SECTION 2.2 DEVELOPMENT PLAN AND PERMIT PROCESSING PROCEDURES

2.2.1 PURPOSE

The purpose of this section is to help facilitate development plan and permit processing.

2.2.2 DEPOSIT and/or FEES

The District collects deposits and/or fees for development review, improvement plan check and inspection, or any other tasks that require staff time. See Administrative Code Article 190 for fee amounts.

2.2.3 SUB-Area Master Plan (WATER, SEWER, RECYCLED WATER STUDY)

The necessity of a SAMP will be determined solely by the District. Necessity is based upon, but not limited to, Code requirements, size of project, project location and/or size of existing sewer collection, or water distribution facilities, location within an Improvement District/Service Area/Assessment District or drainage basin or other determining factors.

However, for all development, developers are responsible to size pipelines to meet current fire flow requirements, water quality conditions, and current design criteria. When the District determines that a SAMP is necessary, the developer shall provide the detailed information listed in Section 4.4. In some cases the SAMP may be prepared by the District or a consulting engineer hired by the District. In all cases, the cost of the SAMP shall be the responsibility of the developer.

General information regarding SAMP's follows:

- A. <u>Water and/or Sewer SAMP's</u>:
 - 1. A water and/or sewer SAMP for the proposed development shall be submitted to the District for review at least sixty (60) days prior to filing a tentative map for the development, accompanied by a written request for the DISTRICT's "facility commitment" form.
 - 2. Correction comments will be indicated on the SAMP and returned to the Engineer of Work. Depending on the complexity of the development, more than one submittal may be necessary.
- B. Recycled water landscape irrigation plans shall be as required in Section 2.5.

2.2.4 GENERAL RESIDENTIAL IMPROVEMENT PLAN PROCESSING GUIDELINES

- A. Pre-Improvement Plan Check Submittal:
 - 1. Preliminary plans may be required by the District to determine the plan check, construction inspection deposit and bond amounts. The District will use the unit prices listed in Appendix 2.2.C as a minimum or established prices not listed in the table for estimating construction cost and deposits and/or fees. See District for current or updated unit costs.

- 2. Contact District to determine if a pre-improvement plan check or construction cost estimate submittal is required.
- 3. If a pre-improvement plan submittal is not required, the Engineer of Work shall provide a construction cost estimate with the second improvement plan check using the unit prices listed in Appendix 2.2.C as a minimum. Once the District is satisfied with the construction cost estimate, performance and labor and material bond amounts will be established based on the quantities and unit prices.

B. District Processing Time:

- 1. The District will diligently pursue completion of the first plan check of the utility improvement plans within twenty (20) working days of the submittal date, provided that all of the required information is submitted at first plan check, and the plans are sufficiently complete to review. Subsequent plan checks generally take ten (10) working days. Turnaround of plans will depend upon the extent of the corrections required on a plan set and the current workload of the District.
- 2. Status of plans currently in for plan check can be obtained by contacting the District.
- 3. Plans submitted after the first plan check submittal shall be rejected if comments from previous check set are not addressed. If the Engineer of Work disagrees with a comment made in a prior plan check, the consultant shall contact the plan checker (include sheet number, comment, and design engineer's response) to discuss the issue prior to resubmittal of plans to the District. A note shall be made on the redline set of plans by the Engineer of Work as to the outcome of the conversation and include the written response from the District for any deviation from the comment in the previous plan check.
- C. <u>First Improvement Plan Check Submittal</u>: The Engineer of Work shall submit the following items for first review of any residential, commercial, or industrial development. (Submittal shall be made in electronic format):
 - 1. Transmittal letter from the developer or Engineer of Work requesting the commencement of the District's plan check process.
 - 2. Fee deposit if not previously submitted.
 - 3. Utility improvement plans, size as listed in Section 1.1.
 - 4. Completed plan check checklist, See Appendix 2.2 A
 - 5. Tract/parcel map showing gross acreage, street names, and water, sewer, and recycled water easements with provision for the District's execution.
 - 6. Grading plans.
 - 7. Irrigation/Landscape Plans.

After first plan check, the District will return one (1) electronic red-lined set of the utility improvement plans and tract/parcel map, and grading plans to the Engineer of Work for corrections.

Grading plans are required if the developer's grading operation will interfere with existing water, sewer, or recycled water pipeline easements or when new pipeline and/or access roads in easements will be granted from the developer to the District. In some instances, the City or County may request that the District sign the grading plans even if the aforementioned circumstances do not exist. See Appendix 2.2.B for notes. If, after first plan check, it is determined that the grading plans will not affect pipelines or contain new District pipeline easements and/or access roads, a note will be made on the grading plans that no further submittal is required.

Landscape irrigation plans are required if it is determined that recycled water is or will become available to a project in accordance with Article 175 or as required by the District.

- D. <u>Subsequent Improvement Plan Check Submittal</u>: The Engineer of Work shall submit the following items with second and subsequent plan checks for residential, commercial, or industrial subdivision:
 - 1. Revised utility improvement plans, tract/parcel map, landscape irrigation, and grading plans.
 - 2. Letter or signed plans from the governing fire department approving the plan or stipulating their conditions
 - 3. Check print from the first and subsequent checks and any comments by the Engineer of Work on items for design elements that vary from the previous plan check.
 - 4. Easement documents (if required) shall be as noted in this Section.
 - 5. Cost estimates prepared by the Engineer of Work for water, sewer, and recycled water facilities as required by the District. Use unit prices listed in Appendix 2.2.C.

When the plans are substantially complete, with only minor revisions remaining, the District will complete the bonds (Labor and Materials, Performance) and agreements (Construction, Reimbursement (if needed), other) or have the Developer complete and submit the bonds and agreements for District approval. One (1) red-lined set of plan check comments will be returned to the Engineer of Work for corrections upon completion of the second and any subsequent plan check. In some cases, the District will have joint bonds with the City or County.

E. <u>Easements</u>: Refer to Section 1.5 for easement width and location requirements. Dedication of easements can be done by separate document or by map dedication.

When dedicating by separate document the following applies:

- 1. Copies of easement legal descriptions with accompanying plat map shall be prepared by the Engineer of Work and submitted to the District for review.
- 2. Legal descriptions for easements shall be in a form acceptable to the District and shall be accompanied by a current title report (within 3 months) to be checked by the District for current ownership.
- 3. For easements that have been dedicated by separate document, a call out with the document number and date shall be shown on the improvement

plan sheets and on the index map to identify that the easement has been dedicated by separate document.

- 4. Improvement plans for the District facilities will not be approved until all required easements have been dedicated to the District along with any necessary re-conveyances or subordination agreements.
- 5. Easement exhibit size shall be per Section 1.1.

When dedicating by tract or parcel map the following applies:

- 1. Tract or parcel map shall be prepared by the Engineer of Work and submitted to the District for review.
- 2. Appropriate certificates shall be shown on the map for District acceptance.
- 3. Easements shall be shown on the improvement plan sheet and on the index map and identify the tract or parcel map number where the easement is being dedicated.
- 4. All easements shall be shown with bearings, distances, and dimensions.

In some cases, it is necessary for the District to quitclaim or vacate easements to a developer when water or sewer utilities are being relocated into public right of way. Quitclaim of easements needs to be done prior to tract or parcel map recording because the new subdivision can cut the easement into segments. The vacation of easements may require approval from the District's Board of Director's.

- F. <u>Improvement Plan Approval and Permit to Construct</u>: The District and, if necessary, the County or City shall approve improvement plans before a pre-construction meeting can be scheduled. Approval by the Engineer will be contingent upon satisfying the following requirements:
 - 1. All required corrections have been made on the utility improvement plans, and all systems are in conformance with the District.
 - 2. The water, sewer, and/or recycled water Construction and Dedication Agreements have been executed.
 - If applicable, the water, sewer, and/or recycled water Developer/District Reimbursement Agreement has been executed. The reimbursement agreement applies to reimbursable projects such as District Capital Improvement Program projects that will be built by a developer for the District.
 - 4. The governing fire department, developer, and Engineer of Work have signed the plans.
 - 5. All required easement documents have been executed and delivered to the District. When required, the Engineer has signed tract/parcel maps.
 - 6. The developer has paid all required deposits/fees.
 - 7. Labor and material, and performance bonds have been posted.

- 8. A copy of the Contractor's insurance certificates has been provided to the District.
- 9. All electronic data has been submitted in accordance with this Section.

When these requirements have been satisfied, the original mylar title sheet, a clean bond set of plans and the latest plan check comments shall be submitted to the District. When the plans have been approved, the Engineer of Work will be notified. Engineer of Work shall provide the District with signed copies of improvement plans. In some cases, the District may request that an original mylar or photo mylar copy be submitted.

The approved plans shall constitute a "permit" to construct water, sewer, and/or recycled water facilities as referenced in the District's Rules and Regulations.

2.2.5 DETAILED RESIDENTIAL IMPROVEMENT PLAN REQUIREMENTS

All plans submitted to the District for plan check and approval of water, sewer, and/or recycled water facilities shall conform to the standards of the County or City where the improvements will be constructed. The plans shall also contain the information detailed herein. A checklist of the items to be reviewed by the Engineer of Work is provided in Appendix 2.2.A. If all the items can be checked off as fully satisfied or not applicable, the plan-check corrections should be minor in nature.

- A. <u>Title Sheets</u>: Title sheets for utility improvement plans shall contain the following information as a minimum:
 - 1. Project identification legal description, assessor's parcel number(s), tract/parcel map number, project name, assigned plan check number, and site address.
 - 2. Vicinity map per Section 1.1.
 - 3. *A key map per Section 1.1 with the following additional information for development projects:
 - a. The size of all pipelines.
 - b. The direction of flow for all sewer lines and the manhole numbers.
 - c. Lot lines for the proposed development, driveways, footprints of buildings, and service lateral locations for each lot.
 - d. Existing and proposed easements for District facilities.
 - e. Map numbers and records of survey for adjacent properties.
 - 4. Sheet index per Section 1.1.
 - 5. Follow drafting guidelines per Section 1.2 and use provided templates, Exhibits 1.1A through 1.1F
 - 6. General notes per Section 1.1 and Appendix 2.2B.
 - 7. Dig alert symbol per Exhibit 1.1-D.
 - 8. Horizontal and vertical control per Section 1.1 and 1.6.
 - 9. Standard notes go on all improvement plans. Water, sewer, and recycled water notes need to be included on the improvement plans when those

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types of public improvements will be constructed. Standard, water, sewer, and recycled water notes shall appear under separate headings and not be co-mingled.

- 10. Signature block for District approval to be provided by the District.
- 11. Signature block for the governing fire department.
- 12. Signature block for County or City if an improvement plan is required by them.
- 13. Revision Block for Construction Changes.
- 14. Engineer of work's name, address, phone number, California registration number, expiration date, stamp, signature, date of signature, declaration of responsible charge, and name of engineering firm.
- 15. Name, address, phone number, and contact person of the property owner or developer.
- 16. *Legend with quantity estimates.
- 17. *Construction notes.
- 18. Grading plan, permit number, and/or drawing number.
- * Denotes may be placed on a second sheet if insufficient space on cover sheet.
- B. <u>Second Sheet</u>: Typically the second sheet of the plan set will have the following information:
 - 1. Legend with quantity estimates, if not on the title sheet.
 - 2. Continuation of notes and construction notes.
 - 3. Typical street cross sections showing all utilities, right-of-way widths, and sidewalks.
 - 4. Detail drawings.
- C. <u>Plan View and Profile Sheets</u>: Provisions and requirements of Water Pipeline Design Section 5 and Sewer Pipeline Design Section 6 shall be adhered to in designing water, sewer, and recycled water facilities.
 - 1. Profile: Provide information on profiles per Section 1.1.
 - 2. Plan View: Provide information on plan view per Section 1.1 with the following additional information for development projects:
 - a. Data tables for District utilities that include:
 - i. Bearing of line or delta.
 - ii. Radius.
 - iii. Length.
 - iv. Comments to include pipe size, class, and type of pipe.

- b. Existing water, sewer, and recycled water facility tie-in locations. Indicate size, class, and type of pipe for these facilities and the District drawing number. Proposed development adjacent to subdivision boundary shall be shown.
- c. Subdivision boundary, lot lines and lot numbers.
- d. Pressure zone (tank overflow elevation).
- e. Station for change of pipe size, class, direction, and type of pipe.
- f. Existing easements with document number and date and proposed easements to be dedicated to the District for sewer, water, and recycled water facilities shall be shown on the plan.
- g. Proposed building or dwelling unit pad elevations shall be shown.
- D. <u>Electronic Data Submittal</u>: The Engineer of Work will be requested to submit both the tract/parcel map and improvement plans in electronic format. If the County or City requires electronic submittals, the District will accept the electronic file in the same format as the County or City format. If the County or City does not require electronic submittals, the format for layers, line types, etc. listed in Section 1.2 shall be used.
 - 1. Data Accuracy and Coordinate System: The accuracy of data submitted in accordance with these specifications shall be consistent with data converted directly from COGO and may be used for computational purposes during the plan check and construction phase of the submitted project.
 - 2. File Formats and Media Requirements: Digital files shall be submitted in PDF format, via file transfer platforms.
 - 3. Checking of Digital Data for the following:
 - a. Correct layering.
 - b. Verification that annotated and calculated data are consistent.
 - c. Verification that digital and hard copy plans are consistent.
 - d. Verification of correct coordinate system.
 - e. Verification that pipeline plan and profile drawings are shown in one drawing file.
 - f. Verification that digital files do not contain unresolved line types, font files, and cross-references.

2.2.6 GENERAL COMMERCIAL/INDUSTRIAL IMPROVEMENT PLAN PROCESSING GUIDELINES

A. <u>Water and Sewer Service Requirements</u>: All commercial and industrial water services will require that a reduced pressure device assembly (RPDA) be installed downstream of the water meter. The device shall be installed in accordance with Standard Drawing W-7 or W-8. The assembly shall be above ground and not in an underground vault. If applicable, Appendix 2.2.C shall be used for estimating construction cost and for bond amounts.

Items required to make application for commercial/industrial service are:

- 4. Improvement plans with water and sewer service lateral location stationed and called out. Number of plan sets to be determined by District.
- 5. Plumbing plans showing the number of fixtures units/estimated water usage. Number of plan sets to be determined by District.
- 6. Irrigation plans showing the estimated annual irrigation demand and maximum flow rates for each irrigation zone.
- 7. A letter from the developer or Engineer of Work requesting a <u>(size)</u> meter, not to exceed <u>(quantity)</u> gpm, to serve <u>(company name)</u> at <u>(address)</u> and payment for the cost of installation.

Recycle water shall be used for irrigation when available. See Article 175 for Recycled Water Facility Guidelines.

B. <u>Private Fire Protection Systems</u>: Check with the District to verify the limits of a "Private Fire Protection System". All private fire protection systems shall be made through a double check reduced pressure backflow prevention device with bypass meter as shown on Standard Drawing W-8. These assemblies can be installed in such a manner as to be screened from view, but shall be accessible to the governing fire department ant the District's personnel at all times. There shall be five feet (5') of clearance on all sides of the assembly installed above ground.

The plan check submittal package, if required based on District's discretion, shall include a site utility plan showing:

- 1. Property lines and required easements.
- 2. Building footprint.
- 3. All on-site private fire protection systems.
- 4. Stamp or signature of governing fire department.
- 5. Address of the building.
- 6. Assessor's Parcel Number.
- 7. Owner/Developer.
- 8. Location of fire service lateral and backflow prevention device.
- C. <u>Public Fire Hydrant Systems</u>: Where public fire hydrant system(s) are being installed and a public distribution pipeline needs to be extended parallel with the street to reach the property being served or when street improvement will occur, water improvement plans are required and the developer's contractor shall install the improvements. Process improvement plans in accordance with this Section.

The plan check submittal package for installation of public fire hydrants without a public extension, if required based on District's discretion, shall include a site utility plan showing:

- 1. Property lines and all existing and proposed easements.
- 2. Building footprint.

- 3. Locations and flow requirements for fire hydrants. Must be approved by the governing fire department.
- 4. Payment of all required plan check or field estimate deposits/fees to District. The developer shall bear the responsibility and cost of installing the fire hydrant after the plans are approved by the District. Fire hydrant will be installed after deposit/fee has been made. Plans are required if a water pipeline needs to be extended for the fire hydrant installation or when there is street improvements.
- D. Recycled water service requirements shall be in accordance with Article 175.

2.2.7 DETAILED COMMERCIAL/INDUSTRIAL IMPROVEMENT PLAN REQUIREMENTS

Improvement plans are required for commercial/industrial developments with the following additions:

Commercial/Industrial improvement plans shall be process in accordance with this Section and shall also generally follow in accordance with Sections 2.2.4 and 2.2.5.

- A. See District for water meter sizing standards.
- B. Deposits and/or fees will be determined based on guidelines in the Administrative Code. The service may be installed by the District if the service lateral will be connected to an existing pipeline or by a contractor hired by the developer. If the developer hires a contractor, the contractor shall construct the facilities on the improvement plans including the services and the District will inspect the work. All wet taps will be performed by District or District approved contractor.

2.2.8 INDIVIDUAL SERVICE REQUESTS

- A. Individual service requests shall be made in writing and, such projects depending on the complexity of improvements, may be required to have an improvement plan. After the plans depicting the service connections are approved, the developer shall prepare a service request application. Fees and/or deposits will be required at the time the service application is submitted.
- B. Once the service application is approved and the developer has paid fees, the service will be installed by the District.

2.2.9 SUPPLEMENTAL INFORMATION FOR RESIDENTIAL, COMMERCIAL/INDUSTRIAL PROJECTS

- A. On backflow prevention devices at unmetered connections, such as fire services, the District will install/replace the "tattle tale" meter that normally comes with those devices. This is because the supplied meters are not compatible with the District Automatic Metering Infrastructure (AMI) system, the owner will be charged per current rates.
- B. Plans will be valid for a period of one (1) year from the date of the District's approval. If construction has not started within this timeframe, the approval of the plans becomes null and void. In this event, the District will require that the plans be re-checked. Recheck may require additional plan check fees and/or connection fees. Bonds and

agreements shall also be renewed. New updates to the Standards during the lapse shall be included during redesign and construction of the public improvements.

- C. An increase in the number of units to be served by the system will not be allowed without approval from the District.
- D. Contractor material submittals and shop drawings shall be provided to the Engineer of Work for review and approval. The Engineer of Work shall review and mark the submittals as either approved or denied and submit them to the District for review. The District will return the submittal to the contractor.
- E. Pre-Construction Meeting for Public Improvements shall be in accordance with Standard Specification 01200.
- F. Construction Schedule for Public Improvements shall be in accordance with Standard Specification 01312.
- G. <u>Construction Changes</u>: During construction, if circumstances or conditions require that pipeline horizontal or vertical alignments need to change, water or service later locations need to be moved, fire hydrant locations need to be changed, or any other deviations that in the opinion of the District's Inspector or Engineer warrants a change to be shown on the plans, the Engineer of Work shall prepare a construction change showing the proposed location, alignment or discrepancy on the original mylar improvement plans. The construction change shall be signed by the Engineer prior to the work being completed. The District's Inspector shall determine whether a construction change is warranted and may elect to as-built changes rather than require a construction change. Under no circumstance shall field revisions be made without prior written approval of the Design Engineer and District.
- H. <u>District Authority</u>: The District shall have full access to the work at all times during construction and shall be furnished with every reasonable facility for ascertaining full knowledge of the progress, workmanship, and character of materials used and employed in the work.

The District's Inspector shall have the authority to suspend the work completely or in part for such time as they may deem necessary if the contractor fails to carry out instructions given by the District's Inspector. The contractor shall immediately comply with a written order of the District's Inspector to suspend the work completely or in part. The work shall be resumed when improper methods or defective work are corrected as ordered and approved in writing by the District's Inspector.

I. <u>Service Prior to Acceptance</u>: The District may approve putting newly installed water, sewer and recycled water lines into service prior to final completion. The District shall grant this conditional acceptance only upon written agreement with the developer stipulating certain terms for the conditional acceptance. Refer to Article 190 for additional information. Upon this written approval for conditional acceptance of facilities, the developer shall be relieved of the duty to maintain the portions so used or placed into operation provided that nothing shall be construed as relieving the developer 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 as full acceptance, and such action shall not relieve the developer of the guarantee provisions of their Agreement with the District.

- J. <u>Acceptance of Work</u>: Upon filing of the notice of completion, satisfactory completion of construction and acceptance by the District, the facilities shall be conveyed to the District. Where capital improvement projects are funded by developers and reimbursed by an District, the developer shall supply a Cost of Construction Statement (CCS) supplied by the District for reporting the actual cost of construction. Completed forms shall be submitted to the District within thirty (30) days after completion of the final inspection and prior to the release of the final dwelling units along with "Record" mylars of the improvement plans and an electronic files plans for the street, water, sewer and recycled water improvement plans. A warranty bond by the project owner for the one year period must also be provided at this time. Upon receipt of these items, the District will approve the release performance bonds posted for construction of the sewer, water, and/or recycled water facilities. For information regarding "Record" mylars refer to Section 1.7.
- K. <u>Release Given to County or City</u>: After final inspection has been completed and punch list items have been substantially completed, Notice of Completion recorded, and the requirements outlined in this Section fulfilled, the District will provide notification of its final acceptance to the County or City to facilitate the partial release of the developer's bonds for water, sewer, and recycled water facilities, except for the bonds which will remain in effect for the one (1) year warranty period after the Notice of Completion. At the discretion of the District, a unit of the development, may be held and not released for occupancy until all items on the final punch list have been completed to the satisfaction of the District's Inspector. The unit cannot be sold or occupied prior to the completion of all punch list items.

2.2.10 DISTRICT REGULATION REGARDING CROSS-CONNECTIONS

All potable water services shall be subject to the provisions of an District's Rules and Regulations regarding water backflow prevention. The following summarizes those provisions:

- A. Cross connections of any type that permit a backflow condition from any source or system other than that of the District's potable water pipelines to the potable water system are prohibited. A connection constituting a potential or actual backflow hazard will not be permitted unless a backflow device or air gap, which is approved by the California State Department of Health and local health District 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 backflow.
- B. The District will not provide water service to any premises unless the public water supply is protected as required by State, County, and District regulations.
- C. For residential, domestic and fire services, backflow prevention devices shall be installed by the District as part of the meter install process, see Standard Drawing W-3A. Once installed the device is considered private and is the responsibility of the property owner to protect against damage. The District will test the device on an annual basis. For Industrial and commercial applications, backflow devices are to be installed and tested by developer, see Standard Drawing W-7 and W-8. Annual testing will be the owners responsibility, with documentation provided to the District.
- D. Water service to any premises may be discontinued by the District, after notice, if a backflow prevention device required by District's Rules and Regulations is not installed, tested, and maintained; if any defect is found in an installed backflow prevention device; if it is found that the backflow prevention device has been removed or bypassed; or if unprotected cross-connections exist on the premises. Service will be Standard Specifications for Design and Construction

restored only when such conditions or defects are corrected to the satisfaction of each District.

- E. Additional references for guidelines as to when, why, and what types of backflow and cross-connection control devices are approved may be found in:
 - 1. Regulations Relating to Cross-Connections, California Administrative Code-Title 17-Public Health.
 - 2. 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.

2.2.11 REFERENCE

Should the reader have any suggestions or questions concerning the material in this section, contact the District Engineer.

The publications listed below form a part of this section to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said publications unless otherwise called for. The following list of publications, as directly referenced within the body of this document, has been provided for the user's convenience. It is the responsibility of the user of these documents to make reference to and/or utilize industry standards not otherwise directly referenced within this document.

- 1. Valley Center Municipal Water District Standards:
 - A. Design Guidelines:
 - i. Section 1.1, Drafting Guidelines
 - ii. Section 1.2, AutoCAD Guidelines
 - iii. Section 1.5, Easements and Encroachments
 - iv. Section 1.6, Survey Standards Guideline
 - v. Section 1.7, Record Drawing Guidelines
 - vi. Section 4.4, SAMP Development (Master Plan)
 - vii. Article 175, Recycled Water Guidelines
 - B. Standard Drawings:
 - i. W-3, W-3A, W-7 and W-8
- 2. Regulations Relating to Cross-Connections, California Admin. Code Title 17 Public Health.
- 3. Manual of Cross-Connection Control, published by Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California.

END OF SECTION