DEVELOPER / CONTRACTOR HANDBOOK AND GUIDELINES FOR DESIGN AND CONSTRUCTION OF WATER AND SEWER FACILITIES

MISSION SPRINGS WATER DISTRICT
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MSWD DEVELOPER/CONTRACTOR HANDBOOK & GUIDELINES

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1.0 INTRODUCTION

Mission Springs Water District (MSWD) is a “Publicly Owned Water District” with the mission to “Provide, protect, preserve our most valuable resource . . . **water**.”

Those eight words capture a complex and dynamic task.

PROVIDE The District serves an area of 135 square miles, covering the communities of Desert Hot Springs, North Palm Springs, West Garnet, West Palm Springs Village, Palm Springs Crest, and some adjacent areas of Riverside County. As of January 2016, it serves 36,000 people in an estimated 12,500 households and 500 businesses.

Water service to residential and commercial accounts takes about 9,000 acre/feet per year. The water served comes primarily from the Mission Creek Groundwater Sub-basin and the Cabazon Groundwater Basin.

The District provides sewer service to over 50% of its customers and has worked with residents to form assessment districts that fund the replacing of customers' septic systems with more environmentally friendly sewer service. Wastewater treatment takes place in two treatment plants, the larger being the Alan L. Horton Wastewater Treatment Plant which can treat two million gallons of wastewater per day.

PROTECT Septic tank effluent contains significant amounts of nitrates and poses a great threat to local groundwater supplies.

Replacing septic systems with sewer connections is a high priority for the District and those efforts continue to pay off, with over 50% of the District now on sewer service.

Capital to fund the development of modern sewer systems is achieved by aggressively pursuing financial assistance through grants at the federal, state, and local levels.

PRESERVE Wisely managing water supplies today is the best way to assure water for the future.

The District's conservation and outreach program has been organized to educate and motivate the community to care about protecting the groundwater. The District's replenishment activities include obtaining water from sources outside the District and incorporating it into the District's water supply.

1.01 PURPOSE

The District developed this manual to guide developers and their engineers through the process of design and construction of new water and sewer facilities. Staff has included information pertinent to residential tract development, multi-family residential developments, industrial, and commercial developments. If, after reviewing this handbook, there are questions or comments regarding the contents, please contact the Engineering Department at (760) 329-6448 ext. 127 or by email at engineering@mswd.org.

1.02 BACKGROUND

While prospecting for water, early homesteaders in the desert discovered the hot springs that have made this area famous. It was not until 1940, however, that the first subdivisions were established and L. W. Coffee started the village he called Desert Hot Springs.

The critical need for fresh water led residents to form a mutual water company, which eventually proved unsatisfactory. Later, a privately-owned utility, called the Desert Hot Springs Water Company, acquired its assets. But this too failed and widespread dissatisfaction led local citizens to form a publicly owned water district.

By 1953, an election swept the new Desert Hot Springs County Water District into existence with a vote of 246 to 9. The new District began with 100,000 feet of pipelines, 5 water wells and two reservoirs. It covered one square mile.

The District expanded rapidly. It absorbed parts of the Coachella Valley County Water District, the West Palm Springs Village and San Gorgonio Mutual Water Company systems. Today, it boasts more than 1.9 million feet of pipelines, 14 water wells and 24 reservoirs, serving an area of 135 square miles.

As early as 1954, local citizens petitioned for sewer service. The cost, however, was prohibitive. But growth brought an overload to the septic systems and health hazards to the community. The District built the Alan J. Horton Wastewater Treatment Plant in 1972, and it has been expanded four times to a capacity of 2 million gallons of wastewater a day.

MSWD provides water supply, wastewater disposal, and water resource management to the public in a safe, reliable, environmentally sensitive, and financially responsible manner. The district strongly supports and encourages wise water use by our customers as well as the public.

Much of MSWD background, history and invaluable water conservation information can be found on its website at www.mswd.org.

1.03 GENERAL SERVICE CRITERIA

Within the design manual, the term “MSWD” means Mission Springs Water District. “developer’s engineer” means a currently licensed civil engineer retained by the owner or developer to perform engineering for water and sewer systems in conjunction with land division development.

Water facilities include water pipelines, related appurtenances, and may include offsite facilities such as pump stations, water storage reservoirs, and pressure regulating stations that are necessary to deliver sufficient water at adequate volume and pressure to the development.

Sewer facilities include sewer pipelines, manholes, clean outs, and lift stations necessary to deliver wastewater to a treatment facility.

If water or sewer service is desired within an existing service area, service can normally be provided if the developer meets the following conditions:

1. Pays all applicable fees and rates.

2. Designs, constructs, and dedicates to MSWD the necessary facilities. MSWD will review all plans, and may revise, modify or request the redesign of any concepts, plans or details submitted. Signed engineers cost estimate and any recorded maps or easements will be required prior to MSWD approval. All plans must be approved and signed by MSWD district engineer or designee, prior to the issuance of a Notice to Proceed for construction. Treatment facilities (water or sewer) must already exist or their creation will be part of the obligation of the developer.

3. Grants Fee Title parcels to MSWD on MSWD Grant Deed forms for all facilities not located within public right-of-way. Fee Title parcels shall be a minimum of 30 feet in width unless otherwise approved by MSWD.

4. Pays current applicable charges in addition to completing the requirements listed above. Fees may include: plan check fees, water and/or sewer connection charges, inspection fees, front footage or fire flow charges, and meter charges or other charges authorized by MSWD Board of Directors. MSWD should be consulted for current and applicable fees.

The procedures for the development of water and/or sewer systems for tract maps, parcel maps, multi-family developments, commercial developments, and single lot development differ only slightly. The design standards contained herein are primarily prepared for residential tract map development but can be used for all types. The applicable minimum requirements are as follows:

1. Design required facilities to MSWD standards.

2. Prepare water and/or sewer plans. MSWD has the authority to waive this requirement for single lot developments.

3. MSWD staff reviews and approves plans.

4. Dedicate right-of-way for all facilities to be owned and operated by MSWD.

5. Provide an opinion of probable cost of all improvements.

6. Post all necessary fees.

7. Execute a water and/or sewer system construction agreement and post bonds with MSWD, retain a qualified licensed contractor, and provide proof of insurance.

8. Fund and obtain inspection services by MSWD.

9. Obtain a written Notice to Proceed before construction begins.

10. Have an engineer certify that the proposed final road grade (as shown on the plans and approved by the County of Riverside, the City of Palm Springs, or the City of Desert Hot Springs over the pipeline alignment has been achieved. If the existing surface of the alignment is not to be changed, the project engineer shall certify.

11. Construct facilities to MSWD standards.

12. MSWD staff provides final approval of facilities constructed.

13. Complete “record drawings” plans (field changes recorded on the original plans) for MSWD.

14. MSWD accepts Bill of Sale for the transfer of title for the constructed water and/or sewer facilities to MSWD.

15. See Flow Chart Section 5.03.01.

Developer must make necessary financial arrangements with MSWD to accomplish the above items.

1.04 OTHER PUBLIC AGENCY REQUIREMENTS

The requirements for the design of water and sewer plans and systems specified herein do not waive nor are they intended to contradict any requirements required by other legal governing public agencies.

1. State of California Water Supply Assessment (WSA)

   Subject: WSA Triggers

   Here is what defines a project:

   California Water Code section 10912.

   For the purposes of this part, the following terms have the following meanings:

   (a) "Project" means any of the following:

   (1) A proposed residential development of more than 500 dwelling units.

   (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

   (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

   (4) A proposed hotel or motel, or both, having more than 500 rooms.

   (5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(6) A mixed-use project that includes one or more of the projects specified in this subdivision.

(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

(b) If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections.

If a project falls within the above definitions, then the Developer will need to contact the County, or City (depending on the jurisdiction where the project is located) to request a WSA from MSWD. Upon receipt of the request MSWD will determine the costs involved for the WSA preparation by a District approved firm and will supply the Developer with an invoice for those costs. The Developer shall be responsible for all costs involved in preparation and the required MSWD Board of Director approval.

Engineers designing water and sewer plans and systems for the MSWD system must be knowledgeable of and comply with the regulations of the State of California, the County of Riverside, City of Palm Springs, the City of Desert Hot Springs, or other local agencies having jurisdiction, as appropriate. These regulations shall include administrative codes, civil codes, and health regulations, permit requirements.

1.05 WATER AND SEWER PLAN APPROVAL PROCESS

Note: For landscape plan submittals refer to the MSWD website for requirements; plan check review times will generally be the same as below.

The developer’s engineer must design the facilities and prepare the “water and/or sewer construction” drawings to MSWD requirements and shall submit such designs to MSWD for review. MSWD staff may revise, modify, or otherwise require redesign of any concepts, drawings, or details submitted. Construction must begin within one year of approval of the water and/or sewer construction drawings. If more than one year has elapsed, before starting construction, the project must go through the plan check procedure again. The steps required to process a project and obtain plan approval are as follows:

1. Attend preliminary planning meeting.

    a) Call or email the MSWD Engineering Department to arrange a preliminary planning meeting to discuss the proposed project. At the preliminary planning meeting, submit a tentative tract map or project site map with the preliminary water and/or sewer facilities shown. Upon review of the project, MSWD may require a preliminary report and/or hydraulic network analysis. MSWD files of the construction notes, title

block and other required certificates can be downloaded from the Water and Sewer CAD Toolbox.

b) MSWD will discuss the general location and size of required facilities and will provide information on known existing MSWD facilities in the area. MSWD staff will provide available record drawings for existing facilities. MSWD staff will designate any special location, size, and depths, prior to the engineer preparing plans.

c) MSWD provides water and/or sewer service to customers directly when the customer's property is located in one of its service districts. If customers are outside an existing service district, service may be obtained by (1) annexing into an existing service district (2) forming a new service district, or (3) seeking service from another nearby public or private utility. MSWD shall be consulted for advice regarding service in any of the above circumstances.

2. Submit a completed and signed Application for New Development along with the required deposit for plan check and inspection; MSWD staff will determine the amount based on the following:

MSWD staff will require a deposit to cover staff time and costs before plan checking and other related engineering services may proceed. The fee covers engineering services related to preliminary reports, hydraulic network analyses, plan checks, and inspection of the construction. When the staff time and costs have exhausted the deposit funds, MSWD will request an additional deposit to avoid an interruption in engineering, plan checking, inspection and other related services.

The normal plan check deposit is as follows:

Water and or Sewer Improvement Plans	$2,250 per sheet (two sheet minimum including the cover sheet)
Landscape Improvement Plans	$1,500
Waste Discharge Report (if applicable)	$700

Any unused deposit funds will be refunded to the payee following the one-year warranty completion.

3. Submit preliminary report and/or hydraulic network analyses (if required).

If required, the preliminary report and hydraulic network analyses must be submitted to MSWD staff for review and comments. The preliminary report and/or hydraulic network analyses must be approved prior to submittal of any drawings for plan check. After MSWD

staff and the developer's engineer have agreed on a conceptual design, detailed plans may be prepared and submitted.

After review and approval of the preliminary report and/or hydraulic network analyses, developer's engineer shall electronically submit first plan check.

Submit first plan check with the following required material:

1) Water construction drawings.

2) Sewer construction drawings.

3) Street improvement drawings.

4) Grading plans.

5) Storm drain plans.

6) Tentative tract/parcel map.

7) Tract phasing Map (including lot numbers and street names).

8) Letter stating fire flow requirements from the governing fire authority.

9) Soils Report. This report is to include information on:

    a. Subsurface soil and groundwater conditions;

    b. Site geology, regional faulting and seismicity, near source factors, and site seismic accelerations;

    c. Soil conditions which may be aggressive to metal and concrete;

    d. Soil infiltration rates;

    e. Professional opinion on site grading and earthwork;

    f. Professional opinion on lateral earth pressures;

    g. Professional opinion on excavation conditions and buried utility installations; and

    h. Professional opinion on pavement structural sections

10) Environmental Site Assessment, Phase 1 report with the following information, at a minimum:

a. Identify potential environmental hazards associated with past and present activities on the subject site or in the site vicinity, in general conformance to ASTM Standard E-1527-05, "*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process"* This report is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with the project.

4. Incomplete submittals will be rejected. **Each submittal shall include a transmittal/email listing all items being submitted**. Details regarding design criteria are included in Sections 2.0 for water and 3.0 for sewer. Details regarding preparation of plans and grant deed documents are included in Section 4.0.

5. After MSWD staff reviews the first plan check submittal for completeness, the plans may be sent to an MSWD consultant for a detailed review. MSWD staff will provide to the reviewing consultant red line comments on the water and sewer construction drawings plus any supplemental information provided by the developer's engineer. MSWD will then return the reviewed plans to the developer's engineer for revisions. In addition, MSWD staff may provide additional comments clarifying all required resubmittal information.

6. It is the goal of MSWD staff and consultants to complete the first plan check within twenty-five (25) calendar days of receipt of a complete submittal. Plan review time varies depending on the number of plans in the review process, size of project, and the complexity and completeness of the project plans. Contact MSWD staff after first plan check submittal for estimated turnaround times.

7. The developer's engineer is to check off all completed items on the Plan Check Checklist. MSWD staff and consultants encourage the developer's engineer to contact them with any questions regarding the plan check comments prior to resubmitting the subsequent plan check.

8. It is the responsibility of the developer's engineer to arrange for any fire flow tests required. An Application for Fire Flow Test Request along with the required fee should be sent to MSWD allowing approximately two weeks for the District to complete the testing.

9. It is the responsibility of the developer's engineer to submit the water construction drawings and fire flow calculations to the Fire Marshal for review and approval. Any edits received from the fire department should be incorporated in the corrected plans and a copy of the correction notice or red line shall be sent to MSWD with the next submittal.

10. After the first set of check prints is returned, no changes, **except those requested or approved by MSWD**, shall be made by the developer's engineer. If the developer's engineer wishes to make a change other than those requested by MSWD, a copy marked with the proposed change in red shall be submitted to MSWD for approval. Only after written approval shall the original be changed. The authorized change shall be

highlighted on the next recheck submittal. Drawings that do not follow the requirements contained in this Design Manual and/or that are unclear, misleading, or confusing will be subject to rejection without review.

11. Submit subsequent plan checks, MSWD staff and consultants will normally return subsequent plan checks within fifteen (15) business days.

12. For each subsequent plan check, developer's engineer must submit the following:

    1) Original plan check checklist(s) with comments.

    2) Revised construction drawings.

    3) Hydraulic fire flow calculations including proposed service demands signed by a registered engineer.

    4) Any additional material requested.

    5) Engineers estimate of probable costs for District facilities.

    6) Recorded Maps or Easements to MSWD as required.

    MSWD staff will notify the developer's engineer to submit a PDF copy of signed plans when all plan checks are completed, and the plans are acceptable to MSWD staff and consultants. Any signed plans sent prior to being requested by MSWD staff will not be considered or returned. The plans must be signed by the developer's engineer, any other required agency, and Fire Marshal prior to being submitted to MSWD staff for signature. Prior to final approval of the construction drawings, developer must pay any deposit amounts deemed to be required for project completion through warranty and submit the required items. (Section 1.05.01).

13. MSWD Execution of Plans:

When all submittals have been completed to the satisfaction of MSWD staff, MSWD will notify the developer's engineer to route a PDF copy of the plans for signature from all other agencies then provide the plans for MSWD approval. MSWD staff will file and obtain four (4) bond copies for District use at project expense and provide a PDF file to the developer's engineer. The developers engineer will be responsible for providing any additional copies needed. Original water and sewer plans become the property of MSWD. MSWD staff will furnish the developer with a fee letter and pre-construction requirements.

When signed, the original plans cannot be modified without written permission from the MSWD District engineer or designee. Any modification after signing shall "be clouded" with a revision number on the drawing and noted in the revision block for that sheet and the cover sheet revision block.

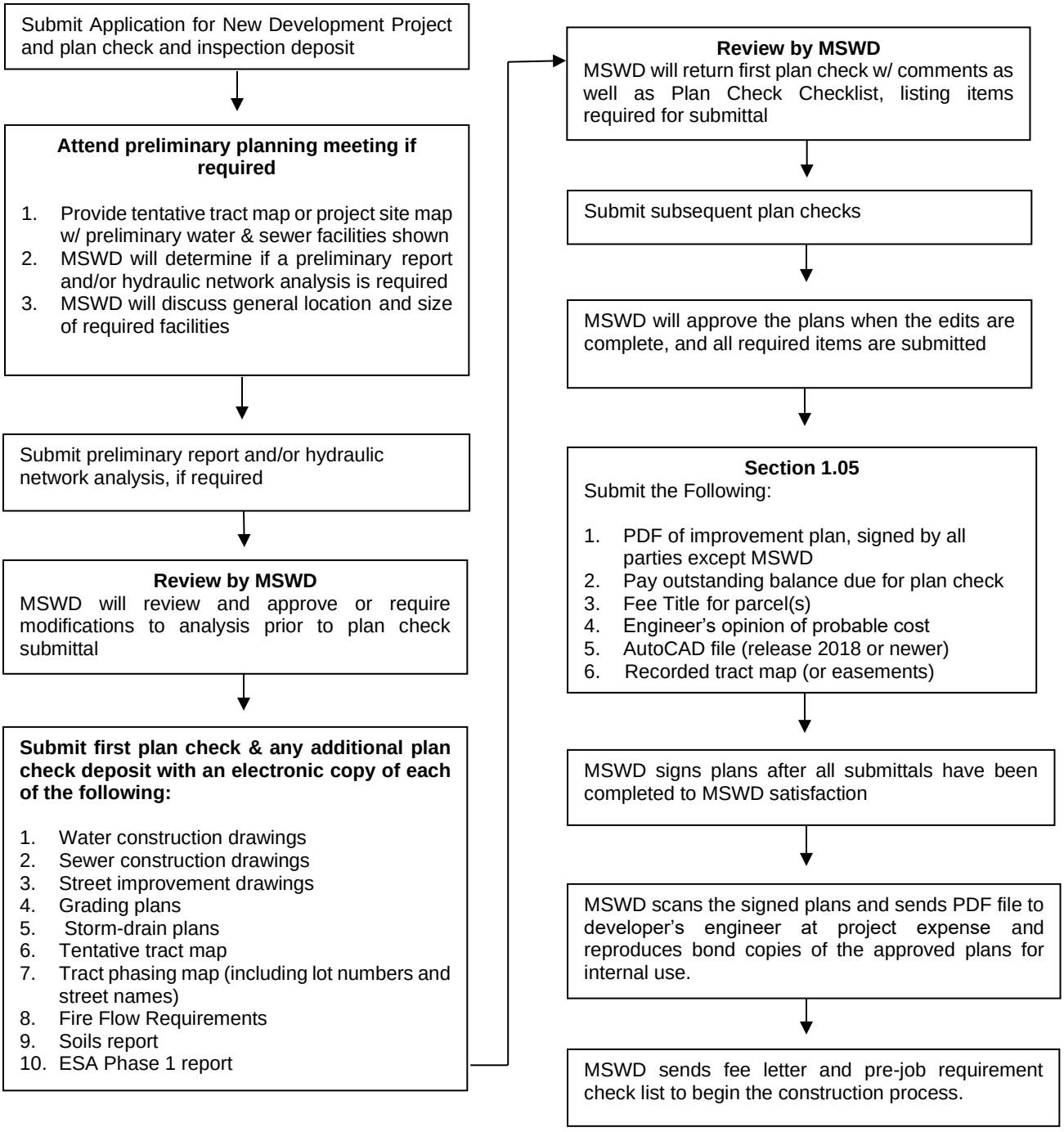
Plan checks resubmitted after one (1) year from date of last submittal, regardless of number of previous submittals, will be deemed "expired". "Expired" plan checks

resubmitted will be subject to current MSWD design requirements and considered a “first plan check submittal”.

Approved plans not submitted for construction within one year from approval date will be considered expired and MSWD may require that plans be resubmitted for review prior to construction.

1.05.01 FLOW CHART – WATER AND SEWER PLAN APPROVAL PROCESS

Reference section 1.05 Water and Sewer Plan Approval Process



1.06 WATER CONSERVATION AND LANDSCAPE REQUIREMENTS

All developments shall be required to prepare Landscape and Irrigation Plans in conformance with the latest version of the Mission Springs Water District Efficient Landscaping Guidelines and the requirements of the local city or county agency, whichever is more stringent.

Plans shall be submitted concurrently to MSWD and the appropriate local agency for review.

Plans will be reviewed by the MSWD Consultant and red line comments will be returned to the applicant for corrections. Where local agency comments conflict with MSWD requirements, the applicant shall contact the MSWD Consultant for resolution.

Final plans will be stamped and signed by the landscape architect and the MSWD General Manager.

All landscape and irrigation construction shall be subject to MSWD inspection and shall be complete and approved to receive MSWD Certificate of Completion. Certificate of Completion is required prior to issuance of Certificate of Occupancy by the governing land use authority.

1.06.01 MSWD RESIDENTIAL MODEL HOME REQUIREMENTS

1. At least one model home, within residential subdivisions, shall demonstrate a water conserving landscape. The MSWD one-acre garden which exhibits water-wise landscaping and showcases more than 250 water-efficient plants, opens daily at 10 a.m. closing at 4 p.m. and is free to the public.

2. The developer's landscape architect shall consult with the MSWD Engineering team prior to preparation of final plans to ensure compliance with MSWD guidelines and requirements. Contact the MSWD Engineering Department for the review fee charge.

3. The developer shall submit model home landscape and irrigation plans for MSWD review concurrently with the City or County submittal. MSWD approval is required prior to a building permit being issued.

4. Developer shall supply water conservation materials to buyers upon the sale of each dwelling unit within the development.

5. Developer shall display water conservation materials, inside the model homes.

6. No water meter installations will be permitted until the landscape and irrigation plans have been reviewed and approved by MSWD.

2.0 DESIGN CRITERIA FOR WATER DISTRIBUTION SYSTEMS

Water system improvements proposed for inclusion into the MSWD service area shall be designed in accordance with all appropriate AWWA standards and the following criteria:

2.01 SYSTEM DEMAND CRITERIA

MSWD staff reserves the right to determine specific criteria for each water system or sub-system based upon conditions that may exist for that location, anticipated level of development, planned use or other criteria. In general, however, water pipelines, reservoirs, pump stations, pressure reducing stations and appurtenances shall be sized to handle the highest demand on the system within the sphere of influence and shall provide capacity for the following:

1. The maximum hourly flow.

2. The maximum daily flow plus fire flow.

Average day domestic demand shall be calculated using 327 gallons per capita per day (gpcpd). For single family residences, use 3.0 residents per house, or 981 gpd/unit, and a peak factor of 2.0 to determine maximum daily flow. Consult with MSWD staff for required flows for other uses.[1]

Fire flow requirements shall be in accordance with the specification of the Fire Protection Agency having jurisdiction.

Commercial and industrial development requirements shall be analyzed separately based on the specific proposed project.

Water pipelines to all service areas shall be looped to provide dual direction supply and system flexibility. Dead end water mains are undesirable but can be considered on a case-by-case basis.

2.02 SYSTEM ANALYSIS

The proposed water system shall be analyzed for the following three conditions:

1. Peak hour demands with booster pumping plants on.

   For the peak hour demand flow analysis, the pressure at each node shall be a minimum of 40 psi and a maximum of 120 psi.

2. Maximum day demand plus fire flow with booster pumping plants off.

   For the maximum day demand plus fire flow analysis, fire flow should be selected for the worst-case scenario (typically the hydrant farthest from the connection(s) to MSWD distribution system, at the highest system elevation) and as directed by MSWD staff. The pressure at each node shall be a minimum of 20 psi and the maximum velocity in existing and proposed pipelines shall be 7.5 feet per second.

[1] The figures above were derived using the 2010 MSWD Urban Water Management Plan, 2007 Water Master Plan and the “person per household” data from the 2010 U.S. Census Bureau – Desert Hot Springs.

3. Minimum hour demands with wells and boosters on.

   For the minimum hour demand analysis, the maximum velocity in existing and proposed pipelines shall be 5.0 feet per second and the maximum pressure at each node shall be 120 psi.

The developer's engineer will be required to submit an analysis of anticipated flow demands; average, maximum hour flow, and maximum day plus fire flow. The calculations shall be based on a fire hydrant test performed by MSWD within six (6) months of submittal. Upon review, MSWD shall accept or request the engineer to modify and resubmit the analysis.

2.03 WATER PIPELINE SIZING CRITERIA

Minimum size water pipeline for residential development is eight-inch (8") inner diameter (I.D.). Minimum size water pipeline for commercial development is twelve-inch (12") diameter (I.D.).

For maximum hourly flow, pipeline is to be sized to provide head losses not exceeding 3.5 feet per 1,000 feet of water pipeline.

For maximum daily flow plus fire flow, pipeline is to be sized to provide head losses not exceeding 5 feet per 1,000 feet of water pipeline.

For all cases, mainline velocities are not to exceed 7.5 feet per second for fire flow conditions or 5 feet per second for maximum daily flow.

Use a Hazen-Williams formula "C" value of 120 for cement mortar lined ductile iron pipe and all existing mains.

MSWD may approve use of higher head loss factors if a detailed hydraulic analysis is submitted, including analysis of a "pumps off and fire flow plus maximum hour flow from storage condition."

Provide a minimum of 40-psi pressure to each customer service using the pad elevation of the water tank serving the area as the starting hydraulic grade line. Fire hydrants are to have 20-psi minimum residual pressure at design capacities.

Commercial and industrial developments are to be analyzed by developer's engineer for review by MSWD staff. MSWD staff shall accept or modify the proposed pipe sizing.

MSWD staff reserves the right to specify sizing of any water pipeline.

MSWD staff may require a larger size pipeline than would normally be required for a project to satisfy MSWD design standards for system distribution requirement purposes. The MSWD Board of Directors may authorize participation and payment of increased cost of such water pipeline in accordance with MSWD criteria.

2.04 WATER PIPELINE LOCATION

All locations shall be approved by MSWD staff prior to the preparation of plans and water pipelines shall generally be located on the northerly or easterly side of the street, six (6') to eight feet (8') from curb face or berm. The curb face or berm location shall be per the Riverside County Transportation Department or City design standards. The water main location shall not interfere with other existing utilities.

The cover over the water pipeline shall be sufficient to provide protection of the water pipeline and for the operation of the appurtenances. The minimum depth shall be three feet (3') from the ground surface (pavement, graded travel way, or open ground) to the top of the water pipeline for eight-inch (8") pipe or smaller. For water pipeline twelve-inch (12") or larger, the minimum depth shall be four feet (4').

MSWD staff may increase or decrease this required depth as necessary to cover non-standard conditions. Minimum slope of water pipelines shall be 0.2% unless otherwise authorized by MSWD staff.

2.05 CURVE DATA AND DEFLECTIONS

Water pipeline curvature shall be designed to maintain a maximum deflection angle of 2.5 degrees per joint for eight-inch (8") and smaller diameter mains and 1.5 degrees for twelve-inch (12") and larger diameter mains. Pipeline curve data shall be shown on the plans, including radius, central angle, and arc length. The minimum radius of curvature for water pipelines using standard pipe joints is as follows:

Diameter (in.)	D.I. Pipe (18' Joint Lengths Min. Radius (ft.)
8">	458'
12"<	764'

Smaller radius of curvature using specially manufactured shorter pipe lengths may be allowed only with prior approval of MSWD staff.

All other water pipeline alignments shall use allowable curves or straight-line segments in combination with standard manufactured bends of 11 ¼, 22 ½, 45, or 90 degrees maintaining the same maximum allowable deflection per joint of 2.5 degrees for eight-inch (8") and smaller pipe and 1.5 degrees for twelve-inch (12") and larger pipe.

Vertical alignments shall maintain these same deflection criteria. The maximum slope deflection is S=0.0437 for eight-inch (8") and smaller pipes and S=0.0262 for pipes twelve-inch (12") and larger. Grade breaks should be separated by at least one full pipe joint when feasible. Vertical standard bends shall be used if larger grade breaks are required.

2.06 OTHER UTILITIES

Water pipeline installation near sewer lines shall be in accordance with State Department of Health Services, Criteria for the Separation of Water mains and Sanitary Sewers or MSWD criteria, whichever is most restrictive. In general, water pipelines should cross perpendicular to sewer pipelines a minimum of one foot (1') above the sewer. If water pipeline crosses beneath the sewer, it should have a minimum separation of one-foot (1'), have no joints within nine feet (9') feet of each side of the sewer, and shall be constructed of materials per aforementioned criteria. Water pipelines parallel to sewer pipelines shall be located a minimum of ten feet (10') (outside to outside) from the sewer pipeline.

Storm drain crossings shall follow the same guidelines as sewer. When crossing other utilities, a minimum vertical clearance of six-inch (6") shall be provided (outside to outside).

2.07 FEE TITLE PARCELS AND EASEMENTS

Legal documentation for Fee Title Parcels and Easements shall be on MSWD forms and shall consist of three parts: Grant Deed (see section 2.08.01) or Grant of Easement form (see section 2.08.02, legal description, and plat.

The legal description shall be designated as Exhibit "A" and, if appropriate, shall have the assessor's parcel numbers indicated on the upper right corner of the exhibits. The legal description shall include the area of the parcel or easement and shall incorporate Exhibit "B" as a part of the description. The legal description shall be prepared by a California registered civil engineer with a registration number not larger than 33965, or California registered land surveyor and wet signed and stamped by said engineer or surveyor.

The plat shall be designated as Exhibit "B" and signed and stamped by a California registered civil engineer with a registration number less than 33965, or California registered land surveyor.

2.08 FEE TITLE CRITERIA

Water pipelines not located within the public rights-of-way must be in Fee Title parcels or Easements granted to MSWD on MSWD Grant Deed forms.

Fee Title parcels are generally required for Wells, Pumping, or Storage Facilities and will generally be a minimum of 0.5 acres.

Fee Title parcels shall have direct access to a public right-of way or dedicated easement to MSWD with no impediment to district access at any time.

Easements shall have a minimum width of thirty feet (30') unless otherwise authorized by MSWD staff. Easements are generally only used for sewer and water transmission lines.

2.08.01 GRANT DEED FORM

SEE APPENDIX A – GRANT DEED

2.08.02 GRANT OF EASEMENT DEED FORM

SEE APPENDIX B – GRANT OF EASEMENT DEED

2.09 WATER PIPELINE MATERIALS

Unless otherwise authorized by MSWD staff, all water pipelines up to and including forty-eight-inch (48”) shall be Class 350 Ductile Iron (D.I.) pipe in accordance with MSWD standard specifications unless conditions dictate the use of CML/CMC welded steel pipe. Then ten (10) Ga. CML/CMC welded steel pipe and fittings shall be used in accordance with MSWD standard specifications.

Main sizes of eight-inch (8”), twelve-inch (12”), eighteen-inch (18”), twenty-four inch (24”), thirty-inch (30”), or forty-eight inch (48”) shall be used in all new designs unless otherwise approved by the District.

2.10 VALVES

LOCATION:

1. Large water pipelines (greater than twelve-inch (12”) diameter): To be determined for each system to meet operational requirements.

2. Small water pipelines (eight-inch (8”) & twelve-inch (12”) diameter): To provide flexibility of operation, generally located on discharge side of pipeline connections; three (3) at crosses, two (2) at tees and at beginning of dead-end mains.

3. If one of the options above does not apply, valves shall be spaced at 660-foot maximum intervals or as directed by MSWD.

SIZE:

1. Full line size gate valves through twelve-inch (12”). For larger than twelve-inch (12”), use full line size butterfly valves.

2. Unless otherwise approved by MSWD staff, all valves, four-inch (4”) through twelve-inch (12”), shall be ductile iron body resilient seat gate valves in accordance with MSWD standards, as listed in the MSWD Approved Material List.

3. Valves larger than twelve-inch (12”) shall be ductile iron body, rubber seated butterfly valve in accordance with MSWD specifications Approved Material List.

4. Valves shall be installed with valve can and cover as shown on MSWD Standard Drawings. Pressure class rating shall be the same as the water pipe on which the valve is being installed.

2.11 COMBINATION AIR VACUUM AND AIR RELEASE VALVES

Air valves shall be located at all high points of water pipelines where trapped air could exceed one pipe diameter of main; however, air valves shall not be installed at the end of cul-de-sacs where water services are installed unless the slope of the water pipeline is 5% or greater. Minimum size of air valves shall be one inch (1") and shall be sized as follows:

Pipeline Diameter (in.)	Air Valve Size (in.)
8" & 12"	1"
18" & 24"	2"
30"	4"
>30"	Consult with MSWD

In phased tract development, air valves are often located at the end of the pipeline as dictated by the phasing plan. When additional phases are constructed, the air valve shall be removed unless it is required by creation of a high point with the new phase.

Provide four-inch (4") guard posts on either side of air valves that are not installed behind straight face curbs per MSWD Standard Drawings and paint all above ground material with two (2) coats approved paint per MSWD Standards (see approved Material List).

2.12 BLOW-OFF VALVE ASSEMBLIES

Blow-off valve assemblies shall be in accordance with MSWD Standard Drawings and shall be located behind the curb face at right angles to the water pipeline or as approved by MSWD staff. Blow-off assemblies shall be located at all low points of the pipeline and at all dead-ends or terminal points. Fire hydrants may be used as blow-offs. Where possible, isolated low points shall be located at fire hydrant tees to minimize the number of required blow-off assemblies.

Minimum size of blow-off assemblies shall be two-inch (2") for eight-inch (8") and twelve-inch (12") mains and for larger mains six-inch (6") fire hydrants shall be used as blow-offs per MSWD standard drawings.

2.13 FIRE HYDRANTS

Design per requirements of the fire protection agency having jurisdiction (Riverside County or applicable City). Developer's engineer shall obtain hydrant location and spacing information from the governing fire protection agency. Fire hydrants shall be in accordance with MSWD Standard Drawings, installed behind the curb face or sidewalk at right angles to the water pipeline. Minimum fire hydrant spacing shall be 350 feet between fire hydrants in any new development unless fire protection agency specified distances are less.

2.14 SERVICE INSTALLATIONS

Services shall be in accordance with MSWD Standard Drawings unless otherwise approved in writing by MSWD staff and shall be supplied from a MSWD water main. Private domestic water systems serving more than one building will not be allowed without specific approval in writing by the MSWD engineer. All domestic or landscape service installations larger than two-inch (2") will require approval by MSWD staff in writing. Domestic water services for commercial services shall be two inches (2") minimum and will be bushed down to the required meter size if smaller. This is required to facilitate future use changes that would require a larger meter.

Saddle connections are only allowable for services two-inches (2") in diameter and smaller. Tees and gate valves or approved hot tap assemblies will be required for larger connections.

2.15 CORROSIVE SOIL

Where pipelines are to be constructed in known or likely to be corrosive soil conditions, corrosion test stations shall be provided for steel pipe at locations determined by MSWD staff. If required, developer will install sacrificial anodes, etc. utilizing MSWD approved materials.

2.16 LARGE COMMERCIAL OR MULTI-FAMILY SYSTEMS

Minimum water main size for new commercial or industrial developments shall be twelve-inch (12"). Large commercial or multi-family developments consisting of multiple buildings within a private development shall provide Fee Title easements or dedicated right-of-way in favor of MSWD for all public water and sewer systems. The minimum easement width for water systems only shall be thirty feet (30') and shall be designed so that proposed meter locations fall within the easement, outside of any traveled way in islands or planting areas. Easements for both water and sewer systems shall be a minimum of thirty-one feet (31') in width with eleven feet (11') separation between domestic water and sewer lines. Domestic water lines shall be constructed using ductile iron pipe per MSWD standards and specifications. Free access shall be available for District crews at any time.

2.17 PRIVATE FIRE LINES

Private fire lines shall be isolated from the MSWD system by installation of a Double Check Detector Assembly per MSWD Standard Drawings. Private fire systems will be subject to approval and inspection by the appropriate City or Riverside County Engineering and Fire Departments. When private fire lines serve fire systems in more than one building, each building shall be separated from the main fire line by a position indicator valve and check valve per Fire Department specifications in such manner as required to prevent fire line failure due to failure of any separate building system. No private lines shall cross any parcel lines to serve a separate property.

2.18 PRESSURE REDUCING STATION

Pressure Reducing Stations shall be placed per MSWD staff direction when required. Pressure Reducing Stations, including various types of control valves, pressure relief valves, and other unique valves shall be individually designed specifically for each installation utilizing MSWD Standards. Design shall be subject to MSWD staff review and approval.

2.19 BACKFLOW PREVENTION

Where the MSWD domestic water system has the potential of becoming cross-connected to other water supplies or sources, an approved backflow prevention device is required by Title 17, Drinking Water Supplies, of the California Administrative Code, and shall be installed in accordance with MSWD Standard Drawings and Approved Materials List. A certified backflow technician approved by or provided by MSWD shall test the backflow device and submit the report for final approval by MSWD staff prior to use of the service. An approved backflow prevention device is required for any fire service connection except for Classes 1 and 2 fire protection systems. For further information, see the MSWD Ordinance. 97-1 section 8 Fire Services and 9 Cross Connection. All non-residential water services shall have a MSWD approved backflow prevention device installed adjacent to the meter unless otherwise approved by MSWD.

2.20 BEDDING AND BACKFILL

Pipe bedding shall be chosen and placed in accordance with MSWD Standard Drawings. Prior to placing backfill, all pipe shall be "shaded" at least twelve inches (12") over the pipe with sufficiently granular material having a sand equivalent of at least 30 and free of any rock. Backfill placed at over three feet (3') below finished grade shall be compacted to a minimum density of 90% maximum dry density per ASTM D1557-02; the upper three feet (3') of backfill shall be compacted to a minimum density of 95% maximum dry density, per ASTM D1557-02, or to meet the requirements of a relevant local agency, if those standards are more rigorous.

2.21 CONCRETE THRUST BLOCKS AND RESTRAINED JOINTS

Concrete thrust blocks and restrained joints shall be installed in accordance with MSWD Std. Dwg. W-08A thru W-08C.

Beginning and ending stations for restrained joints shall be shown on the profile view of all water lines. Restrained joints shall be required whether or not shown on the plans.

2.22 WATER METER SIZING REQUIREMENTS

Meters and services shall be installed in accordance with MSWD Std. Dwg. W-09, W-09A, W-16 & W-16A, or W-17 & W-17A.

1. Commercial services shall all be two-inch (2") with meters sized for actual fixture counts for maximum demand as supplied by a Licensed Engineer. All commercial meters will be required to provide meter size backflow prevention in accordance Section 2.19.

2. Dedicated irrigation meters shall be sized in accordance with the approved landscape plans and water budget calculations in accordance with Section 1.06. All irrigation meters will be required to provide meter size backflow prevention in accordance Section 2.19.

3. Residential meters shall be sized to provide for 5.0 GPM of domestic flow in addition to the fire sprinkler demands satisfying the requirements of NFPA 13D unless provided with an approved automatic diversion valve. The Developer or Engineer will be required to provide stamped and signed calculations prepared by a Licensed Civil Engineer or

Licensed Fire Protection design professional showing the required flow and the required pressure at the meter for review and approval by MSWD.

4. Maximum allowable meter flow rates shall be as follows:

Meter Size (in.)	Maximum GPM
3/4"	30 GPM
1"	50 GPM
1 ½"	100 GPM
2"	160 GPM

Meter Size (in.)	Maximum GPM
3"	420 GPM
4"	1100 GPM
6"	1800 GPM

3.0 DESIGN CRITERIA FOR SEWER SYSTEM FACILITIES

The following design criteria shall be used for sewer systems to be included in MSWD service areas. Exceptions and deviations from these specifications must be approved in writing from MSWD staff.

3.01 SYSTEM FLOW RATE CRITERIA

Design flow rates shall be in accordance with the following formula:

$$Q \text{ design (GPM)} = \frac{\text{GPD from chart X peak factor}}{1440}$$

DESIGN UNIT FLOWS			
LAND USE	UNIT	AV. DAILY FLOW	PEAK FACTOR
Residential	GPD/EDU	200	2.5
Commercial / Industrial	GPD/ACRE	2,000	1.33
Public Uses (excluding schools)	GPD/ACRE	1,000	1.33
Schools	GPD/ACRE	500	2.0

The above chart is intended as a basic guide and Mission Springs Water District reserves the right to modify the flows on a case-by-case basis for developments.

3.02 SEWER PIPELINE SIZING

Pipeline sizing for gravity pipelines shall be determined on the basis of the design flow rate and incorporating the following criteria at the D/d max.:

Pipe Diameter (in.)	Manning's Roughness Coefficient	D/d Max.
8" to 12"	0.013	0.50
15" or greater	0.013	0.75

Required velocities at design flow (Q) shall be as follows:

	Minimum	Desired	Maximum
Sewer Pipelines	2 fps	3 fps	10 fps
Force Pipelines	3 fps		5 fps
Inverted Siphons	3 fps		5 fps

The maximum velocity at design flow allowed in any sewer pipeline is 10 fps.

Also see Section 3.07 Pipe Slope.

Do not increase sewer sizes in flat topography merely to justify use of flatter grades. Under minimal flow conditions, wastewater in larger pipelines can have velocities lower than that in smaller pipelines.

Head losses for force mains shall be approximately five (5) feet per one thousand (1,000) feet of force main. The developer's engineer shall evaluate the need for odor control facilities for all force mains.

3.03 SYSTEM ANALYSIS

Each sewer main in the proposed sewer system shall be analyzed for peak flow plus infiltration.

3.04 LOCATION

All locations shall be approved by MSWD staff prior to preparation of plans and sewer pipelines shall generally be located on the southerly or westerly side of the street, 6 feet from street centerline. Location shall not interfere with other existing utilities.

Horizontal curves are allowed on all pipe sizes eight-inch (8”) and larger where necessary to maintain the required clearance from water pipelines and other utilities on curved streets. The minimum curve radius for sewers shall conform to the manufacturer’s minimum recommendations. MSWD staff shall review, modify, and/or approve all proposed horizontal curved sewer designs.

Also see Section 3.08 Curved sewers

Vertical curves are not permitted within sewer systems except when approved by MSWD staff. Application for exceptions shall be in writing and submitted prior to plan check submittal and include justification.

The minimum depth of cover over the sewer pipeline should be sufficient to sewer adjacent properties. Typical depth from the finish street grade to sewer flow line is eight feet (8’). Adequate depth shall be provided so the sewer laterals will have a minimum cover of five feet (5’) at the property line.

If an area is outside the development, but tributary to it, and can be logically served by future extension of a proposed sewer, the sewer pipeline shall extend to the tract boundary or to the end of a paved street in a manner to facilitate the future extension and include any necessary diameter over-sizing and extra depth.

Sewer installation near water pipelines shall be in accordance with State Department of Health Services, Criteria for the Separation of Water Mains and Sanitary Sewers, or MSWD criteria, whichever is most restrictive. In general, sewers should cross perpendicular to water lines a minimum of 1 foot below the water pipeline. Sewer pipelines parallel to water pipelines shall be located a minimum of ten feet (10’) (outside to outside) from the water pipeline.

When crossing other utilities, a minimum vertical clearance of six inches (6") shall be provided (outside to outside), unless otherwise approved by MSWD and State Department of Health Services.

Sewer installation shall provide a minimum clearance of fifty feet (50’) from all potable, non-potable, and water quality monitoring wells.

3.05 SEWER LATERALS

Sewer laterals shall have a minimum diameter of four-inch (4") for residential use up to four (4) units. Six-inch (6”) diameter laterals are required for all commercial projects or residential use of four (4) or more units. Laterals shall have a minimum slope of 2% from sewer to property line and shall have a minimum cover of five feet (5’) at the property line. Engineered laterals at 1% slope may be allowed with prior written approval of the MSWD engineer.

3.06 MATERIALS AND INSTALLATION

Unless otherwise authorized by MSWD, all sewers and laterals shall be extra strength vitrified clay pipe (VCP) in accordance with MSWD Standards. All force mains shall be ductile iron pipe, conforming to ANSI/AWWA C150, or C900 PVC in accordance with MSWD specifications. All installations are to be as shown in MSWD Standard Drawings.

3.07 PIPE SLOPE

Gravity sewers shall have the following slopes at D/d minimum:

Pipe Dia. (in.)	Preferred Min. Slope (V=3 fps)	Min. Slope (V=2 fps)	Extreme Min. Slope (V=1.5 fps)	Max Slope (V=10 fps)
8”	0.0076	0.0040	0.0020	0.086
10”	0.0060	0.0028	0.0016	0.061
12”	0.0044	0.0020	0.0012	0.049
15”	0.0036	0.0016	0.0008	0.036
18”	0.0024	0.0012	0.0008	0.029
21”	0.0020	0.0010	0.0006	0.024
24”	0.0016	0.0008	0.0004	0.020
27”	0.0016	0.0008	0.0004	0.017
30”	0.0012	0.0006	0.0003	0.015
33”	0.0012	0.0006	0.0003	0.012

Extreme minimum slopes may be used only under special conditions approved by MSWD staff.

3.08 CURVED SEWERS

Curved sewers shall be used to follow street centerline alignments whenever possible. Curves shall be designed to limit deflections at each pipe joint to a maximum of 2.5 degrees for eight-inch (8”) through twelve-inch (12”) diameter sewer or 1.5 degrees for larger sewers. Manholes shall be placed so that no point of reverse curve and no more than one point of curvature or point of

tangency occurs between any two manholes. Pipe centerline curve data, beginning and end points of all curves shall be shown and stationed.

3.09 MANHOLES

All manholes with a depth less than twelve feet (12') and no sewer over eighteen-inch (18”) diameter shall have a diameter of forty-eight inches (48").

All manholes with a depth greater than twelve feet (12’) or with any sewer greater than eighteen-inch (18”) diameter shall have a diameter of sixty-inches (60"). Manholes with a depth less than six feet (6’) shall be constructed as a shallow manhole per MSWD Standard Drawings. All manholes shall be per MSWD Standard Drawings.

Manholes shall be spaced at three hundred-fifty foot (350’) maximum intervals for all sewers. In addition, manholes shall be placed at all the following locations: grade breaks, changes in horizontal alignment, changes in sewer diameter, at street intersections, at sewer pipe intersections, at connections with laterals larger than six-inches (6”) in diameter, and at the beginning of sewer runs such as a cul-de-sacs. On curvilinear sewers, there shall be no reverse curves between manholes and only one point of curvature or tangency between manholes.

A minimum drop of 0.1 feet for straight runs and bends up to 45° and 0.2 feet for 90° bends shall occur across manholes. Junction manholes shall be designed with the soffits of the intersecting sewer at the same elevation as the soffit of the upstream sewer. Where slopes of sewers in and out of manhole create a larger drop than the minimum then that shall be used through the manhole.

Clean-outs shall require prior MSWD approval and may be installed at the permanent end of a sewer pipeline if the distance from a manhole is less than one hundred seventy-five feet (175’) and there are less than four (4) lateral connections.

Marker posts shall be required if manholes or clean-outs are to be installed outside of paved areas.

3.10 DROP MANHOLES

Drop manholes shall not be used without prior approval by MSWD staff.

3.11 LIFT STATIONS AND INVERTED SIPHONS

Lift stations, inverted siphons or nonstandard construction should be avoided whenever possible. In situations requiring such installations, facilities shall be designed by MSWD staff, a MSWD retained consultant, or the developer’s engineer and reviewed and approved by MSWD staff. MSWD staff should be consulted in the early planning stages to assess the need for such installations and to develop the site-specific design criteria.

3.12 BACKWATER OVERFLOW VALVES

Backwater overflow valves shall be required wherever structures served by sewer laterals are subject to flooding in the event a sewer main stoppage causes the upstream manhole to overflow. Residences with slab elevations lower than street elevation and/or lower than the rim of the upstream manhole shall have backwater overflow valves installed according to MSWD Standard Drawings and plumbing code.

Backwater overflow valves will not be required wherever intermediate manholes can be economically placed to preclude the need for backwater valves (such spacing to be not less than one hundred twenty feet (120')). Ordinarily, one additional manhole can be economically justified if four backwater overflow valves can be eliminated.

Backwater overflow valves will be in accordance with MSWD standard drawings and installed at the shallowest location allowing for future inspection and maintenance. Backwater valve installations shall include provision for maintenance access.

The design engineer shall show all backwater overflow valves and their locations for installations on private property. These valves shall be indicated on both the location map (cover sheet) and the plan and profile sheets.

3.13 BEDDING AND BACKFILL

Pipe bedding shall be chosen and placed in accordance with MSWD standard drawings.

All pipes shall be "shaded" prior to placing backfill with sufficiently granular material having a sand equivalent of at least 30 for a minimum thickness of twelve-inch (12") over the pipe.

Backfill placed three feet (3') below finished grade and shall be compacted to at least 90% maximum dry density, per ASTM D1557-02; the upper three feet (3') of backfill shall be compacted to at least 95% maximum dry density, per ASTM D1557-02, or to meet requirements of local agency, whichever is more stringent.

3.14 GREASE INTERCEPTORS

Waste lines leading from sinks, drains, and other fixtures or equipment in establishments such as restaurants, cafes, lunch counters, cafeterias, bars and clubs, hotels, hospitals, sanitariums, factory and school kitchens or other establishments where grease may be introduced into the system shall be provided with a grease interceptor per MSWD Standards and Specifications, and ordinances. Waste lines leading from car washes or other facilities with the potential of discharging sands and oils shall be connected to a sand/oil interceptor per MSWD Standards and Specifications, and ordinances.

Required interceptors shall be placed on private property and shall be maintained in perpetuity by the property owner or their designated agent.

MSWD shall determine the initial minimum pumping, sampling, and inspection frequency for each interceptor. MSWD maintains the right of entry for the purpose of inspection of any interceptor.

Design of the interceptors shall be shown on the plans submitted to MSWD for review and approval by MSWD staff.

3.15 FEE TITLE CRITERIA

Sewers not located within public rights-of-way must be located in Fee Title parcels or easements granted to MSWD on MSWD forms. Fee Title parcels or easements shall have the following minimum widths:

Sewer Flow Line Depth (Ft)	Minimum Width of Fee Title Parcel (ft)
10’ and less	30’
11’-15’	35’
16’-20’	45’
21’-25’	50’

4.0 PLAN FORMAT AND REQUIREMENTS - WATER AND SEWER

The developer’s engineer shall prepare system improvement plans that are clear, concise, and meet MSWD standards. A set of plans that meets all the requirements set forth herein, but are difficult to interpret, likely to mislead a contractor, confuse the reader, or do not address previous plan check comments, are unacceptable and will be subject to rejection by MSWD staff without detailed review.

4.01 SHEET FORMAT – GENERAL

Please visit our website at www.mswd.org for the current Improvement Plan Title Block.

The improvement plans shall be of professional quality specifically prepared as WATER IMPROVEMENT PLANS, SEWER IMPROVEMENT PLANS or WATER AND SEWER IMPROVEMENT PLANS (for point of connection only). Work shall be of standard engineering practice and shall be well arranged, neat, and legible and present the proposed construction without confusion. Applicable prints submitted for checking shall also be clear, bright duplications. Water and sewer designs shall be shown on separate drawings. In some cases where no mainline construction is required, sewer and water improvements may be placed on the same drawing without profiles unless specifically required by MSWD staff. Drawings shall show both plan and profile of the facilities. The profile shall be shown on gridline background and shown vertically above the plan.

All drawings shall be drawn to scale using 1”=40’ horizontal scale, and 1”=4’ vertical scale. Scale bars shall be provided. Match lines and continuations from sheet to sheet shall be used and identified with applicable station points and cross-reference. Always indicate true north with a suitable north arrow. Indicate tract number and sheet number on all drawings. Each sheet shall have a title block with tract number, street name and stations appearing on that sheet. North is to be placed so that stationing runs from left to right wherever practical. Alternate positioning shall

be approved by MSWD staff. (Orientation of North as “up” or to the “right” may not always be meaningful.)

For special assemblies, and unusual and/or complex connections, provide a detailed schematic plan, (preferably on the same sheet). The detailed schematic plan shall be drawn to scale, show pipe size, and shall fully identify all the parts in the detail. Show and call out all special features and indicate scale.

The engineer shall note on the plans all connections to existing water and sewer facilities and shall note who is to construct them. Contractors are not authorized to make connections to existing water facilities, unless approved by MSWD staff and performed under direct MSWD inspection. Contractors shall not operate any valve on any portion of MSWD system that is under pressure unless specifically directed by MSWD staff or inspector.

4.02 COVER SHEET

As a minimum, the Cover Sheet shall show the following:

1. General Notes (Section 4.06 for Water Drawings and Section 4.07 for Sewer Drawings). No changes or additions to said notes shall be allowed.

2. Legend with Standard MSWD Symbols (Std. Dwg. D-02).

3. Numbered Construction Notes with Estimate of Quantities (Std. Dwg. D-03).

4. Fire flow certification block for water plans.

5. Sheet Index

6. Vicinity and Location Map

    a) Scale

    b) North Arrow

    c) Street Names

    d) Section, Township, and Range

7. Signature Blocks for Approval (Std. Dwg. D-04)

4.03 INDEX MAP

Index map may be placed on the title sheet if all required information can be clearly shown. Otherwise index map shall be shown on the following sheet or sheets.

As a minimum, the Index Map shall show the following:

1. Scale (1" = 100' or 1" = 200') and Graphic Scale Bar.

2. North Arrow (up, MSWD staff approval not required)

3. California Zone 6 State Plane Coordinates – Coordinates shall be shown for two field identifiable points for location purposes. Points shall be spaced as far apart as reasonable for the development.

4. The entire land division showing proposed tract layout with street names and lot numbers, last lot number shall be circled.

5. For water pipeline construction drawings, the following shall be shown under label of index map:

    a) Pressure Zone _____

    b) Highest Pad Elevation _____

    c) Lowest Pad Elevation _____

6. Proposed water pipelines identified by diameter and materials

7. Proposed sewers identified by diameter and materials

8. Proposed water pipeline appurtenances:

    a) Fire hydrants

    b) Tees, crosses

    c) Valves

9. Proposed sewer appurtenances

    a) Manholes

    b) Backwater valves

10. Sheet numbers corresponding to plan and profile sheets

4.04 PLAN AND PROFILE FORMAT

The plan/profile sheets shall be drawn at a horizontal scale of 1"=40' and a vertical scale of 1"=4'. A vertical scale of 1" = 8' is permissible only if approved in writing by MSWD staff prior to preparation of the construction drawings. As a minimum, the drawings shall show the following:

4.04.01 PLAN FORMAT REQUIREMENTS

1. Title Block **-** Title block shall include tract Number, street name, and stations. Current MSWD CAD files can be downloaded from the MSWD Water and Sewer CAD Toolbox.

2. North Arrow **-** North is to be placed so that stationing runs from left to right when practical, review special conditions with MSWD staff.

3. Graphic Scale – A graphic scale bar shall be placed on each sheet showing the horizontal scale.

4. Numbered Construction Notes – A table showing numbered construction notes shall be included on each sheet conforming to the numbers used in the table on the cover sheet. Only items in use on the current sheet shall be shown (see Std. Dwg. D-03).

5. Street Names **-** All street names shall be shown.

6. Lot Lines **-** All lot lines and parcel lines shall be shown. All lots shall be numbered or labeled. All adjacent tracts shall be identified.

7. Right-of-Way **-** Existing and proposed right-of-way shall be identified with dimensions for same shown.

8. Curbs **-** Existing and/or proposed curbs shall be identified with dimensions from street centerline shown.

9. Fee Title Parcels **-** Existing or proposed Fee Title parcels shall be identified with dimensions for same shown.

10. Utilities **-** All existing and proposed utilities shall be shown including, but not be limited to, water (existing MSWD water pipelines shall be identified by MSWD Plan No.), sewer (existing MSWD sewer pipelines shall be identified by MSWD Plan No.), gas, power, telephone, storm drain, irrigation, traffic, and cable television. Each utility shall be identified with a symbol and the size of the utility shall be shown.

11. Existing and Proposed Improvements **-** All existing surface improvements shall be shown including, but not limited to, curb and gutter, edge of pavement, power poles, driveways, sidewalks, and fences.

12. Proposed Pipeline **-** Proposed pipeline shall be indicated with a heavy solid line. For water pipelines, dimensions from street centerline to centerline of water pipeline and from centerline of water pipeline to existing or proposed curb shall be shown. For sewers, dimensions from street centerline to centerline of sewer shall be shown. For both water and sewer, dimensions between water and sewer lines shall be shown.

13. Stationing **-** For water pipelines, stationing shall be along the centerline of pipe in the direction of any sewer on the same street or easement. For sewers, stationing shall be along the centerline of the sewers increasing upstream. Unless otherwise specified,

stationing shall increase from left to right. Stationing shall be identified with tick marks at fifty-foot (50') intervals and labels at one hundred-foot (100') intervals. This shall apply for projects with water and sewer improvements are proposed.

For water pipelines and/or sewers with curves, stations for the beginning and end of each curve shall be shown. In addition, a curve data table shall be included showing the delta, curve radius, curve length, and tangent length for each curve. No more than one point of curvature will be allowed between two manholes and no reverse curves shall be allowed between manholes.

14. Matchlines **–** Matchlines for each end of the sheet shall be shown as follows:

    STA 15+00.00 Match Line

    See Sheet 5

15. Water pipelines - Water pipelines and appurtenances (valves, fittings, thrust blocks, fire hydrants, air valves, water services, and blow-offs) shall be identified by numerical identification and construction notes with the following sample format:

    a) 8" Class 350 D.I. Water Main.

    b) 1" Domestic Water Service per MSWD Std. Dwg. No. W-09.

    c) 4" Blow-off Assembly per MSWD Std. Dwg. No. W-04.

    All water pipeline appurtenances, including services, valves, tees, crosses, elbows, plugs, thrust blocks, fire hydrants, air valves, and blow-offs, shall be identified by Station and a numerical identification.

    All connections to existing water system shall be identified by station and size. Details for connections shall be used where required. Each connection shall have the following note, "Connection by contractor to be performed under direct MSWD inspection".

    Only those construction notes that apply to each sheet shall be shown in the construction note legend on that sheet.

16. Sewers - Sewers and appurtenances (sewer laterals, manholes, and backwater valves) shall be identified by numerical identification and construction notes with the following sample format:

    1. 8" VCP sewer.

    2. 48" Dia. Sewer Manhole per MSWD Std. Dwg. No. S-05.

    3. 4" Sewer Lateral per MSWD Std. Dwg. No. S-08.

All sewer appurtenances, including laterals, shall be identified by station and a numerical identification.

Only those construction notes that apply to each sheet shall be shown in the construction note legend on that sheet.

All connections to existing sewer system shall be identified by station and size. Details for connections shall be used where required. Each connection shall have the following note, "Connection by contractor to be performed under direct MSWD inspection".

4.04.02 PROFILE FORMAT REQUIREMENTS

Only profiles for water and sewer mains shall be shown. All other utility profiles shall not be shown except where crossing over or under (i.e. storm drain, gas, electric, cable, etc.).

1. Stationing **-** Stations shall be shown along bottom of profile at one hundred-foot (100') intervals. Profile stationing shall line up as closely as possible above plan stationing.

2. Profiles shall be placed above the plan view with stationing aligned as close as possible to remain normal to the plan view below.

3. Elevations **-** Elevations shall be shown at even five-foot (5') gridlines on both ends of the profile sheet.

4. Existing and Proposed Ground Surface **-** Existing ground surface or pavement over the proposed pipeline shall be identified as follows:

   Existing top of pavement (or ground surface) over centerline of water pipeline (or sewer): Proposed ground surface or pavement over the proposed pipeline shall be identified as follows: proposed top of pavement (or ground surface) over centerline of water pipeline (or sewer). Finished grade and existing grade shall be easily identifiable by different line type.

5. Match lines **-** Match lines for each end of sheet shall be shown as follows:

   STA 15+00.00 Match Line

   See Sheet 5

   Match lines for sewers shall occur at manholes and manhole, including invert **elevations** in and out, shall be shown on each sheet.

   Vertical match lines shall break by an even five (5) or ten (10) foot interval and shall label elevations on each side.

- **WATER PIPELINES:**

Water pipeline identification **-** Inverts of proposed water pipelines shall be identified as follows:

a) Invert __" (Class ___) DI Water pipeline.

b) Both the invert and top of water pipelines shall be shown.

Water pipeline Length **-** At bottom of profile, water pipeline length shall be identified as follows:

a) _____ L.F. of __" DI Water pipeline.

Restrained Joints **-** Locations that require restrained joints shall be identified as follows:

a) Welded Steel Pipe:

   1) Full weld double pass all joints - beginning and end stations shall be shown

b) Ductile Iron Pipe:

   1) Restrained joints - beginning and end stations shall be shown

Stationing and Invert Elevations **-** Pipeline stationing, flow line elevations and deflection, shall be shown for each grade break as follows:

a) STA 14+00.00 GB	Numerical
1192.35 INV	Identification
$\Delta = 1.52^{o}$	Deflection

Pipeline stationing and invert elevations shall be shown for each tee, cross, air valve, and blow off as follows:

a) STA 12+25.00	Numerical
1190.00 INV	Identification

Pipeline stationing shall be shown for all fire hydrants, elbows, BCs, and ECs as follows:

a) STA 12+25.00	Numerical
DI Bend or etc.	Identification

All pipeline stationing and flow line elevations shall be placed below the water pipeline.

Pipeline Slopes **-** Minimum slopes shall be 0.0020. Pipe slopes shall be shown between all grade breaks to four decimal places (i.e. +0.0076) with + or – for direction of slope with respect to increasing stationing.

Pipe Cover **-** For eight-inch (8”) water pipelines, the pipe cover shall be three feet (3') and for water pipelines twelve-inch (12”) and larger, the pipe cover shall be four-feet (4').

Utility Crossings **-** ALL UTILITY CROSSINGS shall be shown in the profile. Where water pipelines cross over or under utilities with a clearance of two feet (2') or less, the drawings

shall show the elevations for the top or bottom of the water pipeline and the top or bottom of the utility. All existing crossings shall be noted for field verification.

- **SEWER PIPELINES:**

Sewer Identification **-** Invert of proposed sewers shall be identified as follows:

a) INV __" VCP Sewer.

b) Both the invert and top of sewers shall be shown.

Stationing and Invert Elevation **-** Sewer stationing and invert elevations shall be shown at inlet and outlet of each sewer manhole as follows:

a) STA 12+25.00	Numerical
1192.35 INV	Identification
IN/OUT W	Direction

A minimum drop of 0.1' shall be shown across each manhole with a horizontal deflection of 45 degrees or less and a 0.2’ drop for 45 to 90-degree deflection. In no case shall the drop across any manhole be less than the drop produced by the incoming and outgoing sewer grades.

Manholes **-** Each manhole shall be identified as follows:

a) STA12+25.00	Numerical
Manhole No.__	Identification

Sewer Lengths and Sewer Slopes **-** Sewer lengths and sewer slopes shall be shown between all manholes as follows:

a) S = 0.0050 135.00 LF X" VCP

Minimum Cover **-** The minimum cover shall be seven feet (7’) between the top of sewer and existing or proposed ground surface.

Utility Crossing **-** ALL UTILITY CROSSINGS shall be shown in the profile. Where sewers cross under or over utilities with a clearance of two feet (2') or less, the drawings shall show the elevations for the top or bottom of the sewer and the top or bottom of the utility as applicable. All existing crossings shall be noted for field verification. Where crossing requires special pipe or concrete encasement this shall be shown and labeled in the profile.

4.05 STANDARD APPROVAL AND LEGEND BLOCKS

The following examples of standard information shall appear on all plans submitted to MSWD for approval. If too much information is required for a clear and concise single cover sheet, two separate sheets may be used.

For Symbol Legend on cover sheet see MSWD Std. Dwg. D-02.

Cover Sheet of system improvement plans for other agencies to be reviewed by MSWD for non-interference compliance shall have the following:

Approved by MISSION SPRINGS WATER DISTRICT for Construction

_____

MSWD GENERAL MANAGER; DATE

The time limit of drawing(s) approval shall be one year from the date of MSWD General Manager signature. If construction has not commenced within that year, MSWD requires re-review of the drawings by MSWD for possible changes in the project piping and in specifications and standards.

4.06 GENERAL CONSTRUCTION NOTES FOR BOTH WATER AND SEWER PLANS

GENERAL CONSTRUCTION NOTES:

(FOR BOTH WATER AND SEWER)

1. ALL CONSTRUCTION UNDER COUNTY, CITY OR CALTRANS JURISDICTION SHALL CONFORM TO ALL PROVISIONS OF THE PROJECT SPECIFICATIONS, SPECIAL CONDITIONS, STANDARD AND CONSTRUCTION DRAWINGS, ALL INCLUSIVE UNDER THIS CONTRACT. IN THE EVENT OF ANY CONFLICT, THE MOST STRINGENT REQUIREMENT SHALL GOVERN.

2. ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE PROJECT SPECIFICATIONS, STANDARD DRAWINGS AND THE SPECIAL REQUIREMENTS FOR THIS PROJECT.

3. CONSTRUCTION WILL BE DONE ONLY UNDER SIGNED AND APPROVED PLANS. CUT SHEETS SHALL BE PROVIDED TO THE DISTRICT FOR THE REVIEW 24-HOURS PRIOR TO CONSTRUCTION.

4. THE SANITARY SEWER WILL BE INSTALLED BEFORE ANY OTHER UNDERGROUND FACILITIES ARE CONSTRUCTED EXCEPT WHEN OTHER UTILITIES ARE PROPOSED THAT WILL BE DEEPER THAN THE SANITARY SEWERS. INSTALLATION INCLUDES, BUT IS NOT LIMITED TO, STAKING, PIPELINE INSTALLATION, COMPACTION TESTING, AIR TEST, WASH AND VIDEO REVIEWS. AIR TESTS, WASH AND VIDEO WILL BE COMPLETED PRIOR TO INSTALLATION OF DOMESTIC WATER AND SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION “GREENBOOK” OR AS DIRECTED BY THE DISTRICT RESIDENT INSPECTOR/REPRESENTATIVE. THE

DISTRICT RESERVES THE RIGHT TO REQUIRE ADDITIONAL AIR TESTS, WASHES AND VIDEO REVIEWS PRIOR TO FINAL ACCEPTANCE OF FACILITIES.

5. CURBS AND GUTTERS SHALL BE IN PLACE BEFORE ANY DOMESTIC WATER PIPELINES AND APPURTENANCES ARE CONSTRUCTED. FINAL GRADES SHALL BE ESTABLISHED BEFORE THE INSTALLATION OF WATER SERVICES, FIRE HYDRANTS AND APPURTENANCES.

6. DOMESTIC WATER LINES SHALL BE INSTALLED IN ACCORDANCE TO THE DISTRICT STANDARD SPECIFICATIONS, AWWA (AMERICAN WATER WORKS ASSOCIATION) STANDARDS" AND/OR STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION – "GREENBOOK". INSTALLATION INCLUDING BUT IS NOT LIMITED TO STAKING, PIPELINE INSTALLATION, COMPACTION, HYDROSTATIC PRESSURE TEST AND CHLORINATION/DISINFECTION IN ACCORDANCE TO THE AWWA STANDARDS AND THE DISTRICT STANDARD SPECIFICATIONS FOR CONSTRUCTING WATER AND SEWER FACILITIES.

7. REPLACEMENT PAVING (ONSITE & OFFSITE), TRAFFIC CONTROL, RE-STRIPING, SPECIAL TRENCH BACKFILL, BASE REQUIREMENTS, ETC. SHALL BE IN ACCORDANCE WITH THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT ENCROACHMENT PERMIT AND/OR THE CITY ENCROACHMENT PERMIT REQUIREMENTS AND AS DETAILED IN THE PROJECT SPECIFICATIONS AT NO ADDITIONAL COST TO THE DISTRICT. THE CONTRACTOR SHALL NOTIFY THE COUNTY AND/OR CITY AT LEAST 48 WORKING HOURS PRIOR TO STARTING CONSTRUCTION. IF THE PROPOSED PIPELINE CROSSES A PAVED STREET AT OTHER THAN 90 DEGREES, THE LIMITS OF PAVEMENT OVERLAY SHALL BE AT RIGHT ANGLES TO THE STREET CENTERLINE AND SHALL ENCOMPASS THE ENTIRE TRENCH PAVING.

8. CONTRACTOR IS RESPONSIBLE FOR EROSION, DUST AND TEMPORARY DRAINAGE CONTROL DURING OPERATIONS AND AFTER WORKING HOURS. THE CONTRACTOR MUST TAKE ALL NECESSARY PRECAUTIONS IN ORDER TO COMPLY WITH ALL APPLICABLE REGULATIONS.

9. PIPE SHALL BE HANDLED SO AS TO PROTECT PIPE, JOINTS, AND LININGS AND COATINGS. THE PIPE SHALL BE BEDDED CAREFULLY TO PROVIDE CONTINUOUS BEARING AND PREVENT UNEVEN SETTLEMENT; PIPE SHALL BE PROTECTED AGAINST FLOTATION AT ALL TIMES, OPEN ENDS SHALL BE SEALED AT ALL TIMES WHEN CONSTRUCTION IS IN PROGRESS.

10. PIPE JOINTS SHALL NOT BE DEFLECTED AT ANY ANGLE GREATER THAN THE MAXIMUM DEFLECTION RECOMMENDED BY THE PIPE MANUFACTURER.

11. ALL REVISIONS TO THESE DRAWINGS MUST BE APPROVED IN WRITING BY THE MSWD DISTRICT ENGINEER OR DESIGNEE, PRIOR TO ACTUAL CONSTRUCTION.

12. TRAFFIC STRIPING AND/OR LANE MARKINGS WHICH ARE OBLITERATED SHALL BE REPLACED IN KIND AS DIRECTED BY THE AGENCY HAVING JURISDICTION.

13. NO CONSTRUCTION OR INSTALLATION SHALL BE PERMITTED ON FILL MATERIAL WHICH DOES NOT MEET THE COMPACTION REQUIREMENTS DEFINED IN THESE SPECIFICATIONS

14. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6409.1(8) OF THE CALIFORNIA LABOR CODE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE STATE DIVISION OF OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

15. ALL CONTRACTOR(S)/SUBCONTRACTOR(S) PERFORMING WORK ON THIS PROJECT SHALL BE FAMILIAR WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES DIRECTLY OR INDIRECTLY FROM OPERATIONS. SAID EXISTING IMPROVEMENTS SHALL INCLUDE, BUT ARE NOT LIMITED TO, DIRT BERMS, DITCHES, FENCES, MAILBOXES, DRIVEWAYS, SIDEWALKS AND PLANTS/LANDSCAPING. ANY REMOVAL OR DAMAGE TO EXISTING IMPROVEMENTS SHALL BE REPLACED OR REPAIRED AT THE CONTRACTOR'S EXPENSE AND SHALL BE APPROVED BY THE DISTRICT.

16. ALL CONTRACTOR(S)/SUBCONTRACTOR(S) SHALL EXAMINE CAREFULLY THE SITE OF THE WORK CONTEMPLATED AS WELL AS THE PLANS AND SPECIFICATIONS. THE SUBMISSION OF A BID SHALL BE CONCLUSIVE EVIDENCE THAT THE CONTRACTOR/SUBCONTRACTOR HAS INVESTIGATED THE PROJECT SITE AND REVIEWED THE PLANS & SPECIFICATIONS AND IS SATISFIED AS TO THE REQUIREMENTS, QUALITY, THE SCOPE OF WORK TO BE PERFORMED AND THE QUANTITIES OF MATERIALS TO BE FURNISHED.

17. ALL EXCESS MATERIAL GENERATED FROM THE PROJECT EXCAVATION AND/OR COMPACTION SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF AT THE CONTRACTOR'S EXPENSE UNLESS OTHERWISE NOTED.

18. ALL EXISTING AND NEW INFRASTRUCTURE (VALVE CANS, MANHOLES, ETC.) MUST BE ACCESSIBLE TO GRADE THROUGHOUT THE ENTIRE COURSE OF CONSTRUCTION.

19. SITE PAVING SHALL NOT BE PLACED UNTIL ALL UNDERGROUND FACILITIES HAVE BEEN INSTALLED, TESTED AND APPROVED BY THE DISTRICT, AND THE LAND USE AGENCY HAVING JURISDICTION.

20. STATIONS SHOWN ARE HORIZONTAL DISTANCES ALONG CENTERLINE OF PIPE, UNLESS OTHERWISE NOTED.

21. CONTRACTOR SHALL SHORE ALL TRENCHES AS REQUIRED AND CONDUCT ALL CONSTRUCTION AND OPERATIONS IN ACCORDANCE WITH CAL-OSHA REQUIREMENTS.

22. CONTRACTOR IS REQUIRED TO CONTACT MSWD INSPECTOR 72 HOURS PRIOR TO START OF CONSTRUCTION. DAILY COMMUNICATION THROUGHOUT THE

ENTIRE DURATION OF THE PROJECT IS REQUIRED. CONTRACTOR SHALL CALL MISSION SPRINGS WATER DISTRICT'S OFFICE BY 3:00 P.M. FOR THE FOLLOWING DAY'S INSPECTION.

23. APPROVAL BY MSWD IMPLIES NO PERMISSION OTHER THAN THAT WITHIN THE DISTRICT'S JURISDICTION. ALL REQUIRED PERMITS BY LAW, SHALL BE OBTAINED BY THE CONTRACTOR, UNLESS OTHERWISE NOTED IN MSWD PROJECT SPECIFICATIONS.

24. THE MINIMUM DEPTH OF COVER FOR THE VARIOUS UNDERGROUND UTILITIES IS DEPICTED IN THE PROFILE AND GIVEN BELOW. THE DEPTHS ARE BASED UPON AVAILABLE INFORMATION. THE ACCURACY OF THIS INFORMATION; HOWEVER, IS NOT GUARANTEED BY THE DISTRICT OR THE ENGINEER, NO ADDITIONAL COMPENSATION SHALL BE MADE BY THE DISTRICT FOR UTILITIES AT ELEVATIONS DIFFERENT THAN DEPICTED OR GIVEN BELOW:

    WATER: 36" TO 48" TELEPHONE CABLES: 30"

    ELECTRICAL CABLES: 30" CABLE TV. CABLES: 30"

    GAS MAINS: 36"

25. THE CONTRACTOR SHALL DETERMINE LOCATION AND DEPTH OF ALL THE EXISTING UNDERGROUND FACILITIES BY POTHOLING PRIOR TO TRENCHING AND/OR EXCAVATION. THE EXISTENCE AND LOCATIONS OF ALL UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS WERE OBTAINED FROM AVAILABLE RECORDS AND ARE APPROXIMATE (IN ACCORDANCE WITH THE SPECIFICATIONS, ONLY MAIN LINES ARE SHOWN; NO LATERALS OR SERVICES ARE SHOWN). CONTRACTOR SHALL COORDINATE WITH THE DISTRICT FOR FIELD LOCATION OF SERVICES AND CONTRACTOR SHALL ASSUME THE RESPONSIBILITY FOR PROTECTING ALL EXISTING SERVICES AT NO ADDITIONAL COST TO THE DISTRICT. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES NOT SHOWN. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT ALL LINES SHOWN AND/OR ANY OTHER UNDERGROUND UTILITY LINES NOT OF RECORD OR NOT SHOWN ON THE PLANS. THE CONTRACTOR IS REQUIRED TO CALL UNDERGROUND SERVICE ALERT (USA DIG ALERT) AT (811), AT LEAST 2 WORKING DAYS PRIOR TO EXCAVATION.

26. ELEVATIONS SHOWN ON THE PROFILE FOR EXISTING AND/OR PROPOSED UTILITIES AT CROSSING ARE TO THE OUTSIDE OF CONDUIT (TOP & BOTTOM), UNLESS OTHERWISE INDICATED.

27. CONTRACTOR IS RESPONSIBLE FOR KEEPING-UP-TO-DATE RECORD DRAWINGS (RED-LINES) OF ANY CHANGES TO THE PLANS DURING CONSTRUCTION.

28. CONTRACTOR SHALL PROVIDE AN ACCURATE AND LEGIBLE COPY OF THE "RECORD DRAWING" PLANS TO THE DISTRICT AND THE DISTRICT WILL SEND

THESE TO THE ENGINEER AFTER APPROVAL. THE ENGINEER WILL SUPPLY THE DISTRICT WITH A COPY OF "RECORD DRAWING" MYLAR PLANS, ALONG WITH AN ELECTRONIC FILE (PDF & AUTOCAD FORMAT) AT NO ADDITIONAL COST TO THE DISTRICT.

29. THE DISTRICT RESERVES THE RIGHT TO MAKE ANY MODIFICATION TO THE PLANS DURING CONSTRUCTION AS NECESSARY AT NO ADDITIONAL COST TO THE DISTRICT.

4.07 UTILITY NOTIFICATIONS FOR BOTH WATER AND SEWER PLANS

NOTIFICATIONS:

THE CONTRACTOR IS REQUIRED TO NOTIFY THE EXISTING ORGANIZATIONS IN THE AREA BEFORE THE START OF ANY WORK. THE UTILITIES IN THE AREA ARE:

WATER/SEWER:	
MISSION SPRINGS WATER DISTRICT	(760) 329-6448
COUNTY ROADS:	
RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT	(760) 863-8267
CITY STREETS:	
CITY OF DESERT HOT SPRINGS	(760) 329-6411
CITY OF PALM SPRINGS	(760) 323-8253
ELECTRICTY:	
SOUTHERN CALIFORNIA EDISON	(800) 655-4555
GAS:	
SOUTHERN CALIFORNIA GAS	(800) 427-2200
TELEPHONE:	
FRONTIER	(855) 988-0048
CABLE:	
SPECTRUM	(800) 892-2253
FLOOD CONTROL:	

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT (951) 955-1200

UNDERGROUND UTILITIES:

UNDERGROUND SERVICE ALERT (811)

4.08 GENERAL NOTES FOR WATER PIPELINES

WATER CONSTRUCTION NOTES:

1. ALL PIPELINES LESS THAN 12" DIA. SHALL BE INSTALLED WITH A MINIMUM OF 36" COVER TO FINISH GRADE OVER THE PIPE AND ALL PIPELINES 12" DIA. OR GREATER, SHALL HAVE A MINIMUM OF 48" COVER, UNLESS OTHERWISE SPECIFIED.

2. UNLESS OTHERWISE SHOWN ON THE PLANS OR SPECIFIED, PROPOSED WATER LINES SHALL BE: CLASS 350 DUCTILE IRON PIPE.

3. ALL WATER TIE-INS OR POINTS OF CONNECTION TO AN EXISTING SYSTEM SHALL HAVE A "TEST-PLATE" FOR A PHYSICAL SEPARATION BETWEEN APPROVED AND NON-APPROVED WATER SYSTEMS AT ALL TIMES. PLATE(S) SHALL NOT BE REMOVED UNTIL THE WATER SYSTEM HAS PASSED BACTERIOLOGICAL TESTING AND INSTRUCTION HAS BEEN GIVEN BY THE MSWD INSPECTOR.

4. HYDROSTATIC PRESSURE TESTING SHALL BE IN ACCORDANCE WITH AWWA C600-05 SPECIFICATIONS. NO VISIBLE LEAKAGE SHALL BE PERMITTED AND TEST DURATION IS A MINIMUM OF 4 HOURS. THE DISTRICT INSPECTOR SHALL BE NOTIFIED 48 HOURS PRIOR TO THE TEST DATE AND SHALL BE ON SITE DURING THE PRESSURE TEST. THE CONTRACTOR/SUBCONTRACTOR SHALL CONDUCT ALL PRESSURE AND LEAK TESTING USING CONTRACTOR PROVIDED PRESSURE GAUGES AND EQUIPMENT. TIME SPENT BY DISTRICT INSPECTOR INSPECTING ANY REQUIRED RETESTS (MSWD RATE INCLUDES OVERHEAD) SHALL BE AT THE CONTRACTOR'S EXPENSE.

5. ALL WATER LINES AND APPURTENANCES SHALL BE SUPER CHLORINATED/DISINFECTED AT AN INITIAL DOSAGE OF 100-PPM (PARTS PER MILLION) MINIMUM BY MEANS OF LIQUID SODIUM HYPOCHLORITE (APPROVED FOR POTABLE WATER USE) OR BY CHLORINE GAS. INITIAL DISINFECTION SHALL BE HELD FOR A MINIMUM PERIOD OF 24 HOURS AND A MAXIMUM 48 HOURS CONTACT TIME. AFTER INITIAL CONTACT TIME PERIOD, A MINIMUM OF 50 PPM (PARTS PER MILLION) CHLORINE RESIDUAL MUST BE MAINTAINED THROUGH OUT THE ENTIRE WATERLINE AND APPURTENANCES IN ORDER TO FLUSH SYSTEM. IF 50 PPM IS NOT MAINTAINED THE ENTIRE WATER LINE AND APPURTENANCES MUST BE RE-DISINFECTED TO 100 PPM MINIMUM AND

SHALL BE HELD FOR AN ADDITIONAL 24 HOURS BEFORE FLUSHING THE SYSTEM.

6. THE SPECIFIED DISINFECTION OF THE PIPELINES MAY NOT BE PERFORMED CONCURRENT WITH THE HYDROSTATIC TESTING.

7. THE PIPELINE SHALL BE FILLED AT A RATE SUCH THAT THE AVERAGE VELOCITY OF FLOW IS NOT GREATER THAN TWO FEET PER SECOND. THE FOLLOWING TABLE GIVES FILLING RATES TO PROVIDE 2 FEET PER SECOND VELOCITY FOR VARIOUS PIPE DIAMETERS.

NOMINAL PIPE SIZE (INCHES)	FILLING RATES TO ACHIEVE VELOCITY OF 2 FPS (GPM)
4	80
6	180
8	320
10	490
12	700
16	1250
18	1580
20	1960
24	2820
30	4400

8. FLUSHING OF WATER LINES SHOULD BE CONDUCTED UNTIL THE CHLORINE RESIDUALS ARE LESS THAN 1 (ONE) PPM. BACTERIOLOGICAL SAMPLE TESTING WILL BE PERFORMED AFTER 24 HOUR PERIOD.

9. THE PIPELINE ALIGNMENT SHOWN ON THE PLANS IS APPROXIMATE AND MAY BE ADJUSTED IF NECESSARY, DUE TO UTILITY CONFLICT (BUT ONLY AS DIRECTED BY THE DISTRICT).

10. REFER TO MSWD STANDARD DRAWINGS FOR PLACEMENT OF ALL FIRE HYDRANTS WITH RESPECT TO RIGHTS-OF-WAY, SIDEWALKS AND CURB LINES. FIRE HYDRANTS SHALL BE CONSTRUCTED AT THE STATIONS INDICATED ON THE PLANS, UNLESS OTHERWISE DIRECTED BY THE DISTRICT INSPECTOR. ALL INSTALLATIONS SHALL CONFORM TO MSWD STANDARD DRAWINGS.

(APPLICABLE TO ALL WATERLINE APPURTENANCES: AIR VALVES, BLOW-OFFS, SERVICES, ETC.).

11. ALL EXISTING ABOVE GROUND APPURTENANCES CONNECTED TO EXISTING WATERLINES WHICH ARE TO BE ABANDONED AS INDICATED ON THE PLANS, SHALL BE REMOVED AND DELIVERED TO THE DISTRICT YARD UPON COMPLETION OF THE NEW FACILITIES. ALL COSTS ASSOCIATED WITH THIS WORK SHALL BE INCLUDED IN THE CONTRACTOR'S BID AND THE DISTRICT SHALL MAKE NO ADDITIONAL COMPENSATION UNLESS OTHERWISE SPECIFIED.

12. ALL EXISTING WATERLINES AND APPURTENANCES THAT ARE TO BE ABANDONED SHALL REMAIN IN SERVICE UNTIL SUCH TIME THAT NEW WATERLINES AND APPURTENANCES ARE TESTED, DISINFECTED AND APPROVED FOR DOMESTIC USE BY MSWD.

13. STATIONS SHOWN ARE HORIZONTAL DISTANCE ALONG THE CENTERLINE OF PIPE.

14. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF THE EXISTING PIPELINE(S) AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY VARIATION OR DISCREPANCIES FROM PLAN DESIGN.

15. ALL HOT-TAPS OR TIE-INS MUST BE WITNESSED BY MSWD INSPECTOR.

16. ALL HIGH POINTS IN THE PIPE LINE SHALL HAVE AN AIR/VAC INSTALLED PER MSWD STANDARD DRAWINGS.

4.09 GENERAL NOTES FOR SEWER PLANS

SEWER CONSTRUCTION NOTES:

1. STATIONS SHOWN ARE HORIZONTAL DISTANCES ALONG CENTERLINE OF PIPE

2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY NOT TO EXCEED THE PIPE MANUFACTURER'S DEFLECTION SPECIFICATIONS. SHORT LENGTH PIPES MAY BE REQUIRED IN SOME CASES.

3. ALL MANHOLE STUB-OUTS SHALL NOT EXCEED 18 INCHES BEYOND MANHOLE BASE. PLUG END WITH REMOVABLE WATERTIGHT CAP AS MANUFACTURED BY PIPE MANUFACTURER.

4. THE LOCATION OF NEW SEWER LATERALS SHALL BE MARKED AS FOLLOWS: STREETS WITH CURBS: A LETTER "S" SHALL BE CHISELED OR PERMANENTLY MARKED ON THE CURB AT THE LOCATION OF THE SEWER LATERAL; AND AN APPROPRIATE MID-RANGE OR FULL RANGE MAGNETIC MARKER MANUFACTURED BY 3M ELECTRICAL PRODUCTS DIVISION, SCOTCH MARK

MARKER LOCATOR (EMS) SHALL BE PLACED ONE FOOT BELOW THE FINISHED GROUND SURFACE DIRECTLY ABOVE THE TERMINUS OF THE LATERAL. IF FINISH GRADE IS UNKNOWN, THE MARKER SHALL BE INSTALLED TWO FEET BELOW THE ASSUMED FINISHED GROUND SURFACE.

5. ALL SEWER LATERALS TO BE 4" OR 6" IN DIAMETER PER MSWD STANDARD DRAWINGS. LOCATIONS SHALL BE DETERMINED IN THE FIELD PRIOR TO CONSTRUCTION. SEE SPECIFICATIONS FOR DETAILS.

6. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO SUPPORT AND PROTECT IN PLACE ALL EXISTING UTILITIES PARALLEL AND/OR PERPENDICULAR TO THE PROPOSED SEWER LINE. EXISTING UTILITIES SHALL REMAIN IN OPERATION AT ALL TIMES UNLESS APPROVED IN WRITING BY APPROPRIATE UTILITY COMPANY.

7. AIR TESTING OF ALL SEWER LINES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION – "GREENBOOK" SECTION 306-1.4.4 "AIR PRESSURE TEST" AND CONDUCTED IN THE PRESENCE OF THE INSPECTOR.

8. ALL SEWER MAIN, LATERAL CONNECTIONS AND MANHOLES MUST BE WASHED AND VIDEOED IN THE PRESENCE OF THE INSPECTOR. THE DISTRICT REQUIRES A VIDEO COPY IN A DVD FORMAT OF THE ENTIRE VIDEO INSPECTION AT NO ADDITIONAL COST TO THE DISTRICT.

9. ALL PRIVATE SEWER SYSTEMS SHALL BE FLUSHED BY THE CONTRACTOR AND DETERMINED TO BE CLEAN BY THE MSWD INSPECTOR PRIOR TO CONNECTION TO DISTRICT FACILITIES.

4.10 WATER PLAN - CHECKLIST

SEE APPENDIX C – WATER PLAN CHECK PROCEDURES

4.11 SEWER PLAN – CHECKLIST

SEE APPENDIX D – SEWER PLAN CHECK PROCEDURES

4.12 WATER AND SEWER PLAN – CHECKLIST

SEE APPENDIX E – WATER AND SEWER PLAN CHECK PROCEDURES

4.13 WATER POINT OF CONNECTION PLAN – CHECKLIST

SEE APPENDIX F – WATER POINT OF CONNECTION PLAN CHECK PROCEDURES

4.14 DIGITAL PLAN SUBMITTAL

MSWD requires the developer's engineer preparing the improvement plans to submit approved plans in AutoCAD Drawing format.

Files shall be e-transmitted or otherwise packaged to include all appropriate font files and CTB or STB required for opening the file for plotting.

1. Software Format

   The acceptable format for digital submissions shall be one of the following:

   a) AutoCAD's Release 2020 (.DWG) or an earlier version

   b) Drawing Exchange File (.DXF) subject to district approval

2. Digital Data Media

   All digital information shall be submitted to MSWD on one of the following:

   a) DVD

   b) Flash or Thumb Drive (will be retained by MSWD)

The following information must be labeled on all digital data:

- DATE (Date submitted)
- MAP NAME (TR, PM, PP, Etc.)
- MSWD WO#
- COMPANY (engineering Firm Name)

5.0 PRE-CONSTRUCTION AND CONSTRUCTION PROCEDURES

All water and sewer facility projects shall be constructed by developer and inspected by MSWD inspectors. Work performed without the knowledge or the observation of a MSWD inspector will not be accepted. An outline of the required steps to construct water and sewer facilities is set forth in Section 5.01. The steps for the pre-construction and construction procedures are illustrated in a flow chart in Section 5.03.01; and outlined in greater detail in Section 5.02.

5.01 CONSTRUCTION STEPS

1. MSWD Engineering Department sends developer a Fee Letter and Pre-construction Requirements Checklist. See Section 5.03.02.

2. All required items listed in a pre-construction requirements checklist must be received by MSWD prior to scheduling a pre-construction meeting.

3. Engineering Department notifies developer when all pre-construction requirements have been received.

4. Engineering Department schedules a pre-construction meeting with the developer.

5. MSWD, developer and contractor attend pre-construction meeting.

6. Engineering Department issues a Notice to Proceed.

7. Developer's contractor constructs water and/or sewer system facilities per MSWD specifications.

8. Developer's contractor pressure tests and disinfects water system facilities and leak tests sewer system facilities.

9. MSWD Inspector notifies the Engineering Department when the bacteriological and pressure tests have passed on an extension of pipeline.

10. Inspection deposit must be kept current throughout construction phase.

11. MSWD or Developer's contractor sets meter boxes.

12. Upon approval of meter box installation, the Engineering Department will process the application/request for meter installation. Meter installation can take up to two weeks.

13. Developer's contractor connects to existing water and sewer facilities.

14. MSWD notifies the City or County Fire Department and releases lots for fire protection and construction water.

15. Engineering Department coordinates installation of drop-in meters with MSWD field crew.

16. MSWD installs the meter(s).

17. MSWD releases lots for temporary occupancy to the City or County.

18. MSWD Inspector prepares preliminary final construction punch list items.

19. Developer's contractor completes all punch list items and prepares red line drawings given to MSWD for review and approval.

20. MSWD provides final inspection and acceptance and issues a Notice of Final Inspection.

21. Notice of Final Inspection is forwarded to Engineering Department.

22. MSWD issues a Notice of Completion (NOC) and/or Bill of Sale.

23. Following the recording of the NOC or Board of Directors acceptance of the Bill of Sale, MSWD reduces the Faithful Performance Bond by 90% and holds a10% retention for one year, if applicable.

24. MSWD closes project deposit account after the one-year warranty period established by the Bill of Sale and returns any remaining funds to the developer.

5.02 PRE-CONSTRUCTION AND CONSTRUCTION PROCEDURES DETAIL

1. The developer shall pay the following deposits, fees, and charges:

   a) Engineering and plan check review fees.

   b) Inspection Deposit – The inspection deposit is submitted with the initial plan check deposit (see 1.05 2). Engineering Department will determine if sufficient funds remain or if an additional deposit is required.

   c) Meter Fees – Payment is required for each meter. MSWD will install the meters on behalf of the contractor.

   d) Water Connection Charge – Payment of the distribution system fee is required for all new customers connecting to an existing MSWD water pipeline.

   e) Back flow preventer assembly charges.

   f) Sewer connection fees.

2. Submit three copies of water/sewer system construction agreement.

   MSWD will prepare the Water/Sewer System Construction Agreement for execution by the developer and contractor. All three copies shall be returned to MSWD and all three copies shall have original signatures for the developer and contractor. A sample agreement is set forth in Sections 5.03.03 and 5.03.04.

3. Submit Two Copies of Participation/Refund Waiver Agreement.

   MSWD will prepare the Participation/Refund Waiver Agreement for execution by the developer. Both copies shall be returned to MSWD and both copies shall have original signatures. A sample agreement is set forth in Section 5.03.05.

4. Submit Labor and Materials Bond and Faithful Performance Bond.

Developer shall provide MSWD with evidence of a labor and materials bond and a faithful performance bond. Each bond shall be in the amount of the total contract price for construction of the water and sewer facilities.

5. Provide contractor's Name, Address, and License Number.

   Developer shall provide MSWD with the name, address, and license number for the contractor that will construct the sewer and water system facilities.

6. Provide Certificate of Insurance Naming MSWD as Additional Insured.

   Contractor shall provide MSWD with certificate of insurance and original endorsements in accordance with the insurance requirements as specified in the Water/Sewer Construction Agreement.

7. Provide copy of contractor's bid.

   Developer shall provide MSWD with a copy of the contractor's bid for the water and sewer system facilities. The bid shall include line item costs of all work as specified on the approved construction drawings.

8. Provide copy of encroachment permit (if working in a public right-of-way).

   If the project involves construction within a public right-of-way, developer shall provide MSWD with a copy of the encroachment permit from the public agency. Said permit shall allow the contractor to construct the facilities and shall allow MSWD to operate and maintain the facilities once completed.

9. Provide Letter from Licensed civil engineer that streets have been graded to rough grade.

   Developer shall submit a letter from a licensed civil engineer stating that streets have been graded to rough grade (0.2'±). A sample letter is included as Section 5.03.06.

10. Provide Letter from Licensed civil engineer that Curb and Gutters have been constructed or submit a Letter Requesting a Waiver.

11. Developer shall submit a letter from a licensed civil engineer stating that curb and gutters have been constructed. As an alternative, developer may submit a letter requesting a waiver from construction of the curb and gutters prior to construction of the water pipelines. For a sample letter for an installation waiver, see Section 5.03.07.

12. Easements or Fee Title: Developer shall provide MSWD with an executed and notarized easement document or a grant deed, for any easements or Fee Title parcels shown on the water or sewer plans.

13. Soils Report: Developer shall provide MSWD staff with a copy of the soils report prepared for the site.

14. Recorded Map: Developer shall submit a copy of the recorded map (MSWD requires copy of recorded map prior to recording the Notice of Completion). Dedicated easements will be required if the tract Map is not recorded. MSWD will not record the easement unless it is necessary to own, operate and maintain facilities.

15. Tract Construction phasing Maps: Developer shall submit a tract construction phasing map (8½" X 11" format) showing lot numbers and street names.

16. Schedule a Pre-construction Meeting with MSWD Engineering Department.

17. Developer shall schedule a pre-construction meeting with MSWD Engineering Department after all required fees and line items have been received by Development Services. A one-week notice is required prior to said pre-construction meeting.

18. Attend Pre-construction Meeting. Pre-construction meeting shall be held at MSWD administrative office, or via video conference, and shall be attended by developer's representative, developer's contractor, MSWD Engineering Department, City and County representatives, other utility agencies, as well as by MSWD staff.

19. Provide copies of cut sheets. The contractor shall submit three copies of the construction cut sheets for MSWD use during construction. Water pipelines shall be staked at 50' intervals (if curb and gutters are not installed, stake at 25' intervals) and at all water services, fire hydrants, tees, crosses, elbows, valves, air valves, blow-offs, and grade breaks. Sewers shall be staked at 25' intervals and at all sewer laterals and manholes.

20. MSWD issues notice to proceed. When all the above items are completed to the satisfaction of MSWD, MSWD Engineering Department will issue a notice to proceed for construction of the water and sewer system facilities.

21. Notify MSWD regarding construction start. The contractor shall notify MSWD a minimum of 48 hours prior to construction start.

22. Construct water and sewer system facilities. The water and sewer system facilities shall be constructed by developer's contractor per MSWD specifications and inspected by MSWD inspectors. Inspection requirements are set forth in (Section 5.03.08).

23. Compaction test: The contractor shall furnish evidence that compaction of trenches has been completed to the satisfaction of the County of Riverside, the City of Desert Hot Springs or the City of Palm Springs, as appropriate.

24. Pressure test and disinfect water system facilities and leak test sewer system facilities. After water facilities are completed to the satisfaction of MSWD inspector including all items on inspector's construction deficiencies list, and after compaction of trenches has been completed to the satisfaction of MSWD, the County of Riverside, the City of Desert Hot Springs, or the City of Palm Springs, as appropriate, contractor shall test and disinfect the water facilities in accordance with MSWD standards. Contractor shall video

inspect all welded steel water pipelines twelve-inch (12”) or larger prior to testing and disinfection.

25. After sewer facilities are completed to the satisfaction of MSWD inspector including all items on inspector's construction deficiencies list, and after contractor furnishes evidence that compaction of trenches has been completed to the satisfaction of MSWD, the County of Riverside, the City of Desert Hot Springs or the City of Palm Springs, as appropriate, contractor shall test the sewer facilities in accordance with MSWD standards. Contractor shall video inspect all sewer pipelines.

26. Landscape meters: The developer will install the landscape lateral, meter box and backflow device but not the meter. MSWD will install the meter after all meter fees have been paid. Meters will be locked off until backflow device has been installed, tested and certified by MSWD.

27. After the water system is tested and disinfected, contractor may connect water facilities to existing water facilities. Contractor shall provide MSWD with two weeks written notification requesting a system shutdown to make connections to existing MSWD facilities. After all sewer connection fees have been paid, and the sewer system is tested, contractor may connect sewer facilities to existing sewer facilities. Contractor shall perform all connections with continuous inspection by MSWD. Thereafter, MSWD will release lots for fire protection and construction water.

28. Developer will install meter boxes. MSWD Engineering Department provides work orders to MSWD Operations Department to schedule meter installation. When meters have been installed, the Engineering Department will release lots for occupancy and will provide notices to the County of Riverside, the City of Desert Hot Springs, and the City of Palm Springs, as appropriate.

29. After construction of the water and sewer system facilities for the entire tract, MSWD inspector will prepare a preliminary final construction punch list and deliver copies to contractor.

30. The contractor shall complete all items listed on MSWD preliminary final construction punch list.

31. The contractor shall provide MSWD inspector with accurate record drawings.

32. When the water system and sewer system facilities have been accepted by MSWD, MSWD will issue a Notice of Final Inspection stating that the final inspection has been made and the construction is complete.

33. MSWD prepares a notice of completion and/or Bill of Sale for the water and sewer system facilities to the Board of Directors for acceptance.

34. When the developer executes the Notice of Completion and/or Bill of Sale, developer shall return the documents to MSWD. When MSWD has received the executed

documents, MSWD Submits Notice of Completion for Recordation and Releases the Labor and Materials Bond.

35. After the Notice of Completion is recorded and following the 90-day lien period, MSWD will reduce the Faithful Performance Bond by 90%.

36. MSWD issues a letter of acceptance of water and/or sewer system for the County of Riverside or the City of Desert Hot Springs.

37. MSWD performs a warranty inspection at one (1) year from the NOC and/or Bill of Sale.

38. MSWD will close the deposit account and return any remaining deposit after one (1) year warranty period has expired.

5.03 PRE-CONSTRUCTION AND CONSTRUCTION FORMS INDEX

5.03.01 Flowchart – pre-construction and construction

5.03.02 Pre-construction requirement checklist

5.03.03 Water system construction agreement

5.03.04 Sewer system construction agreement

5.03.05 Agreement for on-site water/sewer participation waiver

5.03.06 Form letter - rough grade verification

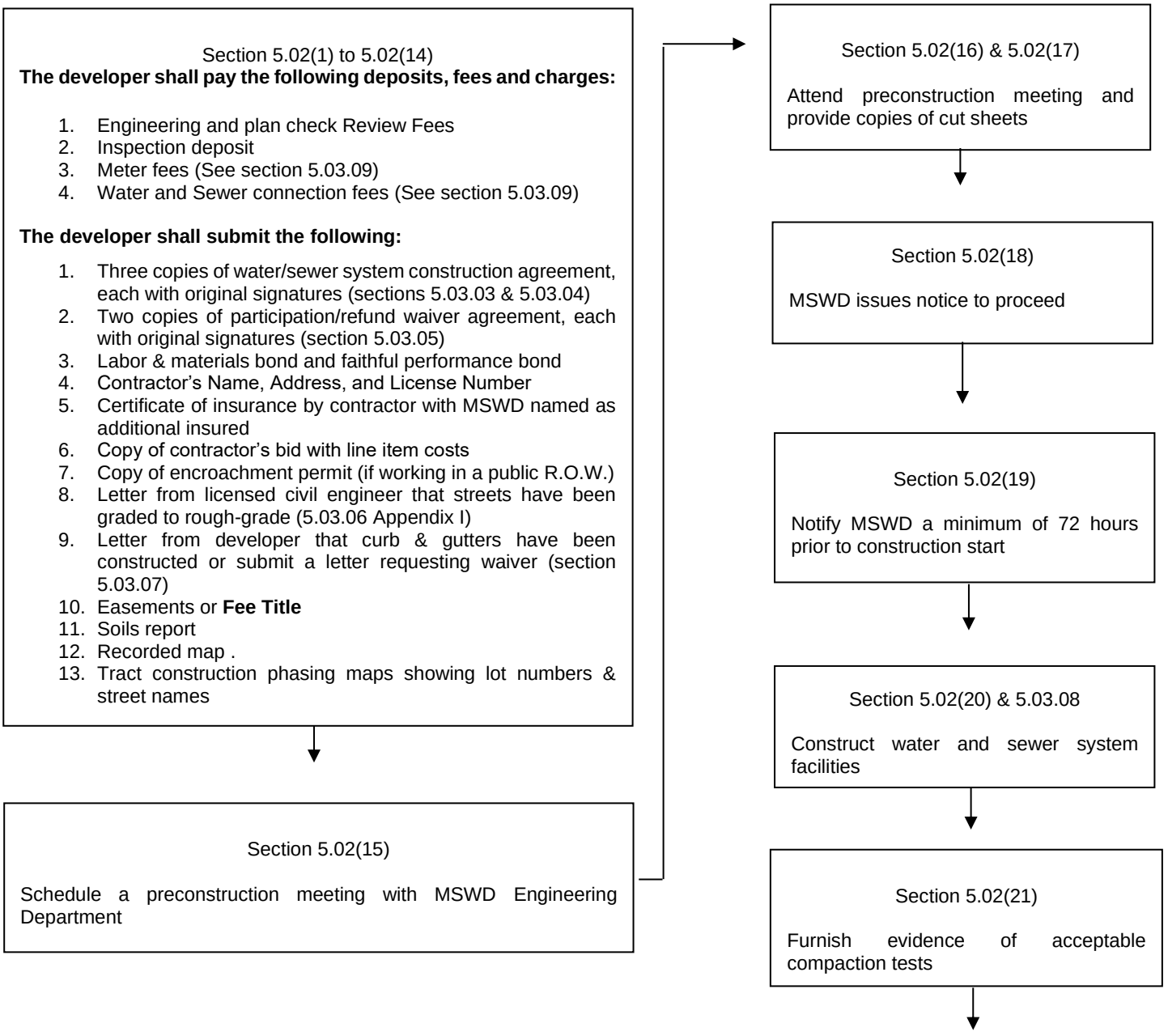
5.03.07 Form letter - curb and gutter installation waiver request

5.03.08 Inspector requirements - hand out at pre-construction meeting

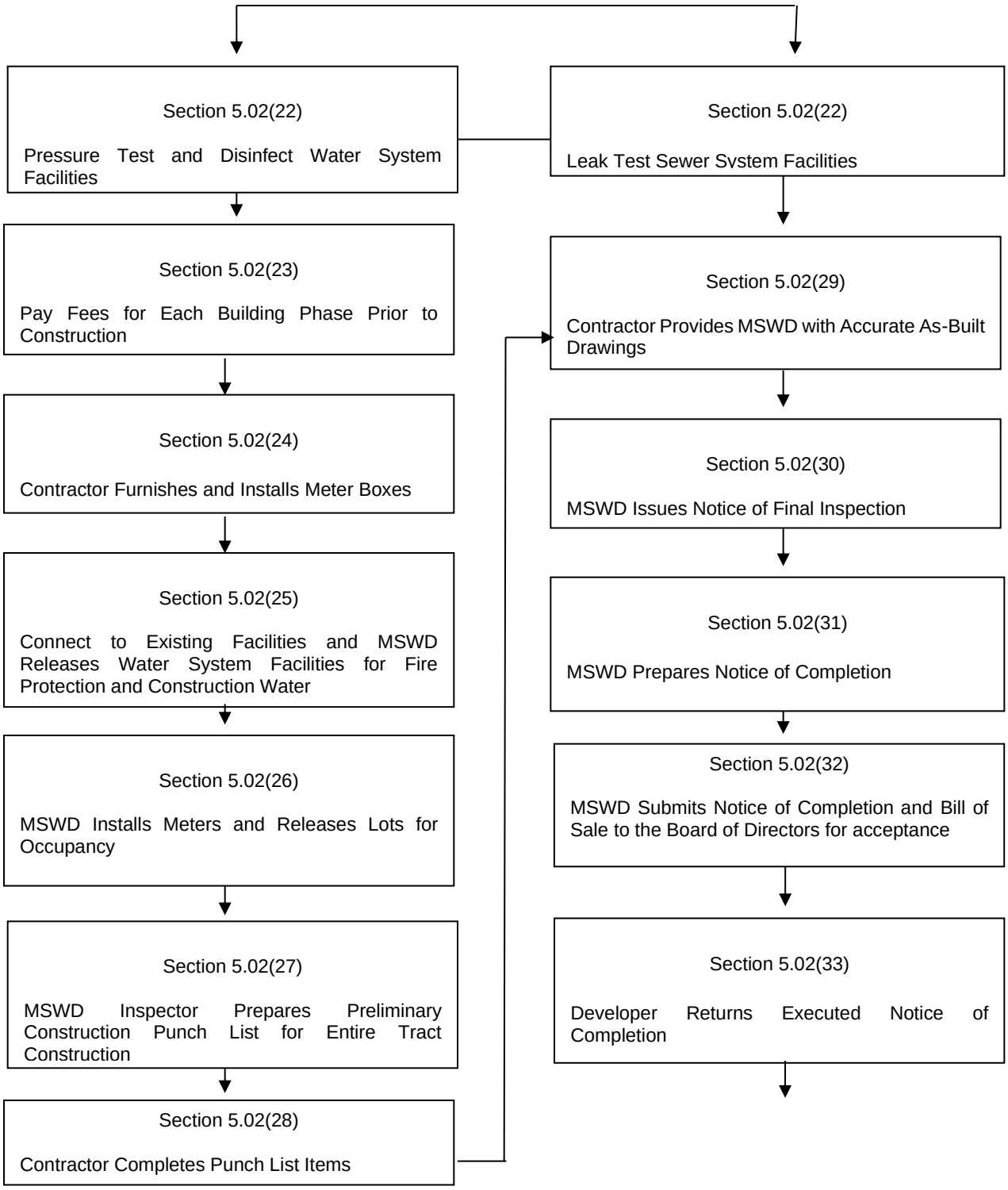
5.03.09 MSWD meter fee cost worksheet

5.03.10 Instructions for ordering meters - handout at pre-con meeting

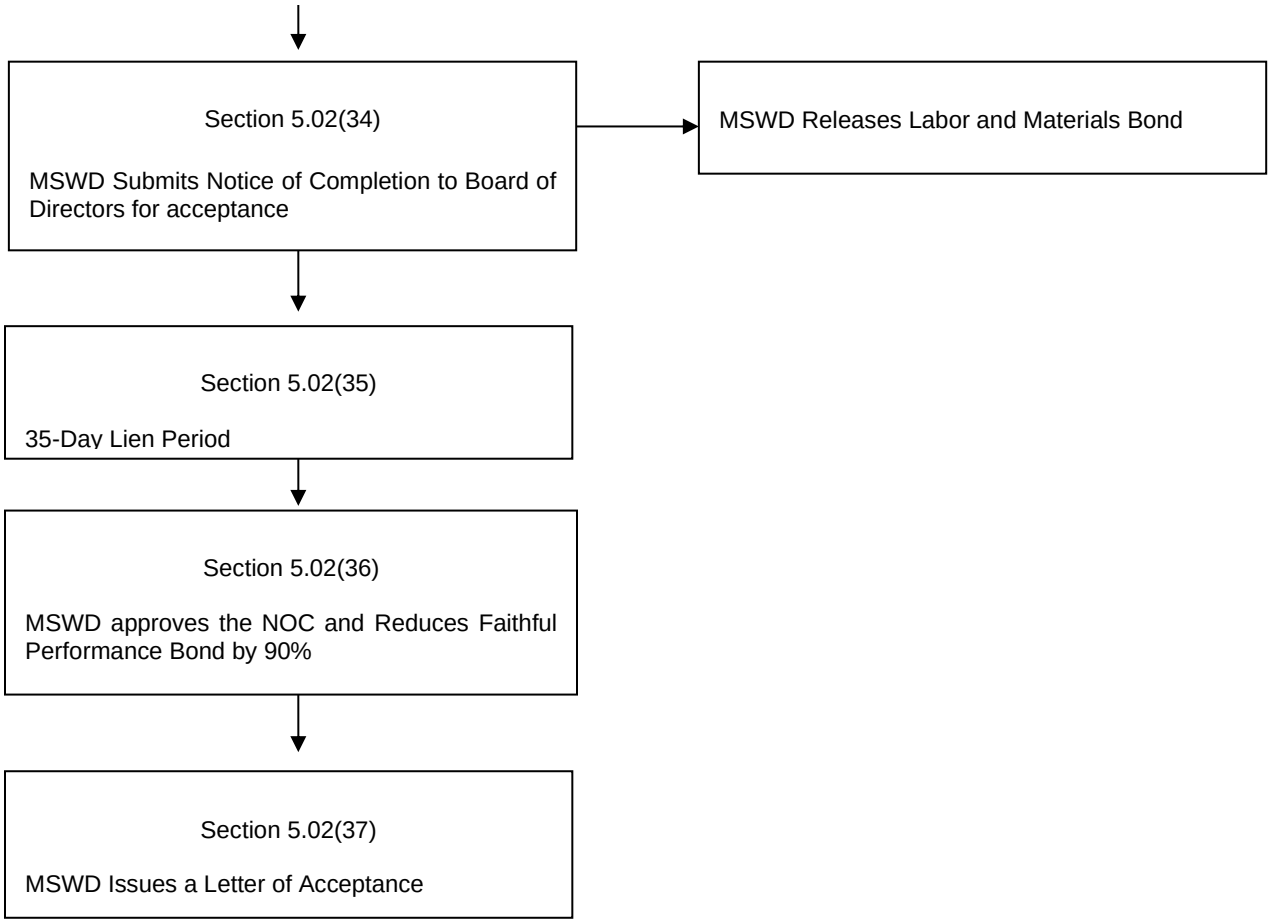
5.03.01 FLOW CHART – PRE-CONSTRUCTION AND CONSTRUCTION



5.03.01 FLOW CHART – PRE-CONSTRUCTION AND CONSTRUCTION (continued)



5.03.01 FLOW CHART – PRE-CONSTRUCTION AND CONSTRUCTION (continued)



5.03.02 TRACT PRE-CONSTRUCTION WATER & SEWER CHECKLIST – FORM T-1

SEE APPENDIX E – TRACT DEVELOPMENT FEE CHECKLIST

5.03.03 WATER SYSTEM CONSTRUCTION AGREEMENT

SEE APPENDIX F – WATER SYSTEM CONSTRUCTION AGREEMENT (DEVELOPER INITIATED/CONTRACTOR INSTALLED)

5.03.04 SEWER SYSTEM CONSTRUCTION AGREEMENT

SEE APPENDIX G – SEWER SYSTEM CONSTRUCTION AGREEMENT (DEVELOPER INITIATED/CONTRACTOR INSTALLED)

5.03.05 AGREEMENT FOR ON-SITE WATER/SEWER PARTICIPATION WAIVER

SEE APPENDIX H – AGREEMENT FOR ON SITE WATER / SEWER SYSTEM PARTICIPATION / REFUND WAIVER

5.03.06 ROUGH GRADE VERIFICATION FORM T-3

SEE APPENDIX I – ROUGH GRADE VERIFICATION FORM T-3

5.03.07 CURB AND GUTTER INSTALLATION WAIVER REQUEST FORM T-4

SEE APPENDIX J – CURB AND GUTTER INSTALLATION WAIVER REQUEST FORM T-4

5.03.08 INSPECTOR REQUIREMENTS - FORM G-4

SEE APPENDIX K – INSPECTOR REQUIREMENTS – FORM G-4

5.03.09 METER FEE COST WORKSHEET - FORM T-6

SEE APPENDIX L – METER FEE COST WORKSHEET

5.03.10 INSTRUCTIONS FOR ORDERING METERS – FORM T-8

SEE APPENDIX M – INSTRUCTIONS FOR ORDERING METERS – FORM T-8

6.0 TECHNICAL PROVISIONS

6.01 CONSTRUCTION METHODS

It shall be the responsibility of the contractor to perform the construction in a neat, orderly and professional manner. The contractor must provide an adequate number of trained personnel to perform the work with safety always the first concern.

6.01.01 PROJECT SITE

It shall be the responsibility of the contractor to examine the site of the work and to make all investigation necessary, both surface and sub-surface, to determine the character of materials to be encountered and all other existing conditions affecting the work.

The entire site within the area affected by construction shall be cleared and bladed. Surfaces shall be cut or filled to the extent indicated by finish grade stakes. Finish surfaces shall slope uniformly between spot elevations or finish contour lines shown on the drawings and away from structures. Grading tolerance will be plus or minus 0.1 feet from surface elevations indicated.

All lines and grades shall be established before Notice to Proceed, and the contractor shall provide such assistance and materials as may be required. The contractor shall carefully preserve all survey stakes and reference points. Any stakes or points removed or destroyed by any act of the contractor will be reset at the contractor’s expense.

The contractor shall inform MSWD a reasonable length of time in advance of the times and places at which he intends to work in order that lines and grades may be furnished, that inspection may be provided, and that necessary measurements for records and payments may be made with minimum inconvenience.

6.01.02 ADMINISTRATIVE REQUIREMENTS

The contractor shall comply with all applicable federal, state, county and municipal rules and regulations pertaining to sanitation, fire protection, and safety contractor shall obtain and have available at the job site a copy of these specifications to comply with all provisions herein.

The contractor shall provide such modern plant and equipment as may be necessary to perform all the work in a satisfactory and acceptable manner, and in accordance with the specifications.

The contractor shall file with MSWD a written list giving the names, addresses, and telephone numbers of at least two (2) of the contractor's representatives who can be contacted at any time in case of emergency. The representatives shall be fully authorized and equipped to correct unsafe or inconvenient conditions on short notice. The contractor shall promptly notify MSWD of all changes in the listing.

The contractor shall provide all necessary power required for the contractor's operations under the contract. The contractor shall provide and maintain in good order such modern power equipment as shall be adequate, in the opinion of MSWD, to perform in a safe and satisfactory manner, the work required by the contract.

The contractor shall obtain construction water for work under this specification. All water used to fill potable water distribution systems must meet state and local health requirement for domestic consumption.

6.01.03 PROTECTION OF FACILITIES AND PROPERTY

The drawings identify the various pipelines, conduits, and other existing utility structures as they are supposed to exist in construction areas, but no error or omission on said drawings shall be construed to relieve the contractor from the responsibility of protecting any such pipeline, conduit, or other existing utility structures.

When deemed necessary by MSWD, revisions of the contract drawings and additional detailed drawings will be issued to the contractor during the progress of the work.

When performing underground work, the contractor shall call Underground Service Alert (USA), the on-call underground facility locating service, two (2) working days prior to making an excavation. Contractor shall be responsible for such notification of sub-contractor's work or shall require sub-contractor to assume this responsibility.

No MSWD valves or appurtenances of other utility facilities shall be operated by the contractor without approval and/or instruction from MSWD or the utility, as appropriate.

Insofar as practical during the progress of the work, the property of any owner (including facilities such as a pipeline, conduit, sewer, culvert, storm drain, drainage ditch, flood control channel, overhead wire, cable, underground wire, or any other facility) shall not be disturbed but shall be supported and protected against injury and maintained in good operating condition at the expense of the contractor. In no case shall any such property be disturbed or removed without the consent of the owner and approval of MSWD. The contractor shall be responsible for making good all damage due to the contractor's operations and the provisions of this section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of backfilling.

The contractor shall explore the location and depth of under-ground facilities, sewers, and storm drains sufficiently in advance of pipeline laying or other construction operations so that changes in line or grade, or both, can be made in the pipeline without delay of the contractor's construction schedule, without relaying or reconstructing previously installed pipelines or other facilities and to avoid wherever possible moving, altering, or reconstruction of the obstructing underground facilities, sewers, or storm drains.

It shall be the responsibility of the contractor to verify the location of all obstructions shown on the plans and to locate any other underground utilities and structures which might necessitate a change in the line and grade of the new work. If the contractor, while performing the work of construction, discovers utility facilities not identified in contract plans or specifications, the contractor shall immediately notify MSWD.

In no case shall any utility that has been damaged, whether shown or not shown on the plans, be backfilled without the contractor notifying the utility company of the damage.

If the work requires, as shown on the drawings or as specified, or as required for the contractor's convenience, that the surface and overhead facilities, underground facilities, sewers and storm drains should be moved, altered, relocated, reconstructed, or temporarily supported, in order that the facilities included in the contract can be constructed, the contractor shall make all arrangements, therefore, with the respective owners and shall bear all expenses for moving, altering, relocating, or temporarily supporting the facilities.

In addition, MSWD may require the moving, altering, or reconstructing of obstructing underground facilities, sewers, or storm drains, and any compensation, therefore, will be the responsibility of the contracting party and not MSWD.

Pipelines determined to be abandoned may be destroyed if conflicting with the contract work and properly disposed of after approval by MSWD.

All pipelines abandoned in place shall be crushed or filled (sand/cement slurry) and exposed ends of abandoned pipelines shall be plugged for water tightness as approved by MSWD.

6.01.04 RIGHTS-OF-WAY

Rights-of-way for the pipelines to be constructed shall be acquired before Notice to Proceed is issued. Neither the terms hereof nor anything shown on the drawings in connection with the right-of-way shall be construed to entitle the contractor to conduct operations in said right-of-way in

violation of any public agency ordinance or regulation restricting interference with water courses and drainage channels, road, alley, or street, until the contractor has obtained permits from the proper authorities.

In all of the streets in which the contractor's work may interfere with ingress or egress of the occupants of the abutting property or of their vehicles, the contractor shall maintain temporary practical means of ingress and egress or shall make satisfactory arrangements with the occupants for the obstruction of ways to their properties for the duration of the interference. Such arrangements shall be made in writing and a copy submitted to MSWD.

Nothing herein shall be construed to entitle the contractor to the exclusive use of any public street or way during performance of the contract work, and the contractor shall so conduct the work as not to interfere unnecessarily with the authorized work of other agencies in such streets and ways.

Fences on the rights-of-way shall be removed by the contractor where necessary for the performance of the work, but, where required, shall be maintained until the work is completed or removal is authorized. Where the contractor removed existing fences to facilitate the work, temporary fence protection for lands adjacent to the rights-of-way shall be provided at all times during the continuation of the contract. Such temporary fence protection shall be adequate to prevent livestock from straying from or onto adjacent lands and shall be constructed complete with gates and/or cattle guards. The cost of all work described in this paragraph shall be included in the prices bid for other items of work and no separate payment shall be made.

Where pipelines are to be constructed through and adjacent to tracts of improved property, the contractor shall, where practical, confine the contractor's operations within a thirty foot (30') wide right-of-way or such other width rights-of-way as may be designated on the drawings or in the Special Provisions. If contractor's operations are such as to require additional space, the contractor shall arrange for and secure at the contractor's own expense any additional right-of-way required. The contractor shall enter into written agreements with the landowners and copies of the agreements shall be furnished to MSWD.

Where the pipeline is to be constructed through cultivated fields not in public road rights-of-way, the contracting party will obtain and pay for damage to crops over a total overall width of 30' or such other width as may be designated. Any damage to crops outside of the designated right-of-way shall be paid for by the contractor.

6.01.05 JOB SITE SAFETY

The contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. This requirement will apply continuously 24 hours a day every day until final acceptance of the work and shall not be limited to normal working hours.

The contractor shall provide and maintain barricades, guards, temporary bridges and walkways, watchmen, night-lights, and danger signals illuminated from sunset to sunrise, and all other necessary appliances and safeguards to protect the work, life, property, the public, excavations, equipment, and materials. Barricades shall be of substantial construction and shall be painted such as to increase their visibility at night. Suitable warning signs shall be placed and illuminated

at night as to show in advance where construction, barricades, or detours exist. Guardrails shall be provided for bridges and walkways over or adjoining excavations, shafts, and other openings and locations where injury may occur.

The contractor's Safety Officer shall inspect the entire work and site, including storage areas, at frequent intervals to verify that fire prevention measures are constantly enforced.

The contractor shall furnish and maintain fully charged fire extinguishers of the appropriate type, supplements with temporary fire hoses wherever an adequate water supply exists, at the places where burning, welding, or other operations that may cause a fire are being performed.

Only a working supply of flammable or toxic materials shall be permitted on any of the permanent structures and improvements and shall be removed at the end of each day's operations. The contractor shall store flammable or toxic materials and waste separate from the work and stored materials for the work in a manner that prevents spontaneous combustion or dispersion, and none shall be placed in any sewer or drain piping or buried on the site.

The contractor shall not permit any person for whom the contractor is responsible or liable to enter or remain on the site of the work unless the person is equipped with and wearing a safety helmet and other protective clothing and safety equipment conforming to the requirements of MSWD or regulatory agencies and shall discharge from the site all persons not so equipped. The contractor shall post conspicuous signs at appropriate locations warning the public and persons engaged upon the work of this requirement. The contractor shall furnish for their temporary use such safety helmets, protective clothing, and safety equipment as MSWD may request.

The contractor shall not permit or allow any person or persons to enter any pipeline or space containing hazardous or noxious substances or gases, or where there is an insufficient amount of oxygen to sustain life and consciousness, or any other hazardous area unless equipped with lawful and appropriate safety equipment and life support apparatus, and unless those entering are continually monitored and guarded by and in communications with other persons outside the space or area who are equipped in the same way, can give an alarm to others for assistance, and initiate immediate rescue operations in the event of mishap.

The contractor shall perform any and all operations and shall furnish any materials and equipment necessary during an emergency endangering life or property and, in all cases, shall notify MSWD of the emergency as soon as practical, but shall not wait for instruction before proceeding to properly protect both life and property.

Excavations shall be adequately shored and braced so that the earth will not slide or settle and so that all existing improvements of any kind will be fully protected from damage. Any damage resulting from a lack of adequate shoring and bracing shall be the responsibility of the contractor. The contractor shall affect all necessary repairs or reconstruction at the contractor's own expense as directed by MSWD and shall bear all other expenses resulting from such damage.

Each contract for construction subject to these specifications for the construction of a water pipeline, sewer pipeline, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, or the use of such a trench or open excavation, shall include the costs necessary to provide adequate sheeting, shoring, and bracing, or equivalent method for the

protection of life or limb, which shall conform to applicable safety order, including the Construction Safety Orders of the California Division of Industrial Safety, in accordance with the requirements of the California Occupational Safety and Health Act.

When working in, or connecting to, existing systems in operation, the required safety provisions work in an operating system will be enforced, including provisions for working in confined air spaces when appropriate.

Nothing in this requirement shall be construed to impose tort liability on MSWD or any of its officers, or employees.

6.01.06 JOB SITE MAINTENANCE

Excavating and grading shall be performed only when the weather conditions do not adversely affect the quality of the finished product. Any graded or excavated areas that are damaged by the effect of rain, or other weather conditions, during any phase of the construction, shall be re-excavated, re-graded, and re-compacted to conform to the herein specified requirements, at the contractor's expense.

The contractor shall furnish all labor, equipment and means required and shall carry out protective measures wherever and as often as necessary, in the opinion of MSWD, to prevent contractor's operations from producing dust in amounts damaging to property or causing nuisance. The contractor shall be responsible for any damage resulting from dust originating from his operations. The dust abatement measures shall be continued until all required resurfacing is completed or until the contractor has completed arrangements with the proper authorities whereby the contractor is relieved of further responsibility.

The contractor shall acquire such permits and take such measures as may be required, and shall furnish, install, and operate such pumps or other devices as may be necessary to remove any seepage, storm water, or sewage that may be found or may accumulate in excavations during the progress of the work. The contractor shall keep all excavations entirely free from water at all times during the construction of the work and until MSWD has given permission to cease pumping. The contractor shall keep the complete work reasonably free from accumulations of water and sewage and shall free it entirely at such times as may be required by MSWD for inspection or other purposes. Any accumulated water or sewage thus pumped shall be disposed of in accordance with good practice and local ordinances.

The contractor shall provide an adequate dewatering system for the control of surface and groundwater seepage into the excavations as may be required during the construction period. The proposed plan of this dewatering system shall be submitted to MSWD for concept approval prior to the installation of the system.

6.01.07 PROJECT CLEAN-UP

The contractor shall keep the premises occupied by him in a neat and clean condition, and free from the unsightly accumulation of rubbish. Upon completion of the work and before the final estimate is submitted, the contractor shall, at contractor's own cost and expense, satisfactorily dispose of or remove from the vicinity of the work all plants, buildings, rubbish, rock, unused and

excavated materials belonging to the contractor or used under the contractor's direction during the construction, and in the event of the contractor's failure to do so, the same may be removed and disposed of by MSWD at the contractor's expense. Contractor's responsibility shall include satisfactory disposal of all debris or protective material resulting from material delivery such as plastic wrappings, pipe stulls, etc., whether or not the contractor furnished such material.

The contractor's operations shall be carried on in such sequence and in such manner as to interfere as little as possible with other improvements. When the construction is adjacent to or on residential property or cultivated fields or orchards, disposal of material and backfill operations shall be performed in such manner as to restore the properties to their original condition as nearly as practical as determined by MSWD. Topsoil shall be carefully removed, stockpiled, and replaced after the backfill is placed.

As a part of the clean-up operation of facilities in private right-of-way, the contractor shall restore the soil over the full width of the right-of-way to a condition equivalent to that which existed at the time of the construction operations on such areas, by thoroughly loosening the soil with subsoilers, or other acceptable means and by disking and leveling, if necessary, any stones, gravel, or other deleterious material left in spoil banks. On such lands, debris shall be removed by the contractor before final preparation of the soil and shall be disposed of as required for excavated materials.

6.02 EARTHWORK SPECIFICATIONS

6.02.01 EXCAVATION

Excavation shall include, without classification, the removal of all materials of whatever nature encountered, including all vegetation or other obstructions of every nature that would interfere with the proper execution and completion of the work. The contractor shall furnish, place, and maintain all supports and shoring required for the sides of the excavations. The contractor shall perform all pumping, ditching or other approved measures for the removal or exclusion of water (including taking care of storm water and wastewater reaching the site of the work from any source) so as to prevent damage to the work or adjoining property. Excavations shall be supported in the manner set forth in the rules, orders and regulations prescribed by the Department of Industrial Relations, Division of Industrial Safety.

Unless otherwise approved, all pipeline trenches shall have vertical sides and shall have a minimum width equal to the outside diameter of the pipe plus twelve-inches (12") and a maximum width equal to the outside diameter of the pipe plus twenty-inches (20").

Any excavation carried down below the grades shown on the drawings or in excess of those ordered by MSWD shall be backfilled to the required grade with sand or suitable selected sandy material. Such material shall be properly moistened and thoroughly compacted in a manner consistent with the project soils report, excepting that the layers shall not exceed four-inches (4") in thickness, compacted by means of a hand-operated, power-driven tamper.

All excavations shall be kept free of water while concrete or pipeline is being placed and until concrete has attained its initial set to eliminate any possible damage from such water. Any water accumulations in excavations from any source shall be removed by the contractor at the

contractor's expense. Wastewater shall be disposed of in such a manner that it will not cause any damage to public or private property or will not be a menace or inconvenience to the public.

Excess excavated material shall be removed from the site and disposed of by the contractor at the contractor's expense.

6.02.02 PREPARATION OF PIPE AND STRUCTURE FOUNDATIONS

Normal bedding shall be used unless otherwise shown or ordered. For normal bedding of pipe, the bottom of the trench shall be excavated uniformly to the grade shown on the drawings. The trench bottom shall be given a final trim such that each pipe section when first laid shall be continually in contact with the ground along the extreme bottom of the pipe. Rounding out of the trench to form a cradle for the pipe will not be required. Where called for on the bidding sheets or otherwise ordered by MSWD, the contractor shall furnish imported sand bedding. Said material shall be placed in accordance with the details shown in the plans.

Where the bottom of the trench is in rock or boulders, such material shall be removed to a minimum depth of six inches (6") below the grade of the bottom of the pipe and the trench refilled to the grade of the pipe with sand or suitable selected sandy material. The material shall be properly moistened and thoroughly compacted in a manner consistent with the project soils report, excepting that the layers shall not exceed four-inches (4") in thickness, compacted in layers not exceeding four-inches (4") in thickness by means of a hand-operated, power-driven tamper.

6.02.03 BACKFILL AND COMPACTION

All excavations shall be backfilled to the level of the original ground surfaces except where otherwise shown or ordered by MSWD. The trench shall be backfilled to a level twelve inches (12") below the top of the trench with sufficiently granular material obtained from the excavation having a sand equivalent of at least 30. Such material shall be compacted to 90 percent of maximum dry density per ASTM D1557-02.

The remaining backfill shall be placed in horizontal layers not exceeding six inches (6") in depth before compaction. Each layer shall be moistened, tamped, rolled, or otherwise compacted to 95 percent of maximum dry density per ASTM D1557-02 as determined by the compaction test specified herein.

Where backfill is required to be compacted to a specified percentage of maximum dry density, tests for compliance may be made by a qualified soils technician using the test procedure specified in "Methods of Test for Moisture-Density Relations of Soils Using a 10-lb. Rammer and an eighteen-inch (18") Drop", (ASTM Designation D1557), modified to use 3 layers. Field density tests shall be performed in accordance with the test procedure specified in "Method of Test for Density of Soil in Place by the Sand-Cone Method" (ASTM Designation D1556).

6.02.04 CUTTING AND RESTORING ROAD SURFACING, ETC.

In cutting or breaking up road surfacing, the contractor shall not use equipment which will damage the adjacent surfacing. All cement concrete surfaces shall be scored with concrete sawing equipment of a type meeting the approval of MSWD; provided however, that any cement concrete

base under an asphaltic mix surface will not be required to be scored by sawing. Existing paved surfaces shall be cut back beyond the edges of the trenches to form neat square cuts before paving is commenced.

Surfacing, gutters, and culverts destroyed in connection with performing the work required under the contract shall be replaced with the same kind or with better surfacing, gutters, and culverts by the contractor in accordance with the latest specifications, rules and regulations and subject to the inspection of the agency having jurisdiction over the street or highway. Damaged or destroyed sidewalks shall be replaced with new sidewalks having a minimum thickness of 3-1/2 inches.

Valve box sleeves or covers damaged or destroyed shall be replaced with the same kind of sleeves or covers.

6.03 CONCRETE SPECIFICATIONS

6.03.01 CONCRETE AND MORTAR MIX

Contractor shall furnish all materials for concrete and mortar, and shall form, mix, place, cure, repair, finish and do all other work required to produce finished concrete structures. No exposed concrete such as pads, manhole collars, or valve collars shall be placed during high wind conditions. Any concrete showing surface cracking due to exposure shall be replaced at the request of the MSWD inspector.

The concrete mix used for all concrete required hereunder shall be composed of Portland Cement and properly graded sand and rock. The proportions of cement and aggregates shall be such as to produce a workable mix with a minimum compressive strength of 3,250 psi at the age of 28 days. The quantity of water used shall be just sufficient, with a normal mixing period, to produce a concrete, which, in the judgment of the engineer, can be worked properly into place without segregation.

4,000 psi concrete may be used for same day placement of manhole shafting with prior written approval of the MSWD inspector.

Mortar shall consist of 1 part of Portland cement and 1-1/2 parts of sand, all by volume. The materials shall be thoroughly mixed dry until the mixture assumes a uniform color and then sufficient water shall be added to bring the mixture to a workable consistency.

6.03.02 CEMENT

All cement used on the work shall be standard brand Portland Cement conforming to the "Specifications for Portland Cement", Type II (ASTM Designation C150).

6.03.03 AGGREGATES

All aggregates shall be obtained from pits approved by the engineer. Fine aggregate shall be composed of clean, hard, strong, durable, uncoated grains, free from shale, lumps and soft or flaky particles and from injurious amounts of dust, alkali, organic matter, loam, mica, or other deleterious substances. The grading as determined in accordance with the "Method of Test for

Sieve Analysis of Fine and Coarse Aggregates" (ASTM Designation C136) shall conform approximately to the following:

SIEVE SIZE	PERCENTAGE PASSING SIEVES
3/8"	100
NO. 4	90 - 100
NO. 8	65 - 90
NO. 16	45 - 70
NO. 30	25 - 45
NO. 50	10 - 20
NO. 100	2 - 8
NO. 200	0 - 4

Fine aggregate shall in all cases be washed. The control of washing of fine aggregate shall be such that the finer particles of sand are retained or removed as required. Washed or saturated sand shall be allowed to drain at least 24 hours to uniform moisture content before batching. Dry sand shall be moistened before handling when necessary to prevent segregation. The fine aggregate shall be well graded so as to insure a dense concrete.

When tested in accordance with the "Method of Test for Organic Impurities in Sand for Concrete" (ASTM Designation C40-04), it shall show a color not darker than the standard color and shall contain not more than a total of 5 percent by volume of clay, silt, mica, or other objectionable inorganic materials as determined after shaking well with two and one-half times (2 1/2) its volume of water in a graduated cylinder. At least 400 cc of sand by volume shall be used in this test.

Coarse aggregate shall be composed of strong, hard, clean, durable, uncoated pebbles or rock fragments, free from alkali, organic or other deleterious matter and shall contain not more than 25 percent of crushed material. Not more than 5 percent by weight of soft or friable particles and not more than 3 percent of thin, elongated, or laminated pieces will be allowed. Coarse aggregate shall be washed, and if necessary, shall be again uniformly moistened just before batching. Coarse aggregate shall be furnished in the primary sizes specified below, and shall be stored in separate batching bins, and batched as required to conform to the combined grading requirement. The grading or proportioning of the fine and coarse aggregates in the mix shall be varied as directed by the engineer and will be based on securing a well-graded aggregate and producing concrete having the required workability, density, and strength, without the use of excess sand,

water or cement. The grading of the primary size of the coarse aggregates shall be within the limits in percentages, by weights, as follows:

PRIMARY AGGREGATE SIZE NO. 2 (1-1/2 inch maximum size)

	Percent	
Passing a 2-inch square sieve		100
Passing a 1-1/3 in square sieve	90	- 100
Passing a 1 in square sieve	20	- 55
Passing a 3/4 in square sieve	0	- 15
Passing a 3/8 in square sieve	0	- 5

PRIMARY AGGREGATE SIZE NO. 3 (1-inch maximum size)

	Percent	
Passing a 1-1/2 in square sieve		100
Passing a 1 in square sieve	90	-100
Passing a 3/4 in square sieve	60	- 80
Passing a 3/8 in square sieve	0	-15
Passing a No. 4 square sieve	0	- 5

PRIMARY AGGREGATE SIZE NO. 4 (3/8 in. maximum size, pea gravel)

	Percent	
Passing a 1/2 in square sieve		100
Passing a 3/8 in square sieve	90	- 100
Passing a No. 4 square sieve	0	- 5

In the event coarse aggregate is stored in stockpiles in advance of concreting operations, such stockpiles shall be built up by approved methods so that coning or segregating of the materials cannot occur.

6.03.04 WATER

Water shall be clean and free from objectionable quantities of organic matter, alkali, salts, and other impurities.

6.03.05 FORMS

Forms to confine the concrete and shape it to the required lines shall be used wherever necessary. Forms shall be smooth, tongue and groove boards, shiplap, or plywood. Forms shall not be removed until the engineer has given permission to do so.

6.03.06 TAMPING AND VIBRATING

As concrete is placed in forms or in excavations, it shall be thoroughly settled and compacted throughout the entire depth of the layer being consolidated, into a dense, homogeneous mass. Except in special cases where the engineer deems their use impracticable, the contractor shall use high-speed internal vibrators of an approved immersion type.

6.04 WATER PIPELINE CONSTRUCTION SPECIFICATION

6.04.01 GENERAL

This Specification for water pipeline construction is prepared and presented to provide general information and requirements for construction of water pipelines within Mission Springs Water District (MSWD).

Compliance with these requirements does not waive the requirements of other governing public bodies or agencies. Requirements of all other governing public bodies are to be closely adhered to, including all safety orders, encroachment permits, and other federal, state, county and local laws and ordinances.

This specification is applicable to the construction phase of water facilities and is effective only after MSWD design requirements for water plans and systems have been complied with and water plan drawings have been approved and signed. A contractor holding either a current and valid Class “A” General engineering contractor’s License or a Class “C-34” Pipeline Specialty License shall install all water pipeline work.

In general, all material furnished and all construction including trenching, installation, backfill, testing and disinfection shall conform to the applicable specifications of the following standards in the precedence indicated:

1. The specifications contained herein,

2. "American Water Works Association Standards" for the applicable work,

3. "Standard Specifications for Public Works Construction", (GreenBook, current edition, as published by Building News, Inc. of Los Angeles). MSWD designated Inspector may issue supplemental orders and instructions.

6.04.02 PRE-CONSTRUCTION CONFERENCE AND NOTICE-TO-PROCEED

MSWD requires that a Pre-construction Conference be held. A formal written “Notice-to-Proceed” will be issued prior to the commencement of work.

6.04.03 MATERIALS

All materials shall be new materials, and must be from MSWD Approved Materials List (Section 8.0), and shall be provided in accordance with the following:

WATER PIPE:

Water pipe shall be in accordance with (Section 6.04.06) STEEL CYLINDER WATER PIPE SPECIFICATIONS or in accordance with (Section 6.04.07) DUCTILE IRON WATER PIPE SPECIFICATIONS included herein. "PRE-TENSIONED CONCRETE CYLINDER PIPE" is not to be used unless specifically specified and approved by MSWD. Asbestos-Cement pipe is not permitted.

All steel cylinder pipe shall have cement mortar lining and cement mortar coating (CML & C) unless specifically stated otherwise on the drawings.

Steel cylinder pipe ends shall normally be prepared for rubber gasket bell and spigot joints except as modified in Section 6.04.06, STEEL CYLINDER WATER PIPE SPECIFICATIONS included herein. FITTINGS: All fittings shall be in accordance with Section 6.04.08 STEEL FITTINGS SPECIFICATIONS (for use with steel cylinder pipe) or with Section 6.04.09, DUCTILE IRON FITTINGS SPECIFICATIONS included herein. Cast iron fittings are not acceptable. All fittings (tees, crosses, elbows, reducers, etc.) shall be fabricated from steel or be forged steel. Lining and coating shall be shop applied and shall be equal to the pipeline lining and coating. Elbows shall be smooth radius construction and long radius dimension. MSWD shall approve special fittings requiring reinforcement. Reducers shall always be eccentric type and installed with the horizontal side up.

VALVES:

All valves two-inch (2”) to twelve-inch (12”) shall be gate valves; all valves fourteen-inch (14") and larger shall be butterfly valves, and all valves shall be in accordance with Section 6.05 Valves. Valves shall always be pressure rated for design service conditions. Valves shall be installed as shown on MSWD Standard Drawings and protectively coated as specified in Section 6.06 PAINTING AND PROTECTIVE COATINGS.

FLANGES:

Flanges shall be per AWWA Standard C207, forged steel, slip-on, hub type, Class E (Table 3) for welded installation. For service above a design pressure of 275 psi, higher pressure rated flanges shall be provided.

FLANGE GASKETS:

Flange gaskets shall be first-rate natural or synthetic material, non-asbestos, ring type for the size installation required.

COMBINATION AIR VACUUM AND AIR RELEASE VALVES:

Valves shall be installed per MSWD Standard Drawings.

FIRE HYDRANTS:

Hydrants shall be installed per MSWD Standard Drawings.

6.04.04 WARRANTY

The contractor shall guarantee that the entire work constructed, and all materials furnished, will meet all the requirements specified herein. This warranty shall include both the quality of the workmanship and the materials used as well as that of subcontractors and suppliers.

The contractor shall agree to make any repairs or replacements made necessary by defective materials or workmanship in the pipe materials supplied which have become evident within one year after date of recording Notice of Completion, and to restore to full compliance with the requirements of these specifications, including the test requirements, any part of the water system, which during said one-year period, is found to be deficient with respect to any provision of this specification. The contractor shall make all repairs and replacements promptly upon receipt of written orders from MSWD or if in the event the repair work must be performed by MSWD, shall reimburse MSWD for actual labor, equipment and material expenses incurred to perform such corrective work. If the contractor fails to make the repair and replacements promptly, MSWD may do the work, and the contractor shall be liable to MSWD for the cost thereof as described above.

6.04.05 WATER PIPELINE INSTALLATION SPECIFICATIONS

Installation of water pipeline, fittings, valves, hydrants and other appurtenances shall be in accordance with all provisions of these specifications including (Sections 6.02 and 6.03) EARTHWORK, CONCRETE SPECIFICATIONS, Standard Drawings (Section 9.0), Approved Materials List (Section 8.0). MSWD shall make all connections to existing MSWD facilities. The contractor shall notify Underground Service Alert at 811 at least two (2) working days prior to construction to locate potential utility interference in the right-of-way.

MSWD will provide an Inspector for inspection of pipeline construction work. The Inspector will check for compliance with MSWD requirements for pipeline construction but will not have the responsibility for checking survey work (horizontal and vertical control) nor installed quantities of pipe for developer projects. The MSWD Inspector is not a Safety Inspector and is not responsible

for enforcing compliance with OSHA or other safety requirements. Job site safety is not MSWD responsibility and MSWD does not accept any liability connected with the construction.

Thrust resistance is required to restrain the Class 350 Ductile Iron pipe from pulling apart due to pressure forces (i.e.: elbows, dead ends, tees, etc.), restraint joints shall be installed per MSWD Standard Drawings. Where thrust resistance is required to restrain steel cylinder pipe from pulling apart due to pressure forces (i.e.: elbows, dead ends, tees, etc.), joints shall be welded per MSWD Standard Drawings for at least the full distance indicated on the plans.

6.04.06 STEEL CYLINDER WATER PIPE SPECIFICATIONS

It is required that the contractor shall furnish, deliver, and install, all pipe and material as hereinafter described in these specifications. All fabrication, workmanship, material and testing of pipe shall conform to the latest revision of the standard specifications specified herein.

STEEL CASING:

Steel casing shall be butt welded of sheets conforming to ASTM Specification A-283 and shall be installed at the location shown on the plans or as directed by the District. Installation may be by open trench. If the contractor elects to install the casing pipe by jacking, the provisions of these specifications for jacked steel casing pipe shall apply. However, payment shall be at the bid price for steel casing.

The casing pipe shall have a steel thickness not less than ½ inch with a yield strength of 35,000 psi min. It shall be the contractor's responsibility for selecting a size of casing, at or above the minimum specified, in order that the installation may be done with a sufficient degree of accuracy. Any and all increased costs resulting from the contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne by the contractor. Carrier pipe conforming to these specifications for the designed pipe shall be installed within the casing pipe to the lines and grades shown on the plans. The carrier pipe shall be supported within the casing on steel casing insulators with the following minimum properties:

Bandwidth shall be eight-inch (8") for nominal twelve-inch (12") diameter pipe and twelve-inch (12") for sixteen-inch (16") nominal diameter and larger. Band shall be minimum fourteen-inch (14") gauge (.074") steel, hot rolled and pickled and manufactured in two halves.

The liner shall be of polyvinyl chloride, with a minimum thickness of .090" and a durometer of "A" 55.90. The liner shall have a minimum dielectric strength of 57,000 V. (1/8" thick) and a maximum water absorption of 1%.

The runners shall be manufactured of two-inch (2") wide glass reinforced plastic molded under high pressure. Height of runners to be appropriate to center carrier pipe in casing. Runners shall be 7" long for eight-inch (8") steel band width and eleven-inch (11") long for twelve-inch (12") bandwidth and shall have the following minimum qualities.

Tensile strength	- (ASTM D638) – 17,600 psi
Flexural strength	- (ASTM D790) – 25,300 psi
Compression strength (10% deformation)	- (ASTM D695) – 18,000 psi
Deflection temp. @ 264 psi Deformation under load	- (ASTM D648) - 405°F (250°C)
(@ 122°F (50°C) – 2,000 lb. load)	- (ASTM D621) – 1.2%

Minimum number of runners per band shall be:

4” through 14” diameter – 2 top, 2 bottom

16” through 36” diameter – 2 top, 4 bottom

Insulators shall be arranged within the casing as follows: The first insulator at each end of casing shall be maximum one foot (1’) from the end of casing. The second insulator shall be five (5’) from end of casing. The remainder of the casing length shall have insulators distributed throughout at a maximum spacing of 15’ O.C.

The insulators shall be as manufactured Pipeline Seal & Insulator, Inc. (psi) or District approved equal.

The ends of the steel casing shall be sealed with synthetic rubber casing end seals with a minimum thickness of 1/8” and secured with stainless steel bands and clamps. End seals shall maintain the casing pipe in a watertight condition. The end seals shall be as manufactured by Pipeline Seal & Insulator, Inc. or District approved equal. The annular space between the seal casings and carrier pipe shall be left empty.

Voids, if developed outside the casing and within limits for boring or jacking, from any cause such as removal of rocks encountered in boring, shall be filled with lean grout forced in under pressure by insertion of a grout pipe outside of the casing. The lean grout shall consist of one part of Portland cement to not more than four parts of sand by volume, paced at low pressure. Grout pressure is to be controlled so as to avoid deformation of the casing. Sand for grout to be placed outside the casing shall be of such fineness that 100% will pass a No. 8 sieve and no less than 35% will pass No. 50 sieve.

Measurement for payment for casing pipe excluding carrier pipe within said casing shall be made along the centerline of the casing pipe between the limits shown on the plans and/or staked in the field.

Payment for steel casing pipe will be at the contract unit price per linear foot for steel casing pipe placed in accordance with these plans and specifications. Payment shall be full compensation for furnishing all labor, excavation, backfill, boring, jacking, steel casing pipe, insulated pipe supports, casing end seals, shoring, equipment, services, transportation, sand cement, concrete, all grouting operations described herein, and other appurtenant items of labor and material required to complete the work. The water carrier pipe will be paid for under the bid item for pipe.

TYPE OF PIPE:

This specification includes steel pipe, cement mortar lined and coated steel pipe classes 150 and 200.

Steel pipe with the various coatings and linings shall conform to the provisions of AWWA specifications C200 and C205, unless otherwise specified herein.

PIPE DIAMETER:

Nominal pipe diameter for all pipe shall mean the approximate inside diameter of the cement lining of the pipe, the permissible tolerance shall be plus or minus 1/4-inch.

PIPE JOINTS:

All joints shall conform to MSWD Standard Specifications, AWWA Standard C200, AWWA M9, and AWWA M11.

BELL AND SPIGOT JOINTS:

Pipe larger than twenty-four-inch (24”) diameter and having a wall thickness greater than 0.1875, shall be Carnegie type joints. Bell and Spigot joints for pipe twenty-four-inch (24”) diameter and smaller shall be formed joints either by swaging or rolling the end of the steel cylinder. The joint shape shall confirm to a rolled groove rubber gasket joint as shown in AWWA M11. The nominal thickness of a preformed bell ring shall not be less than the thickness of the steel cylinder to which it is attached. Bell and Spigots shall be the same nominal diameter as the pipeline.

WELDED FIELD JOINTS:

Welded field joints shall be lap welded. A bell shall be formed on the steel cylinder to accommodate the spigot. The spigot insertion shall be a minimum of one- and one-half inches (1-1/2”).

FLANGED JOINTS:

Steel flanges shall conform to the requirements of AWWA C207, Class E or Class F. Flange faces shall be machined flat with serrated finish for connection to valves and equipment. Bolts and nuts for buried or non-buried service shall be carbon steel confirming to ASTM A307, Grade B. Bolts and nuts used for buried service shall be coated per Division 6 using protective coating system P6. Bolts and nuts for immersed or intermittingly immersed installations shall be 316 stainless steel conforming to ASTM A276. All assembly bolts shall be hexagonal head conforming to ANSI B18.2.1 for wrench head bolts and nuts. All threads shall be coarse threaded in accordance with ANSI B1.1, Class 2A and 2B.

Joint rings for steel pipe shall be manufactured of the same material as the pipe cylinder.

Where called for, the joint shall be sealed with a continuous ring gasket made of a special composition rubber of such size and cross section as to fill completely the recess provided for it. The gasket shall be the sole element depended upon to make the joint watertight. Gasket shall be furnished with the pipe. The rubber compound shall consist of first grade natural rubber, synthetic rubber, or a suitable combination thereof. The compound shall conform to the requirements of Section 3.4 of AWWA Specification C301 and Shore Durometer, Type A, 50-65. All gasket material shall be stored in a cool, well-ventilated place and protected from direct sunlight. The contractor shall submit test results showing the physical properties of the materials used in the manufacture of the rubber gaskets, if requested by MSWD All rubber gaskets furnished under this specification shall be subject to inspection and/or test by MSWD. Any gasket found to be unsatisfactory by MSWD should be immediately replaced by the contractor, at no expense to MSWD.

Joints requiring thrust restraint shall be lap welded utilizing certified welders and multiple pass welds. Such joints will be at the joints of all fittings such as elbows, tees, crosses, laterals, reducers and bulkheads. Engineers shall supply MSWD the calculations determining the length of welded joints (minimum factor of safety shall be 2). Additional weld joints shall be shown on the plans.

PIPE TESTING:

All steel cylinders shall be hydro-statically tested to a stress equal to seventy-five percent (75%) of the minimum yield point.

STEEL PIPE DESIGN:

Cylinder thickness shall be calculated in accordance with AWWA C200 and AWWA M11. Allowable stresses shall not exceed 18,000 PSI, or fifty percent (50%) of the minimum yield strength of steel.

STEEL PIPE MATERIALS:

All materials used shall conform to the requirements of standards specified in these specifications except as otherwise specified or approved by MSWD.

STEEL:

Steel shall be hot rolled low carbon steel plates or sheets conforming to ASTM A283 Grade D, ASTM A516 Grade 60, and ASTM A572 Grade 42. Steel plates shall be fully kilned steel to fine grained practice.

Steel sheet and coil shall conform to ASTM A570 Grades 33, 36, 40 or 45, or ASTM A635 Grade 1015, 1018 or 1020. Steel coil shall be fully kilned to fine grained practice.

Cement mortar lining shall be as specified in AWWA 205. Cement mortar coating shall be as specified in AWWA 205.

STEEL PIPE FABRICATION:

All fabrication shall conform to the requirements of standards in these specifications except as otherwise specified or approved by MSWD.

The cement mortar lining for all sizes of pipe shall be applied to the inside of the steel cylinder after it has been fabricated, tested, and cleaned of all loose mill scale and rust. Inside cement mortar lining shall be in accordance with AWWA Standard C205, Section 4 except that the lining thickness shall be no less than that amount specified in Table 1 of AWWA standard C205. The lining thickness may be increased to that amount which provides a pipe I.D. equal to the nominal pipe diameter size.

Before applying the exterior coating, the exterior surface of the pipe shall be thoroughly cleaned to bright metal and shall be free from all-loose mill scale and rust.

Exterior cement mortar coating shall conform to Section 5 of AWWA C205, except exterior coating shall be a minimum of 3/4" thick. The mortar shall be applied pneumatically or by impaction, resulting in a dense, uniform coating that shall adhere tightly to the pipe.

PIPE SUPPLIER REQUIREMENTS:

All pipe furnished under this specification shall be the product of an organization which has had not less than three (3) years successful experience in the manufacture of pipe of the type specified, or comparable. The total pipeline shall be the product of one company, or more than one integrated company, in business for the design and manufacture of the pipeline materials required herein. The name of the manufacturer of the pipe to be furnished shall be from MSWD list of approved manufacturers.

All pipe and joints proposed to be furnished under this specification and the materials, methods and processes of the manufacturer, must have been approved prior to the Notice to Proceed. If approval by MSWD has not been made, such product cannot be used under this specification. Such approval will be considered and may be obtained after completion by MSWD of design review, manufacturing inspection and performance evaluation. Requests for consideration of approval must be received in writing, not less than ninety (90) days prior to the date that acceptance is desired.

DEFECTIVE LINING AND COATING:

Any defective area in the lining or coating shall be removed to the pipe wall and the area shall be repaired by hand application to the full-required thickness. The coating shall be repaired or replaced as necessary to assure a complete and soundly reinforced coating. The materials used for repair of defective lining and coating shall be the same type of materials.

PROTECTION OF PIPELINE MATERIALS:

During the entire period of the application of the lining and coating and the curing thereof, the materials shall be protected from freezing, and the pipe sections shall be carefully supported and handled so as to avoid injury to the linings and coatings. The pipe shall be properly stored to prevent damage to the linings and coatings, including excessive cracking or separation from the steel surfaces.

CORROSION PROTECTION:

The unlined interior surface of each bell, the uncoated exterior of each spigot, and bare metal surface of specials and fittings shall be protected against corrosion by shop applying one coat of Rust-Oleum No. 769 damp-proof red primer (SO) or approved equal.

LONG RADIUS CURVES AND PULLED JOINTS:

Horizontal and vertical long radius curves, when specified, may be accomplished by taking small angular deflections at the field joints and the use of short length pipe sections. Maximum joint deflection shall not exceed one half of that recommended by the manufacturer.

PIPE OUTLETS 2 INCHES AND SMALLER:

Small outlets (two-inch (2”) or less) shall be standard steel pipe couplings, shop welded to the pipe in a manner conforming to the requirements of the A.P.I. - A.S.M.E. code for Unfired Pressure Vessels for Petroleum Liquids and Gasses. Plugs of the proper diameter shall be provided for each pipe outlet. The threads for each pipe outlet two inches (2”) and smaller shall be free from burrs and obstructions after the coupling has been welded to the pipe wall.

PIPE OUTLETS LARGER THAN 2 INCHES:

Large outlets (more than two-inches (2”)) including Wye-branches, crosses, and tees, shall be reinforced with a cross-sectional area at least twice the area of the steel removed from the pipe walls, except that the minimum combined thickness of the pipe wall and reinforcement shall be not less than 3/16 inch. At the option of the pipe manufacturer, pipe outlets larger than two-inches (2”) may be formed in the pipe sections with a nominal wall thickness of 3/16 inch without additional reinforcement. The outlets shall have protective linings and coatings equivalent to that of the adjoining pipe.

BUTT STRAPS:

Butt Straps shall be split and shall have a minimum thickness of 3/16 inch and a five-inch (5") half coupling with plug. Two hand-holes shall be required on pipelines fourteen-inch (14") and larger. All butt straps shall be shipped loose.

TESTING JOINTS:

Every pipe section shall be tested hydro-statically. After the joint ends have been formed and attached, a dye-check method or approved equal of testing the end ring welds shall be used.

LOADING AND TRANSPORTING PIPE:

After the pipe has been properly cured as set forth above, it shall be loaded on trucks or railroad cars, adequately supported and chocked with sawdust bags or other methods approved by MSWD. During loading and unloading operations, the pipe shall be moved with non-metallic slings of sufficient width to prevent damage to the exterior coating and in such a manner to prevent injury to the cement mortar lining. The sling webbing shall be no less than four inches (4") in width. The Material Supplier shall accomplish unloading in a workmanlike manner, and every precaution shall be taken to prevent damage to the pipe. Under no circumstances are pipe sections to be dropped or bumped in handling.

6.04.07 DUCTILE IRON WATER PIPE SPECIFICATIONS

It is required that the contractor shall furnish, deliver, and install all pipe and material as hereinafter described in these specifications. All fabrication, workmanship, material and testing of pipe shall conform to the latest revision of the standard specifications specified herein.

TYPE OF PIPE:

Ductile Iron Pipe waterlines shall be pressure rated to minimum Class 350 w/ Tyton Joint & Spigot. Pipe shall come with an asphaltic outside coating in accordance with ANSI/AWWA C151/A21.51 (current revision) and standard thickness cement-mortar lining and inside coating in accordance with ANSI/AWWA C104/A21.1 (current revision) which includes all sizes up to forty-eight-inches (48") unless otherwise specified.

All Ductile Iron pipe shall be eighteen (18) or twenty (20) foot laying lengths.

The contractor shall submit test results showing the physical properties of the materials used in the manufacture of the rubber gaskets, if requested by MSWD. All rubber gaskets furnished under this specification shall be subject to inspection and/or test by MSWD. Any gasket found to be unsatisfactory by MSWD shall be immediately replaced by the contractor, at no expense.

TESTING:

Each piece of pipe shall be hydro-statically proof-tested at four (4) times its rated class pressure for a minimum duration of five (5) seconds. Integral bells shall be tested with the pipe.

MATERIALS:

All fabrication, workmanship and materials used shall conform to the requirements of standards specified in these specifications.

EXPERIENCE REQUIREMENT:

All pipe furnished under these specifications shall be the project of an organization, which has had not less than three (3) years successful experience in the manufacture of pipe of the type specified. The total pipeline shall be the product of one company (or integrated companies) in the business for the design and manufacture of the pipeline materials required herein, unless approved in writing by MSWD.

PIPE MANUFACTURER:

The name of the manufacturer of the pipe to be furnished by the contractor shall be stated on the bidding sheets. All pipe proposed to be furnished under this specification must have been approved prior to the time of receiving the bids.

PIPE MARKINGS:

All pipe to be supplied under these specifications must have the following markings on the pipe barrel: Nominal size and O.D. base, dimension ratio number; AWWA pressure class; and manufacturer's name or trademark and production record code.

LONG RADIUS CURVES AND PULLED JOINTS:

Horizontal and vertical long radius curves, when specified, may be accomplished by taking small angular deflections at the field joints and the use of short length pipe sections. Maximum joint deflections shall not exceed that recommended by the manufacturer. Vertical curves require specific written authorization from MSWD.

PIPE OUTLETS 2 INCHES AND SMALLER:

Outlets two inches (2”) inches and smaller shall be standard full circle bronze double strap saddles designed specifically for ductile iron pipe. Single strap saddles are not allowed.

PIPE OUTLETS LARGER THAN 2 INCHES:

Outlets in Ductile Iron pipe larger than two inches (2") shall be accomplished through the use of ductile iron fittings (Section 6.04.09).

For outlets installed after initial pipeline, a tapping tee may be used if approved in writing by MSWD.

LOADING AND TRANSPORTING PIPE:

Pipe shall be properly crated and packaged in a manner acceptable to the manufacturer. Pipe shall be loaded on trucks and securely strapped to the truck bed to prevent movement and distortion. Straps must be wide fabric web type.

Chains or cables shall not be utilized. During loading and unloading operations the pipe shall be moved with slings whose webbing is no less than four inches (4”) in width. Unloading shall be accomplished in a workmanlike manner and pipe shall not be dropped or damaged.

CERTIFICATE OF COMPLIANCE:

MSWD may require the manufacturer to submit a certificate stating that all pipe has been manufactured and tested in accordance with this specification.

6.04.08 STEEL FITTINGS SPECIFICATIONS

This specification covers shop manufactured pipe fittings for use with steel cylinder piping including tees, crosses, elbows, reducers, laterals, flanges and related special fittings. All fittings shall be fabricated from steel or be forged steel. Cast iron fittings are not permitted. Pipelines twelve-inch (12”) and smaller shall have flanged connections unless weld joint fittings are approved by MSWD. Pipelines fourteen-inch (14") and larger may utilize weld joint fittings when approved by MSWD.

STEEL FITTINGS:

Special fittings and sections shall be in accordance with the requirements of AWWA Standards C200 (Section 4), C207 and C208. Fittings shall be designed and fabricated for a pressure which is 150 percent of the pressure class as designated for the pipeline, except where otherwise indicated. Dye penetrant process may be used on all untested welds in lieu of hydrostatic testing if straight pipe used in fabricating the special has passed a hydrostatic test of 75 percent of the yield point. All defective welds shall be removed, re-welded and retested. Lining and coating material shall be shop applied and be the same as that indicated for the mating piping. Flanges, where indicted, shall be AWWA Class E, bored in accordance with the recommended clearance for the O.D. of the cylinder pipe being served.

Special fittings and sections shall be reinforced with stiffener rings, collars, crotch plates, etc. as necessary to keep the maximum working stress to that level permitted for the pipe in accordance with AWWA M11 Steel Pipe Manual, Section 13.3.

Non-flanged joints shall be designed for lap-weld joints and shall have bell ends for receiving the O.D. of the mating steel pipe cylinder.

Approved manufacturers must be used for steel fittings to be furnished under this Specification (approved Materials List, (Section 8.0). Manufacturers of steel fittings that seek MSWD approval are to submit sample fittings for testing and acceptance by MSWD and must submit samples together with detail drawings, not less than 90 calendar days prior to the time acceptance is desired.

TESTS:

The special fittings shall be factory tested in accordance with AWWA Standard C200, Section 4.3, except that the test pressure shall be 1-1/2 times the specified pipe class.

GUARANTEE:

The contractor shall guarantee all materials and workmanship of items furnished under these Specifications shall be free from defects for a period of one (1) year after final completion and acceptance of the entire contract work. The contractor shall, at contractor's own expense, repair or replace all defective materials or workmanship found to be deficient with respect to any provisions of this specification.

6.04.09 DUCTILE IRON FITTINGS SPECIFICATIONS

DUCTILE IRON FITTINGS:

All Ductile Iron fittings (Tees, elbows, crosses, adapters, etc.) shall be ductile iron per ASTM A536 in accordance with ANSI/AWWA C110/A21.10 AND ANSI B16.1 Class 125 Flanges. Flanged fittings sizes 4" thru 48" shall be pressure rated @ 250 psi minimum. All mechanical Joint (MJ) or Tyton® interchangeability (PO, TJ, UT) shall be ductile iron per ASTM A536. Fitting 4" thru 24" shall be pressure rated @ 350 psi minimum and 36" thru 48" size shall be pressure rated @ 250 psi minimum. All fittings shall conform to either ANSI/AWWA Standard C110/A21.10 and/or ANSI/AWWA Standard C153/A21.53 (both current revisions) with cement-lining and seal coating in accordance with ANSI/AWWA C104/A21.4 unless specified otherwise.

MANUFACTURER:

Manufacturers of ductile iron fittings proposed to be furnished under the specification must be approved by MSWD. Manufacturers of ductile iron fittings, which seek MSWD approval, are to submit sample fittings for testing and detail drawings, not less than 90 calendar days prior to the time acceptance is desired.

TESTS:

The special fittings shall be factory pressure tested in accordance with Sections 10-10 and 1012 of AWWA C110, except that the test pressure shall be 1-1/2 times the specified pipe class.

GUARANTEE:

The contractor shall guarantee that all materials and workmanship of items furnished under these specifications shall be free from defects for a period of one (1) year after final completion and acceptance of the entire contract work. The contractor shall repair or replace all defective materials or workmanship supplied found to be deficient with respect to any of these specifications.

6.04.10 WATER PIPELINE INSTALLATION SPECIFICATIONS

The contractor shall install pipe, closure sections, fittings, valves and appurtenances, including pipe supports, bolts, nuts, gaskets, and jointing materials. All exposed piping shall be adequately supported with devices of appropriate design approved by MSWD.

At all times when the work of installing pipe is not in progress, all openings into the pipe and the ends of the pipe in the trenches or structure shall be kept tightly closed to prevent entrance of animals and foreign materials. The contractor shall take all necessary precautions to prevent the pipe from floating due to water entering the trench from any source, shall assume full responsibility for any damage due to this cause and shall restore and replace the pipe to its specified condition and grade if it is displaced during this period. The contractor shall maintain the inside of the pipe free from foreign materials and in a clean and sanitary condition until its acceptance by MSWD.

Where closure sections are required by the contractor laying operations, the sections shall be installed in accordance with the applicable sections of these Specifications.

The pipe sections shall be laid in the trench to true alignment and grade in accordance with the plans. Exceptional care shall be taken in placing the pipe and making the field joint. Bumping of the pipe in the trench will not be permitted. Concrete thrust blocks shall be provided at the locations and of the sizes as shown on the drawings. Welded joints shall be provided where indicated on the drawings.

LAYING AND JOINTING STEEL CYLINDER AND DUCTILE IRON PIPE:

Trenches shall be in a reasonably dry condition when the pipe is laid. Necessary facilities shall be provided for lowering and properly placing the pipe sections in the trench without damage. All handling of the piping shall be done with slings that will not damage the pipe. The slings shall bear uniformly against the pipe. When not being handled, all pipe shall be supported on timber cradles, sand bags, or mounds of earth. The pipe shall be laid carefully to the lines and grades given and the sections shall be closely jointed to form a smooth flow line. Where no grades are given, pipe shall be laid in a smooth continuous grade between connections to other mains, blowoffs and/or air relief valves with a minimum cover of thirty-six-inches (36”). Immediately before placing each section of pipe in final position for jointing, the bedding for the pipe shall be checked for firmness and uniformity of surface.

Where called for on the plans, the bell end of steel cylinder piping shall be circumferentially welded to the spigot end of the adjoining pipe as shown on MSWD Standard Drawings. The weld shall be continuous and ample bell holes shall be dug to permit proper welding. The field weld between the bell and spigot ends shall be made in two (2) or more passes so as to build up a fillet weld having a minimum thickness of 1/4 of an inch. Three (3) passes will be required for 5/16-inch thick plate with one additional pass for each 1/8 inch of plate thickness above 5/16 inch. Prior to welding those joints designated for welding, the joints shall be made up in accordance with this section, except that the rubber gasket and the bond wire may be omitted. All joints shall be inspected and approved by MSWD before the coating is placed on the outside of the joint. Where butt-straps or closure pieces are used, the exterior of the closure pieces shall be given a coating at least equal to that on the pipe.

Prior to joining bell and spigot pipe, the rubber gasket shall be placed in the spigot groove and shall be properly lubricated with a suitable compound soap supplied by the pipe manufacturer. The gasket shall not be twisted, rolled, cut, crimped, or otherwise injured or forced out of position during the closure of the joint.

CONNECTIONS TO EXISTING FACILITIES:

All wet tap connections to existing facilities will be made by MSWD or by the contractor in the presence of the MSWD inspector if approved by MSWD staff. contractor shall make all non-pressure connections to existing facilities, as shown on the plans.

INSTALLATION OF VALVES:

All buried valves shall be installed with the stems in a vertical position except as otherwise noted. Valve boxes shall be centered over the operating nuts and shall be set plumb. Installation shall be per MSWD Standard Drawing.

INSTALLATION OF AIR VACUUM/AIR RELEASE VALVES:

Air Vacuum/Air release valve assemblies with guard posts shall be installed as shown on MSWD Standard Drawings.

INSTALLATION OF BLOW-OFF VALVE ASSEMBLIES:

Blow-off Assemblies shall be installed as shown on MSWD Standard Drawings.

INSTALLATION OF FIRE HYDRANTS:

Fire hydrants shall be installed as shown on MSWD Standard Drawings.

FIELD APPLICATION OF PROTECTIVE COATINGS:

All unburied metal surfaces of piping and appurtenances in structures and above ground shall be prepared for paint. All ungalvanized metal surface shall have deposits of dirt, grease, tar and oil removed by the use of Amercoat No. 57 Surface Cleaner or approved equal. All sharp edges and weld splatter shall be removed. The surface to be painted shall be wire-brushed to remove all dust, mill scale, paint, or other foreign matter. All dust shall be removed from the surface by brush or industrial vacuum.

All buried miscellaneous ferrous surfaces including buried valves, flanged joints and other buried miscellaneous fittings and appurtenances, not specifically covered elsewhere herein, shall be thoroughly cleaned and field coated with Koppers Bitumatic, or approved equal. The coating shall be applied in strict accordance with the manufacturer’s recommendations. Bare metal pipe and weldments shall be cleaned and then coated with an approved primer and two layers (20 mils min.) of Protector-Wrap or approved equal. At no time shall epoxy lined and/or coated pipe be field fabricated.

THRUST RESTRAINT:

Thrust shall be contained by welding joints (steel cylinder pipe) or by use of thrust blocks and restrained joints (Ductile Iron pipe). Thrust blocks and restrained joints shall be in accordance with MSWD standards.

TEMPORARY PIPELINE TERMINATION (FOR FUTURE):

When tees and crosses are installed for future water system expansion, a line sized valve shall be installed on the portions of the cross or tee designated for future water pipelines. One full length of pipe shall then be installed from the valve in the direction of the future pipeline. The end of the pipe shall be plugged, and a concrete thrust block shall be poured to prevent movement at the dead end.

FIELD FABRICATION:

At all locations where field fabrication of fittings occurs, the contractor shall fabricate the fittings in accordance with AWWA C208 and in such a manner that the adjacent rubber gasket joint is in close enough proximity to permit field repair of the mortar lining or the contractor shall furnish and install suitable hand holes to permit the hand lining and repair and patching of the field fabrication joint. The completed field fabricated fitting shall provide a smooth transition surface across the fabricated joint. The exterior coating of the fitting shall be repaired as hereinbefore specified.

CORROSION TEST STATIONS (STEEL PIPE):

Corrosion test stations shall be installed at the locations shown on the drawings.

FLANGE INSULATING JOINTS (STEEL PIPE):

Flange insulation joints shall be installed at the locations shown on the drawings. Insulating joints shall prevent the flow of electric current across the joint and is of adequate strength to withstand the working water pressure of the adjacent piping. Flange insulation joints shall consist of:

Dielectric gaskets: Full-faced, 1/8-inch thickness, phenolic with gaskets on each side, Type “E”, PSI Line Backer, or equal.

Insulating stud sleeves for each bolt: High-density polyethylene or spiral wound Mylar.

Two insulating washers for each bolt: 1/8-inch thick phenolic.

Bolts shall conform to ASTM A193, Grade B7, Heavy Hex, stainless steel, Type 316.

Nuts shall conform to ASTM A194; Grade 2H, Heavy Hex, stainless steel, Type 316.

Steel washers over each insulating washer: 1/8-inch-thick hardened stainless steel, Type 316, with the same outside diameter as the insulating washer.

One-piece molded acetal resin combination sleeve and washers are acceptable. Flange Insulation Products: PSI Industries, Central Plastics Company, or equal.

INSTALLATION OF FLANGE INSULATION JOINTS:

Flange insulation joints shall be installed as follows:

Insulating materials shall be verified to be of proper size and type.

Faces of flange pairs shall be cleaned of all dirt, rust or fouling materials, which would interfere with a watertight joint or insulating properties of the flange insulation material.

Full-length insulating sleeves and insulating washers and insulating gaskets shall be as required herein. Alignment pins shall be used to properly align the flange and gasket. The manufacturer's recommended bolt-tightening sequence shall be followed. Bolt insulation sleeves shall be centered within the insulation washers so that the insulating sleeve is not compressed and cracked.

For buried insulators, the entire flange assembly and all bolts shall be covered with 20 Mils bitumastic coal tar epoxy.

A cathodic Protection bonding test station shall be installed at each buried insulating joint. Two test wires shall be installed on each side of the buried insulator.

TESTING FLANGE INSULATING JOINTS:

Contractor shall retain the services of a corrosion engineer registered in the State of California to check each insulation joint for electrical continuity and potential after installation is completed. Test results at each insulating joint shall be recorded in a notebook, which shall be submitted to MSWD upon completion of the project. If a discontinuity should occur, the system shall be repaired and retested at the contractor's expense.

6.04.11 TESTING AND DISINFECTING SPECIFICATIONS

The contractor shall furnish all equipment, labor, and material, exclusive of water, for testing and disinfecting the pipelines. MSWD will furnish water used for testing, but the contractor shall provide the necessary means to deliver water from the designated connection to the points of use. All tests of the piping shall be made in the presence of MSWD. All pipelines and appurtenances shall be thoroughly flushed out with water prior to testing. Where deemed appropriate by MSWD, video inspection of water pipelines shall be performed in the presence of the Inspector. Prior to inspection, the equipment to be used shall be disinfected and lines shall be drained. Complete videotapes and a detailed report of the inspection shall be furnished to MSWD.

TESTING PIPELINES:

The contractor shall pressure test the pipeline either in sections or as a unit before any resurfacing is done except for resurfacing at intersections which may be done prior to testing. (The pipeline shall not be tested before the mortar lining and coating on all of the steel cylinder pipe lengths in the pipeline has attained at age of 14 days.) The test shall be made by placing temporary bulkheads in the pipe where needed and filling the line slowly with water. Care shall be used to see that all air vents are open during the filling.

After the pipeline, or section thereof, has been completely filled, it shall be allowed to stand under a slight pressure for a sufficient length of time to allow the mortar lining to absorb what water it will and/or to allow the escape of air from any air pockets. During this period, the bulkheads, valves, and connections shall be examined for leaks. If any are found, they shall be stopped, or in case of leakage through valves in the pipeline or through bulkheads, provisions shall be made for measuring such leakage during the test. The test shall consist of holding the test pressure on each section of the line between valves or bulkheads for a period of four (4) hours. The test pressure at the lowest point in the line, or in the section of line being tested, shall be not less than 150% of the specified class pipe. The water necessary to maintain the pressure shall be measured through a meter or by other means satisfactory to MSWD. The leakage shall be considered the amount of water entering the pipeline during the test, less the measured leakage through valves and bulkheads. This leakage shall not exceed ten (10) gallons per inch of diameter per mile per twenty-four (24) hours. Any noticeable leaks shall be stopped and any defective pipe shall be replaced with new sections.

DISINFECTING:

All water lines and appurtenances shall be super chlorinated/disinfected at an initial dosage of 100-PPM (parts per million) minimum by means of liquid sodium hypochlorite (approved for potable water use) or by chlorine gas. Initial disinfection shall be held for a minimum period of twenty-four (24) hours and a maximum of forty-eight (48) hours contact time. After initial contact time period, a minimum of 50 PPM (parts per million) chlorine residual must be maintained throughout the entire waterline and appurtenances in order to flush system. If 50 PPM is not maintained the entire water line and appurtenances must be re-disinfected to 100 PPM minimum and shall be held for an additional twenty-four (24) hours before flushing the system.

During the process of chlorinating the pipeline, all valves or other appurtenances shall be operated while the pipeline is filled with the heavily chlorinated water. Care shall be exercised such that no valve shall be opened that allows the heavily chlorinated water to enter portions of the pipelines, which are already in service.

FINAL FLUSHING AND BACTERIOLOGIC TEST:

Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its lengths shows upon test, a chlorine residual of less than one (1) mg/l. In the event chlorine is normally used in the source of supply, the chlorine test shall indicate chlorine residual less than or equal to that carried in the system.

Contractor shall provide all equipment and supplies for performance work and shall flush water at locations or by procedures approved by MSWD. The contractor shall obtain permission and permits from regulatory agencies for discharging water. If required, the contractor shall (at his expense) apply a reducing agent to the solution to neutralize residual chlorine or chloramines remaining in the water. Flow of water shall be controlled to prevent erosion, damage to vegetation, and altering ecological conditions. After final flushing, and before the water pipeline is placed in service, water samples shall be taken

and tested for bacteriological quality. If the initial disinfection fails to produce satisfactory samples, the disinfection process shall be repeated until satisfactory samples have been obtained. Once samples are satisfactory and MSWD has given approval, the pipeline may be placed in service. After passing an initial bacteriological test with a negative Coliform Test but having a high plate count, the contractor may, with the approval of MSWD, be allowed to flush using a six-inch (6”) or greater connection to MSWD domestic system.

An acceptable test shall be a negative Total Coliform twenty-four (24) hour Presence/Absence Test and a standard plate count (Heterotrophic Plate Count or HPC) of less than 100 colony-forming units (cfu) per milliliter. Alternately a plate count of no more than 50% greater than MSWD incoming supply water to the project area will be considered passing.

All disinfection testing shall be at the contractor's expense and shall be inspected/monitored by MSWD. Bacteriologic samples will be taken by MSWD personnel and tested at a MSWD approved laboratory.

6.05 VALVES SPECIFICATIONS

The contractor shall be required to furnish and deliver valves as specified in these specifications and all valves and operators shall be Class 150 or greater unless noted otherwise on the plans. All valves shall be designed to work equally well with pressure on either side, have non-rising stems, open left (counterclockwise).

GATE VALVES:

All valves shall conform to the standards as set forth in the latest revision of AWWA Standard for Gate Valves for Water and other Liquids C-509 (resilient seat). All valves shall be iron body, bronze mounted, and resilient seat. Resilient seat valves shall have a "flow through" passage with no depressions for the sealing disc. All gate valves, two-inch (2”) – fourteen-inch (14") shall be constructed in the vertical position.

CAST MARKING:

In addition to markings required by AWWA Standards C-500 and C-509, valves shall have the manufacturer's name, the size of the valve and the working pressure cast on the side of valves.

VALVE ENDS:

Valves for use with steel cylinder pipe shall be flanged on both ends. Valves for use with Ductile Iron pipe shall have flanges both ends, push-on both ends, or a combination of one each end. All ends shall be designed for the water pressure as specified in AWWA Standards C-500 or C509. Flange ends shall be drilled to the American Standard for 125# Cast Iron Flanges, flange face shall not be raised and the flange face shall have standard machine finish. Push-on (Hub) ends shall be "Griptite" or approved equal with hubs dimensioned for C.I.O.D. pipe.

STEM:

All valve stems shall be of bronze having a minimum tensile strength of 55,000 P.S.I. and a yield point of not less than 40,000 P.S.I., with an elongation of not less than 10 percent in two-inches (2”). Heat treatment will be permitted to develop these requirements. All bronze shall contain not more than 7 percent zinc or more than 2 percent aluminum. Stem seals shall consist of a minimum of two "O" rings above the stem collar under full working water pressure with the valves in full open position.

OPERATING MECHANISM:

All valves unless otherwise specified shall be provided with a two-inch (2”) square operating nut with a cast arrow showing directing in which the nut is to be turned to open the valve. AWWA Standard C-500 Section 3.12, and Standard C-509 Section 4.7 shall be amended by this requirement to limit the number of turns to a maximum of five over the minimum number specified in Table 5 and Table 3 respectively.

GEARS:

Where required by the sizing table above, valves shall be equipped with gears of the totally enclosed type in conformance with AWWA Standard C500, and suitable for installation of the valve underground. All parts requiring lubrication shall be provided with Alemite grease fittings.

INDICATORS:

When required on the supplemental specifications, valves shall be equipped with indicators to show the position of the gates. The indicator mechanism shall be made of bronze or other non-corrodible metal throughout, except for the case that may be cast iron.

HORIZONTAL VALVES (DOUBLE DISC VALVES):

Double square bottom construction (double disc) valves are not approved.

DOUBLE SQUARE BOTTOM CONSTRUCTION (DOUBLE DISC) VALVES:

Double square bottom construction (double disc) valves are not approved.

RESILIENT WEDGE AND SEAT:

Resilient seated gate valves shall test "bubble tight" with zero leakage allowed. Resilient coating of the gate shall be fusion bonded to prevent future separations.

RUBBER SEATED BUTTERFLY VALVE:

Butterfly valves shall meet the provision of AWWA Specification C-504 for rubber-seated, tight-closing valves. Operators shall be sized as recommended by the manufacturer.

Buried operators shall be equipped with a two-inch square operating nut and shall be waterproof and suitable for burial. contractor shall coordinate pipe fabrication to insure free movement of valve disc. All valves shall have their internal and external surfaces (except stainless steel parts, rubber surfaces, and flange faces) epoxy coated, with a minimum of 10 mils of holiday free Keysite 750, (white) epoxy, or MSWD approved equal, or Shop applied by manufacturer at his plant with Keysite 750 (white) epoxy (10 Mils min.).

VALVE MANUFACTURER:

The name of the manufacturer of the valves to be furnished by the contractor shall be listed on the APPROVED MATERIALS LIST (Section 8.0).

GUARANTEE:

The contractor shall guarantee all materials and workmanship of valves furnished under these specifications shall be free from defects for a period of one (1) year after final completion and acceptance of the entire contract work. The contractor shall repair or replace all defective materials or workmanship found to be deficient with respect to any provisions of this specification.

6.06 PAINTING AND PROTECTIVE COATINGS

6.06.01 GENERAL

The work included in this section consists of the furnishings of all labor, materials, apparatus, scaffolding, and all appurtenant work in connection with painting. In no case shall any concrete, wood, metal, or any other surface requiring protection be left unpainted even though not specifically defined herein. All paints and coatings shall be in compliance with all South Coast Air Quality Management District requirements including volatile organic chemicals (VOC). The contractor shall take the necessary steps to protect the work of others during the time his work is in progress. The contractor shall be responsible for all damage to the work. Motors, pumps, and other equipment that might be damaged by sandblasting and that are furnished with approved, factory-applied finish shall be solvent cleaned, lightly sanded, and given one (1) coat of painting system “P2” per Section 2.01 herein. MSWD shall be the final judge as to which equipment the above requirement applies. Color shall be as determined by MSWD.

6.06.02 MATERIALS

PAINT:

All materials specified by name and/or manufacturer or selected for use under these specifications shall be delivered unopened at the job site in their original containers and shall not be opened until inspected by MSWD. Whenever a manufacturer’s brand name is specified, it is intended to define the general type and quality of paint desired. Other paints of equal quality may be used only with written approval of MSWD. No paint, varnish, or stain shall be reduced or applied in any way, except as herein specifically called for or if not specifically called for, then it shall be applied in accordance with the manufacturer’s recommendations.

POWDER EXPOXY:

Heat Fusion Method shall apply Epoxy as a powder to heated metal either by Electrostatic Method or, as specified herein.

Electrostatic Method: The powder shall be applied to the heated, grounded metal part which has been electrostatically charged by means of a current of approximately 400 volts. After application of the epoxy, the part shall be reheated as specified by the manufacturer. Particular care shall be taken to protect non-ferrous masked parts. The finished product shall be carefully examined for epoxy interference on working parts.

Heat Fusion Method: The powder shall be applied to the heated, grounded metal part which has been electrostatically charged by means of a current of approximately 1 1/2 amperes at approximately 400 volts. After application of the epoxy, the part shall be reheated as specified by the manufacturer. Particular care shall be taken to protect non-ferrous masked parts. The finished product shall be carefully examined for epoxy interference on working parts.

Thickness of Coating: The minimum dry coating thickness shall be 8 mils provided, however, that the thickness of coating in the grooves for valves of fittings designed to receive a rubber gasket shall be approximately 5 mils.

LIQUID EPOXY:

Where the size of the valve or other item is too large to be coated by the powder epoxy method, it shall be prepared in accordance with the requirements specified herein and coatings shall conform to the following requirements.

Thickness of Coating: The epoxy shall be applied in 2-5 spray coats to a minimum dry film thickness of 8 mils.

Application and Cure: The first coat of liquid epoxy shall be spray applied to the prepared surface within four (4) hours after completion of sandblasting. All items to be coated with the epoxy to be applied shall be at a minimum temperature of 50° F and a maximum surface temperature of 100° F at time of application. The first coat shall be air-dried with adequate ventilation for five (5) days at a minimum temperature of 65° F.

6.06.03 COLOR SELECTION

All color sections shall be subject to approval of submittals by MSWD.

6.06.04 PRIMER AND INTERMEDIATE COATS

Primer and intermediate coats of paint shall be unscarred and completely integral at the time of application of each succeeding coat. Each coat shall be subject to the inspection and approval of MSWD before the next succeeding coat is applied, and defective work of any kind shall be deemed sufficient cause for recoating the entire surface involved.

Sufficient time shall be allowed between coats to insure proper drying, unless these specifications or manufacturer's recommendations specifically state otherwise. Excessive time or exposure between coats shall not occur in cases where such excessive time or exposure will impair the bond between coats.

6.06.05 SUBMITTALS

Submit samples of field-applied paint and coating finishes, colors, and covering at least sixty (60) days prior to start of such finishing operations.

6.06.06 IDENTIFICATION

Label or tag each sample or set of samples identifying the manufacturer's name and address, brand name, catalog number, project title, and intended use.

6.06.07 COLORS, PATTERNS, AND TEXTURES

For items required to be of selected and approved colors, patterns, textures, or other finish, submit sufficient samples to show the range of shades, tones, values, patterns, textures, or other features corresponding to the instructions and requirements specified.

6.06.08 FACTORY FINISH COLORS

Colors of material specified to be furnished with a factory finish are subject to approval. Submit duplicate samples of factory finishes showing the full range of available colors for selection and approval.

6.06.09 PROTECTIVE COATING MATERIALS

For items required to be selected and approved, material submittal required for review and approval by MSWD.

6.06.10 SURFACE PREPARATION AND COATING THICKNESS

Surface preparation shall be per manufacturers' current recommendations.

6.06.11 COLOR AND PAINT SCHEDULE

PROCESS SYSTEM	DESCRIPTIVE COLOR CODING	MANUFACTURERS' COLOR DESIGNATION
All exposed piping standards	Per MSWD Approved Material List	Submit to MSWD for approval

6.06.12 PREPARATION

1. Surface Preparation:

   The contractor shall carefully examine all surfaces to be finished and before beginning any of his work shall see that the work of the other trades has been left or installed in a

workmanlike condition to receive paint. Metals shall be clean, dry, and free from mill scale, rust, grease, and oil.

Except as otherwise provided, all preparation of metal surfaces shall be in accordance with Specifications SP-1 through SP-10 of the Steel Structures Painting Council (SSPC). Grease and oil shall be removed by wiping with mineral spirits or naphtha per Specification SP-1. Rust, scale, welding slag, and spatter shall be removed by wiping with mineral spirits or naptha per Specification SP-1. Rust, scale, welding slag, and spatter shall be removed, and the surface prepared by hand tool cleaning, power tool cleaning, or blast cleaning in accordance with the appropriate Specification SP-2 through SP-10.

2. Mixing:

Paint containers shall be opened only when required for use. Paint shall be mixed only in designated rooms or spaces in the presence of MSWD. Paint shall be thoroughly stirred or agitated to uniformly smooth consistency suitable for proper application. In all cases, paint shall be prepared and handled in a manner to prevent deterioration and inclusion of foreign matter.

a) EPOXY COATINGS:

All oil and grease shall be removed from the metal by caustic degreasing or steam cleaning. The surface shall be sandblasted to near-white metal in accordance with SSPC-SP10. To obtain maximum adhesion of epoxy coating, the grit used for blasting shall be coarse enough to impact a tooth in the metal equal to 25% of the thickness of the coating to be applied. The metal shall be cleaned, after sandblasting, with clean, dry compressed air. Use of rags to remove residual dust after sandblasting will not be permitted.

b) POWDER EPOXY:

Where the size of the valve or other item is not too large, it shall be coated by the powder epoxy method. Application of powder epoxy shall conform to the following requirements:

c) PREHEATING:

Areas that are not to be coated shall be masked using 500° F. Masking tape, similar to Permacel, as by Minnesota Mining and Manufacturing Company. The part to be coated shall be placed in an oven and preheated to the temperature specified by the epoxy manufacturer. An accurate temperature-measuring device such as a pyrometer shall be used to determine the substrate temperature.

6.06.13 VENTILATION

The contractor shall not permit painting to begin in enclosed places until a forced draft ventilation system of sufficient air volume has been placed in operation.

6.06.14 APPLICATION OF PAINT

The applicator of the paint shall have had experience in applying the type or types of coatings and under similar conditions that he will be required to meet in this contract. The contractor shall verify the paint applicator's qualifications before subcontracting the work to him.

No painting shall be done under dusty conditions, during or immediately after a rain, during rainy weather, or when the temperature is less than 50° F.

Except that prime coats shall be applied by brush and well worked into the surface, paint may be applied by brush, roller, trowel, or spray, unless the manufacturer's recommendations or these specifications call for some particular type of application.

Where spray application is used, each coat of paint shall be applied to a thickness equivalent to a brush coat application at coverage not greater than that specified by the manufacturer for a brush coat application.

All work shall be done in a workmanlike manner, leaving the finished surfaces free from drops, waves, holidays, laps, or brush marks. Drop cloths and other coverings shall be placed at all times as to protect floors and other surface from spatter and droppings. Hardware, plates, lighting fixtures, nameplates, and similar articles, which are not to be painted, shall be masked off or removed completely. After completion of painting, any spatter or droppings shall be removed.

The number of coats specified is the minimum to be applied. Suction spots between coats shall be touched up, and additional coats shall be provided if required to produce a finished surface of solid, even color, free from defects. The total thickness of the coating shall be as specified. Additional coats of paint shall be added if necessary to bring the total thickness up to not less than that specified. No holidays shall be left.

Particular care shall be used to assure that the specified coverage is secured on the edges and corners of all surfaces. Additional brush coats shall be applied if necessary to cover the edges and corners. The contractor shall control and check the dry film thickness of the coatings on metal surfaces with a correctly calibrated thickness meter and shall check for holidays with a low-voltage holiday detector. MSWD may use the contractor's meter and detector for additional checking.

Damaged paint or scratched painted surfaces shall be sanded smooth before repainting. Sanding areas to be repainted shall be done to such a degree and in such a manner that all evidence of the scratches or damages are obscured.

6.06.15 CLEAN UP

Upon completion of his work, the painting contractor shall remove his surplus materials. All paint spills shall be removed, and the entire premises shall be free from rubbish, debris, etc., caused by his work. He shall present the work clean and free from blemish so that it is acceptable in every way.

6.06.16 PAINT TO BE PROVIDED TO MSWD

At the end of the project, the contractor shall turn over to MSWD a gallon can of each type and color of paint, primer, thinner, or other coating used in the field painting. If the manufacturer packages the material concerned in gallon cans, then it shall be delivered in unopened labeled cans as it comes from the factory. If the manufacturer does not package the material in gallon cans, and in the case of special colors, the materials shall be delivered in new gallon containers, properly closed with typed labels indicating brand, type, color, etc. The manufacturer's literature describing the materials and giving directions for their use shall be furnished in three (3) bound copies. A typewritten inventory list shall be furnished at the time of delivery.

6.06.17 WARRANTY INSPECTION

Warranty inspections shall be conducted during the eleventh (11th) month following completion of all coating work. All personnel present at the pre-job conference shall be present at this inspection. All defective work shall be repaired in strict accordance with this specification and to the satisfaction of MSWD.

6.07 SEWER PIPELINE CONSTRUCTION

6.07.01 GENERAL

These specifications for construction are for use by the contractor when installing sewerage systems within Mission Springs Water District (MSWD).

These specifications are intended to be used in conjunction with the Standard Specifications for Public Works construction, latest edition, (herein referred to as the "Green Book"), and all requirements of applicable Codes and Regulations from the State of California Department of Health Services regarding the construction phase of sanitary sewerage systems. MSWD should be consulted for any modifications or deviations from these Specifications.

Certain work in connection with tying into existing sewers and manholes may require the temporary handling of sewage either by temporary bypass lines, pumping, bulk heading at low flows, or other means, to be approved by MSWD. Sewage so diverted shall be handled in a manner so as not to create a public nuisance or health hazard. Bypassing of untreated or partially treated wastewater to surface waters, drainage courses, or storm drains will not be permitted.

6.07.02 MATERIALS

All material shall be new and conform to, or exceed, the standard for each type of pipe, fitting, manhole, etc. as required by this specification and shall be from the Approved Materials List, (Section 8.0)

SEWER PIPE:

Unless otherwise approved by MSWD, all sewers shall be extra strength Vitrified Clay Pipe (VCP) and shall conform to the requirements of ASTM C-700 "Specifications for Extra

Strength Vitrified Clay Pipe), the "Green Book" 207-8, 208-2, and the requirement specified herein.

All Vitrified Clay Pipe shall be subject to the Bearing Strength Tests and hydrostatic pressure tests described in ASTM C-301. MSWD may select at random and test one length of pipe for each 200 lengths of pipe (or fraction thereof) delivered to the project site.

Ductile Iron Pipe and fittings shall be used only in special circumstances and only when approved in writing by MSWD.

JOINTS:

For Vitrified Clay Pipe shall be made up using a factory-made mechanical or compression joint meeting the requirements of ASTM C-425 "Specification for Vitrified Clay Pipe Joints Using Material Having Resilient Properties".

FITTINGS:

Vitrified Clay Pipe fittings shall include branches of every type and stoppers. These fittings shall conform to these specifications, ASTM C-301 and shall equal or exceed the pipe in quality. Branches shall be of the type called for on the plan and standard drawings and shall be securely and completely fastened to the barrel of the pipe in the process of manufacture.

Stoppers shall be strong enough to sustain all applied earth and hydrostatic tests or air testing. Stoppers shall be capable, unbraced, of remaining in place when subjected an air pressure up to 5 psi.

MANHOLES:

Shall be constructed of precast concrete manhole sections with a minimum wall thickness of 6 inches. Manholes, manhole covers, and frames shall conform to the specification shown on MSWD Standard Drawings.

CLEANOUTS:

Where approved, cleanouts shall conform to MSWD Standard Drawings.

BACKFLOW VALVES:

Where required by the plans or specified by MSWD, sewer backflow valves shall be installed. These valves shall conform to MSWD Standard Drawings.

6.07.03 WARRANTY

The contractor shall guarantee the entire work constructed and all materials furnished will meet all the requirements specified herein. This warranty shall include both the quality of the workmanship and the materials used as well as that of subcontractors and suppliers.

The contractor shall agree to make at any repairs or replacements made necessary by defective materials or workmanship in the pipe materials supplied which have become evident within one-year after date of recording Notice-of-Completion, and to restore to full compliance with the requirements of these specifications, including the test requirements, any part of the sewer system which during said one year period is found to be deficient with respect to any provision of this specification. The contractor shall make all repairs and replacements promptly upon receipt of written orders for same from MSWD or if in the event the repair work must be performed by MSWD, shall reimburse MSWD for actual labor, equipment and material expenses incurred to perform such corrective work. If the contractor fails to make the repair and replacements promptly, MSWD may do the work, and the contractor shall be liable to MSWD for the cost thereof as described above.

6.07.04 SEWER PIPE INSTALLATION

Installation of all sewer pipeline materials required for the construction of sewer collection systems shall be in accordance with all provisions of these specifications including ASTM C-12 - Installing Vitrified Clay Pipelines, (Section 6.01) Construction Methods, (Section 6.02) Earthwork, (Section 6.03) Concrete, MSWD Standard Drawings (Section 9.0) the Approved Materials List (Section 8.0), and in accordance with the manufacturers specifications and applicable published standards unless modified herein. Contractor shall notify Underground Service Alert at 811 at least 2 working days prior to construction to locate potential utility interference in the project right-of-way.

MSWD will provide an Inspector for inspection of sewer pipeline construction work. The Inspector will check for compliance with MSWD requirements for sewer pipeline construction but will not have the responsibility for checking survey work (horizontal and vertical control) nor installed quantities of pipe. MSWD Inspector is Not a Safety Inspector and is not responsible for enforcing compliance with OSHA or other safety requirements. Jobsite safety is not MSWD responsibility and MSWD does not accept any liability connected with the construction.

Installation requiring connection to existing MSWD facilities must be done as shown on MSWD Standard Drawings and under continuous inspection by MSWD. Any existing sewer pipeline damaged by such work will be completely removed and replaced as directed by MSWD Inspector.

Pipe laying shall proceed upgrade with the spigot ends of bell-and-spigot pipe pointing in the direction of flow. Each pipe shall be laid true to line and grade and in such a manner as to form a close concentric joint with the adjoining pipe. Care shall be taken by the contractor to ensure safe installation of the pipe in an undamaged condition. Pipe which is damaged after installation shall be removed and replaced.

At all times when the work of installing sewer pipeline is not in progress, all openings into the pipe and the ends of the pipe in the trench shall be kept tightly closed to prevent entrance of animals and foreign materials. The contractor shall take all necessary precautions to prevent the pipe from floating due to water entering the trench from any source. The contractor shall assume full responsibility for any damage due to any cause and shall restore and replace the pipe to its specified condition and grade if it is damaged during construction. The pipe sections shall be installed in the trench to true alignment and grade in accordance with the plans and these

specifications. Exceptional care shall be taken in placing the pipe and making the field joint. All pipes shall be installed without break, up-grade from structure to structure, with the socket (bell) ends of the pipe up-grade.

Pipe shall be installed true to line and grade with a uniform bearing under the full length of the barrel of the pipe. Suitable excavation shall be made to receive the socket (bell) of each pipe section. All adjustments to line and grade must be made by scraping away or tamping earth under the body of the pipe, and not by wedging or blocking up the spigot. Pipe shall be installed only in dry trenches.

Unless waived by MSWD, metallic locater tape 2 inches wide shall be placed in the trenches of all mains and laterals for future pipeline locating. The tape shall be placed at least 6 feet above the pipe but no deeper than 4 feet below final grade.

Where sewer lines are placed crossing above existing waterlines, ductile iron pipe with hot dip bituminous coating shall be used 10 feet on each side of the waterline (or suitable concrete encasement in accordance with State Health Department requirements).

Curved sewers (vertical and horizontal) shall be avoided where practical alignments are available, pipe sections for curved sewers shall be chosen by the contractor based on the required radius called out on the plans in conjunction with the manufacturer's recommendations. Curved sewers shall be constructed to not exceed or equal the minimum radius specified in the manufacturer's recommendations. Vertical curves are discouraged and require specific written approval by MSWD.

Pipe bedding and pipe placement shall be in accordance with MSWD Standard Drawings. All pipe shall be "shaded" (with granular material having a sand equivalent of at least 30) to at least 12 inches over the pipes and prior to placing backfill. Backfill shall be placed to at least 3 feet below finished grade and shall be compacted to a minimum density of 90% of maximum dry density, per ASTM D1557-02, or to the compaction level required by the local agency having jurisdiction, whichever is greater. The upper 3 feet shall be compacted to a minimum density of 95% maximum dry density, per ASTM D1557-02 or to the compaction level required by the local agency having jurisdiction, whichever is greater. Before final acceptance of sewer facilities or prior to putting any sewer on line, all sewer facilities shall be flushed with water and "balled" or cleaned by acceptable method prior to final air testing to ensure that all dirt, debris, and obstructions are removed from the system. After cleaning, backfill, and compaction, the contractor shall provide a video inspection of the sewer lines by a MSWD approved firm experienced in performing sewer system services. The video inspection shall be performed in the presence of the Inspector. A complete CD, DVD or thumb drive and a detailed report of the inspection shall be furnished to MSWD.

6.07.05 TESTING OF SEWER LINE INSTALLATIONS

All tests for exfiltration from, and infiltration into, the system shall be in accordance with Section 306-1.4.4 of the Green Book except as modified herein.

If leakage of infiltration, as shown in the tests, exceeds the standards set forth in said section, the contractor shall take any actions necessary to correct the deficiencies. All tests must be

completed before the street or trench is resurfaced with permanent pavement, but after complete installation and trench compaction of all facilities within a particular section between manholes.

The air test specified herein, unless otherwise directed by MSWD, shall be used by the contractor to test all sewers. The air test shall be in accordance with Section 306-1.4.4 of the Green Book, except as herein modified.

Air shall be introduced into the pipeline until 3-1/2 PSIG pressure has been reached, at which time the flow of air to the pipe shall be shut off. After the temperature has stabilized the air pressure shall be permitted to drop and, when the internal pressure has reached 3.0 PSIG, the time lapse required for the air pressure to drop to 2.0 PSIG shall be measured. The time lapse (in seconds) required for the air pressure to decrease from 3.0 to 2.0 PSIG shall be more than that given in the following table:

SEWER PIPE DIAMETER	MINIMUM TIME LAPSE (SEC)
8"	140
10"	170
12"	200
15”	260
18"	310
21"	360
24"	410
27"	460
30"	510
33"	560
36"	610

If the time lapse exceeds that shown in the table, the pipe shall be presumed to be within acceptable limits; if the time lapse is less, the contractor shall make the necessary corrections to reduce the leakage to acceptable limits.

The water infiltration test shall be used in lieu of the air test where ground water conditions are encountered and the water level prior to any pumping or dewatering operations is above the top of the proposed sewer pipeline. The water infiltration test shall be in accordance with Section 306-1.4.3 of the Green Book, except as herein modified.

The infiltration shall not exceed ten (10) gallons per day per thousand (1000) feet of sewer, per inch of pipe diameter. The test shall be run for a minimum period of two (2) hours.

If ground water conditions are such that the ground water level is between the flow line of the proposed sewer pipeline and the top of the pipe, both the air test and the water infiltration test shall be conducted. In such cases, the section of pipe being tested shall be deemed acceptable only if it passes both the air test and the water infiltration test.

All sewer force mains shall be water pressure tested in accordance with Section 306-1.4.5 of the Green Book.

6.07.06 MANHOLE INSTALLATION AND TESTING

Manholes shall be constructed using precast manhole section unless other methods are specifically approved in writing by MSWD. Precast manhole sections shall conform to the size, shape, form, and details shown on MSWD Standard Drawings. Shop drawings for precast manholes shall be submitted by the contractor to MSWD for approval prior to installation. All precast units shall meet the strength requirements for "pre-cast concrete manhole risers and tops", ASTM C478. Precast sections shall be set in a bed of grout to make a watertight joint with the base. Manholes shall be set perfectly plumb, and all grout neatly pointed. Different height sections may be used in constructing the manhole to bring the manhole ring and cover to the desired elevation shown on the plans. The manhole shall be constructed so that there is not less than twelve-inch (12”) or more than twenty-inch (20") of throat section between the top of the cone and the bottom of the frame.

Precast rings are to be joined with a minimum thickness of 1/2" of Portland Cement mortar. Mortar for joining ring sections shall be composed of not less than one part Portland Cement to two parts of clean, well-graded sand of such size that all will pass a No. 8 sieve. Mortar sand shall conform to the strength requirements specified for mortar strength under ASTM C87.

Manhole bases shall be constructed of "Class A" concrete poured against native undisturbed material and to the form and dimensions shown on MSWD Standard Drawings. If excavations beyond the required vertical dimension are made during construction, the depth of concrete below the invert of the pipe shall be increased beyond the 9-inch minimum as necessary to meet the invert with the undisturbed excavation. Placement of compacted fill to the desired grade in lieu of concrete will not be allowed.

Concrete shall be poured to a level ring-section seating surface with the base centered over the sewer intersection unless otherwise specified. A metal forming ring shall be used to form a level

joint groove in the manhole base, which will join with the first precast section to form a watertight joint. Base inverts (channel) shall be formed in the field using forms with width and depth equal to the diameter of the sewer pipeline. Channels shall be finished smooth with constant slope from inlet to outlet (at least 2 inches across base). A two--foot (2') Vitrified Clay Pipe joint (with-out bell) of the same inside diameter as the adjoining pipe shall be placed at the inlet and outlet to each manhole or structure with at least one foot of pipe extending outside of the manhole ring. The floor of the manhole shall slope at least two inches (2") from the sides of the manhole to the open channel. All concrete used to construct the manhole base shall achieve the specified compressive strength prior to installation of the precast sections.

Manhole frames and covers shall be in accordance with MSWD Standard Drawings. All frames and covers shall be traffic strength and shall be monogrammed with the letters "MSWD SEWER". Manhole frame and covers shall not be set to final grade until final paving has been completed. Elevations to which frames and covers are to be constructed shall conform to the construction plans. Where the cover is in an existing road shoulder or other unpaved area, it shall be placed flush with the existing surface or as specified on the plans or by MSWD. Manhole frames shall be secured to the upper precast section with a grout bed and filled as shown on the detail drawing.

Once the manhole has been completely constructed and the covers installed, cleaning and scraping of foreign materials from the frames, covers, interior walls and base shall be done to ensure a satisfactory fit.

Drop manholes shall be constructed in accordance with MSWD Standard Drawings. All materials and construction of drop manholes shall conform in all respects to the applicable provisions of the above specifications with modifications for the addition of drop inlets as set forth in the detail drawing. The inside diameter of the drop inlet pipe and channel shall be the same diameter as the intercepted sewer.

Cleanouts shall be constructed in accordance with MSWD Standard Drawings.

The contractor shall make connections to existing manholes at the location and elevation shown on the plans. Where new flow-through channels must be cut in the existing manhole base, they shall be cut so that the resulting section is smooth and conforms to the intended shape. The contractor shall make necessary provisions to keep pieces of concrete and debris out of the sewer. Deviation from form and grade shall not be greater than ¼ inch. The channel surface shall be smoothed with epoxy mortar. The new VCP sewer pipeline (not to exceed twenty-four-inch (24") in length) shall be firmly embedded in epoxy grout where it joins the existing manhole. Where holes are required in existing manhole walls for new or revamped connections, the contractor will be required to use coring type equipment.

Upon completion, manholes shall be tested for leakage using either of the following test methods:

a. Ground water conditions:

Infiltration test all manholes in areas where groundwater exists over the top of the pipe shall be water tested. All pumping of ground water shall be discontinued for at least three (3) days, after which the manhole shall be tested for infiltration. The inlet(s) and outlet of each manhole shall be plugged and any infiltrated water shall be collected in the manhole and measured.

b. Dry conditions:

Exfiltration test where no groundwater exists, approximately one (1) of every ten (10) manholes, as directed by MSWD, shall be water tested. Each manhole shall be filled with water 4 feet 0 inches above the flow line of the manhole with the inlet(s) and outlet of each manhole plugged.

The maximum allowable leakage rate for each type test shall be ten (10) gallons per hour per manhole as tested for a period of thirty (30) minutes (minimum). Where test results indicate that the allowable leakage is exceeded, the contractor shall make the necessary repairs to reduce the leakage to acceptable limits.

6.07.07 SEWER LATERAL INSTALLATION

Laterals of the proper size specified on the plans shall be installed at the locations shown on the plans and shall end at the property line of the lot served. The exact location may be determined in the field by MSWD Inspectors. The contractor shall field reference each lateral connection with a surface marker and record the sewer main station for the As-built documentation.

Tees and wyes shall be of the same material as the sewer main. Tees and wyes of the proper size shown on the plans shall be installed at approximately the locations shown on the plans. The exact location will be determined in the field by MSWD and shall be referenced by the contractor with a stake or suitable surface marker. A suitable plug shall be provided and installed prior to backfilling operations to ensure watertight joints.

Sewer laterals shall be installed per MSWD Standard Drawings. In no case shall any lateral be constructed at less than a 2% slope unless specifically shown on the plans and approved by MSWD. Sewer laterals shall be constructed a minimum distance of 5 feet from water service lines and pass at least 4 inches beneath them.

Unless otherwise approved by MSWD, any required saddle connections to existing mains shall be made with an approved sewer tapping machine or apparatus in accordance with MSWD Standard Drawings. The contractor shall submit his proposed method for tapping. MSWD may also require the contractor to provide the manufacturer’s tapping equipment descriptions for its review. Under no circumstances will such connections be made by “knocking out” openings in the existing main. Pipe sections damaged during construction shall be removed and replaced at the contractor's expense.

Once curb and gutter has been placed, an “S” imprint shall be chiseled on the curb face at each service lateral location.

6.07.08 CONCRETE FOR SEWER SYSTEMS

Concrete shall be composed of Portland Cement (Type II or V as appropriate) natural hard rock aggregates, and water proportioned to produce required strength and well mixed into required consistency.

Portland Cement concrete for manhole bases, cradles, encasements, thrust blocks and structures shall be composed of Portland Cement, fine aggregates, coarse aggregates, and water proportioned and mixed in accordance with the requirements of Section 90 of the State Highway Standard Specifications, except as may be herein modified.

Concrete for manhole bases, cradles and encasements, and all other concrete structures, shall be constructed to the lines and grades and in accordance with the design shown in the details on the plans, and current MSWD Standard Drawings

Prior to placing any concrete, the contractor shall submit to MSWD the design mix proposed to be used. Said mix shall set forth the weights of cement, sand, coarse aggregate, and the amount of water to be used. (Source of supply shall also be furnished to MSWD.) The proposed mix shall be approved by MSWD prior to placing concrete.

PORTLAND CEMENT CONCRETE CLASSIFICATION		
CONCRETE CLASS	**28 DAY COMP STRENGTH**	**SACKS CEMENT/CY**
"A"	3,250 PSI	6
"D"	4,000 PSI	7

The amount of free water used in concrete shall not exceed 312 pounds per cubic yard, plus 20 pounds for each required 100 pounds of cement in excess of 564 per cubic yard.

Class "B" Concrete shall be used for encasements as specified on the plans or as required by MSWD Inspector to remedy unforeseen field conditions.

At the locations shown on the sewer plans, and in accordance with the details shown on the plans or detail drawing, the contractor shall construct reinforced concrete encasement around the sewer carrier pipe. Concrete for reinforced concrete encasement shall be Class "A". Reinforcing steel (unless otherwise indicated) shall be No. 4 bar, billet steel having a minimum yield point of 60,000 PSI, formed and spaced as shown on the plans or the detail drawing.

6.07.09 STEEL CASINGS FOR SEWER INSTALLATIONS

Steel casing shall be continuously butt-welded of sheets conforming to ASTM specification A-283. Casing construction shall be either by open trench or by jacking. If jacked installation is performed, construction shall be in accordance with the specifications herein for jacked steel casing.

The casing pipe shall have a steel thickness not less than 3/8 inch. Steel casing pipe of the minimum size and thickness specified shall be installed in place by jacking and boring methods, without the use of water or air, at the locations shown on the plans, and to grades required to install the carrier pipe at its required grade.

The carrier pipe shall be supported within the casing on redwood skids secured with stainless steel bands. The ends of the steel casing shall be sealed with brick and/or mortar with weep holes installed at the lower end. The annular space between the steel casing and carrier pipe shall be left empty unless grouting is specified.

Voids, which may develop outside the casing, caused by the removal of rocks or obstructions while jacking or boring, shall be filled with a lean grout mix forced in under pressure by insertion of a grout pipe outside of the casing. The lean grout shall consist of one part of Portland Cement to not more than four parts of sand by volume, placed at low pressure. Grout pressure is to be controlled so as to avoid deformation of the casing and to prevent disturbance of the cavity walls. Sand for grout to be placed outside the casing shall be of such fineness that 100% will pass a No. 8 sieve and no less than 35% will pass a No. 50 sieve.

6.07.10 BACKWATER VALVE INSTALLATION

Backflow valves shall be installed as required per the sewer plans and in accordance with MSWD Standard Drawings. All valves shall be installed at the shallowest level of the appropriate location and allowing for future inspection and maintenance. Installation of plastic valves and appurtenances shall be permanently made with appropriate solvent glue providing a waterproof connection.

6.07.11 SEWER PIPE BEDDING

All sewer pipe bedding shall be in accordance with the plans and the detail drawings. Except as modified here following, all earthwork shall be in accordance with MSWD Standard Drawings and (Section 6.02) Earthwork. All bedding shall be granular aggregate material achieving sand equivalent of 30 or better. Bedding material should be moisture conditioned per the project soils report prior to placement in the trench and shall be compacted to a minimum density of 90% of maximum dry density, per ASTM D1557-02. Native material determined to be satisfactory for pipe bedding shall be graded to provide continuous support of the pipe prior to placing of the pipe.

Where rock is encountered, it shall be removed below grade and the trench backfilled with suitable material to provide a compacted base with a thickness under the pipe of not less than 1/2 inch per inch of nominal pipe diameter with a minimum allowable of 6 inches.

When groundwater or soft base material is encountered in the bottom of the trench, the inappropriate material shall be removed to the satisfaction of MSWD and replaced with 3/4-inch crushed rock compacted to a minimum density of 90% of maximum dry density, per ASTM D1557-02.

The crushed rock shall have the following gradational characteristics:

Sieve Size	% Passing
1"	100
3/4"	90-100
3/8"	20-55
No. 4	0-10
No. 8	None

6.08 CHAIN LINK FENCE AND GATES SPECIFICATION

Contractor shall furnish all materials, labor, tools, and equipment required to completely construct the fencing, posts, gates, and miscellaneous material, including removal of trees, brush and other obstacles, as shown on the Drawings and as specified in these specifications. Necessary rights-of-way shall be provided as specified in (Section 6.01.04).

6.08.01 POWER

The contractor shall provide at his own expense all necessary power required for his operations under the contract. The contractor shall provide and maintain in good order such modern power equipment and installation as shall be adequate in the opinion of MSWD to perform in a safe and satisfactory manner the work required by the contract.

6.08.02 MATERIALS

All materials shall be newly manufactured and be free from defect.

Posts, braces and top rail shall be new schedule 40 galvanized pipe manufactured in accordance with. S.T.M. A120 and shall be of the following sizes and weights:

ITEM	OUTSIDE DIAMETER (SIZE IN INCHES)	MIN.WT.(LBS/FT)
Fencing: End and corner posts	2-7/8"	5.79
* Line posts	2-3/8"	3.65
Braces and top rail	1-5/8"	2.27
Bottom tension wire	7 Ga.	--

NOTE:

Walk gateposts shall conform to the requirements specified above for end and corner posts.

Top rail shall run continuously throughout the length of the fence.

Changes in alignment where the angle of deflection is 30 degrees or more shall be considered as corners and corner posts, and braces shall be installed.

* Line post outside diameter shall be 1-7/8" for fencing less than 6' high.

GATE OPENINGS	OUTSIDE DIAMETER	MIN.WT.
Single to 6' or double 12' incl.	2-7/8"	5.79
Single over 6' to 13' or double over 12' to 26' incl.	3-1/2"	7.58
Single over 13' to 18' or double over 26' to 36' incl.	6-5/8"	18.97

The chain link fabric shall be No. 9 AFC gauge galvanized steel wire woven in a two-inch (2”) mesh, manufactured in accordance with the requirements of A.S.T.M. A392. The fabric shall have a heavy zinc coating by hot dip galvanizing after weaving. The fabric shall have a barbed finish at the top and bottom.

All tension wire shall be No. 7 gauge galvanized, hard drawn, steel spring wire and shall conform to the requirements of A.S.T.M. A227.

All tie wire shall be No. 9 AWG gauge galvanized steel wire manufactured in accordance with the requirements of A.S.T.M. A112.

All barbed wire shall be made of two strands of No. 12 1/2 AWG gauge galvanized steel wire twisted with two-point No. 14 AWG gauge barbs spaced at not more than five inches, and manufactured in accordance with the requirements of A.S.T.M. A121, Class I.

All truss rods shall be made from a 3/8" diameter galvanized steel rod, with drop forged turnbuckles, and galvanized in accordance with A.S.T.M. A153.

All hardware, hinges, clamps, fasteners, bolts, nuts, turn-buckles, fittings, post caps, stretcher bars, and other ferrous material not previously covered in these specifications, shall be manufactured of steel, malleable iron or wrought iron, and shall be galvanized in accordance with

the requirements of A.S.T.M. A153. All the above hardware and fittings shall be manufactured so as to allow and assemble in accordance with the drawings and these specifications.

All ferrous materials shall have a heavy zinc coating by hot dip galvanizing, after fabrication or weaving, applied in accordance with the requirements of the A.S.T.M. A153.

Concrete footings shall be concrete Class 500-C-2500 per Standard Specification Public Works construction, ("Green Book") Section 201.

6.08.03 CONSTRUCTION WORK AND METHODS

All fencing shall be installed in a professional manner and shall be inspected by MSWD for compliance with these specifications.

Posts shall be spaced not more than ten feet center to center of posts and be set in a vertical position. Top of the concrete foundations shall be troweled smooth sloping outward from the post. End, corner and gateposts shall be braced to the nearest line post. Line posts, at intervals not greater than 1000 feet and at locations shown on the plans, shall be braced both ways. All posts shall have post caps. The minimum depth of footings shall be 2'-2" for fences of heights less than or equal to 5' and 2'-8" for fences of heights of over 5'. In cross sections, diameter of the footing shall be a minimum of 10" and not be less than three (3) times the outside diameter of the post.

Chain link fabric shall be fastened on the side of the posts as shown on the drawings and shall be stretched taut and securely fastened to the posts, the top rails and tension wires. The fabric shall be fastened to end, corner, and gate posts with 1/4" by 3/4" steel stretcher bars and not less than 1/4" by 3/4" steel stretcher bar bands, spaced not more than one foot apart. The fabric shall be fastened to line posts, rails, and tension wires with NO. 9 AWG gauge tie wires or equivalent metal bands spaced approximately at 14" on line posts and eighteen-inch (18”) on rails and tension wires. Bottom tension wires and fabric shall be stretched straight from post to post. Excavating at high places may be required and filling at low places will not be permitted.

Walk gates and drive gates shall be of the width as shown on the drawings. Gate frames shall be cross trussed with 3/8" truss steel rods equipped with drop-forged turnbuckles.

The corners of gate frames shall be fastened together and reinforced with a malleable iron fitting designed for the purpose or welded securely. Surplus welding material shall be removed prior to galvanizing. Chain link wire fabric shall be of the same type as specified for the fence and shall be fastened to the frame by the use of stretcher bars, clamps and tie wire as specified for the fence, and suitable tension connectors spaced at approximately one-foot intervals. Gates shall be hung by not less than two steel or malleable iron hinges not less than three inches in width so designed as to securely clamp to the gatepost and permit the gate to swing back against the fence. Hinges shall be of high-grade malleable iron of the ball and socket type, which will permit the gate to swing back against the fence. The lower hinges of the gate shall support the entire vertical load of the gates as well as provide for the resultant horizontal reaction. Each gate shall be outfitted with approved latches and provisions for padlocking. Latches, hasps, and bolts shall be accessible from either side of the gate.

Repair of any minor galvanized coating damage shall be made by thoroughly wire brushing the damaged areas and removing all loose and cracked coating, after which the cleaned areas shall be painted with 2 coats of paint, high zinc dust content, conforming to the requirements of Federal Specification: MIL-P-21035.

The contractor shall provide written guarantees that the entire work constructed by him under the contract will fully meet all requirements thereof as to quality of workmanship, and of materials. The contractor shall make at his own expense any repairs or replacements made necessary by defective materials or workmanship supplied by him which have become evident within one year after date of notice of completion and acceptance of the work is filed, and to restore to full compliance with the requirements of these specifications any part of the fencing, posts, gates, or miscellaneous materials which during said one year period is found to be deficient with respect to any provision of this specification. The contractor shall make all repairs and replacements promptly upon receipt of written orders for same from MSWD. If the contractor fails to make the repair and replacement promptly, MSWD may do the work, and the contractor and his surety shall be liable to MSWD for the cost thereof.

6.09.01 PIPE ZONE BACKFILL

Except as modified here following, all earthwork shall be in accordance with MSWD Standard Drawings and (Section 6.02) Earthwork.

Where rock is encountered, it shall be removed below grade and the trench backfilled with suitable material to provide a compacted base with a thickness under the pipe of not less than 1/2 inch per inch of nominal pipe diameter with a minimum allowable of 6 inches.

When groundwater or soft base material is encountered in the bottom of the trench, the inappropriate material shall be removed to the satisfaction of MSWD and replaced with 3/4-inch crushed rock a minimum density of 90% of maximum dry density, per ASTM D1557-02.

The pipe zone shall extend to 6 inches (minimum) below the pipe and 12 inches (minimum) above the pipe. The pipe zone backfill shall consist of crushed rock conforming to the "Green Book" Section 200-1.2 for 1/2-inch maximum rock gradation as follows:

Sieve Size	% Passing
3/4"	100
1/2"	90-100
3/8"	20-60
No. 4	0-15
No. 8	0-5

6.09.02 MINIMUM AND MAXIMUM DEPTH OF COVER

The minimum cover shall be 5 feet and the maximum cover shall be 20 feet. For depths of cover less than 5 feet or for depths of cover more than 20 feet, a special design will be required and shall be approved by MSWD prior to construction.

6.09.03 DEFLECTION AND MANDREL TESTING

Following the placement, cleaning, and backfill and prior to placing permanent asphalt pavement, all sewers shall be cleaned and measured for obstructions or pipe deflections as set forth in Section 306-1.2.12 of the Green Book and as summarized as follows:

A rigid mandrel shall be pulled through the pipe by hand. The mandrel shall be fabricated of steel and shall be nonadjustable with a length of not less than its nominal diameter. The mandrel shall be certified by MSWD prior to use. The diameter of the mandrel shall be in accordance with Table 306-1.2.12 (B) of the Green Book (PVC-ASTM D 3034 (SDR 35)).

Deflection tests shall be performed no sooner than 30 days after placement and compaction of back fill.

7.0 SEWER LIFT STATION AND FORCE MAIN GUIDELINES

7.01 INTRODUCTION

Sewage collection within MSWD service area shall be provided by the construction of gravity sewers, except where it is demonstrated unfeasible, and pumping is required. If a sewage lift station is proposed, it shall be the developer's responsibility to provide the services of a licensed civil engineer to demonstrate to MSWD that a sewage lift station is the most feasible method for sewage conveyance.

These guidelines present basic concepts and general criteria for sewage lift station facilities. Each lift station shall be reviewed and approved by MSWD from concept through design, construction, and start-up. MSWD reserves the right to modify and supplement these guidelines and require additional facilities, depending upon the specific project location, limitations, and changes in government regulations and standards.

7.02 PROCEDURES

Procedures required for MSWD approval of sewage lift stations are as follows:

1. Developer's engineer shall acquire and review these guidelines.

2. Developer and engineer shall request a concept meeting with MSWD staff to demonstrate the need for a sewage lift station and to review requirements, guidelines, criteria, right-of-way, and location of specific project facilities. MSWD will provide list of preferred equipment and materials.

3. Developer shall submit documentation requested by MSWD to demonstrate need for lift station, complete calculations for entire drainage area flows, and size lift station for present planned development and ultimate development.

4. Submit design, drawings, and specifications for MSWD approval as follows:

   a) Preliminary design including capacity, hydraulic design, pump selection and system curves, preliminary site layout, and list of selected equipment and materials. Depending upon location, MSWD will establish site improvements such as block wall or chain link fence, asphalt concrete or concrete pavement, lighting, access, etc. MSWD will provide specialty specifications to be utilized.

   b) Submit 75% complete construction drawings and specifications (if requested by MSWD).

   c) Submit final design and 100% complete construction drawings and specifications.

   d) Shop drawing submittals for all equipment and materials prior to construction (installation).

5. Construction of facilities shall be in accordance with MSWD guidelines for construction. See guidelines for inspection fee deposit, Pre-construction meeting and Notice to Proceed requirements. MSWD will provide part-time inspection of facilities, witness start-up, and provide final inspection of facilities. MSWD staff shall receive operation and maintenance manuals for all equipment a minimum of 10 working days prior to receiving training for station operation and equipment operation. A factory trained equipment manufacturer's representative shall provide the training.

6. Final acceptance of the facilities by MSWD will be done upon payment of all associated fees, filing of a Notice of Completion by MSWD and execution of Grant Deeds of the facilities to MSWD by the developer. MSWD will then allow properties served by the facility to be occupied and start discharging wastewater into the sewer system.

7.03 GENERAL

1. Raw sewage lift stations shall be designed and constructed in accordance with MSWD guidelines herein, MSWD Standards, good engineering practice, applicable government regulations, Riverside County Health Services Department and California Department of Health Services (Health Department), Cal OSHA, Standard Specifications for Public Works Construction (Standard Specification), Uniform Building Code, National Electric Code, Uniform Fire Code, and as approved by MSWD.

2. Facilities shall be designed by a licensed civil engineer, registered in the State of California, experienced in the design of wastewater facilities. Drawings and specifications shall be submitted for review and approval by MSWD. Soils investigation shall be performed for the lift station site and related interceptor and force main by a licensed soils engineer. Force main and lift station construction drawings shall be submitted

simultaneously; force main shall include plan (40 scale) and profile, and lift station shall include site work, structural, mechanical, and electrical details.

3. All costs of facilities including but not limited to the cost of all permit fees, connection fees, utility charges, and inspection fees shall be borne by the developer.

4. Upon approval and acceptance by MSWD, facilities shall be owned by MSWD. Ownership shall include the lift station site and right-of-way for force main and gravity sewers. Gravity sewers and force main shall be constructed on MSWD property, MSWD right-of-way, or within public right-of-way whenever possible. Easements for gravity sewers and force main will only be considered under special conditions. All right-of-way and easement documents shall be submitted to and approved by MSWD prior to approval of the construction drawings. All right-of-way and easement documents shall be conveyed to MSWD and recorded prior to acceptance of facilities.

5. Developer shall guarantee all facilities free of defect for a period of one year after final acceptance of all facilities by MSWD. The developer, at no cost to MSWD, shall repair any deficiencies occurring during the one-year period. A performance bond approved by MSWD shall be furnished. All manufacturer's warranties shall be fully transferred to MSWD.

6. Prior to completion of the facility and MSWD acceptance, complete records shall be furnished to MSWD including:

   a) As-Built record drawings

   b) Final approved shop drawings and submittals for all equipment and materials

   c) Record electrical and control diagrams

   d) Electronic copy of PLC program if part of project

   e) Electronic copy of Operation and Maintenance Manuals on all equipment

   f) MSWD staff training for station operation and equipment operation and maintenance

   g) Right-of-way, grant deed, and easement records

   h) All construction and operating permits

7.04 CAPACITY

1. Size and capacity of facilities shall be based on peak flow of the development to be serviced with consideration of the entire drainage area and master planned facilities. Criteria for peak flow are given in MSWD Design Standards. Flows shall be provided for initial and ultimate conditions. If necessary, lift stations shall be located to maximize sewage collection for the entire drainage area and shall conform to MSWD Wastewater

Master Plan. Lift station pumping capacity may be dictated by minimum acceptable force main size and velocities therein.

2. Where Master Plan facilities have not been established, the developer shall be responsible to prepare wastewater flow projections for the drainage area.

3. Hydraulic calculations and system/pump curves for pump sizing and required capacity shall be submitted for both initial and ultimate peak flows. System curves shall be developed for friction coefficients of C=100, C=130 and C=150.

7.05 SEWAGE LIFT STATION SITE

1. Site shall be of adequate size to operate, maintain, and repair the lift station facilities including access for truck cranes and sewer cleaning trucks (Vactor).

2. All sewage lift station sites require the parcel to be deeded to MSWD. Before construction, a Grant Deed with legal description and plat map must be prepared, approved, and recorded by MSWD.

3. Site shall be secured by commercial grade 6-foot-high chain link fence with 3-strand barbed wire per MSWD specifications or masonry block wall. Access gates shall include minimum 15-foot-wide double gate for vehicles and a 3-foot gate for maintenance personnel.

4. Site shall be provided with weed control, A.C. pavement, concrete driveway, adequate drainage facilities, and concrete sidewalks.

5. All backfill and compaction shall be a minimum density of 90% of maximum dry density, per ASTM D1557-02 unless soils engineer or encroachment permit requirements are more stringent. Compaction adjacent to lift station wet well and under the valve vault shall be a minimum density of 95% of maximum dry density, per ASTM D1557-02.

6. If required by MSWD, based on proximity of the facility to other public facilities, residences, or buildings, landscaping shall be provided in accordance with the surrounding area.

7. Potable water shall be provided to the site by hose bibs with anti-siphon devices, water meter, and a backflow device as approved by MSWD and Health Department.

8. All lift stations shall have a street address sign affixed to the fence at the front of the station.

9. Site shall be designed with a lighting system operating on a photocell and on/off switch with a manual switch override located within the Control Building. Site lighting shall be designed to minimize offsite impacts while maintaining functionality for maintenance personnel working on lift station components.

7.06 FORCE MAIN

1. Force main size (diameter) shall be based on the following:

    a) Minimum size shall be 4-inch diameter.

    b) Peak flow design point between 4 fps and 5 fps

    c) Minimum velocity of 3 fps and maximum velocity of 6 fps under all operating conditions. MSWD shall approve all proposed operating conditions.

2. Material shall be ductile iron, minimum pressure Class 150, Class 53 thickness per ANSI/AWWA. Pipeline shall be constructed using restrained joints.

3. Pipeline profile shall avoid intermediate high points if feasible. All high points shall be provided with combination sewage air and vacuum valve installation and special corrosive resistant pipeline materials.

4. Pipe cover shall be minimum 42-inches.

5. Pipe bedding and backfill in pipe zone to 12-inches above pipe shall be sandy soil with sand equivalent of 50, compacted to a minimum density of 95% compaction, per ASTM D1557-02 The Remaining backfill shall be compacted to a minimum density of 95% compaction, per ASTM D1557-02, in accordance with MSWD standards, unless soils engineer or encroachment permit requirements are more stringent.

6. Separation from water lines shall be in accordance with Health Department requirements.

7. Force main shall be pressure and leak tested at pipe class pressure in accordance with Standard Specification.

8. Force main construction drawings shall include plan (40 scale) and profile.

7.07 LIFT STATION

1. Raw sewage lift station shall be the submersible type with 100% redundancy, electrical service, switchgear, emergency power, control building, and appurtenances.

2. Raw Sewage Pumps:

    a) Number of pumps furnished shall provide complete redundancy. Minimum of two identical pumps each sized for 100% station capacity shall be installed. Discharge to the downstream system may require use of variable speed drives.

    b) Pump Specifications:

        i. Raw sewage non-clog submersible pumps.

ii. Minimum 4-inch discharge.

iii. Ability to pass minimum 2-inch diameter sphere.

iv. Maximum 1800 rpm explosion-proof submersible motor with moisture and temperature sensors.

v. Motor and cooling rating suitable to run dry for 15 minutes without damage to the pump.

vi. UL or Factory Mutual explosion-proof rating without being submerged.

vii. Constructed of corrosion resistant materials and provided with corrosion resistant factory coating.

viii. Prior to acceptance, pump tests shall be performed to verify pump curves and system head curves.

c) Pump Mounting and Removal:

i. Provide rail-type guide system with intermediate supports to allow pump removal without removal of discharge piping or entering the wet well. All materials to be stainless steel.

ii. Provide stainless steel cable or chain fastened to each pump. MSWD will utilize their crane truck for removal of pumps.

iii. Electrical cable(s) shall be spliced at a junction box located 36-inches above wet well roof and meet all provisions of the NEC.

d) Spare parts shall include one set of seals and bearings.

3. Wet Well Specifications:

a) Cast-in-place concrete or precast concrete pipe constructed watertight, with concrete base and cover. Wet well shall be placed on a 24-inch-thick mat of crushed rock. Concrete shall be designed with T-Lock PVC liner, or approved equal, on the interior wet well walls and roof. Wet well bottom shall slope towards pumps.

b) Size based on maximum pump cycling of six times per hour and to provide adequate spacing to permit adjacent pumps to operate simultaneously. Wet well shall have an emergency storage capacity of a minimum of 60 minutes at peak flow conditions. (Use of storage within the gravity sewer is not acceptable.)

c) Concrete roof shall have hatch openings (one hatch per pump) for pump removal and access hatch for floats and level transducer. Hatches shall be Aluminum construction as manufactured by Bilco or equal, with stainless steel hardware, lockable diamond plate cover, safety chain, and spring assisted hinges.

d) Discharge piping shall be flanged Class 53 ductile iron pipe, outside coated with coal tar epoxy, inside coating of ceramic, minimum 40 mils. Discharge piping shall be designed for a maximum velocity of 10 feet per second. Discharge piping shall be properly supported with pipe supports.

e) Pipe supports, brackets, and all other equipment and fasteners within the wet well shall be stainless steel.

f) All collection sewers shall join and enter a single manhole just prior to entering the wet well. Only one sewer shall enter the wet well to allow MSWD to plug influent sewer and bypass around wet well for maintenance and repairs.

g) A concrete pump wash down pad shall be located adjacent to the wet well for pump wash down. Pad shall be provided with a drain and P-trap draining back into the wet well. A potable water wash down hose bib shall be provided.

4. Pump Discharge Piping Out of Wet Well:

a) Discharge from each pump shall exit the wet well and enter a concrete vault with easy access to valves and piping.

b) Valve vault shall be precast concrete vault with concrete floor. Cover shall be aluminum construction with spring assisted hinged covers designed for parkway loading.

c) Each pump shall be provided with 150 lb. swing check valve (AWWA C508 with bronze trim) and shut-off valves (AWWA C509 solid wedge resilient seated gate valve or eccentric nonlubricated plug valve by DeZurk, Clow or approved equivalent). Sewage combination air and vacuum valves shall be provided at high points.

d) A bypass connection to the force main shall be provided to bypass station with portable pumps.

e) A magnetic type flow meter (type and model to be approved by MSWD) shall be installed on the discharge piping to provide instantaneous flow and total flow from the lift station.

5. Odor Control:

a) Sewage lift station shall be evaluated for odor control facilities including calculations for hydrogen sulfide generation. Odor control facilities may include but are not limited to: air scrubber system, chemical addition, wet well aeration, and/or aeration of the force main.

b) Provide odor control equipment if determined necessary by MSWD. If odor control is not required, provisions for future addition of odor control facilities (i.e. installation of ventilation pipe and penetration into wet well for future connections) shall be provided.

All equipment shall include all required construction and operating permits (i.e. SCAQMD) and permits shall be provided to MSWD in MSWD name.

7.08 ELECTRICAL AND CONTROLS

1. All electrical equipment shall be in accordance with the NEC and, where applicable, meet all requirements for hazardous locations. Developer shall coordinate with the electrical utility providing electrical service. Station shall be provided with a separate utility transformer and meter/main with ground fault protection. Primary power to the station shall be 480-volt, 60 Hz, 3-phase service per applicable standards of the utility provider. Single-phase 120-volt power shall be provided for lights, controls, convenience receptacles, and miscellaneous equipment. Provide a minimum of four spare 120-volt circuit breakers. All conduit shall be run concealed below grade or in concrete slabs, and shall not impose tripping or maintenance hazards. All exposed conduit shall be galvanized rigid metal pipe.

2. Automatic transfer switch (ATS) shall be provided to switch from normal utility power to standby emergency power upon normal power fail, and switch back to normal power when restored. ATS shall have indicating lights for normal power, emergency power, and a digital panel indicating volts and amps. Acceptable manufactures are ONAN, Zenith, Russelectric or approved equivalent.

3. Electric switchgear shall be mounted in NEMA 12 Motor Control Center with removable buckets, and shall include, as a minimum, Motor Circuit Protector (MCP), motor starters with electronic overload protection, selector switch (hand-off-load standby), run and fail lights, control transformer, and elapsed time meter. All motors shall be protected by a power monitor, which monitors phase un-balance, phase reversal, and high or low voltage. Switchgear shall be Cutler-Hammer, Allen Bradley, Square "D", or equal.

4. Complete controls for automatic pump operation shall be provided using Milltronics ultrasonic level controller and float switches as back-up. HOA switch for each pump and selector switches shall allow for any pump to operate in any position (lead, lag, or standby). Controls shall limit pump operation and start up emergency power to prevent overloading the standby generator.

5. Milltronics ultrasonic level controller shall have a minimum of five differential level set points for low water level, start/stop lead pump, start/stop lag pump, start/stop standby pump (if required), and high-water level. Controller shall have a digital screen for programming and to indicating water level and capable of outputting a 4-20ma signal corresponding to water level.

6. Back-up float switches shall be provided for low water level, and high-water level. High and low water levels shall override Milltronics unit and shall start all pumps and stop all respectively. Float switches shall be Flygt, Roto-Float, Warrick, or Consolidated Electric Co. provided with intrinsically safe relays. Install floats so levels are readily adjustable.

7. Controls shall provide automatic reset of alarm conditions for normal power fail, high water level, low water level, standby pump run, and a common alarm contact. However, alarm conditions shall activate an alarm light, which once activated shall require manual reset.

Each pump shall be provided with alarm light and pump shut down for pump high temperature, pumps moisture and pump overload fail conditions.

Pump alarm conditions shall require manual reset. Where programmable logic controllers are provided, battery backup shall be furnished.

7.09 EMERGENCY POWER

1. Provide prefabricated skid-mounted diesel engine driven, radiator-cooled, automatic emergency standby generator to power the lift station during normal power failure. Liquid Propane or Natural Gas may be considered based on site location and availability.

2. Acceptable manufacturers are Onan, Caterpillar, or approved equivalent.

3. Generator shall automatically start upon failure of normal power and be sized to operate lighting loads, and number of pumps necessary to meet flow requirements with maximum voltage DIP of 20 percent. Where two-pump station is provided, the generator shall be sized to sequence start and run both pumps.

4. Exhaust system shall be fully insulated and equipped with a residential-type silencer.

5. Fuel tank for generator shall be base type mounted with unit or aboveground out of doors. Tank shall be double-wall welded steel sized for 24 hours of continuous operation at 100% of generator capacity. Tank shall have secondary containment and alarm floats for low fuel and fuel in containment area. Facilities shall meet fire department criteria.

6. Furnish all air quality permits, including payment of fees for the first year of operation. Permits shall have no less than a 200-hour annual operating limit and shall be in MSWD name. The permit to construct shall be transferred into a permit to operate prior to acceptance by MSWD.

7.10 TELEMETRY EQUIPMENT

1. Provide MSWD standard telemetry equipment system to transmit alarm conditions to existing central receiving system at MSWD Operations Center. Provide facilities at MSWD Operations Center central receiving system to receive and display alarms.

2. Connection to MSWD existing telemetry system shall be provided through a direct burial cable connection. Optional radio telemetry will be considered under special circumstances only. Consult with MSWD regarding selection of telemetry based on project location, availability of direct burial cable, radio receiver capability or other operational requirements.

3. Provide telemetry signals as follows; common alarm, normal power failure, wet well water level (4-20 mA), auto status of pump including status of lead/lag or alternative mode operation, discharge pumping flow rate (4-20 mA) and pump fail, at a minimum. MSWD shall approve final signal requirements based operational requirements of the installation.

7.11 CONTROL BUILDING

1. Masonry block building to house standby generator, electrical service, switchgear, and controls.

2. Building construction:

   a) Colored masonry block, solid grouted.

   b) Concrete footing and slab.

   c) Isolated concrete generator foundation.

   d) Wood roof with lightweight concrete shingles.

   e) Dry wall ceiling with insulation.

   f) Thermostat and timer operated forced air ventilation (roof exhausters).

   g) Metal doors with dead bolt locks.

3. Sized for ease of operation and maintenance.

7.12 MISCELLANEOUS MATERIALS

1. Concrete shall be reinforced concrete Class 560-C-3250 with materials and installation per Standard Specifications.

2. Chain link fence shall be per MSWD specifications.

3. Earthwork shall be in accordance with Standard Specifications. All backfill shall be considered structural backfill and compacted to a minimum density of 95% compaction, per ASTM D1557-02, or as required by the soils engineer or encroachment permit if more stringent.

4. Site within chain link fence that is not otherwise paved or concreted shall have 6" of 3/4" graded crushed rock, furnace slag, or approved equal.

8.0 APPROVED MATERIALS

8.01 GENERAL

Mission Springs Water District (MSWD) maintains a list of Approved Materials, and only those materials on the most current list have been approved for use within MSWD. It is the sole responsibility of the user to assure that the product proposed is currently approved. MSWD may require installation of a different product in special circumstances.

8.02 APPROVED MATERIALS

Manufacturers may request approval by (1) making a formal written request for approval, (2) providing detailed drawings and technical information on their product, and (3) providing a non-returnable sample of the product. Documentation of use by other local water and sewer purveyors (with telephone numbers and contact names) will assist MSWD in evaluating the request for approval. MSWD will evaluate the product and if approved, the product will be placed on the Approved Materials List. All products shall always comply with MSWD Standard Specifications

8.03 APPROVED MATERIALS LIST

See Mission Springs Water District Approved Material List, available on our website at www.mswd.org.

9.0 MISSION SPRINGS WATER DISTRICT STANDARD DRAWINGS

See Mission Springs Water District Standard Drawings, available on our website at www.mswd.org.

10.0 SSMP GUIDELINES

See Mission Springs Water District Sewer System Management Plan (SSMP Development Guide), available on our website at www.mswd.org.

APPENDICIES

APPENDIX A

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:
Mission Springs Water District
66575 Second Street
Desert Hot Springs, CA 92240

EXEMPT – GOV'T CODE 6103

The undersigned grantor declares:
Documentary transfer tax is $0.00.
( ) computed on the full value of property conveyed, or
( ) computed on full value less value of liens and encumbrances remaining at time of sale.
( ) Unincorporated area: ( ) City of, and County of.

FOR RECORDER'S USE ONLY

GRANT DEED

This is to certify that the interest in real property conveyed by the Grant Deed dated - _____, _____ hereby acknowledge **MISSION SPRINGS WATER DISTRICT**, a County Water District and public agency formed pursuant to Water Code §§ 30000 et seq. ("Grantor") is hereby accepted by order of the **MISSION SPRINGS WATER DISTRICT**, a County Water District and public agency formed pursuant to Water Code §§ 30000 et seq. ("Grantee") and the grantee consents to the recordation thereof by its duly authorized officer.

Dated this _____ day of _____, 20___

MISSION SPRINGS WATER DISTRICT

By: _____

General Manager

APPENDIX B

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:
Mission Springs Water District
66575 Second Street
Desert Hot Springs, CA 92240

EXEMPT – GOV'T CODE 6103

The undersigned grantor declares:
Documentary transfer tax is $0.00.
( ) computed on the full value of property conveyed, or
( ) computed on full value less value of liens and encumbrances remaining at time of sale.
( ) Unincorporated area: ( ) City of, and County of.

FOR RECORDER'S USE ONLY

GRANT OF EASEMENT DEED

This is to certify that the interest in real property conveyed by the Grant Deed dated - _____, _____ hereby acknowledge **MISSION SPRINGS WATER DISTRICT**, a County Water District and public agency formed pursuant to Water Code §§ 30000 et seq. ("Grantor") is hereby accepted by order of the **MISSION SPRINGS WATER DISTRICT**, a County Water District and public agency formed pursuant to Water Code §§ 30000 et seq. ("Grantee") and the grantee consents to the recordation thereof by its duly authorized officer.

Dated this _____ day of _____, 20___

MISSION SPRINGS WATER DISTRICT

By: _____

General Manager

APPENDIX C

MISSION SPRINGS WATER DISTRICT
WATER PLAN CHECKING PROCEDURES

DEVELOPER: _____

ENGINEER: _____ **MSWD JOB No:** _____

DEVELOPMENT: _____ **PHASE No:** _____

PLAN CHECKED BY: _____ **REVIEWED BY:** _____

REVIEW DATES: **1st:** _____ **2nd:**_____ **3rd:**_____ **4th:**_____ **Final:**_____

Cover Sheet and General Requirements

☐ All sheets shall be 24" high X 36" wide overall sheet size with a minimum clear border of ½" on the top, bottom, and right, and 1" minimum on the left for binding.

☐ A title in bold print centered near the top of the sheet. City and/or County jurisdiction and sectional location by quarter section, township, and range shall be included.

In the City of Desert Hot Springs, County of Riverside, State of California
"WATER IMPROVEMENT PLANS"
For
"Tract, Parcel Map Number, or Project Name"
Located in the northeast quarter of Section 36, T-2-S, R-1-E, SBBM

☐ A vicinity map drawn to scale clearly showing the project location within the surrounding area including major and bounding street names and City, County, or District boundaries as applicable. Bar Scale, north arrow, and scale in feet per inch shall be included and north shall be oriented to the top of sheet.

☐ Mission Springs Water District **"General Construction Notes"** current as of submittal date.

☐ Mission Springs Water District **"Notifications"** current as of submittal date.

☐ Mission Springs Water District **"Water Construction Notes"** current as of submittal date.

☐ A "Title Block" located on the front sheet and all sheets, usually located along the bottom or sometimes along the right side of all sheets. The title block shall be in the same location on all sheets of the sets. The sheet number and total sheets (1 of 6) and a ½ " x 1 ¾ " blank space for the district file number (district will fill in this number when mylars are submitted for signature). The title block shall contain Water Improvement Plans, Tract Number (or other project designation), and sheet description (cover sheet, Street Name, Easement Designation, etc.).

☐ The preparer's logo or block containing name, address, and telephone number shall appear on each sheet of the plans.

☐ Engineer's stamp and signature block including RCE number, signature line and date shall appear on each sheet of the set.

☐ Fire Department Approval block shall appear on each sheet of the plans for the Fire Marshal signature and date.

☐ Mission Springs Water District Approval block for General Manager including signature line and space for date shall be provided on each sheet of the set. The notation VOID AFTER ONE YEAR FROM

THIS DATE shall be at the bottom of this approval block.

- ☐ A revision block located in the title block, usually located on the left side of the title block. (The revision block shall contain space for the revision number with revision symbol, revision description, date, and initials of person submitting revisions).
- ☐ Developer's information shall be shown on the cover sheet. The Developer's Name, address, and telephone number with area code and contact person must be included.
- ☐ An "Underground Service Alert" notice with the phone number (811) shall be clearly shown on all sheets.
- ☐ Bench mark including description and NAVD 88 datum elevation shall be shown on all sheets.
- ☐ Basis of Bearings shall appear on the title sheet.
- ☐ A Sheet Index shall appear on the cover sheet (acceptable on sheet two if the project is too large).
- ☐ A Material Quantity Estimate shall be on the cover sheet.
- ☐ A Symbol Legend shall be on the cover sheet and symbols shall match those used on plans.
- ☐ A fire flow certification block including the design Engineers signature and date shall appear on the cover sheet.
- ☐ Typical Street Sections for all streets showing typical Sewer, Water, and Storm Drain locations and depths. Minimum cover for water and minimum and maximum cover for sewer and storm drains. These may appear on the second sheet if space prevents placement on cover sheet.
- ☐ An Index Map to scale (1"=200' preferred) shall appear on the cover or second sheet. The Index Map shall include the following:
    - ☐ Sheet locations for this plan shall be clearly indicated and any adjoining plans or phases referenced.
    - ☐ The tract and lot numbers or Assessors Parcel Numbers for the project and immediately adjacent properties.
    - ☐ Any phase lines for the project.
    - ☐ The location and size of all existing water lines showed dashed in light or ghosted line type.
    - ☐ Street names and right-of-way lines, easement lines, lot lines shall be shown within the project limits.
    - ☐ A North arrow and graphic scale including scale in feet per inch (1'=200"). North shall be up or to the right on sheet.

Water Plan and Profile Requirements

☐ Water Plan and profiles shall be prepared at scale of 1 "= 40' horizontal and 1"= 4' vertical for all projects unless prior approval is obtained from the District.

☐ Plan view shall be aligned beneath the profile by stationing as closely as possible and shall be oriented with north up or to the right using the 45 degree rule as permissible variation.

☐ All street names correct, lot numbers and parcel numbers shown on all properties.

☐ All existing water lines and existing utilities shall be shown in half tone or dashed lines.

☐ Proposed water mains shall be shown as bold solid lines in plan and profile views and proposed sewer and storm drains shall be shown in lighter solid lines.

☐ Proposed finish surface grade over water main shall be shown in profile where project is to be graded prior to construction.

☐ For construction of water mains through future phases or in dedicated easements that are not currently graded both existing and proposed grades over the water main shall be shown in the profile and existing contours shall be shown in plan view.

☐ The plan view shall show the location of proposed sewer and storm drain lines including laterals and catch basins and manholes. Linear dimensions to centerline shall be shown on all sheets.

☐ The waterline stationing shall be along the horizontal centerline of the pipe, continuous through all bends and curves and shall be tied to the street centerlines by dimensions. The water line stationing shall run in the same direction as sewer stationing. Waterline stationing shall be laid out beginning at tie in points on existing mains or tees or crosses within the project with station ticks at 50' intervals and station labels at even 100' stations.

☐ The size of the proposed water mains, material and class shall be correctly shown on both plan and profile. All water mains shall be class 350 ductile iron pipes unless the District Engineer has approved special arrangements. All fittings shall be ductile iron. Are all tie-in details required for clarity and are these tie-in points correctly called and shown on both the plan and profile view?

☐ The alignment shall be maintained consistent to centerline or curb face whenever possible, A minimum horizontal clearance of 11' shall be maintained between water and sewer mains. Minimum clearance from curbs shall be 4' unless otherwise approved by the District Engineer (See design requirements).

☐ The depth of the waterline shall be shown correctly in the profile. 3' minimum cover for 8” or smaller mains and 4' minimum cover for 12" and larger mains. Deep water mains, over 6' to the bottom of the pipe should be avoided where there may be conflicts with sewer laterals.

☐ Curved alignments are allowed on water mains and shall be designed to maintain maximum joint deflections of 2.5 degrees (0.0437S) for 8" and smaller mains and 1.5 degrees (0.0262S) for 12” & larger mains. A Curve Data Table shall be included on each sheet for all curves on the water main. Acceptable radii are as follows:

458' min. radius for 12" and smaller mains based on 20' pipe joints with 2.5 degrees deflection.
764' min. radius for mains 12" & over based on 20' pipe joints with 1.5 degrees deflection.
229' min. radius for 8" and smaller mains based on 10' pipe joints with 2.5 degrees deflection.
382' min. radius for mains 12" & over based on 10' pipe joints with 1.5 degrees deflection.

☐ Where curves require use of 10' pipe joints, the sections shall be clearly called out in profile.

☐ Where curves cannot be used then the alignment shall be designed using standard bends of 11 ½ degrees, 22 ½ degrees, or 45 degrees maintaining minimum clearances from sewers and curbs.

☐ When there is more than one water line shown on any alignment they shall be clearly labeled and the labels shall remain constant throughout the plans and profiles.

☐ The profile shall show all sewer and storm drain crossings with stations, elevations and clearances.

☐ Existing utility crossings or proposed points of connection to existing water mains shall be shown in the profile and show detail drawing on the plan view with a note to "field verify the location and elevation prior to construction".

☐ All water main junctions shall be made with standard ductile iron tees or crosses and valves shall be provided to minimize loss of service for maintenance or repair shutdowns. This usually requires at least 2 valves at tees and 3 at crosses.

☐ All water services, valves, fire hydrants, air valves, blow offs, points of curvature and grade breaks shall be shown in the profile with stations and invert elevations.

☐ Gate valves shall be used for mains 12" and smaller and butterfly valves shall be used for larger mains. All valves shall be called out on the plan and profile.

☐ Vertical grade breaks shall be limited to maximum deflection of 2.5 degrees (0.04375) for 12" and smaller mains and 1.5 degrees (0.02625) for larger mains.

☐ Water services shall be shown and stationed for each lot or property including size. All services shall be copper and sized per district requirements. Only one water service per property is allowed without the prior approval of the district engineer. Meter locations shall be clear of driveways or within 2' of common lot line if no driveway locations are shown. A minimum horizontal clearance of 10' (12' preferred) shall be maintained between water services and sewer laterals.

☐ All irrigation meters shall be shown and stationed on the plans drawing. Irrigation meters should indicate size, installation of back flow prevention device and location. Meter location shall comply with MSWD Standard specification for constructing water and sewer facilities.

☐ Air & vacuum release valves are required at all high points in main and may be required on long mains without services and shall be installed according to MSWD Standard Specifications for constructing water and sewer facilities.

☐ Blow offs are required at all low points on water mains. Use of fire hydrants for blow offs at low points is encouraged whenever practical and shall be installed according to MSWD Standard specification for constructing water and sewer facilities.

☐ Fire hydrants are required at all intersections and at the end of all cul-de-sac and at spacing in conformance with the Fire Department requirements on all streets. Fire hydrants shall be provided with a shut off valve at the main and no services shall be allowed on fire hydrant runs. Location shall be according with MSWD Standard Specifications for constructing water and sewer facilities and approved by the Fire Marshal.

☐ Fire services and fire hydrant locations shall be approved by the Fire Marshal prior to MSWD approval of plans.

☐ A Fire Flow Letter from the Fire Marshal stating the fire flow requirements and Conditions of

Approval for the project shall be provided to the District.

☐ Waterline easements shall be minimized and only when necessary the District will require that water main shall be provided with shutoff valves at both ends of any easement section. Easement shall be a minimum of 20 feet wide.

☐ Provide fire flow calculations showing full compliance with the Fire Marshal requirements for the project with the second plan check.

☐ Fire flow requirements shall be shown on the plans for all projects requiring a DCDA for building sprinkler systems listing the required pressure and demand for each building.

☐ Easement documents including grant deed, exhibit A (Legal Description), and exhibit B (Plat) are complete for the project.

☐ Engineers estimate has been received, reviewed and approved for the project.

☐ Approved landscape plans shall be received prior to approval of plans.

☐ Provide AutoCadd Drawing files in DWG e-transmitted including all xref, font, and plot files required for MSWD to plot or edit the files as needed.

WATER PLAN - COMMENT SHEET

1st PLAN CHECK: DATE:_____ BY: _____

COMMENTS
WATER PLANS: _____

_____

_____

_____

2nd PLAN CHECK: DATE: _____ BY: _____

COMMENTS
WATER PLANS: _____

_____

_____

_____

3rd PLAN CHECK: DATE: _____ BY: _____

COMMENTS
WATER PLANS: _____

_____

_____

_____

4th PLAN CHECK: DATE: _____ BY: _____

COMMENTS
WATER PLANS: _____

_____

_____

_____

FINAL PLAN CHECK REVIEW AND APPROVAL DATE: _____

APPENDIX D

MISSION SPRINGS WATER DISTRICT
SEWER PLAN CHECKING PROCEDURES

DEVELOPER: _____

ENGINEER: _____ **MSWD JOB No:** _____

DEVELOPMENT: _____ **PHASE No:** _____

PLAN CHECKED BY: _____ **REVIEWED BY:** _____

REVIEW DATES: **1st:** _____ **2nd:** _____ **3rd:** _____ **4th:** _____ **Final:** _____

Cover Sheet and General Requirements

☐ All sheets shall be 24" high X 36" wide overall sheet size with a minimum clear border of ½" on the top, bottom, and right, and 1" minimum on the left for binding.

☐ A title in bold print centered near the top of the sheet. City and/or County jurisdiction and sectional location by quarter section, township, and range shall be included.

In the City of Desert Hot Springs, County of Riverside, State of California
"SEWER IMPROVEMENT PLANS"
For
"Tract, Parcel Map Number, or Project Name"
Located in the northeast quarter of Section 36, T-2-S, R-1-E, SBBM

☐ A vicinity map drawn to scale clearly showing the project location within the surrounding area including major and bounding street names and City, County, or District boundaries as applicable. Bar Scale, north arrow, and scale in feet per inch shall be included and north shall be oriented to the top of sheet.

☐ Mission Springs Water District **"General Construction Notes"** current as of submittal date.

☐ Mission Springs Water District **"Notifications"** current as of submittal date.

☐ Mission Springs Water District **"Sewer Construction Notes"** current as of submittal date.

☐ A "Title Block" located on the front sheet and all sheets, usually located along the bottom or sometimes along the right side of all sheets. The title block shall be in the same location on all sheets of the sets. The sheet number and total sheets (1 of 6) and a ½" x 1 ¾" blank space for the District file number (District will fill in this number when mylars are submitted for signature). The title block shall contain Sewer Improvement Plans, Tract Number (or other project designation), and sheet description (cover sheet, Street Name, Easement Designation, etc.).

☐ The preparer's logo or block containing name, address, and telephone number shall appear on each sheet of the plans.

☐ Engineer's stamp and signature block including RCE number, signature line and date shall appear on each sheet of the set.

☐ Mission Springs Water District Approval block for General Manager including signature line and space for date shall be provided on each sheet of the set. The notation VOID AFTER ONE YEAR FROM THIS DATE shall be at the bottom of this approval block.

- ☐ A revision block located in the title block, usually located on the left side of the title block. (The revision block shall contain space for the revision number with revision symbol, revision description, date, and initials of person submitting revisions).
- ☐ Developer's information shall be shown on the cover sheet. The developer's name, address, and telephone number with area code and contact person must be included.
- ☐ An "Underground Service Alert" notice with the phone number (811) shall be clearly shown on all sheets.
- ☐ Bench mark including description and NAVD 88 datum elevation shall be shown on all sheets.
- ☐ Basis of Bearings shall appear on the title sheet.
- ☐ A Sheet Index shall appear on the cover sheet (acceptable on sheet two if the project is too large).
- ☐ A Material Quantity Estimate shall be on the cover sheet.
- ☐ A Symbol Legend shall be on the cover sheet and symbols shall match those used on plans.
- ☐ A Manhole and Cleanout Legend including number, station, rim elevation, invert elevation in and out with stub direction (N,E,S,W) shall be on the cover sheet.
- ☐ Typical Street Sections for all streets showing typical Sewer, Water, and Storm Drain locations and depths. Minimum cover for water and minimum and maximum cover for sewer and storm drains. These may appear on the second sheet if space prevents placement on cover sheet.
- ☐ An index Map to scale (1"=200' preferred) shall appear on the cover or second sheet. The index map shall include the following:
    - ☐ Sheet locations for this plan shall be clearly indicated and any adjoining plans or phases referenced.
    - ☐ The tract and lot numbers or Assessors Parcel Numbers for the project and immediately adjacent properties.
    - ☐ Any phase lines for the project.
    - ☐ The location and size of all existing sewer lines showed dashed in light or ghosted line type.
    - ☐ Street Names and right-of-way lines, easement lines, lot lines shall be shown within the project limits.
    - ☐ A North arrow and graphic scale including scale in feet per inch (1' = 200"). North shall be up or to the right on sheet.

Sewer Plan and Profile Requirements

☐ Sewer Plan and profiles shall be prepared at a scale of 1” = 40' horizontal and 1” = 4' vertical for all projects unless prior approval is obtained from the district.

☐ Plan view shall be aligned beneath the profile by stationing as closely as possible and shall be oriented with north up or to the right using the 45 degree rule as permissible variation.

☐ Sewer stationing and manhole numbering shall commence at the lowest manhole or point of connection for the project and shall proceed upstream on the **centerline of pipe** by street or easement alignment. Station Equations shall appear at all junction manholes and shall show reference to the appropriate sheet, stationing for lines from the junction shall begin at the centerline of the manhole and proceed upstream. All match lines shall be stationed in both plan and profile and should be placed at manholes when practical. Station ticks shall be placed at 50' Intervals on centerline of pipe and labeled at even 100' stations.

☐ Sewer alignments should parallel street centerline whenever possible. Curved sewers are permitted with a 2 ½” degree (0.04375) joint deflection for 12" and smaller pipes and 1 ½” degree (0.02625) joint deflection for 12" to 24" pipes. Where shorter than standard 6' pipe joints are required, the sections and required length shall be clearly noted in the profile.

☐ Minimum horizontal clearance between sewer and water mains shall be 11'.

☐ Only one point of curvature shall be allowed between manholes and no reverse curves will be allowed.

☐ No vertical curves are allowed in sewers, all grade breaks shall occur at manholes.

☐ Minimum grades for sewer mains are 0.40% for 8", 0.28% for 10", and 0.22% for 12”. Larger trunk lines will be based on the district approved hydraulic calculations.

☐ Manholes shall be designed with 0.10' minimum fall from inlet to outlet for straight through to 45 degree horizontal deflections and 0.20' minimum fall from inlet to outlet for junctions or deflections greater than 45 degrees. If the average slope of the inlet and outlet yields a greater drop then this shall control. For any junction manhole of sewers of the same diameter the inlets shall be the same elevation.

☐ Where sewers of different diameters junction at a manhole the inverts shall be based on matching the crown of the junctioning sewers.

☐ Maximum manhole spacing is 350’ center to center.

☐ 48" (4’) diameter manholes shall be used for sewers 8" through 24" diameter. 60" (5') diameter manholes for larger sewers and for sewer manholes with less than 5 foot in depth.

☐ Profile shall show inlet and outlet elevations and direction of all pipes, including stubs (100.00 Inv I inlet w) for all manholes except terminus manholes, which have a center grade and outlet. All manholes shall be shown with proposed rim elevations and labeled with depth to deepest invert.

☐ Pipe slopes in profile shall reflect actual pipe gradient between manholes, excluding manhole drops.

☐ Proposed finish surface grade over sewer shall be shown in profile where project is to be graded prior to sewer construction.

☐ For construction of sewers through future phases or in dedicated easements that are not currently graded both existing and proposed grades over the sewer main shall be shown in the profile and existing contours shall be shown in plan view.

☐ The profile shall show stations and invert elevations at all match lines, points of curvature, and water or storm drain crossing. Top or bottom of pipe elevations and clearances shall be labeled for proposed crossings. Crossings involving existing utilities shall call for field verification prior to construction.

☐ Where sewer lines cross under storm drains, structural encasement or special pipe will be required if vertical clearance is less than 3'.

☐ Plan view shall show all existing utilities in dashed lines with dimensions to centerline of street. All proposed water services and. meter locations, fire hydrants, blow offs, and air valves shall be shown by symbol in proper locations consistent with appropriate plans.

☐ Plan view shall show all existing and proposed curbs, gutters, sidewalks, and paving type and locations to scale with dimensions to centerline of streets. Driveway locations shall be shown.

☐ Proposed sewer later shall be shown and stationed for all lots. Laterals shall be shown with the line at actual station with the wye symbol shown in the direction of flow at the main line. Laterals shall have a minimum of 4' clearance of any manhole or lateral and may not be placed into any manhole. Laterals shall maintain a minimum of 10' clearance from water services (12' preferred) and shall be 4' clear of driveways. Sewer laterals shall extend to the right-of-way or public utility easement line, whichever is greater, perpendicular to the sewer main wherever possible.

☐ Minimum grade for normal 4" sewer laterals shall be 2.00%. Where sewers are less than 8' deep or parallel storm drains or large water lines may conflict with laterals then a special detail section shall be shown for "engineered laterals" and invert elevations shall be specified on the plan.

☐ Sewer size and materials shall be called out In both plan and profile.

☐ Easement documents including grant deed, exhibit A (Legal Description), and exhibit B (Plat) are complete for the project.

☐ Engineers estimate has been received, reviewed and approved for the project.

☐ Approved landscape plans shall be received prior to approval of plans.

☐ Provide AutoCadd Drawing files in DWG e-transmitted including all xref, font, and plot files required for MSWD to plot or edit the files as needed.

SEWER PLAN - COMMENT SHEET

1st PLAN CHECK: DATE:_____ BY: _____

COMMENTS
SEWER PLANS: _____

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2nd PLAN CHECK: DATE: _____ BY: _____

COMMENTS
SEWER PLANS: _____

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3rd PLAN CHECK: DATE: _____ BY: _____

COMMENTS
SEWER PLANS: _____

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4th PLAN CHECK: DATE: _____ BY: _____

COMMENTS
SEWER PLANS: _____

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_____

FINAL PLAN CHECK REVIEW AND APPROVAL DATE: _____

APPENDIX E

MISSION SPRINGS WATER DISTRICT
WATER & SEWER POINT OF CONNECTION PLAN CHECKING PROCEDURES

DEVELOPER: _____

ENGINEER: _____ **MSWD JOB No:** _____

DEVELOPMENT: _____ **PHASE No:** _____

PLAN CHECKED BY: _____ **REVIEWED BY:** _____

REVIEW DATES: **1st:** _____ **2nd:** _____ **3rd:** _____ **4th:** _____ **Final:** _____

Cover Sheet and General Requirements

☐ All sheets shall be 24" high X 36" wide overall sheet size with a minimum clear border of ½" on the top, bottom, and right, and 1" minimum on the left for binding.

☐ A title in bold print centered near the top of the sheet. City and/or County jurisdiction and sectional location by quarter section, township, and range shall be included.

In the City of Desert Hot Springs, County of Riverside, State of California
"WATER and SEWER IMPROVEMENT PLANS"
For
Project Name
Located in the southeast quarter of Section 15, T-3-S, R-4-E, SBBM (UPDATE FOR PROJECT)
APN

☐ A vicinity map drawn to scale clearly showing the project location within the surrounding area including major and bounding street names and City, County, or District boundaries as applicable. Bar Scale, north arrow, and scale in feet per inch shall be included and north shall be oriented to the top of sheet.

☐ Mission Springs Water District **"General Construction Notes"** current as of submittal date.

☐ Mission Springs Water District **"Notifications"** current as of submittal date.

☐ Mission Springs Water District **"Water Construction Notes"** current as of submittal date.

☐ A "Title Block" located on all sheets usually located along the bottom or sometimes along the right side of all sheets. The title block shall be in the same location on all sheets of the sets. The sheet number and total sheets (1 of 6) and a ½" x 1 ¾" blank space for the district file number (district will fill in this number when mylars are submitted for signature). The title block shall contain Water and Sewer Improvement Plans, Tract Number (or other project designation), and sheet description (cover sheet, Street Name, Easement Designation, etc.).

☐ The preparer's logo or block containing name, address, and telephone number shall appear on each sheet of the plans.

☐ Engineer's stamp and signature block including RCE number, signature line and date shall appear on each sheet of the plans.

☐ Fire Department Approval block shall appear on each sheet of the plans for the Fire Marshal signature

and date.

- ☐ Mission Springs Water District Approval block for General Manager including signature line and space for date shall be provided on each sheet of the set. The notation VOID AFTER ONE YEAR FROM THIS DATE shall be at the bottom of this approval block.
- ☐ Revision block located in the title block, usually located on the left side of the title block. (The revision block shall contain space for the revision number with revision symbol, revision description, date, and initials of person submitting revisions).
- ☐ Developer's information shall be shown on the cover sheet. The Developer's Name, address, and telephone number with area code and contact person must be included.
- ☐ An "Underground Service Alert" notice with the phone number (811) shall be clearly shown on all sheets.
- ☐ Bench mark including description and NAVD 88 datum elevation shall be shown on all sheets.
- ☐ Basis of Bearings shall appear on the title sheet.
- ☐ A Sheet Index shall appear on the cover sheet (acceptable on sheet two if the project is too large).
- ☐ A Material Quantity Estimate for MSWD items, including Std. Dwg. numbers shall be on the cover sheet.
- ☐ A Symbol Legend shall be on the cover sheet and symbols shall match those used on plans.
- ☐ A fire flow certification block including the design Engineers signature and date shall appear on the cover sheet.
- ☐ Typical Street Sections for all streets showing typical Sewer, Water, and Storm Drain locations and depths. Minimum cover for water and minimum and maximum cover for sewer and storm drains. These may appear on the second sheet if space prevents placement on cover sheet.
- ☐ An Index Map to scale (1"=200' preferred) shall appear on the cover or second sheet. The Index Map shall include the following:
    - ☐ Sheet locations for this plan shall be clearly indicated and any adjoining plans or phases referenced.
    - ☐ The tract and lot numbers or Assessors Parcel Numbers for the project and immediately adjacent properties.
    - ☐ Project parcel lines need to be bold.
    - ☐ The location and size of all existing water lines showed dashed in light or ghosted line type.
    - ☐ Street names and right-of-way lines, easement lines, lot lines shall be shown within the project limits, including both sides of streets.
    - ☐ A North arrow and graphic scale including scale in feet per inch (1'=200"). North shall be up or to the right.

Water and Sewer Plan Requirements

☐ Plans shall be prepared at horizontal scale of 1"= 20' or 1"= 40' for all projects unless prior approval is obtained from the District.

☐ Plan view shall be oriented with north up or to the right using the 45° rule as permissible variation.

☐ All street names correct, lot numbers and parcel numbers shown on all properties.

☐ Existing water and sewer lines and existing utilities shall be shown in half tone or dashed lines and shall be dimensioned from centerline.

☐ Proposed water and sewer connections shall be shown as bold solid lines and other proposed utilities and storm drains shall be shown in lighter solid lines.

☐ Plan view shall show the stationed location of proposed water and sewer connections. Connections shall be installed perpendicular to the right-of-way with no bends.

☐ The stationing shall be along the horizontal centerline of the pipe, continuous through all bends and curves and shall be tied to the street centerlines by dimensions. Stations may reference existing MSWD plans or may be stationed using an assumed tie location shown on the plans.

☐ MSWD Dwg. Numbers shall be shown for all new water or sewer connections.

☐ Water service installations shall be performed under direct MSWD inspection as follows:

- 1” and 2” services shall be per MSWD Std. Dwg. W-09 by hot-tap method.
- 4” and larger shall be installed using a cut-in tee and mainline valve and service valve unless prior approval by MSWD.

☐ Sewer lateral connections to existing, active sewers shall be labeled with invert elevations, slopes, length, and “install under direct MSWD inspection” shall generally be designed as follows:

- 4” VCP lateral connecting to 8” or larger VCP sewer main shall be per MSWD Std. Dwg. S-16.
- 6” VCP lateral connecting to 10” or larger VCP sewer main shall be per MSWD Std. Dwg. S-16.
- 6” VCP lateral connecting to 8” VCP sewer main shall be per MSWD staff direction.
- 8” or larger VCP lateral shall be installed using a hot tap sewer manhole per MSWD Std. Dwg. S-10 constructed on the existing sewer and shall terminate in a standard manhole located on the right-of-way line.

☐ Existing utility crossings shall be shown on the plan with a note to "field verify the location and elevation prior to construction".

☐ Vertical grade breaks shall be limited to maximum deflection of 2.5° (0.0437S) for 12" and smaller pipes and 1.5° (0.0262S) for larger pipes and shall not coincide with horizontal deflections.

☐ Water services shall be shown and stationed for each lot or property including size. All services shall be copper and sized per district requirements. Only one water service per property is allowed without the prior approval of the District engineer. Meter locations shall be clear of driveways or within 2' of common lot line if no driveway locations are shown. A minimum horizontal clearance of 10' (12' preferred) shall be maintained between water services and sewer laterals.

☐ All irrigation meters shall be shown and stationed on the plans drawing. Irrigation meters should indicate size, installation of back flow prevention device and location. Meter location shall comply with MSWD Standard specification for constructing water and sewer connections.

- ☐ Fire hydrants are required at all intersections and at the end of all cul-de-sac and at spacing in conformance with the Fire Department requirements on all streets. Fire hydrants shall be provided with a shut off valve at the main and no services shall be allowed on fire hydrant runs. Location shall be according with MSWD Standard Specifications for constructing water and sewer connections and approved by the Fire Marshal.
- ☐ Fire services and fire hydrant locations shall be approved by the Fire Marshal prior to MSWD approval of plans.
- ☐ A Fire Flow Letter from the Fire Marshal stating the fire flow requirements and Conditions of Approval for the project shall be provided to the District.
- ☐ Waterline easements shall be minimized and only when necessary, the District will require that water main shall be provided with shutoff valves at both ends of any easement section. Easement shall be a minimum of 20' wide.
- ☐ Provide fire flow calculations showing full compliance with the Fire Marshal requirements for the project with the second plan check.
- ☐ Fire flow requirements shall be shown on the plans for all projects requiring a DCDA for building sprinkler systems listing the required pressure and demand for each building.
- ☐ Easement documents including grant deed, exhibit A (Legal Description), and exhibit B (Plat) are complete for the project.
- ☐ Engineers estimate has been received, reviewed and approved for the project.
- ☐ Approved landscape plans shall be received prior to approval of plans.
- ☐ Provide AutoCadd Drawing files in DWG e-transmitted including all xref, font, and plot files required for MSWD to plot or edit the files as needed.

WATER and SEWER POC PLAN - COMMENT SHEET

1st PLAN CHECK: DATE:_____ BY: _____

COMMENTS
WATER AND SEWER POC PLANS: _____

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2nd PLAN CHECK: DATE: _____ BY: _____

WATER AND SEWER POC PLANS: _____

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3rd PLAN CHECK: DATE: _____ BY: _____

WATER AND SEWER POC PLANS: _____

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_____

4th PLAN CHECK: DATE: _____ BY: _____

WATER AND SEWER POC PLANS: _____

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_____

_____

FINAL PLAN CHECK REVIEW AND APPROVAL DATE: _____

APPENDIX F

MISSION SPRINGS WATER DISTRICT
WATER POINT OF CONNECTION PLAN CHECKING PROCEDURES

DEVELOPER: _____

ENGINEER: _____ **MSWD JOB No:** _____

DEVELOPMENT: _____ **PHASE No:** _____

PLAN CHECKED BY: _____ **REVIEWED BY:** _____

REVIEW DATES: 1st: _____ **2nd:** _____ **3rd:** _____ **4th:** _____ **Final:** _____

Cover Sheet and General Requirements

☐ All sheets shall be 24" high X 36" wide overall sheet size with a minimum clear border of ½" on the top, bottom, and right, and 1" minimum on the left for binding.

☐ A title in bold print centered near the top of the sheet. City and/or County jurisdiction and sectional location by quarter section, township, and range shall be included.

In the City of Desert Hot Springs, County of Riverside, State of California
"WATER IMPROVEMENT PLANS"
For
Project Name
Located in the southeast quarter of Section 15, T-3-S, R-4-E, SBBM (UPDATE FOR PROJECT)
APN

☐ A vicinity map drawn to scale clearly showing the project location within the surrounding area including major and bounding street names and City, County, or District boundaries as applicable. Bar Scale, north arrow, and scale in feet per inch shall be included and north shall be oriented to the top of sheet.

☐ Mission Springs Water District **"General Construction Notes"** current as of submittal date.

☐ Mission Springs Water District **"Notifications"** current as of submittal date.

☐ Mission Springs Water District **"Water Construction Notes"** current as of submittal date.

☐ A "Title Block" located on all sheets usually located along the bottom or sometimes along the right side of all sheets. The title block shall be in the same location on all sheets of the sets. The sheet number and total sheets (1 of 6) and a ½" x 1 ¾" blank space for the district file number (district will fill in this number when mylars are submitted for signature). The title block shall contain Water and Sewer Improvement Plans, Tract Number (or other project designation), and sheet description (cover sheet, Street Name, Easement Designation, etc.).

☐ The preparer's logo or block containing name, address, and telephone number shall appear on each sheet of the plans.

☐ Engineer's stamp and signature block including RCE number, signature line and date shall appear on each sheet of the plans.

☐ Fire Department Approval block shall appear on each sheet of the plans for the Fire Marshal signature and date.

- ☐ Mission Springs Water District Approval block for General Manager including signature line and space for date shall be provided on each sheet of the set. The notation VOID AFTER ONE YEAR FROM THIS DATE shall be at the bottom of this approval block.
- ☐ Revision block located in the title block, usually located on the left side of the title block. (The revision block shall contain space for the revision number with revision symbol, revision description, date, and initials of person submitting revisions).
- ☐ Developer's information shall be shown on the cover sheet. The Developer's Name, address, and telephone number with area code and contact person must be included.
- ☐ An "Underground Service Alert" notice with the phone number (811) shall be clearly shown on all sheets.
- ☐ Bench mark including description and NAVD 88 datum elevation shall be shown on all sheets.
- ☐ Basis of Bearings shall appear on the title sheet.
- ☐ A Sheet Index shall appear on the cover sheet (acceptable on sheet two if the project is too large).
- ☐ A Material Quantity Estimate for MSWD items, including Std. Dwg. numbers shall be on the cover sheet.
- ☐ A Symbol Legend shall be on the cover sheet and symbols shall match those used on plans.
- ☐ A fire flow certification block including the design Engineers signature and date shall appear on the cover sheet.
- ☐ Typical Street Sections for all streets showing typical Sewer, Water, and Storm Drain locations and depths. Minimum cover for water and minimum and maximum cover for sewer and storm drains. These may appear on the second sheet if space prevents placement on cover sheet.
- ☐ An Index Map to scale (1"=200' preferred) shall appear on the cover or second sheet. The Index Map shall include the following:
    - ☐ Sheet locations for this plan shall be clearly indicated and any adjoining plans or phases referenced.
    - ☐ The tract and lot numbers or Assessors Parcel Numbers for the project and immediately adjacent properties.
    - ☐ Project parcel lines need to be bold.
    - ☐ The location and size of all existing water lines showed dashed in light or ghosted line type.
    - ☐ Street names and right-of-way lines, easement lines, lot lines shall be shown within the project limits, including both sides of streets.
    - ☐ A North arrow and graphic scale including scale in feet per inch (1'=200"). North shall be up or to the right.

☐ Plans shall be prepared at horizontal scale of 1"= 20' or 1"= 40' for all projects unless prior approval is obtained from the District.

☐ Plan view shall be oriented with north up or to the right using the 45° rule as permissible variation.

☐ All street names correct, lot numbers and parcel numbers shown on all properties.

☐ Existing water and sewer lines and existing utilities shall be shown in half tone or dashed lines and shall be dimensioned from centerline.

☐ Proposed water and sewer connections shall be shown as bold solid lines and other proposed utilities and storm drains shall be shown in lighter solid lines.

☐ Plan view shall show the stationed location of proposed water and sewer connections. Connections shall be installed perpendicular to the right-of-way with no bends.

☐ The stationing shall be along the horizontal centerline of the pipe, continuous through all bends and curves and shall be tied to the street centerlines by dimensions. Stations may reference existing MSWD plans or may be stationed using an assumed tie location shown on the plans.

☐ MSWD Dwg. Numbers shall be shown for all new water or sewer connections.

☐ Water service installations shall be performed under direct MSWD inspection as follows:

- 1” and 2” services shall be per MSWD Std. Dwg. W-09 by hot-tap method.
- 4” and larger shall be installed using a cut-in tee and mainline valve and service valve unless prior approval by MSWD.

☐ Existing utility crossings shall be shown on the plan with a note to "field verify the location and elevation prior to construction".

☐ Vertical grade breaks shall be limited to maximum deflection of 2.5° (0.0437S) for 12" and smaller pipes and 1.5° (0.0262S) for larger pipes and shall not coincide with horizontal deflections.

☐ Water services shall be shown and stationed for each lot or property including size. All services shall be copper and sized per district requirements. Only one water service per property is allowed without the prior approval of the district engineer. Meter locations shall be clear of driveways or within 2' of common lot line if no driveway locations are shown. A minimum horizontal clearance of 10' (12' preferred) shall be maintained between water services and sewer laterals.

☐ All irrigation meters shall be shown and stationed on the plans drawing. Irrigation meters should indicate size, installation of back flow prevention device and location. Meter location shall comply with MSWD Standard specification for constructing water and sewer connections.

☐ Fire hydrants are required at all intersections and at the end of all cul-de-sac and at spacing in conformance with the Fire Department requirements on all streets. Fire hydrants shall be provided with a shut off valve at the main and no services shall be allowed on fire hydrant runs. Location shall be according with MSWD Standard Specifications for constructing water and sewer connections and approved by the Fire Marshal.

☐ Fire services and fire hydrant locations shall be approved by the Fire Marshal prior to MSWD approval of plans.

☐ A Fire Flow Letter from the Fire Marshal stating the fire flow requirements and Conditions of Approval for the project shall be provided to the District.

☐ Waterline easements shall be minimized and only when necessary the District will require that water main shall be provided with shutoff valves at both ends of any easement section. Easement shall be a minimum of 20’ wide.

☐ Water main under crossings shall be per district standards and shall include a blow off at the low point and an air release valve at any high point. Locations, stations, elevations, and clearances shall be shown in the plan view and a detail.

☐ Provide fire flow calculations showing full compliance with the Fire Marshal requirements for the project with the second plan check.

☐ Fire flow requirements shall be shown on the plans for all projects requiring a DCDA for building sprinkler systems listing the required pressure and demand for each building.

☐ Easement documents including grant deed, exhibit A (Legal Description), and exhibit B (Plat) are complete for the project.

☐ Engineers estimate has been received, reviewed and approved for the project.

☐ Approved landscape plans shall be received prior to approval of plans.

☐ Provide AutoCadd Drawing files in DWG e-transmitted including all xref, font, and plot files required for MSWD to plot or edit the files as needed.

WATER PLAN - COMMENT SHEET

1st PLAN CHECK: DATE:_____ BY: _____

COMMENTS
WATER PLANS: _____

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2nd PLAN CHECK: DATE: _____ BY: _____

COMMENTS
WATER PLANS: _____

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3rd PLAN CHECK: DATE: _____ BY: _____

COMMENTS
WATER PLANS: _____

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4th PLAN CHECK: DATE: _____ BY: _____

COMMENTS
WATER PLANS: _____

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FINAL PLAN CHECK REVIEW AND APPROVAL DATE: _____

APPENDIX G

TRACT DEVELOPMENT FEE CHECKLIST

DEVELOPER'S NAME:_____ TRACT/PM:_____

DATE RECEIVED: _____

☐ **Bonds:** Labor & Materials & Faithful Performance or copies from County or City

☐ **Contracts:** Water/Sewer System Construction Agreement (3 signed originals)

☐ **Contractor:** Name _____

☐ **Contractor:** Copy of contractor's bid with unit cost breakdown

☐ **Contractor:** Certificate of Insurance and endorsements (MSWD named as additional insured)

☐ **Deposit:** engineering and plan check plan review fees $_____

☐ **Fees:** Landscape Plan Review Fee $_____

☐ **Fees:** Sewer Connection Fee – See attached cost worksheet.

☐ **Fees:** Meter Fees / Fire flow or front footage fees - See attached cost worksheet.

☐ **Form Letter:** Curb and gutter installed waiver letter: (developer signs)

☐ **Form Letter:** Roads graded to sub-grade letter: (Licensed civil engineer signs)

☐ **Maps:** 4 bond copies of approved water/sewer plans.

☐ **Maps:** Recorded Record Map: (copy or supply blanket easement)

☐ **Maps:** Tract phasing Map: Lot numbers and street names (8½"x 11" Black & White)

☐ **Maps:** Chart: Lot #'s and pad elevation for entire tract

☐ **Right of Way:** Type of Easement(s):

☐ **Right of Way:** Encroachment Permit if working in a Public Right of Way

☐ **Notice to Proceed:** Issued after all line items received and deposits paid.

Mail to:

Mission Springs Water District
66575 Second Street
Desert Hot Springs, CA 92240
Phone (760) 329-6448 Fax (760) 329-2482

APPENDIX H

Improvement District No. N/A

MISSION SPRINGS WATER DISTRICT
WATER SYSTEM CONSTRUCTION AGREEMENT
(DEVELOPER INITIATED/CONTRACTOR INSTALLED)

THIS WATER SYSTEM CONSTRUCTION AGREEMENT ("Agreement") is made on this _____day of _____, 20 __by and between MISSION SPRINGS WATER DISTRICT, a County Water District ("District") with its headquarters at 66575 2nd Street, Desert Hot Springs, Riverside County, California," and _____ ("Developer") located at DEVELOPER ADDRESS, phone No. DEVELOPER PHONE NUMBER.

RECITALS

WHEREAS, Developer is planning the construction of a project ("Project") of seventy-six (76) residential lot(s) which is the subject to a **Tract Map No.** _____ further described and identified on the map attached to and made a part of this Agreement as Exhibit "A" ("Property") and which is subject to the Landscape Plan attached hereto and made a part hereof by this reference as Exhibit "B"; and

WHEREAS, the Project will require a water distribution system to provide domestic water service to the to be designed and built by Developer (the "System"); and

WHEREAS, said Developer is desirous of having the District provide domestic water service to said Project and is willing to convey to the District the System after the construction thereof, contingent upon the District's acceptance of such conveyance on the terms and conditions set forth herein.

AGREEMENT

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. **Compliance with Law.** Developer will comply with all applicable state, federal and local laws, statutes and ordinances and the District's ordinances, policies and regulations for planning and constructing the System ("Requirements"). The forgoing laws and regulations, as amended from time to time, are hereby incorporated herein by reference. Developer agrees to comply with the water conservation requirements set by MSWD and the Land Use Agency as well as the Landscape Plan.

2. **District Expenses Covered**. The Developer shall deposit, with the District, costs to cover necessary engineering and other services, permits, inspections and water system connection costs in an amount estimated by the District. Said deposit shall be increased and/or replenished if District determines that the amount deposited is not sufficient to cover the costs as estimated by the District from time to time.

3. **Completion of Work**. The Developer shall contract for the design of the System by a licensed civil engineer experienced in the design of similar systems. The System to service the Project shall comply with the Requirements and construction plans for the same shall be presented

to the District for approval by the District prior to the presentation thereof to Contractors for bidding purposes. Such System shall include all pipelines, valves, hydrants and appurtenances as required by District subject to the Requirements. The Developer shall at its sole cost and expense secure title to property, easements, and rights of way needed for the System prior to the commencement of construction and shall convey offers of dedication or grant deeds along with necessary roads for ingress and egress and for maintenance and operation of the water system. The Developer shall file a Notice of Completion upon completion of the water system.

4. **Licensed Contractor**. The Developer will contract for the services of a licensed and qualified contractor ("Contractor") to construct the System. Said contract shall be signed by Developer and the licensed Contractor. Said Contractor shall be currently licensed by the State of California with a General engineering Contractor, "A" license and/or other appropriate license needed to construct the System. Said Contractor shall be experienced in the construction of domestic water systems and shall have been reviewed by the District and listed by the District as qualified contractor before a contract is signed and actual system construction begins. However, the District's approval of the Contractor shall in no way be deemed to impose on District any liability for the acts or omissions of said Contractor.

5. **Payment and Performance**. The entire cost of the construction of the System shall be paid by the Developer as and when the amounts are due in such regards. Developer and Contractor shall assure that such construction is inspected by District personnel for conformance with the approved plans and specifications and the Requirements. Whenever the Contractor desires to work outside the regular or specified work periods or to vary the work period during any particular day, Contractor shall request permission from the District at least 24 hours in advance so that inspection services may be provided. If the District grants permission and if the work period includes hours outside the normal work hours of the District, the Developer shall pay for the inspection services provided outside of normal work hours in accordance with established District rates. Construction shall not begin until the "Notice to Proceed" is given by the District inspector nor until the Developer, or other authorized party, completes a "CERTIFICATION OF STREETS TO FINAL GRADE" for the streets in which the water pipelines are to be constructed. District inspection is for the purpose of conformance of construction with District requirements, and not for compliance by the Contractor with safety requirements. Inspection or final acceptance shall not constitute a waiver by the District of any claims against Developer and/or Contractor for any defects in the work performed hereunder and shall not result in the imposition on District of any liability with regards to the same. Developer shall guarantee the completion of construction of the Work by _____.
Developer agrees to pay all costs incurred by the District as it may incur and as may be necessary in connection with Contractor completing the Work, including administrative costs.

6. **Insurance and Indemnity**. Developer's contractor shall provide required insurance certificates and endorsements as outlined below:

   6.1 Indemnification: To the extent permitted by law, Developer (as well as Contractor and any other contractors or subcontractors hired to do any construction work), shall defend, indemnify and hold harmless Mission Springs Water District, its directors, officers, employees, and authorized volunteers from and against all claims, damages, losses and expenses, including reasonable attorneys' fees and costs to defend arising out of the performance of the work described herein, and caused in whole or in part by any negligent act or omission of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone whose acts any of them may be liable, except where

caused by the active negligence, sole negligence, or willful misconduct of the Mission Springs Water District, its directors, officers, employees, and authorized volunteers.

6.2 Minimum Insurance Requirements: The Developer shall require Contractor (including any contractors or subcontractors hired to do any construction work) to procure and maintain for the duration of the proposed construction, insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the proposed construction and the activities of the Contractor, guests, agents, representatives, employees or contractors and subcontractors. The Developer's contractor shall provide and maintain the following commercial general liability, automobile liability, workers' compensation coverages as permitted by law:

6.3 Coverage: Coverage shall be at least as broad as the following:

a) **General Liability** - Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 00 01) including products and completed operations, property damage, bodily injury and personal & advertising injury with limits of at least two million dollars ($5,000,000) per occurrence or the full per occurrence limits of the policies available, whichever is greater. If Commercial General Liability Insurance or other form with a general aggregate limit, either the general aggregate limit shall apply separately to the project/location (with the ISO CG 25 03, or ISO CG 25 04, or insurer's equivalent endorsement provided to MSWD) or the general aggregate limit shall be twice the required occurrence limit.

b) **Automobile Liability -** Insurance Services Office (ISO) Business Auto Coverage (Form CA 00 01), covering Symbol 1 (any auto) or if Contractor has no owned autos, Symbol 8 (hired) and 9 (non-owned) with limit of one million dollars ($1,000,000) for bodily injury and property damage each accident.

c) **Workers' Compensation Coverage –** By his/her signature hereunder, Developer certifies that it is aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and it shall cause Contractor to comply with such provisions before commencing the performance of the work of this agreement. Contractors and sub-contractors will keep workers' compensation insurance for their employees in effect during all work covered by this Agreement. The Contractor shall provide workers' compensation coverage as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limits of no less than $1,000,000 per accident for bodily injury or disease. **Waiver of Subrogation** (also known as Transfer of Rights of Recovery Against Others to Us): The Contractor will be required to waive rights of subrogation to obtain endorsement necessary to affect this waiver of subrogation in favor of the Mission Springs Water District, its directors, officers, employees, and authorized volunteers, for losses paid under the terms of this coverage which arise from work performed by the Named Insured for the Mission Springs Water District; this provision applies regardless of whether or not the Mission Springs Water District has received a waiver of subrogation from the insurer.

d) Builder's Risk – (Course of Construction) if necessary- insurance utilizing an "All Risk" (Special Perils) coverage form with limits equal to the completed value of the project and no coinsurance penalty provision.

e) Contractor's Pollution Liability – (optional: if project involves environmental hazards) with limits no less than $5,000,000 per occurrence or claim, and $10,000,000 policy aggregate.

If the Contractor maintains broader coverage and/or higher limits than the minimums shown above, the District requires and shall be entitled to the broader coverage and/or higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the District.

6.4 Required Provisions - The Commercial General Liability policies are to contain, or be endorsed to contain, the following provisions:

a) **Additional Insured Status:** MSWD, its directors, officers, employees, and authorized volunteers are to be given insured status (at least as broad as ISO Form CG 20 12 05 09 or for projects including construction ISO Form CG 20 10 11 85 or both CG 20 10 10 01 and CG 20 37 10 01 including ongoing and completed operations), as respects: liability arising out of the work or activities performed by or on behalf of the Contractor including materials, parts, or equipment furnished in connection with such work or operations, and automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to District, its directors, officers, employees, and authorized volunteers.

b) **Primary Coverage:** For any claims related to this project, the Contractor's insurance coverage shall be primary at least as broad as ISO CG 20 01 04 13 as respects to the District, its directors, officers, employees, and authorized volunteers. Any insurance or self-insurance maintained by the District, its directors, officers, employees, and authorized volunteers; shall be excess of the Contractor's insurance and shall not contribute with it.

6.5 Notice of Cancellation: Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the Mission Springs Water District.

6.6 Acceptability of Insurers: Insurance is to be placed with insurers having a current A.M. Best rating of no less than A: VII, or as otherwise approved by Mission Springs Water District.

The Contractor agrees and he/she will comply with such provisions before commencing project. All of the insurance shall be provided on policy forms and through companies satisfactory to Mission Springs Water District. Mission Springs Water District reserves the right to require complete, certified copies of all required insurance policies, including policy Declaration and Endorsement pages. Failure to continually satisfy the Insurance requirements is a material breach of contract.

6.7 Verification of Coverage: Contractor shall furnish the District with certificates and amendatory endorsements affecting coverage required by the above provisions. All certificates and endorsements are to be received and approved by the District least five days before the Contractor commences activities.

6.8 Contractors and Subcontractors: Contractor shall require and verify that all Contractors and subcontractors maintain the liability insurance requirements stated

herein, and Contractor shall ensure that Mission Springs Water District, its directors, officers, employees, and authorized volunteers are additional insureds on the commercial general liability insurance policy of all Contractors who hire subcontractors to perform work on the scheduled project with a form at least as broad as CG 20 38 04 13.

6.9 Continuation of Coverage: Contractor shall maintain for the duration of the contract, and for 5 years thereafter, insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees, or subcontractors. Contractor shall be required to waive all rights of subrogation under this Agreement. If any of the required coverages expire during the term of this Agreement, the Contractor shall be required to provide a renewal Certificate including the Additional Insured endorsement to the District at least ten (10) days prior to the expiration date.

6.10 Other Considerations/Exceptions: When the Mission Springs Water District determines that any construction work may involve potential environmental pollution liability, the Commercial General Liability policy shall include Contractor's Pollution Liability –with limits no less than $5,000,000 per occurrence or claim, and $10,000,000 policy aggregate.

7. Bonds. Developer shall provide the District with bonds or evidence of bonds as follows:

a) Performance bond with corporate surety or sureties satisfactory to the District said performance bond being for not less than one hundred percent (100%) of the total contract price.

b) A labor and materials payment bond being for not less than one hundred percent (100%) of the total contract price.

8. Notice of Completion. The District's Inspector shall complete a "Notice of Final Inspection" when all work has been completed in accordance with District requirements and prior to the Acceptance of said domestic water system by the District. An executed Notice of Completion shall be filed by the District. The Developer shall comply with the following requirements:

a) A Bill of Sale executed by the Developer vesting title of said water system and appurtenances to the District;

b) A copy of the contract between Developer and Developer's Contractor or other documents which verify the actual cost of the domestic water system as installed.

c) Payment to the District by the Developer of any and all applicable fees including, but not limited to Connection Charge, Fire flow or front footage fee, and meter installation fees.

9. Warranty. The Developer shall guarantee the entire work shall be constructed in a good and workman like manner and all materials furnished shall be new and of high quality and both of the forgoing will meet all the requirements specified herein. This warranty shall include both the quality of the workmanship and the materials used as well as that of subcontractors and suppliers.

a) The Developer shall agree to make any repairs or replacements made necessary by defective materials or workmanship in the pipe materials supplied which have become evident within one year after date of recording Notice of Completion, and to restore to full compliance with the requirements of these specifications, including the test requirements, any part of the water system, which during said one-year period, is found to be deficient with respect to any provision of this specification.

b) The Developer shall make all repairs and replacements promptly upon receipt of written orders from MSWD or if, in the event the repair work must be performed by MSWD, shall reimburse MSWD for actual labor, equipment and material expenses incurred to perform such corrective work. If the Developer fails to make the repair and replacements promptly, MSWD may do the work, and the Developer shall be liable to MSWD for the cost thereof as described above.

10. **Water Services**. The District will not furnish service to the water system until the completed system passes final inspection by the District, and Developer has fully complied with all provisions of this Agreement. Following fulfillment of the terms and conditions herein and acceptance by the District of said domestic water system, the District will provide service to said lands in accordance with the District's rules and regulations governing the provisions of such service. District requires that a permanent meter must be installed prior to landscaping.

11. **Successors and Assigns**. This agreement is binding on the assigns of the District and on the assigns, successors and representatives of the Developer. Assignment of this agreement by the Developer shall require the prior written consent of the District.

12. **Contractor's License**. The Contractor must possess at the time of commencing work and throughout the Project duration, a Contractor's License, issued by the State of California, which is current and in good standing. The Developer and Contractor shall ensure that any subcontractor working on the Project possesses at the time of commencing work and throughout the Project duration, a Contractor's License, issued by the State of California, which is current and in good standing.

13. **Corporation In Good Standing**. If Contractor and/or Developer is a corporation or other entity, the undersigned hereby represents and warrants that the corporation or other entity is duly incorporated and in good standing in the State of California, and that the undersigned is authorized to act for and bind the corporation.

14. **Provisions Required by Law.** Each and every provision of law and clause required by law to be inserted in this Agreement shall be deemed to be inserted herein and the Agreement shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not currently inserted, then upon application of either party the Agreement shall forthwith be physically amended to make such insertion or correction.

15. **Attorneys' Fees**. In the event that either party brings an action to enforce this Agreement, the prevailing party in such action shall be entitled to an award of the costs and expenses incurred in connection with such action including but not limited to attorneys fees, expert witness fees, and filing fees.

16. **Entire Agreement**. This Agreement and the Exhibits and Recitals to this Agreement, which are incorporated herein by this reference, constitute the entire contract of the parties. No other

agreements or contracts, whether oral or written, pertaining to the work to be performed, exists between the parties. This Agreement can be modified only by an amendment in writing, signed by both parties.

EXHIBITS:

Project Overview Map – Exhibit A
Approved Landscape Plan – Exhibit B

MISSION SPRINGS WATER DISTRICT	DEVELOPER
	Company: _____
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

APPENDIX I

Improvement District No. N/A

MISSION SPRINGS WATER DISTRICT
SEWER SYSTEM CONSTRUCTION AGREEMENT
(DEVELOPER INITIATED/CONTRACTOR INSTALLED)

THIS SEWER SYSTEM CONSTRUCTION AGREEMENT ("Agreement") is made on this _____day of _____, 20 __by and between MISSION SPRINGS WATER DISTRICT, a County Water District ("District") with its headquarters at 66575 2nd Street, Desert Hot Springs, Riverside County, California," and **DEVELOPER** ("Developer") located at DEVELOPER ADDRESS, phone No. DEVELOPER PHONE NUMBER.

RECITALS

WHEREAS, Developer is planning the construction of a project ("Project") of _____ (XX) residential lot(s) which is the subject to a **Tract Map No. _____** further described and identified on the map attached to and made a part of this Agreement as Exhibit "A" ("Property") and which is subject to the Landscape Plan attached hereto and made a part hereof by this reference as Exhibit "B"; and

WHEREAS, the Project will require a sewer distribution system to provide sewer service to the to be designed and built by Developer (the "System"); and

WHEREAS, said Developer is desirous of having the District provide sewer service to said Project and is willing to convey to the District the System after the construction thereof, contingent upon the District's acceptance of such conveyance on the terms and conditions set forth herein.

AGREEMENT

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. **Compliance with Law.** Developer will comply with all applicable state, federal and local laws, statutes and ordinances and the District's ordinances, policies and regulations for planning and constructing the System ("Requirements"). The forgoing laws and regulations, as amended from time to time, are hereby incorporated herein by reference.

2. **District Expenses Covered**. The Developer shall deposit, with the District, costs to cover necessary engineering and other services, permits, inspections and sewer system connection costs in an amount estimated by the District. Said deposit shall be increased and/or replenished if District determines that the amount deposited is not sufficient to cover the costs as estimated by the District from time to time.

3. **Completion of Work**. The Developer shall contract for the design of the System by a licensed civil engineer experienced in the design of similar systems. The System to service the Project shall comply with the Requirements and construction plans for the same shall be presented to the District for approval by the District prior to the presentation thereof to Contractors for bidding purposes. Such System shall include all pipelines, pumps, manholes, lift stations, cleanouts and appurtenances as required by District subject to the Requirements. The

Developer shall at its sole cost and expense secure title to property, easements, and rights of way needed for the System prior to the commencement of construction and shall convey offers of dedication or grant deeds along with necessary roads for ingress and egress and for maintenance and operation of the sewer system. The Developer shall file a Notice of Completion upon completion of the sewer system.

4. **Licensed Contractor**. The Developer will contract for the services of a licensed and qualified contractor ("Contractor") to construct the System. Said contract shall be signed by Developer and the licensed Contractor. Said Contractor shall be currently licensed by the State of California with a General engineering Contractor, "A" license and/or other appropriate license needed to construct the System. Said Contractor shall be experienced in the construction of sewer systems and shall have been reviewed by the District and listed by the District as qualified contractors before a contract is signed and actual system construction begins. However, the District's approval of the Contractor shall in no way be deemed to impose on District any liability for the acts or omissions of said Contractor.

5. **Payment and Performance**. The entire cost of the construction of the System shall be paid by the Developer as and when the amounts are due in such regards. Developer and Contractor shall assure that such construction is inspected by District personnel for conformance with the approved plans and specifications and the Requirements. Whenever the Contractor desires to work outside the regular or specified work periods or to vary the work period during any particular day, Contractor shall request permission from the District at least 24 hours in advance so that inspection services may be provided. If the District grants permission and if the work period includes hours outside the normal work hours of the District, the Developer shall pay for the inspection services provided outside of normal work hours in accordance with established District rates. Construction shall not begin until the "Notice to Proceed" is given by the District inspector nor until the Developer, or other authorized party, completes a "CERTIFICATION OF STREETS TO FINAL GRADE" for the streets in which the sewer pipelines are to be constructed. District inspection is for the purpose of conformance of construction with District requirements, and not for compliance by the Contractor with safety requirements. Inspection or final acceptance shall not constitute a waiver by the District of any claims against Developer and/or Contractor for any defects in the work performed hereunder and shall not result in the imposition on District of any liability with regards to the same. Developer shall guarantee the completion of construction of the Work by _____ ___. Developer agrees to pay all costs incurred by the District as it may incur and as may be necessary in connection with Contractor completing the Work, including administrative costs.

6. **Insurance and Indemnity**. Developer's contractor shall provide required insurance certificates and endorsements as outlined below:

   6.1 Indemnification: To the extent permitted by law, Developer (as well as Contractor and any other contractors or subcontractors hired to do any construction work), shall defend, indemnify and hold harmless Mission Springs Water District, its directors, officers, employees, and authorized volunteers from and against all claims, damages, losses and expenses, including reasonable attorneys' fees and costs to defend arising out of the performance of the work described herein, and caused in whole or in part by any negligent act or omission of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone whose acts any of them may be liable, except where caused by the active negligence, sole negligence, or willful misconduct of the Mission Springs Water District, its directors, officers, employees, and authorized volunteers.

6.2 Minimum Insurance Requirements: The Developer shall require Contractor (including any contractors or subcontractors hired to do any construction work) to procure and maintain for the duration of the proposed construction, insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the proposed construction and the activities of the Contractor, guests, agents, representatives, employees or contractors and subcontractors. The Developer's contractor shall provide and maintain the following commercial general liability, automobile liability, workers' compensation coverages as permitted by law:

6.3 Coverage: Coverage shall be at least as broad as the following:

a) **General Liability** - Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 00 01) including products and completed operations, property damage, bodily injury and personal & advertising injury with limits of at least two million dollars ($5,000,000) per occurrence or the full per occurrence limits of the policies available, whichever is greater. If Commercial General Liability Insurance or other form with a general aggregate limit, either the general aggregate limit shall apply separately to the project/location (with the ISO CG 25 03, or ISO CG 25 04, or insurer's equivalent endorsement provided to MSWD) or the general aggregate limit shall be twice the required occurrence limit.

b) **Automobile Liability -** Insurance Services Office (ISO) Business Auto Coverage (Form CA 00 01), covering Symbol 1 (any auto) or if Contractor has no owned autos, Symbol 8 (hired) and 9 (non-owned) with limit of one million dollars ($1,000,000) for bodily injury and property damage each accident.

c) **Workers' Compensation Coverage –** By his/her signature hereunder, Developer certifies that it is aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and it shall cause Contractor to comply with such provisions before commencing the performance of the work of this agreement. Contractors and sub-contractors will keep workers' compensation insurance for their employees in effect during all work covered by this agreement. The Contractor shall provide workers' compensation coverage as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limits of no less than $1,000,000 per accident for bodily injury or disease. **Waiver of Subrogation** (also known as Transfer of Rights of Recovery Against Others to Us): The Contractor will be required to waive rights of subrogation to obtain endorsement necessary to affect this waiver of subrogation in favor of the Mission Springs Water District, its directors, officers, employees, and authorized volunteers, for losses paid under the terms of this coverage which arise from work performed by the Named Insured for the Mission Springs Water District; this provision applies regardless of whether or not the Mission Springs Water District has received a waiver of subrogation from the insurer.

d) Builder's Risk – (Course of Construction) if necessary- insurance utilizing an "All Risk" (Special Perils) coverage form with limits equal to the completed value of the project and no coinsurance penalty provision.

e) Contractor's Pollution Liability – (optional: if project involves environmental hazards) with limits no less than $5,000,000 per occurrence or claim, and $10,000,000 policy aggregate.

If the Contractor maintains broader coverage and/or higher limits than the minimums shown above, the District requires and shall be entitled to the broader coverage and/or higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the District.

6.4 Required Provisions - The Commercial General Liability policies are to contain, or be endorsed to contain, the following provisions:

a) **Additional Insured Status:** MSWD, its directors, officers, employees, and authorized volunteers are to be given insured status (at least as broad as ISO Form CG 20 12 05 09 or for projects including construction ISO Form CG 20 10 11 85 or both CG 20 10 10 01 and CG 20 37 10 01 including ongoing and completed operations), as respects: liability arising out of the work or activities performed by or on behalf of the Contractor including materials, parts, or equipment furnished in connection with such work or operations, and automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to District, its directors, officers, employees, and authorized volunteers.

b) **Primary Coverage:** For any claims related to this project, the Contractor's insurance coverage shall be primary at least as broad as ISO CG 20 01 04 13 as respects to the District, its directors, officers, employees, and authorized volunteers. Any insurance or self-insurance maintained by the District, its directors, officers, employees, and authorized volunteers; shall be excess of the Contractor's insurance and shall not contribute with it.

6.5 Notice of Cancellation: Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the Mission Springs Water District.

6.6 Acceptability of Insurers: Insurance is to be placed with insurers having a current A.M. Best rating of no less than A: VII, or as otherwise approved by Mission Springs Water District.

The Contractor agrees and he/she will comply with such provisions before commencing project. All of the insurance shall be provided on policy forms and through companies satisfactory to Mission Springs Water District. Mission Springs Water District reserves the right to require complete, certified copies of all required insurance policies, including policy Declaration and Endorsement pages. Failure to continually satisfy the Insurance requirements is a material breach of contract.

6.7 Verification of Coverage: Contractor shall furnish the District with certificates and amendatory endorsements affecting coverage required by the above provisions. All certificates and endorsements are to be received and approved by the District least five days before the Contractor commences activities.

6.8 Contractors and Subcontractors: Contractor shall require and verify that all Contractors and subcontractors maintain the liability insurance requirements stated herein, and Contractor shall ensure that Mission Springs Water District, its directors,

officers, employees, and authorized volunteers are additional insureds on the commercial general liability insurance policy of all Contractors who hire subcontractors to perform work on the scheduled project with a form at least as broad as CG 20 38 04 13.

6.9 Continuation of Coverage: The Contractor shall, Contractor shall maintain for the duration of the contract, and for 5 years thereafter, insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees, or subcontractors. Contractor shall be required to waive all rights of subrogation under this Agreement. If any of the required coverages expire during the term of this Agreement, the Contractor shall be required to provide a renewal Certificate including the Additional Insured endorsement to the District at least ten (10) days prior to the expiration date.

6.10 Other Considerations/Exceptions: When the Mission Springs Water District determines that any construction work may involve potential environmental pollution liability, the Commercial General Liability policy shall include Contractor's Pollution Liability –with limits no less than $5,000,000 per occurrence or claim, and $10,000,000 policy aggregate.

7. Bonds. Developer shall provide the District with bonds or evidence of bonds as follows:

a) Performance bond with corporate surety or sureties satisfactory to the District said performance bond being for not less than one hundred percent (100%) of the total contract price.

b) A labor and materials payment bond being for not less than one hundred percent (100%) of the total contract price.

8. Notice of Completion. The District's Inspector shall complete a "Notice of Final Inspection" when all work has been completed in accordance with District requirements and prior to the Acceptance of said sewer system by the District. An executed Notice of Completion shall be filed by the District. The Developer shall comply with the following requirements:

a) A Bill of Sale executed by the Developer vesting title of said sewer system and appurtenances to the District;

b) A copy of the contract between Developer and Developer's Contractor or other documents which verify the actual cost of the sewer system as installed.

c) Payment to the District by the Developer of any and all applicable fees including, but not limited to Connection Charge, Fire flow or front footage fee, and meter installation fees.

9. Warranty. The Developer r shall guarantee the entire work shall be constructed in a good and workman like manner and all materials furnished shall be new and of high quality and both of the forgoing will meet all the requirements specified herein. This warranty shall include both the quality of the workmanship and the materials used as well as that of subcontractors and suppliers.

a) The Developer shall agree to make any repairs or replacements made necessary by defective materials or workmanship in the pipe materials supplied which have become

evident within one year after date of recording Notice of Completion, and to restore to full compliance with the requirements of these specifications, including the test requirements, any part of the sewer system, which during said one-year period, is found to be deficient with respect to any provision of this specification.

b) The Developer shall make all repairs and replacements promptly upon receipt of written orders from MSWD or if, in the event the repair work must be performed by MSWD, shall reimburse MSWD for actual labor, equipment and material expenses incurred to perform such corrective work. If the Developer fails to make the repair and replacements promptly, MSWD may do the work, and the Developer shall be liable to MSWD for the cost thereof as described above.

10. **Sewer Services**. The District will not furnish service to the sewer system until the completed system passes final inspection by the District, and Developer has fully complied with all provisions of this Agreement. Following fulfillment of the terms and conditions herein and acceptance by the District of said sewer system, the District will provide service to said lands in accordance with the District's rules and regulations governing the provisions of such service. District requires that a permanent meter must be installed prior to landscaping.

11. **Successors and Assigns**. This agreement is binding on the assigns of the District and on the assigns, successors and representatives of the Developer. Assignment of this agreement by the Developer shall require the prior written consent of the District.

12. **Contractor's License**. The Contractor must possess at the time of commencing work and throughout the Project duration, a Contractor's License, issued by the State of California, which is current and in good standing. The Developer and Contractor shall ensure that any subcontractor working on the Project possesses at the time of commencing work and throughout the Project duration, a Contractor's License, issued by the State of California, which is current and in good standing.

13. **Corporation In Good Standing**. If Contractor and/or Developer is a corporation or other entity, the undersigned hereby represents and warrants that the corporation or other entity is duly incorporated and in good standing in the State of California, and that the undersigned is authorized to act for and bind the corporation.

14. **Provisions Required by Law.** Each and every provision of law and clause required by law to be inserted in this Agreement shall be deemed to be inserted herein and the Agreement shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not currently inserted, then upon application of either party the Agreement shall forthwith be physically amended to make such insertion or correction.

15. **Attorneys' Fees**. In the event that either party brings an action to enforce this Agreement, the prevailing party in such action shall be entitled to an award of the costs and expenses incurred in connection with such action including but not limited to attorneys fees, expert witness fees, and filing fees.

16. **Entire Agreement**. This Agreement and the Exhibits and Recitals to this Agreement, which are incorporated herein by this reference, constitute the entire contract of the parties. No other agreements or contracts, whether oral or written, pertaining to the work to be performed, exists

between the parties. This Agreement can be modified only by an amendment in writing, signed by both parties.

EXHIBITS:

Project Overview Map – Exhibit A
Approved Landscape Plan – Exhibit B

MISSION SPRINGS WATER DISTRICT	DEVELOPER
	Company: _____
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

APPENDIX J

Sewer Extension No._____

Water Extension No._____

MISSION SPRINGS WATER DISTRICT

AGREEMENT FOR
ON SITE WATER / SEWER SYSTEM PARTICIPATION / REFUND WAIVER

THIS AGREEMENT is made by and between MISSION SPRINGS WATER DISTRICT, a public agency of the State of California with its headquarters in Desert Hot Springs, California, hereinafter designated as the “District” and

hereinafter designated as the “developer”.

WHEREAS, developer is proposing a development requiring a water and/or sewer system located within a portion of Section _____, Township _____ South, Range _____ West, San Bernardino Base and Meridian, on a division of land referenced as

and

WHEREAS, developer is desirous of having the District provide water and/or sewer service to this development and is willing to convey to the District the water and/or sewer system after the construction thereof, and

WHEREAS, developer will comply with the District’s rules and regulations for such water and/or sewer systems, and

WHEREAS, developer has deposited with the District costs necessary to satisfy necessary financial arrangements in amounts estimated by the District, and

WHEREAS, developer has arranged for the services of a licensed qualified contractor evaluated by the District for the construction of said water and/or sewer system, and

WHEREAS, the entire cost of the construction of such water and/or sewer system shall be paid by the developer;

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. Developer hereby agrees to pay for all costs associated with the planning, development, construction and acceptance of the water and/or sewer system.

2. Developer agrees that the water and/or sewer system being installed will be for the benefit of the parcels shown on the map attached and made a part of this Agreement and for the benefit of others as deemed necessary by the District.

3. Developer agrees to waive refunds of any participation in this water system, and further agrees that continuation of the water and/or sewer system shall be initiated at any time by the District for the benefit of others.

4. This Agreement shall be binding on the heirs, successors, and assigns of the parties hereto. All rights, title and interest in the sewer extension and all the appurtenances, and other items as may be shown on the map or installed subsequently by the District shall become the property of the District upon their installation. The developer agrees to hold the District harmless from any claim of right against the property so transferred.

MISSION SPRINGS WATER DISTRICT

Reviewed By: _____

By: _____

Name: _____

Title: _____

Date: _____

DEVELOPER

Company: _____

By: _____

Name: _____

Title: _____

Date: _____

CONTRACTOR

Company: _____

By: _____

Name: _____

Title: _____

Date: _____

APPENDIX K

(Please put this letter on your letterhead)

ROUGH GRADE VERIFICATION

TRACT

SEC. _____, T_____S, R_____E

GRID #:

I hereby approve the rough grading performed for the above referenced project. The rough grading, in reference to line and grade, has been completed within substantial conformance (+/- .20) to the approved Grading Plan.

Sincerely,

(PROJECT ENGINEER TO EXECUTE)

APPENDIX L

(Please put on your letterhead)

CURB AND GUTTER INSTALLATION WAIVER REQUEST

TRACT

SEC. _____, T_____S, R_____E

GRID #:

_____ understands that it is a MISSION SPRINGS WATER DISTRICT (MSWD) policy that curb and gutters be installed prior to installation of in-tract water lines. We are requesting a waiver so that our pipeline contractor can continue with the water installation. All work will conform to MSWD standards and policies.

Sincerely,

(DEVELOPER TO EXECUTE)

APPENDIX M

MISSION SPRINGS WATER DISTRICT
66575 Second St., Desert Hot Springs, CA 92240
Tel: (760) 329-6448 Fax: (760) 329-2482

Inspector's Name: _____ Tel: _____

INSPECTOR REQUIREMENTS

1. Inspections will be part-time (1 to 2 hours per day). Inspector will not be continuously available and will reject work not meeting all MSWD standards and specifications.

2. Developer and contractor are reminded that MSWD is not working for them. They will build facilities to MSWD specification; MSWD will inspect the work for conformance with the specifications and plans then accept and maintain these facilities.

3. Contractor shall call for inspection when needed, 24-hours minimum notice. Special events (pipe delivery, backfill, testing, etc.) require a minimum of 48-hour notice to schedule.

4. **Any work completed without the Inspector's prior knowledge is cause for automatic rejection. Any work buried without inspection shall be exposed and inspected prior to acceptance.**

5. Contractor shall protect existing water and sewer systems at all times or work will be stopped.

6. All damage to existing facilities or work under way shall be reported immediately. If unreported damage is discovered, all work in area shall be exposed and re-inspected or reconstructed.

7. Any revision to plans must be approved in writing by MSWD.

8. No MSWD valves or appurtenances of other utility facilities shall be operated by the contractor without approval and/or instruction from MSWD.

9. Contractor shall have a competent and knowledgeable foreman on the job site at all times.

10. Repeated failure to adhere to MSWD guidelines may result in fines and/or file complaints to the State contractor's Board.

MSWD reserves the right to make changes to these Inspector Requirements at any time.

BACKFLOW REQUIREMENTS - 2 DAYS NOTICE

1. MSWD Inspector shall inspect all materials before installation. MSWD field crew will inspect backflow device before service is turned on.

2. MSWD will perform initial backflow test.

APPENDIX N

NEW SERVICE COST WORKSHEET

Date: _____

Project Name: _____ **Tract No.:** _____

Developer: _____ **Tel:** _____

Developer Contact: _____ **Cell:** _____

Building Phase No.: _____ **Meter Size:** _____

Lot No(s): _____ **Total # of Lots:** _____

WATER CONNECTION FEES	**Amount (USD)**
Meter Installation Fee:	$ -
Back-up Facility Charge:	$ -
Front Footage Charge	$ -
Backflow Prevention Device:	$ -
Fire Flow Charge:	$ -
Annexation Charge:	$ -
WATER CONNECTION FEE TOTAL	$ -

SEWER CONNECTION FEES	
Back-up Facility Charge (Residential):	$ -
Back-up Facility Charge (Commercial):	$ -
Front Footage Charge:	$ -
SEWER CONNECTION FEE TOTAL	$ -
GRAND TOTAL	**$ -**

Exhibit L - New Service Cost Worksheet - Form T-6.xlsx

APPENDIX O

MISSION SPRINGS WATER DISTRICT
66575 Second St., Desert Hot Springs, CA 92240
Tel: (760) 329-6448 Fax: (760) 329-2482

INSTRUCTIONS FOR ORDERING NEW METERS

ORDERING METERS

1. MSWD inspector must approve all meter boxes prior to meter installation.

2. Call MSWD Inspection Line at (760) 329-6448 Ext. 190 to schedule final meter box inspection.

3. Meter installation can take up to six weeks. Occupancy will not be permitted until the meter is installed.

4. A permanent meter must be installed prior to landscaping.

LANDSCAPE METERS

1. Developer installs landscape lateral, meter box and backflow device but **NOT** the meter. MSWD drops in the landscape meter AFTER all meter fees have been paid. Meter will be locked off until backflow device has been tested and certified by MSWD.

2. Four weeks' advance notice is required for drop-in landscape meter.

OCCUPANCY RELEASE

1. Call MSWD Engineering Department at (760) 329-6448 ext. 127 for occupancy releases within the County of Riverside or City of Desert Hot Springs.

APPENDIX P

MISSION SPRINGS WATER DISTRICT

FAITHFUL PERFORMANCE BOND

_____

(Name of Project/Tract Number of Subdivision)

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, _____, (hereinafter designated as "Principal") has executed a Public Water and Sewer System Improvement Bonding Agreement ("Agreement" herein) with the Mission Springs Water District, a county water district and public agency of the State of California (the "District" herein), whereby Principal agrees to construct, install, complete and guarantee for one year after acceptance thereof certain designated public improvements generally identified as follows:

_____

_____

_____; and

WHEREAS, said Agreement is incorporated herein by this reference; and

WHEREAS, said Principal is required under the terms of said Agreement to furnish a corporate surety bond or other approved improvement security to guarantee the faithful performance of said Agreement;

NOW, THEREFORE, the Principal designated above, and _____, as Surety, are held and firmly bound unto the District in the penal sum of _____ _____Dollars ($_____), lawful money of the United States, for the payment of which we bind ourselves, our heirs, successors, executors and administrators, jointly and severally, firmly by these presents.

The condition of this obligation is such that the obligation shall become null and void if the above-bounded Principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to, abide by, well and truly keep and perform the covenants, conditions and provisions in said Agreement and any modification thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the District, its officers, agents and employees, as therein stipulated; otherwise, this obligation shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified, costs and reasonable expenses and fees shall be included, including reasonable attorneys' fees, incurred by the District in successfully enforcing the obligation, all to be taxed as costs and included in any judgment rendered.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Agreement, the work to be performed thereunder, or the Improvement Plans and related specifications accompanying the Agreement shall in any manner affect its obligations on this bond. The Surety hereby waives notice of any such change, extension of time, alteration or addition to the terms of the Agreement, the work, or the Improvement Plans and related specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by the above-named Principal and Surety as of the date or dates set forth below the signatures of their authorized officers.

Note: All signatures must be acknowledged before a notary public. Attach appropriate acknowledgement.

"PRINCIPAL"

_____
(Type name of Principal)

_____
(Street Address)

_____
(City) (State) (Zip)

By: _____

_____
(Title of officer)

Date: _____

"SURETY"

_____

(Type name of Surety)

_____

(Street Address)

_____

(City) (State) (Zip)

By: _____

(Signature of authorized officer)

_____

(Title of officer)

Date: _____

APPROVED BY DISTRICT:

_____

Brian Macy, General Manager

MISSION SPRINGS WATER DISTRICT

PAYMENT BOND

_____

(Name of Project/Tract Number of Subdivision)

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, _____, (hereinafter designated as "Principal") has executed a Public Water and Sewer System Improvement Bonding Agreement ("Agreement" herein) with the Mission Springs Water District, a county water district and public agency of the State of California (the "District" herein), whereby Principal agrees to construct, install and complete certain designated public improvements generally identified as follows:

_____

_____

_____; and

WHEREAS, said Agreement is incorporated herein by this reference; and

WHEREAS, said Principal is required under the terms of said Agreement, before entering upon the performance of the work, to file with the District a good and sufficient payment bond, or other approved security, to secure the claims to which reference is made in Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the California Civil Code and in Government Code Section 66497;

NOW, THEREFORE, the Principal designated above, and _____, as Surety, are held firmly bound unto the District and all contractors, subcontractors, laborers, materialmen and other persons employed in the performance of said Agreement and referred to in the above-referenced Civil Code and Government Code in the sum of _____

_____

_____Dollars ($_____), for materials furnished or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor; that said Surety will pay the same in an amount not exceeding the amount hereinabove set forth; and in case suit is brought upon this bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by the District in successfully enforcing such obligation, to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies and corporations entitled to file claims under

Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code, and under Government Code Section 66497, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of said Agreement or the Improvement Plans or related specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by the above-named Principal and Surety as of the date or dates set forth below the signatures of their authorized officers.

Note: All signatures must be acknowledged before a notary public. Attach appropriate acknowledgement.

"PRINCIPAL"

_____
(Type name of Principal)

_____
(Street Address)

_____
(City) (State) (Zip)

By: _____

_____
(Title of officer)

Date: _____

"SURETY"

_____
(Type name of Surety)

_____
(Street Address)

_____
(City) (State) (Zip)

By: _____
(Signature of authorized officer)

_____
(Title of officer)

Date: _____

APPROVED BY DISTRICT:

_____
Brian Macy, General Manager

APPENDIX Q

66575 Second Street, Desert Hot Springs, CA 92240 • www.mswd.org • p 760.329.6448 • f 760.329.2482

PUBLIC WATER AND SEWER IMPROVEMENT BONDING AGREEMENT FOR:
TRACT MAP No. _____

THIS AGREEMENT made and entered into this _____day of_____, 20____ by and between, **DEVELOPER**, a (insert LLC, Inc, etc.), ("Developer") and the MISSION SPRINGS WATER DISTRICT, a County Water District, ("District").

RECITALS

WHEREAS, the Developer is the owner and developer of land in the City of Desert Hot Springs, County of Riverside, State of California, generally described as follows:

See Exhibit "A" attached hereto and made a part hereof by this reference.

WHEREAS, said Developer has or will cause the recordation of a final approved map known as **Tract Map No. _____** ("Map"), and the Map requires water and sewer improvements to facilities to be owned and maintained by the District for the proposed development project ("Project"), and;

WHEREAS, said Developer has prepared and submitted water and sewer improvement plans ("Plans") for the Project to the District for the construction of said improvements which District has approved prior to the date of this Agreement, and;

WHEREAS, said Developer is desirous of complying with the requirements of the District, relative to the installation and payment for the water and sewer improvements provided in the Project.

AGREEMENT

NOW, THEREFORE, in consideration of the approval by the District of the proposed Plans required for the development and recordation with the County Recorder of the Map within the City of Desert Hot Springs, the Developer agrees that the foregoing Recitals are hereby incorporated by reference and it will comply with the following requirements:

Within one (1) year from the date hereof, said Developer shall cause the water and sewer improvements to be constructed in accordance with all agreements, the Plans, the Mission Springs Water District policies, rules, regulations, ordinances and resolutions and standards, the Map, the Subdivision Map Act, and all applicable state, federal and local laws, regulations, ordinances and policies, all of which are hereby incorporated herein by this reference.

Handed you herewith is a Surety Bond (Faithful Performance and Warranty a copy of which is attached hereto as Exhibit "B") executed _____in the sum of TOTAL WRITTEN IN WORDS and no/100 ($XXX,XXX.00), guaranteeing the faithful performance of this Agreement and Warranty for one (1) year from date of final acceptance by the Mission Springs Water District Board of Directors, together with a Payment Bond in the sum of TOTAL WRITTEN IN WORDS and no/100 ($XXX,XXX.00), securing payment to the contractor, his subcontractors and to persons renting equipment or furnishing labor or materials for the improvements a copy of which is attached hereto as Exhibit "C"

IT IS UNDERSTOOD and AGREED, that upon completion of the work in accordance with all agreements, state, federal and local laws, regulations, ordinances and policies and acceptance thereof by the Mission Springs Water District, said Payment Bond shall be exonerated and the Faithful Performance/Warranty Bond shall continue in force for one (1) year (warranty period) after the date of final acceptance by Mission Springs Water District.

The Bonds required by this Agreement shall be kept on file with the District and they must be issued by a surety company currently admitted to transact surety insurance business in California by the California Department of Insurance, with a Best's Insurance Guide rating of no less than A:VII. The terms of any documents evidencing such Improvement Securities as set forth in this paragraph are incorporated into this Agreement by this reference as if set forth fully herein.

IN WITNESS WHEREAS, the undersigned have affixed their signatures at Desert Hot Springs, California the day and year first above written.

MISSION SPRINGS WATER DISTRICT

By: _____

Name: _____

Title: _____

Date: _____

DEVELOPER

Developer: _____

By: _____

Name: _____

Title: _____

Date: _____

ATTEST

By: _____

Name: _____

Title: _____

EXHIBIT "A'

INSERT LEGAL DESCRIPTION OF PROJECT

EXHIBIT "B"

Faithful Performance and Warranty Bond

EXHIBIT "C"

Payment Bond