN APPROVAL

300.8.1 First Plan Check

The Applicant/Engineer of Record shall submit a complete package consisting of the following.

A. Permit application and fees
B. Improvement Plan(s) for site and structure(s)
C. And other applicable documents as required per Sections 300.3, 300.4, 300.5, 300.6, and 300.7.

300.8.2 Second Plan Check (90%)

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.

300.8.3 **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.

300.8.4 **Final Plans**

Upon completion of any remaining items noted in the plan check, the developer's engineer shall submit two bond and Mylar sets of improvement plans, along with the red line (as-built) mark up, for final verification.

Utility improvement plans shall have the District Engineer or designee signature before any construction by the applicant begins.

300.8.5 **Prerequisites for Signing Plans**

1. "Infrastructure Agreement" must be signed by developer and approved by the District's Board of Directors.

2. Project design support documents, including CAD files, recorded easements, title report, hydraulic models and calculations.

3. 3rd Party Quality Control Inspection and Testing Executed Agreement

4. 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. The easement documents must have been recorded prior to activating any service connections.

5. All fees and charges must be paid in full by the applicant.

6. Signatures of City Engineer and Fire Marshall, when required.

300.8.2 **Surety (For MCWD Facilities)**

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.

300.8.3 **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. The items listed will include, but will not be limited to pipes, valves, meters & appurtenances, connections, hot taps, and facilities construction. A life cycle cost analysis shall be prepared and submitted to the district for all permanent facilities.

300.8.4 VARIANCES

If the site or project conditions require a deviation from these design requirements, a variance must be requested. 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 as per MCWD Code Chapter 2.08.

300.8.5 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:

3. An electronic copy of the drawings in Autodesk Civil 3D.

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

300.8.6 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.

300.8.7 Permit Expiration

Plans will be valid for one (1) 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." If any of the applicable codes or standards were changed or modified prior to starting construction and after the initial approval of the plans, the developer shall be responsible of complying with the new regulations. The District will require rechecking of the plans and it reserves the right to charge additional plan check fees.

300.8.8 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; a letter may be submitted by the developer's engineer, by registered mail, to request a one-year extension of the approval.

300.9 ORDER OF PRECEDENCE OF STANDARDS

A component in the project document part applies as if appearing in each. The parts are complementary and describe and provide for a complete work. If a discrepancy exists, the governing ranking of the project document parts in descending order is:

300.9.1 Project Specifications

Project specific specifications, 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 District facilities.

300.9.2 Project 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 District facilities.

300.9.3 District Standard Specifications

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

300.9.4 District Standard Plans

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

300.9.5 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 any other infrastructures. The "Caltrans Standard Plans and Standard Specifications," CALTRANS, are incorporated herein by this reference, copies of which may be obtained from the State of California, Department of Transportation.

If a discrepancy is found or a confusion arises, the contractor shall submit an RFI to the engineer of record.

300.10 PROJECT CONSTRUCTION

300.10.1 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.

300.10.2 **License Requirements**

1. The applicant's contractor shall have a Class A or any combination of licenses that is deemed sufficient to perform the intended work.

2. The applicant's contractor shall have a business license to operate within the city having jurisdiction.

300.10.3 **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.

300.10.4 **Preconstruction Meeting**

A preconstruction conference is to be held no sooner that 72-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 in a Microsoft Project time bar format, 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. Surety bond, Business license, Insurance Certificate documentations.
3. Working hours
4. Site Accessibility
5. District facilities that will be taken off-line for construction
6. Startup operations of new facilities and other District facilities affected by the project results.
7. Submittal List
8. 3rd Party Special Inspections and Testing
9. Pressure test procedures and startup operations of new facilities and other District facilities affected by the project results.
10. Bacterial test results.
11. As-Builts and Record Drawings
12. Order of Precedence: The order of precedence as defined in Section 300.16 will be reviewed in the pre-construction meeting.

300.10.5 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 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 (available upon request). 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.

300.10.6 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.

300.10.7 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 layout plan 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.

300.10.8 **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.

    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.

300.10.9 **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.

300.10.10 **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 with in 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.

300.10.11 **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.

300.10.12 **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.

300.10.13 **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, bacti-tested, 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

300.10.14 **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
9. For a Sanitary lift station, all proposed equipment shall be tested and verified per Section 500, including all SCADA check lists.

300.11 PROJECT CLOSE-OUT

300.11.1 AS-BUILT SURVEY AND RECORD DRAWINGS

300.11.1.1 As-Built Survey

An as-built survey of the completed water line and appurtenances shall be made by the developer's surveyor and received by the developer’s engineer prior to placement of final paving. The as-built survey consists of redline field changes by the developer’s contractor and surveyors. 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.

As-Built Requirements: Keep accurate and legible records on a single set of full size project prints of the drawings.

1. Make the as-built drawings available for review by District's representative in contractor's field office.

2. Maintain as-built drawings on an up-to-date basis with all entries reviewed by District's representative.

3. Protect the as-built set from damage or loss.

4. The as-built drawings shall show all changes in the work which occur during construction, including adding approved changes.

5. The as-built drawings shall show locations by key dimensions, depths, elevations of all underground lines, conduit runs, sensor lines, valves, capped ends, branch fittings, pull boxes, etc.

6. The as-built drawings shall be complemented with a record of information regarding maintenance access and/or concealed work.

7. The as-built drawings shall be complemented with a record of finalized hydraulic and electrical equipment control settings in the tables and spaces provided on the drawings.

300.11.1.2 **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. The record drawing submittal requirements include:

1. The Applicant/Engineer of Record shall prepare the Record Drawings which includes an update to the quantity information. The Engineer of Record shall stamp and sign the Record Drawings. Changes to the plans shall be identified with a cloud and a revision triangle. The revision stamp shall be updated accordingly. The Engineer of Record shall submit the Record Drawing to the District for review.

2. Following District review of Record Drawings, the Applicant/Engineer of Record shall submit a complete and final set of Record Drawings and it Autodesk 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.

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.

300.11.1.3 **Electronic File Requirements**

300.11.1.3.1.1 Text Files:

1. Specifications shall be submitted in Microsoft Word (.doc) or Portable Document Format (.pdf) format. Specifications shall be searchable documents. Specifications shall have labeled bookmarks when submitted in Portable Document Format (.pdf) format.
2. Tables shall be submitted in Microsoft Excel (.xls) or Portable Document Format (.pdf) format. Tables shall be searchable documents and shall have labeled bookmarks when submitted in Portable Document Format (.pdf) format.

300.11.1.3.1.2 Drawing Files:

1. As-Built Drawings shall be submitted in Portable Document Format (.pdf). As-Built Drawing files shall be searchable and labeled bookmarks shall be included.
2. Record Drawings shall be submitted in Portable Document Format (.pdf) and in Autodesk Civil 3D, 2020 or later. Record Drawing files shall be searchable and labeled bookmarks shall be included.

300.11.2 EASEMENT VERIFICATION

The developer's engineer of record shall 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.

300.11.3 METER USE AND FEE VERIFICATION

With the record drawings, the applicant shall submit 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.

300.11.4 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” (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.

300.11.5 RELEASE GIVEN TO CITY AND/OR COUNTY

300.11.5.1 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.

300.11.5.2 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)

300.11.6 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 typical minimum diameter for a water line shall be 8-inches for distribution mains unless otherwise noted and approved.

On short cul-de-sac streets where there is a dead-end main with no fire hydrant, 4-inch main (with a maximum of ten (10) each, 1-inch services) or 6-inch (with more than ten (10) each, 1-inch service lines) main may be allowed. However, when a fire hydrant is required, an 8-inch size main must be used.

The applicant shall provide hydraulic calculations, which shall be approved by the District Engineer.

400.3 TYPE OF MAIN PIPE

Only AWWA C-900 PVC pipe, SDR-14, pressure class 305 is to be used for distribution mains of 6 inches in diameter or less, or as directed by the District. Either C900 PVC, SDR-14 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.

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 required at all times.

400.4 MINIMUM COVER TO TOP OF WATER MAIN PIPE

Distribution mains, 10-inch or smaller, shall have a minimum of 36 inches of cover between the top of the pipe and the finished street grade. The top of pipe is to be a minimum of 48 inches below finish grade in untraveled or open space areas.

Distribution mains, 12-inch or larger, shall have a minimum of 48 inches of cover between the top of the pipe and the finished street surface. The top of pipe is to be a minimum of 60 inches below finish grade in untraveled or open space areas.

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.

400.5 STANDARD LOCATION

Domestic water main centerlines shall be located six (6) feet from the face of curb. Water lines will not be allowed within easements in residential lots. There must be separate lettered lot and utility easement, minimum width 20 feet, if a water line needs to go outside streets from cul-de-sac to cul-de-sac or from cul-de-sac to open space of tract common area.

Where water pipelines are designed to cross perpendicular beneath retaining walls or other structures (specific written permission required for each instance), the pipeline shall be constructed in a steel pipe casing of sufficient size and thickness (see MCWD Standard Plans) and with a minimum vertical clearance of at least one (1) foot from the footing or structure itself.

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.

On long blocks, intermediate valves shall be installed so that no more than six hundred feet of main, or twenty-eight (28) dwelling units, or two (2) fire hydrants will be out of service at any time. Additional looping of main lines may be necessary to satisfy this condition and the arrangement of valves within the distribution system will be reviewed to identify the optimum network layout.

A valve must be placed at each end of an easement where a water line passes through easements outside the traveled streets.

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

400.7.1 Horizontal and Vertical Separation

State Health Department regulations requires domestic water lines shall not be installed in the same trench as, and shall be at least 10-foot horizontally from and one foot vertically above, any parallel pipeline conveying:

1. Untreated sewage
2. Primary or secondary treated sewage
3. Disinfected secondary recycled water, and
4. Hazardous fluids such as fuels, industrial wastes, and wastewater sludge.

Furthermore, domestic water main lines shall be installed at least 5 feet horizontally from (closet edge to closest edge), and one foot vertically above, any pipeline conveying:

5. Disinfected tertiary recycled water and
6. Storm drainage

Separation other than the Health Department minimums must be approved by the District Engineer and require submitting a proposal to the State Waterboards if the Waterworks Standards cannot be followed.

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 is required and shall be approved by the District Engineer. No connection joints shall be made in the domestic water pipeline within eight horizontal feet of the pipeline to be crossed. Please also refer to the District's Standard Plans and

Specifications.

400.8 FIRE SUPPRESSION REQUIREMENTS

The design requirements for fire suppression shall be as determined by the local fire authority. Any plan submitted must have been reviewed and approved by the local fire authority.

400.9 SERVICE MATERIALS AND MINIMUM SERVICE SIZE

400.9.1 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, W-2, or W-3) or a manifold lateral (Standard Plan W-4). Laterals may not tap into other service or hydrant laterals.

400.9.2 Minimum Domestic Service Size

Minimum domestic service line size shall be 1-inch. The sizing of the service shall be specified on the plans designated by lot numbers. Other service sizes shall be 2", 4", 6", 8": no other sizes will be allowed.

400.9.3 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 inside diameter 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).

400.9.4 Meters

Per District ordinance, all newly constructed dwelling units, commercial units and industrial 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, subsequent to payment of all applicable charges and posting of all required bonds and insurance.

The Developer's Engineer of Record shall provide calculations and correspondence from the local fire authority supporting the proposed 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. 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.

Meter Size		GPM - MAXIMUM
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 turbine meter assembly 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 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.

400.9.5 Pressure Reducing Valves

When system pressure is above 80 psi then all residential lots shall be provided with approved pressure regulators set at the proper pressure and shall be installed per the appropriate standards of the Authority Having Jurisdiction.

400.10 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 assembly 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 assembly 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
- All domestic services to sites with non-potable water (e.g. swimming pools, in-ground spas, etc.) located or stored on the premises
- All domestic services to multi-unit sites with circuitous, crisscrossing, or otherwise complicated plumbing

The customer shall have the assembly 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 assemblies to maintain them in satisfactory operating condition and shall overhaul or replace such assemblies 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 assembly required by the District ordinance is not installed, tested, and maintained; or if any defect is found in an installed back-flow prevention assembly; or if it is found that a back-flow prevention assembly 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 assemblies 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.

4. 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.

5. Backflow Prevention and Cross-Connection Control, Recommended Practices, M14, Latest Edition, American Water Works Association

400.11 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 District's Procedure Guidelines and Design Requirements 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 15 business days prior to commencing work on the water system. Phone (831) 883-5929 for inspection. A preconstruction meeting shall be held at least 48 hours before start of work.

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 one paper copy (24"x36") and a PDF copy 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 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. All water service laterals shall be constructed perpendicular to the water main without bends or angles from the connection point on the main.

8. 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.

9. All main line valves shall be maintained so as to be accessible during tract development, and all valve stem tops having over 60 inches of cover shall require an extension as per MCWD Standard Plan W-7.

10. 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.

11. 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.

12. No facility is to be backfilled until inspected by the District.

13. Shut down or tapping of existing domestic waterlines to facilitate connection to existing facilities shall be coordinated with the District at least 5 working days in advance. Any relocation of existing facilities is subject to approval of the District Engineer.

14. 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.

15. Final Inspection for waterlines must include water samples that will be tested for the presence of bacteria, conductivity, turbidity and odor. The turbidity must be less than 2.5 NTU and the odor must be less that 1.0 TON, not to include chlorine odor, to be acceptable. Two (2) consecutive "passing" samples are required for acceptance.

16. 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 or more shall be manifolded per MCWD Standard Plan W-3. All meter registers and lids shall be marked with address identification.

17. 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.

18. 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.

19. Curb face shall be inscribed with "W" indicating locations of all domestic water services.

20. Water low-flow devices shall be provided for all units within this development in accordance with rules and regulations of the District.

21. 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.

22. Individual pressure regulators will be required by the plumbing codes of the city having jurisdiction if static pressure reaches 80 psi or more.

23. 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.

24. Any District water used for construction shall be metered with a construction meter obtained from the District. All construction meters shall be complemented with a reduced pressure principal backflow prevention device.

25. The contractor working on MCWD waterlines must have a C-34 license issued by the State

Contractor's License Board or Class "A" General Contractors license (with special approval of the District, based upon actual water and sewer pipeline construction experience.)

26. An Encroachment Permit from the County or city having jurisdiction is required prior to any work within public right-of-way or easement.

27. 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.

28. 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.

400.12 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 plans shall show, in plan and profile views, the position of all other known existing underground utilities as well as proposed underground utilities. Vertical clearance at crossings shall be indicated by showing top of pipe and bottom of pipe elevations at the point of intersection.

3. Temporary flush-out assemblies shall be installed at the end of all mains and large service stub-outs for testing and flushing purposes.

4. Manual air-release assembly shall be installed at service stub-outs for testing and flushing purposes.

5. 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.

6. The vacuum release shall be sized to accommodate 100% of the pipeline flow (as CFM of air).

7. 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.

8. Water sample stations shall be provided for each contiguous water service area. Where there are separate pressure zones, a separate water sample station shall be provided for each zone in a location approved by the District.

9. 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 and fully restrained.

10. 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.

11. Blow-offs are required at the ends and low point of all mains.

12. Dead-end water mains are limited to 600-feet or 28 service connections, whichever is most restrictive. Proper flow and pressure demand must be verified in all cases.

400.13 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 (i.e., flushless or waterless) or low water use.

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

Sewage flow shall be based on the criteria in the following table. The basis for flow is the equivalent dwelling unit (EDU) or the flow from a typical residential home.

Sewer Flow Criteria

Design Item	**Flow Criteria**	**Flow**
Average Flow per EDU	Average Flow	174 gpd/EDU
Sewer (Gravity)	Peak Dry Weather Flow	600 gpd/EDU (200 x 3.0)
Lift Station/Force Main	Peak Dry Weather Flow	400 gpd/EDU (200 x 2.0)

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 pipe 12-inches in diameter and smaller, the maximum allowed d/D ratio is 0.50. For pipe equal to 15-inches in diameter, the maximum allowed d/D is 0.67. For pipe 18 inches and greater, the maximum allowed d/D is 0.75.

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

Minimum slopes by pipe size are per the following table:

Sewer Size (inches)	Minimum Slope, s
8	0.0040
10	0.0028
12	0.0022
15	0.0015
18	0.0012
21	0.0010

Sewers shall be designed and constructed to provide a mean velocity of not less than 2.0-fps minimum when flowing half-full at the estimated peak flow. Peak flows shall be calculated using Manning's formula with an "n" value of 0.013. 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 and Alignment

In local, residential, industrial, major, and primary streets, and secondary highways, sewer mains are to be located at the centerline of the street. Where there is a center median, the sewer mains shall be located in the center of the driving lane nearest to the center of the street. Sewers shall not be located in landscaped median strips or parking lanes.

Sewer mains that are constructed in a common trench with another utility will not be accepted by the District. Adequate horizontal and vertical spacing shall be maintained in accordance with District Standards. Concurrent review of other underground utility locations is required for tract developments.

Sewer lines in tracts will not be allowed within easements in residential lots. A separate lettered lot, minimum 20 feet wide, must be created for these situations. Lots may need to be wider than the minimum 20 feet where the sewer main is designed deeper than 10 feet.

500.2.2 Radius of Curvature

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

Polyvinyl Chloride Pipe (PVC)

Pipe Diameter (inches)	6"	8"	10"	12"
Minimum Radius (feet)	210'	280'	350'	420'

500.2.3 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 stationed 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.

500.2.4 Minimum Cover

Minimum cover from finish street grade to top of sewer main pipe is to be 6 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 4 feet depth at curb.

500.2.5 Separation Between Waterlines and Sewers

Adequate horizontal and vertical spacing shall be maintained in accordance with Section 400.7.

500.3 SEWER PIPE MATERIAL

All gravity sewers and laterals 15-inch diameter and smaller and with a pipe slope of 20 percent or less shall be SDR-35 PVC as described in the District's Standard Specification Section 02715. Gravity sewers 18-inch diameter and larger and with a pipe slope of 20 percent or less shall be DIP with polyethylene lining (per Standard Specification Section 15056) or C-900 SDR 14 PVC pipe or thicker. Exceptions must be pre-approved by the District Engineer.

Sewer pipe material shall remain constant (continuous) between manholes. (Meaning that transitioning between pipe material types, such as VCP and PVC or other material changes, size changes, or pipe class changes, such as SDR-35 PVC and SDR-14 C-900, may only be done at manholes.)

All sewer force mains shall be PVC pipe meeting District Standard Specification Section 15064 and AWWA C-900 and SDR 14 pipe standards. Force main pipe shall have restrained joints wherever there are changes in grade (vertical direction) or alignment (horizontal direction) of more than five degrees (5°) and for the necessary length to prevent joint-movement or separation up and downstream of those deflections.

All sewer service laterals shall be either SDR-35 PVC or extra strength VCP pipe. The material used for construction of the sewer laterals shall match the materials of construction for the adjacent sewer main (to which they are connected).

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 8-inch sewers, 400 feet for 10- through 15-inch sewers and 500 feet for 18- to or larger sewers. If a sewer is curved, closer spacing of manholes will be required. Only one curve (horizontal or vertical) shall be allowed between any two manholes.

500.5.2 Manhole Type, Size, and Depth

Manholes shall be precast reinforced concrete with eccentric cone in accordance with the applicable District Standard Specifications and Standard Drawings.

Minimum manhole diameter shall be 48-inches. Larger diameter manholes are required as shown in the following tables:

MANHOLE DIAMETER SIZES (based on sewer size)

Sewer Diameter of Main (inches)	Maximum Branch Size (inches)	Manhole Shaft Minimum (inches)	Frame & Cover Diameter (inches)
8” to 15”	10”	48”	30”
16” to 24”	12”	60”	30”
>24” to 36”	15”	72”	36”
>36”	21”	84”	36”

These are minimum manhole diameters based on the diameter of the main sewer passing through the manhole. Where branch sewer diameters are larger than the maximum listed in the table above, the diameter shall be increased to the next larger practicable size. There are additional requirements for larger diameter manholes where the sewer main is at greater depths.

The diameter requirements for manholes for various depths (measured from the top of pipe to the finished-surface) are as shown in the following table:

MANHOLE DIAMETER REQUIREMENTS
(based on sewer depth)

Depth of Cover Range (feet)	Manhole Shaft Diameter Minimum (inches)
0’ to 15’	48”
>15’ to 20’	60”
>22’	72”

Manhole diameters shall be upsized to the more conservative requirement (larger diameter) established in the two preceding tables.

Manholes deeper than twenty (20’) feet shall have steel-reinforced concrete bases. Reinforcement shall be provided for the specific soils conditions at each deep manhole location. The reinforcement design shall be submitted to the District under the signature and stamp of a Licensed California Civil Engineer.

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 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.

500.5.5 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 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. Sewer laterals for Accessory Dwelling Units (ADUs, either attached or detached units) may connect to the primary unit's sewer lateral inside the property line. Separate cleanouts for detached ADUs are recommended.

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 5 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 SANITARY SEWER PRETREATMENT DEVICES

Requirements for pretreatment of sewage will be determined by the California Plumbing Code, latest edition and the District Engineer.

For example, for waste enclosures there are different interceptor types available depending on use. For example, a sand separator is required for waste generators that do not produce grease, such as waste enclosures exclusively serving apartments. The minimum inceptor size for this type of use shall be 200 gallons.

500.11 GREASE INTERCEPTORS

A grease inceptor shall be required for waste generators that produce grease, such as waste enclosures that include serving restaurants and other grease and oil generating businesses. All restaurants and other facilities which discharge grease into the District's sewers shall be required to use grease interceptors to minimize grease problems in collection systems and treatment plants. The minimum gravity grease interceptor size shall be 750 gallons and shall be complemented with a minimum 5-gallon sample box. Comply with the California Plumbing Code, latest edition 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 sewers. Phone (831) 883-5929 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.

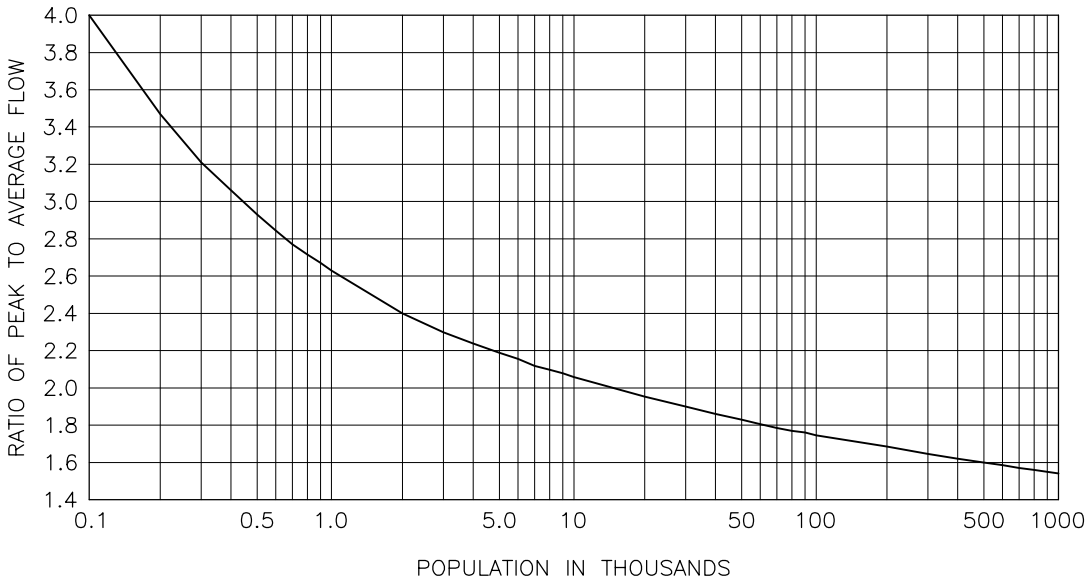
13. Any work to be performed inside a live manhole shall be done in accordance with Cal OSHA "Confined Spaces" and District manhole entry regulations. Manhole entry without District personnel present is not allowed.

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	MARINA COAST WATER DISTRICT	FIGURE
DATE 09/2003	DESIGN FACTORS FOR DESIGN OF SUBDIVISION SEWERS	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 and MCWD's Title 22 Engineering Report) 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 Design Requirements for Off-Site Recycled Water Facilities
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 recycled water facilities available. All on-site facilities using recycled water must perform an annual cross connection test and annual backflow prevention certification unless otherwise approved by the state and county health agencies. Details of specific cross connection tests can be found in subsequent sections. All inspections and testing 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 District such as transmission or distribution mains in public rights of way or public easement. Off-site recycled water facilities (or Capital facilities) are on the upstream side of the recycled water meter and includes the meter.

On-site recycled water facilities typically consist of those recycled water facilities, which are or will be, owned, operated, and maintained by the user (or customer or private property owner), and is downstream of the recycled water meter. The customer typically constructs, operates, and maintains recycled water facilities, downstream of the meter as per the district's requirements set forth below. There are two types of on-site recycled water facilities: Non-Residential On-Site recycled water facilities and Residential Dual-Plumbed Homes. Note that the Residential Dual-

Plumbed Homes are not currently permitted as per the WDR Order dNo. WQ 2016-0068-DDW issued by the Central Coast Regional Water Quality Control Board (CCRWQCB).

600.1.2 Recycled Water System Inspection

Authorized representatives of MCWD shall inspect the entire recycled water system including both On-site and Off-site facilities. 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. MCWD shall conduct monitoring programs for Off-site recycled water system only, maintain a record as deemed necessary, and provide reports as requested by regulatory agencies.

For single-family residences receiving recycled water, the permit holder shall be responsible for providing access and cooperate with the MCWD's representative to 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 assembly. 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 DESIGN REQUIREMENTS FOR OFF-SITE RECYCLED WATER FACILITIES

600.2.1 Minimum Size

The typical minimum size distribution main shall be 8-inch looped line. Smaller than 6-inch diameter mains are not allowed. These mains shall be sized so that sufficient water is regularly drawn to prevent stagnation. Capital facilities will be designed and constructed by District and/or Developer in most cases.

Only 1-inch and 2-inch copper or polyethylene pipe is allowed for single-family residences. A 6-inch or larger size pipe is allowed for commercial/industrial use as service lateral lines.

On-site recycled water facilities (or Developer facilities) will be those recycled water mains of any diameter that is downstream of the water meter and located interior to the developer's project, refer to MCWD In-Tract Policy. Developer facilities designed by the developer shall be approved by District and remains with the developer to own, operate and maintain purpose. Developer facilities found on the private parcels downstream of the meter shall be the ownership of the developer.

600.2.2 Approved Pipe Materials

C-900 PVC pipe Pressure Class (PC) 235 or DR 18, shall be used for all 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. DIP may be used if properly sleeved and marked with purple marking tape. All pipe joints shall be restrained via restraint joint fittings or thrust blocks as approved by the District.

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. Typically, it shall be on the East or South side of the public right-of-way.

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 plans.

1. Recycled water systems shall be constructed in accordance with the requirements of District's potable water system design requirements.

2. Recycled water pipe shall be purple PVC C-900 pipe, PC 235 (DR 18), 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 service laterals 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 shall not be used for any other purpose than stated above. 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"

All piping shall conform to 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 48-hours prior to connection at (831) 883-5929 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 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.

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 California Plumbing Code, as adopted by the Authority Having Jurisdiction.

- 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, downstream side of the meter, 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 the 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.
4. Enter into an infrastructure agreement with the District and the Developer.

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:

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.

- Use or installation of hose bibs is prohibited on recycled water facilities where the public has access. 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 assembly 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 assembly 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 assembly 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 Adopted Marina Coast Water District Budget, lasted approved copy, which is available online at www.mcwd.org.

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 assembly 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 assembly may be installed at the point where the recycled main is connected to the potable system, instead of installing assembly at every irrigation meter.

Reduced pressure backflow prevention assembly are required on all potable water services to sites served with recycled water. The backflow prevention assembly 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 assembly will not be required on the potable services, but sites must be plumbed to allow the addition of the assembly 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. Immediate verbal notification followed by written notification within 10 business days 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 statues, 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 User Supervisor and Operations Manual

Specific information is required to be incorporated in the **User Supervisor and Operations Manual**. A list of the required information and an example of the URP can be found in Appendix19.

General guidelines for the User Supervisor and Operations Manual 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.

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 User's premises, the MCWD, state DDW, and the Regional Board must be immediately notified by the User within 24 hours. so that appropriate corrective measures may be taken. The District may impose a startup fee upon resumption of service to the User whose service has been terminated, depending on the severity of the violation of the provisions of the On-Site Recycled Water Use Permit.

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 assembly.

   B. Refusal to test a backflow prevention assembly.

   C. Refusal to repair a faulty backflow prevention assembly.

   D. Refusal to replace a faulty backflow prevention assembly.

   E. Refusal to install a RPBP on the potable service when recycled water is provided on site.

   F. Director 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.

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 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.

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.

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.
- PVC plastic pipe fittings shall meet or exceed all buried on-site piping specifications as stated above.

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 twenty-four (24)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.

600.6 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) 883-5929. In no case shall irrigation lines be backfilled before inspection by the District. If the non-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 assembly 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 Assembly

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.

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) 883-5929 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 sites receiving recycled water will be in accordance with these procedures and the on-site Recycle Water User Plan. Random inspections may also occur.

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.

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 assembly.

F. Homeowner Information. Provide the homeowner with literature regarding the design and construction and use guidelines of recycled water irrigation systems.

G. Notice of Violation will be issued if the recycled water system does not comply with MCWD procedures.

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. 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.

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 are to meet District standards.

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 assembly. 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.

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.

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 assembly. 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 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) 883-5929 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 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

The following procedures apply to all of the following landscape projects:

- New construction projects with a landscape area as defined in Section 700.3(A)(41) equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review;
- Rehabilitated landscape projects with a landscape area as defined in Section 700.3.(A)(41) equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
- Existing non-rehabilitated landscapes limited to Section 700.4; and
- Cemeteries. Recognizing the special landscape management needs of cemeteries, new and rehabilitated cemeteries are limited to Sections 700.9.3, 700.10.3 and 700.10.4; and existing cemeteries are limited to Sections 700.9 and Section 700.4.

Any project with a landscape area as defined in Section 700.3(A)(41) of 2,500 square feet or less may comply with either the performance requirements of this ordinance, described in Section 700.9, or conform to the prescriptive measures contained in Section 700.8.

These procedures 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
- Existing 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

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

1. “applied water” means the portion of water supplied by the irrigation system to the landscape.
2. “applicant signature” means the signature of the property owner or their designee.
3. “application rate” or “precipitation rate” means the rate at which an irrigation system applies water to a given area by an emission device(s), it is usually expressed as depth or volume per unit

time (i.e., inches per hour or gallons per hour). Application rate is generally used with drip irrigation while precipitation rate is generally used with overhead irrigation.

4. "automatic irrigation controller" means a timing device with stations that can be used to remotely control valves that operate an irrigation system. For the purposes of this ordinance, automatic irrigation controllers are able to self-adjust and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data (sensor-based).
5. "backflow prevention device" means a safety device required by the California Plumbing Code (Title 24, Part 5, Chapter 6) used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.
6. "Certificate of Completion Package" means the document with the required elements pursuant to Section 700.11.
7. "certified landscape irrigation auditor" means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program labeled by the US Environmental Protection Agency's WaterSense professional certification program including the Irrigation Association's Certified Landscape Irrigation Auditor program.
8. "check valve" or "anti-drain valve" means a valve used in a pipeline or emission device that holds water in the system to prevent drainage from emission devices when the system is off.
9. "common interest developments" means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 4100 and applies to this ordinance when there is a separate interest coupled with an interest in the common area or membership in the association per Chapter 2 Civil Code Section 4200 through 4202.
10. "compost" means the safe and stable product of controlled biologic decomposition of organic materials that is beneficial to plant growth.
11. "conversion factor (0.62)" means the number used in the Maximum Applied Water Allowance (MAWA) calculation that converts acre-inches per acre per year to gallons per square foot per year.
12. "dedicated irrigation meter" means a customer service meter dedicated to landscape use provided by the local water purveyor.
13. "designee" means a person or entity authorized to sign documents on behalf of the project applicant.
14. "designer of record" for the purposes of this ordinance means the professional practitioner or project applicant functioning and providing services in compliance with Division 3, Chapter 3.5, Article 3 of the Business and Professions Code.
15. "design review" means review by the jurisdiction having authority for enforcing the water efficient landscape ordinance.
16. "distribution uniformity" means the measure of the uniformity of irrigation water over a defined area.
17. "drip irrigation" means any non-spray low volume irrigation system utilizing emission devices where water is slowly applied at or below the soil surface and at or near the root zone of plants. Drip irrigation emission devices have a manufacturer specification for flow rate measured in gallons per hour.
18. "dynamic pressure" means the measure of water pressure with the water in motion, also known as working pressure.
19. "ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.
20. "effective precipitation" (Eppt) means the portion of total precipitation which becomes available for plant growth.
21. "emission device" means an irrigation system component that dispenses water to the landscape.
22. "established landscape" means the stage 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.

23. "establishment period of the plants" or "establishment period" means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth. Native habitat mitigation areas and trees may need three to five years for establishment.
24. "Estimated Total Water Use" (ETWU) is the sum of each hydrozone's estimated water use (EWU) and means the total water used for the landscape as described in Section 700.9.3. ETWU must be equal to or below the maximum applied water allowance (MAWA) to comply with Model Water Efficient Landscape Ordinance (MWELO).
25. "Estimated Water Use" (EWU) is the calculated water used for each hydrozone as described in Section 700.9.3.
26. "ET adjustment factor" (ETAF) means a factor 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. The maximum ETAF allowed in the MAWA equation must be equal to or below:
    a. 0.55 for residential regular landscapes areas.
    b. 0.45 for non-residential regular landscape areas.
    c. 1.0 for Special Landscape Areas.
    d. 0.8 for existing non-rehabilitated regular landscape areas over one acre in size installed before December 1, 2015, per Section 491.1.
27. "evapotranspiration rate" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.
28. "flow rate" means the volume of water per unit of time that flows through pipes, valves, and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.
29. "flow sensor" means an inline device installed at the supply point of the irrigation system that produces a repeatable signal proportional to flow rate. Flow sensors must be connected to a compatible automatic irrigation controller, or flow monitor capable of receiving flow signals and operating master valves. For the purposes of this definition, "compatible" means the flow sensor can communicate with the irrigation controller to allow the controller to record and report actual water usage. This combination flow sensor/controller may also function as a privately-owned submeter.
30. "friable" means a soil condition that is easily crumbled or loosely compacted down to a minimum depth per planting material requirements, whereby the root structure of newly planted material will be allowed to spread unimpeded.
31. "Fuel Modification Plan Guideline" means landscaping guidelines from a local fire authority to assist residents and businesses that are developing land or building structures in a fire hazard severity zone.
32. "gray water" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Gray water" includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers. Health and Safety Code Section 17922.12.
33. "hardscapes" means any durable material (pervious and non-pervious).
34. "hydrozone" means a section of the landscaped area having plants with similar water needs (i.e. "plant factors" as defined in Section 490.2.(A)(64)) and generally similar rooting depth (e.g. turfgrass (shallow to moderate), shrubs (moderate), and trees (deep)). A hydrozone may be irrigated or non-irrigated.

35. “infiltration rate” means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).
36. “invasive plant species” means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. Lists of invasive plants are maintained by the California Invasive Plant Council in their Inventory and invasive plants and noxious weeds by the USDA in their PLANTS database.
37. “irrigation audit” means 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 water waste, overspray or runoff that causes overland flow, and preparation of an irrigation schedule. The audit must be conducted in a manner consistent with the Irrigation Association's Landscape Irrigation Auditor Certification program or other U.S. Environmental Protection Agency “WaterSense” labeled auditing program.
38. “irrigation efficiency” (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied and is expressed as a percentage. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The average irrigation efficiency used in the Estimated Total Water use equation for purposes of this ordinance are:
    a. 0.75 for overhead irrigation systems, and
    b. 0.81 for drip irrigation systems.
39. “irrigation survey” means 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 recommendations to improve performance of the irrigation system.
40. “irrigation water use analysis” means an analysis of water use data based on meter readings and billing data.
41. “landscape area” (LA) means all the irrigated planting areas, turfgrass areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The irrigated planting 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 non-development (e.g., open spaces and existing native vegetation). The landscape area is the sum of the landscape projects’ regular landscape areas (RLA) and special landscape areas (SLA). LA = RLA + SLA.
42. “Landscape Documentation Package” means the documents required per the compliance option chosen by the applicant, described in Section 493.
43. “landscape project” for the purposes of this ordinance, means the total landscape area, defined in Section 700.3(A)(41), meeting requirements under Section 491 that requires a building or landscape permit, plan check or design review.
44. “lateral line” means the water delivery pipeline that supplies water from the valve to the emission devices.
45. “local agency” means a city or county, or city and 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.
46. “local water purveyor” means any entity, including a public agency, city, county, or private water company that provides retail water service.
47. “low head drainage” means a condition where water partially or completely drains from the lateral line through the emission device after the irrigation cycle is completed.
48. “master shut-off valve” is an automatic valve installed at the irrigation supply point which controls water flow into the irrigation system. When this valve is closed water will not be

supplied to the irrigation system. A master shut-off valve will greatly reduce any water loss due to a ruptured pipe or leak in the irrigation system.

49. "matched precipitation rate" or "matched application rate" means that all emission devices within a hydrozone delivers water at a similar precipitation rate per unit of time.
50. "Maximum Applied Water Allowance" (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in Section 700.9.3. It is based upon the area's reference evapotranspiration, the maximum ET Adjustment Factor allowed, and the size of the regular landscape area (RLA) and the special landscape area (SLA). MAWA = (ETo) x (0.62) x [ETAF x RLA + 1.0 x SLA]
51. "median" is a landscape project area between opposing lanes of traffic that may be unplanted or planted with trees, shrubs, perennials, and ornamental grasses.
52. "mined-land reclamation projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.
53. "mulch" means any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, or 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.
54. "multifamily residential landscape" means the landscape area surrounding or associated with any structure designed for human habitation that has been divided into two or more legally created independent living quarters.
55. "new construction" means, for the purposes of this ordinance, a new building with a landscape area or other new landscape project, such as a park, playground, or greenbelt without an associated building.
56. "non-residential landscape" means the landscape area surrounding or associated with commercial, institutional, industrial and public settings that may have areas designated for recreation or public assembly. It also includes the landscape area associated with common areas of common interest developments with designated recreational areas.
57. "non-volatile memory" means a type of computer memory used in automatic irrigation controllers that retains stored information after power is removed and will maintain the programmed irrigation schedule after power is restored.
58. "operating pressure" means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.
59. "overhead irrigation systems" means irrigation systems that deliver water through the air.
60. "overspray" means the irrigation water which is delivered beyond the target area.
61. "parkway" means the area between a sidewalk and the curb or traffic lane. It may be planted or unplanted, and with or without pedestrian egress.
62. "permit" means an authorizing document issued by local agencies for new construction or rehabilitated landscapes.
63. "pervious" means any surface or material that allows the passage of water through the material and into the underlying soil.
64. "plant factor" or "plant water use factor" is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this ordinance, the plant factor ranges are:
    a. very low water use plants is 0 to 0.1,
    b. low water use plants is 0.1 to 0.3,
    c. moderate water use plants is 0.4 to 0.6, (d) high water use plants is 0.7 to 1.0.

    Plant factors cited in this ordinance are derived from the database "Water Use Classification of Landscape Species". Plant factors may also be obtained from horticultural researchers from academic institutions or professional associations as approved by the California Department of Water Resources (DWR).

65. "project applicant" means the individual or entity submitting a Landscape Documentation Package required under Section 700.7, to request a permit, plan check, or design review from the local agency. A project applicant may be the property owner or their designee.
66. "rain sensor" or "rain sensing shutoff device" means a component which automatically interrupts an irrigation event when it rains.
67. "record drawing" or "as-builts" means 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.
68. "recreational area" means areas, excluding private single-family residential landscapes, designated for active play, recreation or public assembly in parks, sports fields, picnic grounds, amphitheaters or golf course tees, fairways, roughs, surrounds and greens.
69. "recycled water" or "reclaimed water" means treated wastewater of a quality suitable for nonpotable uses such as landscape irrigation and water features, as described in California Code of Regulations, Title 22, Division 4, Chapter 3. This water is not intended for human consumption.
70. "reference evapotranspiration" or "ETo" means a standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per day, month, or year as represented in MWELO Appendix C, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season turfgrass that is well-watered. The annual reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowances so that regional differences in climate can be accommodated.
71. "Regional Water Efficient Landscape Ordinance" means a local Ordinance adopted by two or more local agencies, water suppliers and other interested parties for implementing a consistent set of landscape provisions throughout a geographical region. Regional ordinances are strongly encouraged to provide a consistent framework for the landscape industry and applicants to adhere to.
72. "regular landscape area" (RLA) is the portion of the irrigated landscape area that is not a special landscape area. RLA = LA – SLA.
73. "rehabilitated landscape" means any landscape renovation project that requires a permit, plan check, or design review, meets the requirements of Section 491, and the modified landscape area is equal to or greater than 2,500 square feet.
74. "riser" means a length of pipe with male nominal pipe threads on each end usually affixed to a lateral or submain supporting a sprinkler head or anti-siphon valve.
75. "runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the target landscape area. Runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate), from low head drainage, or when there is a slope.
76. "single-family residential landscape" means the landscape areas surrounding or associated with a one or two-family dwelling or townhouse. Swimming pools of single-family residential landscapes are water features and not special landscape areas.
77. "soil moisture sensing device" or "soil moisture sensor" means a device that measures the amount of water in the soil and sends a signal to the automatic irrigation controller to interrupt or initiate an irrigation event.
78. "soil texture" means the classification of soil based on its percentage of sand, silt, and clay.
79. "Special Landscape Area" (SLA) means an irrigated area that may be all or part of the landscape project and is permanently and solely dedicated to edible plants such as orchards and vegetable gardens, recreational areas, areas irrigated with recycled water, or water features using recycled water.
80. "sprinkler head" or "sprinkler" means an emission device that applies water by converting water pressure to a high velocity discharge stream or stream(s) through the air by a nozzle (e.g. spray,

rotors and rotators). Sprinklers have a manufacturer specification for flow rate measured in gallons per minute.

81. "static water pressure" means the pipeline or municipal water supply pressure when water is not flowing.
82. "station" means a hydrozone served by a circuit on an automatic irrigation controller that operates either one valve or a set of valves that operate simultaneously.
83. "swing joint" means 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.
84. "submeter" means a privately owned metering device to measure water applied to the landscape that is installed after the primary utility water meter.
85. "turfgrass" means a living ground cover surface of mowed grass.
86. "valve" means a device used to control the flow of water in the irrigation system.
87. "water budget calculation" means the calculation of a landscape water budget defined by Estimated Water Use (EWU), Estimated Total Water Use (ETWU) and Maximum Applied Water Allowance (MAWA).
88. "water conserving plant species" means a plant species identified as having a very low or low plant factor.
89. "water feature" means 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 high-water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.
90. "water waste" means the over application of water through inefficient landscape irrigation that causes runoff to leave the target landscape area onto adjacent property, non-irrigated landscapes, private and public walkways, roadways, parking lots, or structures. Water waste includes low head drainage, overspray, runoff, or other similar conditions that causes overland flow.
91. "watering window" means the times of days per week and the hours per day irrigation is allowed.
92. "WUCOLS" means the Water Use Classification of Landscape Species maintained by the California Center for Urban Horticulture, University of California. WUCOLS is an online database that classifies and provides regional water needs for commonly available landscape plants.

700.4 PROVISIONS FOR EXISTING NON-REHABILITATED LANDSCAPES

A. This section, 491.1, shall apply to all existing non-rehabilitated landscapes that were installed before December 1, 2015 and are over one acre in size.

1. For all existing non-rehabilitated landscapes that have a water meter, the local agency shall administer programs that may include, but not be limited to, irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for existing non-rehabilitated landscapes.
   a. The Maximum Applied Water Allowance for existing non-rehabilitated landscapes shall be calculated as: MAWA = (ETo) x (0.62) x (0.8 x RLA + 1.0 x SLA).
2. For all existing non-rehabilitated landscapes, that do not have a meter, the local agency shall administer programs that may include, but not be limited to, irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary in order to prevent water waste.
   a. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

700.5 PROVISIONS FOR NEW CONSTRUCTION OR REHABILITATED LANDSCAPES

There are two options for compliance with the Model Water Efficient Landscape Ordinance;

A. Prescriptive compliance option as described in Sections 700.7(A), 700.8, and 700.11(A).

B. Performance compliance option as described in Sections 700.7(B), 493, and 700.11(B).

An applicant may comply with either the prescriptive or performance compliance option for any new construction project with a landscape area between 500 and 2,500 square feet.

An applicant shall use the performance compliance option for any landscape project with a landscape area of 2,500 square feet, or greater.

700.6 SUBMITTAL PROCEDURES

Prior to construction, the project applicant shall:

A. Submit payment to the District for plan check procedures.
B. The applicant shall indicate which Compliance Option is selected for the project.
C. Submit one (1) printed copy and one (1) electronic PDF copy of the Landscape Documentation Package (per the compliance option requirements) to the District for plan check procedures, the development of comments, and if required, a listing of requested revisions. The Landscape Documentation Package will be reviewed as many times as needed until the District requirements and standards are satisfied.
D. Receive the District's authorization to construct and record the date of the District authorization in the Certificate of Completion.
E. 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.
F. Submit a copy of the District approved Landscape Documentation Package to the property owner or his/her designee.

Prior to construction, the District shall:

A. Provide the project applicant with an outline of the District's procedures for project authorization.
B. Provide a receipt for payment of fees, deposits, and charges.
C. Review the submitted Landscape Documentation Package, develop comments, and if required, request revisions to the documents submitted by the project applicant.
D. Approve or deny the Landscape Documentation Package; and
E. Upon approval, provide District authorization to construct.

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

A. 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.

B. 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.

C. Submit the MCWD accepted Landscape Documentation Package and Certificate and Completion along with the record drawings, and any other information to the property owner or their designee.

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

A. Provide a signed copy of the Certificate of Completion to the applicant.
B. Keep a record of the documentation for water use evaluation.
C. 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.

700.7 ELEMENTS OF THE LANDSCAPE DOCUMENTATION PACKAGE

A. Prescriptive Compliance. Submit a Landscape Documentation Package which includes:

3. Project information sheet with the following elements;
   b. Date
   c. Name of the project applicant
   d. Contact information for the project applicant and property owner
   e. Project address (including parcel and/or lot number(s))
   f. Total landscape area (square feet)
   g. Project type (e.g., institutional (i.e. public), private, cemetery, homeowner- installed)
   h. Water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well
   i. Applicant signature and date with statement, "I agree to comply with the requirements of the prescriptive compliance option to the MWELO."
4. A landscape design plan that includes:
   a. Total landscape area (square feet)
   b. A breakdown of turfgrass and plant material (e.g., plant legend).

B. Performance Compliance. The Landscape Documentation Package shall include the following six (6) elements:

1. Project information sheet that includes;
   a. Date
   b. Name of the project applicant
   c. Contact information for the project applicant and property owner
   d. Project address (including parcel and/or lot number(s))
   e. Total landscape area (square feet)
   f. Project type (e.g., new, rehabilitated, institutional (i.e. public), private, cemetery, homeowner-installed)
   g. Water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well
   h. Checklist of all documents in Landscape Documentation Package
   i. Applicant signature and date with statement, "I agree to comply with the requirements for the performance compliance option of the water efficient landscape ordinance and submit a complete Landscape Documentation Package."
2. Soil management report (pursuant to Section 700.9.1);
3. Landscape design plan (pursuant to Section 700.9.2);
4. Grading design plan (pursuant to Section 700.9.2.1);
5. Irrigation design plan (pursuant to Section 700.9.2.3); and
6. Water Efficient Landscape Worksheet (pursuant to Section 700.9.3);
   a. Maximum Applied Water Allowance (MAWA)
   b. Estimated Water Use (EWU)
   c. Estimated Total Water Use (ETWU)

700.8 PRESCRIPTIVE COMPLIANCE OPTION

This section contains prescriptive requirements, which may be used as a compliance option for new construction projects with a landscape area between 500 and 2,500 square feet.

Compliance with the requirements of this section is mandatory and must be documented in the Landscape Documentation Package pursuant to Section 700.7(A) in order to use the prescriptive compliance option.

Landscape project requirements

A. Incorporate compost at a rate of at least four cubic yards per 1,000 square feet to a depth of six inches into landscape area (unless contra-indicated by a soil test). Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.

B. Irrigation systems shall comply with the following:

   1. For non-residential projects with landscape areas of 1,000 sq. ft. or more, a dedicated irrigation meter or private submeter(s) to measure landscape water use shall be installed.
   2. Automatic irrigation controllers are required and must use either evapotranspiration (weather-based) or soil moisture (sensor-based) data and utilize a rain sensor.
   3. Irrigation controllers shall use non-volatile memory.
   4. Pressure regulating devices, which may include pressure boosters or reducers, shall be installed on the irrigation system to ensure the dynamic pressure of the system is within the manufacturers recommended pressure range.
   5. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be installed as close as possible to the point of connection of the water supply.
   6. All irrigation emission devices must meet the requirements set in the ANSI standard, ASABE/ICC 802-2020. “Landscape Irrigation Sprinkler and Emitter Standard,” All sprinkler heads installed in the landscape must document a low-quarter distribution uniformity of 0.65 or higher using the protocol defined in ASABE/ICC 802-2020.
   7. Non-rotating spray sprinkler bodies to meet the standards described in the California Code of Regulations, Title 20, Division 4, Chapter 4, Section 1605.3(x).
   8. Landscape areas less than ten (10) feet in width in any direction shall be irrigated with subsurface irrigation or other means that produces no water waste, runoff or overspray.

C. Plant material shall comply with all of the following;

   1. For residential landscapes, install climate adapted plants that require occasional, little or no summer water (average WUCOLS plant factor 0.3) for 75% of the landscape area excluding areas permanently and solely dedicated to edible plants;
   2. For non-residential landscapes, install climate adapted plants that require occasional, little or no summer water (average WUCOLS plant factor 0.3) for 100% of the landscape area excluding areas permanently and solely dedicated to edible plants, and areas using recycled water;
   3. Turfgrass shall comply with all of the following:
      a. Turfgrass shall not exceed 25% of the landscape area in residential landscapes,
      b. There shall be no turfgrass in non-residential landscapes;
      c. Turfgrass shall not be planted on sloped areas which exceed a slope of 1 foot vertical elevation change for every 4 feet of horizontal length;

d. Turfgrass is prohibited in parkways less than 10 feet wide, unless the parkway is adjacent to a parking strip and used to enter and exit vehicles. Any turfgrass in parkways must be irrigated by subsurface irrigation or by other technology that creates no water waste, overspray or runoff.

4. A minimum three inch (3″) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turfgrass areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.

The designer of record shall make plants identifiable to an inspector during final inspection. Plants must be identifiable by botanical name, common name or cultivar as specified in Division 18, Chapter 5, Article 7 of the Food and Agricultural Code.

At the time of final inspection, the permit applicant must provide the owner of the property and the local agency with a certificate of completion package, pursuant to Section 700.11(A).

700.9 PERFORMANCE COMPLIANCE OPTION

The performance compliance requirements shall be used as the compliance option for any landscape project with greater than 2,500 square feet of area and documented in the Landscape Documentation Package, Section 700.7(B), and the Certificate of Completion Package, as described in Section 700.11(B).

700.9.1 SOIL MANAGEMENT REPORT

A soil management report shall be completed by the project applicant, or their designee, as follows:

A. Submit soil samples to a laboratory for analysis and recommendations.

1. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.
2. The soil analysis shall include:
   a. soil texture;
   b. infiltration rate determined by laboratory test or soil texture infiltration rate table;
   c. pH;
   d. total soluble salts;
   e. sodium;
   f. percent organic matter; and
   g. recommendations.
3. In landscape projects with multiple landscape installations (i.e. production home developments) a soil sampling rate of 1 in 7 lots or approximately 15% of the total number of lots will satisfy this requirement.
   a. Large landscape projects shall sample at a rate equivalent to 1 in 7 lots.
4. The project applicant, or their designee, shall comply with one of the following:
   a. If significant mass grading is not planned, the soil management report shall be submitted to the local agency as part of the Landscape Documentation Package; or
   b. If significant mass grading is planned, the soil management report shall be submitted to the local agency as part of the Certificate of Completion.
5. The soil management report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.

6. The project applicant, or their designee, shall submit documentation verifying implementation of soil management report recommendations to the local agency with the Certificate of Completion. Recommendations may include, but not limited to the following:
   a. A specification indicating 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.
   b. A specification of the type and quantity of soil amendments and fertilizers to be incorporated into each 1000 square feet of planting area.
   c. A specification of the type and quantity of mulch material required to provide two to six-inch deep layer of mulch to all planting areas (except turf).
7. A sample Soil Analysis and Soil Amendment Recommendation is available in Appendix 42.

700.9.2 LANDSCAPE DESIGN PLAN

A. Landscape Design Plan. The landscape design plan, at a minimum shall

1. Delineate and label each hydrozone by number, letter or other method;
2. Identify the plant factor for each hydrozone as very low, low, moderate, high, or mixed water use.
   a. Temporarily irrigated landscape areas shall use the low water use plant factor range in the water budget calculation.
3. Identify special landscape areas, including:
   a. recreational areas;
   b. areas permanently and solely dedicated to edible plants;
   c. areas irrigated with or water features using recycled water;
4. Identify type of mulch and application depth;
5. Identify type and quantity of soil amendments;
6. Identify type and surface areas of water features;
7. Identify hardscapes (pervious and non-pervious);
8. Identify location, installation details, and 24-hour retention or infiltration capacity of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Project applicants shall refer to the local agency or regional Water Quality Control Board for information on any applicable stormwater technical requirements. Stormwater best management practices are encouraged in the landscape design plan and examples are provided in Section 490.1(A)(5) requirements.
9. Identify any applicable rain harvesting or catchment technologies and their 24-hour retention or infiltration capacity, if applicable;
10. Identify any applicable graywater discharge piping, system components, and area(s) of distribution;
11. Designated insect habitat must be identified in the landscape design plan. (12) The designer of record shall make plants identifiable to an inspector during final inspection. Plants must be identifiable by botanical name, common name or cultivar as specified in Division 18, Chapter 5, Article 7 of the Food and Agricultural Code.
12. Contain the following statement: “I have complied with the performance compliance option criteria of the ordinance and applied them for the efficient use of water in the landscape design plan”; and
13. Bear the signature of the designer of record. (See Division 3, Chapter 3.5, Article 3 of the Business and Professions Code).

B. Plant Selection

1. Any plant may be selected for the landscape, providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance.
2. The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.
3. Each hydrozone shall have plant materials with similar water use. (A) Exceptions are allowed for hydrozones that use a mix of plant materials with low and moderate plant factors or moderate and high plant factors, as specified in Section 700.9.2.3(D)(7).
4. High water use plants, characterized by a plant factor range of 0.7 to 1.0, are prohibited in street medians.
5. Turfgrass is not allowed on slopes greater than 25% where the toe of the slope is adjacent to a non-pervious 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).
6. Methods to achieve water efficiency shall include one or more of the following:
   a. Protection and preservation of native species and natural vegetation;
   b. Selection of plants based on local climate suitability, disease and pest resistance;
   c. Selection of water-conserving plant, tree and turfgrass species, especially local native plants;
   d. Selection of trees based on applicable local tree ordinances or tree shading guidelines, and size at maturity as appropriate for the planting area; and
   e. Selection of plants from local and regional landscape program recommended plant lists;
   f. Selection of plants from local Fuel Modification Plan Guidelines.
7. Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. Methods to achieve water efficiency shall include one or more of the following:
   a. Use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;
   b. Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure [e.g., buildings, sidewalks, power lines]; allow for adequate soil volume for healthy root growth; and
   c. Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

C. Water Features

1. Recirculating water systems shall be used for water features.
2. Surface area of a water feature shall use the high water use hydrozone plant factor in the water budget calculation.
3. Pool and spa covers are highly recommended pursuant to Division 104, Part 10, Chapter 5, Article 2.5 of the Health and Safety Code.

D. Soil Preparation, Mulch and Amendments

1. Prior to the planting of any materials, compacted soils shall be transformed to a friable condition. On engineered slopes, only amended planting holes need meet this requirement.

2. Soil amendments shall be incorporated according to recommendations of the soil management report and what is appropriate for the plants selected (see Section 700.9.1).
3. For landscape installations, compost at a rate of a minimum of four cubic yards per 1,000 square feet of pervious area shall be incorporated to a depth of six inches into the soil. Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.
4. A minimum three-inch (3″) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turfgrass areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.
5. To provide habitat for beneficial insects and other wildlife, up to 5% of the landscape area may be left without mulch and identified in the landscape design plan (see Section 700.9.2(A)(11)).
6. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement in Section 700.9.2(D)(4).
7. Stabilizing mulching products shall be used on slopes that meet current engineering standards.
8. Organic mulch made from recycled or post-consumer materials shall take precedence over inorganic materials or virgin forest products unless the recycled post-consumer organic products are not locally available.
    a. Organic mulches are not required where prohibited by local Fuel Modification Plan Guidelines or other applicable local ordinances. (Public Resources Code Section 4291)

700.9.2.1 GRADING DESIGN PLAN

A. Grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading plan shall be submitted by the project applicant as part of the Landscape Documentation Package. A comprehensive grading plan the local agency for other local agency permits satisfies this requirement.

1. A landscape grading plan that indicates finished configurations and elevations of the landscape area including:
    a. height of graded slopes;
    b. drainage patterns;
    c. pad elevations;
    d. finish grade; and
    e. stormwater retention improvements, if applicable.
2. To prevent excessive erosion and runoff, it is highly recommended that project applicants:
    a. grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-pervious hardscapes;
    b. avoid disruption of natural drainage patterns and undisturbed soil; and
    c. avoid soil compaction in landscape areas.
3. The grading design plan shall contain the following statement: “I have complied with the performance compliance option criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan” and shall bear the signature of a licensed professional as authorized by law.

700.9.2.2 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.

700.9.2.3 IRRIGATION DESIGN PLAN

A. This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers' recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

B. Irrigation System Efficiency

1. The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in Section 493.5 regarding the Maximum Applied Water Allowance
2. For the purpose of determining Estimated Total Water Use, average irrigation system efficiency is assumed to be:
   a. 0.75 for overhead irrigation systems and
   b. 0.81 for drip irrigation systems.
3. Sprinkler head spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer’s recommendations. Head-to-head coverage is recommended.

C. Irrigation Design Plan Criteria. The irrigation design plan, at a minimum, shall contain:

1. Location and size of separate water meters and submeters;
2. Location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, emission devices, moisture sensing devices, rain sensors, quick couplers, pressure regulating devices, and backflow prevention devices;
3. Static water pressure at the point of connection to the public water supply;
4. Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for the emission devices controlled by each station;
5. Identify special landscape areas irrigated with and water features using recycled water as specified in Section 490.1.(A).(3);
6. Identify any applicable graywater discharge piping, system components, and landscape areas where graywater is distributed;
7. On the irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation as identified on the landscape design plan. Designate the areas irrigated by each valve, and assign a number to each valve using the Water Efficient Landscape Worksheet (see MWELO Appendix A). This table can also assist with the irrigation audit and programming the controller,
   a. Each valve shall irrigate a hydrozone, or part of a hydrozone, with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
8. The following statement: “I have complied with the performance compliance option criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan”; and
9. The signature of the designer of record. (See Division 3, Chapter 3.5, Article 3, of the Business and Professions Code)

D. General Design Criteria

1. Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system as specified in the California Plumbing Code (Title 24, Part 5, Chapter 6). A project applicant shall refer to the applicable local agency code (i.e., public health) for additional backflow prevention requirements.
2. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
3. Emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
4. Where feasible, trees shall be placed on separate stations from hydrozones that include shrubs, groundcovers, and turfgrass to facilitate the appropriate irrigation of trees. The mature size and extent of the root zone shall be considered when designing irrigation for the tree.
5. In mulched planting areas, the use of low-pressure and low volume irrigation systems is required to maximize water infiltration into the root zone.
6. Areas less than ten (10) feet in width in any direction shall be irrigated with subsurface irrigation or other means that produces no water waste, runoff, or overspray.
7. Individual hydrozones that use a mix plants of with low and moderate plant factors, or moderate and high plant factors, may be allowed if the plant factor used in the calculation of the estimated water use (EWU) is either: (A) plant factor calculation is based on the proportions of the respective plant factors; or (B) the highest plant factor is used.
8. Individual hydrozones that use a mix of plants with high and low plant factors shall not be permitted.
9. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
10. Overhead irrigation shall not be permitted within 24 inches of any non- pervious surface. Allowable irrigation within the setback from non-permeable surfaces may include drip irrigation, 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. no runoff occurs;
    b. the adjacent non-pervious surfaces are designed and constructed to drain entirely to landscaping; or
    c. the irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package and clearly demonstrates strict adherence to the prevention of water waste. Prevention of overspray and runoff must be confirmed during the irrigation audit.
11. Restrictions regarding overspray and runoff in any irrigation system may be modified if:
    a. the landscape area is adjacent to pervious surfacing and no runoff occurs; or
    b. the adjacent non-pervious surfaces are designed and constructed to drain entirely to landscaping; or
12. Slopes greater than 25% shall not be irrigated with an irrigation system using an application rate exceeding 0.75 inches per hour.
    a. 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 the irrigation audit.

13. It is highly recommended that the project applicant or local agency inquire with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
14. Individual hydrozones that mix high and low water use plants shall not be permitted.
15. 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.

E. Irrigation System Component Criteria

1. Meters
   a. 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.
   b. Pursuant to California Water Code Section 535, MCWD shall install dedicated irrigation meters for new retail water service to a property with more than 5,000 sq.ft. of irrigated landscape excluding single-family residential connections and connections for the commercial production of agricultural crops or livestock.
   c. A submeter or dedicated irrigation meter shall be installed and may be used to assist with leak detection and water management for:
      i. non-residential landscapes with an irrigated landscape of 1,000 sq.ft. or more.
      ii. residential landscapes with an irrigated landscape of 5,000 sq. ft. or more.
2. Water Pressure
   a. Static water pressure, dynamic or operating pressure, and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.
   b. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.
   c. If the water pressure is below or exceeds the recommended pressure of the specified emission devices, the installation of a pressure-regulating devices device is required to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
3. Water Waste Prevention Equipment
   a. The irrigation system shall be designed to prevent water waste.
   b. Master shut-off valves are required on all projects except landscapes that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features.
   c. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency (such as a break in the pressurized pipeline that delivers water from the water source to the valve or outlet) or routine repair.

d. Check valves or anti-drain valves are required on all sprinkler heads where low point drainage could occur.
e. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to hardscapes or in high traffic areas of turfgrass.
f. Flow sensors that detect high flow conditions created by system damage or malfunction are required for all on non-residential landscapes and residential landscapes of 5000 sq. ft. or larger.

4. Emission Devices
   a. Emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.
   b. All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standard, American Society of Agricultural and Biological Engineers'/International Code Council's (ASABE/ICC) 802-2020 “Landscape Irrigation Sprinkler and Emitter Standard.
      i. All overhead irrigation systems installed in the landscape must document a low quarter distribution uniformity of 0.65 or higher using the protocol defined in ASABE/ICC 802-2020.
   c. Non-rotating spray sprinkler bodies are required to meet standards described in California Code of Regulations Title 20, Division 2, Chapter 4, Section 1605.3(x).
5. System Controls
   a. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for scheduling irrigation events.
   b. Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.

700.9.2.3.1 IRRIGATION DESIGN PLAN REQUIREMENTS

A. 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 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..
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.

700.9.3 WATER EFFICIENT LANDSCAPE WORKSHEET

A. A project applicant shall complete the Water Efficient Landscape Worksheet in MWELO Appendix A which compares the landscape project's Estimated Total Water Use (ETWU) with the Maximum Applied Water Allowance (MAWA). ETWU must be equal to or below the MAWA.

1. The MAWA is calculated based on the maximum ETAF allowed for the landscape project and expressed as annual gallons allowed. The maximum ETAF allowed is:
   a. 0.55 for residential regular landscape areas,
   b. 0.45 for non-residential regular landscape areas,
   c. 1.0 for new and existing (non-rehabilitated) Special Landscape Areas. (2) The ETWU is the sum of estimated water use (EWU) for each hydrozone.
2. The evapotranspiration adjustment factor (ETAF) for each hydrozone is based on the plant factor and the average irrigation system efficiency. EWU is calculated using the ETAF, regular landscape areas, and the special landscape areas.
3. In calculating the Maximum Applied Water Allowance and Estimated Total Water Use, a project applicant shall use the ETo values from the Reference Evapotranspiration Table in MWELO Appendix C. For geographic areas not covered in MWELO Appendix C, use data from other cities located nearby in the same reference evapotranspiration zone, as found in the CIMIS Reference Evapotranspiration Zones Map, Department of Water Resources, 1999.

B. Water budget calculations shall adhere to the following requirements:

1. The plant factor used shall be from WUCOLS or from horticultural researchers with academic institutions or professional associations as approved by the California Department of Water Resources (DWR). The plant factor ranges are:
   a. 0 to 0.1 for very low water using plants,
   b. 0.1 to 0.3 for low water use plants,
   c. 0.4 to 0.6 for moderate water use plants,
   d. 0.7 to 1.0 for high water use plants.
2. All water features shall use the high water use plant factor in the water budget calculations.
3. Temporarily irrigated areas shall use the low water use plant factor in the water budget calculations.
4. All Special Landscape Areas (SLA) shall be identified in the Landscape Design Plan (Section 700.9.2) and the Irrigation Design Plan (Section 700.9.3) and their water use calculated as shown in MWELO Appendix A.
5. A local agency may consider Effective Precipitation (25% of annual precipitation) in tracking water use and may use the following equation to calculate Maximum Applied Water Allowance:
   a. Residential landscapes:

      MAWA = (ETo - Eppt) x (0.62) x [0.55 x RLA + 1.0 x SLA].

   b. Non-residential landscapes:

      MAWA = (ETo - Eppt) x (0.62) x [0.45 x RLA + 1.0 x SLA].

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

D. 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.

700.9.3.1 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:

A. 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.

B. The project applicant shall use a local, historical, reference evapotranspiration (ETo) 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**

C. The surface area of water features shall be included in the calculation of Landscape Area.

D. 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 = (ETo)(0.62)[(0.7 x LA) + (0.3 x SLA)]

Where MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = 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.

MAWA = (ETo)(0.62)[(0.7 x LA)+(0.3 x SLA)]
MAWA = (51.1 inches)(0.62)[(0.7 x 50,000 square feet) + (0.3 x 0)]
= 1,108,870 gallons per year

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 ETo 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.

MAWA = (ETo) (0.62)[(0.7 x LA)+(0.3 x SLA)]
MAWA = (51.1 inches)(0.62)[(0.7 x 50,000 square feet) + (0.3 x 2,000 square feet)]
= 31.68 x [35,000 +600] gallons per year
= 31.68 x 35,600 gallons per year
=1,127,808 gallons per year or 1,508 hundred-cubic-feet per year

700.9.3.2 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.

A. The project applicant shall use a local, historical, reference evapotranspiration (ETo) 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**

B. The surface area of water features shall be included in the calculation and assigned a high water use plant factor of 1.0.

C. Hydrozones classified as Special Landscape Area shall be identified. There is no plant factor multiplier for the Special Landscape Area.

D. 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.

E. Temporarily irrigated areas shall be included as a low water use hydrozone.

ETWU = (ETo)(0.62)[(PF x HA/IE) + SLA]
Where:
ETWU = Estimated Total Water Use per year (gallons)
ETo = 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)

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 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.

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

ETWU = (51.1)(0.62)(33,098 + 2,000)
= 1,111,975 gallons per year

Compare ETWU with MAWA. For this example:
MAWA = (51.1)(0.62)[(0.7 x 50,000) +(0.3 x 2000)]
= 31.68 x [35000 +600]
= 31.68 x 35,600
=1,127,808 gallons per year

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.

700.9.4 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.

700.9.5 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.

700.9.6 IRRIGATION SCHEDULING CRITERIA

A. All irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health and prevent water waste. Irrigation schedules shall meet the following criteria:

1. Irrigation scheduling shall be regulated by automatic irrigation controllers.
2. Parameters used to set the automatic irrigation controller shall be developed and submitted with the Certificate of Completion for each of the following:
   a. the plant establishment period;
   b. the established landscape; and
   c. temporarily irrigated areas.
3. Each irrigation schedule shall consider for each station all of the following parameters that apply:
   a. irrigation interval (days between irrigation events);
   b. irrigation run times (hours or minutes per irrigation event to avoid runoff and prevent water waste);
   c. number of cycle starts required for each irrigation event to avoid runoff and prevent water waste;
   d. amount of applied water scheduled to be applied on a monthly basis; (E) application rate setting;
   e. root depth setting; (G) plant type setting; (H) soil type;
   f. slope factor setting;
   g. shade factor setting; and
   h. distribution uniformity or irrigation efficiency setting.
4. Overhead irrigation systems shall be scheduled between 8:00 p.m. and 10:00 a.m. unless weather conditions prevent it. If the local agency or water purveyor has watering windows that are different or longer, the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
5. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA).
   a. Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.
   b. For implementation of the irrigation schedule, carefully consider the irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water does not exceed the Estimated Total Water Use.

700.10 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.

700.10.1 IRRIGATION SYSTEM MAP

A. 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.

700.10.2 INDIVIDUAL STATION MAPS

A. 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

B. Unique Hydrozone information (used to program the controller) including:

1. plant factor
2. soil type
3. sun exposure
4. slope
5. allowable water deficiency
6. root zone depth

An example Individual Station Map is shown in Appendix 40.

700.10.2.1 IRRIGATION EQUIPMENT

To promote water conservation the following equipment is required.

A. District-approved, weather- based irrigation controllers or soil moisture-based irrigation controllers shall be installed by the developer to control watering systems in:

1. 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.
2. Multiple parcels and lots served by a single point of connection and having an aggregate landscape area greater than 2,500 square feet.

B. 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.

C. 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:

1. Irrigation interval (days between irrigation);
2. Irrigation run times (hours or minutes per irrigation event to avoid runoff);
3. Number of cycle starts required for each irrigation event;
4. Application rate setting;
5. Plant type setting;
6. Soil type;
7. Slope factor setting;
8. Shade factor setting; and
9. Irrigation uniformity or efficiency setting.

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

E. 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.

F. 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.

G. A pressure-reducing valve must be installed down-stream of the strainer for each system using recycled water, unless otherwise determined to be inappropriate.

H. 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).

I. Bubbler flow rates shall not exceed 1.5 gallons per minute per device. Adjustable bubblers are not permitted.

J. Pop-up sprinklers shall have a minimum riser height of 6-inches.

K. 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.

L. Dedicated landscape water meters shall be installed for all landscape projects except for single family homes.

M. 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.

N. 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.

O. Anti-drain (check) valves shall be designed into drip irrigation systems, at strategic points, to minimize or prevent low-head drainage.

P. In-head pressure regulation and check valve devices are required in overhead sprinklers when the device is available from the manufacturer.

Q. It is recommended that soil moisture sensing devices be considered where appropriate.

700.10.2.2 ADDITIONAL IRRIGATION EQUIPMENT FOR LARGE LANDSCAPES

A. 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.

B. Automatically operated master control valves must be installed to protect against water loss due to mainline breaks or system malfunction.

C. Flow meters must be installed to allow observation, water loss protection, and recording of irrigation parameters.

700.10.3 LANDSCAPE AND IRRIGATION MAINTENANCE SCHEDULE

A. Landscapes shall be maintained to ensure water use efficiency. A regular landscape and irrigation maintenance schedule shall be submitted with the Certificate of Completion.

B. A regular maintenance schedule shall include, but not be limited to routine inspection; auditing, adjustment and repair of the irrigation system and its components; aerating and dethatching turfgrass areas; topdressing with compost, replenishing mulch; fertilizing; pruning; weeding in all landscape areas and removing obstructions to emission devices.

   1. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

C. Repair of all irrigation equipment shall be done with replacement parts for the originally installed components or their equivalents or with components that improve the average irrigation system efficiency.

D. A project applicant is encouraged to implement established landscape industry sustainable Best Practices for all landscape maintenance activities.

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

700.10.4 IRRIGATION AUDIT

A. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor. Landscape irrigation audits shall not be conducted by the person who designed the landscape or installed the landscape.

B. In large landscape projects or landscape projects with multiple landscape installations (i.e. production home developments) an auditing rate of 1 in 7 individual lots or approximately 15% of the total number of individual lots will satisfy this requirement.

C. For new construction and rehabilitated landscape projects installed after December 1, 2015, as described in Section 491 493.

   2. the project applicant shall submit an irrigation audit report with the Certificate of Completion to the local agency that 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;
   3. the local agency shall 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.

700.11 CERTIFICATE OF COMPLETION PACKAGE

A. Prescriptive Compliance Option. The Certificate of Completion Package (see MWELO Appendix B for a sample certificate) shall include:

1. A certificate of completion limited to:
   a. Project Information Sheet (MWELO Appendix B – Element 1)
   b. Certificate of Installation according to the Landscape Documentation Package (MWELO Appendix B – Element 2)
   c. addressing applicable parameters as described in Section 700.9.6(A)(3); (MWELO Appendix B – Element 4):
   d. Landscape and irrigation maintenance schedule (MWELO Appendix B – Element 5).

B. Performance Compliance Option. The Certificate of Completion Package (see MWELO Appendix B for a sample certificate) shall include the following six (6) elements:

1. project information sheet that contains:
   a. date;
   b. project name;
   c. project applicant name, telephone, and mailing address; (D) project address and location; and
   d. property owner name, telephone, and mailing address;
2. certification by the designer of record that the landscape project has been installed per the approved Landscape Documentation Package (see Section 700.7);
   a. where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;
   b. A diagram of the irrigation plan showing hydrozones shall be kept with the automatic irrigation controller for subsequent management purposes.
3. soil management report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations (see Section 700.9.1).
4. irrigation scheduling parameters used to set the automatic irrigation controller (see Section 700.9.6);
5. landscape and irrigation maintenance schedule (see Section 700.10.3);
6. irrigation audit report (see Section 700.10.4); and

C. The project applicant shall:

1. submit the signed Certificate of Completion Package to the local agency for review;
2. ensure that copies of the approved Certificate of Completion Package are submitted to the local water purveyor and property owner or their designee.

D. The Marina Coast Water District shall:

1. receive the signed Certificate of Completion Package from the project applicant;
2. approve or deny the Certificate of Completion Package. If the Certificate of Completion Package is denied, the local agency shall provide information to the project applicant regarding reapplication, appeal, or other assistance.

700.12 ON-SIE RECYCLE 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.

700.13 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.

A. 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.

B. 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.

C. 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.

700.14 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.

700.15 PENALTIES

The District may establish penalties for noncompliance with these standards.

700.16 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.

700.17 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)
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

APPENDIX 19

ON-SITE RECYCLED WATER USER PLAN

APPENDIX 19

MARINA COAST WATER DISTRICT

ON-SITE RECYCLED WATER USER PLAN REQUIREMENTS

GENERAL INFORMATION

- Project Name.
- Map of use areas and narrative description.
- Assessor's parcel numbers.
- Property owner's name, title, address, and phone number.

SITE CHARACTERISTICS

- Type of property.
- Acres to be irrigated.
- Topography of the site (slope of the land).
- Soil types and their capacities to accept water, minimum infiltration rate, etc.
- Present source of irrigation water. Describe method of disconnection from current system and backflow prevention.

IRRIGATION DEMAND

- Calculations of estimated irrigation demand by month.
- Estimated annual demand.
- Maximum day demand.
- Irrigation time of day.
- Irrigation application rate.

DESIGN AND CONSTRUCTION

- Source of recycled water.
- Schematic diagram of recycled water distribution system.
- Detailed maps of on-site piping location, size, and type of pipe, valves, sprinkler heads, and points of use.
- Name, title, address, and phone number of the person who will maintain accurate up-to-date maps, plans, and operation information for the on-site non-residential recycled water system.
- Describe evapotranspiration based timer operation.
- Identify points of possible interconnection with the water system and describe air gap separations.
- Describe types of sprinkler heads or outlets that will apply the recycled water. Set back distances between the recycled water sprinklers and adjacent roads, walks, houses, businesses, food service areas, drinking fountains, swimming pools, and wells.
- Describe any outlets other than sprinklers, such as quick disconnects.

- List flushing blow off valves or air/vacuum relief valves. How will unauthorized discharges be prevented from these points.

OPERATION OF THE RECYCLED WATER SYSTEM

- List name, title, address, and phone number of the person responsible for the daily operation.
- Describe control water system that monitors the ET based watering schedule time of day, duration of cycles, and seasonal changes.
- List control measures to prevent over-spray and mosquito breeding.
- Describe what requirements will be instituted to curtail operation during rainy or windy weather.
- Describe contingency plan for maintaining irrigation if recycled water is not available.
- Identify points of public access to the irrigated areas.

SIGNAGE

- Describe the appearance, color, size, and language of the signs.
- Describe location and number of signs.

EMPLOYEE TRAINING

- Describe personnel training.
- Provide copies of any printed material used in training or informational purposes.

OVERSIGHT PROVISIONS

- List MCWDcontact persons.
- Include recycled water use agreement.
- Describe cross connection inspection.

APPENDIX 31

EXAMPLE
WATER CONSERVATION CONCEPT STATEMENT

Print Form

Marina Coast Water District

11 Reservation Road, Marina, Ca 93933
831-384-6131
Water Conservation Department
831-883-5905
Fax 831-384-0197

WATER CONSERVATION CONCEPT STATEMENT

This form is required as part of the Landscape Documentation Package submitted to the District for plan check procedures. Please attach worksheets showing required calculations.

Project Name: La Posada School **Number of Metered Sites:** 2

Please indicate with a check mark that the following additional documents that have been included in the Landscape Documentation Package submitted to the District.

- ☑ On-Site Recycled Water User Plan
- ☑ MCWD Landscape Site Data Sheet
- ☑ Effective Precipitation Statement
- ☑ ET-Based Irrigation Schedules
- ☑ Landscape Design Plan
- ☑ Landscape Grading Plan
- ☑ Irrigation Plan
- ☑ Irrigation System Map and Valve Site Maps
- ☑ Landscape & Irr. Maintenance Schedules
- ☑ Soil Analysis
- ☑ Soil Amendment Recommendation
- ☑ Certificate of Substantial Completion
- ☑ Public Information Plan

Description of Project

Please describe below the planning and design actions that are intended to achieve conservation and efficiency in water use.

Use of ET-based irrigation controller with soil moisture monitoring/shut-off device

Polymer soil amendment to increase the soil water holding capability of the sports field.

All planting beds to receive a heavy 3" layer of course mulch to reduce soil evaporation.

Use of low-angle spray nozzles and pressure compensating heads to reduce wind drift and run-off.

Project Name: La Posada School

Name of Metered Site # 1: Common Areas

Landscape Area	Acres	5	Ft^2	217,800
Estimated Applied Water Use	Acre - Ft	8.2	Ft^3	357,192
+ * Water Expected From Effective Precipitation	Acre - Ft	0.65	Ft^3	28,314
Estimated Total Water Use	Acre - Ft	8.85	Ft^3	385,506
Does this meter serve any Recreational Turf Area?	Acres	0	Ft^2	0
If so, how much water, in addition to the Maximum Applied Water Allowance, is required for this Recreational Turf Area?	Acre - Ft	0	Ft^3	0

Name of Metered Site # 2: Sports Field

Landscape Area	Acres	1.4	Ft^2	60,984
Estimated Applied Water Use	Acre - Ft	5.74	Ft^3	250,034
+ * Water Expected From Effective Precipitation	Acre - Ft	0.18	Ft^3	7,841
Estimated Total Water Use	Acre - Ft	5.92	Ft^3	257,875
Does this meter serve any Recreational Turf Area?	Acres	1.4	Ft^2	60,984
If so, how much water, in addition to the Maximum Applied Water Allowance, is required for this Recreational Turf Area?	Acre - Ft	0	Ft^3	0

Name of Metered Site # 3: _____

Landscape Area	Acres		Ft^2	
Estimated Applied Water Use	Acre - Ft		Ft^3	
+ * Water Expected From Effective Precipitation	Acre - Ft		Ft^3	
Estimated Total Water Use	Acre - Ft		Ft^3	
Does this meter serve any Recreational Turf Area?	Acres		Ft^2	
If so, how much water, in addition to the Maximum Applied Water Allowance, is required for this Recreational Turf Area?	Acre - Ft		Ft^3	

Project Name: _____

Name of Metered Site # 4: _____

Landscape Area Acres _____ Ft^2 _____

Estimated Applied Water Use Acre - Ft _____ Ft^3 _____

+ * Water Expected From Effective Precipitation Acre - Ft _____ Ft^3 _____

Estimated Total Water Use Acre - Ft _____ Ft^3 _____

Does this meter serve any Recreational Turf Area? Acres _____ Ft^2 _____

If so, how much water, in addition to the Maximum Applied Water Allowance, is required for this Recreational Turf Area?

Acre - Ft _____ Ft^3 _____

Name of Metered Site # 5: _____

Landscape Area Acres _____ Ft^2 _____

Estimated Applied Water Use Acre - Ft _____ Ft^3 _____

+ * Water Expected From Effective Precipitation Acre - Ft _____ Ft^3 _____

Estimated Total Water Use Acre - Ft _____ Ft^3 _____

Does this meter serve any Recreational Turf Area? Acres _____ Ft^2 _____

If so, how much water, in addition to the Maximum Applied Water Allowance, is required for this Recreational Turf Area?

Acre - Ft _____ Ft^3 _____

Name of Metered Site # 6: _____

Landscape Area Acres _____ Ft^2 _____

Estimated Applied Water Use Acre - Ft _____ Ft^3 _____

+ * Water Expected From Effective Precipitation Acre - Ft _____ Ft^3 _____

Estimated Total Water Use Acre - Ft _____ Ft^3 _____

Does this meter serve any Recreational Turf Area? Acres _____ Ft^2 _____

If so, how much water, in addition to the Maximum Applied Water Allowance, is required for this Recreational Turf Area?

Acre - Ft _____ Ft^3 _____

Project's Total Landscape Area: Acres 7.2 Ft^2 313,632

1. Non-irrigated: Acres 0.8 Ft^2 34,848
2. Irrigated: Acres 6.4 Ft^2 278,784

Project's Recreational Turf Area

Total size of Recreational Turf Area Acres 1.4 Ft^2 60,984

Estimated Total Water Use for this area Acre - Ft 5.92 Ft^3 257,875

Project's Water Budget

Project's Maximum Applied Water Allowance Acre - Ft 15.12 Ft^3 658,627

Additional water above Maximum Applied Water Allowance required for Recreational Turf Area

Acre - Ft 0 Ft^3 0

Water Budget Total Acre - Ft 15.12 Ft^3 658,627

Project's Water Use

Project's Estimated Applied Water Use Acre - Ft 13.94 Ft^3 607,226

Total Water Expected From Effective Precipitation Acre - Ft 0.83 Ft^3 36,155

Estimated Total Water Use Acre - Ft 14.77 Ft^3 643,381

Notes:

1. If you claim that a part of the Estimated Total Water Use will be provided by Effective Precipitation, an Effective Precipitation Disclosure Statement shall be completed and submitted. The Estimated Total Water Use for the project would then be the sum of the Estimated Applied Water Use and the amount of water expected as Effective Precipitation.
2. Upon completion of the landscape installation and prior to any request for occupancy, a Certificate of Substantial Completion must be completed and submitted to the district to verify compliance with District code.

Date: February, 3, 2007

Prepared By: David Spool

Title: Landscape Architect

Firm: Spool and Partners

Phone # (316) 455-9898

Water Use Calculations
La Posada School

Total Landscape Area:

1)	Common Areas,	single water meter,	5.00 acres
2)	Sports Field,	single water meter,	1.40 acres
3)	Non-irrigated Landscape		0.80 acres
			7.20 acres or 313,632 sq. ft.

Maximum Applied Water Allowance

313,632 sq. ft X 36.2 " ET X 0.7 adj. factor X 0.62 conversion factor = 4,927,409 gallons or 15.12 ac. ft.

Effective Precipitation (EP)

Effective Precipitation Calculation

Annual Rainfall, Castroville CA 14.89 Inches

	January	February	March	April	May	June	July	August	September	October	November	December
Average Rainfall	3.64	3.40	2.48	1.08	0.44	0.00	0.00	0.00	0.00	0.52	1.52	2.56
Effective Precipitation = 10%	0.36	0.34	0.25	0.11	0.04	0.00	0.00	0.00	0.00	0.05	0.15	0.26

Total Inches Effective Precipitation Annually 1.56 Inches 0.13 Feet

Water Expected from Effective Precipitation

1) Common Areas
217,800 sq. ft. X 0.13 ' Effective Precipitation = 28314 cu. ft. or 0.65 ac. ft. water

2) Sports Field
60,984 sq. ft. X 0.13 ' Effective Precipitation = 7928 cu. ft. or 0.18 ac. ft. water

Estimated Applied Water Use (individual meters)

1) Common Areas
[217,800 sq. ft. X 0.4 Landscape Factor X (36.20" ET less Effective Precipitation of 1.56") X 0.62 conversion factor] / 0.70 irrigation efficiency = 2,672,941 gallons or 8.20 ac. ft.

2) Sports Field
[60,984 sq. ft. X 1.0 Landscape Factor X (36.20" ET less Effective Precipitation of 1.56") X 0.62 conversion factor] / 0.70 irrigation efficiency = 1,871,059 gallons or 5.74 ac. ft.

Estimated Applied Water Use (whole project)

8.20 ac. ft (Common Areas) + 5.74 ac. ft. (Sports Field) = 13.94 ac. ft.

Amount of Estimated Applied Water Use over the Maximum Applied Water Allowance

15.12 ac. ft. (Water Budget) – 13.94 ac. ft. (Applied Water) = 1.18 ac. ft water remains. There is no Applied Water Use beyond that allowed for the project.

APPENDIX 32

EXAMPLE
LANDSCAPE SITE DATA FORM

Marina Coast Water District
11 Reservation Road, Marina, Ca 93933
831-384-6131
Water Conservation Department
831-883-5905
Fax 831-384-0197

LANDSCAPE SITE DATA FORM

The data on this form is a requirement as written in Section 700 of the District document entitled Procedures, Guidelines, and Design Requirements. This form is to be submitted to the District for plan check purposes.

Project Name: Hometown Cottages

Project Location: 1070 West Coast Drive, Marina CA

For the complete project site, each individual lot and individual landscape water meters, please provide the acreage and square footage for the following categories as indicated:

The data requested below may be shown on plans, but must be presented as a separate 8.5"x11" attached document. Alternative charts/tables are acceptable. Please use this form as a cover page.

Categories	Site	Typ. Lot	Meter
1) Area of entire project:	**3.24 acres**	**0.06 acres**	**N/A**
	141,134sq. ft.	**2,617 sq. ft.**	
2) Area of hardscape(roads, sidewalks)	**1.3 acres**	**0.02 acres**	**N/A**
	56,628 sq. ft.	**870 sq. ft.**	
3) Area of structures(buildings)	**0.52 acres**	**0.03 acres**	**N/A**
	22, 770 sq. ft.	**1307 sq. ft.**	
4) Total landscaped area(porous areas)	**1.42 acres**	**0.03acres**	**0.13 acres**
	62,855 sq. ft.	**1,307 sq. ft.**	**5,726 sq. ft.**
A) Non-irrigated landscape area	**1.04 acres**	**0.02 acres**	**0 acres**
	45,530 sq. ft.	**870 sq. ft.**	**0 sq. ft.**
B) Total irrigated landscape area	**0.38 acres**	**.01 acres**	**0.13 acres**
	16,591 sq. ft.	**437 sq. ft.**	**5,726 sq. ft.**
i) Irrigated turf area	**0.03 acres**	**0 acres**	**0 acres**
	1,426 sq. ft.	**0 sq. ft.**	**0 sq. ft.**
ii) Irrigated area other than turf	**0.35 acres**	**.01 acres**	**0.13 acres**
	15,165 sq. ft.	**437 sq. ft.**	**5,726 sq. ft.**

This data has been submitted by:

Name; Mark Builder

Title: VP Home Town Developers, LLC.

Date: September 26, 2005

Phone #: (774) 567-8910

APPENDIX 33

EXAMPLE
CALCULATION OF MAXIMUM APPLIED WATER ALLOWANCE

Hometown Cottages
Water Budget Worksheet

SITE: Common Area Landscaping Only

Red = Input Data
Blue = Calculated Data

MAWA = Maximum Applied Water Allowance **= (Eto) (0.8) (LA) (0.62) Where:**

Eto = 36" Reference Evapotranspiration for Marina, CA
0.7 = Eto Adjustment Factor
LA = Total Landscape area
0.62 = Conversion Factor to Gallons

PROJECT INPUT FACTORS:

Annual Reference Evapotranspiration for location (Eto)		36.0	inches/ yr
Eto Adjustment Factor		0.7	
Square footage (LA) of	Trees on Bubblers	544	square feet
	Small shrubs on drip	1,257	square feet
	Groundcover on Laserline	539	square feet
	Mixed shrubs/Trees on Drip	3,386	square feet
	none	0	square feet
	none	0	square feet
	Total Landscape Area (LA)	5,726	square feet
	Conversion Factor to Gallons	0.62	

MAWA =	89,463	**Gallons/Year**
or	11,960	**Cubic Ft /Year**
or	119.6	**Units/Year**
or	0.27	**Acre-ft / Year**

APPENDIX 34

EXAMPLE
CALCULATION OF ESTIMATED TOTAL WATER USE
(BY HYDROZONE METHOD)

Hometown Cottages **Common Area Landscaping Only**

Estimated Total Water Use Worksheet, Page #1

ETWU = Sum of individual hydrozone EWU's
where:
Hydrozone EWU = (Eto) (Kl) (LA) (0.62) / IE
when:

Eto	= Reference Evapotranspiration (for location in inches per year)	
Kl	= Landscape Coefficient - a product of:	a) the water requirements of plant species (Ks)
		b) the density of planting (Kd)
IE	= Irrigation Efficiency	c) specific site microclimates (Kmc)
LA	= Landscape Planting area (in square feet)	
0.62	= Conversion Factor to Gallons	

Hydrozone #1 **Trees on Bubblers**

Reference Evapotranspiration for location (Eto)			36.0	inches/year
Kl =	a. (Ks) Species factor	0.2		
	b. (Kd) Density factor	1.0	0.2	(Kl)
	c. (Kmc) Microclimate factor	1.1		
Square Footage (LA) of plant material			544	square feet
Irrigation efficiency of system			90%	%

EWU=	36.0	0.22	544	0.62	0.900

AWU= 2,968 gallons/year or 397 Cubic Ft/Year or 4.0 **Units/Year for**
or 0.01 Acre-ft /Year **Trees on Bubblers**

Hydrozone #2 **Small shrubs on drip**

Reference Evapotranspiration for location (Eto)			36.2	inches/year
Kl =	a. (Ks) Species factor	0.2		
	b. (Kd) Density factor	1.0	0.2	(Kl)
	c. (Kmc) Microclimate factor	1.0		
Square Footage (LA) of plant material			1,257	square feet
Irrigation efficiency of system			90%	%

AWU=	36.2	0.2	1,257	0.62	0.900

AWU= 6,269 gallons/year or 838 Cubic Ft/Year or 8.4 **Units/Year for**
or 0.02 Acre-ft /Year **Small shrubs on drip**

Hydrozone #3 **Groundcover on Laserline**

Reference Evapotranspiration for location (Eto)			36.2	inches/year
Kl =	a. (Ks) Species factor	0.2		
	b. (Kd) Density factor	1.0	0.2	(Kl)
	c. (Kmc) Microclimate factor	0.9		
Square Footage (LA) of plant material			539	square feet
Irrigation efficiency of system			65%	%

AWU=	36.2	0.18	539	0.62	0.650

AWU= 3,350 gallons/year or 448 Cubic Ft/Year or 4.5 **Units/Year for**
or 0.01 Acre-ft /Year **Groundcover on Laserline**

Sub-Total Water Use (EWU) equals 16.8 **Units**
or 0.04 **Acre-Ft**

Hometown Cottages **Common Area Landscaping Only**

Estimated Total Water Use Worksheet, Page #2

ETWU = Sum of individual hydrozone EWU's
where:
Hydrozone EWU = (Eto) (Kl) (LA) (0.62) / IE
when:

Eto	= Reference Evapotranspiration (for location in inches per year)	
Kl	= Landscape Coefficient - a product of:	a) the water requirements of plant species (Ks)
		b) the density of planting (Kd)
IE	= Irrigation Efficiency	c) specific site microclimates (Kmc)
LA	= Landscape Planting area (in square feet)	
0.62	= Conversion Factor to Gallons	

Hydrozone # 4 — **Mixed shrubs/Trees on Drip**

Reference Evapotranspiration for location (Eto)			36.2	inches/year
Kl =	a. (Ks) Species factor	0.2		
	b. (Kd) Density factor	0.8	0.2	(Kl)
	c. (Kmc) Microclimate factor	1.0		
Square Footage (LA) of plant material			3,386	square feet
Irrigation efficiency of system			65%	%

EWU= 36.2 | 0.16 | 3,386 | 0.62 | 0.650

AWU= 18,707 gallons/year or 2,501 Cubic Ft/Year or 25.0 **Units/Year for**
or 0.06 Acre-ft /Year **Mixed shrubs/Trees on Drip**

Hydrozone # 5 — **none**

Reference Evapotranspiration for location (Eto)			36.2	inches/year
Kl =	a. (Ks) Species factor	1.0		
	b. (Kd) Density factor	1.0	1.0	(Kl)
	c. (Kmc) Microclimate factor	1.0		
Square Footage (LA) of plant material			0	square feet
Irrigation efficiency of system			65%	%

AWU= 36.2 | 1 | 0 | 0.62 | 0.650

AWU= 0 gallons/year or 0 Cubic Ft/Year or 0.0 **Units/Year for**
or 0.00 Acre-ft /Year **none**

Hydrozone # 6 — **none**

Reference Evapotranspiration for location (Eto)			36.2	inches/year
Kl =	a. (Ks) Species factor	1.0		
	b. (Kd) Density factor	1.0	1.0	(Kl)
	c. (Kmc) Microclimate factor	1.0		
Square Footage (LA) of plant material			0	square feet
Irrigation efficiency of system			65%	%

AWU= 36.2 | 1 | 0 | 0.62 | 0.650

AWU= 0 gallons/year or 0 Cubic Ft/Year or 0.0 **Units/Year for**
or 0.00 Acre-ft /Year **none**

Estimated Total Water Use (EWU) equals 41.8 **Units**
or 0.10 **Acre-Ft**

APPENDIX 35

EFFECTIVE PRECIPITATION DISCLOSURE STATEMENT

Marina Coast Water District
11 Reservation Road, Marina, Ca 93933
831-384-6131
Water Conservation Department
831-883-5905
Fax 831-384-0197

EXAMPLE
DETERMINATION OF EFFECTIVE PRECIPITATION

A somewhat low 10% Effective Precipitation rate is used due to the following factors:

1. Porous sandy soil with low water holding capacity of 0.08 H_2O/inch of soil depth.
2. Site has a high wind and South facing sun exposure.
3. Slope on majority of site exceeds 5%.
4. Periods of rainfall are relatively light, not often more than ½" per application, with drying periods shortly afterwards.
5. Dense plantings prevent contact with soil.

Effective Precipitation Calculation

Annual Rainfall, Castroville CA 14.89 Inches

	January	February	March	April	May	June	July	August	September	October	November	December
Average Rainfall	3.64	3.40	2.48	1.08	0.44	0.00	0.00	0.00	0.00	0.52	1.52	2.56
Effective Precipitation = 10%	0.36	0.34	0.25	0.11	0.04	0.00	0.00	0.00	0.00	0.05	0.15	0.26

Total Inches Effective Precipitation Annually 1.56 Inches 0.13 Feet

Sports Field = 60,984 square feet

0.13' Effective Precipitation x 60,984 square feet sports field = 7,927.92 ft^3 water
Or 59,301 gallons water
Or 0.182 acre-feet of water

Common Landscaping = 217,800 square feet

0.13' Effective Precipitation x 217,800 square feet common landscaping = 28,314 ft^3 water
Or 211,789 gallons water
Or 0.64 acre-feet of water

Total Effective Precipitation = 36241.92 ft^3 or 0.832 acre-feet.

APPENDIX 36

EXAMPLE
ET-BASED IRRIGATION SCHEDULE FOR THE ESTABLISHMENT PERIOD

Irrigation Station Data, Establishment Period

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Monthly Reference ET In Inches (ET_o)	1.44	1.71	2.96	4.19	4.63	4.81	4.03	3.81	2.98	2.63	1.62	1.39
Marina, Ca	1.44	1.71	2.96	4.19	4.63	4.81	4.03	3.81	2.98	2.63	1.62	1.39

▪ Station Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
▪ Station Flow Rate (gpm)	8.0	3.0	4.0	4.5	3.0	6.0	5.0	7.5	5.0	6.0	5.6	3.8	5.3	0.0
▪ Landscape Coefficient For Station	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.0	0.2	0.2	1.0	1.0	0.2	1.0
▪ Sprinkler Preciptation Rate (In/Hr)	4.00	0.80	4.00	0.80	0.98	4.00	4.00	0.80	4.00	4.00	0.80	0.80	0.98	2.00
▪ Irrigation Station Efficiency (%)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	65%
▪ Effective Root Zone Depth (Inches)	6	6	6	6	6	6	6	6	6	6	6	6	6	0
▪ Soil Moisture Holding Capacity (In/In)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.00
▪ Management Allowed Depletion (%)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	50%

▪ Station Number	15	16	17	18	19	20	21	22	23	24	25	26	27	28
▪ Station Flow Rate (gpm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
▪ Landscape Coefficient For Station	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
▪ Sprinkler Preciptation Rate (In/Hr)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
▪ Irrigation Station Efficiency (%)	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
▪ Effective Root Zone Depth (Inches)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
▪ Soil Moisture Holding Capacity (In/In)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
▪ Management Allowed Depletion (%)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%

▪ Station Number	29	30	31	32	33	34	35	36	37	38	39	40	41	42
▪ Station Flow Rate (gpm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
▪ Landscape Coefficient For Station	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
▪ Sprinkler Preciptation Rate (In/Hr)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
▪ Irrigation Station Efficiency (%)	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
▪ Effective Root Zone Depth (Inches)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
▪ Soil Moisture Holding Capacity (In/In)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
▪ Management Allowed Depletion (%)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%

ET-Based Irrigation Schedule, Establishment Period

Stations # 1,3,6,7,9,10

Calculated Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Daily Reference ET (ET_o)	0.05	0.06	0.10	0.14	0.15	0.16	0.13	0.13	0.10	0.09	0.05	0.05
▪ Root Zone Working Storage (Inches)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
▪ Monthly Plant Water Requirement (In)	0.32	0.38	0.65	0.92	1.02	1.06	0.89	0.84	0.66	0.58	0.36	0.31
▪ Monthly Irrigation Water Requiremnt (In)	0.35	0.42	0.72	1.02	1.13	1.18	0.99	0.93	0.73	0.64	0.40	0.34
▪ Effective Precipitation Rate (In/Hr)	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60

ET-Based Irrigation Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Irrigation Event Frequency (Days)	9	8	4	3	3	3	3	3	4	5	8	9
▪ Irrigation Days Per 30 Day Period (est.)	3	4	7	10	11	11	9	9	7	6	4	3
▪ Skip Days (Days Between Irrigations)	8	7	3	2	2	2	2	2	3	4	7	8
▪ Total Minutes Per Irrigation Day	2	2	1	2	2	2	1	1	1	2	2	2

Establishment Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Desired Irrigation Days Per Week (enter)	1	1	2	2	3	3	3	3	2	2	1	1
▪ Total Minutes Per Irrigation Day	2	2	1	2	2	2	1	1	1	1	2	2
▪ Net Irrigation Applied (Inches)	0.12	0.12	0.06	0.12	0.12	0.12	0.06	0.06	0.06	0.06	0.12	0.12

ET-Based Irrigation Schedule, Establishment Period

Stations # 2,4

Calculated Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Daily Reference ET (ET_o)	0.05	0.06	0.10	0.14	0.15	0.16	0.13	0.13	0.10	0.09	0.05	0.05
▪ Root Zone Working Storage (Inches)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
▪ Monthly Plant Water Requirement (In)	0.26	0.31	0.53	0.75	0.83	0.87	0.73	0.69	0.54	0.47	0.29	0.25
▪ Monthly Irrigation Water Requiremnt (In)	0.29	0.34	0.59	0.84	0.93	0.96	0.81	0.76	0.60	0.53	0.32	0.28
▪ Effective Precipitation Rate (In/Hr)	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72

ET-Based Irrigation Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Irrigation Event Frequency (Days)	11	9	5	4	3	3	4	4	5	6	10	12
▪ Irrigation Days Per 30 Day Period (est.)	3	3	6	8	9	9	8	7	6	5	3	3
▪ Skip Days (Days Between Irrigations)	10	8	4	3	2	2	3	3	4	5	9	11
▪ Total Minutes Per Irrigation Day	8	8	7	8	7	7	8	8	7	8	8	8

Establishment Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Desired Irrigation Days Per Week (enter)	1	1	2	2	3	3	3	3	2	2	1	1
▪ Total Minutes Per Irrigation Day	5	6	5	7	5	5	5	5	5	5	6	5
▪ Net Irrigation Applied (Inches)	0.06	0.07	0.06	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06

ET-Based Irrigation Schedule, Establishment Period

Stations # 2,4

Calculated Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Daily Reference ET (ET_o)	0.05	0.06	0.10	0.14	0.15	0.16	0.13	0.13	0.10	0.09	0.05	0.05
▪ Root Zone Working Storage (Inches)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
▪ Monthly Plant Water Requirement (In)	0.26	0.31	0.53	0.75	0.83	0.87	0.73	0.69	0.54	0.47	0.29	0.25
▪ Monthly Irrigation Water Requiremnt (In)	0.29	0.34	0.59	0.84	0.93	0.96	0.81	0.76	0.60	0.53	0.32	0.28
▪ Effective Precipitation Rate (In/Hr)	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72

ET-Based Irrigation Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Irrigation Event Frequency (Days)	11	9	5	4	3	3	4	4	5	6	10	12
▪ Irrigation Days Per 30 Day Period (est.)	3	3	6	8	9	9	8	7	6	5	3	3
▪ Skip Days (Days Between Irrigations)	10	8	4	3	2	2	3	3	4	5	9	11
▪ Total Minutes Per Irrigation Day	8	8	7	8	7	7	8	8	7	8	8	8

Establishment Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Desired Irrigation Days Per Week (enter)	1	1	2	2	3	3	3	3	2	2	1	1
▪ Total Minutes Per Irrigation Day	5	6	5	7	5	5	5	5	5	5	6	5
▪ Net Irrigation Applied (Inches)	0.06	0.07	0.06	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06

ET-Based Irrigation Schedule, Establishment Period

Stations # 8,11,12

Calculated Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Daily Reference ET (ET_o)	0.05	0.06	0.10	0.14	0.15	0.16	0.13	0.13	0.10	0.09	0.05	0.05
▪ Root Zone Working Storage (Inches)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
▪ Monthly Plant Water Requirement (In)	1.44	1.71	2.96	4.19	4.63	4.81	4.03	3.81	2.98	2.63	1.62	1.39
▪ Monthly Irrigation Water Requiremnt (In)	1.60	1.90	3.29	4.66	5.14	5.34	4.48	4.23	3.31	2.92	1.80	1.54
▪ Effective Precipitation Rate (In/Hr)	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72

ET-Based Irrigation Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Irrigation Event Frequency (Days)	2	2	1	1	1	1	1	1	1	1	2	2
▪ Irrigation Days Per 30 Day Period (est.)	15	18	31	44	48	50	42	40	31	27	17	14
▪ Skip Days (Days Between Irrigations)	1	1	0	0	0	0	0	0	0	0	1	1
▪ Total Minutes Per Irrigation Day	8	10	8	12	13	13	11	11	8	7	9	8

Establishment Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Desired Irrigation Days Per Week (enter)	1	1	2	2	3	3	3	3	2	2	1	1
▪ Total Minutes Per Irrigation Day	28	35	28	42	30	30	26	26	28	25	32	28
▪ Net Irrigation Applied (Inches)	0.34	0.42	0.34	0.50	0.36	0.36	0.31	0.31	0.34	0.30	0.38	0.34

APPENDIX 37

EXAMPLE
ET-BASED IRRIGATION SCHEDULE FOR THE MATURE LANDSCAPE

Irrigation Station Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Monthly Reference ET In Inches (ET_o)	1.44	1.71	2.96	4.19	4.63	4.81	4.03	3.81	2.98	2.63	1.62	1.39
Marina, Ca	1.44	1.71	2.96	4.19	4.63	4.81	4.03	3.81	2.98	2.63	1.62	1.39

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
▪ Station Number														
▪ Station Flow Rate (gpm)	8.0	3.0	4.0	4.5	3.0	6.0	5.0	7.5	5.0	6.0	5.6	3.8	5.3	0.0
▪ Landscape Coefficient For Station	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.0	0.2	0.2	1.0	1.0	0.2	1.0
▪ Sprinkler Preciptation Rate (In/Hr)	4.00	0.80	4.00	0.80	0.98	4.00	4.00	0.80	4.00	4.00	0.80	0.80	0.98	2.00
▪ Irrigation Station Efficiency (%)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	65%
▪ Effective Root Zone Depth (Inches)	6	6	6	6	6	6	6	6	6	6	6	6	6	0
▪ Soil Moisture Holding Capacity (In/In)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.00
▪ Management Allowed Depletion (%)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%

	15	16	17	18	19	20	21	22	23	24	25	26	27	28
▪ Station Number														
▪ Station Flow Rate (gpm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
▪ Landscape Coefficient For Station	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
▪ Sprinkler Preciptation Rate (In/Hr)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
▪ Irrigation Station Efficiency (%)	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
▪ Effective Root Zone Depth (Inches)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
▪ Soil Moisture Holding Capacity (In/In)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
▪ Management Allowed Depletion (%)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%

	29	30	31	32	33	34	35	36	37	38	39	40	41	42
▪ Station Number														
▪ Station Flow Rate (gpm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
▪ Landscape Coefficient For Station	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
▪ Sprinkler Preciptation Rate (In/Hr)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
▪ Irrigation Station Efficiency (%)	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
▪ Effective Root Zone Depth (Inches)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
▪ Soil Moisture Holding Capacity (In/In)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
▪ Management Allowed Depletion (%)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%

ET-Based Irrigation Schedule, Mature Landscape

Stations # 1,3,6,7,9,10

Calculated Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Daily Reference ET (ET_o)	0.05	0.06	0.10	0.14	0.15	0.16	0.13	0.13	0.10	0.09	0.05	0.05
▪ Root Zone Working Storage (Inches)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
▪ Monthly Plant Water Requirement (In)	0.32	0.38	0.65	0.92	1.02	1.06	0.89	0.84	0.66	0.58	0.36	0.31
▪ Monthly Irrigation Water Requiremnt (In)	0.35	0.42	0.72	1.02	1.13	1.18	0.99	0.93	0.73	0.64	0.40	0.34
▪ Effective Preciptation Rate (In/Hr)	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60

ET-Based Irrigation Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Irrigation Event Frequency (Days)	23	19	11	8	7	7	8	9	11	12	20	24
▪ Irrigation Days Per 30 Day Period (est.)	1	2	3	4	4	4	4	3	3	2	1	1
▪ Skip Days (Days Between Irrigations)	22	18	10	7	6	6	7	8	10	11	19	23
▪ Total Minutes Per Irrigation Day	4	4	4	4	4	4	4	4	4	4	4	4

Establishment Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Desired Irrigation Days Per Week (enter)	1	1	2	2	3	3	3	3	2	2	1	1
▪ Total Minutes Per Irrigation Day	1	1	1	2	1	1	1	1	1	1	1	1
▪ Net Irrigation Applied (Inches)	0.06	0.06	0.06	0.12	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06

ET-Based Irrigation Schedule, Mature Landscape

Stations # 5,13

Calculated Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Daily Reference ET (ET_o)	0.05	0.06	0.10	0.14	0.15	0.16	0.13	0.13	0.10	0.09	0.05	0.05
▪ Root Zone Working Storage (Inches)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
▪ Monthly Plant Water Requirement (In)	0.23	0.27	0.47	0.67	0.74	0.77	0.64	0.61	0.48	0.42	0.26	0.22
▪ Monthly Irrigation Water Requiremnt (In)	0.26	0.30	0.53	0.74	0.82	0.86	0.72	0.68	0.53	0.47	0.29	0.25
▪ Effective Preciptation Rate (In/Hr)	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88

ET-Based Irrigation Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Irrigation Event Frequency (Days)	31	26	15	11	10	9	11	12	15	17	28	32
▪ Irrigation Days Per 30 Day Period (est.)	1	1	2	3	3	3	3	3	2	2	1	1
▪ Skip Days (Days Between Irrigations)	30	25	14	10	9	8	10	11	14	16	27	31
▪ Total Minutes Per Irrigation Day	16	16	16	17	17	16	16	17	16	16	16	16

Establishment Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Desired Irrigation Days Per Week (enter)	1	1	2	2	3	3	3	3	2	2	1	1
▪ Total Minutes Per Irrigation Day	4	4	4	5	4	4	3	3	4	3	4	4
▪ Net Irrigation Applied (Inches)	0.06	0.06	0.06	0.07	0.06	0.06	0.04	0.04	0.06	0.04	0.06	0.06

ET-Based Irrigation Schedule, Mature Landscape

Stations # 2,4

Calculated Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Daily Reference ET (ET_o)	0.05	0.06	0.10	0.14	0.15	0.16	0.13	0.13	0.10	0.09	0.05	0.05
▪ Root Zone Working Storage (Inches)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
▪ Monthly Plant Water Requirement (In)	0.26	0.31	0.53	0.75	0.83	0.87	0.73	0.69	0.54	0.47	0.29	0.25
▪ Monthly Irrigation Water Requiremnt (In)	0.29	0.34	0.59	0.84	0.93	0.96	0.81	0.76	0.60	0.53	0.32	0.28
▪ Effective Preciptation Rate (In/Hr)	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72

ET-Based Irrigation Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Irrigation Event Frequency (Days)	28	23	14	10	9	8	10	10	13	15	25	29
▪ Irrigation Days Per 30 Day Period (est.)	1	1	2	3	3	4	3	3	2	2	1	1
▪ Skip Days (Days Between Irrigations)	27	22	13	9	8	7	9	9	12	14	24	28
▪ Total Minutes Per Irrigation Day	20	20	21	21	21	19	20	19	19	20	20	20

Establishment Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Desired Irrigation Days Per Week (enter)	1	1	2	2	3	3	3	3	2	2	1	1
▪ Total Minutes Per Irrigation Day	5	6	5	7	5	6	5	4	5	5	6	5
▪ Net Irrigation Applied (Inches)	0.06	0.07	0.06	0.08	0.06	0.07	0.06	0.05	0.06	0.06	0.07	0.06

ET-Based Irrigation Schedule, Mature Landscape

Stations # 8,11,12

Calculated Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Daily Reference ET (ET_o)	0.05	0.06	0.10	0.14	0.15	0.16	0.13	0.13	0.10	0.09	0.05	0.05
▪ Root Zone Working Storage (Inches)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
▪ Monthly Plant Water Requirement (In)	1.44	1.71	2.96	4.19	4.63	4.81	4.03	3.81	2.98	2.63	1.62	1.39
▪ Monthly Irrigation Water Requiremnt (In)	1.60	1.90	3.29	4.66	5.14	5.34	4.48	4.23	3.31	2.92	1.80	1.54
▪ Effective Preciptation Rate (In/Hr)	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72

ET-Based Irrigation Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Irrigation Event Frequency (Days)	5	4	2	2	2	1	2	2	2	3	4	5
▪ Irrigation Days Per 30 Day Period (est.)	6	7	12	17	19	20	17	16	12	11	7	6
▪ Skip Days (Days Between Irrigations)	4	3	1	1	1	0	1	1	1	2	3	4
▪ Total Minutes Per Irrigation Day	20	19	16	23	26	13	22	21	17	22	18	19

Establishment Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
▪ Desired Irrigation Days Per Week (enter)	1	1	2	2	3	3	3	3	2	2	1	1
▪ Total Minutes Per Irrigation Day	28	33	28	40	30	30	26	25	30	26	32	27
▪ Net Irrigation Applied (Inches)	0.34	0.40	0.34	0.48	0.36	0.36	0.31	0.30	0.36	0.31	0.38	0.32

APPENDIX 38

EXAMPLE
CALCULATION OF
ESTIMATED APPLIED WATER USE
(Derived from the irrigation schedule for the mature landscape)

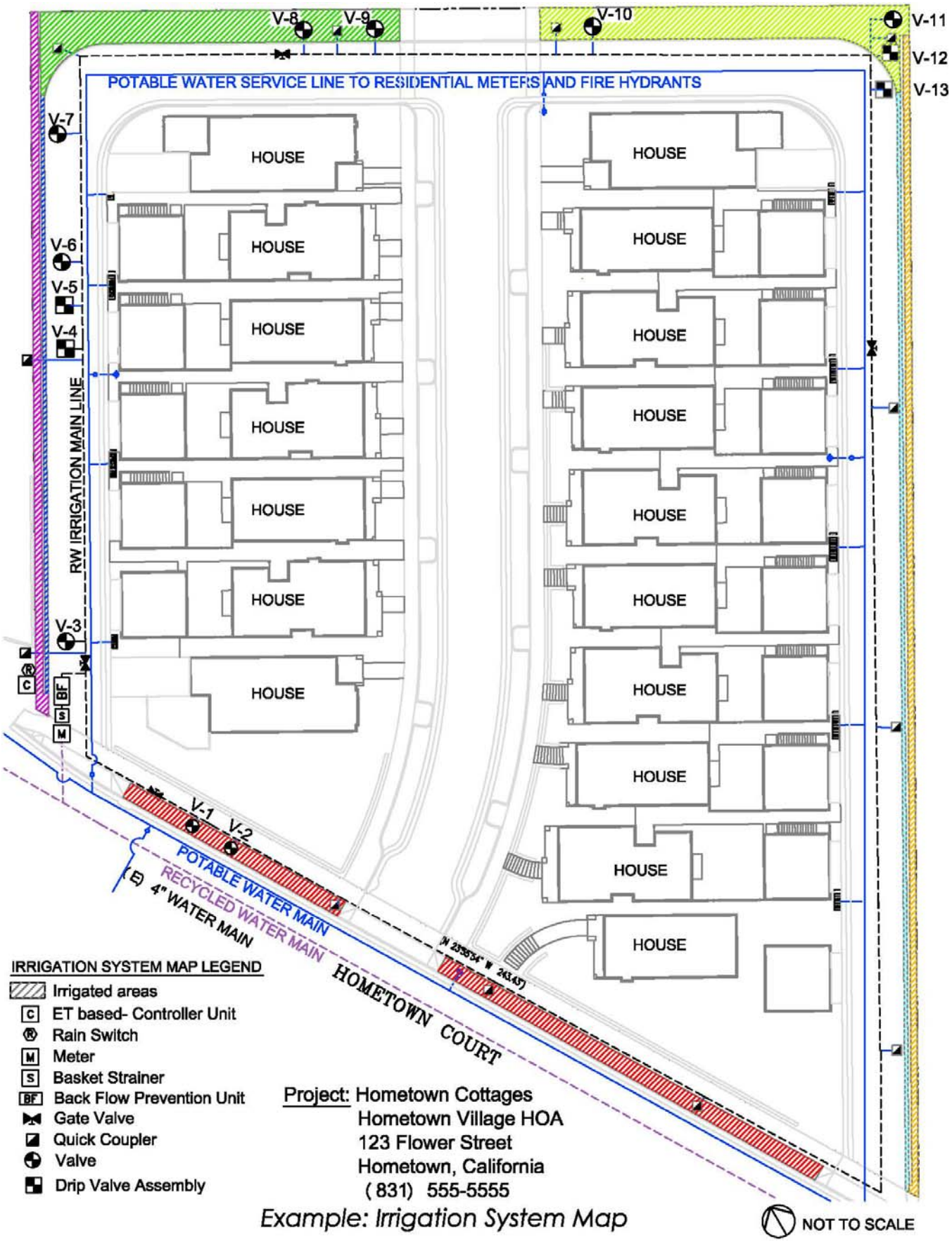
Hometown Cottages, Common Area Landscaping
Estimated Applied Water Use, Stations #1-13
Monthly/Annual Totals Based on ET Adjusted Schedule, Mature Landscape

Station #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	42	50	87	123	136	141	118	112	87	77	48	41	
Annual Total in Gallons			1062	Annual Total in Cu-Ft.				142	Annual Total in Units				1.4
2	65	77	140	198	219	206	181	163	127	118	73	63	
Annual Total in Gallons			1629	Annual Total in Cu-Ft.				218	Annual Total in Units				2.2
3	21	25	43	61	68	71	59	56	44	39	24	20	
Annual Total in Gallons			531	Annual Total in Cu-Ft.				71	Annual Total in Units				0.7
4	97	115	210	297	328	308	272	244	191	178	109	94	
Annual Total in Gallons			2444	Annual Total in Cu-Ft.				327	Annual Total in Units				3.3
5	46	55	95	142	157	154	129	130	95	84	52	44	
Annual Total in Gallons			1184	Annual Total in Cu-Ft.				158	Annual Total in Units				1.6
6	32	38	65	92	102	106	89	84	66	58	36	31	
Annual Total in Gallons			796	Annual Total in Cu-Ft.				106	Annual Total in Units				1.1
7	26	31	54	77	85	88	74	70	55	48	30	25	
Annual Total in Gallons			664	Annual Total in Cu-Ft.				89	Annual Total in Units				0.9
8	900	1015	1480	3012	3762	1954	2771	2500	1583	1808	911	825	
Annual Total in Gallons			22522	Annual Total in Cu-Ft.				3011	Annual Total in Units				30.1
9	26	31	54	77	85	88	74	70	55	48	30	25	
Annual Total in Gallons			664	Annual Total in Cu-Ft.				89	Annual Total in Units				0.9
10	32	38	65	92	102	106	89	84	66	58	36	31	
Annual Total in Gallons			796	Annual Total in Cu-Ft.				106	Annual Total in Units				1.1
11	672	758	1105	2249	2809	1459	2069	1867	1182	1350	680	616	
Annual Total in Gallons			16816	Annual Total in Cu-Ft.				2248	Annual Total in Units				22.5
12	456	514	750	1526	1906	990	1404	1267	802	916	462	418	
Annual Total in Gallons			11411	Annual Total in Cu-Ft.				1526	Annual Total in Units				15.3
13	81	97	167	252	278	272	228	229	168	149	92	79	
Annual Total in Gallons			2091	Annual Total in Cu-Ft.				280	Annual Total in Units				2.8

Total Stations # 1-24	62610	Gallons	Total Stations # 1-24	8370	Cu-Ft.	Units	83.7

APPENDIX 39

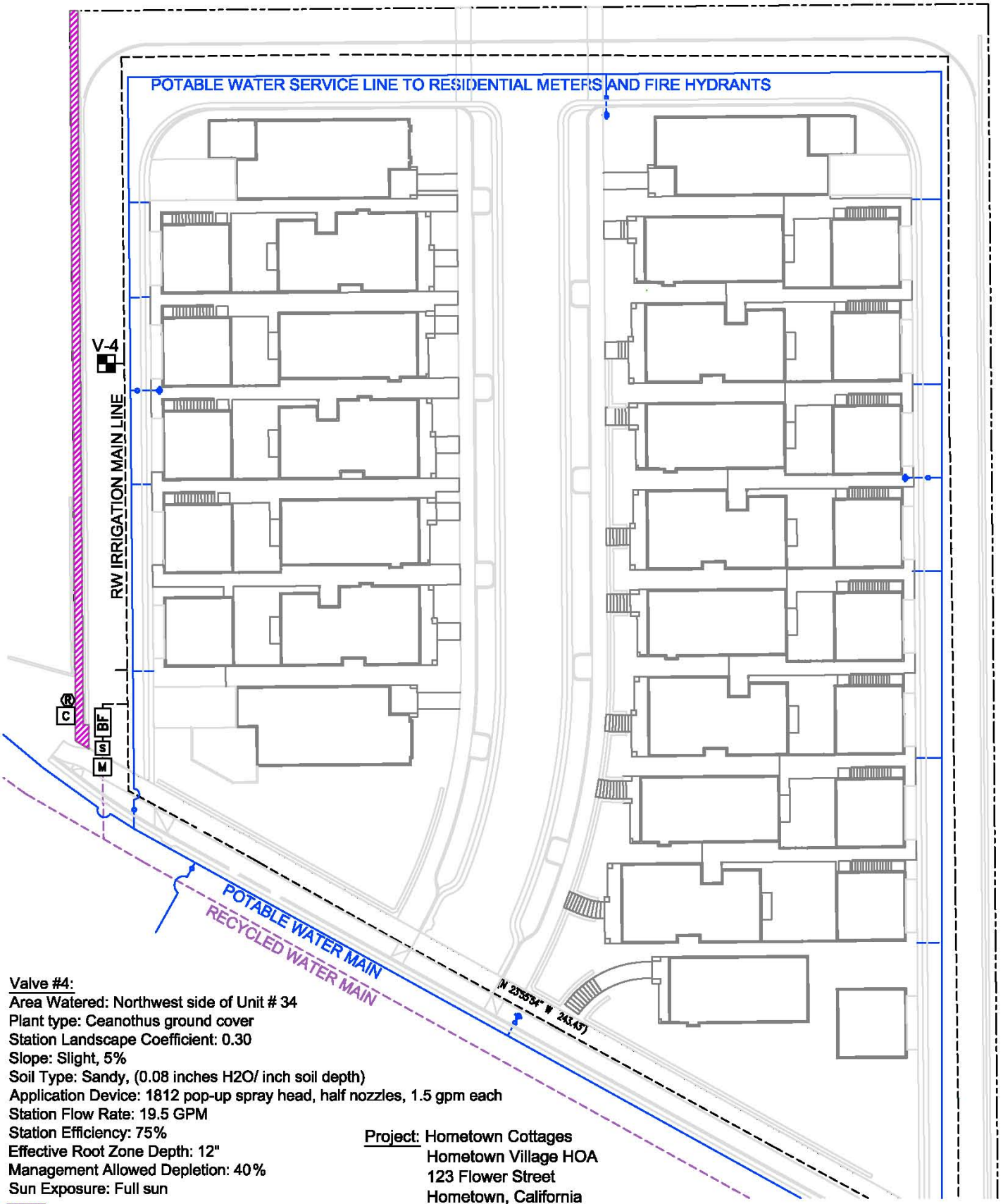
EXAMPLE
IRRIGATION SYSTEM MAP



Example: Irrigation System Map

APPENDIX 40

EXAMPLE
VALVE SITE MAP



Example: Individual station map

APPENDIX 41

EXAMPLE
LANDSCAPE AND IRRIGATION MAINTENANCE SCHEDULE

Hometown Cottages Home Owners Association

Landscape and Irrigation Maintenance Schedules

Landscape Maintenance:

Task	Bi-Weekly	Weekly	Quarterly	Bi-Annually	Annually	Every Five Years
Lawn Mowing	X					
Lawn Aeration/Dethatching				X		
Lawn Fertilization			X			
Native Lawn Mowing				X		
Native Lawn Fertilization				X		
Native Lawn Aeration/Dethatching					X	
Plant Trimming					X	
Plant Fertilization			X			
Clean Roadways/Walkways/Paths		X				
Plant Annual Flowers			X			
Maintain Annual Flowers	X					
Fertilize Annual Flowers			X			
Tree Trimming					X	
Tree Fertilization					X	

Lawn Areas:

- All lawn areas are to be mowed frequently or as needed to maintain a height of 3 1/2" to 4 ½". Clippings are to be collected and borders neatly edged vertically. Grass blades around sprinkler heads and landscape lighting are to be mechanically trimmed only as needed to eliminate any blockage of sprinkler spray pattern. Grass is to be removed from around the base of trees creating a tree well 12" in radius. Trim around planters and along walkways.
- Maintain lawn areas in a weed-free condition. Chemically control broadleaf weeds on an as needed basis.
- Aerate all lawn areas annually between September 01 and October 15th of each year. Follow up immediately with de-thatching. Aeration shall be conducted by removing

½" by 4" cores at not more than 6" spacing. Cores shall be broken down during de-thatching and excess debris removed by hand. Notify the Association Manager when work is to take place.

- Fertilize at a rate of 1 lb. of Nitrogen per 1,000 square feet on the following schedule:
  - October: 16 – 4 – 8 Complete
  - January: 16 – 4 – 8
  - April: 40 – 6 – 00 (Urea)
  - July: 40 – 6 – 00 (Urea)
- A broad spectrum fungicide shall be applied to all turf areas, as necessary, at the preventative rate i.e.: Subdue 2%.
- Control pests, rodents and snails, as needed, to provide a healthy environment for plants and public.

Lawn Irrigation:

- To maintain proper growth rate and optimum appearance, water according to the Et-based irrigation schedule. Adjust the base schedule to apply water deeply throughout the complete soil profile, with at least one day between irrigation cycles. Spot check soil moisture with a soil sampling probe weekly.
- Maintain an irrigation log, recording all water usage on a weekly basis. A copy of these readings is to be given to the Association Manager on a weekly basis.

"Native" Fescue Areas:

- Native fescue will be dethatched and aerated annually in the fall.
- Native fescue will be cut and fertilized during the spring and late fall of each year. All trimmings are to be removed from the site.
- Seed heads will be knocked down on a continual basis as needed.
- Maintain native fescue areas in a weed-free condition. Chemically control broadleaf weeds on an as needed basis.
- Irrigate according to the Et-based irrigation schedule to maintain proper growth rate and optimum appearance. Adjust scheduling to apply water deeply throughout the complete soil profile, with at least five days between irrigation cycles. Spot check soil moisture weekly with a soil sampling probe.

Groundcover Areas:

- All weeds shall be removed as they appear. Additional weed control shall be initiated as necessary to maintain a weed-free condition.
- Ground covers shall be fertilized every (90) days. Application to be 1lb. of actual Nitrogen per 1,000 square feet using a 16-16-16 formula material.
- Trim and edge as necessary to restrict growth from encroaching on sidewalks, sprinkler heads, or other adjacent areas.
- Irrigate as necessary to maintain adequate growth and reasonable appearance.
- Spot check soil moisture with a soil sampling probe weekly.
- Control pests, including rodents and snails, to provide a healthy environment for plants and public.

Annual Flowers:

- Annual flowers will be planted and maintained in designated areas as needed but at least three times annually.
- Flower beds will be cultivated once a week to reduce weeds and improve water infiltration.
- An application of 3-12-21 fertilizer will be applied to all annuals on (90) day intervals.
- Annual beds will be maintained weekly.

Trees:

All trimming of trees on property is to be discussed with Association Management prior to commencement of work and may require guidance and/or skills of a certified arborist.

- Trim, shape and selectively prune to maintain a safe, reasonable appearance.
- Thinning and/or trimming of Cypress and Pine trees are to be completed during late January or February of each year.
- Control pest and diseases as needed. Report occurrences to the Association Manager.
- Tag and report pitch canker or bark beetle infestations to the Association Manager immediately. Removal of infested plant debris will be cleared with the Management.
- Tag and report any trees that show stress or weakness or trees that are in danger of uprooting patios or endangering buildings to the Association Manager as soon as they are detected.
- Remove all dead, diseased or damaged branches back to a side branch.
- Stake and support trees when necessary. Check all trees and remove unnecessary tree guy wires at least annually.
- All guys and ties shall be checked frequently to avoid girdling.
- Maintain watering basins on young trees through the second year of establishment.
- Fertilized trees each April with deep root feeding and a 3-4 month, soluble, 10-15-15 slow release fertilizer at recommended rates for the individual planting.
- Irrigate as required to maintain adequate growth and appearance.

Shrubs:

- Thin, shape, and head back all shrubs only as needed, yet at least annually.
- All shrubs with leaf size exceeding 2 inches shall be selectively pruned with hand clippers.
- Maximize plant size. Encourage shrubs to completely fill planting beds. Shrubs shall have a natural branching habit and form at all times.
- Maintain shrubs at entrances to a height that will ensure safe vehicular access and view.
- Prune at proper time of year for each species to promote new growth and flowering.

Roadways, Patios, Walkways, and Paths:

- All roadways and roadside drainage culverts are to be cleaned of sand, weeds, and debris weekly.
- Patios and walkways are to be cleaned of debris each Friday. Spot stains are to be reported to the Association Manager immediately.

- Garden paths are to be raked of debris weekly. Preventative weed control shall be applied as needed and at least annually.
- Damaged roadside lighting and pathway light standards shall be reported to the Association Manager immediately.

Irrigation System Maintenance:

Task	Bi-Weekly	Weekly	Monthly	Bi-Annually	Annually	Every Five Years
Irrigation System Audit						X
Recycled Water Users Plan Review					X	
Backflow Device Testing					X	
Drought Planning Report					X	
Irrigation Timers/Rain Sensors Checked			X			
Recycled Water Signage Check			X			
Irrigation System Check			X		X	
Pressure Reading			X			
Meter Reading		X				
Clean Basket Strainers		X				

It is the responsibility of the landscaping crew to maintain the complete sprinkler and irrigation systems in an operable condition at all times. This includes, but is not limited to, pressure regulators, basket strainers, backflow devices, pump systems, main pressure lines, lateral lines, clocks, valves, drip emitters, and sprinkler heads.

- Annually, during the month of February, a complete Irrigation System Audit shall be performed. Upon completion of any irrigation system upgrade or installation, an irrigation audit of those zones modified shall be performed. Performance results of all Irrigation System Audits shall to be submitted to the Association Manager. Every five years, the results of the Irrigation System Audit shall be provided to the Marina Coast Water District, Water Conservation Department. Irrigation audits must to be performed and submitted to the water district by March 1st, every 5 years. The next scheduled Irrigation System Audit is due March 1st, 2008.
- At the same time as the Irrigation System Audit, a detailed Irrigation System Check shall be performed. A report on all necessary and suggested repairs shall be submitted to the HOA Manager by March 1st.

- All systems are to be operationally checked monthly by running each zone a minimum of two minutes. The results will be recorded in an irrigation log to be maintained in the Association office.
- Keep valves in adjustment to prevent excessive flow velocity, slow or rapid closure, excessive pressure, and water hammer.
- Check and record the water supply static pressure monthly. Differences in the sprinkler systems design operating pressure and actual available water pressure can affect operation and efficiency.
- Annual backflow device certification tests for all devices shall be completed in February of each year, and the results submitted to the HOA manager by March 1st. Monthly, the devices shall be visually checked for failure, and results submitted to the HOA Manager.
- Water meter readings are to be taken weekly and recorded in a water usage log be maintained in the HOA office. Leak detection shall be a part of this procedure. A record of monthly units through the common irrigation meter shall be kept to summarize water units at the end of the year. A comparison from actual water usage to water budget shall be performed monthly. Any leaks detected through the common meter shall be reported to the HOA manager immediately.
- Check all irrigation control clocks after power outages and reset as necessary. In addition, check all clocks once a month to ensure that timers are still programmed correctly and are receiving ET data. Adjust water application settings of timers only if automatic ET irrigation controller shows error. Verify appropriate operation duration and frequency and start-time. Irrigate only at night between 6pm and 6 am. Reprogram the ET-based automatic controllers two months after the establishment period and of any new planting installations. Refer to the Mature Landscape Irrigation Schedule.
- Monthly, make sure a rain sensor is still properly installed, set at one-fourth of an inch or less, and not sheltered by walls, shrubs or other plants. All irrigation systems must be turned off during periods of rain.
- Repair and adjust all sprinkler heads to maintain proper coverage on an as needed and ongoing basis. Adjust irrigation system components whenever irrigation water falls or runs onto hard surfaces such as sidewalks, streets or driveways.
- General plant health, due to under or over watering and vandalism to irrigation materials shall be reported monthly.
- Verify that sprinkler coverage is properly adjusted. Check the nozzle, arc, radius, level and attitude with respect to slope. Make sure all heads pop-up completely and fully retract when the water is turned off. Check for sprinklers blocked by grass, plants or other obstacles. If the spray is blocked, remove the obstacle or move the sprinkler head. Make sure sprinklers are vertical and flush with the soil grade.
- Check drip zone emitters for debris and assure proper operation.
- Clean out Y-filters of drip valve assemblies and flush drip lines, if excessive dirt or mineral deposits are noticed.
- Identify pipeline and valve leaks, and low head drainage problems. Make repairs immediately. Signs of leakage include green and soggy areas, often around spray heads and hose bibs.
- Repair or replace broken hardware and pipes with matching, original equipment. Refer to pipe size in irrigation plan, to maintain correct design pressure after repairs. Test all repairs.

- Winterize sprinkler systems if freezing is to be expected by removing all the water from the irrigation system in order to prevent cracked pipes, broken heads and other problems.
- Identify your priorities during water-limited situations such as various stages of drought. These priorities shall be summarized and reported to the Association Manager annually.

Additional Irrigation System Maintenance for Irrigation Systems Using Recycled Water:

- The Recycled Water Management Plan, supplied by the Association, shall be reviewed annually by each staff member, and suggested edits submitted to the Association Manager. At all times, the Recycled Water Management Plan shall be posted in the Maintenance Facilities Shop and available to all landscape maintenance personal.
- Ensure that proper recycled water warning site signage and individual component warning tags are in place monthly.
- A basket strainer must be installed downstream from the irrigation water meter. The filter shall be checked weekly and cleaned at least monthly to remove debris. Any puddles of standing recycled water caused from flushing filter units, irrigation lines or irrigation leaks shall be removed or monitored until infiltration into the soil has occurred.
- Ensure proper valve box labeling and verify that all purple valve box covers are bolted down.
- All site inspection reports outlined in the Recycled Water Management Plan must be prepared and submitted to the Association Manager by March 1st each year.

APPENDIX 42

SOIL ANALYSIS AND SOIL AMENDMENT RECOMMENDATION

SOIL ANALYSIS AND SOIL AMENDMENT RECOMMENDATION

Hometown Cottages Home Owners Association

The sample received was described as representing site soil to 6 inches in depth from an area scheduled for landscaping with trees and shrubs.

ANALYSIS RESULTS

Particle size data show a loam classification by USDA standards. No significant problems are suggested by the distribution of particle sizes. Organic content is very low and the estimated infiltration rate is 0.29 inch per hour. Loosening the soil and improving the organic content will help improve porosity.

The reaction value is slightly alkaline and suitable for most plants though slightly acidic is preferred. Lime content is favorably absent indicating the pH will adjust readily to a more appropriate range. Salinity, sodium and boron are safely low and the SAR value shows soluble sodium adequately balanced by calcium and magnesium.

Nutritional data reveal low nitrogen, phosphorous, potassium and sulfate. Calcium is sufficient with magnesium ample.

RECOMMENDATIONS

AMENDING SOILS
To improve drainage of the root zone, first loosen any undisturbed or compacted area to a 10-inch depth. The following material should then be evenly spread and thoroughly incorporated with 6-inches of soil to form a homogeneously blended layer:

Amount / 1000 Square Feet	
6 cubic yards	Nitrogen Stabilized Organic Amendment
20 pounds	6-20-20 Commercial Fertilizer
5 pounds	Potassium Sulfate (0-0-50)
10 pounds	Soil Sulfur

The above organic amendment rate is based on an organic content of 270 pounds per cubic yard and may be adjusted based on the amendment selected.

To prepare backfill:

- Excavate planting pits at least twice as wide as the diameter of the rootball.
- Soil immediately below the root ball should be left undisturbed to provide support but the sides and the bottom around the sides should be cultivated to improve porosity.
- The top of the rootball should be at or slightly above final grade.
- The top 12-inches of backfill around the sides of the rootball of trees and shrubs may consist of the above amended soil or may be prepared as follows:

3 parts	Pulverized Site Soil
1 part	Nitrogen Stabilized Organic Amendment

Blended with 1 pound 6-20-20, 1/4 pound potassium sulfate, and 1/2 pound soil sulfur per cubic yard backfill.

- Backfill below 12 inches required for 24-inch box or larger material **should not contain** the organic matter and should *replace* the 1/2 pound soil sulfur with 1 pound iron sulfate* per cubic yard backfill.

MULCHING

Ideally a weed and turf free zone should be maintained just beyond the diameter of the planting hole. A 3-4 inch deep layer of coarse mulch can be placed around the tree or shrub. **Mulch should be kept a minimum 4 inches from the trunk.**

IRRIGATION

Irrigation of new plantings should take into consideration the differing texture of the root ball substrate and surrounding soil matrix to maintain adequate moisture during this critical period of establishment.

**Apply the iron sulfate cautiously* avoiding contact with moist concrete since staining can result.

MAINTENANCE

General maintenance fertilization for new plantings may rely on nitrogen fertilization complemented by a complete fertilizer in the spring and fall. During the winter, plants in need of nitrogen to maintain suitable color may respond best to calcium nitrate (15.5-0-0) applied at a rate of 6 pounds per 1000 square feet. A spring application of 16-6-8 at a 6-pound rate and a fall application of 21-7-14 at a 5-pound rate should insure continuing adequate phosphorous and potassium supply. During the summer, ammonium sulfate (21-0-0) is a good source of nitrogen and should be applied at a 5-pound rate. **Larger tree plantings will require a less aggressive fertilizer regime and applications at half the given rate will be sufficient.** The first application of calcium nitrate should be made 30 days after planting is complete with retreatment scheduled at 45 to 60 day intervals. Once the plants have established, the frequency of fertilization may be decreased depending on color and rate of growth desired.

Additional mulch should be applied annually replacing any mulch lost through decomposition. Maintaining a mulch level of 3-4 inches depth will aid erosion control, reduce unwanted weed growth and prevent water loss through evaporation from the soil surface.

Shrub areas should receive treatment with granular pre-emergent herbicide to reduce weed growth.

LANDSCAPE PREPLANT

COMPREHENSIVE SOIL ANALYSIS
(AO5-1, AO5-2 or AO5-3)

Sample #	Half Sat%/ TEC	pH/ Qual Lime	ECe	NO3 N	NH4 N	PO4 P	K	Ca	Mg	Cu	Zn	Mn	Fe	Organic % dry wt.	Sample Description & Log Number
				Parts Per Million Parts Dry Soil											
1	18	7.5	0.4	3	6	5	60	2340	986					0.2	
	201	None		0.2		0.2	0.3	0.9	2.8						

Sample #	Saturation Extract Values: Ca me/l	Mg me/l	Na me/l	K me/l	B ppm	SO4 me/l	SAR	Percent of Sample Passing 2 mm Screen: Gravel: Coarse 5-12	Gravel: Fine 2-5	Sand: Very Coarse 1-2	Sand: Coarse 0.5-1	Sand: Med. to V. Fine 0.05-.5	Silt .002-.05	Clay 0-.002	USDA Soil Classification
1	1.6	1.4	1.5	0.1	0.03	0.6	1.2	0.3	2.7	5.1	9.3	37.4	32.1	16.1	Loam

Sufficiency factor (1.0=sufficient for average crop) below each nutrient value. N factor based on 200 ppm constant feed. SAR = Sodium adsorption ratio. Half Saturation %=approx field moisture capacity. Nitrogen(N), Potassium(K), Calcium(Ca) and Magnesium(Mg) by sodium chloride extraction. Phosphorus(P) by sodium bicarbonate extraction. Copper(Cu), Zinc(Zn), Manganese(Mn) & Iron(Fe) by DTPA extraction. Sat. ext. method for salinity (ECe as dS/m), Boron(B), Sulfate(SO4), Sodium(Na) and SAR. TEC(listed below Half Sat) = Est.Total Exchangeable Cations(meq/kg). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm(1/2 inch) sieve. Particle sizes in millimeters.

APPENDIX 43

CERTIFIFCATE OF SUBSTANTIL COMPLETION FOR LANDSCAPE

Print Form

Marina Coast Water District
11 Reservation Road, Marina, Ca 93933
831-384-6131
Water Conservation Department
831-883-5905
Fax 831-384-0197

Certificate of Substantial Completion

Project Name: _____

Post-Installation Inspection: (Check indicating substantial completion)

☐ A. Plants installed as specified ☐ B. Irrigation system installed as designed
☐ C. Irrigation controller adjusted ☐ D. Irrigation system operation checked
☐ E. A copy of this certification has been provided to the Project's owner/manager.

Please note below or on an attached sheet any deviations from the approved plans.

_____
_____
_____

I/we certify that work has been installed in accordance with the contract documents.

Contractor Printed Name	**State License Number**	**Date**	**Signature**

Address _____ **Phone Number** _____

I/we certify that based upon periodic site observations, the landscape planting and irrigation installation work has been substantially completed and that work conforms to the MCWD approved plans and specifications.

Landscape Architect Printed Name	**State License Number**	**Date**	**Signature**

Address _____ **Phone Number** _____

I certify that I have received all of the contract documents and that it is our responsibility to see that the project is maintained in accordance with the contract documents. I understand that if there is a requirement to provide public information on water conservation, I must provide that information to the new residents. I agree to comply with the MCWD Water Conservation Ordinance and understand that water use at this site is to be managed below the Maximum Applied Water Allowance (Water Budget) defined for the project.

Owner/Developer Printed Name	**Date**	**Signature**

Address _____ **Phone Number** _____

APPENDIX 44

EXAMPLE
WATER CONSERVATION PUBLIC INFORMATION PLAN

HOME TOWN DEVELOPERS, L.L.C. 123 Hometown Blvd., Hometown, CA 93933

Martina Coast Water District

11 Reservation Road

Marina, CA 93933

RE.: Actions taken to provide public information on water conservation.

To Whom It May Concern:

Following actions will be taken to provide public information on water conservation:

- The home on flag lot number 8 will demonstrate a model water-wise landscape installation.
- All common and residential lot irrigation systems feature ET-irrigation controllers and automatic rain shutoff devices. Manufacturer owner's manual and brochures describing how these units conserve water are included in the new homeowner's welcoming Package. The first year subscription fee required for wireless access to the daily weather data will be paid for by Home Town Developer, L.L.C. for each residence and the common landscaped area.
- The new homeowner's welcoming package includes a cover letter from Home Town developers, L.L.C. to the new home owner (see example letter attached), the Water-wise Landscape Design and Planting Guide, the Marina Coast Water District, Garden Watering Schedule, the Monterey County brochure: Plant Choices for the Central Coast and the Homeowners Guide to Efficient Water Use.
- Home Town Developers, L.L.C. donated $5,000 dollars to design and build an interpretive sign about native drought tolerant plant material installed for the Hometown's library water-wise demonstration garden.

Please find attached a sample of the letter we are including in the New Homeowner's Welcoming Package.

We are looking to work with you in the future.

Best regards,

Mark Builder - Vice President Home Town Developers, LLC

Dear Home Owner:

The landscape of your new home was designed to conserve water. A carefully selected arrangement of low maintenance, colorful, yet drought tolerant plant material replaces a typical thirsty front lawn. A three inch layer of mulch covers your newly installed landscape. The mulch keeps unwanted weed seeds from germinating and helps to retain moisture in the soil. Mulch will break down and it is recommended that you add additional mulch annually, until the anticipated density of mature plant material is reached.

Your front yard is drip irrigated, which conserves large amount of water because it irrigates only the root zone of the plants, eliminates unnecessary run-off and watering of unwanted weeds. There is little or no loss of water due to evaporation or overspray onto pavement.

Drip irrigation will keep your water bill low, but does require some maintenance over the years. Drippers may clog up and need to be replaced. You are advised to check your system about every three months. Look for obvious leaks and check the overall health of the plant material. Replace clogged up drippers, if necessary.

Your irrigation controller is equipped with a rain shut-off device, which will automatically shut off irrigation during the rainy season and save you approximately 20% on your annual water bill. This device is mounted to your roof and needs an annual check to make sure it is still mounted properly and free of obstruction.

Your irrigation schedule is automatically calculated by a state of the art ET controller (see additional information in this package). These controllers conserve approximately another 20% on your annual water bill and are virtually maintenance free. The ET controller automatically considers establishing periods and maturity level of plant material and climate changes of the seasons for you. Watering times are changed accordingly via program, which results in healthier plant material, because the plants will not get under or over watered. There is

an additional station on the controller available to be programmed to irrigate your backyard. Enclosed with this package you find the owner's manual for your ET irrigation controller and all necessary information you need to program the additional station to irrigate the backyard when you are ready. The customer service for the manufacturer of your controller can also help you if you have additional questions. The number can be found in the owner's manual.

Enclosed are the following publications to aid you in designing your own water-wise, private, backyard garden space:

- Water-wise Landscape Design and Planting Guide
- Marina Coast Water District, Garden Watering Schedule
- Plant Choices for the Central Coast
- Homeowners Guide to Efficient Water Use

By maintaining your "un-thirsty" landscape, you help conserve our most valuable, non-renewable resource of water, while keeping your water bill low.

Hometown Cottages subdivision also provides a model home that has a water-wise demonstration landscape installed. You are invited to visit the model home and get inspired to design your own backyard with water conservation in mind. Other water-wise installations to visit are nearby at Hometown Park and in front of the public library.

For further assistance on conserving water, you may contact the Marina Coast Water District (831) 384-6131 www.mcwd.org , the Water Awareness Committee of Monterey County (831) 646-4656 www.waterawareness.org, or the Monterey Bay Green Gardener Association www.green-gardener.org.

We hope you will enjoy your new home and landscape.

Best regards,

Mark Builder - Vice President Home Town Developers, LLC

APPENDIX 45

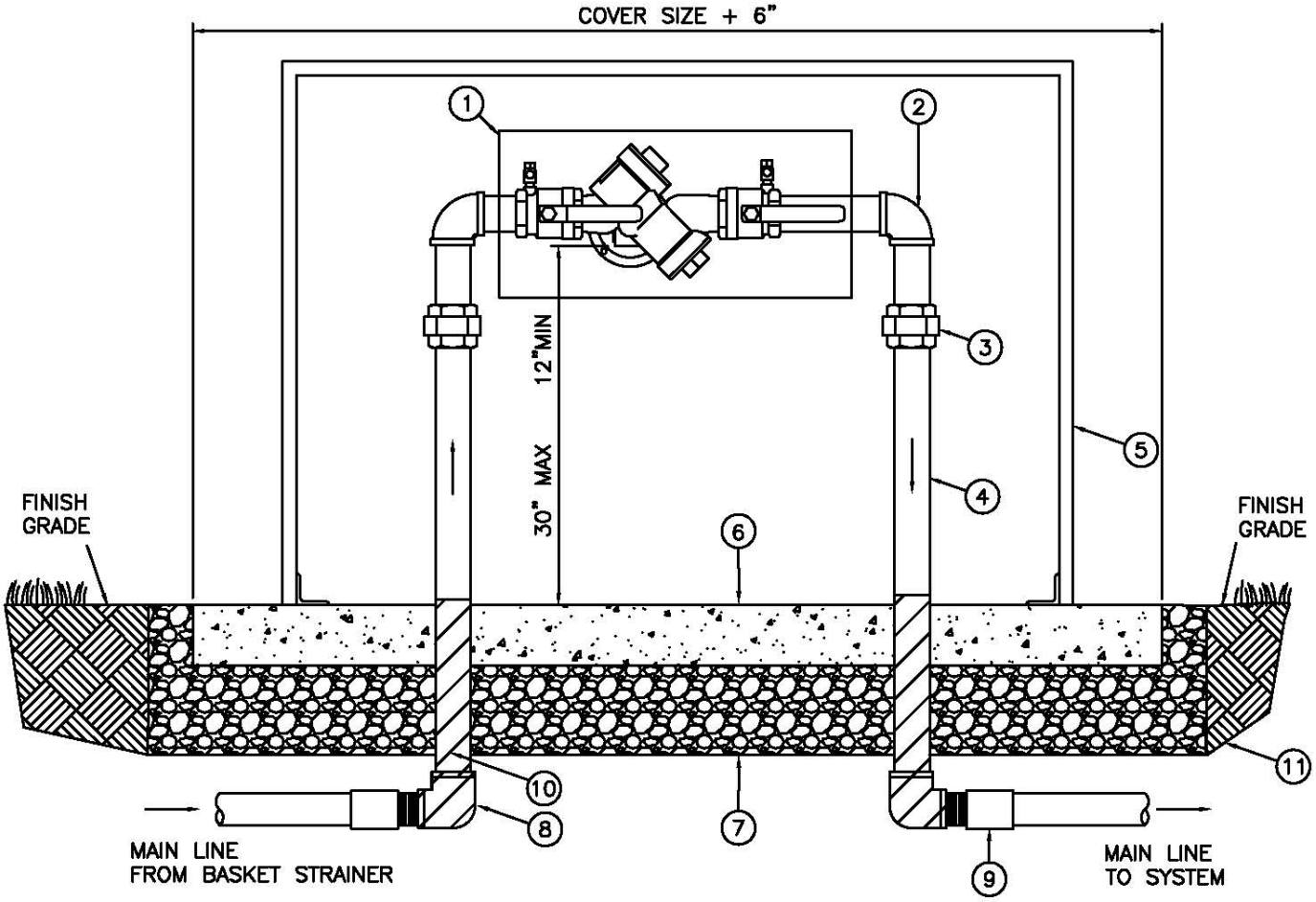
EXAMPLE
BACK FLOW PREVENTION UNIT

MATERIALS

1. APPROVED BACKFLOW PREVENTION UNIT, PER SECTION 15112, MCWD STANDARD SPECIFICATIONS
2. BRASS ELLS–TYP.
3. BRASS UNIONS AT EACH SIDE
4. BRASS PIPE
5. LOCKING BACK FLOW COVER
6. CONCRETE SPLASH BLOCK 4" THICK
7. GRAVEL 6" THICK
8. BRASS FEMALE THREADED ELBOW
9. SCH 80 MALE ADAPTER
10. WRAP BRASS PIPING BELOW GRADE WITH UPC 10 MIL. PIPE WRAP
11. UNDISTURBED OR COMPACTED SUBGRADE.

NOTES

1. BACK FLOW DEVICE SHALL BE TESTED ANNUALLY BY CERTIFIED PERSONNEL.
2. APPROVED BACK FLOW DEVICE SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE BASKET STRAINER, METER AND POINT OF CONNECTION.
3. EXAMPLE SHOWN MEETS M.C.W.D. AND C.H.D.S. REQUIREMENTS. ACTUAL LAYOUT SHALL BE BY LANDSCAPE DESIGNER.



APPROVED BY DISTRICT ENGINEER		MARINA COAST WATER DISTRICT	EXAMPLE
DATE 10/07		EXAMPLE BACK FLOW PREVENTION UNIT	L-3
			SHEET 1 OF 1

APPENDIX 46

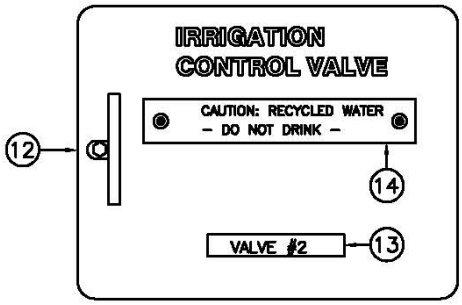
EXAMPLE
BASKET STRAINER

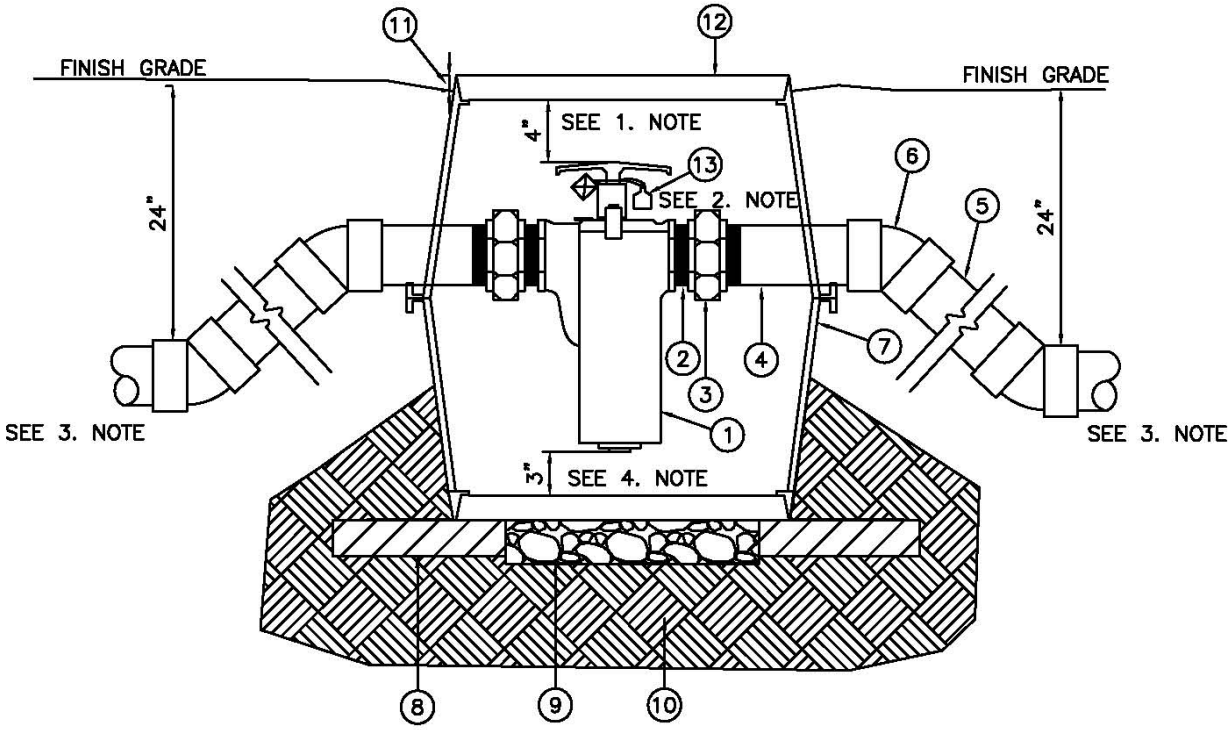
MATERIALS

1. BASKET STRAINER
2. PVC SCH 80 OR BRASS NIPPLE
3. PVC SCH 80 OR BRASS UNION–TYP. WITH REDUCTION BUSHINGS AS REQUIRED
4. PVC SCH 80 NIPPLE
5. PVC SCH 40 OR PVC CLASS 315 MAINLINE AS REQUIRED–TYP.
6. PVC SCH 80 45 DEGREE ELLIS–TYP. 4 PLACES
7. JUMBO VALVE BOX–26"X20" STACKED BACK TO BACK TO PROVIDE ADEQUATE ROOM TO SERVICE EQUIPMENT
8. BRICK SUPPORT– 1 EA CORNER
9. 3" DEEP PEA GRAVEL SUMP.
10. UNDISTURBED OR COMPACTED SUB–GRADE.
11. FLUSH IN TURF, 1" IN GROUND COVER
12. LABELED VALVE BOX COVER, PURPLE AND BOLTED DOWN FOR RECYCLED WATER CONNECTION
13. VALVE IDENTIFICATION LABEL
14. ATTACH WARNING LABEL: "CAUTION: RECYCLED WATER – DO NOT DRINK"

NOTES

1. 4–45 DEGREE PVC SCH 80 ELBOW FITTINGS SHALL BE USED TO RAISE VALVE HANDLE TO WITHIN 4" OF FINISH GRADE.
2. ATTACH PURPLE RECYCLED WATER IDENTIFICATION TAGS AS REQUIRED ON RECLAIMED SYSTEMS.
3. PLACE PURPLE "CAUTION RECLAIMED WATER BELOW" IDENTIFICATION TAPE ABOVE RECLAIMED WATER PIPING.
4. INSTALL WITHIN 2 JUMBO RECTANGULAR PLASTIC VALVE BOXES AS SHOWN TO PROVIDE CLEARANCES AS SHOWN.





APPROVED BY DISTRICT ENGINEER DATE 10/07	MARINA COAST WATER DISTRICT	MARINA COAST WATER DISTRICT EXAMPLE BASKET STRAINER	EXAMPLE L-2 SHEET 1 OF 1