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

- **PROCEDURES, POLICIES AND GUIDELINES**
- **STANDARD DRAWINGS AND NOTES**
- **STANDARD SPECIFICATIONS**

SEPTEMBER 2012

MSWD DEVELOPER/CONTRACTOR HANDBOOK & GUIDELINES

TABLE OF CONTENTS

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 2005, it serves 27,000 people in an estimated 10,000 households and 450 businesses.

Water service to residential and commercial accounts takes about 8,400 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 40% 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 40% 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.

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. 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, Connection Charges, Inspection Fees, Added Facilities Charges, Zone of Benefit Fees, Front Footage Charges, Participation Charges, Service Connection Fees, 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 with MSWD, post bonds with the County of Riverside, the City of Palm Springs, or the City of Desert Hot Springs, 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 so certify.

11. Construct facilities to MSWD standards.

12. MSWD staff provides final approval of facilities constructed.

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

14. Transfer title (Grant Deed) 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.

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 agency having jurisdiction, as appropriate. These regulations shall include administrative codes, civil codes, and health regulations.

1.05 WATER AND SEWER PLAN APPROVAL PROCESS

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 plan check procedure again. The steps required to obtain plan or project site map approval are as follows:

1. Attend preliminary planning meeting.

    a) Call 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.

    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.

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 some other nearby public or private utility. MSWD shall be consulted for advice regarding service in any of the above circumstances.

2. Submit deposit for engineering review by district staff.

MSWD staff will require a fee 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 met this level, additional funds will be required to avoid an interruption in engineering related services. Should this additional amount not be adequate to cover the District's time and costs, additional sums will be required.

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.

4. Submit first plan check with plan check deposit.

The normal plan check deposit is $1,750 per sheet or 5% of the estimated construction costs, whichever is greater. Any unused plan check funds will be refunded to the payee.

After review and approval of the preliminary report and/or hydraulic network analyses, developer's engineer must submit the following, for the first plan check:

1) Three copies of the water construction drawings.

2) Three copies of the sewer construction drawings.

3) One copy of the street improvement drawings.

4) One copy of the grading plans.

5) One copy of the storm drain plans.

6) Two copies of tentative tract/parcel map.

7) Two copies of tract phasing Map (including lot numbers and street names).

8) 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.

5. Incomplete submittals may be rejected. Each submittal shall include a transmittal listing all items 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.

6. After MSWD staff reviews the first plan check submittal for completeness, the plans will be sent to an MSWD consultant for a detailed review. MSWD staff will provide to the reviewing consultant red line comments on one set of the water and sewer construction drawings plus any supplemental information provided by the developer's engineer. MSWD will then return the reviewed plans to developer's engineer for revisions. In addition, MSWD staff will provide a copy of Section 1.05.01, listing all required resubmittal information. All subsequent plan checks, including the previous red lined drawings, shall be returned to MSWD.

7. It is the goal of MSWD staff and consultants to complete the first plan check within 15 to 20 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.

8. The developer's engineer is to check off all completed items on the red line drawings in yellow with any special comments for review by the MSWD plan reviewer made in green or black. MSWD staff and consultants encourage the developer's engineer to contact them in regards to any questions regarding the plan check comments.

9. It is the responsibility of the developer's engineer to arrange for any fire flow tests required. An application for fire flow test along with the required fee should be sent to MSWD allowing a week to 10 days for the district to complete the testing.

10. 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.

11. 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 print marked with the proposed change in red pencil 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.

12. Submit subsequent plan checks

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

    1) Previous MSWD plan check set.

    2) Two copies of revised construction drawings.

    3) Two copies of hydraulic fire flow calculations including proposed service demands signed and sealed by a registered engineer.

    4) Any additional material requested.

    5) Submit final Plans for approval, and all items required per Section 1.05.04

    MSWD staff will notify the developer's engineer to submit mylars when all plan checks are completed and the plans are acceptable to MSWD staff and consultants. Any mylars sent prior to being requested by MSWD staff will not be considered or returned. The original mylars must be signed by the developer's engineer and Fire Marshal prior to being submitted to MSWD staff for signature. Prior to final approval of the

construction drawings, developer must pay the outstanding balance for the plan check work order and submit the required items. (Section 1.05.01).

14. MSWD Signs Plans:

When all submittals have been completed to the satisfaction of MSWD staff, the mylars will be signed. The developer's engineer is required to obtain signatures from all other agencies and provide MSWD staff with the original mylars and 4 bond prints. Original water and sewer plan mylars become the property of MSWD. MSWD staff will furnish the developer with a fee letter and pre-construction requirements.

When signed, the originals 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.

Plans checks resubmitted after one year, 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".

1.05.01 CHECKLIST OF ITEMS REQUIRED OF THE DEVELOPER'S ENGINEER

(EXHIBIT D)

Date: _____ Developer: _____

To: _____ Phone: _____

_____ Fax: _____

_____ ID# ___ SEC ___, T ___ S, R ___ E

Tract/PM#: _____

MSWD must receive the following items before plans will be signed **(checked boxes only).** See attached sheets for detailed explanations.

Required / Date Received

- ☐ GRADING INSPECTION DEPOSIT
- ☐ FIRE FLOW CALCULATIONS
- ☐ SOILS REPORT
- ☐ EASEMENT OR FEE TITLE PARCEL QUITCLAIM DEED
- ☐ ENGINEER'S OPINION OF PROBABLE COST (See next page)
- ☐ AutoCAD CD (See next page)
- ☐ RECORD MAP**:** If the tract Map has not been recorded, a blanket easement will be required.
- ☐ LANDSCAPE PLANS
- ☐ SEQUENCE LIST
- ☐ PAD ELEVATIONS
- ☐ VERIFICATION OF "STAND ALONE" TRACT

cc:

- ☐ Developer/Owner
- ☐ MSWD – Tract File
- ☐ Plan check consultant

1.05.01 CHECKLIST OF ITEMS REQUIRED OF THE DEVELOPER'S ENGINEER

1. GRADING INSPECTION DEPOSIT:

   If grading is to be completed near MSWD existing facilities prior to or during the plan check process, a grading inspection deposit of $1,000 is due.

2. FIRE FLOW CALCULATIONS:

   MSWD will complete the required fire flow tests and furnish a report per requirements of fire agency having jurisdiction (city/county) to be used in the preparation of the required hydraulic calculations and fire flow report by the developer's engineer. The fee for MSWD tests shall be submitted with the request for fire flow test. *The fire flow calculations are to be sent with the 2nd plan check.*

3. SOILS REPORT:

   Please provide a soils report from a certified geotechnical firm. See 1.05.4(9) for requirements of the report

4. ENVIRONMENTAL SITE ASSESSMENT, PHASE 1

   Please provide an Environmental Site Assessment, Phase 1, report from a certified geotechnical firm. See 1.05.04(10) for requirements of the report

5. EASEMENT OR FEE TITLE PARCEL:

   Required for locations where MSWD facilities are not in a dedicated public right of way.

6. QUITCLAIM DEED:

   Quitclaim Deed(s) to the developer will be required for locations where MSWD is abandoning easements. Quitclaim document(s) shall include the legal description. Please allow several weeks for this item, as it requires Board approval.

7. ENGINEER'S OPINION OF PROBABLE COSTS:

   Please provide an updated engineer's opinion of probable cost to MSWD. The engineer's opinion of probable cost shall include an itemization and unit costs for each item that is listed on the quantity estimate on plans. Submittal of this item is to be done prior to MSWD affixing approval signatures on mylars.

8. AutoCAD CD:

   An AutoCAD CD is to be submitted in accordance with MSWD Standard Specification and Design Manual, Section 4.0. The CD will contain plan information ready for approval, with all plan check comments reflected. PLEASE SUBMIT IN

AutoCAD 2007 OR EARLIER FORMAT. The mylars are to be submitted with this CD.

9. RECORD MAP:

If the tract Map has not been recorded, a blanket easement will be required, **and** must be provided for final acceptance of water system. (For tracts only).

10. LANDSCAPE PLANS:

Landscape plans must be submitted for all developments.

11. SEQUENCE LIST:

Building sequence list of lot numbers, phases and addresses for all lots within the tract in digital format.

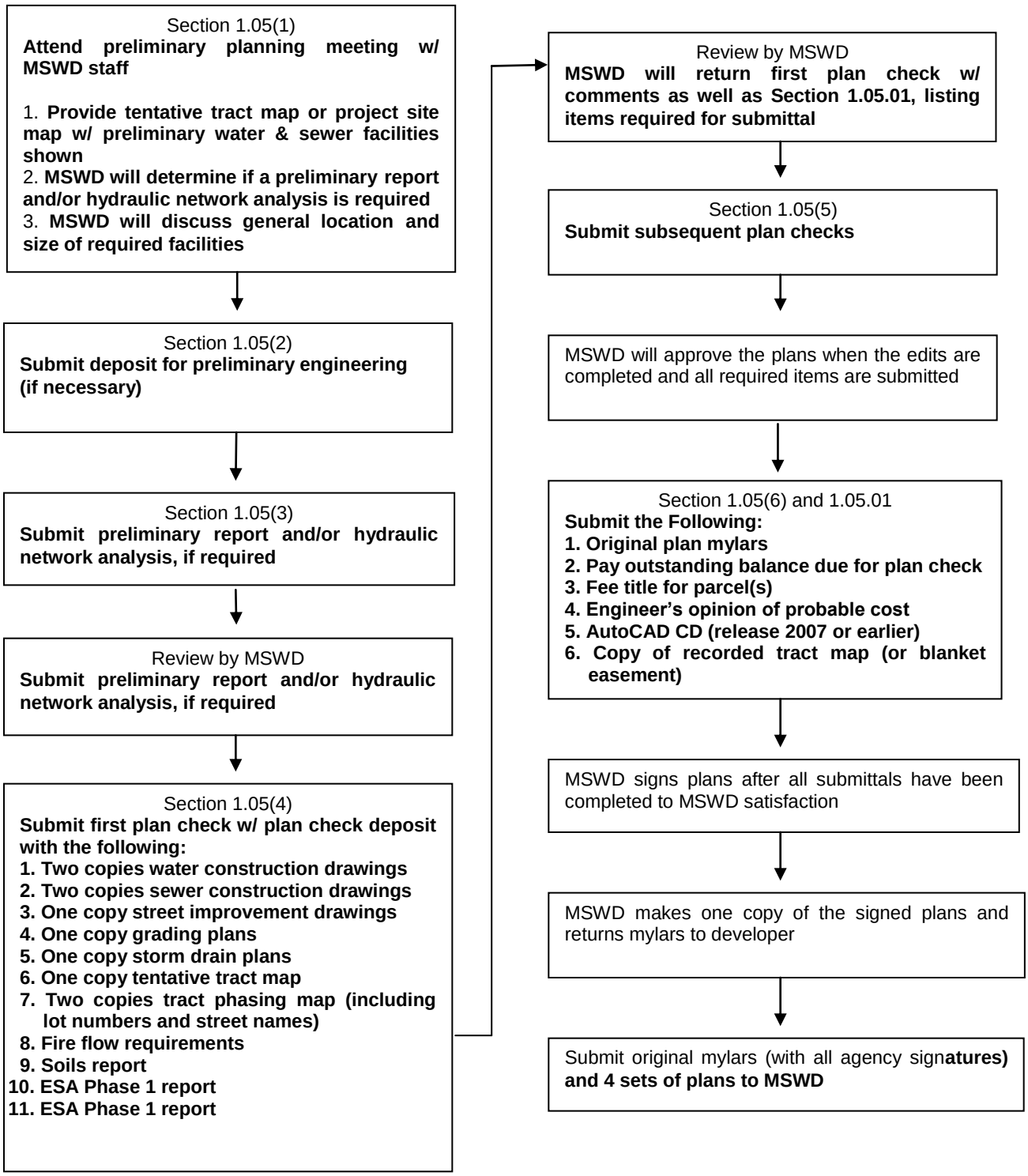
12. PAD ELEVATIONS:

Lot numbers and pad elevations will be submitted in digital version in an Excel spreadsheet.

13. VERIFICATION THAT TRACT “STANDS ALONE”

All tracts must “stand alone. Offsite facilities that are not part of the tract must be designed and constructed to serve this tract. Those facilities must be bonded and plans must be submitted to MSWD for approval. All applicable easements and rights-of-way must also be provided.

1.05.02 FLOW CHART – 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 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 lines will be returned to the applicant for corrections. Where local agency comments conflict with MSWD requirements, the applicant is encouraged to contact the MSWD Consultant for resolution.

Final plans will be wet 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 in order 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 RIVERSIDE COUNTY RESIDENTIAL MODEL HOME REQUIREMENTS

1. In residential subdivisions, all model homes in the project shall comply with the provisions of Article XIX of Ordinance 348d Section 19.304 Residential Model Home Requirements.

2. The project applicant shall provide homebuyers with sample water-efficient landscape and irrigation plans and additional educational material as approved by the Planning Director upon the sale of each dwelling unit within the project. The plans shall include a key identifying the common names of the plants used in the landscaping.

3. The project applicant shall distribute outdoor water conservation pamphlets provided by local water purveyors, if available, to buyers upon the sale of each dwelling unit within the development. *MSWD can provide these at no cost.*

4. A sign, which is clearly visible to homebuyers, shall be displayed in the front yard of each model home. The sign shall indicate that the model home features a water-efficient landscape irrigation design.

1.06.02 MSWD RESIDENTIAL MODEL HOME REQUIREMENTS

1. At least one model home, within residential subdivisions, shall demonstrate a water conserving landscape. MSWD can make available brochures on water conservation for inclusion in new homebuyers' sales packets. The MSWD drought 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. Virtual tours of the garden are on the MSWD website – www.mswd.org – where valuable water conservation information is available.

2. The developer's landscape architect shall consult with the MSWD conservation 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, supplied by MSWD, to buyers upon the sale of each dwelling unit within the development.

5. Developer shall display water conservation materials, supplied by MSWD, 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 particular 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.

[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.

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 the pipelines shall be 7.5 feet per second.

3. Minimum hour demands with wells and boosters on.

   For the minimum hour demand analysis, the maximum velocity in the 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. MSWD shall accept or modify the submitted analysis.

2.03 WATER PIPELINE SIZING CRITERIA

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

For maximum hourly flow, pipeline is to be sized to provide head losses not exceeding 3.5 feet per 1000 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 1000 feet of water pipeline.

For all cases, mainline velocities are not to exceed 7.5 feet per second.

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

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 and every 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 particular 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

Unless otherwise approved by MSWD staff, all water pipelines shall be located on the northerly or easterly side of the street, 6 to 8 feet 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 3.0 feet from the ground surface (pavement, graded travel way, or open ground) to the top of the water pipeline for 8-inch pipe or smaller. For water pipeline 12-inch or larger, the minimum depth shall be 4.0 feet.

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 8” and smaller diameter mains and 1.5 degrees for 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	D.I. Pipe (20' 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 8” and smaller pipe and 1.5 degrees for 12” and larger pipe.

Vertical alignments shall maintain these same deflection criteria. The maximum slope deflection is S=0.0437 for 8” and smaller pipes and S=0.0262 for pipes 12” and larger. Grade breaks should be separated by at least one full pipe joint. 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 1 foot above the sewer. If water pipeline crosses beneath the sewer, it should have a minimum separation of one foot, have no joints within 10 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 (outside to outside) from the sewer pipeline.

Storm drain crossings shall follow the same guidelines as sewer unless specifically approved by MSWD staff.

When crossing other utilities, a minimum vertical clearance of 6" shall be provided (outside to outside).

2.07 FEE TITLE PARCELS

Legal documentation for Fee Title Parcels shall be on MSWD forms and shall consist of three parts: Grant Deed form (see section 2.08.01), 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 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 located in fee title parcels granted to MSWD on MSWD Grant Deed forms. Fee title parcels shall have a minimum width of 30 feet unless otherwise authorized by MSWD staff.

2.08.01 GRANT DEED FORM

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

2.09 WATER PIPELINE MATERIALS

Unless otherwise authorized by MSWD staff, all water pipelines up to and including 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 10 Ga. CML/CMC welded steel pipe and fittings shall be in accordance with MSWD standard specifications.

Main sizes of 8”, 12”, 18”, 24”, or 30” shall be used in all new designs unless otherwise approved by the district.

2.10 VALVES

LOCATION:

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

2. Small water pipelines (8 &12-inch diameter): To provide flexibility of operation, generally located on discharge side of pipeline connections; 3 at crosses, 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 1,320-foot maximum intervals or as directed by MSWD.

SIZE:

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

2. Unless otherwise approved by MSWD staff, all valves, 2” through 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 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; however, air valves shall not be installed at the end of cul-de-sacs unless the slope of the water pipeline is 5% or greater. Minimum size of air valves shall be 1" and shall be sized as follows:

Pipeline Diameter	Air Valve Size
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 4-inch 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 2 coats approved paint per MSWD Standards.

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 2” for 8” mains and 4” for 12” and larger mains. Fire hydrants may also serve as blow-offs when positioning allows.

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. Developer shall provide hydrant cap painting per fire protection agency having jurisdiction.

Fire hydrants shall be in accordance with MSWD Standard Drawings, installed behind the curb face or sidewalk at right angles to the water pipeline.

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 2" will require approval by MSWD staff in writing.

Saddle connections are only allowable for services 2” in diameter and smaller. Tees and gate valve 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 in accordance with MSWD standards at locations determined by MSWD staff. If required, developer will install sacrificial anodes, etc. utilizing MSWD standards and approved materials.

2.16 LARGE COMMERCIAL OR MULTI-FAMILY SYSTEMS

Minimum water main size for new commercial or industrial developments shall be 12". Large commercial or multi-family developments consisting of multiple buildings within a private development shall provide fee title easements in favor of MSWD for all public water and sewer systems. The minimum easement width for water systems only shall be 20 feet 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 31 feet in width with 11 foot separation between domestic water and sewer lines. Domestic water lines shall be constructed using ductile iron pipe per MSWD standards and specifications.

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 preventing fire line failure due to failure of any separate building system.

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 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 backflow ordinance. All non-residential water services shall have a MSWD approved backflow prevention device installed adjacent to 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 12 inches over the pipe with sufficiently granular material having a sand equivalent of at least 30 and free of any rock over 4” diameter. Backfill placed at least 3 feet below finished grade shall be compacted to a minimum density of 95% maximum dry density per ASTM D1557-02; the upper 3 feet 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 CONSERVATION REQUIREMENTS

MSWD requires all developments to promote water conservation through use of water-efficient landscaping, water use management and appropriate use of irrigation technology and management. MSWD requires that all landscape and irrigation plans for all new development shall be reviewed and approved by MSWD staff and consultants prior to installation of any water meter.

At least one model home within a tract development shall demonstrate a water conserving landscape per the County of Riverside’s Ordinance 348d.

Riverside County Ordinance 348d Section 19.304. Residential Model Home Requirements:

1. In residential subdivisions, all model homes in the project shall comply with the provisions of Article XIX of this ordinance.

2. The project applicant shall provide homebuyers with sample water-efficient landscape and irrigation plans and additional educational material as approved by the Planning Director upon the sale of each dwelling unit within the project. The plans shall include a key identifying the common names of the plants used in the landscaping.

3. The project applicant shall distribute outdoor water conservation pamphlets provided by local water purveyors, if available, to buyers upon the sale of each dwelling unit with the development. MSWD staff can provide these at no cost.

4. A sign shall be displayed in the front yard of each model home, which is clearly visible to homebuyers. The sign shall indicate that the model home features water-efficient landscape irrigation design and approved landscape materials per the MSWD approved list and shall encourage buyers to consult with MSWD staff and consultants for requirements prior to adding any additional landscaping or irrigation.

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:

Pipe Diameter	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.

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 5 feet per 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

Unless otherwise approved by MSWD, all sewers shall 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 8" and larger, *but are not encouraged* except where necessary to maintain the required clearance from water pipelines. 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.

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 7.5 feet. Adequate depth shall be provided so that the sewer laterals will have a minimum cover of 5 feet 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 (outside to outside) from the water pipeline.

When crossing other utilities, a minimum vertical clearance of 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 50 feet from all potable, non-potable, and water quality monitoring wells.

3.05 SEWER LATERALS

Sewer laterals shall have a minimum diameter of 4". Laterals shall have a minimum slope of 2% from sewer to property line and shall have a minimum cover of 5 feet 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 in accordance with MSWD Standard Drawing. All installations are to be as shown in MSWD Standard Drawings.

3.07 PIPE SLOPE

Gravity sewers shall have the following slopes:

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 may be used to follow street centerline alignments. Curves shall be designed to limit deflections at each pipe joint to a maximum of 2.5 degrees for 8” through 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 12' and no sewer over 18” diameter shall have a diameter of 48".

All manholes with a depth greater than 12 feet or with any sewer greater than 18” diameter shall have a diameter of 60". Manholes with a depth less than 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 350-foot 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 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 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 then that shall be used through the manhole.

Clean-outs may be installed at the permanent end of a sewer pipeline if the distance from a manhole is less than 175 feet and there are less than 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 120 feet). 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.

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 12” over the pipe.

Backfill shall be placed to at least 3 feet below finished grade and shall be compacted to at least 90% maximum dry density, per ASTM D1557-02; the upper 3 feet 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 granted to MSWD on MSWD Grant of Deed forms. Fee title parcels 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

Details for fee title parcels are in Section 4.0 PLAN FORMAT AND REQUIREMENTS - WATER AND SEWER.

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

Drawings shall be drawn in ink on D size Mylar (4 mil double matted) sheets (24" x 36") with MSWD standard title blocks as shown in (Section 4.05). Please contact MSWD engineering department for a copy of the cover sheet format in AutoCAD.

The improvement plans shall be professional quality especially prepared as WATER DRAWINGS or SEWER DRAWINGS. 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, sewer and water improvements may be placed on the same drawing if approved in advance 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. (Orientation of North as “up” or to the “left” is not 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. Contractors shall not operate any valve on any portion of MSWD system that is under pressure.

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). Said notes shall include engineered fire flow requirements.
2. Legend with Standard MSWD Symbols (Std. Dwg. D-02).
3. Numbered Construction Notes with Estimate of Quantities (Std. Dwg. D-03).
4. Water and/or Sewer System Certification (Section 4.05).
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')

2. North Arrow

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

4. Pad elevations shall show four digits to the left of the decimal point, and shall be accurate to the nearest one half foot.

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) Air valves

    c) Blow-offs

    d) Tees, crosses

    e) Valves

    f) Water services

9. Proposed sewer appurtenances

    a) Manholes

    b) Sewer laterals

    c) 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 **-** Contact MSWD for standard title block. Title block shall include tract Number, street name, and stations.

2. North Arrow **-** North is to be placed so that stationing runs from left to right.

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

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

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

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

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

8. 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.

9. 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.

10. Proposed Pipeline **-** Proposed pipeline shall be indicated with a heavy 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.

11. Stationing **-** For water pipelines, stationing along the centerline of the improvement is acceptable. 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 100' intervals.

    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.

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

    STA 15+00.00 Match Line

    See Sheet 5

13. Water pipelines - Water pipe lines 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 with continuous inspection by MSWD".

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

    a) 8" VCP sewer.

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

    c) 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 with continuous inspection by MSWD".

4.04.02 PROFILE FORMAT REQUIREMENTS

Only profiles for water and sewer shall be shown. All other utility profiles shall not be shown unless conflicting, or where crossing over or under (i.e. storm drain).

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

2. Elevations **-** Elevations shall be shown at even 5' gridlines on both ends of the profile sheet.

3. 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).

4. 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.

- **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

b) Ductile Iron Pipe:

    1) Restrained joints

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

a) STA 14+00.00 GB	Numerical
1192.35 INV	Identification

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
	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.

Pipe Cover **-** For 8" water pipelines, the pipe cover shall be 3.0' and for water pipelines 12" and larger, the pipe cover shall be 4.0'.

Utility Crossings **-** Where water pipelines cross over utilities with a clearance of 2' or less, the drawings shall show the elevations for the bottom of the water pipeline and the top of the utility. Where water pipelines cross under utilities with a clearance of 2' or less, the drawings shall show the elevations for the top of the water pipeline and the bottom of the utility.

- **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

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 7 feet between the top of sewer and existing or proposed ground surface.

Utility Crossing **-** Where sewers cross over utilities with a clearance of 2' or less, the drawings shall show the elevations for the bottom of the sewer and the top of the utility. Where sewers cross under utilities with a clearance of 2' or less, the drawings shall show the elevations for the top of the sewer and the bottom of the utility.

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.

Certification blocks appear on certain sheets as indicated below:

Cover Sheet and Plan and Profile Sheets of plans for system improvements proposed to become part of MSWD shall have the following:

WATER CERTIFICATION BLOCK

I certify that the design of the Water System in Tract No. _____ is in accordance with the Water System master plans for Mission Springs Water District, and that the water service, storage and distribution system will be adequate to provide water service to such tract. This certification does not constitute a guarantee that it will supply water to such tract at any specific quantities, flows or pressures for the fire protection or any other purpose.

_____

MSWD GENERAL MANAGER; DATE

SEWER CERTIFICATION BLOCK

I certify that the design of the Sewer System in Tract No. _____ is in accordance with the Sewer System expansion plans for Mission Springs Water District, and that the waste disposal system is adequate at this time to treat the anticipated wastes from the proposed tract.

_____

MSWD GENERAL MANAGER; DATE

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 INCLUDES 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 OF DESERT HOT SPRINGS 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, RCE #_____ DATE_____ 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 ROAD, 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 48 HOURS PRIOR TO START OF CONSTRUCTION. DAILY COMMUNICATION THROUGH OUT THE ENTIRE DURATION OF THE PROJECT IS REQUIRED. CONTRACTOR SHALL CALL MISSION SPRINGS WATER DISTRICT'S OFFICE BY 3:30 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 TO 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 DESIGN ENGINEER. 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

ELECTRICITY:

SOUTHERN CALIFORNIA EDISON	(760) 321-4291

GAS:

SOUTHERN CALIFORNIA GAS	(909) 335-7729

TELEPHONE:

VERIZON	(760) 778-3620

CABLE TV:

TIME WARNER CABLE	(760) 329-6310

FLOOD CONTROL:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

(909) 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 A MINIMUM OF 4 INCHES IN DIAMETER PER MSWD STANDARD DRAWINGS, UNLESS OTHERWISE NOTED ON PLANS. 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

MISSION SPRINGS WATER DISTRICT
WATER PLAN CHECKING PROCEDURES

DEVELOPER: _____ 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.

Mission Springs Water District, 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 is to be placed so that stationing runs from left to right.

☐ 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 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, expiration date and signature line and date shall appear on each sheet of the set.

- ☐ Riverside County Fire Department Approval block shall appear on all title sheets for the Fire Marshal signature and date.

- ☐ Recommend for Approval by the district engineer block including RCE , exp. and signature line for and date shall be provided 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

- ☐ 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 shall be clearly shown on all sheets.

- ☐ Benchmark including description, datum and 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

- ☐ 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.

- ☐ 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 Assessor's 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.

- ☐ Proposed Water Mains, including size and valve locations within the project limits, shall be shall be shown in bold solid lines. District drawing numbers for points of connection shall be shown.

- ☐ Street names and right-of-way lines, easement lines and widths, and lot lines shall be shown within the project limits.

- ☐ A North arrow (placed so that stationing runs from left to right), and graphic scale, including scale in feet per inch (1'=200").

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 by stationing beneath the profile as closely as possible and shall be oriented with North is to be placed so that stationing runs from left to right.

- ☐ All street names correctly indicated, with 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 of the water main.

- ☐ 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, catch basins and manholes.

- ☐ 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 shown on both plan and profile. All water mains shall be Class 350 ductile iron pipes unless the District Engineer or designee 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 consistently 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 or designee (See design requirements).

- ☐ The depth of the waterline shall be shown in the profile. 3' minimum cover for 8' and 10' 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 12" and smaller mains and 1.5 degrees (0.0262S) for 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 over 12" based on 20' pipe joints with 1.5 degrees deflection.
- 229' min. radius for 12" and smaller mains based on 10' pipe joints with 2.5 degrees deflection.
- 382' min. radius for mains over 12" 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, the alignment shall be designed using standard bends of 11 ¼ 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, the water lines shall be clearly labeled and the labels shall remain constant throughout the plans and profiles.

☐ The profile shall show all stations, elevations and clearances for proposed sewer and storm drain crossings.

☐ 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 calves 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.

☐ Water services, including size, shall be shown and stationed for each lot or property. 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 plan drawings. Irrigation meter drawings should indicate size as well as details of the installation of back flow prevention devices and location. Meter locations shall comply with MSWD Standard specification for constructing water and sewer facilities.

- ☐ Air & vacuum release valves are required at all high points in main lines 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-sacs and at spacing on all streets in conformance with the Fire Department requirements. 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 shall be approved by the Fire Marshal prior to submittal to the District.

- ☐ Waterline easements shall be minimized and utilized only when necessary. The District will require that the water mains shall be provided with shutoff valves at both ends of any easement section. Easement shall be a minimum of 20 feet wide.

- ☐ Water mains 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 and stations shall be shown in plan view. Stations, elevations and clearances shall be shown in the profile.

4.11 SEWER PLAN – CHECKLIST

MISSION SPRINGS WATER DISTRICT
SEWER PLAN CHECKING PROCEDURES

DEVELOPER: _____ 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 _____, 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.

- ☐ 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, expiration date and signature line and date shall appear on each sheet of the set.

- ☐ Recommend for Approval by the district engineer block including RCE , exp, and signature line and date shall be provided 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.

- ☐ 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 shall be clearly shown on all sheets.

- ☐ Benchmark including description, datum and 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.

- ☐ 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.

- ☐ The location and size for all proposed sewer mains including size and manhole locations and manhole numbers within the project limits shall be shown in bold solid lines. District drawing numbers for points of connection shall be shown.

- ☐ Street Names and right-of-way lines, easement lines and widths, lot lines shall be shown within the project limits.

- ☐ A North arrow and graphic scale including scale in feet per inch (1' = 200").

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 stationing running from left to right.

- ☐ 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 10' between pipes OD.

- ☐ 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 shown in chapter 3.07 “Pipe Slope” of this handbook. Grades for larger trunk lines will be based on 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 that will 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 the depth of flow, assuming pipe to be 1/2 full for 8" through 15" sewers and 3/4 full for larger sewers unless otherwise approved by the district.

- ☐ Maximum manhole spacing is 350 ft. center to center.

- ☐ 48" (4ft.) diameter manholes shall be used for sewers 8" through 24" diameter, 60" (5') diameter manholes for larger sewers and for any sewer manholes with less than 5 foot in depth.

- ☐ Profile shall show inlet and outlet elevations and direction of all pipes, including stubs, for all manholes, except terminus manholes. 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 subgrade over sewer shall be shown in profile if the project is to be graded prior to sewer construction.

- ☐ Design plans for the construction of sewers in future phases, or in dedicated easements that are not currently graded, shall provide both existing and proposed grades over the sewer main in the profile view, 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 field verified 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 laterals shall be shown and stationed for all lots. Laterals shall be shown with the line at actual station with the wye tic 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 farther away, perpendicular to the sewer main wherever possible.

- ☐ Minimum grade for normal 4" sewer laterals shall be 2.00%. When sewers are less than 8' deep or parallel to storm drains or large water lines which may conflict with laterals, 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.

4.12 DIGITAL PLAN SUBMITTAL

MSWD requires the developer's engineer preparing the improvement plans to submit ONE composite/ overall map in plan view showing the description and layers listed below in digital format. No individual plan and profile sheets.

THIS IS NOT AN OPTIONAL ITEM. The graphics file must contain water and/or sewer pipelines, improvement area boundary, street centerline, right-of-way and lot/parcel line data to facilitate transferring the information into MSWD mapping system. The digital drawing shall be at a 1:1 scale.

If the engineer does not have the capability to provide such files, MSWD will input the improvement information into the mapping system and recover the costs from the developer prior to final acceptance of the improvements through the plan check process. Receipt and acceptance of the digital data is a plan check requirement prior to MSWD signing the improvement plans.

Files shall be e-transmitted to include appropriate font files and CTB or STB so files plot.

1. The tie coordinates shall be based on the California State Plane Coordinate system (NAD 83 and Zone VI) in at least two locations, preferably on opposite sides of the area being mapped. Vertical datum shall be NAVD 88.

2. MSWD will provide two reference points for the project area, at the engineer's request.

3. Software Format

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

   a) AutoCAD's Release 2007 (.DWG) or an earlier version

   b) Drawing Exchange File (.DXF)

4. Digital Data Media

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

   a) CD Rom

   b) DVD

      If the developer's engineer does not have the capability to provide such files, MSWD will input the data into their existing mapping system and recover the costs from the developer. A fee (call MSWD Engineering Department for cost estimate) per lot will be required in lieu of submitting the digital data should the developer's engineer only provide hard copy plans. The digital data shall be submitted prior to MSWD signing the plans.

The following information must be submitted with all digital data:

- DATE (Date submitted)
- MAP NAME (TR, PM, PP, Etc.)
- MSWD WO# (MSWD will complete this)
- COMPANY (engineering Firm Name)
- MEDIA CREATOR (Name of person creating media)
- FILE NAME (Filename with extension)

5. Requirements for Hardcopy Submission

   In conjunction with the digital submission of the proposed improvement a printed overall layout of the information will be required.

The scale for this plan shall be either 1”=100’, 1”=200’, or 1”=400’, whichever best fits a D-size (24” x 36”) drawing sheet.

6. Symbol Representation

All water and sewer symbols shall conform to MSWD AutoCAD map symbols. MSWD will provide these symbols in .DWG or .DXF formats on a diskette or via email.

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. See Section 5.03.02.

2. All required items listed in fee letter 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 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's pressure tests and disinfects water system facilities and leak test sewer system facilities.

9. MSWD Inspector notifies Engineering Department when the bacterial and pressure tests have passed on an extension of pipeline. No water will be supplied to that extension until the proper fees have been paid.

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

11. Engineering Department provides developer a Meter Cost Worksheet outlining meter and jumper fees due, see Section 5.03.09.

12. Upon receipt of the meter and jumper fees, Engineering Department processes the paperwork and forwards paperwork to MSWD Finance Department.

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. Jumpers can now be utilized by the developer to use water; MSWD inspector contacts the developer to advise when jumpers may be installed. MSWD inspector tracks jumper use in order to determine when meters should be ordered, see Section 5.03.10.

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

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

18. MSWD installs the meter(s).

19. MSWD releases lots for occupancy to the City or County.

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

21. Developer's contractor completes all punch list items and prepares record drawings.

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

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

24. Developer prepares Grant Deed for acceptance of the water and sewer system facilities and MSWD prepares a Notice of Completion.

25. Developer submits a recorded Record Map to MSWD.

26. MSWD submits a Grant Deed and Notice of Completion (NOC) to developer for signature, records NOC and releases the Labor and Materials Bond.

27. Following the Notice of Completion 35 Day lien period, MSWD submits the Grant Deed for recordation and reduces the Faithful Performance Bond by 90% and holds a10% retention for one year.

28. MSWD issues a letter to the City or County accepting the water and sewer system.

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 first plan check deposit (see 1.05 4a). Engineering Department will determine if sufficient funds remain or if an additional deposit is required.

    c) Added Facilities Charge (AFC) – The added facilities charge is based on MSWD Improvement District and the size and number of water meters to be installed.

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

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

f) Back flow preventer assembly charges.

g) Sewer connection fees.

h) MSWD mapping Fee for GIS record update.

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). A blanket easement will be required if the tract Map is not recorded. MSWD will not record the blanket 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 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 of 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 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 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 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. Pay meter and jumper fees: Once bacterial testing and pressure testing has passed on an extension of pipeline, the Engineering Department will notify Development Services, who will then fax a Meter Cost Worksheet to the developer requesting payment of meter fees and a sequence list (list of addresses and lot numbers). All meter and jumper fees are due for lots fronting that extension of pipeline. No water will be supplied to that extension of pipeline until the proper fees have been paid. A Meter

Cost Worksheet and instructions for ordering jumpers and meters are set forth in (Sections 5.03.09 and 5.03.10).

27. 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 tested and certified by MSWD.

28. Receipt of meter and jumper fees: Development Services will process the meter paperwork through MSWD mapping and finance departments. Thereafter, the department will forward field memos to the MSWD Engineering Department. Jumpers can now be utilized by developer to obtain water. Developers supply their own jumpers. MSWD inspector tracks jumper use to determine when meters are ready to be installed.

29. 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.

30. 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.

31. 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.

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

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

34. 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.

35. MSWD prepares a notice of completion and grant deed for the water and sewer system facilities.

36. Developer submits a recorded record map. If a recorded record map has not yet been submitted, the developer shall submit one prior to MSWD submitting the Notice of Completion and Grant Deed to developer for Execution.

37. When MSWD has received a copy of a recorded tract map, MSWD will submit the Notice of Completion and Grant Deed to developer for execution.

38. When the developer executes the Notice of Completion and Grant deed, 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.

39. After the Notice of Completion is recorded and following the 90-day lien period, MSWD will submit the Grant Deed to the County Recorder for recordation and will reduce the Faithful Performance Bond by 90%.

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

5.03 PRE-CONSTRUCTION AND CONSTRUCTION FORMS INDEX

5.03.01 FLOW CHART – PRE-CONSTRUCTION AND CONSTRUCTION

Section 5.02(1) to 5.02(14)

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

1. Engineering and plan check Review Fees
2. Inspection deposit
3. Added facilities charge (AFC) (See section 5.03.11)
4. Meter fees (See section 5.03.09)
5. Jumper fees (See section 5.03.09)
6. Distribution system fee (DSF) (See section 5.03.09)
7. Sewer connection fees (See section 5.03.09)
8. New demand charge (NDC)

The developer shall submit the following:

1. Three copies of water/sewer system construction agreement, each with original signatures (sections 5.03.03 & 5.03.04)
2. Two copies of participation/refund waiver agreement, each with original signatures (section 5.03.05)
3. Labor & materials bond and faithful performance bond
4. Contractor's Name, Address, and License Number
5. Certificate of insurance by contractor with MSWD named as additional insured
6. Copy of contractor's bid with line item costs
7. Copy of encroachment permit (if working in a public R.O.W.)
8. Letter from licensed civil engineer that streets have been graded to rough-grade (exhibit 5.03.06)
9. Letter from developer that curb & gutters have been constructed or submit a letter requesting waiver (section 5.03.07)
10. Easements or fee title
11. Soils report
12. Recorded map or blanket easement.
13. Tract construction phasing maps showing lot numbers & street names

↓

Section 5.02(15)

Schedule a preconstruction meeting with MSWD Engineering Department

→

Section 5.02(16) & 5.02(17)

Attend preconstruction meeting and provide copies of cut sheets

↓

Section 5.02(18)

MSWD issues notice to proceed

↓

Section 5.02(19)

Notify MSWD a minimum of 48 hours prior to construction start

↓

Section 5.02(20) & 5.03.08

Construct water and sewer system facilities

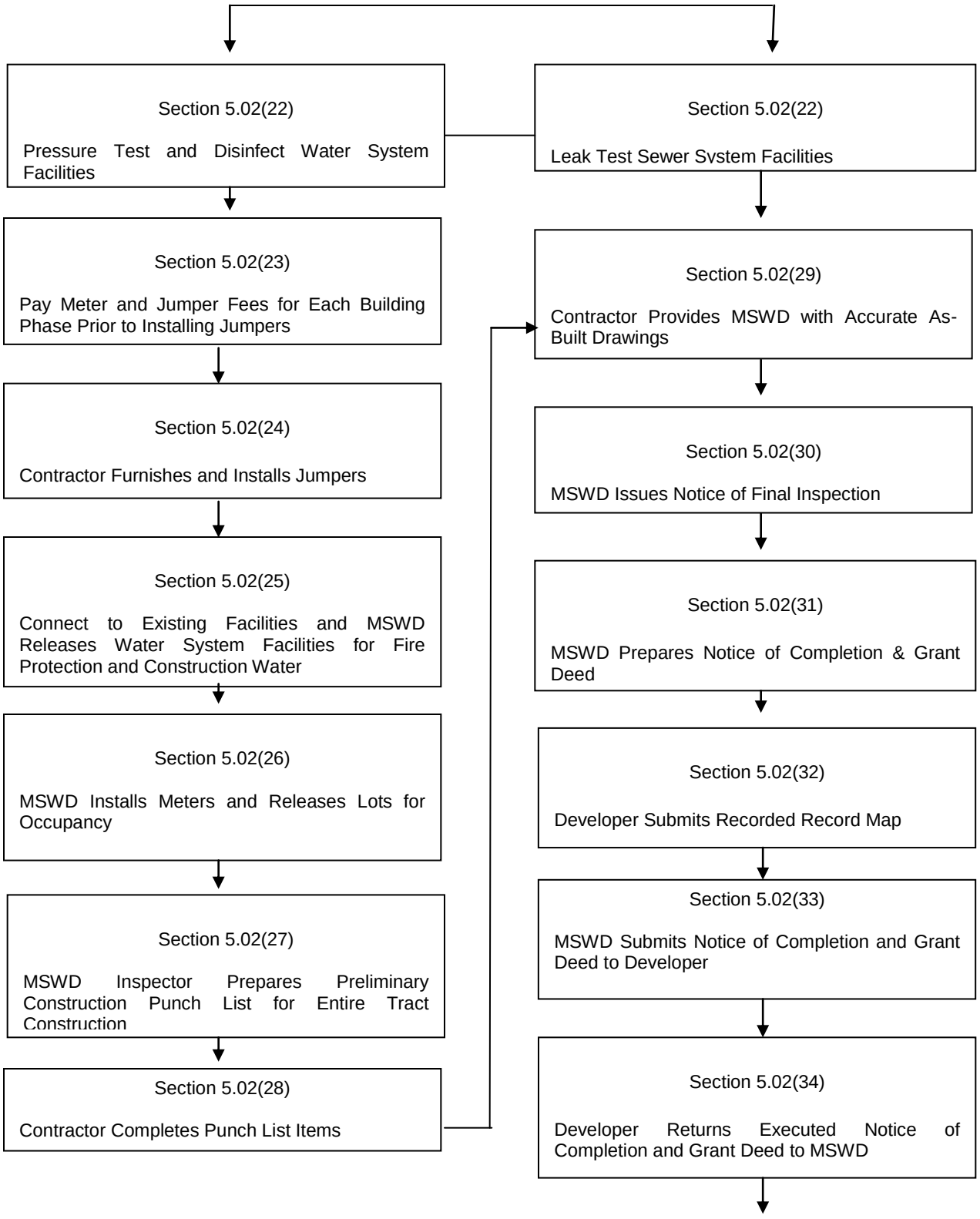
↓

Section 5.02(21)

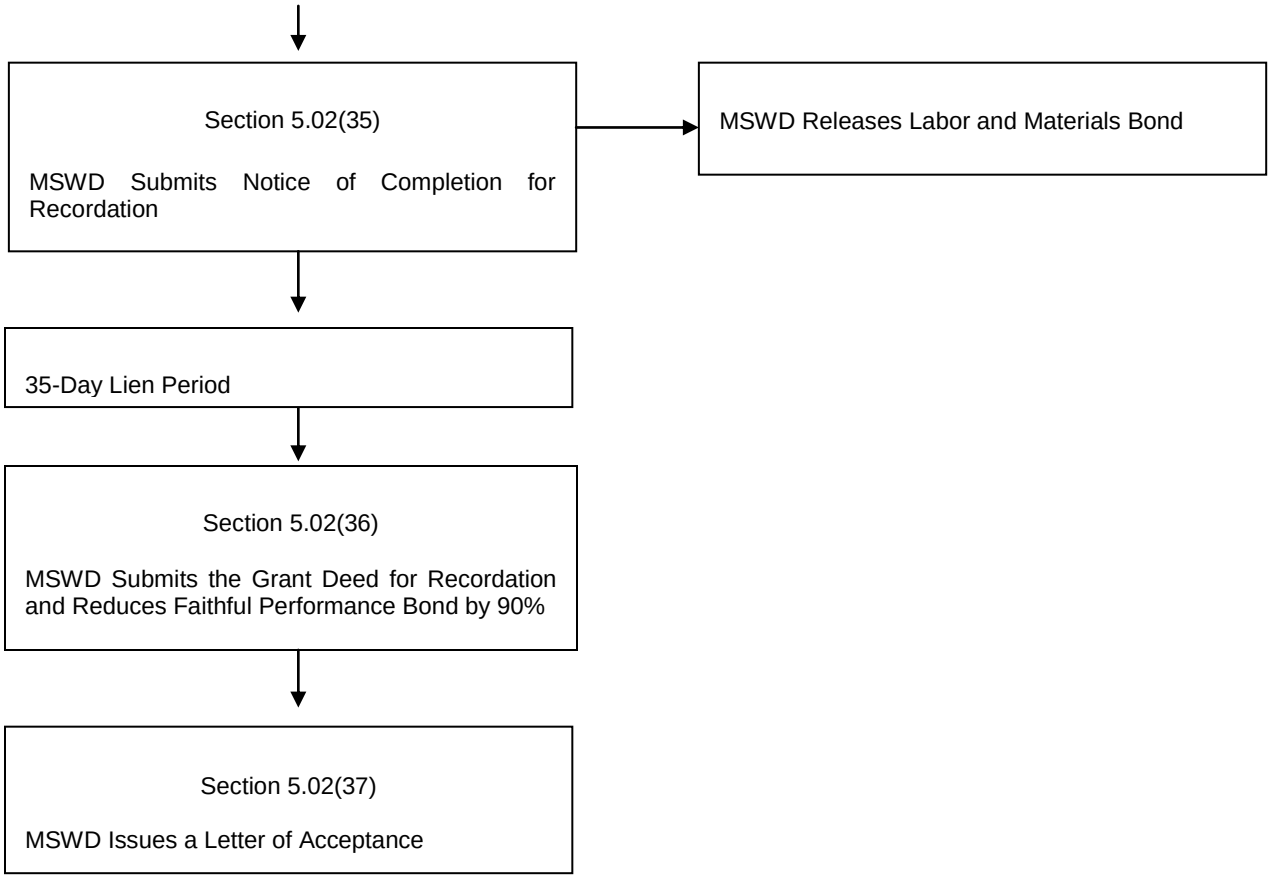
Furnish evidence of acceptable compaction tests

↓

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

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)

Contracts: Participation Refund or Waiver Agreement (2 signed originals)

Contractor: Name

Contractor: Copy of contractor's bid with unit cost breakdown

Contractor: Certificate of Insurance (MSWD named as additional insured)

Deposit: engineering and Plan Check plan review fees $

Deposit: Inspection Model Home/common area landscape $

Fees: Mapping Charge $

Fees: Model Home Landscape Plan Review Fee $

Fees: Sewer Connection Fee – See attached cost worksheet.

Fees: Added Facilities Charge / Meters / Jumpers - 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)

Form Letter: AFC Deferral Agreement Letter. (developer signs)

Form Letter: Water Conservation Compliance for Model Homes (developer)

Maps: Original mylars.

Maps: 4 bond copies of 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

5.03.03 WATER SYSTEM CONSTRUCTION AGREEMENT

Improvement District No. _____

MISSION SPRINGS WATER DISTRICT
WATER SYSTEM CONSTRUCTION AGREEMENT
(DEVELOPER INITIATED/CONTRACTOR INSTALLED)

THIS AGREEMENT is made on this_____day of _____, 20 __by_____and between MISSION SPRINGS WATER DISTRICT, a public agency of the State of California with its headquarters at Desert Hot Springs, California, hereinafter designated as the "District" and _____located at _____ _____, phone No. _____ represented by _____hereinafter designated as the "developer" and _____located at _____ _____, phone No. _____ represented by _____ hereinafter designated as the "contractor".

WHEREAS, developer is planning a development of _____ lot(s) located in a portion of Section _____, Township _____ South, Range _____ East, San Bernardino Base and Meridian, and such development is referenced within records of the County of Riverside, State of California, as and is further identified on the map attached to and made a part of this Agreement; and

WHEREAS, said subdivision will require a water distribution system to provide domestic water service to the lands referenced above; and

WHEREAS, said developer is desirous of having the District provide domestic water service to said lands and is willing to convey to the District the water distribution system after the construction thereof, contingent upon the District's acceptance of such conveyance on the terms and conditions set forth herein,

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. Developer will comply with the District's regulations for planning domestic water systems. These regulations, which may be amended from time to time, are incorporated herein by reference.

2. The developer shall deposit, with the District, costs to cover necessary engineering services, permits, inspection and water system connection costs in an amount estimated by the District.

3. The developer shall contract for the design to be prepared by a licensed civil engineer experienced in the design of similar systems.

4. The domestic water system to service said lands shall comply with the District's specifications and construction plans shall be approved by the District prior to the presentation thereof to contractors for bidding purposes. Such domestic water systems shall include all pipelines, valves, hydrants and appurtenances.

5. The developer will contract for the services of a licensed and qualified 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. 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.

6. The entire cost of the construction of such domestic system shall be paid by the developer. Such construction shall be inspected by District personnel for conformance with the approved plans and specifications. Whenever the contractor desires to work outside the regular or specified work periods or to vary the work period during any particular day, he 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 contractor 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.

7. Developer shall guarantee the completion of construction by Day, Month, 20XX. Developer shall comply with Paragraph 9 herein.

8. Developer agrees to pay all costs incurred by the District as may be necessary to complete construction, including administrative costs, or to secure compliance with the provisions on Paragraph 11.

9. Contractor shall procure and maintain for the duration of the contract, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the contractor, contractor's agents, representatives, employees or subcontractors.

    a) Coverage shall be at least as broad as:

        i. Insurance Services Office form number GL 0002 (Ed. 1/73) covering Comprehensive General Liability and Insurance Services Office form number GL 0404 covering Broad Form Comprehensive General Liability coverage ("occurrence" form CG 001).

ii. Insurance Services Office form number CA 0001 (Ed. 1/78) covering Automobile Liability, code 1, "any auto" and endorsement CA 0025.

iii. Workers' Compensation insurance as required by the Labor Code of the State of California and Employers Liability Insurance.

b) Limits of Insurance shall be:

i. General Liability: $1,000,000 combined single limit per occurrence for bodily injury personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

ii. Automobile Liability: $1,000,000 combines single limit per accident for bodily injury and property damage.

iii. Workers' Compensation and Employers Liability: Workers' Compensation limits as required by the Labor Code of the State of California and Employers Liability limits of $1,000,000 per accident.

c) Any deductible or self-insured retention must be declared to and approved by the District. At the option of the District, either: the insurer shall reduce or eliminate such deductible or self-insured retentions as respects the District, its officers, officials, employees and volunteers; or the contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

d) The contractor shall provide endorsements on the forms attached hereto as Exhibits A, B, & C to add the following provisions to the insurance policies:

i. General Liability and Automobile Liability Coverage:

1) The District, its officers, officials, employees and volunteers are to be covered as insured as respects: liability arising out of activities performed by or on behalf of the contractor, products and completed operations of the contractor, premises owned, occupied or used by the contractor. The coverage shall contain no special limitations on the scope of protection afforded to the District, its officers, officials, employees or volunteers.

2) The contractor's insurance coverage shall be primary insurance as respects the District, its officers, officials, employees and volunteers. Any insurance of self-insurance maintained by the District, its officers, officials, employees or volunteers shall be excess of the contractor's insurance and shall not contribute with it.

3) Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the District, its officers, officials, employees or volunteers.

4) The contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

ii. Workers' Compensation and Employers Liability Coverage:

1) The insurer shall agree to waive all rights of subrogation against the District, its officers, officials, employees or volunteers for losses arising from work performed by the contractor.

iii. All Coverage:

1) Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the District.

e) Contractor shall furnish the District with certificates of insurance and with original endorsements effecting coverage required by this clause. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be on forms provided by the District. Where by statute, the District's Workers' compensation related forms cannot be used, equivalent forms approved by the Insurance Commissioner are to be substituted. All certificates and endorsements are to be received and approved by the District before work commences. The District reserves the right to require complete, certified copies of all required insurance polices, at any time.

f) Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein.

10. 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 as referenced in Paragraph 11 (v).

b) A labor and materials payment bond being for not less than one hundred percent (100%) of the total contract price as referenced in Paragraph 11 (v).

11. 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. Also, the developer shall furnish to the District any and all requested documents including, but not limited to, the following:

a) Easement Deed or Grant Deed to any rights-of way or other real property interests necessary for roads, for ingress and egress, and for maintenance and operation of the domestic water system: A Declaration by the contractor that the contractor has been paid in full and that all persons employed by the contractor or who have furnished material for the construction of the water system have been paid in full;

b) The executed Notice of Completion to be filed by the District;

c) A Grant Deed executed by the developer vesting title of said water system and appurtenances to the District;

d) 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.

e) Payment to the District by the developer of any and all applicable fees including, but not limited to Added Facilities Charge, Distribution System Fee, and meter installation fees.

12. 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.

    a) 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.

    b) 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.

13. The District will not furnish water to the water system until the completed system passes final inspection by the District, and developer has fully complied with Paragraph 11. 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.

14. The District will allow jumper connections only after the water system has been pressure tested, chlorinated, and successfully tested for lack of bacteria and that all permanent meter fees and the jumper flat fee be paid prior to jumper installation.

15. District requires that a permanent meter must be installed prior to landscaping.

16. This agreement is binding on the assigns of the District and on the assigns, successors and representatives of the developer and the contractor. Assignment of this agreement by the developer or the contractor shall have prior written authorization by the District.

17. Developer shall agree to comply with the water conservation requirements set MSWD and local ordinances.

EXHIBITS:

Map – Exhibit A
Model Home Landscape Requirement – Exhibit B
Brochure Distribution Requirement – Exhibit C

MISSION SPRINGS WATER DISTRICT

By:_____

Name:_____

Title:_____

Date:_____

DEVELOPER

Company:_____

By:_____

Name:_____

Title:_____

Date:_____

CONTRACTOR

Reviewed By: _____

Company:_____

By:_____

Name:_____

Title:_____

Date:_____

Name:_____

Title:_____

Date:_____

MISSION SPRINGS WATER DISTRICT
MODEL HOME WATER CONSERVATION REQUIREMENTS
EXHIBIT "B"

Water Conservation and Landscape Requirements

All developments shall be required to prepare Landscape and Irrigation Plans in conformance with 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 lines will be returned to the applicant for corrections. Where local agency comments conflict with MSWD requirements, the applicant is encouraged to contact the MSWD Consultant for resolution.

Final plans will be wet 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 in order to receive MSWD Certificate of Completion. Certificate of Completion is required prior to issuance of Certificate of Occupancy by the governing land use authority.

Riverside County Residential Model Home Requirements

1. In residential subdivisions, all model homes in the project shall comply with the provisions of Article XIX of Ordinance 348d Section 19.304 Residential Model Home Requirements.

2. The project applicant shall provide homebuyers with sample water-efficient landscape and irrigation plans and additional educational material as approved by the Planning Director upon the sale of each dwelling unit within the project. The plans shall include a key identifying the common names of the plants used in the landscaping.

3. The project applicant shall distribute outdoor water conservation pamphlets provided by local water purveyors, if available, to buyers upon the sale of each dwelling unit within the development. *MSWD can provide these at no cost.*

4. A sign, which is clearly visible to homebuyers, shall be displayed in the front yard of each model home. The sign shall indicate that the model home features a water-efficient landscape irrigation design.

MSWD Residential Model Home Requirements

1. At least one model home, within residential subdivisions, shall demonstrate a water conserving landscape. MSWD can make available brochures on water conservation for inclusion in new homebuyers' sales packets. 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. Virtual tours of the garden are on the MSWD website – www.mswd.org – where valuable water conservation information is available.

2. The developer's landscape architect shall consult with the MSWD conservation 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, supplied by MSWD, to buyers upon the sale of each dwelling unit within the development.

5. Developer shall display water conservation materials, supplied by MSWD, 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.

MISSION SPRINGS WATER DISTRICT
MODEL HOME BROCHURE AGREEMENT
EXHIBIT "C"

(Date)

(Developer)

BROCHURE DISTRIBUTION AGREEMENT

EXHIBIT "C" FOR MODEL HOMES AND SALES PACKAGE

(developer) agrees to: 1) distribute the following brochures: "California Water Facts" and Mission Springs Water District's "Landscapes Southern California Style" to your new home purchasers in the sales package, and 2) display these brochures in the model homes during business hours.

Please provide MSWD with the name of the contact person for tract _____ who will be responsible for receiving and distributing the brochures.

Title:_____

Name:_____

Mailing Address:_____

_____

Business Phone :(___)_____

Cell Phone :(___)_____

Email:_____

By signing this letter, (developer) agrees to display and distribute brochures until all of the homes are sold.

Developer:_____ Date:_____

Title:_____

5.03.04 SEWER SYSTEM CONSTRUCTION AGREEMENT

MISSION SPRINGS WATER DISTRICT

Improvement District No. _____

SEWER SYSTEM CONSTRUCTION AGREEMENT

(DEVELOPER INITIATED/CONTRACTOR INSTALLED)

THIS AGREEMENT is made on this_____day of _____, 20 __by_____and between MISSION SPRINGS WATER DISTRICT, a public agency of the State of California with its headquarters at Desert Hot Springs, California, hereinafter designated as the "District" and _____located at _____ _____, phone No. _____ represented by _____hereinafter designated as the "developer" and _____located at _____ _____, phone No. _____ represented by _____ hereinafter designated as the "contractor".

WHEREAS, developer is planning a development of _____ lot(s) located in a portion of Section _____, Township _____ South, Range _____ East, San Bernardino Base and Meridian, and such development is referenced within records of the County of Riverside, State of California, as

and is further identified on the map attached to and made a part of this Agreement; and

WHEREAS, said subdivision will require a sewer system to provide sewer service to the lands referenced above; and

WHEREAS, developer is desirous of having the District provide sewer service to said lands and is willing to convey to the District the sewer system after the construction thereof, contingent upon the District's acceptance of such conveyance on the terms and conditions set forth herein,

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

Developer will comply with District regulations for planning sewer systems. These regulations, which may be amended from time to time, are incorporated herein by reference.

The developer shall deposit with the District costs to cover necessary engineering services permits, inspection and sewer system connection costs in an amount estimated by the District.

The developer shall contract for the design with a licensed civil engineer experienced in the design of similar systems.

The sewer system to service said these lands shall comply with District specifications and construction plans shall be approved by the District prior to the presentation thereof to contractors for bidding purposes. Such sewer system shall include all pipelines, manholes, cleanouts and appurtenances.

The developer will contract for the services of a licensed and qualified 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. 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 contractor before a contract is signed and actual system construction begins.

The entire cost of the construction of such sewer system shall be paid by the developer. Such construction shall be inspected by District personnel for conformance with the approved plans and specifications. Whenever the contractor desires to work outside the regular or specified work periods or to vary the work period during any particular day, he 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 contractor 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 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.

Developer shall guarantee the completion of construction on _____ Developer shall comply with Paragraph 9 herein.

Developer agrees to pay all costs incurred by the District as may be necessary to complete construction, including administrative costs, or to secure compliance with the provisions on Paragraph 11.

Contractor shall procure and maintain for the duration of the contract, insurance against claims for injuries 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.

A. Coverage shall be at least as broad as:

Insurance Services Office form number GL 0002 (Ed. 1/73) covering Comprehensive General Liability and Insurance Services Office form number GL 0404 covering Broad Form Comprehensive General Liability coverage ("occurrence" form CG 001).

Insurance Services Office form number CA 0001 (Ed. 1/78) covering Automobile Liability, code 1, "any auto" and endorsement CA 0025.

Workers' Compensation insurance as required by the Labor Code of the State of California and Employers Liability Insurance.

B. Limits of Insurance shall be:

General Liability: $1,000,000 combined single limit per occurrence for bodily injury personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

Automobile Liability: $1,000,000 combines single limit per accident for bodily injury and property damage.

Workers' Compensation and Employers Liability: Workers' Compensation limits as required by the Labor Code of the State of California and Employers Liability limits of $1,000,000 per accident.

C. Any deductible or self-insured retention must be declared to and approved by the District. At the option of the District, either: the insurer shall reduce or eliminate such deductible or self-insured retentions as respects the District, its officers, officials, employees and volunteers; or the contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

D. The contractor shall provide endorsements on the forms attached hereto as Exhibits A, B, & C to add the following provisions to the insurance policies:

(i) General Liability and Automobile Liability Coverage:

The District, its officers, officials, employees and volunteers are to be covered as insured as respects: liability arising out of activities performed by or on behalf of the contractor, products and completed operations of the contractor, premises owned, occupied or used by the contractor. The coverage shall contain no special limitations on the scope of protection afforded to the District, its officer's officials, employees or volunteers.

The contractor's insurance coverage shall be primary insurance as respects the District, its officers, officials, employees and volunteers. Any insurance of self-insurance maintained by the District, its officers, officials, employees or volunteers shall be excess of the contractor's insurance and shall not contribute with it.

Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the District, its officers, officials, employees or volunteers.

The contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

(ii) Workers' Compensation and Employers Liability Coverage:

(iii) The insurer shall agree to waive all rights of subrogation against the District, its officers, officials, employees or volunteers for losses arising from work performed by the contractor.

(iv) All Coverage:

Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the District.

E. Contractor shall furnish the District with certificates of insurance and with original endorsements effecting coverage required by this clause. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be on forms provided by the District. Where by statute, the District's Workers' compensation - related forms cannot be used, equivalent forms approved by the Insurance Commissioner are to be substituted. All certificates and endorsements are to be received and approved by the District before work commences. The District reserves the right to require complete, certified copies of all required insurance polices, at any time.

F. Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein.

Developer shall provide the District with 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 as referenced in Paragraph 11 (v).

A labor and materials payment bond being for not less than one hundred percent (100%) of the total contract price as referenced in Paragraph 11 (v).

G. 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. Also, the developer shall furnish to the District any and all requested documents including, but not limited to, the following:

Easement Deed or Grant Deed to any rights-of way or other real property interests necessary for roads, for ingress and egress, and for maintenance and operation of the sewer system;

A Declaration by the contractor that the contractor has been paid in full and that all persons employed by the contractor or who have furnished material for the construction of the sewer system have been paid in full;

The executed Notice of Completion to be filed by the District;

A Grant Deed/Bill of Sale executed by the developer vesting title of said sewer system and appurtenances to the District;

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.

H. The District will not furnish sanitary sewer service until the completed system passes final inspection by the District, and developer has fully compiled with Paragraph 11. 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.

I. This Agreement is binding on the assigns of the District and on the assigns, successors and representatives of the developer and the contractor.

MISSION SPRINGS WATER DISTRICT	DEVELOPER
Reviewed By:	Company
By:	By:
Name:	Name:
Title:	Title:
Date:	Date:

CONTRACTOR

Company	
By:	By:
Name:	Name:
Title:	Title:
Date:	Date:

5.03.05 AGREEMENT FOR ON-SITE WATER/SEWER PARTICIPATION WAIVER

Sewer Extension No._____

Water Extension No._____

MISSION SPRINGS WATER DISTRICT

AGREEMENT FOR
ON SITE WATER / SITE 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	DEVELOPER
Reviewed By:_____	Company:_____
By:_____	By:_____
Name:_____	Name:_____
Title:_____	Title:_____
Date:_____	Date:_____

Reviewed By:_____

Name:_____

Title:_____

Date:_____

5.03.06 ROUGH GRADE VERIFICATION FORM T-3

(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)

5.03.07 CURB AND GUTTER INSTALLATION WAVER REQUEST FORM T-4

(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)

5.03.08 INSPECTOR REQUIREMENTS - FORM G-4

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 of 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 – 4 to 6 hours minimum notice. Special events (pipe delivery, backfill, testing, etc.) require a minimum of 24 hours 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 system 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.

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.

5.03.09 METER FEE COST WORKSHEET - FORM T-6

MISSION SPRINGS WATER DISTRICT
66575 Second St., Desert Hot Springs, CA 92240
Tel: (760) 329-6448 Fax: (760) 329-2482

METER FEE COST WORKSHEET

Date:_____ Tract No. _____

Project Name: _____ Tel: ( ) _____

Developer:_____ Fax: ( ) _____

Developer Contact:_____ Cell: ( ) _____

Superintendent:_____ Trailer:_____

Superintendent Cell# :( ) _____ Fax: ( ) _____

Building Phase No.:_____ Meter Size:_____

Lot No.:_____ Total Lots:_____

METER FEES DUE:

AFC$	$_____	X (# Lots)	=$_____
(AFC Credits (i.e. CFD)	$_____	X (each lot)	=$_____
DSF	$_____	X (# Lots)	=$_____
Meter Cost	$_____	X (# Lots)	=$_____
Jumper Flat Fee	$_____	X (# Lots)	=$_____
Sewer Connection Fee	$_____	X (# Lots)	=$_____
Water Resource Management Fee	$50.00	X (# Lots)	=$_____
		Total Due:	=$_____

5.03.10 INSTRUCTIONS FOR ORDERING JUMPERS AND METERS – FORM T-8

MISSION SPRINGS WATER DISTRICT
66575 Second St., Desert Hot Springs, CA 92240
Tel: (760) 329-6448 Fax: (760) 329-2482

JUMPERS

1. Jumper connections are available only for subdivision (tract) development in lieu of setting the service meter while street improvements are being completed. Jumpers are **NOT** available for Model Homes.

2. Jumpers are installed only after the water system has been pressure tested, chlorinated and successfully tested for lack of bacteria and progressed by the District.

3. Per MSWD Ordinance, all fees, including AFC, meter fees and a flat fee per lot must be paid prior to jumper installation.

4. MSWD does not supply the jumpers. Contractors are required to purchase jumpers from MSWD approved equipment list.

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 meter 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 for occupancy releases within the County or City of Desert Hot Springs.

5.03.11 ADDED FACILITIES CHARGE (AFC) DEFERRAL REQUEST FORM T-9

(Please put this letter on your letterhead)

ADDED FACILITIES CHARGE (AFC) DEFERRAL REQUEST

TRACT _____

SEC. _____, T_____S, R_____E

On behalf of _____, I request that, pursuant to MISSION SPRINGS WATER district's current Ordinance, the Added Facilities Charges (AFC) flat fee, as well as the meter fee, for the referenced tract be deferred to such time as a jumper connection is installed. Jumpers are to be installed in lieu of setting the meters while street improvements are being completed.

I understand that all fees for a permanent meter installation and a jumper flat fee per lot must be paid prior to jumper installation Permanent meters will be installed prior to landscaping.

Thank you for your consideration.

Sincerely,

(DEVELOPER TO EXECUTE)

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 in order 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 30-foot 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 so 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 there from 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 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 waste water reaching the site of the work form 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 12 inches and a maximum width equal to the outside diameter of the pipe plus 20 inches.

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 4 inches 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 6 inches 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 4 inches in thickness, compacted in layers not exceeding 4 inches 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 12 inches 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 6 inches 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 18-inch 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 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.

Steel cylinder pipe 12-inch diameter and smaller shall have cement mortar lining and cement mortar coating (CML & C) unless specifically stated otherwise on the drawings. All pipe 14-inch and larger shall have cement mortar lining and coating (CML & C) unless 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 2" to 12" shall be gate valves; all valves 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 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 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 8" for nominal 12" diameter pipe and 12" for 16" nominal diameter and larger. Band shall be minimum 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 linear 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 2" wide glass reinforced plastic moulded under high pressure. Height of runners to be appropriate to center carrier pipe in casing. Runners shall be 7" long for 8" steel band width an 11" long for 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 1' from the end of casing. The second insulator shall be 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 ¼ 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 24 inch diameter and having a wall thickness greater than 0.1875, shall be Carnegie type joints. Bell and Spigot joints for pipe 24-inch 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 1-½ inches.

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 com-pound 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 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 50 percent 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 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 (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 2 inches 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 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 2 inches 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 5-inch half coupling with plug. Two hand-holes shall be required on pipelines 14 inch 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 (4) inches 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 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 the 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 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 (2") inches 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 (4) inches 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 12" and smaller shall have flanged connections unless weld joint fittings are approved by MSWD. Pipelines 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 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 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 this specification.

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 36 inches. 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 2 or more passes so as to build up a fillet weld having a minimum thickness of 1/4 of an inch. 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, in accordance with MSWD Standard Drawings.

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 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 10 gallons per inch of diameter per mile per 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 24 hours and a maximum of 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 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 6” or greater connection to MSWD domestic system.

An acceptable test shall be a negative Total Coliform 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). For pipelines 14" and larger, butterfly valves with gate valve

by-pass lines shall be installed in conformance with AWWA C500 Section 3.2 and Table 8. (By-pass gate valves shall be 6" for pipelines 14" to 24", 8" for pipelines 26" to 42", and 10" for pipelines larger than 42".)

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, 2" - 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 2 inches. Heat treatment will be permitted to develop these requirements. All bronze shall contain not more than 7 per cent zinc or more than 2 per cent 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 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-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 any and 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 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

P1	Alkyd-rust-inhibitive primer	Devoe Bar-Ox 461
		Kop-Coat/Carboline Rustarmor AD29
		Tnemec 4-55
P2	Alkyd finish	Devoe Bar-Ox 450
		Kop-Coat/Carboline 500 VOC
		Tnemec 2 H
P3	Rubber primer	Polyken Plicoflex
P4	PVC 20-mil tape	Polyken tape
		Plicoflex tape
P5	Coal Tar Epoxy	Devoe Devtar 5A
		Kop-Coat/Carboline 300M
		Tnemec 46 H-413
P6	Coal Tar Mastic	Tnemec 46-450 Heavy
		Kop-Coat/Carboline Bitumastic 50
P7	Universal Primer	Tnemec Chem-Prime P37-77
		Devoe Bar-Ox P-50
P8	Grease	Chevron E.P. Roller Grease
		Texaco Rust Inhibitive Grease

P9	Heat Resistant Silicone Aluminum	Tnemec 39-1261 (up to 1200° F) Devoe HT-12 High Heat Silicone Coating
P10	Vinyl Wash Primer	Devoe Vy-Kote 443 Kop-Coat/Carboline 30 Tnemec 32-1210
P11	Epoxy Coating - Powder	3M Scotchkote 134 Dow DC 3100 Furane 2611
P12	Epoxy Coating - Liquid (EPA Approved)	Keysite 750(White) Tnemec 20(White) Devoe Bar-Rust 235
P13	Waterproofing	Regular Rainguard Regular Penetreat-50 Rainproof
P14	Acrylic Latex	Prufcoat-Prufacryl 556 Series Devoe 12YY
P15	Epoxy Coating – Liquid	Plasite 7156 150°F+

6.06.10 CHART - SURFACE PREPARATION AND COATING THICKNESS

ITEM	SURFACE PREP.	FIRST COAT	SECOND COAT	THIRD COAT	MIN. TOTAL DRY FILM THICKNESS (MILS)
1. Ferrous Metal Surfaces					
a) Exposed	SP6	P1	P2	P2	6.0
b) Submerged	SP10	P5	P5	--	24.0

c)	Underground	SP3	P6	P6	--	32.0
d)	Subject to High Temp. (300°+F)	SP6	P9	P9	--	2.0
e)	Wearing Surfaces	None	P8	--	--	50.0
2.	Steel Pipe					
a)	Interior (if not CML)	SP10	P12	P12	P12[1]	--
b)	Exterior/Buried (if Concrete encased)	SP3	P1	--	--	3.0
c)	Exterior/Buried (if not CMC or concrete encased)		(coated and wrapped per current AWWA C-203)			
d)	Exterior/Above Grade	SP6	P1	P2	P2	6.0
e)	Interior/150°+F	SP10	P15	P15	--	12.0
3.	Ferrous Metal Valves					
a)	Exterior		(as described per Item 1 above)			
b)	Interior	SP10	P11 or P12	P11 or P12	-- --	10.0 12.0
4.	Black Steel Pipe (Buried)	SP3	P3	P4	--	40.0
5.	Galvanized Surfaces					
a)	Coated in addition to galv.	SP3[2]	P10	P2	P2	6.0
b)	Buried	SP3	P3	P4	--	40.0
6.	Structural Steel					
a)	Shop Primed	SP6	P1	P2	P2	6.0
b)	Not Shop Prim.	SP6	P1	P2	P2	6.0
7.	Mech. Equip. w/Factory Finish					

a) Field Applied Touch-up	SP2	P1	P2	--	--(3)

(1)Where required by manufacturer to meet minimum DFT requirement.
(2)Acid wash and wash prime.
(3)Thickness to be same as for service exposure of adjacent surfaces.

6.06.11 COLOR AND PAINT SCHEDULE

PROCESS SYSTEM	DESCRIPTIVE COLOR CODING	MANUFACTURERS' COLOR DESIGNATION
All exposed Piping Standards	Per MSWD	Submit to MSWD

6.06.12 IDENTIFICATION OF PIPING

PIPING SYSTEMS:

Identification of piping systems shall conform to the requirements of ANSI A13.1, "Scheme for the Identification of Piping System", unless otherwise specified herein.

SYSTEM	(TNEMEC COLOR DESIGNATION)	LABEL
Air, Low Pressure	Light Green (AU52)	Compressed Air
Air, High Pressure	Light Green (AU52)	Compressed Air
(Over 50 psi)	w/Yellow Bands (BV57)	(as approp.) psig
Gas & LPG	Light Yellow (BV57)	Gas
Wash Water	Red (CC13)	Wash Water
Potable Water	Pale Blue (BB42)	Water
Supply Oil Lines	Light Gray (BG62)	Supply Oil
Drain Oil Lines	Dark Gray (BD22)	Drain Oil
Engine Cooling Lines	Orange (BX36)	Engine Cooling Water

COLOR IDENTIFICATION:

All exposed and/or unburied pipe, other than unit suction and discharge piping, including tubing, galvanized pipe, polyvinyl chloride pipe and fiberglass reinforced pipe, shall be

painted “Desert Sands” with color bands of an approved tape type. VCP, FRP, stainless steel pipe and all other pipe not readily receptive to a painted finish may be left natural. Markers shall be adhesive type with extra strength and suitable for continuous duty at 250◦. All markers shall have a protective silicone film.

Each utility shall be clearly labeled with 1” high lettering on piping 2” in diameter and large; on pipes 1/2” to 2” in diameter the lettering height shall be 1/2 of the pipe diameter; on piping/tubing smaller than 1/2” diameter. A sheet metal band shall be formed around the pipe and extend 1” beyond on front and back to form a “Flag”. The sheet metal “Flag Band” shall be made of a material that is not detrimental to the host piping. The front and back “Flag” shall be riveted together at each end to affix permanently to the host pipe. The lettering height on the “Flag” shall be 1/2”.

MSWD reserves the right to make modifications to the color identifications schedule outlined above.

Contractor shall submit color charts to MSWD for approval.

6.06.13 PREPARATION

1. Surface Preparation:

   The contractor shall examine carefully 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. In order 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.

6.06.14 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.

6.06.15 APPLICATION OF PAINT

The applicator of the paint shall have had past 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 so 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.

6.06.16 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.

6.06.17 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.

6.06.18 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 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 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 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 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 and backfill 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. Complete CD or DVD 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 so as 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 in order 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 12" or more than 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 2-foot 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 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 have to 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 1/4 inch. The channel surface shall be smoothed with epoxy mortar. The new VCP sewer pipeline (not to exceed 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 in order 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 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 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 of 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. Tops 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 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. Fabric shall have a paint stripe not less than 12" in width painted longitudinal per MSWD instruction.

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) CD-Rom of PLC program if part of project

   e) Minimum three copies 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 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 off site 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. Acceptable manufacturers are Essco, Flygt, KSB, Hydromatic, Fairbanks-Morse or approved equivalent.

ix. 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 place 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 five 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 on 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 an 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 particular 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.

7.13 SEWER LIFT STATION DRAWINGS LS-1 – LS-5 (TABLE OF CONTENTS ONLY)

Lift Station Plan	LS-1
Lift Station Hatch Plan	LS-2
Lift Station Section	LS-3
Control Building Plan	LS-4
Control Building Section	LS-5

SUBMERSIBLE SEWER LIFT STATION

Contact MISSION SPRINGS WATER DISTRICT Engineering Department for Standard Specifications (760) 329-6448

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

TITLE	DWG #
Typical Line Types	D-01
Typical Legend	D-02
Curve Data Table, Manhole Legend, and Construction Notes Table	D-03
Typical Title Block	D-04
Typical Sewer Cover Sheet	D-05
Typical Sewer Plan and Profile Sheet	D-06
Typical Water Cover Sheet	D-07
Typical Water Plan and Profile Sheet	D-08
Fire Flow Certifications	D-09
Parallel Separations	G-01
Perpendicular Separations	G-02
Separation Notes	G-03
Post Meter Recycled Water Separations	G-04
Marker Post Installation	G-05
Guard Post Installation	G-06
Typical Sewer Trench	S-01
Sewer Bedding	S-02A
Concrete Sewer Bedding	S-02B
Manhole Frame and Cover	S-03
Manhole Collar and Grade Rings	S-04
4’ Diameter Pre-cast Manhole	S-05
5’ Diameter Pre-cast Manhole	S-06
Terminus Manhole With Laterals	S-07
Knuckle Manhole With Laterals	S-08
Shallow Manhole	S-09
Hot Tap Manhole	S-10
Inside Drop Manhole	S-11
Main Line Cleanout	S-12
Sewer Lateral	S-13
Deep Sewer Lateral	S-14

SEWER PLAN VIEW

SEWER MAIN	———	0.65mm
MAN HOLES	———	0.45mm
LATERALS, TEXT	———	0.30mm
OTHER UTILITIES	———	0.20mm

SEWER PROFILE VIEW

SEWER MAIN	———	0.65mm
MAN HOLES	———	0.45mm
INTERSECTING SEWER LINES, TEXT	———	0.30mm
OTHER UTILITIES	———	0.20mm

WATER PLAN VIEW

WATER MAIN	———	0.65mm
VALVES, FIRE HYDRANTS	———	0.45mm
WATER SERVICES, TEXT	———	0.30mm
OTHER UTILITIES	———	0.20mm

WATER PROFILE VIEW

WATER MAIN	———	0.65mm
FIRE HYDRANTS, TEXT	———	0.30mm
OTHER UTILITIES	———	0.20mm

MSWD
Mission Springs Water District

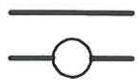
TYPICAL LINE TYPES

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01-14-08

DRAWING No.
D-01

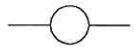
SEWER PLAN VIEW


SEWER MAIN

SEWER MANHOLE


SEWER LATERAL

WATER MAIN


WATER MANHOLE


WATER SERVICE


FIRE HYDRANT

WATER PLAN VIEW

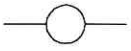
WATER MAIN


WATER MANHOLE


WATER SERVICE


FIRE HYDRANT

SEWER MAIN


SEWER MANHOLE


SEWER LATERAL

SEWER PROFILE VIEW


SEWER MAIN


SEWER MANHOLE


CROSSING UTILITIES

EXISTING SURFACE

PROPOSED SURFACE

WATER PROFILE VIEW


WATER MAIN

CROSSING UTILITIES


EXISTING SURFACE

PROPOSED SURFACE


FIRE HYDRANT


BLOW-OFF ASSEMBLY


AIR RELIEF VALVE

MSWD
Mission Springs Water District

TYPICAL LEGEND

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/14/08

DRAWING No.
D-02

CURVE DATA TABLE

C#	DELTA	RADIUS	LENGTH	TANGENT
C1	–	–	–	–
C2	–	–	–	–
C3	–	–	–	–
C4	–	–	–	–
C5	–	–	–	–
C6	–	–	–	–
C7	–	–	–	–

MANHOLE / CLEANOUT LEGEND

NO.	STATION	RIM/C.O. ELEV.(FT)	INV. ELEV. (IN)	DIR.	INV. ELEV. (OUT)	DIR.	SHEET #	DEPTH (FT)
M.H. 1	–	–	–	–	–	–	–	–
M.H. 2								
M.H. 3								
M.H. 4								
M.H. 5								

QUANTITIES & UNITS ON TITLE SHEET ONLY

CONSTRUCTION NOTES & QUANTITY ESTIMATE

SHOW ONLY NOTES PERTAINING TO SHEET

NO.	ITEM	QUANTITY	UNIT
①	–	–	–
②	–	–	–
③	–	–	–
④	–	–	–
⑤	–	–	–
⑥	–	–	–
⑦	–	–	–
⑧	–	–	–
⑨	–	–	–
⑩	–	–	–
⑪	–	–	–
⑫	–	–	–
⑬	–	–	–
⑭	–	–	–

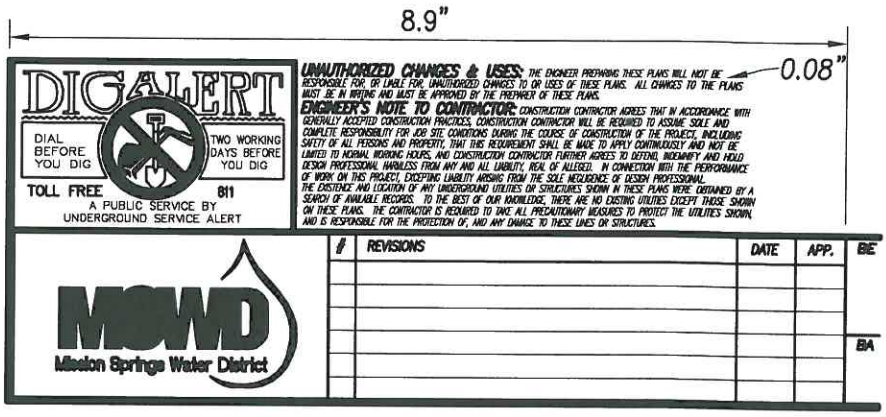
MSWD
Mission Springs Water District

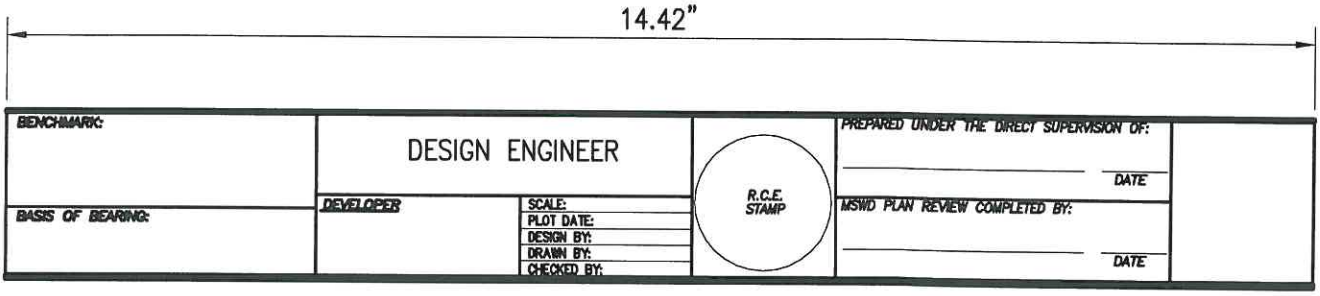
CURVE DATA TABLE,
MANHOLE / CLEANOUT LEGEND,
AND CONSTRUCTION NOTES &
QUANTITY ESTIMATE

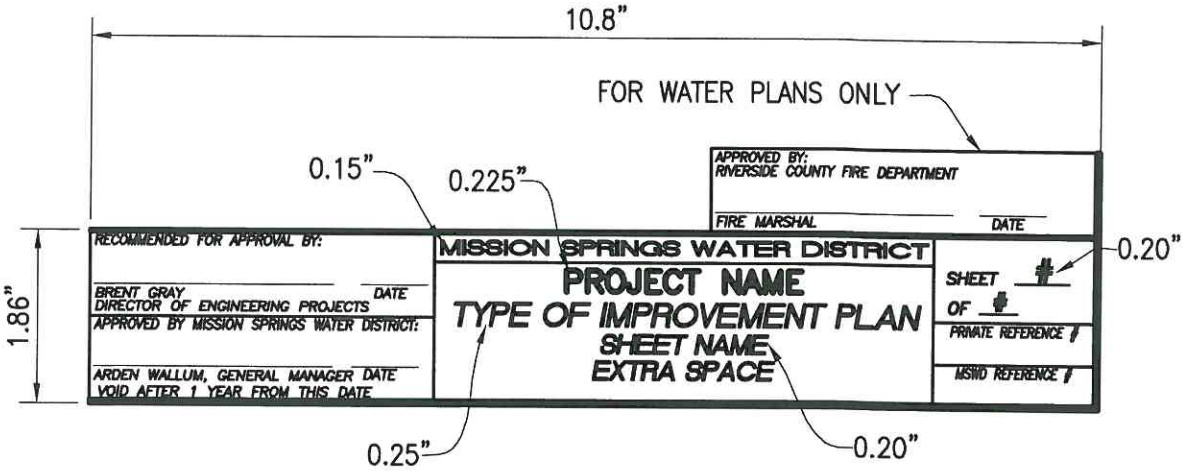
Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/14/08

DRAWING No.
D-03







ALL TITLE BLOCK TEXT TO BE 0.10" UNLESS OTHERWISE SPECIFIED

TITLE BLOCK AVAILABLE FOR DOWNLOAD FROM MSWD'S WEB SITE

MSWD
Mission Springs Water District

TYPICAL TITLE BLOCK

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 8/29/12

DRAWING No.
D-04

MSWD
Mission Springs Water District

TYPICAL SEWER COVER SHEET

Approved: Arden Wallum, General Manager

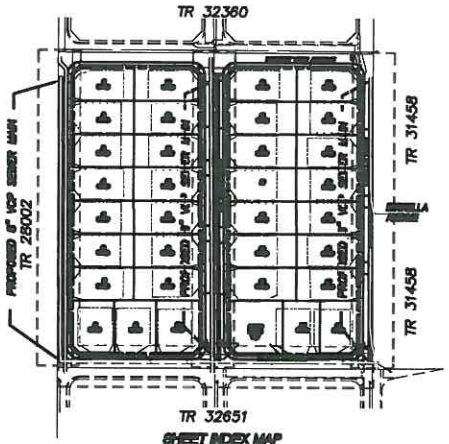
Drawn: Heitec Inc. Date: 8/31/12

DRAWING No. D-05

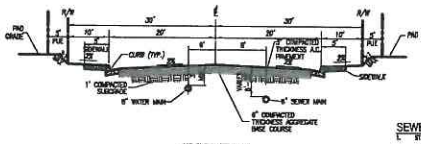
IN THE CITY OF DESERT HOT SPRINGS, CALIFORNIA

SEWER IMPROVEMENT PLAN

TRACT NO. 33643



SHEET INDEX MAP



*AS SHOWN PER PLAN

TYPICAL STREET SECTION
NOT TO SCALE

MANHOLE AND CLEANOUT LEGEND

M.H. NO.	STATION	RIM ELEV.	INV. ELEV. (IN)	DIR.	INV. ELEV. (CENTER OR OUT)	DIR.
M.H. 1	1+00.00	(1041.42)	(1026.89)	NW	(1026.69)	E
M.H. 2	3+39.00	1050.11	1039.18	E	1039.08	S
M.H. 3	7+40.00	1045.43	—	—	1039.47	S
CO. M.H. 4	11+00.00	1038.88	(1031.38)	E	(1031.21)	S
M.H. 5	14+39.00	1037.49	1026.73	N	1026.64	S
M.H. 6	7+65.00	1043.38	—	—	1034.35	S
M.H. 7	1+00.00	1037.49	1031.49	N	(1031.29)	E
M.H. 8	5+99.38	1039.88	1028.43	N	1028.33	S
M.H. 9	9+98.54	1041.97	—	—	1032.97	S

QUANTITY ESTIMATE

QUANTITIES SHOWN ARE FOR PERMIT PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE TO CHECK THE ONE DEPICTED QUANTITIES FOR BID PURPOSES.

8" V.C.P. SEWER MAIN	1,800	LF
4" SEWER LATERAL WITH PRIVATE CLEAN OUT AT R.	33	EA
MANHOLE	7	EA
BACKFLOW PREVENTER	1	EA

LEGEND

FIRE HYDRANT	ASSY	ASSEMBLY
WATER SERVICE	BO	BLOWOFF
REDUCER	BP	BACKFLOW PREVENTER
GATE VALVE	C&G	CURB AND GUTTER
CAP	CL	CENTER LINE
PLUG	CO	CLEAN OUT
BEND	D.I.P.	DUCTILE IRON PIPE
TEE	EX	EXISTING
CROSS	FH	FIRE HYDRANT
CROSSOVER	MH	MANHOLE
BLOWOFF	MIN.	MINIMUM
AIR & VACUUM RELEASE	PL	PROPERTY LINE
AIR RELEASE	R/W	RIGHT-OF-WAY
SEWER MANHOLE	SVC	SERVICE
SEWER LATERAL	S/W	SIDEWALK
SEWER STUB-OUT	SWR	SEWER
SEWER CLEAN OUT	V.C.P.	VITRIFIED CLAY PIPE
	PROP.	PROPOSED
	TOM	TOP OF SEWER MAN
	TYP.	TYPICAL
	WM	WATER MAIN INVERT
	WTR	WATER
	4" SWR LAT	4" VCP SEWER LATERAL

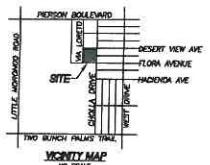
SEWER CONSTRUCTION NOTES:

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 SWANELL 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 VCP 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 (SML) OR EQUAL SHALL BE PLACED ONE FOOT BELOW THE FINISHED GROUND SURFACE DIRECTLY ALONG THE TERMINUS OF THE LATERAL. IF CURB GRADE IS UNKNOWN, THE MARKER SHALL BE INSTALLED TWO FEET BELOW THE ASSUMED FINISHED GROUND SURFACE.
5. ALL SEWER LATERALS TO BE 4 INCHES IN DIAMETER (PER UNIFORM MECHANICAL CODE, TABLE 7-3) UNLESS OTHERWISE NOTED ON PLANS. 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 2006 "GREENBOOK" STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION SECTION 306-1.4.4 "AIR PRESSURE TEST" AND 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.

NOTIFICATIONS:

1. 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) 328-6448
COUNTY ROADS	RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT (760) 863-8097
CITY STREETS	CITY OF DESERT HOT SPRINGS (760) 329-6411
ELECTRICITY	SOUTHERN CALIFORNIA EDISON (760) 251-4261
GAS	SOUTHERN CALIFORNIA GAS (800) 336-7729
TELEPHONE	VERIZON (760) 776-3826
CABLE TV	TIME WARNER CABLE 11555 PALM DR. DESERT HOT SPRINGS, CA 92240 (760) 329-6310
FLOOD CONTROL	RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT (800) 955-1359
UNDERGROUND UTILITIES	UNDERGROUND SERVICE ALERT (800) 227-2600



VICINITY MAP
NO SCALE

GENERAL CONSTRUCTION NOTES:

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 HIGHEST AND 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 24-HOUR PRIOR TO CONSTRUCTION FOR THE DISTRICT'S REVIEW.
4. SANITARY SEWER WILL BE INSTALLED BEFORE ANY OTHER UNDERGROUND FACILITIES ARE CONSTRUCTED EXCEPT WHEN OTHER UTILITIES ARE PROPOSED DEEPER THAN SANITARY SEWER. INSTALLATION INCLUDES BUT IS NOT LIMITED TO: STAKING, PIPELINE INSTALLATION, COMPACTION TESTING, AIR TEST, MASH AND VIDEO. AIR TEST, MASH 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 REQUEST ADDITIONAL AIR TEST, MASH AND VIDEO PRIOR TO FINAL ACCEPTANCE OF FACILITIES.
5. CURB 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" 2006 EDITION. INSTALLATION INCLUDES, BUT IS NOT LIMITED TO, STAKING, PIPELINE INSTALLATION, CHLORINATION, 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 CRISTE & DIPSTEL, TRAFFIC CONTROL, RE-STRIPING, STEGN, TRENCH BACKFILL, BASE REQUIREMENTS, ETC. SHALL BE IN ACCORDANCE WITH THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT ENCROACHMENT PERMIT AND/OR THE CITY OF DESERT HOT SPRINGS 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 AS OTHER THAN 90 DEGREES, THE LIMITS OF PAVEMENT OVERLAY SHALL BE AT RIGHT ANGLES TO THE STREET CENTERLINE AND SHALL ENCOMPASS THE ENTIRE TRENCH PAVED.
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 JOINTS, LINING AND COATING. IF SHALL BE CAREFULLY LOWERED TO PROVIDE CONTINUOUS BEARING AND PREVENT UNDUE 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 DISTRICT PRIOR TO ACTUAL CONSTRUCTION.
12. IN THE EVENT TRAFFIC STRIPING AND/OR LANE MARKINGS ARE OBLITERATED, THEY SHALL BE REPLACED IN KIND AS DIRECTED BY THE AGENCY HAVING JURISDICTION.
13. NO CONSTRUCTION OR INSTALLATION SHALL BE PERMITTED ON ANY MATERIAL WITHOUT MEETING THE COMPACTION REQUIREMENTS AS DETERMINED BY THE DISTRICT.
14. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6500.1(b) 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 THE CONTRACTOR'S OPERATIONS. SAID EXISTING IMPROVEMENTS SHALL INCLUDE, BUT NOT LIMITED TO DRY STORMS, UTILITIES, FENCES, AND PLANTS. ANY REMOVAL OR DAMAGE TO EXISTING IMPROVEMENTS SHALL BE REPLACED OR REPAIRED BY THE CONTRACTOR AT THEIR EXPENSE AND SHALL BE APPROVED BY THE DISTRICT.
16. ALL CONTRACTOR(S)/SUBCONTRACTOR(S) SHALL EXAMINE DIRECTLY 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 APPLICABLE TO MSWD PROJECTS.
17. ALL EXCESS MATERIAL GENERATED FROM THE PROJECT EXCAVATION AND/OR COMPACTION SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF BY THE CONTRACTOR AT THEIR EXPENSE UNLESS OTHERWISE NOTED.
18. ALL EXISTING AND NEW INFRASTRUCTURE (VALVE CANS, MANHOLES, ETC.) MUST BE ACCESSIBLE TO ANNOY 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.
20. STATIONS SHOWN ARE HORIZONTAL DISTANCES ALONG CENTERLINE OF ROAD, 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'S INSPECTOR 48 HOURS PRIOR TO START OF CONSTRUCTION. DAILY COMMUNICATION THROUGH OUT THE ENTIRE DURATION OF THE PROJECT IS REQUIRED. CONTRACTOR SHALL CALL MISSION SPRINGS WATER DISTRICT'S OFFICE BY 3:30 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. THEY ARE SHOWN UPON THE BEST INFORMATION AVAILABLE. THE ACCURACY OF THIS INFORMATION HOWEVER, IS NOT GUARANTEED BY THE DISTRICT OR THE ENGINEER AS NO EXCAVATIONS WERE MADE TO VERIFY THE SAME. 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	36"
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 TO THE SPECIFICATIONS, ONLY MAIN LINES ARE SHOWN AND 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 1-800-227-2600, AT LEAST 2 WORKING DAYS PRIOR TO EXCAVATION.
26. ELEVATIONS SHOWN ON THE PROFILE FOR EXISTING AND/OR PROPOSED UTILITIES AT CROSSINGS ARE TO THE OUTSIDE OF CONDUIT (TOP & BOTTOM), UNLESS OTHERWISE NOTED.
27. CONTRACTOR IS RESPONSIBLE FOR KEEPING UP TO DATE RECORD OF ANY "AS-BUILT" (RED-LINE) CHANGES TO THE PLANS DURING CONSTRUCTION.
28. CONTRACTOR SHALL PROVIDE AN ACCURATE AND LEGIBLE COPY OF THE "AS-BUILT" PLANS TO THE DESIGN ENGINEER. THE ENGINEER WILL SUPPLY THE DISTRICT WITH A COPY OF "AS-BUILT" 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.

SHEET INDEX

NO.	DESCRIPTION
1	COVER SHEET
2	VIA LORETA
3	SYLVANUS DRIVE
4	CHOLLA DRIVE
5	FLORA AVENUE

DIGALERT — USA — TOLL FREE — A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

UNAUTHORIZED CHANGES & USES: THE ENGINEER WILL NOT BE RESPONSIBLE FOR CHANGES TO THE PLANS THAT ARE MADE BY ANYONE OTHER THAN THE ENGINEER. ANY CHANGES MADE BY THE CONTRACTOR OR OTHERS MUST BE CLEARLY IDENTIFIED AS SUCH AND THE ENGINEER MUST BE NOTIFIED IN WRITING OF SUCH CHANGES. CONTRACTOR AGREES TO INDEMNIFY AND HOLD HARMLESS THE ENGINEER FROM ANY LIABILITY RESULTING FROM SUCH CHANGES MADE BY THE CONTRACTOR OR OTHERS.

OWNER'S NOTE TO CONTRACTOR:

THE LOCATION OF HOUSE LATERALS SHALL BE MARKED AS FOLLOWS:

STREETS WITH CURBS: AN "S" SHALL BE CHISELED OR PERMANENTLY MARKED ON THE CURB AT THE LOCATION OF THE HOUSE LATERALS AND AN APPROPRIATE MID-RANGE OR FULL RANGE MAGNETIC MARKER MANUFACTURED BY 3M ELECTRICAL PRODUCTS DIVISION, SCOTCH-MARK MARKER LOCATOR (SML) OR EQUAL SHALL BE PLACED ONE FOOT BELOW THE FINISHED GROUND SURFACE DIRECTLY ABOVE THE TERMINUS OF THE LATERAL. IN AREAS WHERE THE FINISHED GROUND SURFACE IS UNKNOWN, THE MARKER SHALL BE INSTALLED TWO FEET BELOW THE ASSUMED FINISHED GROUND SURFACE.

MSWD Mission Springs Water District

NO.	DESCRIPTION	DATE	BY

DESIGN ENGINEER

SCALE:
PLOT DATE:
DESIGN BY:
DRAWN BY:
CHECKED BY:

R.C.E. 61849

PREPARED UNDER THE DIRECT SUPERVISION OF:

R.C.E. EXP. DATE

DESIGN PLAN REVIEW COMPLETED BY: DATE

RECOMMENDED FOR APPROVAL BY:

BRENT GRAY, DIRECTOR OF ENGINEERING/ PROJECTS DATE

APPROVED BY MISSION SPRINGS WATER DISTRICT:

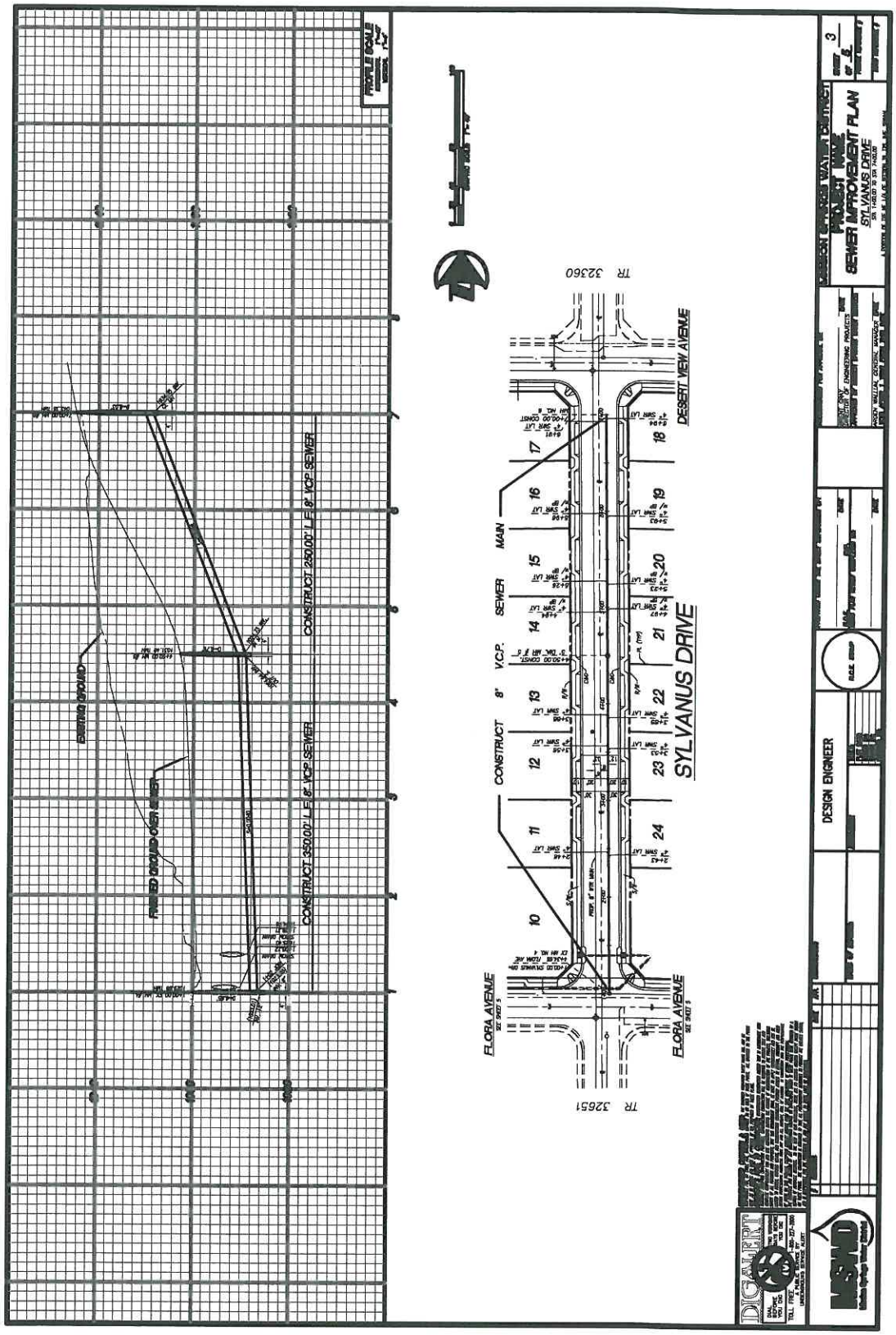
ARDEN WALLUM, GENERAL MANAGER DATE

MISSION SPRINGS WATER DISTRICT

PROJECT NAME
SEWER IMPROVEMENT PLAN
COVER SHEET

SHEET 1 OF 5 SHEETS

A PORTION OF THE NE 1/4 OF SECTION 19, THE SW 1/4 OF SECTION 20, AND THE NW 1/4 OF SECTION 29, T.3S., R.4E., S.B.B.M.



MSWD Mission Springs Water District	TYPICAL SEWER PLAN AND PROFILE	Approved: Arden Wallum, General Manager Drawn: Heitec Inc. Date: 8/31/12 DRAWING No. D–06

MSWD
Mission Springs Water District

TYPICAL WATER COVER SHEET

Approved:
Arden Wallum
General Manager

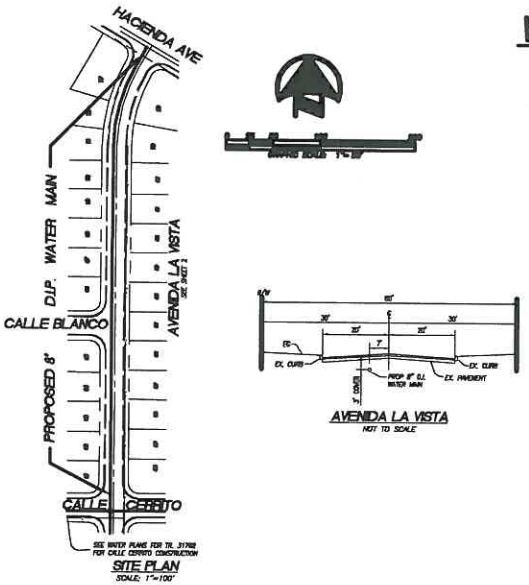
Drawn: Heitec Inc. Date: 8/31/12

DRAWING No.
D-07

IN THE CITY OF DESERT HOT SPRINGS, CALIFORNIA

WATER IMPROVEMENT PLAN

AVENIDA LA VISTA



AVENIDA LA VISTA
NOT TO SCALE

LEGEND

- FIRE HYDRANT
- GATE VALVE
- WATER SERVICE
- REFLECTIVE MARKER

F.H. ASSY.	FIRE HYDRANT ASSEMBLY
C&G	CURB AND GUTTER
℄	PROPERTY LINE
R/W	RIGHT-OF-WAY
MIN.	MINIMUM
TYP.	TYPICAL
D.I.P.	DUCTILE IRON PIPE
P.I.P.	PROTECT IN PLACE
S/W	SIDEWALK
G.B.	GRADE BREAK
I.E.	INVERT ELEVATION
E.P.	EDGE OF PAVEMENT
G.V.	GATE VALVE
P.P.	POWER POLE

DESERT HOT SPRINGS

VICINITY MAP
THOMAS GUIDE COORDINATES PAGE 897, D-6

QUANTITY ESTIMATES

THE QUANTITIES SHOWN ARE FOR PERMIT PURPOSES ONLY.
THE CONTRACTOR IS RESPONSIBLE TO OBTAIN HIS OWN ESTIMATE OF QUANTITIES FOR BID PURPOSES.

8" D.I.P. WATER MAIN	857	LF
8" F.H. ASSEMBLY (INCT SWIVEL) WITH 8" RUNOUT*	2	EA
1" SERVICE W/ 3/4" METER	25	EA

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 DEPARTMENT	RIVERSIDE COUNTY TRANSPORTATION (760) 863-8267
CITY STREETS	CITY OF DESERT HOT SPRINGS (760) 329-6411
ELECTRICITY	SOUTHERN CALIFORNIA EDISON (760) 325-4261
GAS	SOUTHERN CALIFORNIA GAS (909) 335-7729
TELEPHONE	VERIZON (760) 778-3020
CABLE TV	TIME WARNER CABLE 11855 PALM DR. DESERT HOT SPRINGS, CA 92240 (760) 328-6316
FLOOD CONTROL	RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT (951) 955-1200
UNDERGROUND UTILITIES	UNDERGROUND SERVICE ALERT (800) 227-2600

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-IN'S OR POINTS OF CONNECTION TO AN EXISTING SYSTEM SHALL HAVE A "TEST-PLATE" FOR A HYDROSTATIC SEPARATION BETWEEN APPROVED AND NON-APPROVED WATER SYSTEMS AT ALL TIMES. PLANT(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 C600-99 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. THE DISTRICT INSPECTORS TIME SPENT INSPECTING ANY REQUIRED RETESTS (DUE MATE INCLUDES OVERHEAD) SHALL BE AT THE CONTRACTORS 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 MINIMUM 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 CONCURRENTLY 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 OF 2FPS (GPM)
4	40
6	100
8	330
10	495
12	700
16	1250
18	1550
20	1950
24	2800
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 (ONLY AS DIRECTED BY THE DISTRICT).
10. REFER TO MSWD STANDARD DRAWINGS W-7 AND W-34 FOR PLACEMENT OF ALL FIRE HYDRANTS WITH RESPECT TO RIGHT-OF-WAY, SIDEWALKS AND CURB LINES. FIRE HYDRANTS SHALL BE CONSTRUCTED TO 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 COST ASSOCIATED WITH THIS WORK SHALL BE INCLUDED IN THE CONTRACTORS BID AND NO ADDITIONAL COMPENSATION SHALL BE MADE BY THE DISTRICT 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-IN'S MUST BE WITNESSED BY MSWD INSPECTOR.
16. ALL HIGH POINTS IN THE PIPE LINE SHALL HAVE AN AIR/VAC INSTALLED PER MSWD STD. DWG. W-5

GENERAL CONTRUCTION NOTES:

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 HIGHEST AND 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 24-HOUR PRIOR TO CONSTRUCTION FOR THE DISTRICT'S REVIEW.
4. SANITARY SEWER WILL BE INSTALLED BEFORE ANY OTHER UNDERGROUND FACILITIES ARE CONSTRUCTED EXCEPT WHEN OTHER UTILITIES ARE PROPOSED DEEPER THAN SANITARY SEWER. INSTALLATION INCLUDES BUT IS NOT LIMITED TO STAKING, PIPELINE INSTALLATION, COMPACTION TESTING, AIR TEST, WASH AND WHEEL AIR TEST, 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 REQUEST ADDITIONAL AIR TEST, WASH AND VIDEO PRIOR TO FINAL ACCEPTANCE OF FACILITIES.
5. CURB 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 INCLUDES 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 OF DESERT HOT SPRINGS 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 FRAME.
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, LINING AND COATING. IT SHALL BE CAREFULLY BEDDED 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 DISTRICT PRIOR TO ACTUAL CONSTRUCTION.
12. IN THE EVENT TRAFFIC STRIPING AND/OR LANE MARKINGS ARE OBLITERATED, THEY SHALL BE REPLACED IN KIND AS DIRECTED BY THE AGENCY HAVING JURISDICTION.
13. NO CONSTRUCTION OR INSTALLATION SHALL BE PERMITTED ON FILL MATERIAL WITHOUT MEETING THE COMPACTION REQUIREMENTS AS DETERMINED BY THE DISTRICT.
14. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6409.1(B) 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 FAMILIARIZE HIMSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES DIRECTLY OR INDIRECTLY FROM HIS OPERATIONS. SAID EXISTING IMPROVEMENTS SHALL INCLUDE, BUT NOT LIMITED TO CURB MONES, DITCHES, FENCES, AND PLANTS. ANY REMOVAL OR DAMAGE TO EXISTING IMPROVEMENTS SHALL BE REPLACED OR REPAIRED BY THE CONTRACTOR AT HIS EXPENSE AND SHALL BE APPROVED BY THE DISTRICT.
16. ALL CONTRACTOR(S)/SUBCONTRACTOR(S) SHALL EXAMINE DIRECTLY 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. APPLICABLE TO MSWD PROJECTS.
17. ALL EXCESS MATERIAL GENERATED FROM THE PROJECT EXCAVATION AND/OR COMPACTION SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF BY THE CONTRACTOR AT HIS EXPENSE UNLESS OTHERWISE NOTED.
18. ALL EXISTING AND NEW INFRASTRUCTURE (VALVE CANS, MANHOLES, ETC.) MUST BE ACCESSIBLE TO GRADE THROUGH OUT 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.
20. STATIONS SHOWN ARE HORIZONTAL DISTANCES ALONG CENTERLINE OF ROAD, 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'S INSPECTOR 48 HOURS PRIOR TO START OF CONSTRUCTION. DAILY CONSIDERATION THROUGH OUT THE ENTIRE DURATION OF THE PROJECT IS REQUIRED. CONTRACTOR SHALL CALL MISSION SPRINGS WATER DISTRICT'S OFFICE BY 3:30 P.M. FOR THE FOLLOWING DAYS INSPECTION.
23. APPROVAL BY MSWD BUYERS NO POSSESSION 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. THEY ARE BASED UPON THE BEST INFORMATION AVAILABLE AND THE ACCURACY OF THIS INFORMATION; HOWEVER, NOT GUARANTEED BY THE DISTRICT OR THE ENGINEER AS NO EXCAVATIONS WERE MADE TO VERIFY THE SAME. 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 OR ACCORDANCE TO THE SPECIFICATIONS, ONLY MAIN LINES ARE SHOWN AND 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 1-800-227-2600, 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 OF ANY "AS-BUILT" (RED-LINE) CHANGES TO THE PLANS DURING CONSTRUCTION.
28. CONTRACTOR SHALL PROVIDE AN ACCURATE AND LEGIBLE COPY OF THE "AS-BUILT" PLANS TO THE DESIGN ENGINEER. THE ENGINEER WILL SUPPLY THE DISTRICT WITH A COPY OF "AS-BUILT" 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.

AVENIDA LA VISTA

DIGALERT
DIAL BEFORE YOU DIG
TOLL FREE
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

MSWD
Mission Springs Water District

NO.	DATE	APP.	REVISIONS

DESIGN ENGINEER

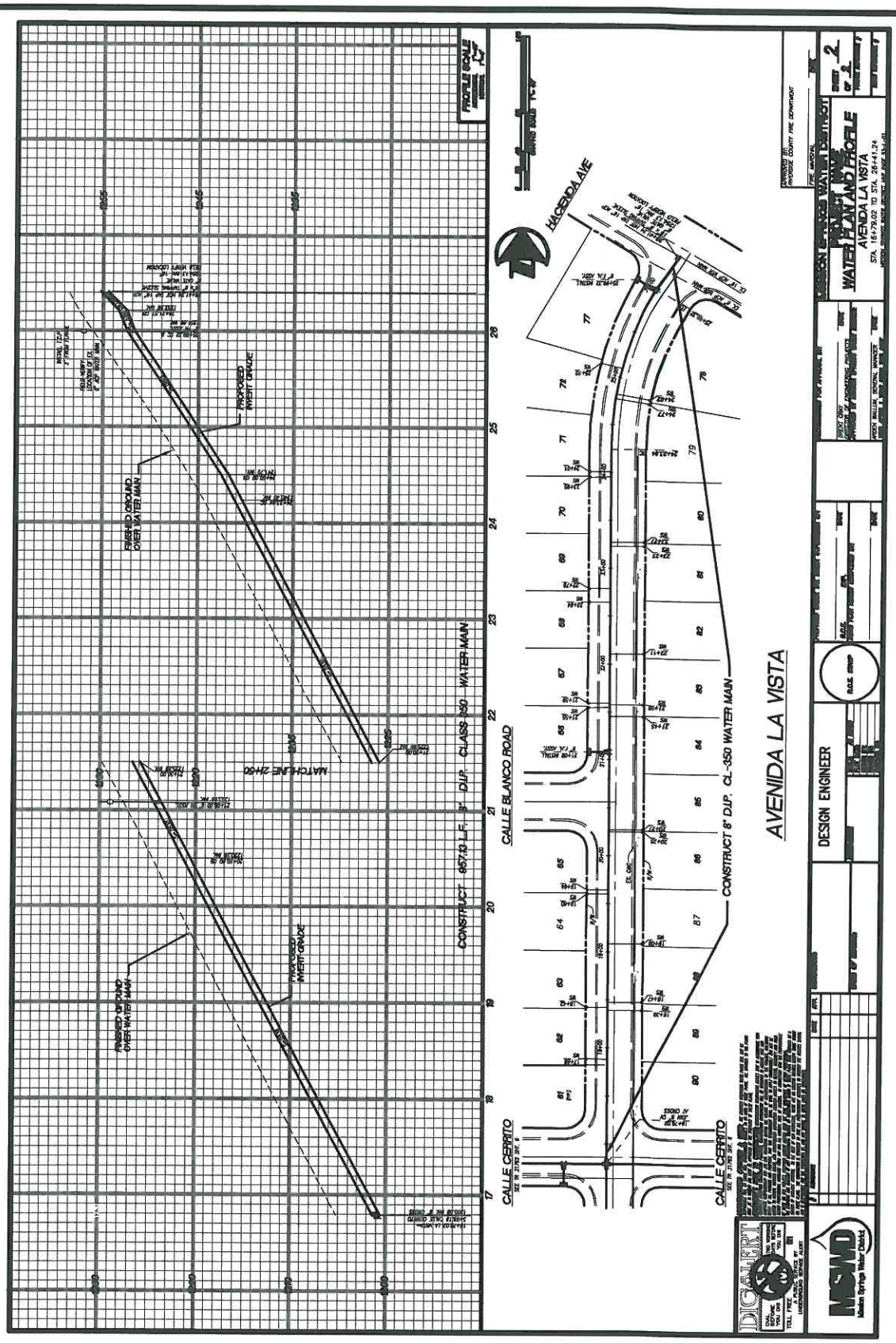
R.C.E. STAMP

APPROVED BY RIVERSIDE COUNTY FIRE DEPARTMENT
FIRE MARSHAL — DATE

BRENT GRAY, DIRECTOR OF ENGINEERING & PROJECTS — DATE
ARDEN WALLUM, GENERAL MANAGER — DATE

MISSION SPRINGS WATER DISTRICT
PROJECT NAME
WATER IMPROVEMENT PLAN
COVER SHEET

SHEET 1 OF 2 SHEETS
PLANS APPROVED BY
DATE



MSWD
Mission Springs Water District

TYPICAL WATER PLAN AND PROFILE

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 8/31/12

DRAWING No.
D-08

FIRE FLOW CERTIFICATION

I HEREBY CERTIFY THAT THE FIRE WATER SUPPLY SYSTEM SHOWN HEREIN WILL PROVIDE A MINIMUM FLOW OF _____GPM FOR A _ HOUR DURATION WITH A MINIMUM RESIDUAL PRESSURE OF 20 PSI IN ACCORDANCE WITH THE FIRE DEPARTMENT CONDITIONS FOR THIS PROJECT.

_____ RCE_____ _____
ENGINEER'S NAME EXP._____ DATE

THE ABOVE CERTIFICATION SHALL BE PLACED ON ALL WATER IMPROVEMENT PLANS CONTAINING OR SERVING FIRE PROTECTION DEVICES. THE ENGINEER SHALL COMPLETE THE INFORMATION IN ACCORDANCE WITH THE FIRE MARSHAL REQUIREMENTS FOR THE PROJECT AND SHALL SIGN AND DATE THE CERTIFICATE ON THE MYLAR SUBMITTAL.

FOR PROJECTS PROVIDING FIRE PROTECTION TO BUILDINGS THROUGH ONE OR MORE DOUBLE CHECK DETECTOR ASSEMBLIES, THE FIRE SPRINKLER DEMAND IN G.P.M. AND THE REQUIRED PRESSURE AT THE BUILDING RISER SHALL BE OBTAINED FROM THE FIRE SPRINKLER DESIGN ENGINEER AND LISTED ON THE PLANS AS SHOWN BELOW.

FIRE SPRINKLER DEMAND AT RISER

BUILDING NO. _____=____G.P.M. AT ___ P.S.I. MIN. AT FIRE RISER
BUILDING NO. _____=____G.P.M. AT ___ P.S.I. MIN. AT FIRE RISER

THE ABOVE INFORMATION IS REQUIRED TO JUSTIFY THE SIZE FOR ANY DOUBLE CHECK DETECTOR ASSEMBLY, AND SHALL BE USED IN CALCULATION OF THE REQUIRED FIRE FLOW COMPUTATIONS.

MSWD
Mission Springs Water District

FIRE FLOW CERTIFICATIONS

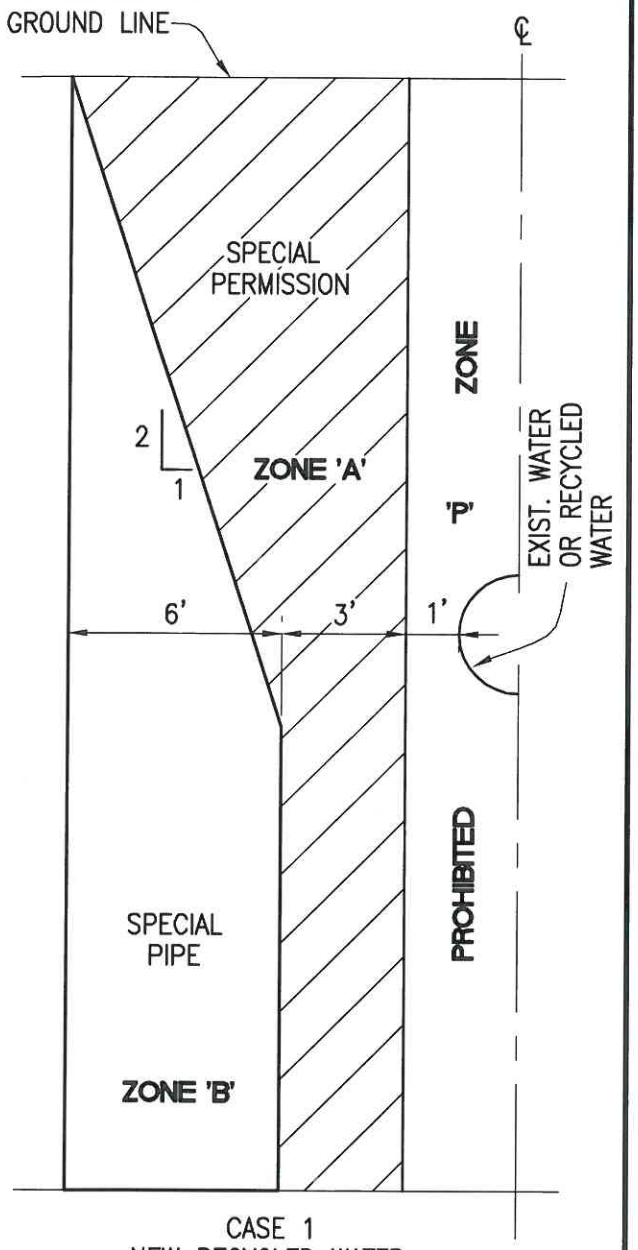
Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 04-24-12

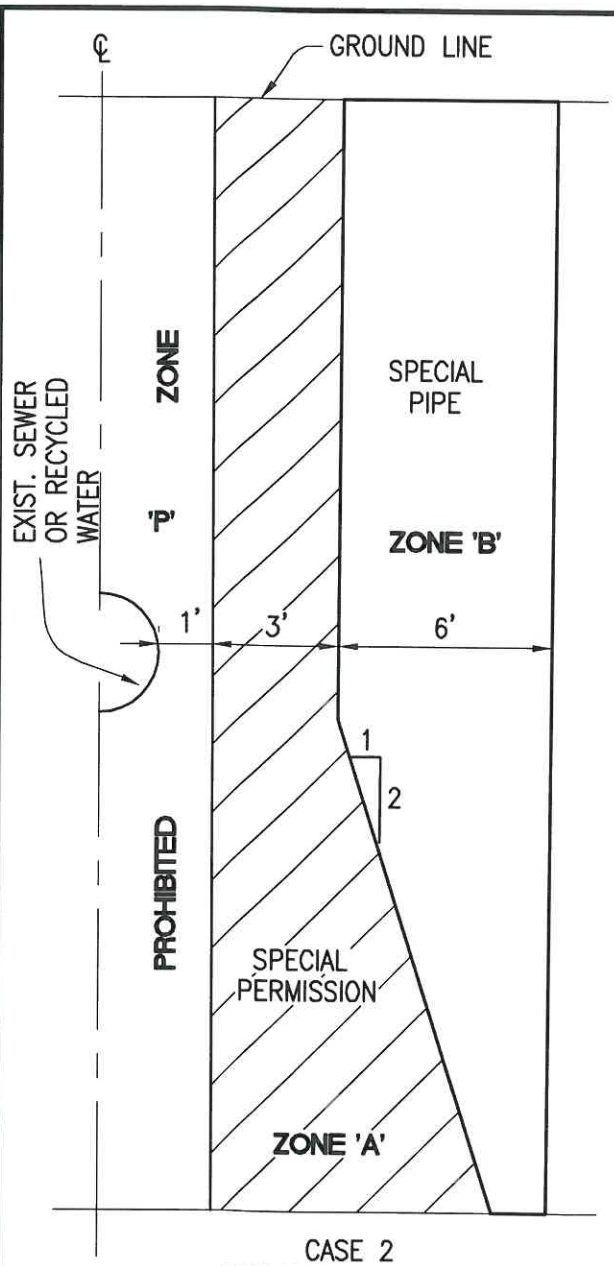
DRAWING No.
D-09

NOTES:

1. ZONES IDENTICAL ON EITHER SIDE OF CENTERLINE AS SHOWN BELOW.
2. REQUIREMENTS OF THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH.
3. SEE G-03 FOR NOTES ON WATER, RECYCLED WATER AND SEWER MAIN PARALLEL AND PERPENDICULAR SEPARATIONS.
4. REFER TO THE MSWD STANDARD DESIGN GUIDELINES FOR NEW PIPE SEPARATION REQUIREMENTS. MINIMUM SEPARATION BETWEEN WATER, RECYCLED WATER, AND SEWER MAINS SHALL BE 10' FROM PIPE O.D.



CASE 1
NEW RECYCLED WATER
OR
NEW SEWER



CASE 2
NEW POTABLE WATER
OR
NEW RECYCLED WATER

MSWD
Mission Springs Water District

PARALLEL SEPARATIONS
NEW AND EXISTING WATER, SEWER,
OR RECYCLED WATER

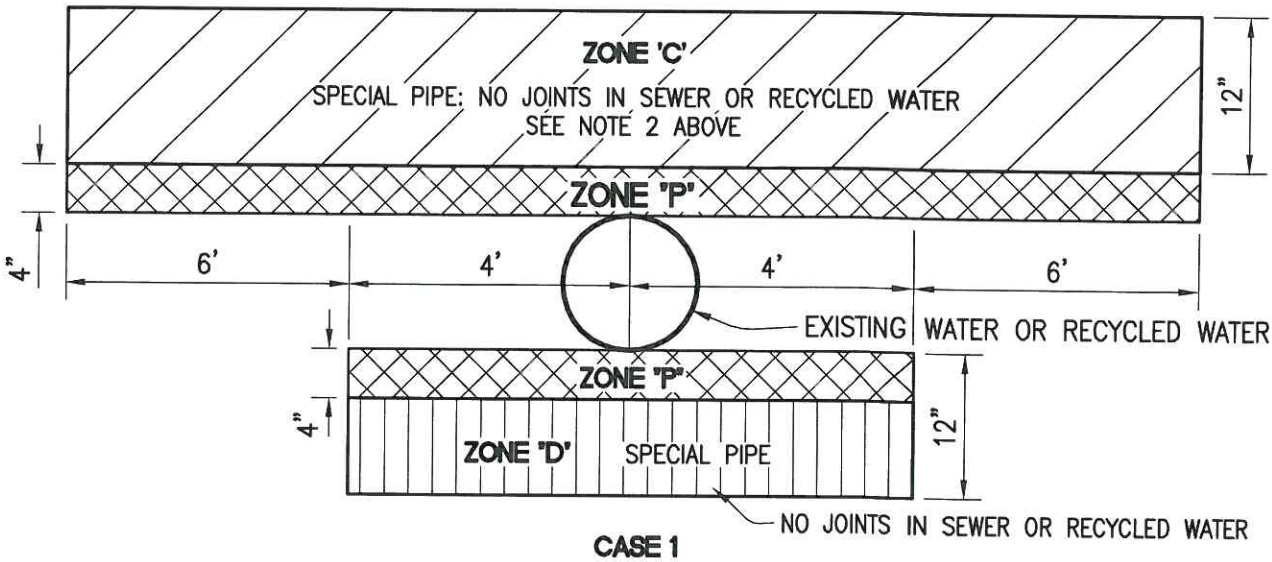
Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 4/24/12

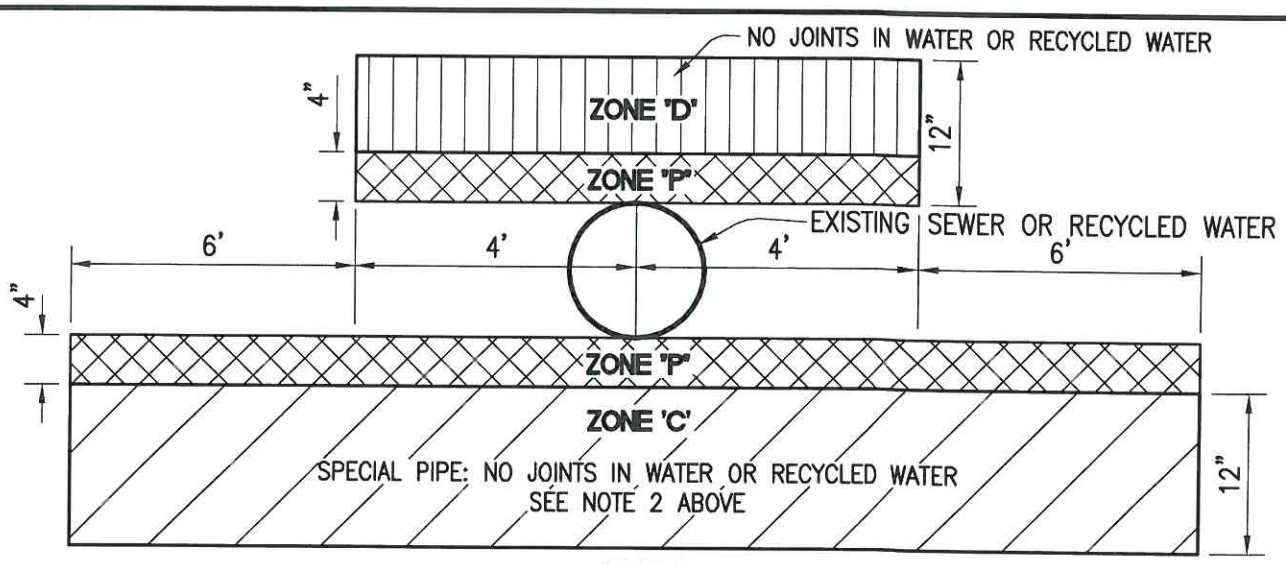
DRAWING No.
G-01

NOTES:

1. REQUIREMENTS OF THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH.
2. SEE G-03 FOR NOTES ON WATER, RECYCLED WATER AND SEWER MAIN PARALLEL AND PERPENDICULAR SEPARATIONS.
3. MAINS SHALL CROSS OTHER UTILITIES AT A PERPENDICULAR ANGLE, UNLESS OTHERWISE APPROVED. IN ANY CASE, UTILITIES CROSSING AT A SKEW ANGLE OF SEVENTY-FIVE DEGREES (75°) OR LESS SHALL BE AVOIDED.
4. REFER TO THE MSWD STANDARD DESIGN GUIDELINES FOR NEW PIPE SEPARATION REQUIREMENTS. MINIMUM SEPARATION BETWEEN WATER, RECYCLED WATER, AND SEWER MAINS SHALL BE 10' FROM PIPE O.D.



CASE 1
NEW RECYCLED WATER
OR
NEW SEWER



CASE 2
NEW POTABLE WATER
OR
NEW RECYCLED WATER

Mission Springs Water District

PERPENDICULAR SEPARATIONS NEW AND EXISTING WATER, SEWER, OR RECYCLED WATER

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 04/24/12

DRAWING No.
G-02

CONSTRUCTION REQUIREMENTS FOR WATER, RECYCLED WATER AND SEWER MAINS

CASE 1: NEW RECYCLED WATER OR SEWER MAINS

ZONE

A. SPECIAL PERMISSION REQUIRED. DO NOT LOCATE ANY PARALLEL SEWER OR RECYCLED WATER MAINS IN THIS AREA WITHOUT SPECIFIC DISTRICT AND CALIFORNIA DEPARTMENT OF PUBLIC HEALTH APPROVAL.

B. CLASS 350 DUCTILE IRON PIPE WITH PROTECTO 401 EPOXY LINING AND PUSH-ON TYPE RUBBER RING JOINTS FOR SEWER MAINS. C-900, CL200, C-905, OR PR235 PURPLE PVC PIPE WITH PUSH ON TYPE RUBBER RING JOINTS FOR RECYCLED WATER MAINS.

C. A 20' SECTION OF CLASS 350 DUCTILE IRON PIPE WITH PROTECTO 401 EPOXY LINING CENTERED AT THE MAIN BEING CROSSED, OR SEWER PIPE INSTALLED IN A CASING (FOR SEWER MAINS).
A 20' SECTION OF C-900, CL200 OR C-905, PR235 PURPLE PVC PIPE CENTERED AT THE MAIN BEING CROSSED, OR RECYCLED WATER PIPE INSTALLED IN A CASING (FOR RECYCLED WATER MAINS).

D. CLASS 350 DUCTILE IRON PIPE WITH PROTECTO 401 EPOXY LINING WITH NO JOINTS LOCATED WITHIN 4' EITHER SIDE OF THE MAIN BEING CROSSED, OR SEWER PIPE INSTALLED IN A CASING (FOR SEWER MAINS). C-900, CL200, C-905, OR PR235 PURPLE PVC PIPE WITH NO JOINTS LOCATED WITHIN 4' EITHER SIDE OF THE MAIN BEING CROSSED, OR RECYCLED WATER PIPE INSTALLED IN A CASING (FOR RECYCLED WATER MAINS).

P. PROHIBITED ZONE: NO SEWER OR RECYCLED WATER MAINS: SECTION 64630 (e) (2) CALIFORNIA ADMINISTRATIVE CODE, TITLE 22.

CASE 2: NEW POTABLE WATER OR RECYCLED WATER MAINS

ZONE

A. SPECIAL PERMISSION REQUIRED. DO NOT LOCATE ANY PARALLEL WATER OR RECYCLED WATER MAINS IN THIS AREA WITHOUT SPECIFIC DISTRICT AND CALIFORNIA DEPARTMENT OF PUBLIC HEALTH APPROVAL.

B. CLASS 350 DUCTILE PIPE WITH PUSH-ON TYPE RUBBER RING JOINTS FOR WATER MAINS. C-900, CL200, C-905, OR PR235 PURPLE PVC PIPE WITH PUSH-ON TYPE RUBBER RING JOINTS FOR RECYCLED WATER MAINS.

C. A 20' SECTION CLASS 350 DUCTILE IRON PIPE CENTERED AT THE MAIN BEING CROSSED, OR WATER PIPE INSTALLED IN A CASING (FOR WATER MAINS).
A 20' SECTION OF C-900, CL200, C-905, OR PR235 PURPLE PVC PIPE CENTERED AT THE MAIN BEING CROSSED, OR RECYCLED WATER PIPE INSTALLED IN A CASING (FOR RECYCLED WATER MAINS).

D. CLASS 350 DUCTILE IRON PIPE WITH NO JOINTS LOCATED WITHIN 4' EITHER SIDE OF THE MAIN BEING CROSSED, OR WATER PIPE INSTALLED IN A CASING (FOR WATER MAINS).
C-900, CL200, C-905, OR PR235 PURPLE PVC PIPE WITH NO JOINTS LOCATED WITHIN 4' EITHER SIDE OF THE MAIN BEING CROSSED, OR RECYCLED WATER PIPE INSTALLED IN A CASING (FOR RECYCLED WATER MAINS).

P. PROHIBITED ZONE: NO WATER OR RECYCLED WATER MAINS: SECTION 64630 (e) (2) CALIFORNIA ADMINISTRATIVE CODE, TITLE 22.

NOTE:
REFER TO THE MSWD STANDARD DESIGN GUIDELINES FOR NEW PIPE SEPARATION REQUIREMENTS. MINIMUM SEPARATION BETWEEN WATER, RECYCLED WATER, AND SEWER MAINS SHALL BE 10' FROM PIPE O.D..

MSWD
Mission Springs Water District

WATER, RECYCLED WATER AND SEWER MAIN PARALLEL AND PERPENDICULAR SEPARATION NOTES

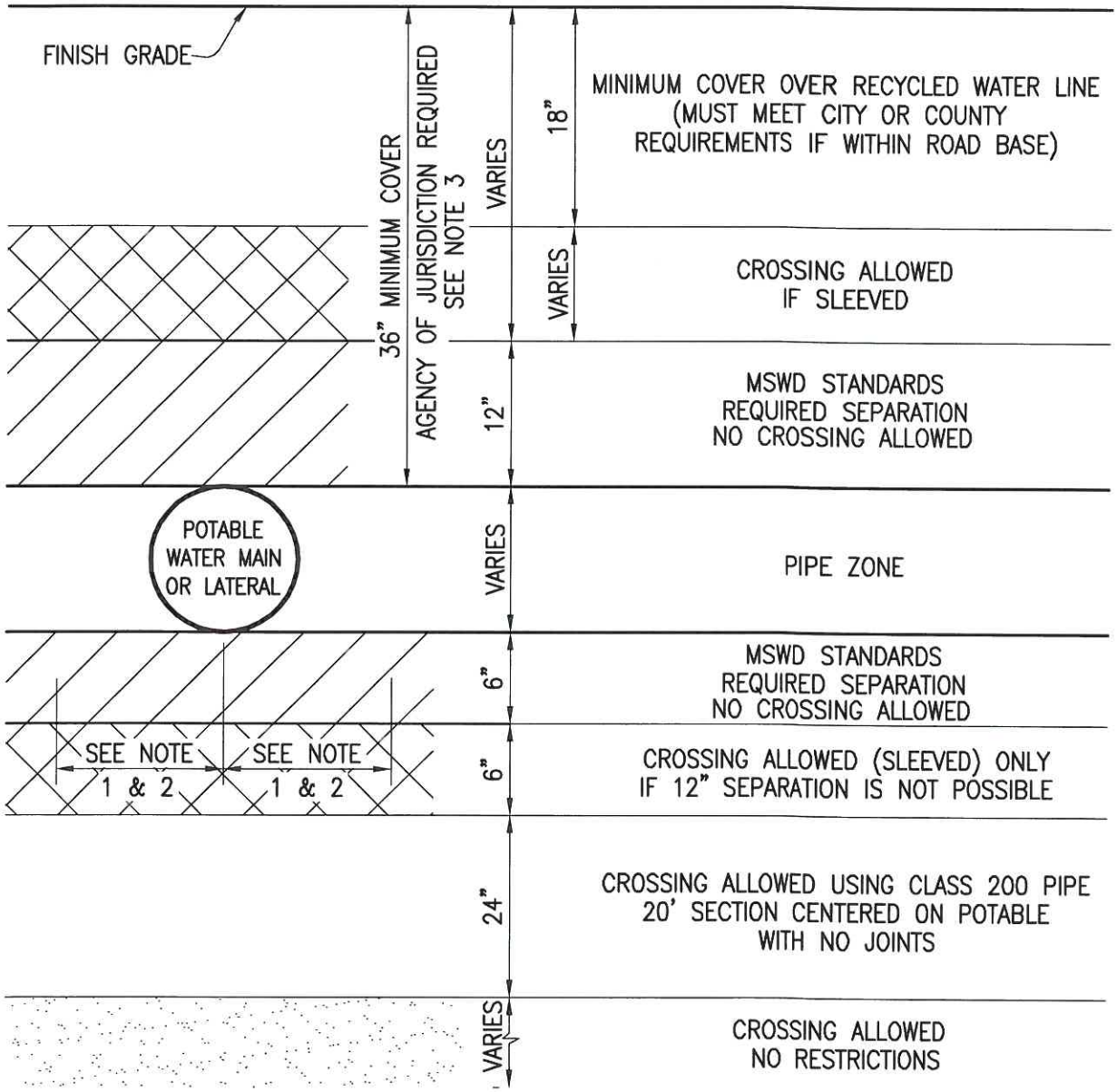
Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/22/08

DRAWING No.
G-03

NOTES:

1. EXTEND SLEEVE 5' ON EITHER SIDE OF POTABLE WATER LATERALS 3" DIAMETER OR SMALLER.
2. EXTEND SLEEVE 10' ON EITHER SIDE OF POTABLE WATER LATERALS 4" DIAMETER OR LARGER (NO JOINTS IN SLEEVE OR PIPE).
3. IF POTABLE WATER LINE HAS LESS THAN 36" COVER, RECYCLED WATER LINE MUST CROSS BELOW POTABLE WATER.
4. REFER TO THE MSWD STANDARD DESIGN GUIDE FOR PIPE SEPARATION REQUIREMENTS.



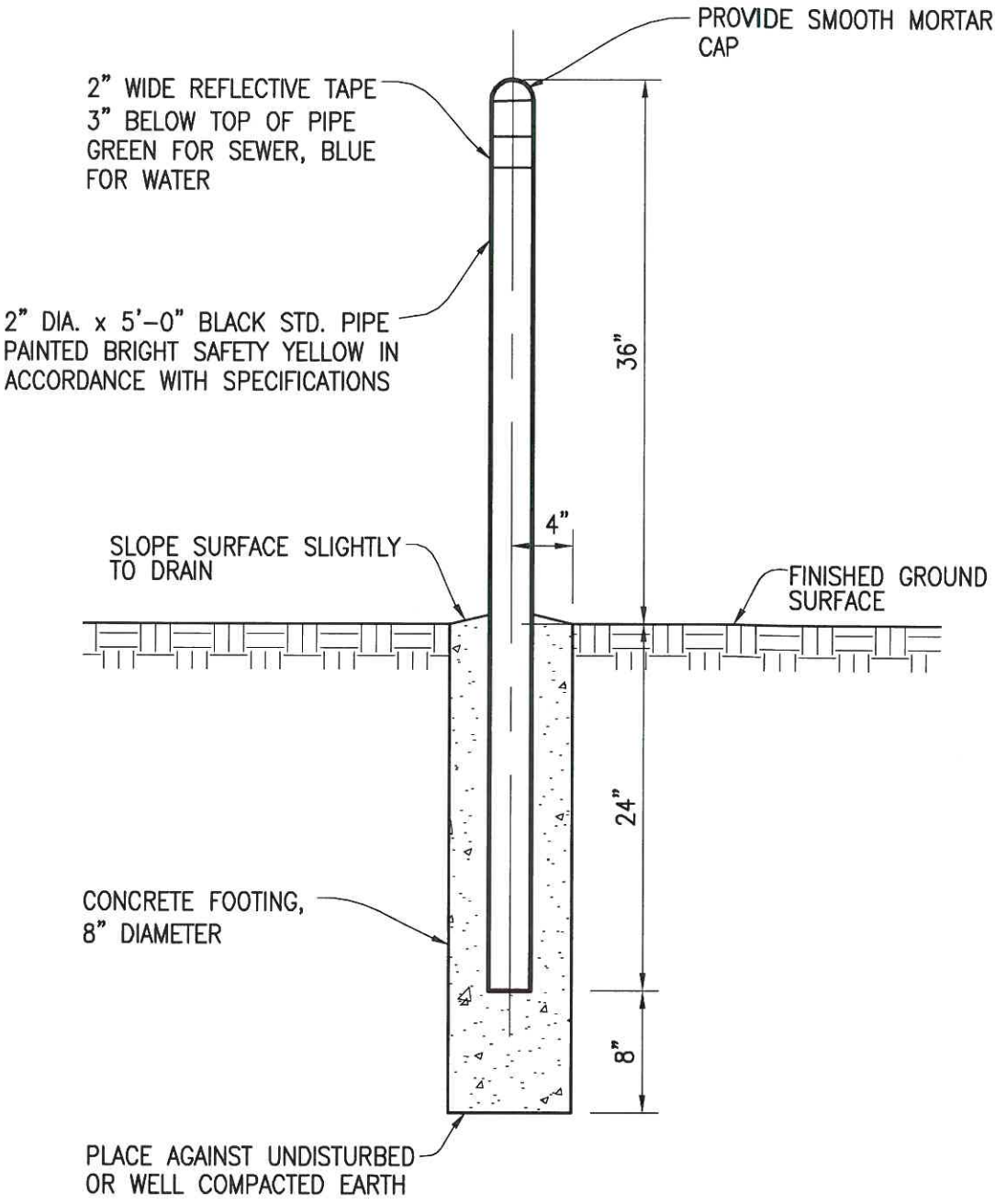
MSWD
Mission Springs Water District

POST METER CONSTANT PRESSURE
RECYCLED WATER LINE 3"
DIAMETER OR LESS CROSSING
POTABLE WATER MAIN OR LATERAL
WITHIN PUBLIC RIGHT OF WAY

Approved:
Arden Wallum
General Manager

Drawn: Date: 4/24/12

DRAWING No.
G-04



NOTE:
MARKERS TO BE INSTALLED AS DIRECTED IN THE FIELD BY THE DISTRICT TO INDICATE LOCATION OF VALVES.

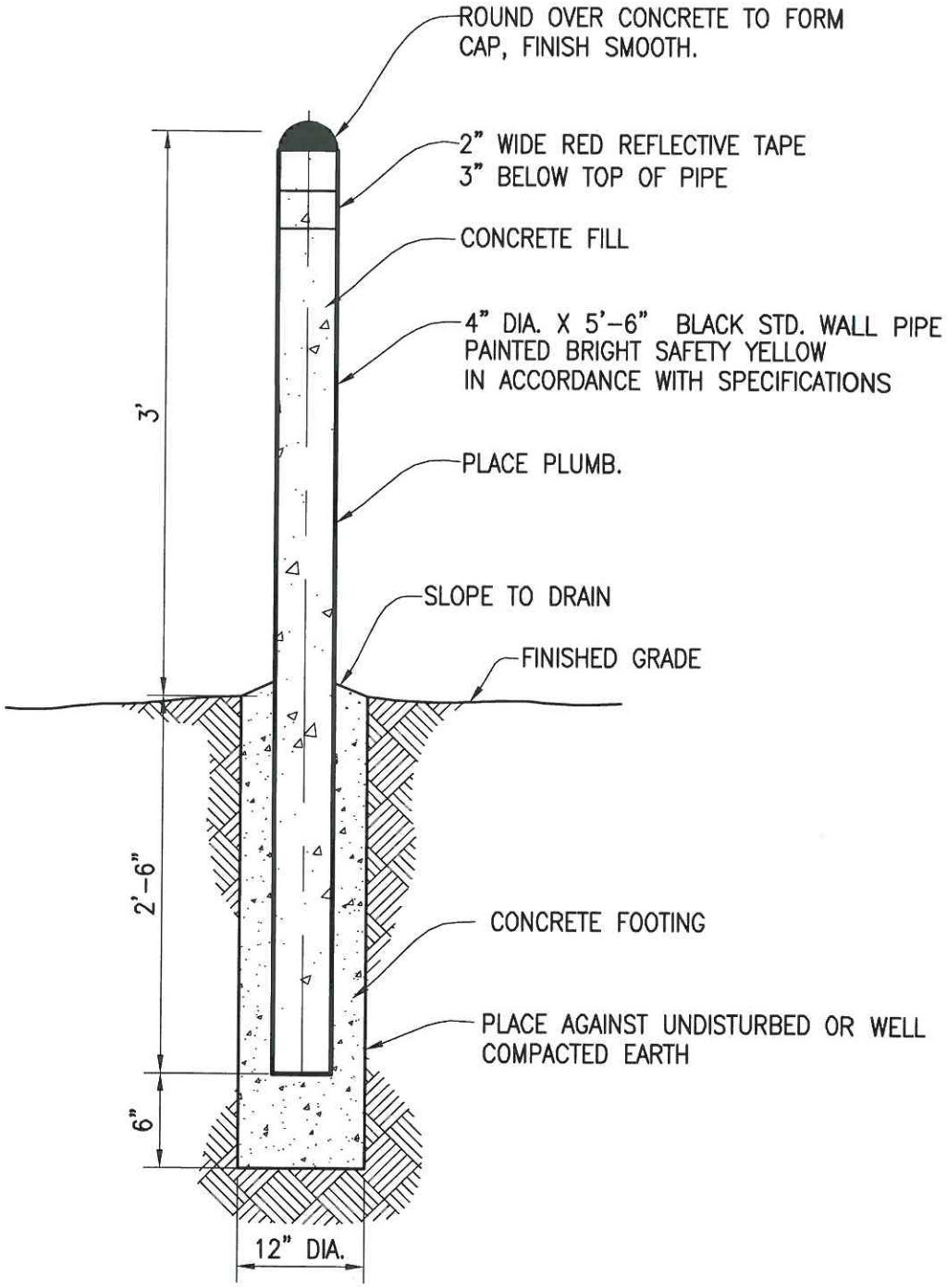
MSWD
Mission Springs Water District

MARKER POST INSTALLATION

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/21/08

DRAWING No.
G-05



NOTE:
LOCATION SHALL BE AS SHOWN ON PLAN VIEW, OR AS DIRECTED IN THE FIELD BY THE DISTRICT

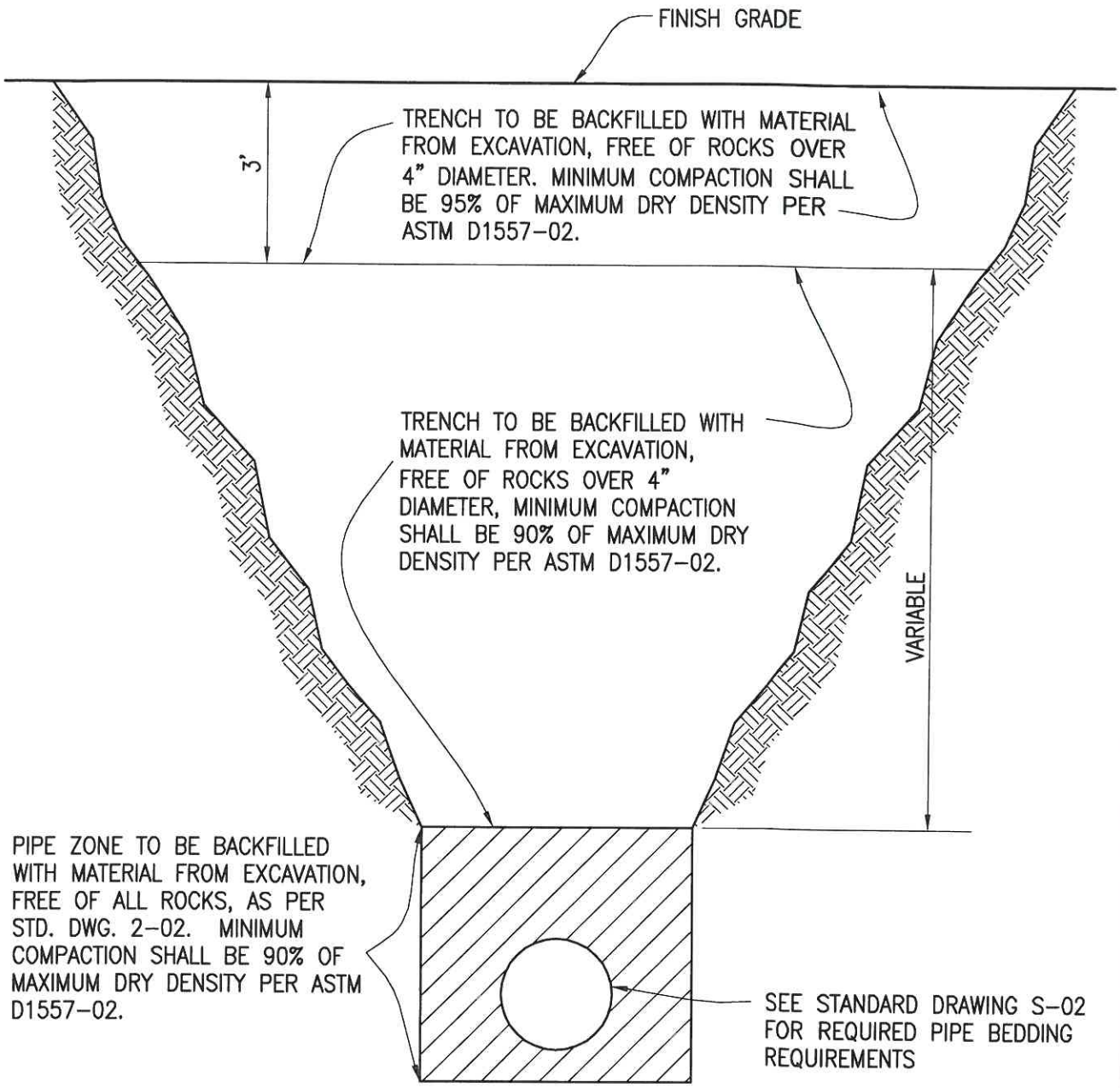
MSWD
Mission Springs Water District

GUARD POST
INSTALLATION

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/21/08

DRAWING No.
G-06



NOTES:

1. ALL TRENCHING SHALL CONFORM TO CAL-OSHA SAFETY STANDARDS.

2. ALL TRENCH SHALL BE BACKFILLED DAILY AFTER APPROVED INSPECTION BY THE MSWD INSPECTOR UNLESS SPECIFICALLY APPROVED AND SAFELY BARRICADED.

MSWD
Mission Springs Water District

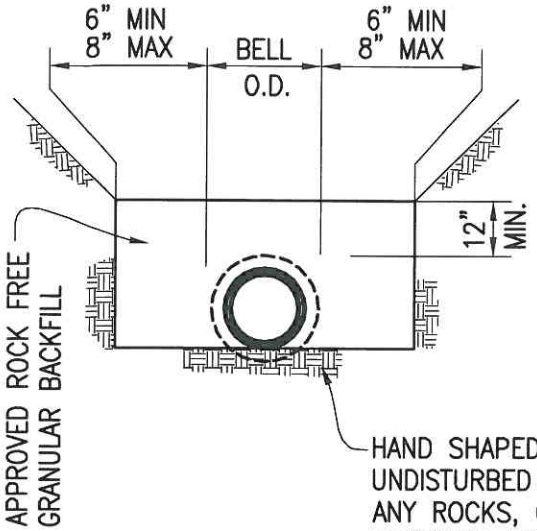
TYPICAL SEWER TRENCH DETAIL

Approved: _____
Arden Wallum
General Manager

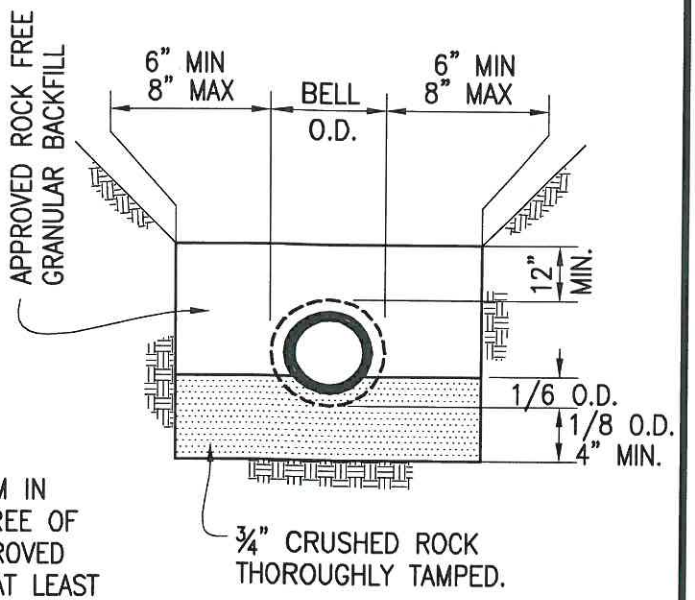
Drawn: Heitec Inc Date: 06/20/11

DRAWING No.
S-01

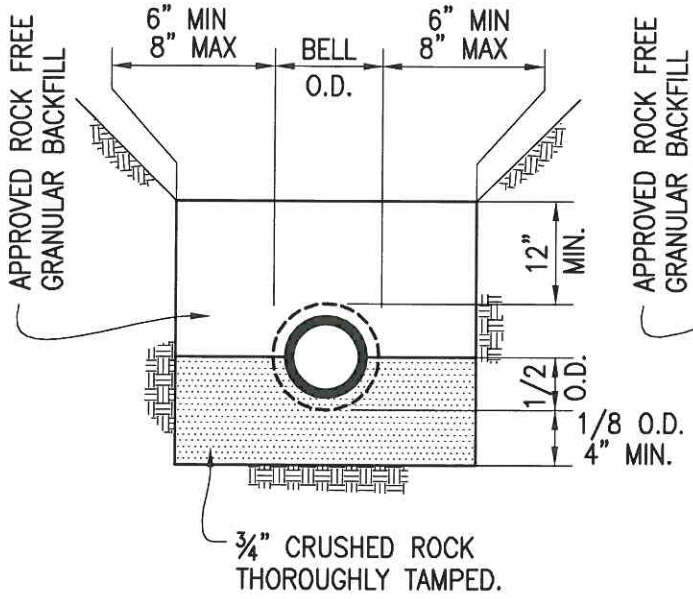
NOTE: ALL DIMENSIONS REFERRING TO O.D. SHALL BE BASED ON THE MAXIMUM BELL OR COUPLING DIAMETER



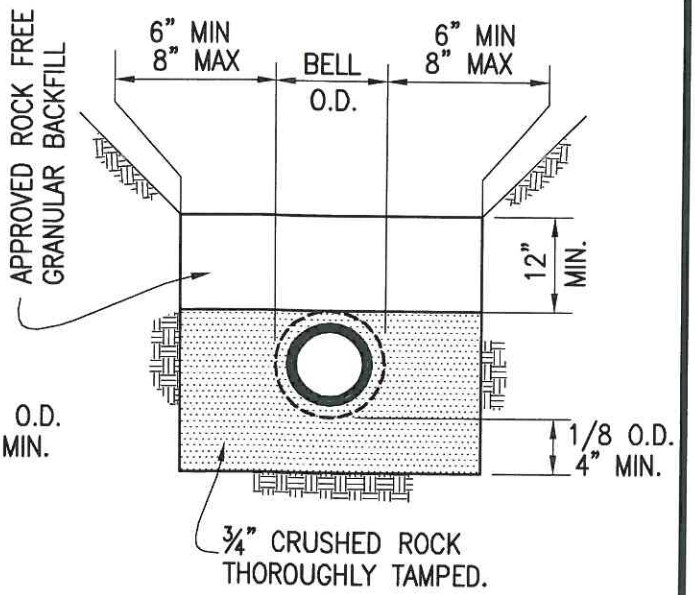
CLASS D
NATIVE BEDDING
(LOAD FACTOR = 1.1)



CLASS C
SPECIAL BEDDING
(LOAD FACTOR = 1.5)



CLASS B
SPECIAL BEDDING
(LOAD FACTOR = 1.9)



CRUSHED STONE
ENCASEMENT
(LOAD FACTOR = 2.2)

MSWD
Mission Springs Water District

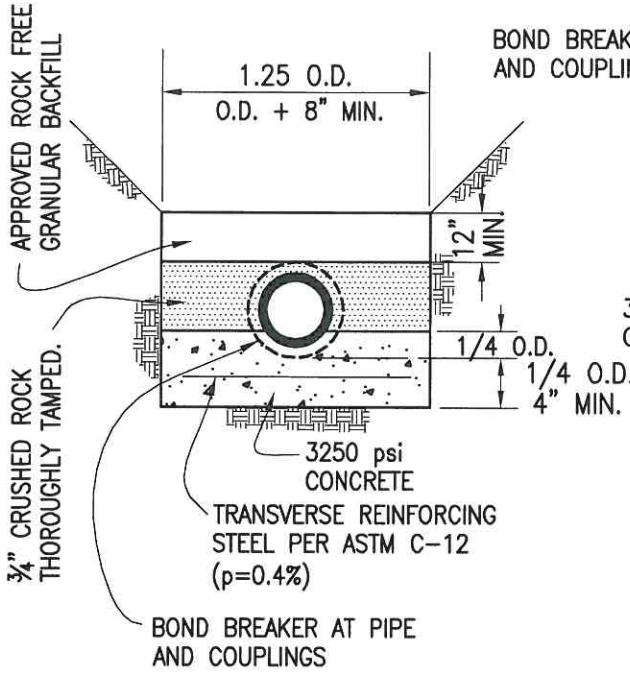
SEWER
PIPE BEDDING

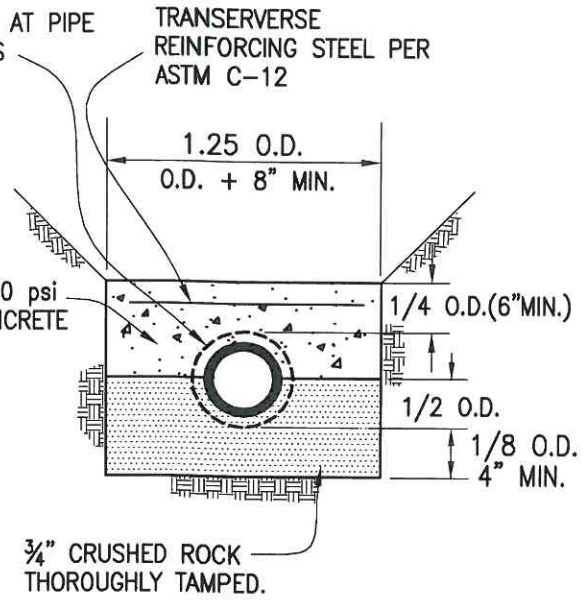
Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/21/08

DRAWING No.
S-02A

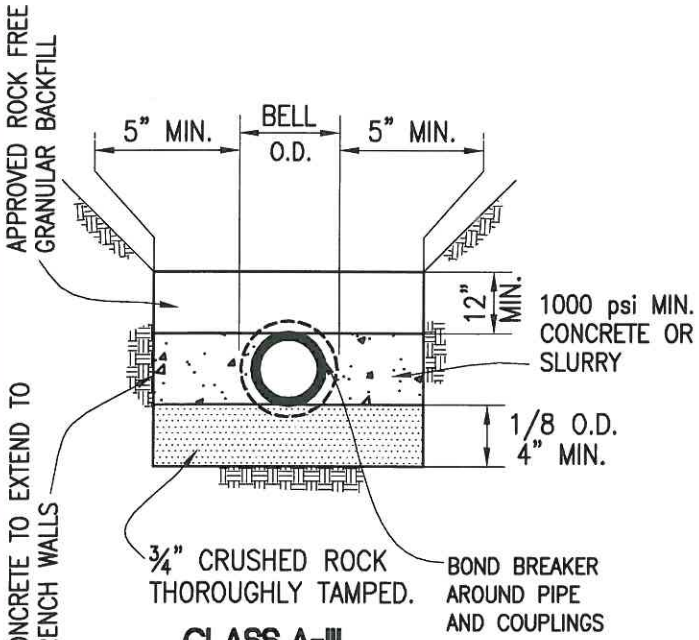
NOTE: ALL DIMENSIONS REFERRING TO O.D. SHALL BE BASED ON THE MAXIMUM BELL OR COUPLING DIAMETER



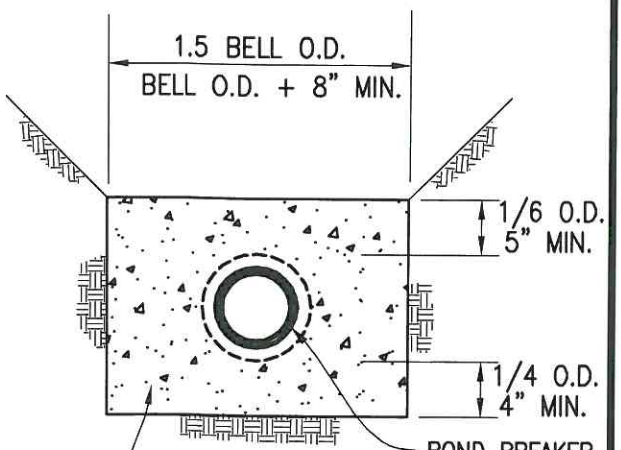


CLASS A-I
CONCRETE CRADLE
(NON-REINFORCED LOAD FACTOR = 2.8)
(REINFORCED LOAD FACTOR = 3.4)

CLASS A-II
CONCRETE ARCH
(REINFORCED p=0.4% LOAD FACTOR = 3.4)
(REINFORCED p=1.0% LOAD FACTOR = 4.5)



CLASS A-III
SIDECRADLING
(LOAD FACTOR = 2.7)
NOT RECOMMENDED FOR USE IN EXPANSIVE SOILS



CLASS A-IV
CONCRETE ENCASEMENT
(LOAD FACTOR OVER 4.5)
SHALL BE DESIGNED BY A REGISTERED ENGINEER

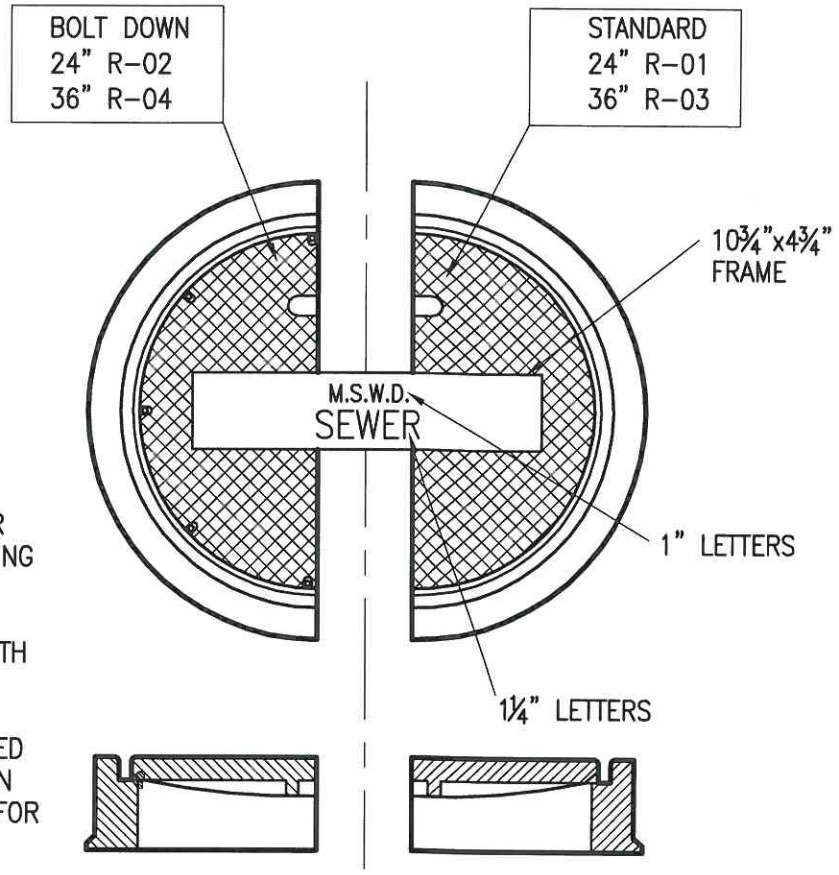
MSWD
Mission Springs Water District

CONCRETE SEWER PIPE BEDDING AND ENCASEMENT

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/21/08

DRAWING No.
S-02B



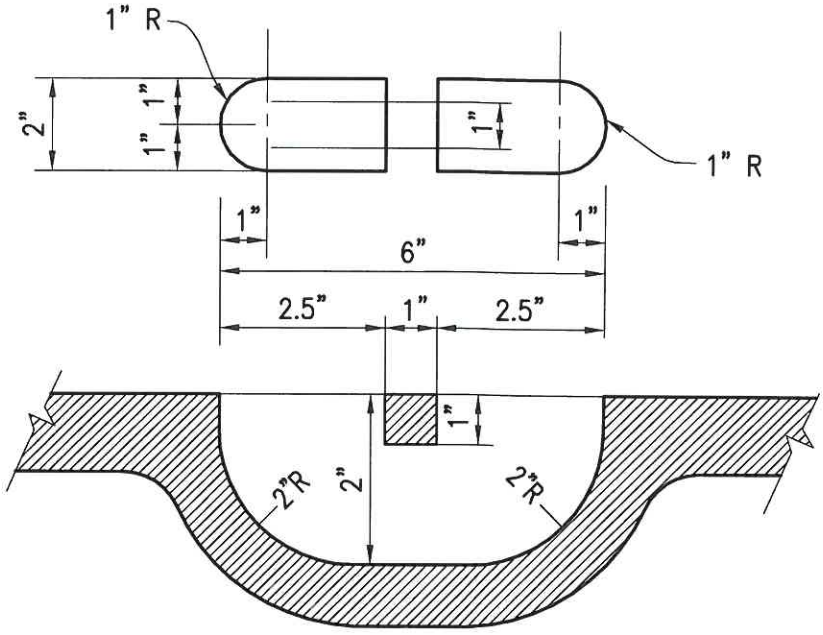
NOTES:

1. FRAME AND COVER SHALL BE PER APPROVED MATERIALS LIST WITH LIFTING DEVICE CAST COVER AS PER DETAIL SHOWN BELOW.
COVER SHALL BE DIAMOND TREAD WITH NAME LETTERED AS SHOWN.

2. BOLT-DOWN COVERS ARE REQUIRED IN SOME LOCATIONS AS SPECIFIED ON THE PLANS. GENERALLY REQUIRED FOR ALL EASEMENT LOCATIONS.

3. FOR 60" MANHOLE USE 36" DIA. FRAME AND COVER.

FRAME AND COVER DETAIL



LIFTING RECEPTACLE DETAIL

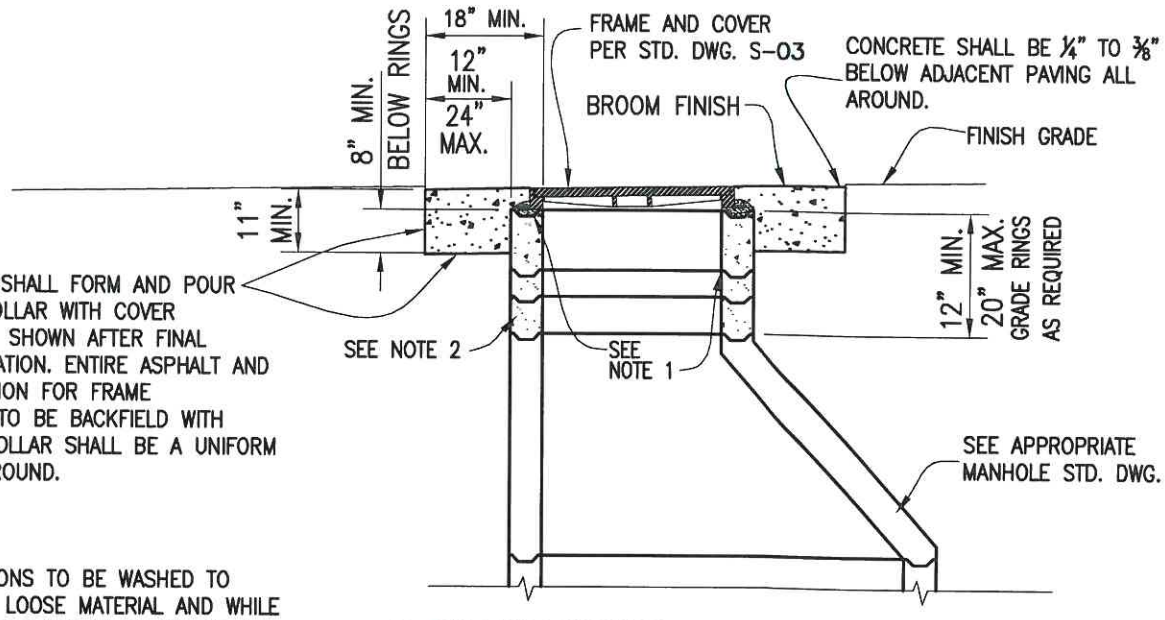
MSWD
Mission Springs Water District

MANHOLE FRAME AND COVER

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/14/08

DRAWING No.
S-03



DETAIL FOR MANHOLE IN PAVED SURFACES

NOTES:

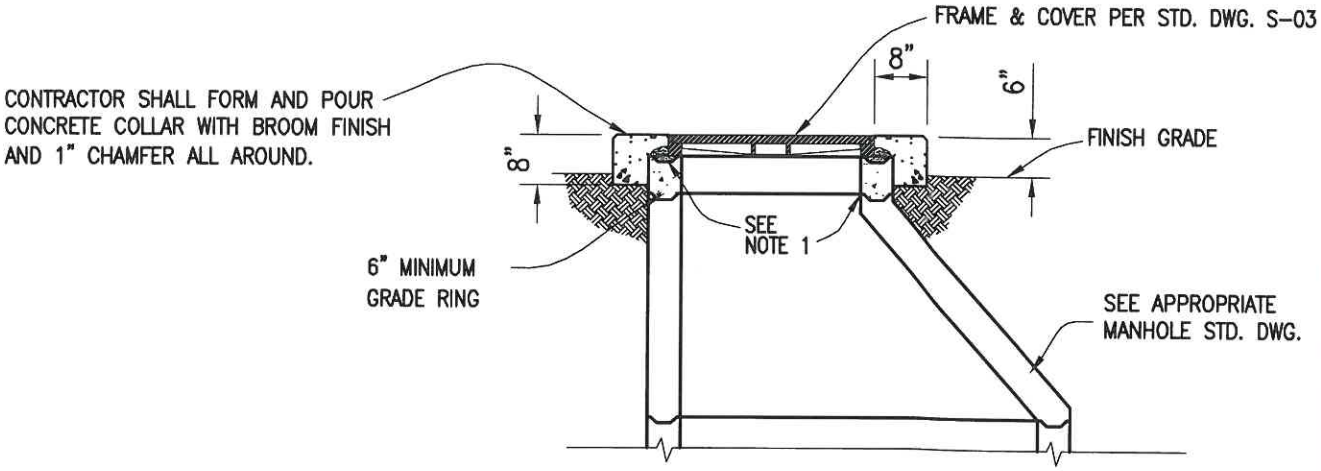
1. ALL SECTIONS TO BE WASHED TO REMOVE ANY LOOSE MATERIAL AND WHILE STILL WET, THEY ARE TO BE SET IN 1:3 MORTAR MIX TRIMMED SMOOTH INSIDE AND OUTSIDE, INCLUDING FRAME.

2. CONCRETE FOR GRADE RINGS SHALL BE 3000 P.S.I. MIN.

3. CONCRETE COLLAR SHALL BE 3250 P.S.I. MIN. WITH FIBERMESH AND BROOM FINSH.

4. FOR 60" MANHOLES USE 36" DIA. FRAME AND COVER.

NOTE:
24" GRADE RINGS PER MATERIAL LIST # S-05
36" GRADE RINGS PER MATERIAL LIST # S-06



DETAIL FOR MANHOLES IN EASEMENTS

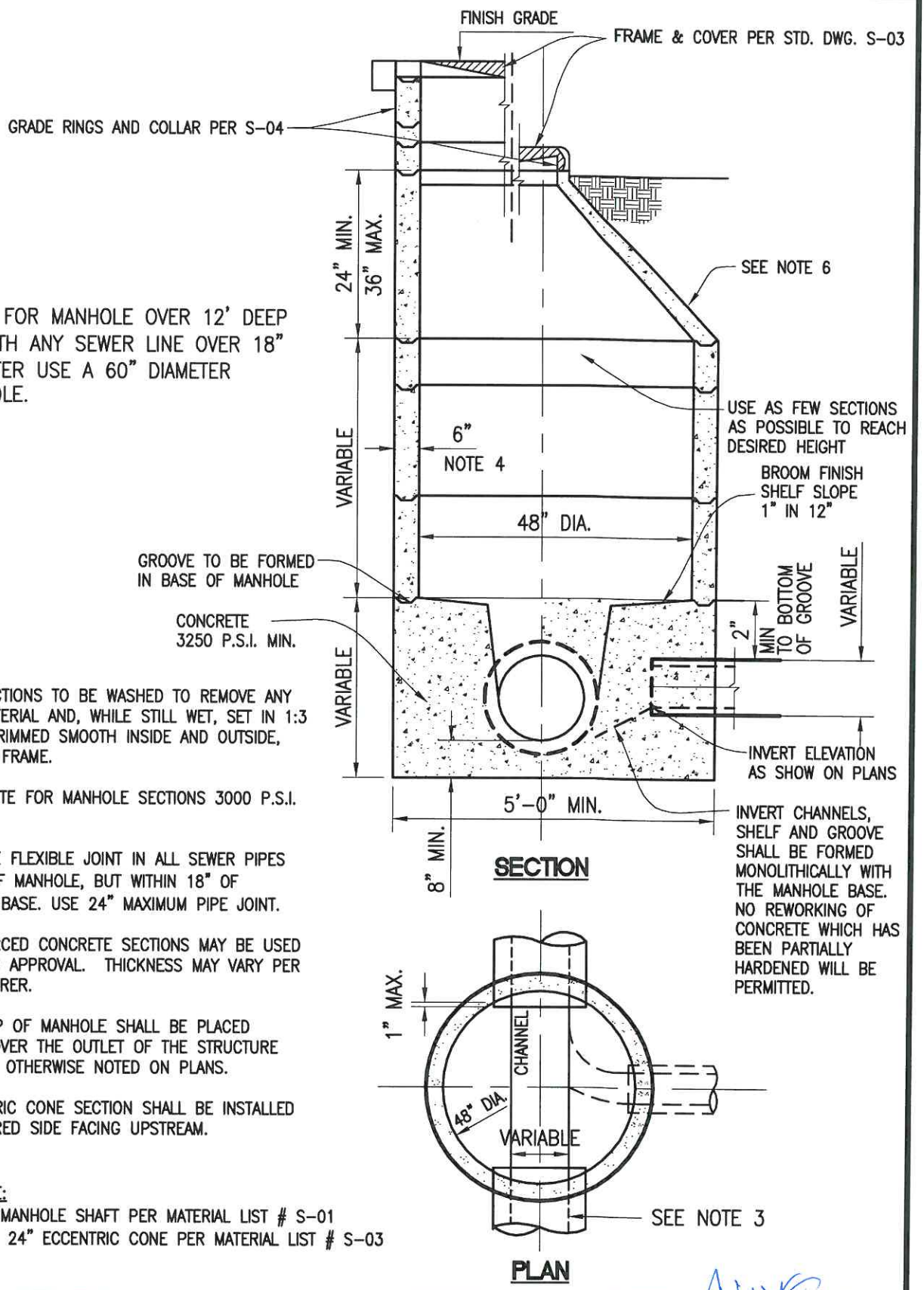
MSWD
Mission Springs Water District

MANHOLE COLLAR AND GRADE RINGS DETAIL

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 4/24/12

DRAWING No.
S-04



NOTE: FOR MANHOLE OVER 12' DEEP OR WITH ANY SEWER LINE OVER 18" DIAMETER USE A 60" DIAMETER MANHOLE.

NOTES:

1. ALL SECTIONS TO BE WASHED TO REMOVE ANY LOOSE MATERIAL AND, WHILE STILL WET, SET IN 1:3 MORTAR, TRIMMED SMOOTH INSIDE AND OUTSIDE, INCLUDING FRAME.

2. CONCRETE FOR MANHOLE SECTIONS 3000 P.S.I. MIN.

3. PROVIDE FLEXIBLE JOINT IN ALL SEWER PIPES OUTSIDE OF MANHOLE, BUT WITHIN 18" OF CONCRETE BASE. USE 24" MAXIMUM PIPE JOINT.

4. REINFORCED CONCRETE SECTIONS MAY BE USED WITH MSWD APPROVAL. THICKNESS MAY VARY PER MANUFACTURER.

5. THE TOP OF MANHOLE SHALL BE PLACED DIRECTLY OVER THE OUTLET OF THE STRUCTURE EXCEPT AS OTHERWISE NOTED ON PLANS.

6. ECCENTRIC CONE SECTION SHALL BE INSTALLED WITH TAPERED SIDE FACING UPSTREAM.

NOTE:
48" MANHOLE SHAFT PER MATERIAL LIST # S-01
48"x 24" ECCENTRIC CONE PER MATERIAL LIST # S-03

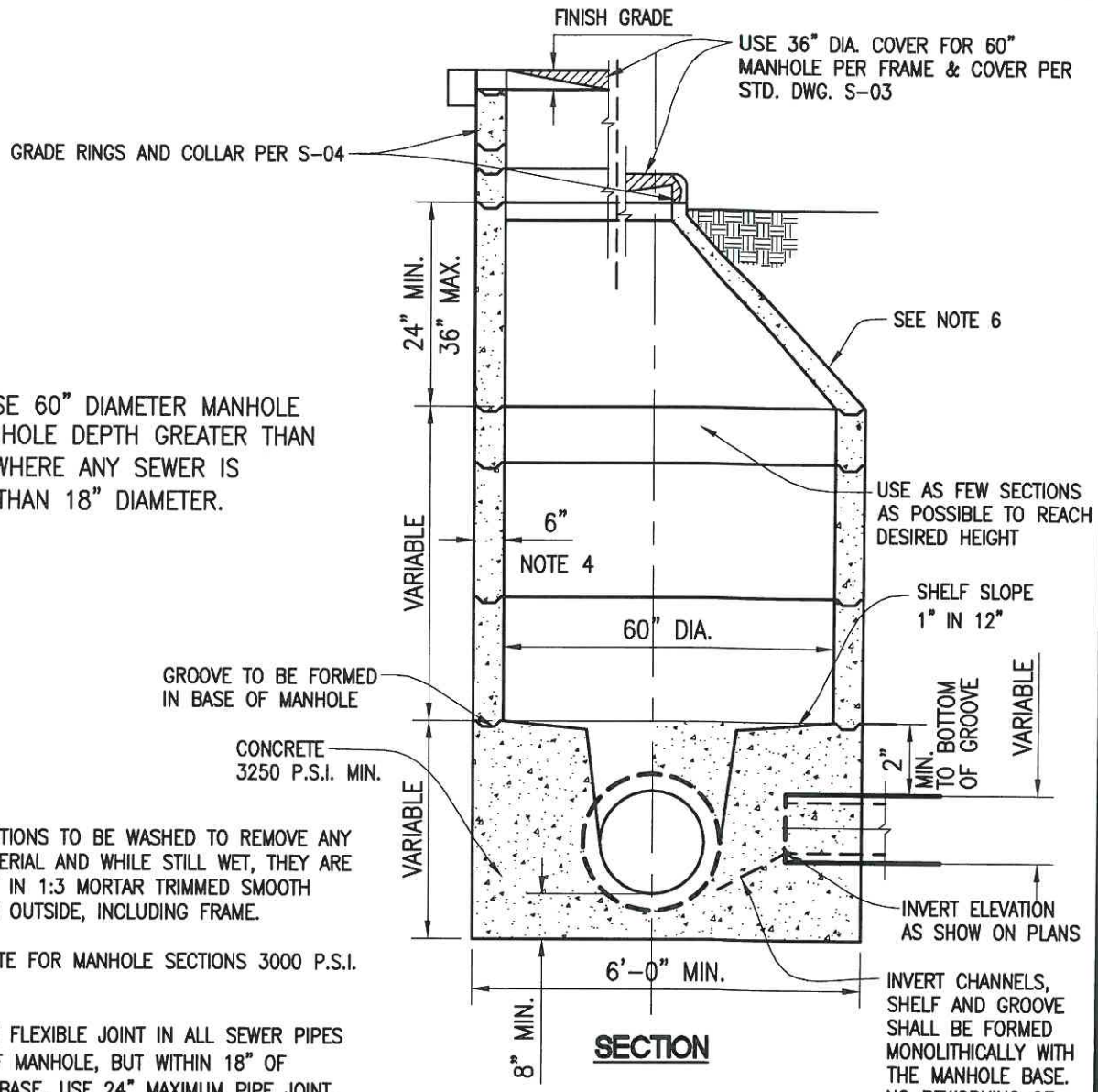
MSWD
Mission Springs Water District

4' DIAMETER PRECAST MANHOLE

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/21/08

DRAWING No.
S-05



SECTION

NOTE: USE 60" DIAMETER MANHOLE FOR MANHOLE DEPTH GREATER THAN 12' OR WHERE ANY SEWER IS LARGER THAN 18" DIAMETER.

NOTES:

1. ALL SECTIONS TO BE WASHED TO REMOVE ANY LOOSE MATERIAL AND WHILE STILL WET, THEY ARE TO BE SET IN 1:3 MORTAR TRIMMED SMOOTH INSIDE AND OUTSIDE, INCLUDING FRAME.

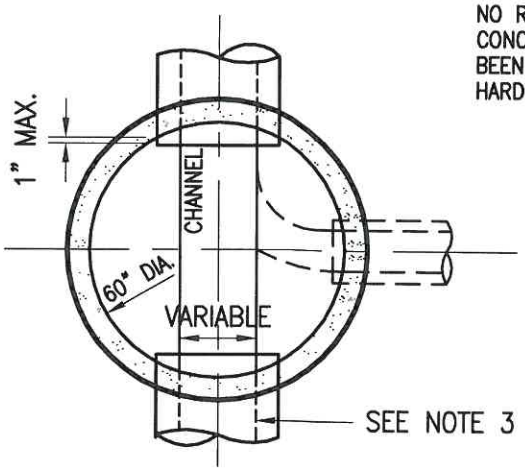
2. CONCRETE FOR MANHOLE SECTIONS 3000 P.S.I. MIN.

3. PROVIDE FLEXIBLE JOINT IN ALL SEWER PIPES OUTSIDE OF MANHOLE, BUT WITHIN 18" OF CONCRETE BASE. USE 24" MAXIMUM PIPE JOINT.

4. REINFORCED CONCRETE SECTIONS MAY BE USED WITH MSWD APPROVAL. THICKNESS MAY VARY PER MANUFACTURER.

5. THE TOP OF MANHOLE SHALL BE PLACED DIRECTLY OVER THE OUTLET OF THE STRUCTURE EXCEPT AS OTHERWISE NOTED ON PLANS.

6. ECCENTRIC CONE SECTION SHALL BE INSTALLED WITH TAPERED SIDE FACING UPSTREAM.



PLAN

NOTE:
60" MANHOLE SHAFT PER MATERIAL LIST # S-02
60"x 36" ECCENTRIC CONE PER MATERIAL LIST # S-04

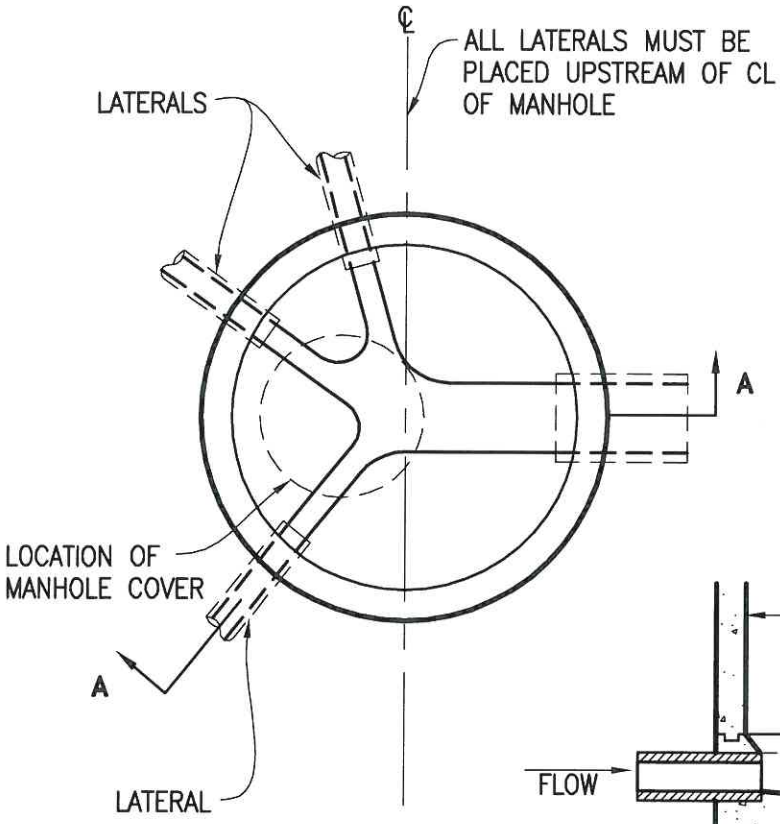
MSWD
Mission Springs Water District

5' DIAMETER PRECAST MANHOLE

Approved: _____
Arden Wallum
General Manager

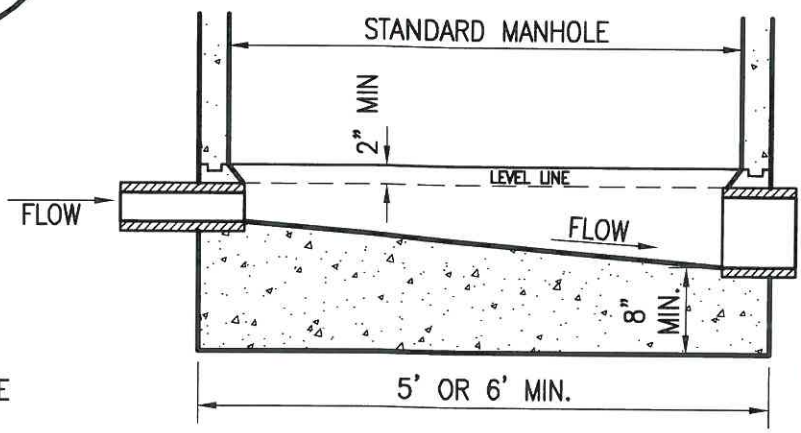
Drawn: Heitec Inc. Date: 01/14/08

DRAWING No.
S-06



PLAN

TERMINUS MANHOLE WITH LATERALS



SECTION A-A

NOTES:

1. REFER TO STANDARD DRAWINGS S-03, S-04, AND S-05 FOR DETAILS PERTAINING TO MANHOLES.
2. THE MAXIMUM NUMBER OF LATERALS INTO A TERMINUS MANHOLE SHALL BE LIMITED TO THREE.
3. ALL LATERAL CONNECTIONS SHALL BE ORIENTED SUCH WITHOUT IN LINE WITH ANY OF THE CONNECTING SEWER MAINS.

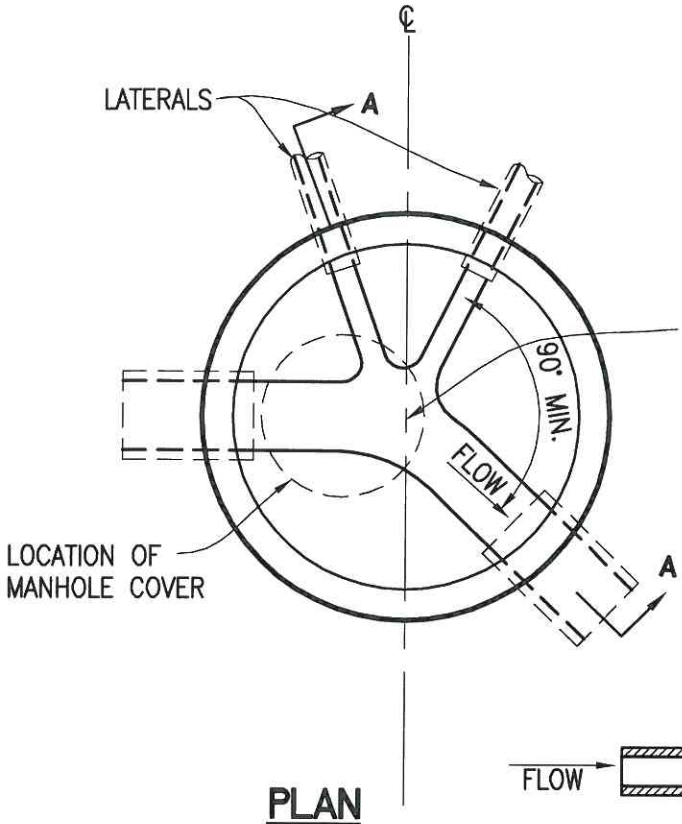
MSWD
Mission Springs Water District

TERMINUS MANHOLE WITH LATERALS

Approved:
Arden Wallum
General Manager

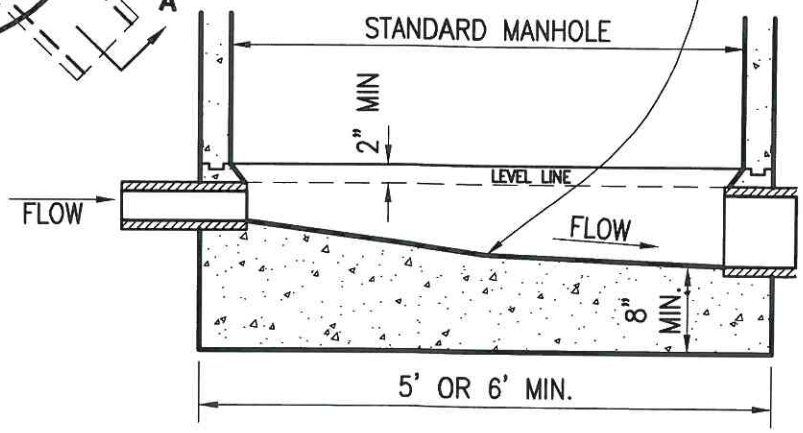
Drawn: Heitec Inc. Date: 4/24/12

DRAWING No.
S-07



PLAN

KNUCKLE MANHOLE
WITH LATERALS



SECTION A-A

NOTES:

1. REFER TO STANDARD DRAWINGS S-03, S-04, AND S-05 FOR DETAILS PERTAINING TO MANHOLES.
2. THE MAXIMUM NUMBER OF LATERALS INTO A KNUCKLE MANHOLE SHALL BE LIMITED TO TWO.
3. ALL LATERAL CONNECTIONS SHALL BE ORIENTED SUCH THAT THEY WILL NOT BE IN LINE WITH ANY OF THE CONNECTING SEWER MAINS.
4. ALL LATERAL INVERTS SHALL JOIN THE NORMAL CENTERLINE INVERT OF THE MANHOLE.

MSWD
Mission Springs Water District

KNUCKLE MANHOLE
WITH LATERALS

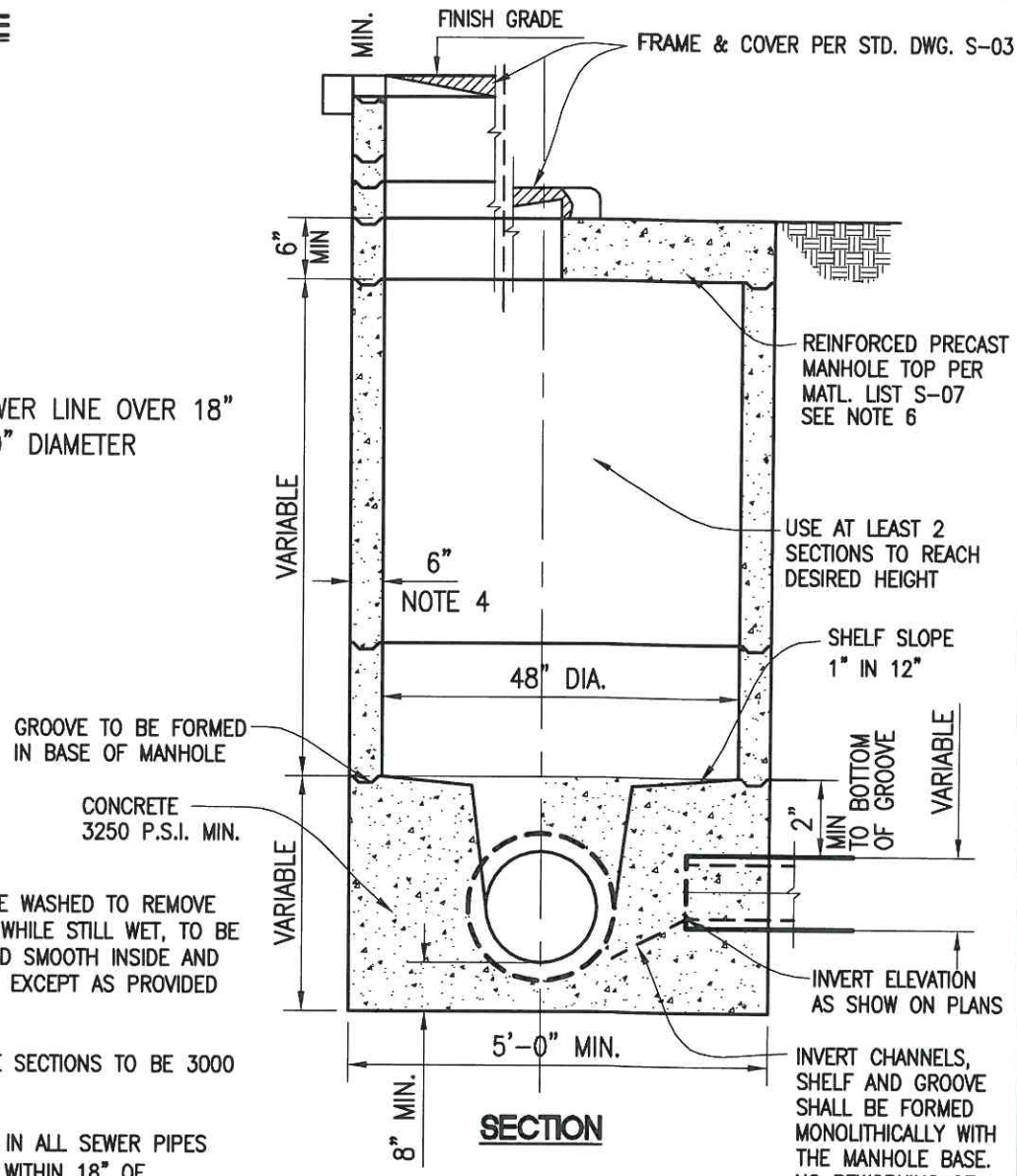
Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 4/24/12

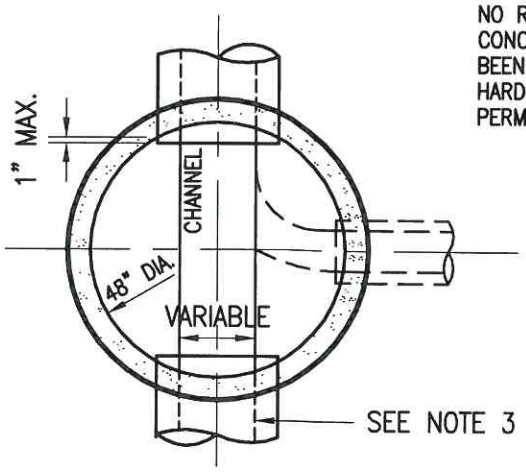
DRAWING No.
S-08

DETAIL FOR MANHOLE IN PAVED SURFACES

NOTE: FOR ANY SEWER LINE OVER 18" DIAMETER USE A 60" DIAMETER MANHOLE.



SECTION



PLAN

NOTES:

1. ALL SECTIONS ARE TO BE WASHED TO REMOVE ANY LOOSE MATERIAL AND, WHILE STILL WET, TO BE SET IN 1:3 MORTAR TRIMMED SMOOTH INSIDE AND OUTSIDE, INCLUDING FRAME, EXCEPT AS PROVIDED IN NOTE 4.

2. CONCRETE FOR MANHOLE SECTIONS TO BE 3000 P.S.I. MIN.

3. PROVIDE FLEXIBLE JOINT IN ALL SEWER PIPES OUTSIDE OF MANHOLE, BUT WITHIN 18" OF CONCRETE BASE. USE 24" MAXIMUM PIPE JOINT.

4. REINFORCED CONCRETE SECTIONS MAY BE USED WITH MSWD APPROVAL. THICKNESS MAY VARY PER MANUFACTURER.

5. THE TOP OF MANHOLE SHALL BE PLACED DIRECTLY OVER THE OUTLET OF THE STRUCTURE EXCEPT AS OTHERWISE NOTED ON PLANS.

6. PRECAST MANHOLE SLAB SHALL BE INSTALLED WITH MANHOLE FACING UPSTREAM.

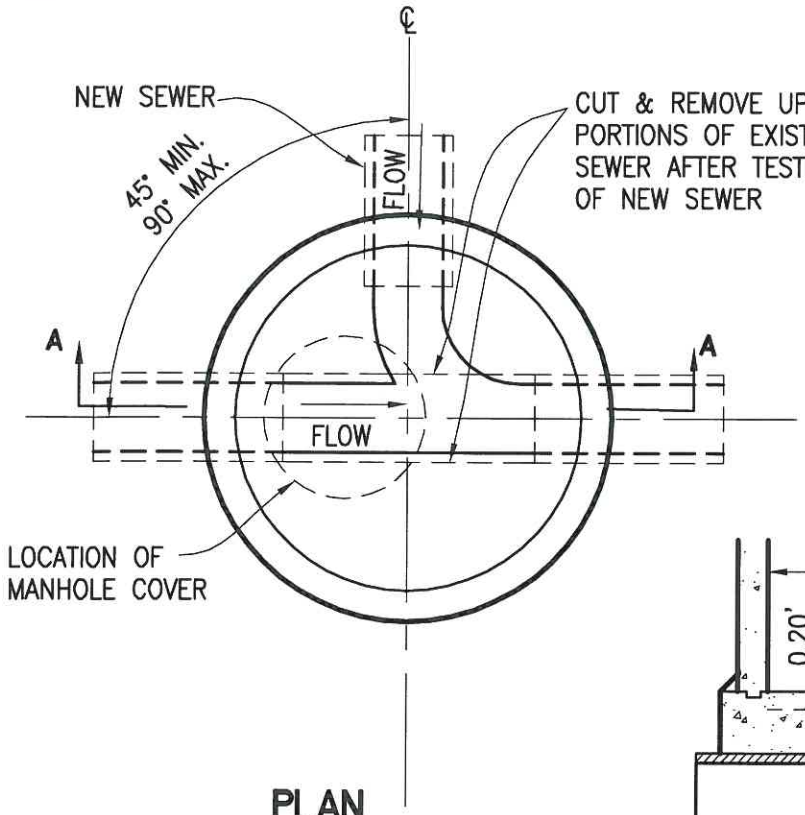
MSWD
Mission Springs Water District

PRECAST SHALLOW MANHOLE
DEPTH LESS THAN 6'

Approved:
Arden Wallum
General Manager

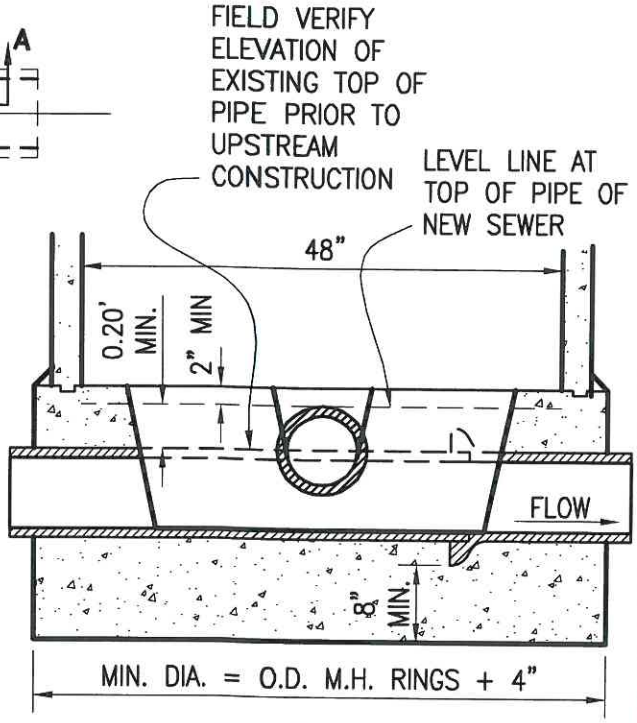
Drawn: Heitec Inc. Date: 01/21/08

DRAWING No.
S-09



PLAN

HOT TAP MANHOLE



SECTION A-A

NOTES:

1. REFER TO STANDARD DRAWINGS S-03, S-04, AND S-05 FOR DETAILS PERTAINING TO MANHOLES.
2. NEW SEWER TO BE PLUGGED WITH MECHANICAL PLUG UNTIL SEWER HAS BEEN TESTED AND APPROVED BY THE MSWD INSPECTOR.
3. INTERFERING PORTIONS OF THE EXISTING PIPE SHALL TO BE BROKEN OUT TO A NEAT LINE. BROKEN EDGES SHALL BE PLASTERED SMOOTH WITH CEMENT MORTAR.
4. CARE SHALL BE TAKEN TO PREVENT BROKEN PIECES OF PIPE FROM ENTERING EXISTING SEWER. MSWD MAY REQUIRE TEMPORARY PLUG IN EXISTING SEWER UPSTREAM OF CONNECTION DURING BREAKOUT OPERATIONS.
5. ANY EXISTING BELL JOINT WITHIN THE MANHOLE BASE SHALL BE SUPPORTED DURING EXCAVATION AND POUR TO PREVENT SETTLEMENT.
6. PROVIDE FLEXIBLE JOINT WITHIN 18" OF MANHOLE BASE ON NEW SEWER.
7. NEW CHANNEL SHALL BE FORMED AND FINISHED TO PROVIDE A SMOOTH TRANSITION INTO EXISTING TROUGH.
8. ALL WORK ON ACTIVE SEWER SHALL BE DONE UNDER DIRECT DISTRICT SUPERVISION.

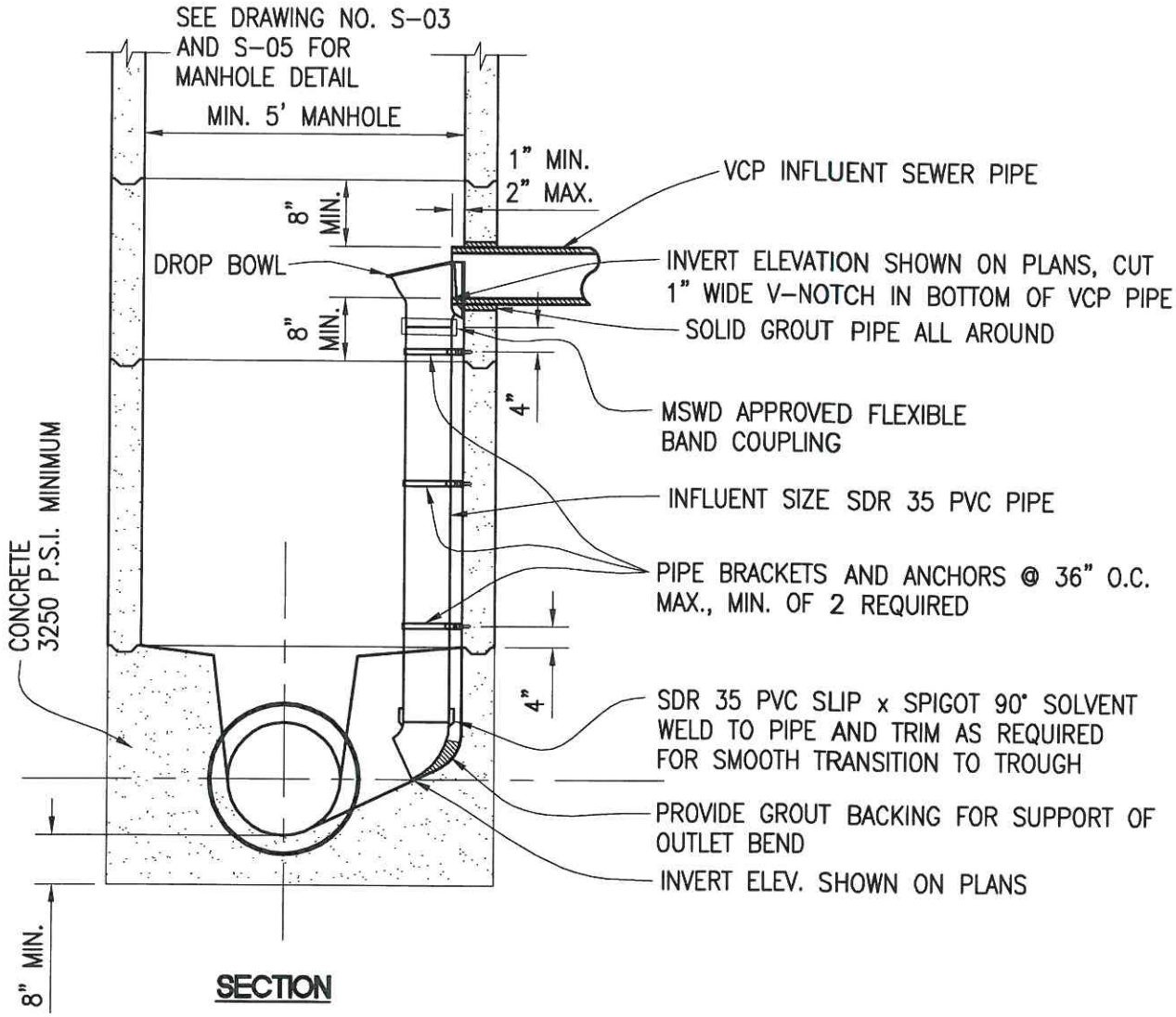
MSWD
Mission Springs Water District

HOT TAP
MANHOLE

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 8/29/12

DRAWING No.
S-10



SECTION

NOTES:

1. DROP BOWL AND MOUNTING HARDWARE SHALL BE RELINER/DURAN "B" DROP BOWL SIZED FOR INFLUENT SEWER SIZE AND MANHOLE DIAMETER, OR APPROVED EQUAL, INSTALLED PER MANUFACTURERS SPECIFICATIONS.
2. DROP BOWL SHALL BE CENTERED DIRECTLY BELOW INFLUENT PIPE WITH APPROXIMTELY 1" CLEARANCE BELOW PIPE AND SHALL BE ATTACHED USING ⅜" x 1" STAINLESS STEEL ANCHOR KTS SUPPLIED BY THE APPROVED MANUFACTURER.
3. PIPE BRACKETS SHALL BE 11 GUAGE 304 STAINLESS STEEL 1 ½" WIDE WITH STAINLESS STEEL HARDWARE AS SUPPLIED BY THE APPROVED MANUFACTURER.
4. THE MANHOLE CONE SECTION SHALL BE PLACED TO ALLOW CLEAR ACCESS WITHOUT INTERFERENCE WITH THE DROP ASEMBLY, LOCATION TO BE APPROVED BY MSWD INSPECTOR.
5. USE OF THE DROP MANHOLE SHALL REQUIRE PRIOR APPROVAL BY MSWD ENGINEERING STAFF.

MSWD
Mission Springs Water District

INSIDE DROP MANHOLE

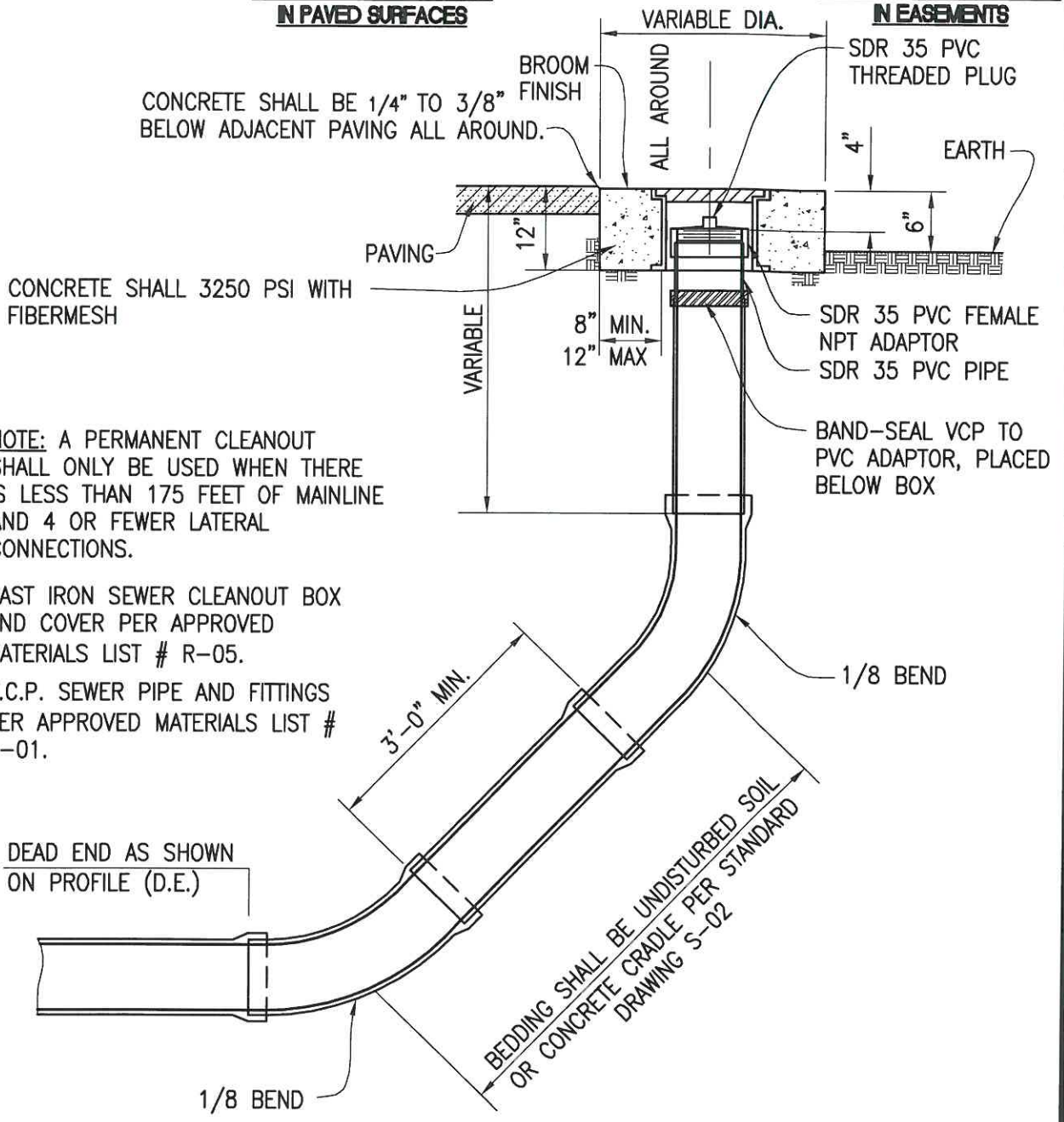
Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 06/6/12

DRAWING No.
S-11

DETAIL FOR CLEAN-OUTS IN PAVED SURFACES

DETAIL FOR CLEAN-OUTS IN EASEMENTS



NOTE: A PERMANENT CLEANOUT SHALL ONLY BE USED WHEN THERE IS LESS THAN 175 FEET OF MAINLINE AND 4 OR FEWER LATERAL CONNECTIONS.

CAST IRON SEWER CLEANOUT BOX AND COVER PER APPROVED MATERIALS LIST # R-05.

V.C.P. SEWER PIPE AND FITTINGS PER APPROVED MATERIALS LIST # Q-01.

NOTE:
CLEAN-OUT TO BE OF THE SAME MATERIAL & SIZE AS SEWER MAIN. THE SEWER MAIN SHALL BE LAID FOR THE FULL LENGTH & DEPTH SHOWN ON THE PLAN & PROFILE TO THE STATION MARKED DEAD END (D.E.). THE TRENCH FOR A DEAD END SHALL BE EXCAVATED ONLY TO SUBGRADE WHICH IS THE BOTTOM OF THE SLOPING PIPE AND FITTINGS. SHOULD THE EXCAVATION, FOR ANY REASON, BE CARRIED BELOW SUBGRADE, IT SHALL BE REFILLED TO SUBGRADE WITH ROCK OR GRAVEL, WHICH SHALL BE TAMPED UNTIL FIRM AND UNYIELDING. SHOULD A FIRM AND UNYIELDING FOUNDATION BE UNATTAINABLE BY THIS METHOD, A CONCRETE PIPE CRADLE SHALL BE USED.

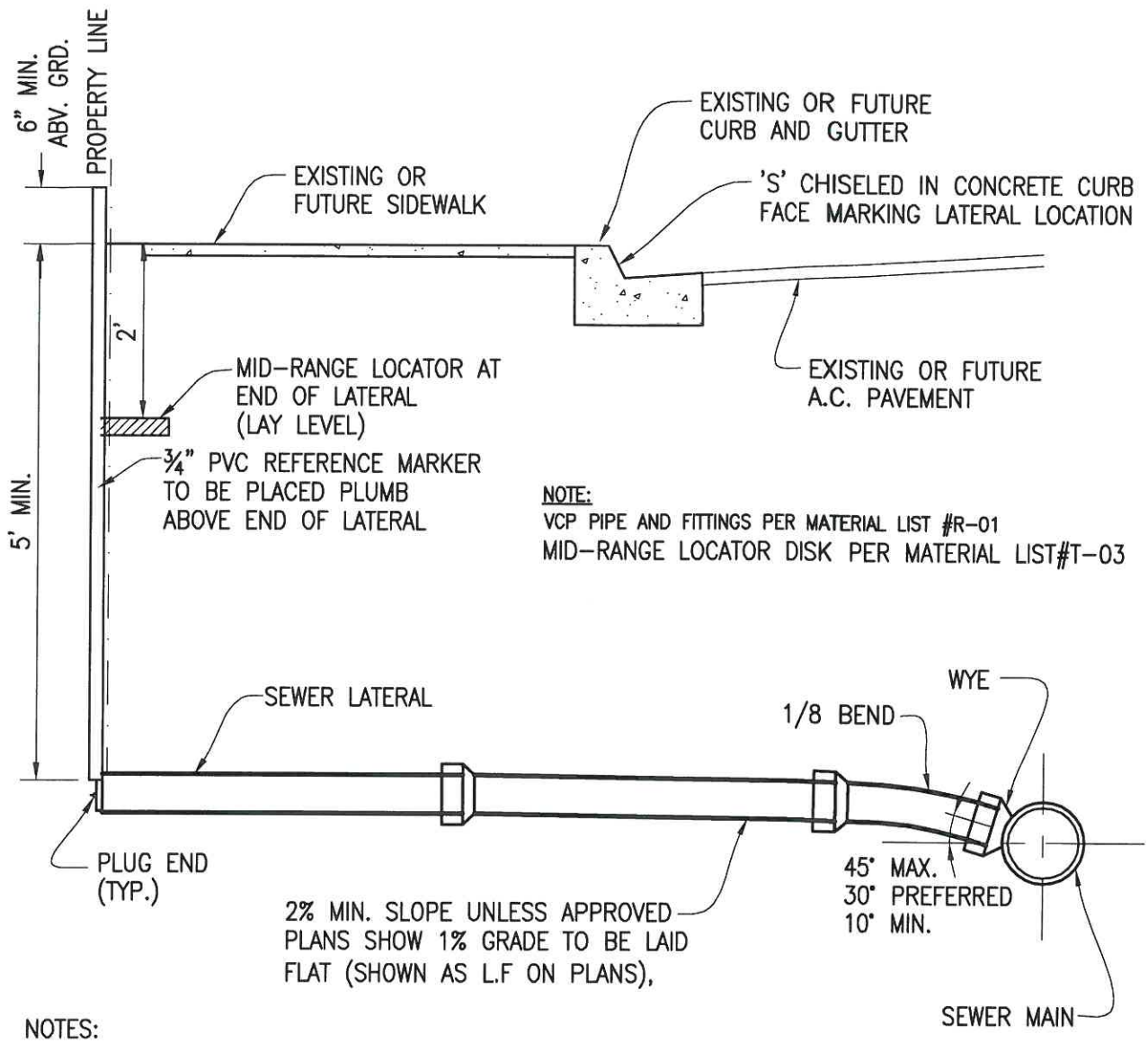
MSWD
Mission Springs Water District

MAINLINE CLEANOUT

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 5/5/12

DRAWING No.
S-12



NOTES:

1. 4" V.C.P. SHALL BE PROVIDED FOR ALL SINGLE-FAMILY DWELLING UNITS. 6" V.C.P. SHALL BE PROVIDED FOR ALL COMMERCIAL UNITS. MULTI-FAMILY UNITS SIZED PER PLAN, NO LATERALS OVER 6" WILL BE ALLOWED.

2. LATERAL LOCATIONS, AS NOTED ON THE 'AS-BUILT' PLANS, SHALL BE MEASURED AT RIGHT ANGLES TO STREET CENTERLINE, FROM THE CENTERLINE OF THE NEAREST DOWNSTREAM MANHOLE COVER, DEPTH FROM FINISH GRADE AND LENGTH AT THE END OF LATERAL AT CUSTOMERS' PROPERTY LINE.

3. CONTRACTOR SHALL REFERENCE EACH LATERAL IN THE FIELD WITH A SURFACE MARKER. MARKER SHALL BE A SCH 40 PVC MARKER LIST PLACED AT TIME OF BACKFILLING. MARKER SHALL BE INSTALLED VERTICAL, CUT OFF AT 6" MIN. ABOVE GRADE.

4. LATERAL SHALL BE INSTALLED AT A CONSTANT GRADE UNLESS SPECIFICALLY APPROVED BY THE MSWD INSPECTOR.

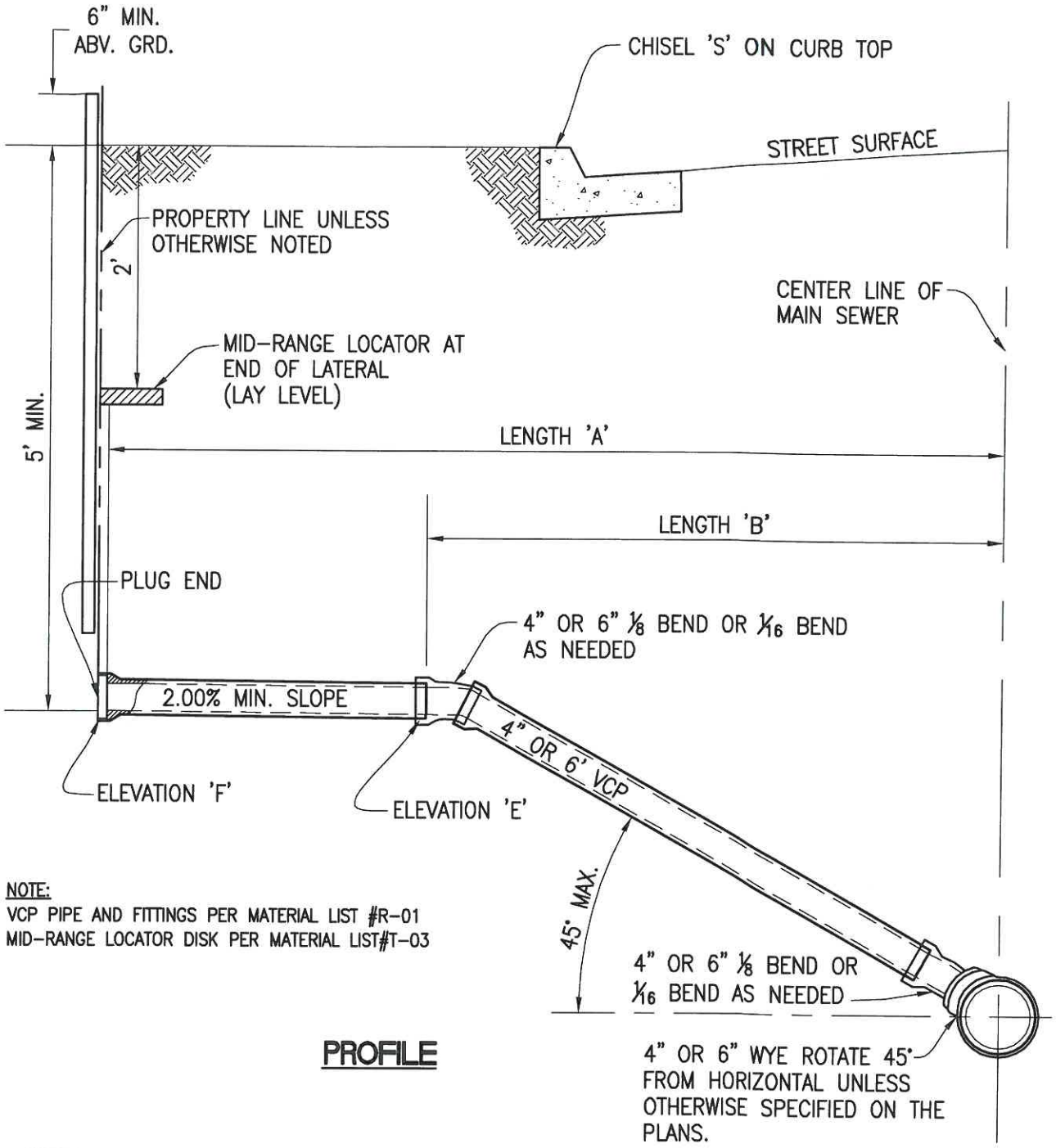
MSWD
Mission Springs Water District

SEWER LATERAL

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 06/20/11

DRAWING No.
S-13



NOTE:
VCP PIPE AND FITTINGS PER MATERIAL LIST #R-01
MID-RANGE LOCATOR DISK PER MATERIAL LIST#T-03

PROFILE

NOTES:

1. SEE SEWER CONSTRUCTION PLANS FOR LENGTH 'A', LENGTH 'B' AND ELEVATIONS 'E' AND 'F'.
2. PIPE FOR SEWER LATERALS SHALL BE 4" OR 6" CLAY PIPE, NO LARGER LATERALS ARE ALLOWED.

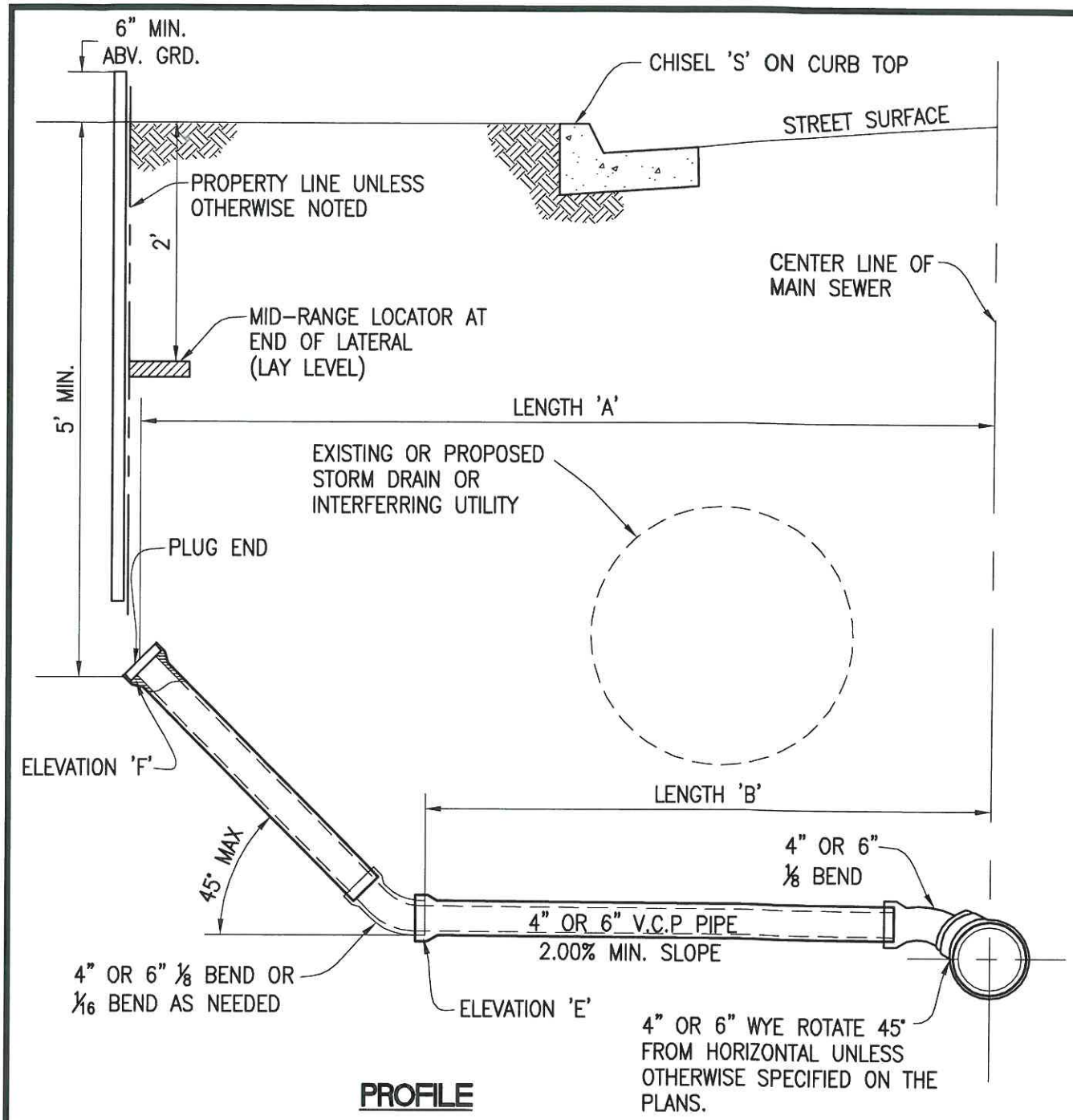
MSWD
Mission Springs Water District

LATERAL FOR DEEP SEWER
WITHOUT UTILITY CROSSING

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 06/20/11

DRAWING No.
S-14



PROFILE

NOTES:

1. SEE SEWER CONSTRUCTION PLANS FOR LENGTH 'A', LENGTH 'B' AND ELEVATIONS 'E' AND 'F'.
2. PIPE FOR SEWER LATERALS SHALL BE 4" OR 6" CLAY PIPE. NO LATERALS OVER 6" ARE ALLOWED.

NOTE:
VCP PIPE AND FITTINGS PER MATERIAL LIST #R-01
MID-RANGE LOCATOR DISK PER MATERIAL LIST#T-03

MSWD
Mission Springs Water District

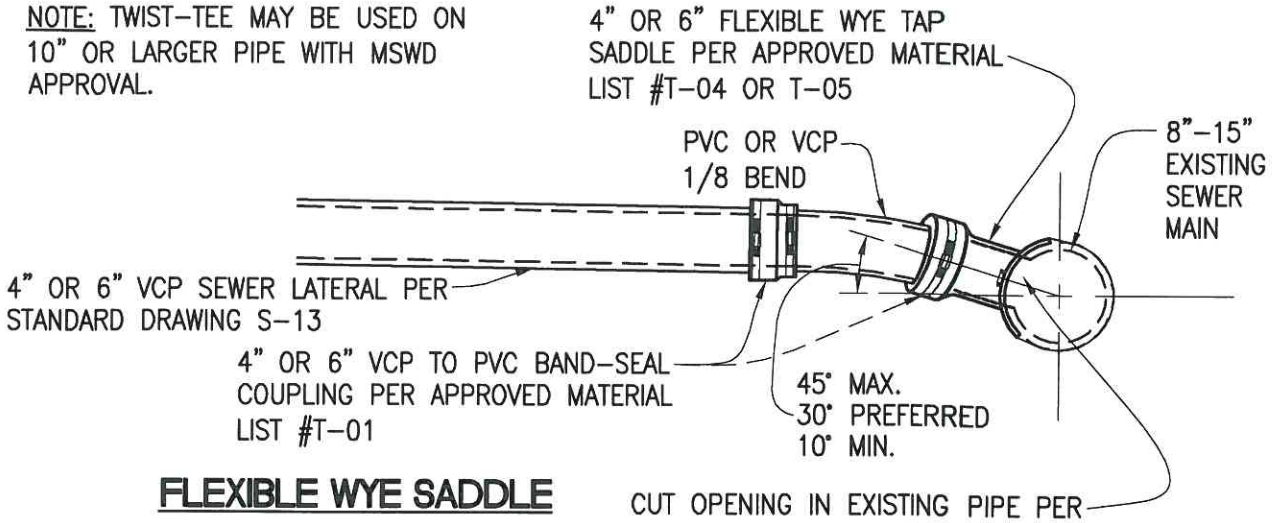
LATERAL FOR DEEP SEWER WITH UTILITY CROSSING

Approved:
Arden Wallum
General Manager

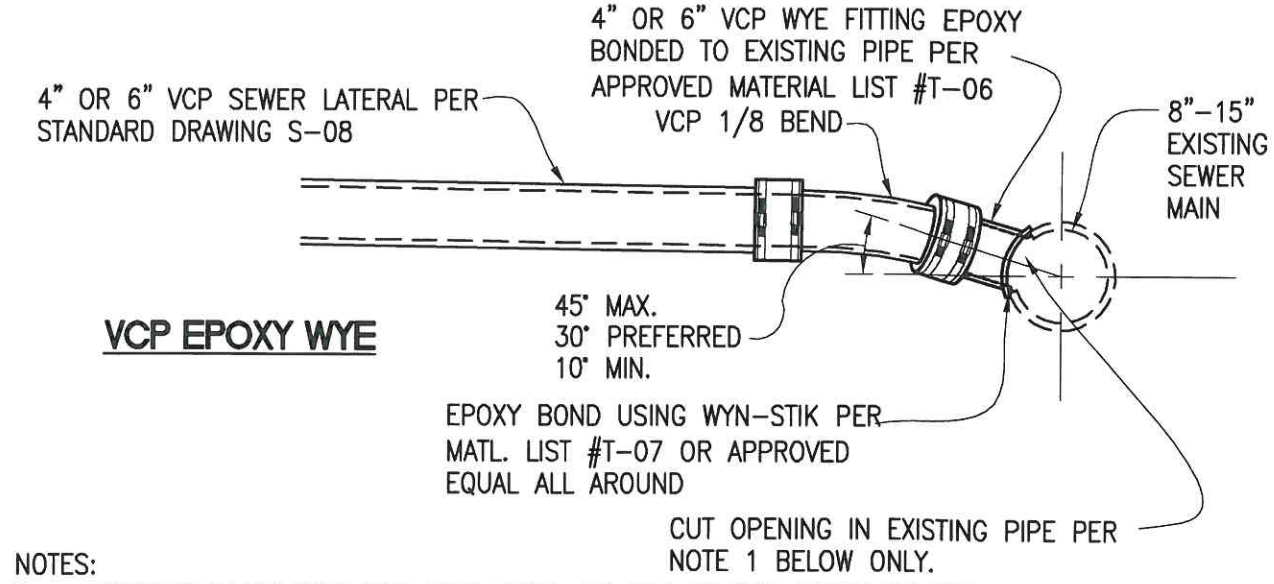
Drawn: Heitec Inc. Date: 06/20/11

DRAWING No.
S-15

NOTE: TWIST-TEE MAY BE USED ON 10" OR LARGER PIPE WITH MSWD APPROVAL.



FLEXIBLE WYE SADDLE



VCP EPOXY WYE

NOTES:

1. OPENING IN EXISTING VCP PIPE SHALL BE CUT ON THE ANGLE OF THE WYE FITTING USING A STABILIZED SHELL CUTTER SIZED PER MANUFACTURERS SPECIFICATION OF SUFFICIENT DEPTH TO PERFORM A CLEAN ELLIPTICAL CUT COMPLETELY THROUGH THE EXISTING PIPE WALL AND CUT SHALL NOT BE WITHIN 2' OF AN EXISTING PIPE JOINT.

2. TRACE ELLIPTICAL PATTERN ON THE EXISTING PIPE THROUGH THE WYE FITTING AND CUT A 4" OR 6" STARTER HOLE WITH A STANDARD HOLE SAW. THEN SHAPE OPENING TO FIT USING A DIAMOND CUTTER.

3. ALL CUTTINGS SHALL BE REMOVED FROM PIPE AND WYE FITTING SHALL BE TESTED FOR FLUSH FIT TO EXISTING MAIN IN THE PRESENCE OF THE MSWD INSPECTOR PRIOR TO PERMANENT ATTACHMENT OF THE FITTING.

4. ALL MAINS WITH HOT TAP LATERAL TO BE VIDEO INSPECTED PER MSWD SPECIFICATIONS PRIOR TO ACCEPTANCE.

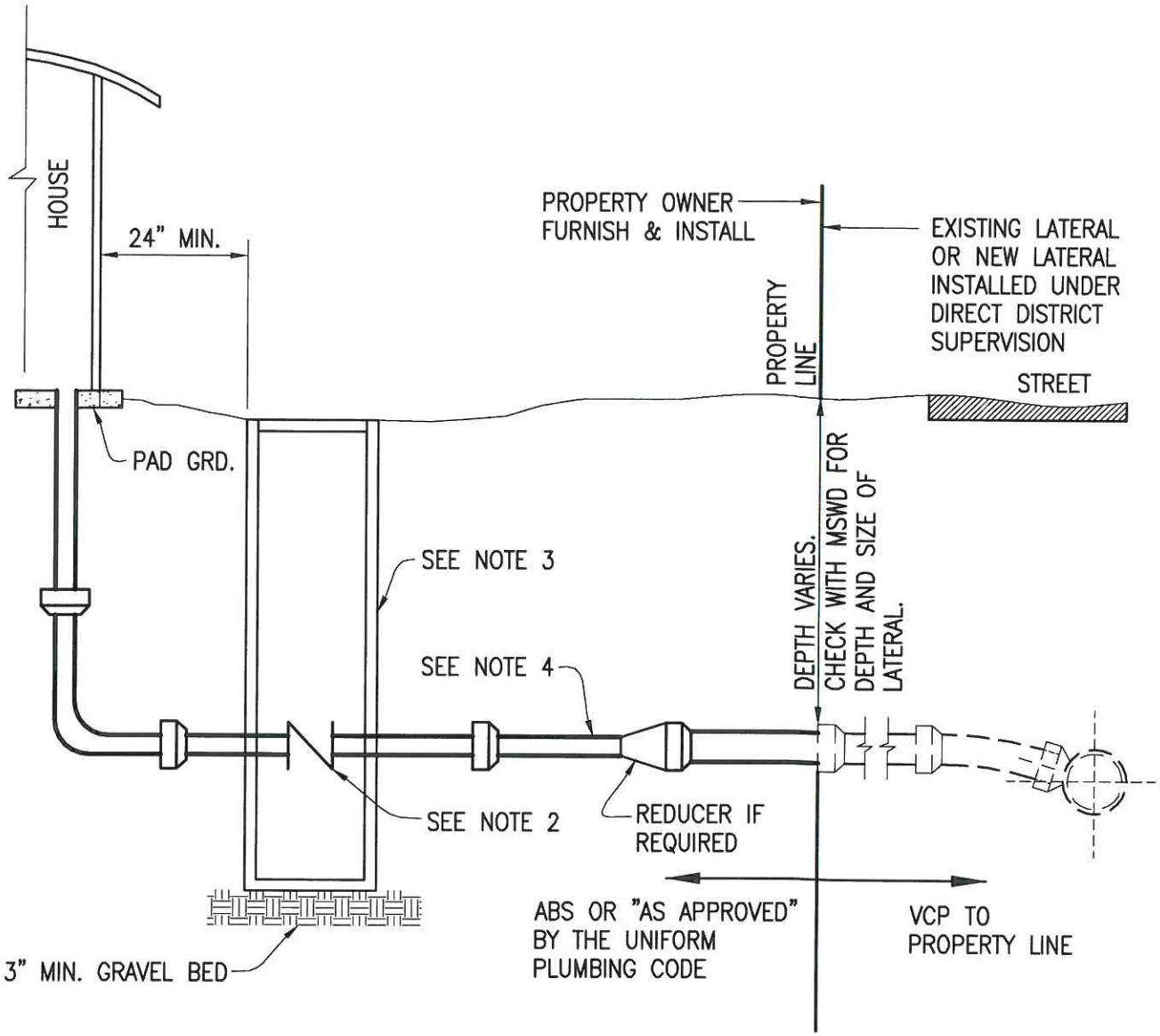
MSWD
Mission Springs Water District

HOT TAP
SEWER LATERAL

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 04/24/12

DRAWING No.
S-16



NOTES:

1. MAINTENANCE OF THE LATERAL TO THE SEWER MAIN IS THE RESPONSIBILITY OF THE PROPERTY OWNER.

2. A BACKWATER VALVE SHALL BE PROVIDED BY THE OWNER AS SPECIFIED IN THE UNIFORM PLUMBING CODE WHERE THE PAD ELEVATION OF THE PROPERTY IS LOCATED BELOW THE ELEVATION OF THE TOP OF THE NEXT UPSTREAM MANHOLE ON THE MAIN SEWER. THE BACKWATER VALVE SHALL BE PER LOCAL AGENCY STANDARDS.

3. THE BACKWATER VALVE, IF REQUIRED, SHALL BE ENCLOSED IN A VALVE BOX OR A VAULT IN ACCORDANCE WITH LOCAL AGENCY STANDARDS.

4. SEWER LATERAL SHALL BE AT A 2% MINIMUM SLOPE UNLESS OTHERWISE APPROVED.

MSWD
Mission Springs Water District

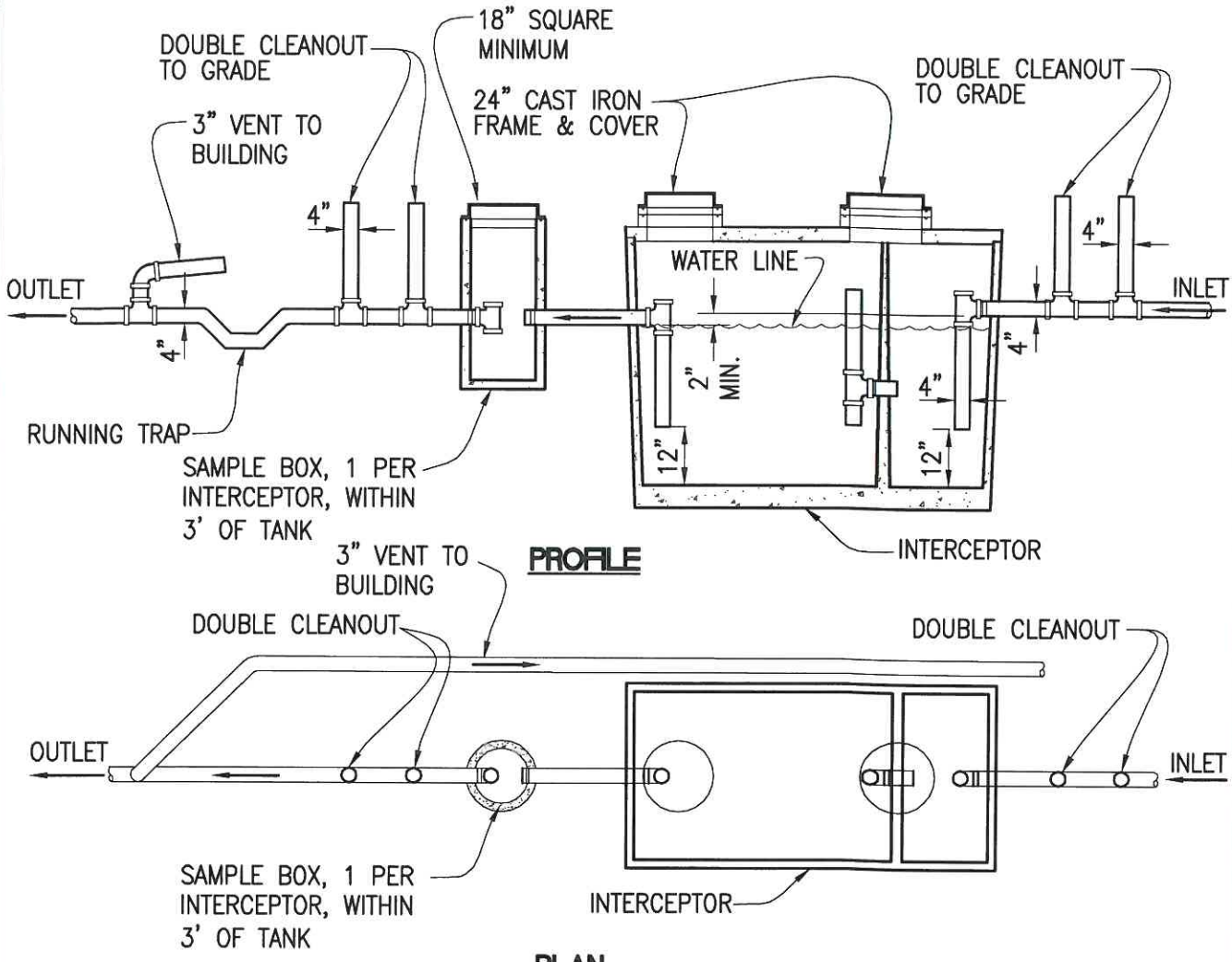
SEWER LATERAL ON PRIVATE PROPERTY

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/21/08

DRAWING No.
S-17

WHERE APPLICABLE, TRAFFIC BEARING TOP MUST BE INSTALLED



NOTES:

1. MINIMUM SIZE FOR ALL GREASE INTERCEPTORS SHALL BE 1000 GALLONS.
2. CONSTRUCTION MATERIALS SHALL BE PRECAST CONCRETE.
3. A 24" DIAMETER SANITARY MANHOLE RING AND COVER SHALL BE INSTALLED TO GRADE OVER BOTH THE INLET AND OUTLET SANITARY TEES FOR INSPECTION PURPOSES.
4. INLET AND OUTLET PIPES MUST BE 4" OR LARGER SCHEDULE 40 ABS OR CAST IRON PIPE AND THE INLET PIPE SHALL BE 2" HIGHER THAN THE OUTLET PIPE.
5. A SANITARY TEE MUST BE INSTALLED ON BOTH THE INLET AND OUTLET PIPES. THE INLET AND OUTLET PIPES SHALL BOTH EXTEND TO WITHIN 12" OF THE INTERCEPTOR FLOOR.
6. WHEN AN INTERCEPTOR IS INSTALLED IN A TRAFFIC AREA, THE TOP MUST MEET SPECIFICATIONS FOR TRAFFIC BEARING SLABS.
7. A DOUBLE COMBINATION TEE MUST BE INSTALLED ON BOTH THE INLET AND OUTLET PIPES JUST OUTSIDE OF THE INTERCEPTOR AND SAMPLE BOX.
8. ALL MANHOLES, CLEANOUTS, AND SAMPLE BOX ACCESS SHALL BE ACCESABLE AT GRADE AND SHALL BE CAPPED OR GASKETED VAPOR TIGHT.

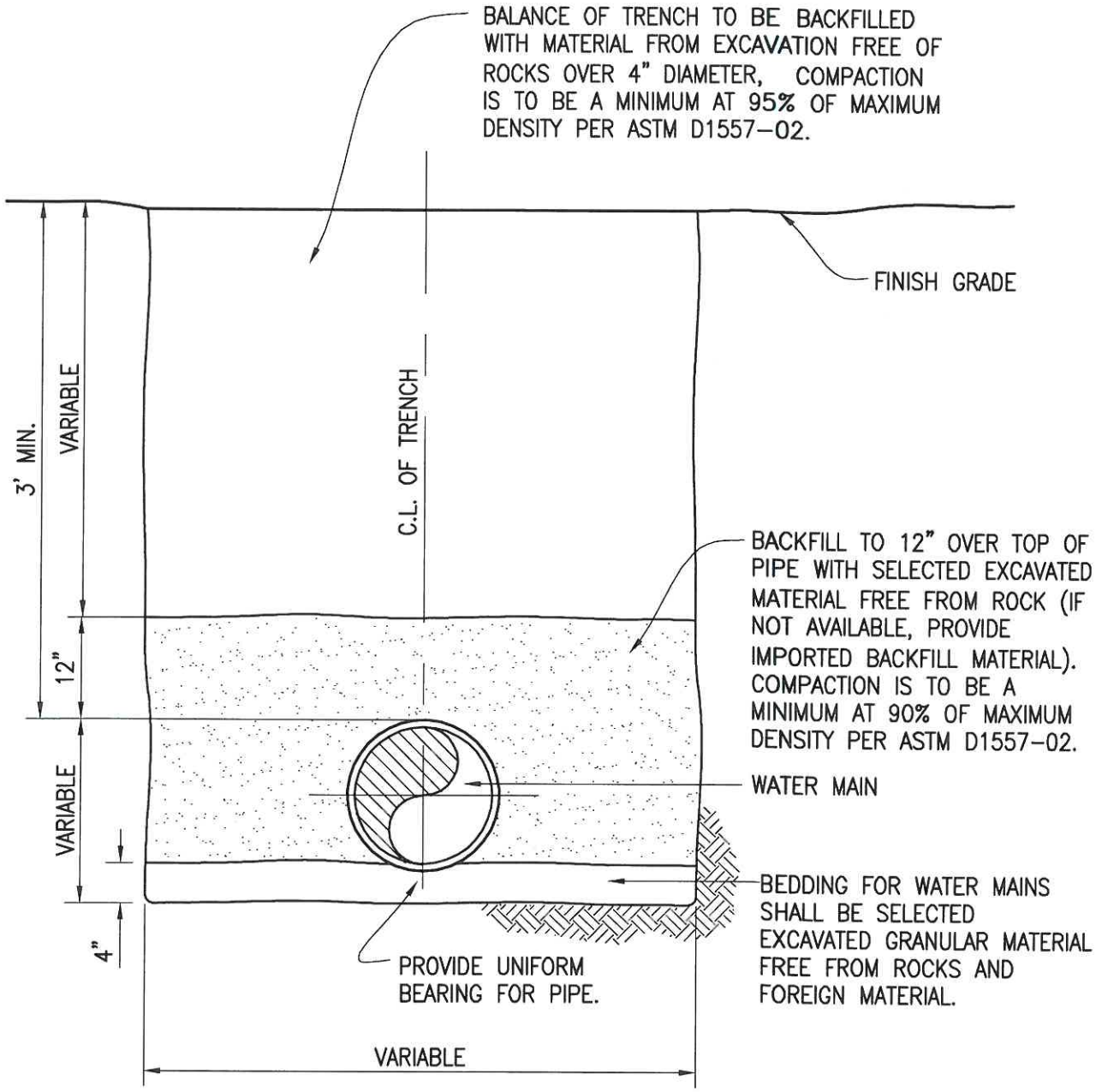
MSWD
Mission Springs Water District

GREASE INTERCEPTOR

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 9-07-10

DRAWING No.
S-18



MIN. WIDTH OF TRENCH FOR 4" TO 12" DIA. PIPE = O.D. PIPE + 12"

NOTES:

1. WHERE BOTTOM OF EXCAVATION IS IN ROCK WHICH CANNOT BE EXCAVATED TO PROVIDE UNIFORM BEARING FOR THE PIPE, OVEREXCAVATE 6" MINIMUM BELOW DESIGN GRADE AND REFILL IN 3" THICK COMPACTED LAYERS WITH SELECTED EXCAVATED MATERIAL OR PROVIDE IMPORTED BACKFILL MATERIAL PER SPECIFICATIONS

2. PIPE COVER SHALL BE 3' MINIMUM FOR 8" DIA.
   FOR 12" DIA. WATER MAINS AND LARGER, MINIMUM COVER SHALL BE 4'.

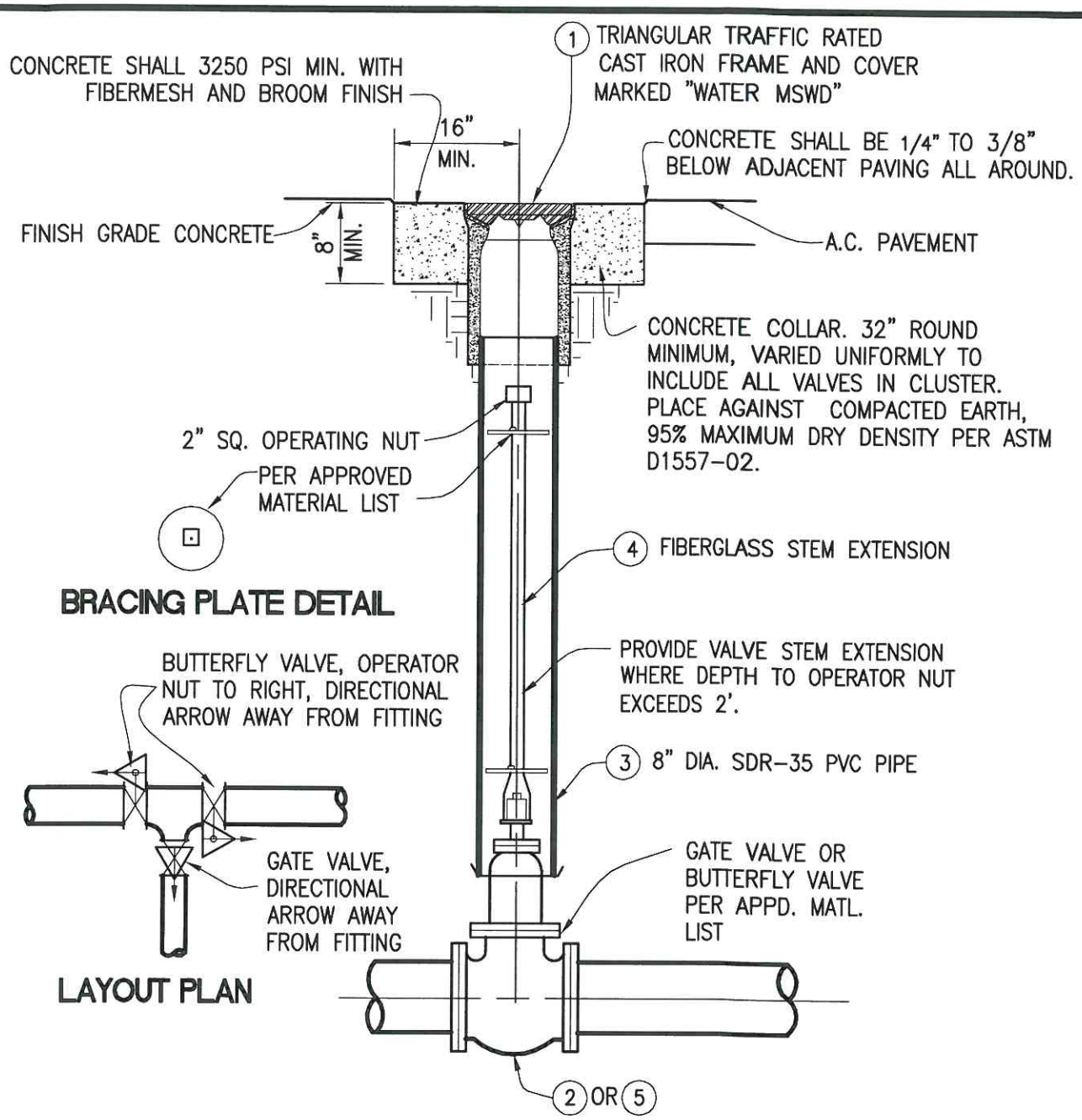
MSWD
Mission Springs Water District

TYPICAL WATER TRENCH DETAIL

Approved:
Arden Wallum
General Manager

Drawn: Hietec Inc. Date: 6/24/11

DRAWING No.
W-01



ITEM	No. Req'D.	DESCRIPTION	Matl. List#
1	1	TRIANGULAR TRAFFIC FRAME AND COVER MARKED "MSWD WATER"	G-04
2	1*	FLANGED GATE VALVE	B-01
3	VARIABLE	8" DIA. x REQUIRED LENGTH SDR-35 PVC	N-05
4	If Reqd.	FIBERGLASS VALVE STEM EXTENSION	N-07
5	1*	FLANGED BUTTERFLY VALVE	B-02

* USE GATE VALVE FOR 12" AND SMALLER PIPES OR BUTTERFLY VALVE FOR PIPES LARGER THAN 12".

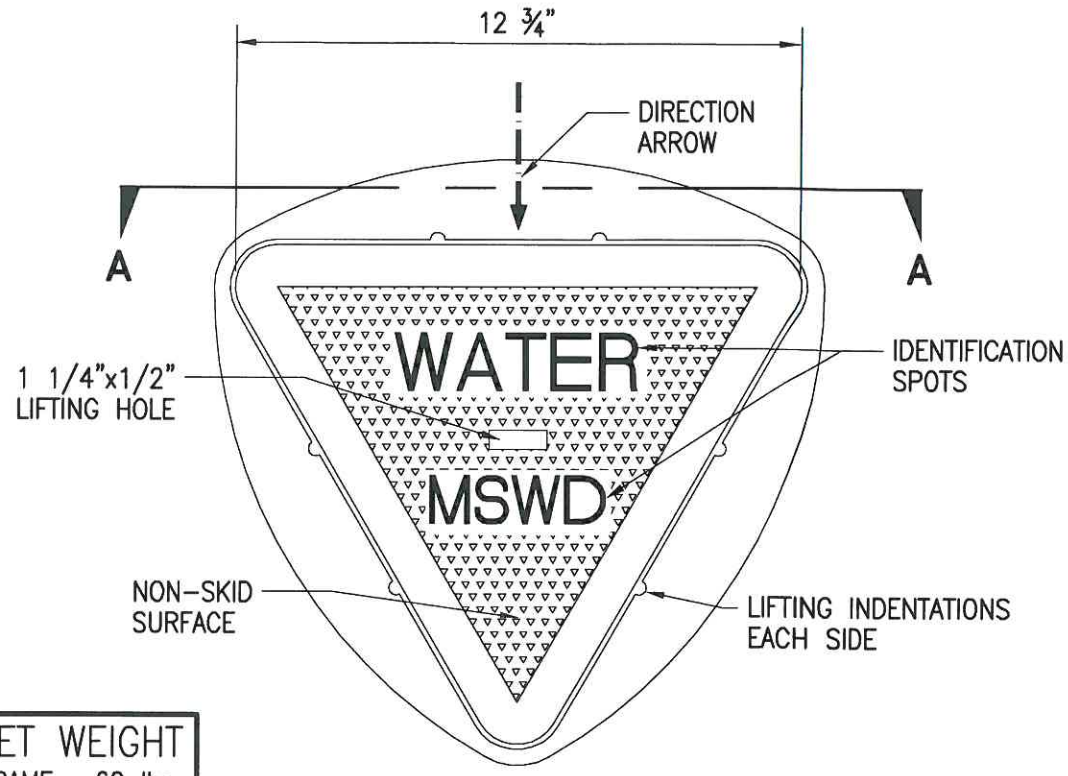
MSWD
Mission Springs Water District

VALVE INSTALLATION

Approved:
Arden Wallum
General Manager

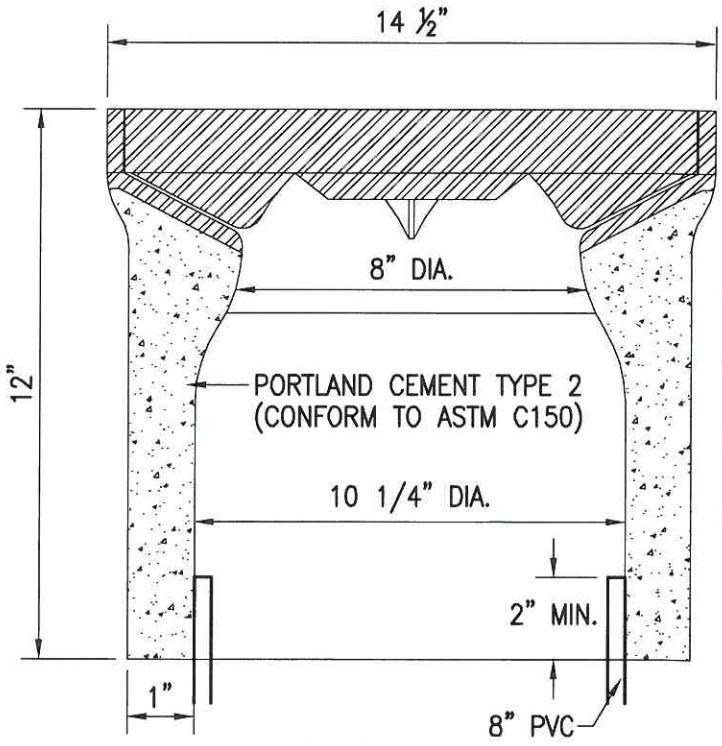
Drawn: Hietec Inc. Date: 4/27/12

DRAWING No.
W-02



SET WEIGHT	
FRAME	60 lbs.
LID	15 lbs.
TOTAL	75 lbs.

PLAN VIEW



SECTION A-A

NOTES:

1. ALL METALLIC MATERIALS SHALL BE CAST IRON OR DUCTILE IRON.
2. FRAME AND LID SHALL HAVE CAST SEAT AND SIDE TO ASSURE CLOSE FIT.
3. CASTING SHALL BE DIPPED IN BLACK BITUMINOUS PAINT.
4. FOR INSTALLATION, SEE STANDARD DRAWING W-02.
5. FRAME AND LID SHALL EXCEED H-20 WHEEL LOADING.
6. SEE APPROVED MATERIALS LIST G-04.

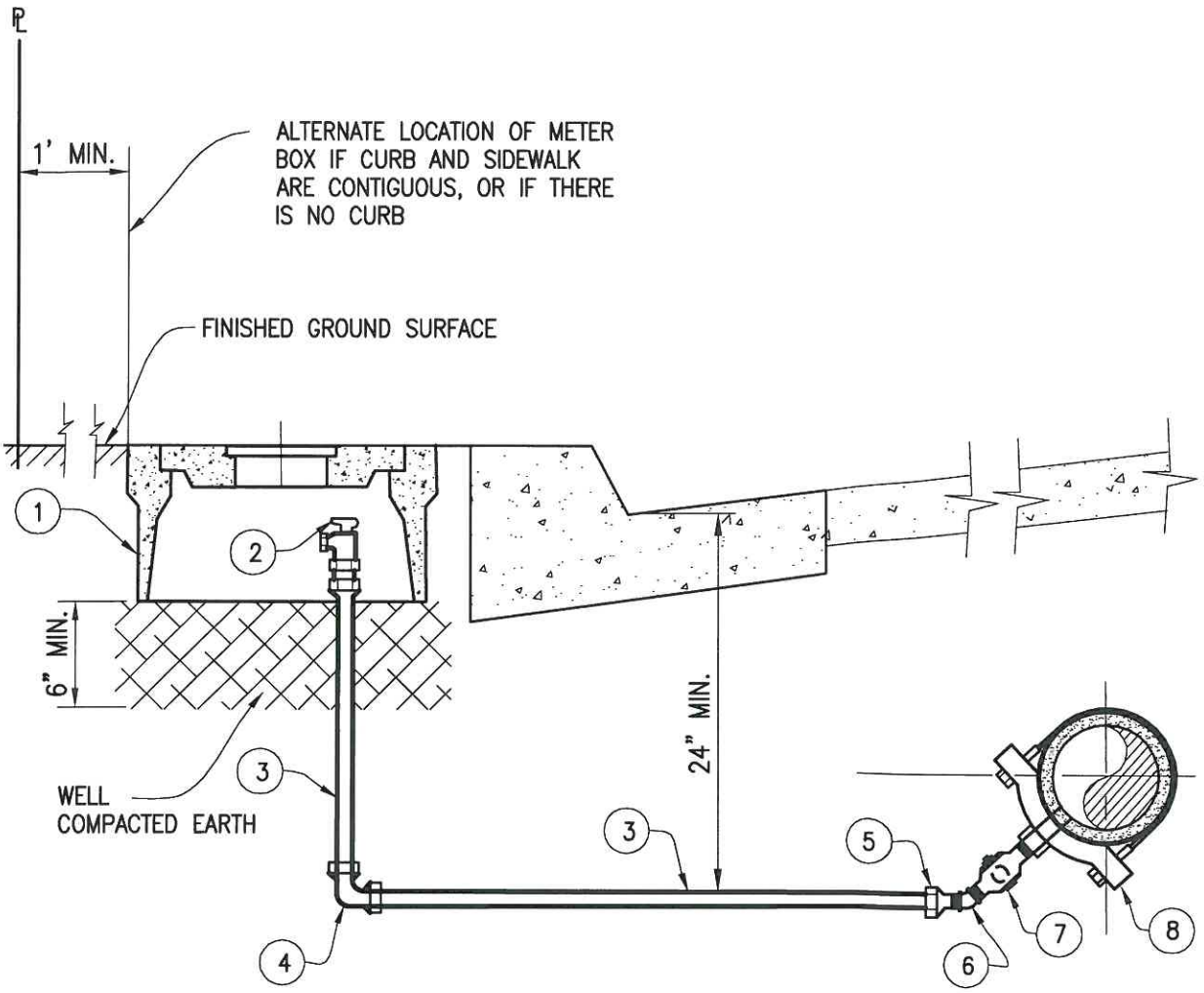
MSWD
Mission Springs Water District

TRIANGULAR WATER VALVE CAP AND FRAME

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 6/24/11

DRAWING No.
W-02A



ITEM	No. Req'D.	DESCRIPTION	Matl. List#
(1)	1	CONCRETE METER BOX WITH CONCRETE COVER & CONCRETE READING LID	G-02
(2)	1	2" BALL ANGLE METER STOP	C-06
(3)	VARIABLE	2" x REQUIRED LENGTH TYPE "K" SOFT TEMPER COPPER	A-04
(4)	1	2" CTS COMPRESSION 90° ELBOW	M-06
(5)	1	2" STRAIGHT COUPLING-CTS O.D. x M.I.P.	M-02
(6)	1	2" BRASS FIPT 45° ELBOW	E-04
(7)	1	2" BALL CORP STOP, I.P.T. INLET AND OUTLET	C-02
(8)	1	2" x MAIN SIZE DOUBLE STRAP BRONZE SERVICE SADDLE	L-01

NOTE:
PIPE THREADS SHALL BE CLEAN AND SHARP AND SEALED WITH AN APPROVED JOINT COMPOUND.

MSWD
Mission Springs Water District

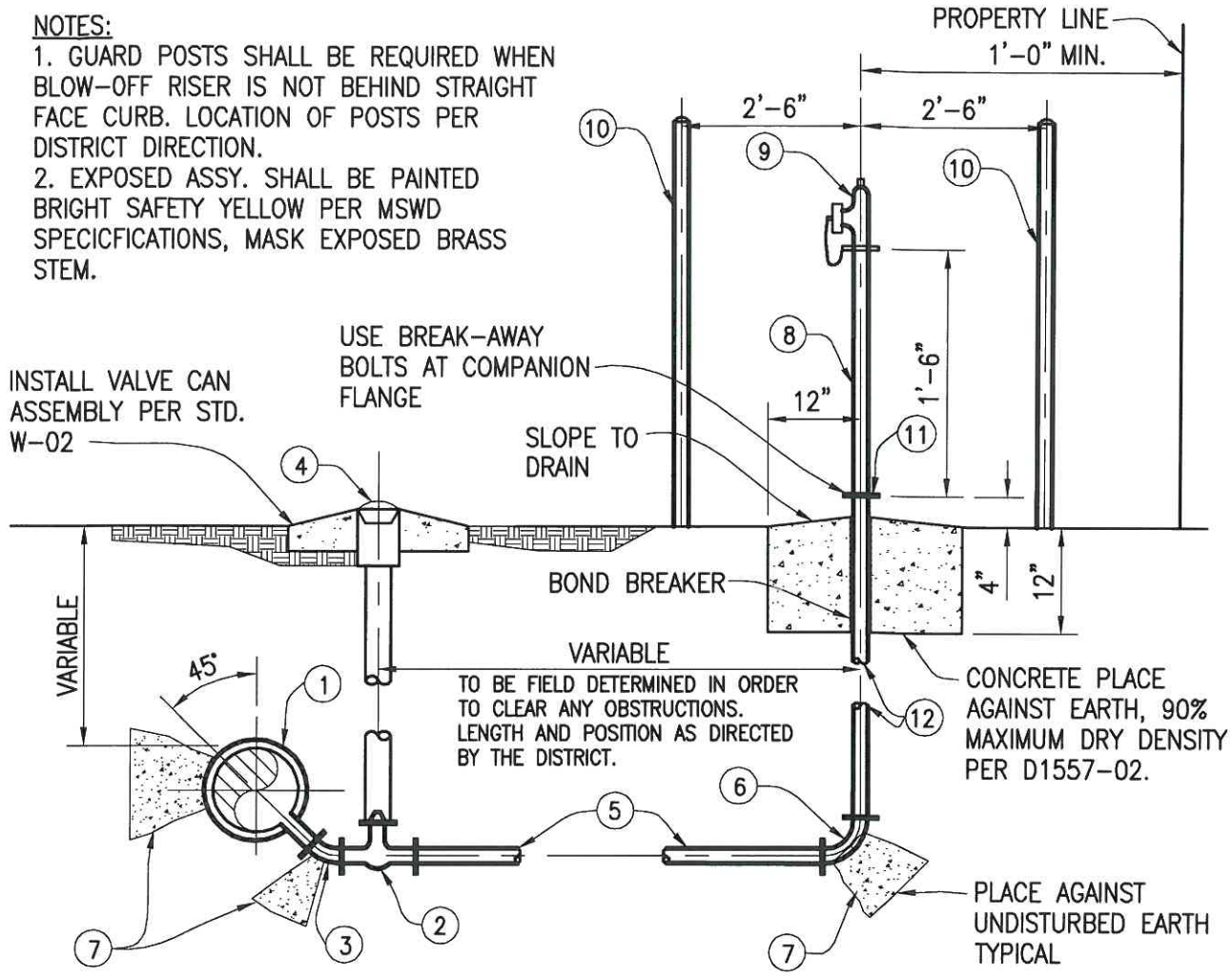
2" DIAMETER BLOW-OFF ASSEMBLY INSTALLATION

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 6/24/11

DRAWING No.
W-03

NOTES:
1. GUARD POSTS SHALL BE REQUIRED WHEN BLOW-OFF RISER IS NOT BEHIND STRAIGHT FACE CURB. LOCATION OF POSTS PER DISTRICT DIRECTION.
2. EXPOSED ASSY. SHALL BE PAINTED BRIGHT SAFETY YELLOW PER MSWD SPECICFICATIONS, MASK EXPOSED BRASS STEM.



ITEM	No. Req'D.	DESCRIPTION	Matl. List#
(1)	1	MAIN SIZE x 4" FLANGED D.I. REDUCING TEE	E-03
(2)	1	4" DIA. FLANGED GATE VALVE	B-01
(3)	1	4" DIA. FLANGED D.I. 45° ELBOW	E-03
(4)	1	STANDARD VALVE BOX ASSEMBLY PER DWG. W-02	N/A
(5)	VARIES	4" DIA. D.I. PIPE FLANGED OR RESTRAINED JOINTS.	A-03
(6)	1	4" DIA. D.I. 90° ELBOW.	E-03
(7)	2	CONCRETE THRUST BLOCK PER STD. W-08, W-08A, & W-08B	N/A
(8)	1	4" DIA. x 1'-6" LONG BLK STD PIPE, NPT	A-07
(9)	1	BRONZE 4"x2 1/2" ANGLE FIRE PLUG VALVE	H-03
(10)	2	GUARD POST INSTALLATION PER STD. G-06	N/A
(11)	1	4" NPT COMPANION FLANGE	D-03
(12)	VARIES	4" FLANGED DUCTILE IRON SPOOL	E-03

MSWD
Mission Springs Water District

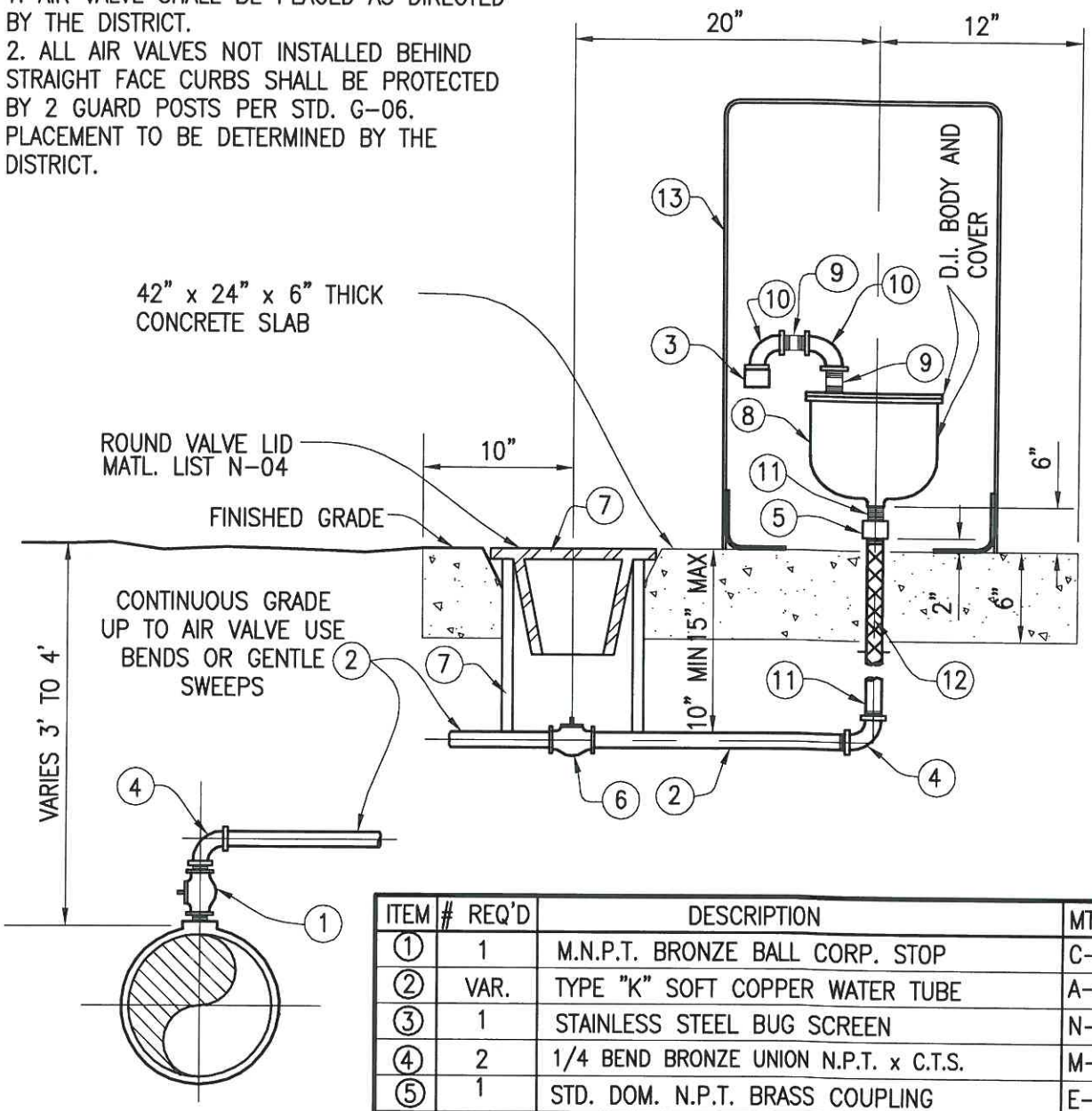
4" DIAMETER BLOW-OFF INSTALLATION

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 5/7/12

DRAWING No.
W-04

NOTE:
1. AIR VALVE SHALL BE PLACED AS DIRECTED BY THE DISTRICT.
2. ALL AIR VALVES NOT INSTALLED BEHIND STRAIGHT FACE CURBS SHALL BE PROTECTED BY 2 GUARD POSTS PER STD. G-06. PLACEMENT TO BE DETERMINED BY THE DISTRICT.



ITEM	# REQ'D	DESCRIPTION	MTL. #
①	1	M.N.P.T. BRONZE BALL CORP. STOP	C-01
②	VAR.	TYPE "K" SOFT COPPER WATER TUBE	A-04
③	1	STAINLESS STEEL BUG SCREEN	N-15
④	2	1/4 BEND BRONZE UNION N.P.T. x C.T.S.	M-07
⑤	1	STD. DOM. N.P.T. BRASS COUPLING	E-04
⑥	1	COMP. BRONZE BALL CURB VALVE W/TEE HEAD	C-03
⑦	1	8" CIRC. VALVE BOX	N-05
⑧	1	HEAVY DUTY D.I. COMB. AIR RELEASE VALVE	B-03
⑨	2	3" LONG STD. BLK. N.P.T. NIPPLE	A-07
⑩	2	STD. BLK. 90° ELBOW	E-06
⑪	2	STD. DOM. BRASS PIPE NIPPLE N.P.T.	A-05
⑫	1	PIPE WRAP	N-10
⑬	1	AIR VALVE ENCLOSURE	N-14

NOTES:
1. ALL PIPE, FITTINGS, AND VALVES SHALL BE SAME DIA. AS THE AIR VALVE INLET.
2. ALL PIPE THREADS SHALL BE CLEAN AND SHARP AND SEALED WITH AN APPROVED JOINT COMPOUND.

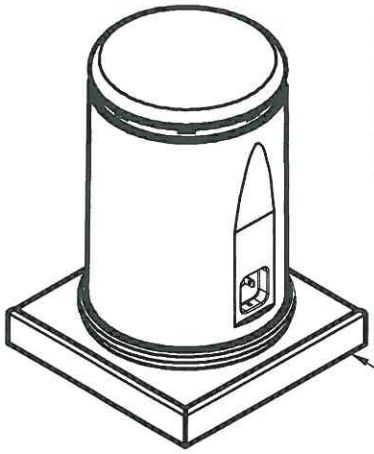
MSWD
Mission Springs Water District

AIR VALVE INSTALLATION
1" OR 2" DIA.

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 4/27/12

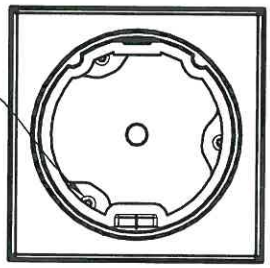
DRAWING No.
W-05



18" DIA. x 30" TALL VALVE ENCLOSURE. ENCLOSURE TO HAVE A BOLT DOWN BASE WITH REMOVABLE COVER. COVER & BASE TO BE MANUFACTURED FROM 3/16" WALL POLYETHYLENE WITH UV STABILIZERS. COVER SHALL LOCK TO BASE WITH AN INTEGRAL AUTO-LATCH AND PADLOCK HASP. MSWD TO PROVIDE PADLOCK.

CONCRETE PAD

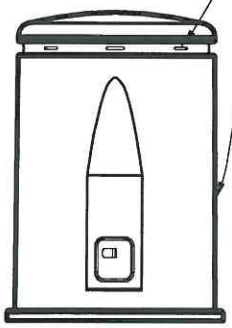
3 – 1/2" CONCRETE ANCHORS WITH STAINLESS FENDER WASHERS



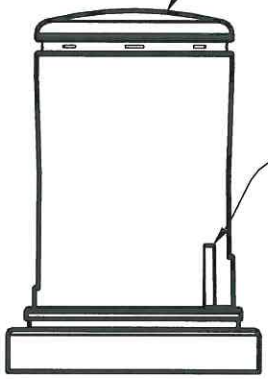
TOP VIEW

8 – 1/4" x 1 3/4" VENT SLOTS

VALVE COVER MTL. LIST N-14

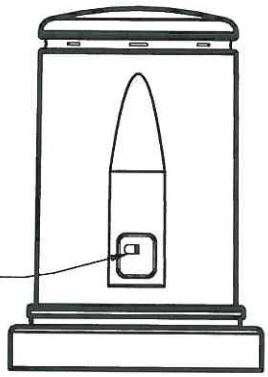


DOMED TOP

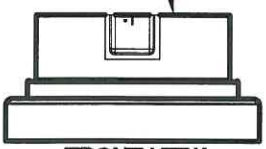


COVER ALIGNMENT TABS

STAINLESS STEEL PADLOCK BACKING PLATE



BOLT-DOWN BASE



FRONT VIEW (OPENED)

SIDE VIEW

FRONT VIEW

NOTE: COLOR SHALL BE TAN PER MSWD SPECIFICATIONS.

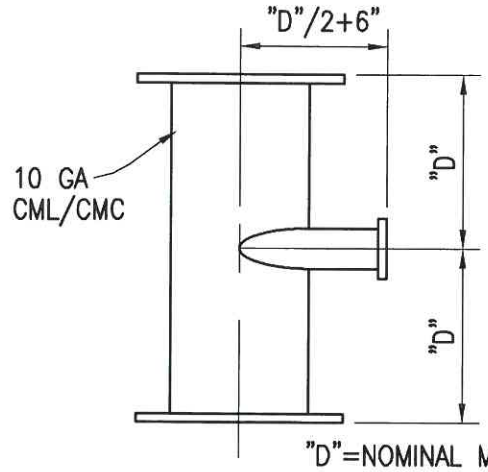
MSWD
Mission Springs Water District

1" OR 2" POLYETHYLENE AIR VALVE ENCLOSURE

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 4/27/12

DRAWING No.
W-05A



"D"=NOMINAL MAIN DIAMETER

FABRICATED
FLANGED CML/CMC
FITTING PLAN

NOTE:
1. AIR VALVE SHALL BE PLACED AS DIRECTED BY THE DISTRICT.
2. ALL AIR VALVES NOT INSTALLED BEHIND STRAIGHT FACE CURBS SHALL BE PROTECTED BY 2 GUARD POSTS PER STD. G-06. PLACEMENT TO BE DETERMINED BY THE DISTRICT.

ITEM	# REQ'D	DESCRIPTION	MTL. #
①	1	MAIN SIZE x AIR VALVE SIZE FABRICATED 10 GA. CML/CMC FLANGED ECCENTRIC REDUCING TEE	E-01
②	1	AIR VALVE SIZE FLANGED GATE VALVE ASSEMBLY PER STD. DWG. W-02	B-02
③	VARIES	AIR VALVE SIZE CLASS 350 DUCTILE IRON PIPE	A-03
④	1	AIR VALVE SIZE DUCTILE IRON 90° BEND, RESTRAINED JOINTS	E-03
⑤	1	AIR VALVE SIZE DUCTILE IRON FLANGED SPOOL	A-03
⑥	1	HEAVY DUTY D.I. COMB. AIR RELEASE VALVE, SIZE PER PLAN	B-03
⑦	2	AIR VALVE SIZE x 4" LONG STD. BLK. N.P.T. NIPPLE	A-07
⑧	2	AIR VALVE SIZE HEAVY DUTY 90° NPT ELBOW	E-06
⑨	1	STAINLESS STEEL BUG SCREEN	N-15

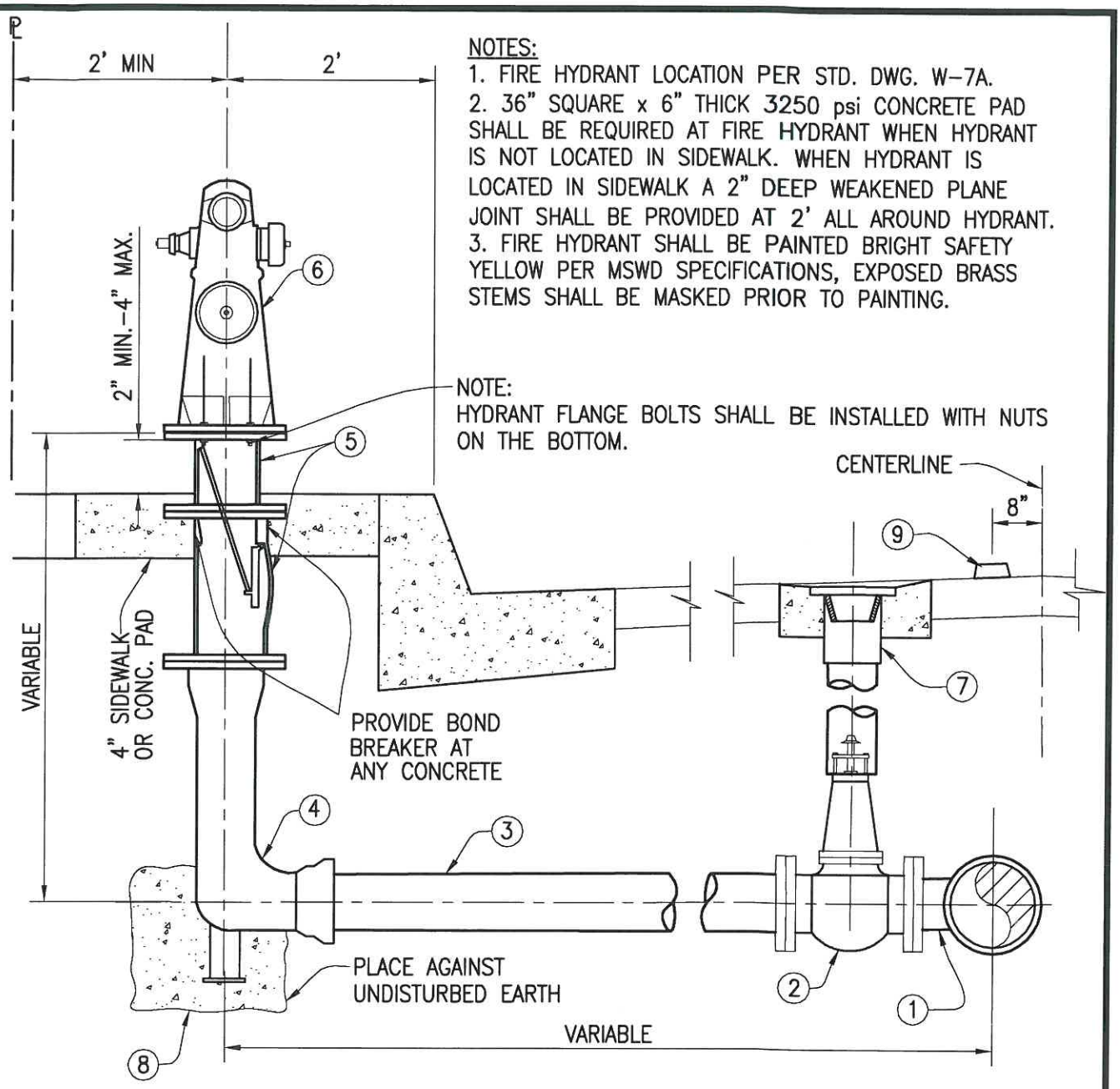
MSWD
Mission Springs Water District

4" OR LARGER AIR VALVE ASSEMBLY

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 5/1/12

DRAWING No.
W-06



NOTES:

1. FIRE HYDRANT LOCATION PER STD. DWG. W-7A.
2. 36" SQUARE x 6" THICK 3250 psi CONCRETE PAD SHALL BE REQUIRED AT FIRE HYDRANT WHEN HYDRANT IS NOT LOCATED IN SIDEWALK. WHEN HYDRANT IS LOCATED IN SIDEWALK A 2" DEEP WEAKENED PLANE JOINT SHALL BE PROVIDED AT 2' ALL AROUND HYDRANT.
3. FIRE HYDRANT SHALL BE PAINTED BRIGHT SAFETY YELLOW PER MSWD SPECIFICATIONS, EXPOSED BRASS STEMS SHALL BE MASKED PRIOR TO PAINTING.

NOTE:
HYDRANT FLANGE BOLTS SHALL BE INSTALLED WITH NUTS ON THE BOTTOM.

ITEM	No.REQUIRED	DESCRIPTION	MTL.#
①	1	MAIN SIZE x 6" FLANGED OUTLET DUCTILE IRON TEE	E-03
②	1	6" GATE VALVE ASSEMBLY PER STD. W-2	B-02
③	VAR. AS REQUIRED	6" DIA. CLASS 350 DUCTILE IRON PIPE WITH RESTRAINED JOINTS	A-03
④	1	6" DUCTILE IRON HYDRANT BURY	I-01
⑤	1	6" DIA. BREAK OFF CHECK VALVE ASSEMBLY	J-02
⑥	1	6" DIAMETER FIRE HYDRANT ASSEMBLY	H-02
⑦	1	STANDARD VALVE BOX INSTALLATION PER STD. W-2 & W-2A	G-04
⑧	1	CONCRETE THRUST & SUPPORT BLOCK PER DETAIL DRAWING W-8 AND W-8A	N-02
⑨	1	BLUE RETRO-REFLECTIVE PVMT. MARKER PER CALTRANS STD. 6-03.4	

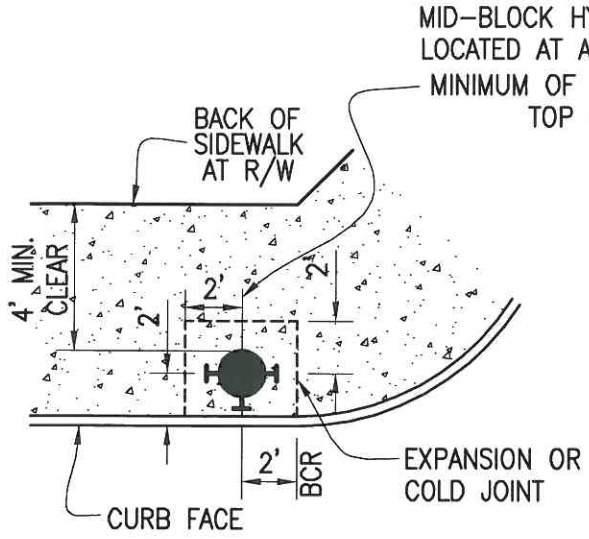
MSWD
Mission Springs Water District

6" DIA. FIRE HYDRANT INSTALLATION

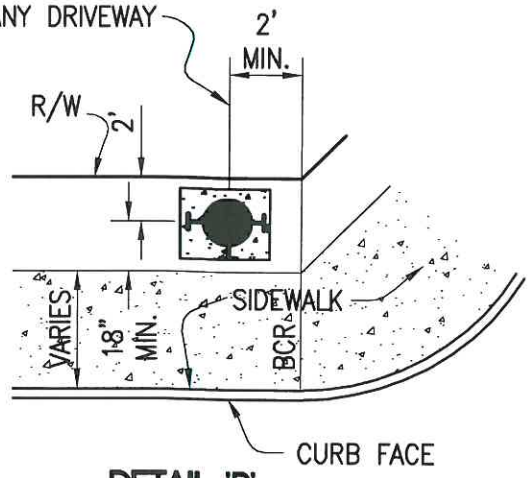
Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 8/29/12

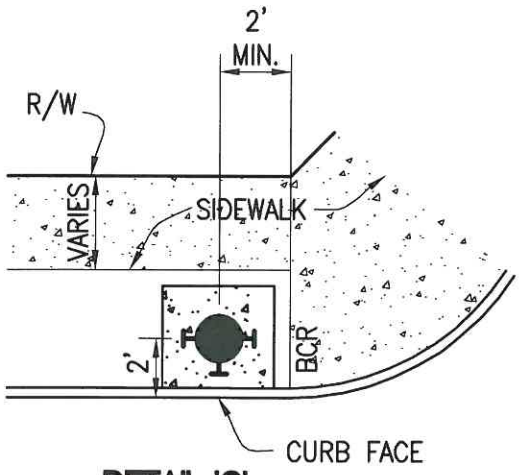
DRAWING No.
W-07



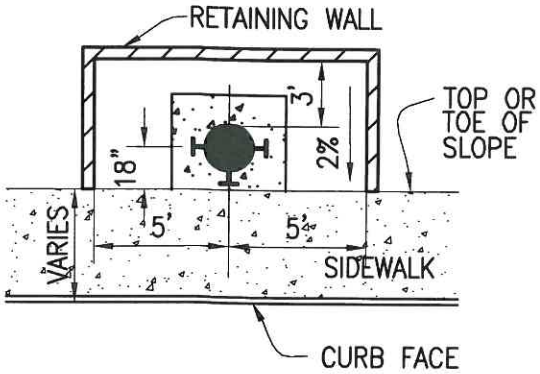
DETAIL 'A'
FULL COMMERCIAL SIDEWALK



DETAIL 'B'
RESIDENTIAL WITH ATTACHED SIDEWALK OR NO SIDEWALK



DETAIL 'C'
PARKWAY WITH DETACHED SIDEWALK



DETAIL 'D'
RETAINING WALL FOR SLOPE ADJACENT TO SIDEWALK

NOTES:

1. ALL FIRE HYDRANTS SHALL BE LOCATED WITHIN PUBLIC RIGHT-OF-WAY OR DEDICATED PUBLIC UTILITY EASEMENTS.
2. ALL FIRE HYDRANT LOCATIONS SHALL BE SUBJECT TO FIRE DEPARTMENT AND DISTRICT APPROVAL.
3. ALL HYDRANTS SHALL HAVE A 36" SQUARE 3250 PSI SQUARE CONCRETE PAD PER STD. DWG. W-07.
4. BLUE REFLECTIVE MARKER SHALL BE PLACED 8" FROM CENTERLINE OF STREET OR DRIVE LANE AT EVERY FIRE HYDRANT PER MSWD AND FIRE DEPARTMENT SPECIFICATIONS.

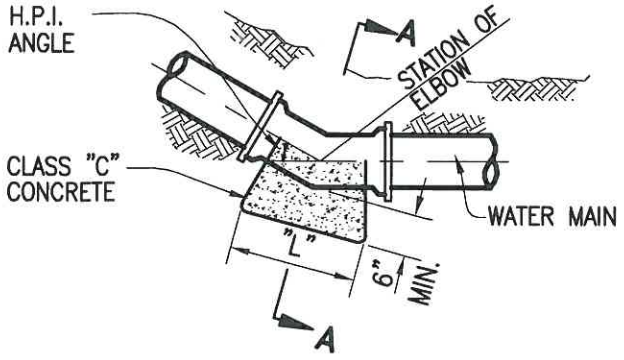
MSWD
Mission Springs Water District

FIRE HYDRANT LOCATION

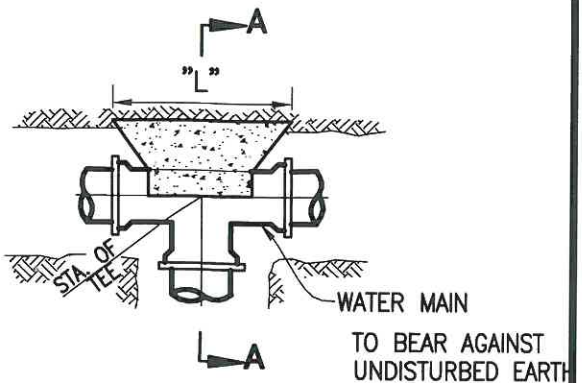
Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 5/7/12

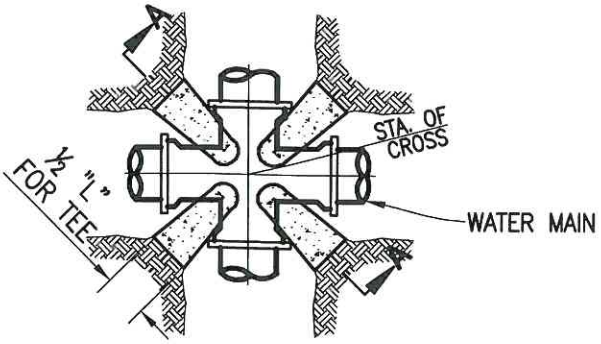
DRAWING No.
W-07A



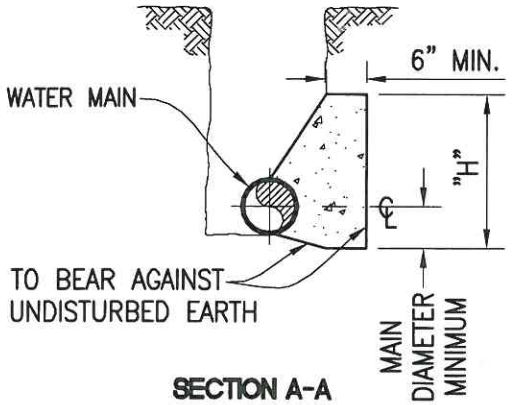
PLAN VIEW BEND



PLAN VIEW TEE

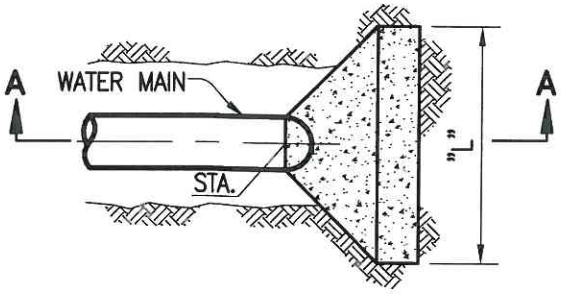


PLAN VIEW CROSS



SECTION A-A

HORIZONTAL THRUST BLOCK



PLAN VIEW END

NOTES:

1. CONCRETE SHALL BE CLASS C 3250 PSI
2. TOTAL BEARING AREA, "A", SHALL BE BASED ON SOILS CONDITIONS AND MAIN SIZE FROM STD. DWG. W-8B.
3. "H" DIMENSION SHALL NORMALLY BE BETWEEN 3 AND 4 MAIN DIAMETERS.
4. "L" DIMENSION SHALL BE AS REQUIRED TO SATISFY THE EQUATION "L"x"H"="A".

SAMPLE CALCULATION

FOR 8" TEE OR END WITH SOILS PRESSURE OF 1500 LBS/SF
FROM CHART REQUIRED "A"=12 S.F.
USE "H"=3 DIA.=2' THEN "L"="A"(12)/"H"(2')=6'.
OR USE "H"= 4 DIA.=2.67' THEN "L"="A"(12)/"H"(2.67)=4.5'
"L" AND "H" MAY BE VARIED TO MEET FIELD CONDITIONS SO LONG AS "L"x"H"="A"

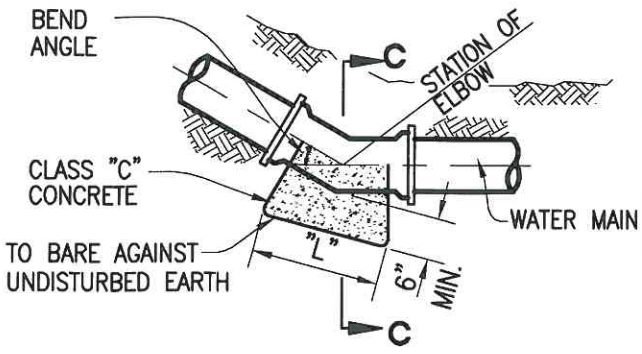
MSWD
Mission Springs Water District

HORIZONTAL
THRUST BLOCKS

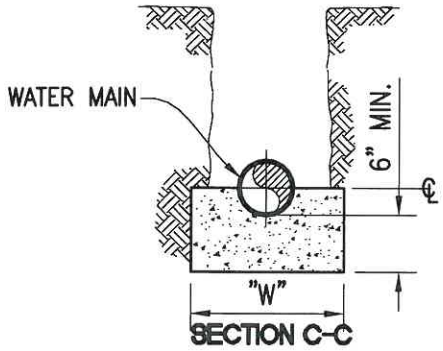
Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 4/27/12

DRAWING No.
W-08



SECTIONAL ELEVATION



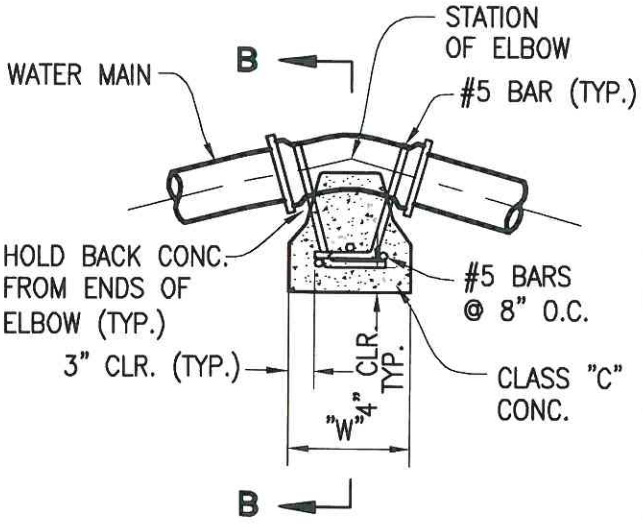
VERTICAL BEARER BLOCK

NOTES:

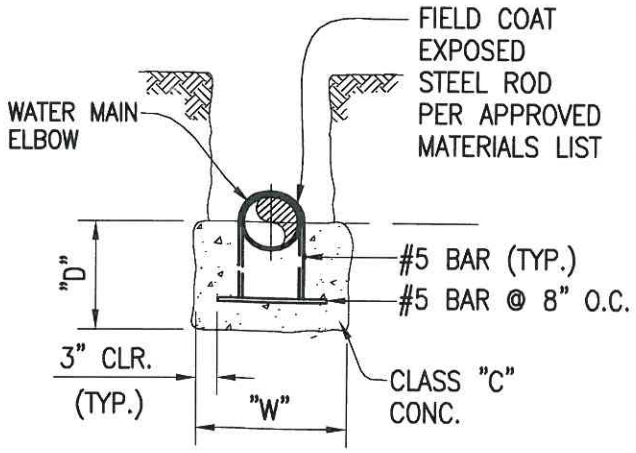
1. CONCRETE SHALL BE CLASS C 3250 PSI
2. TOTAL BEARING AREA, "A", SHALL BE BASED ON SOILS CONDITIONS AND MAIN SIZE FROM STD. DWG. W-8B.
3. "H" DIMENSION SHALL NORMALLY BE BETWEEN 3 AND 4 MAIN DIAMETERS.
4. "L" DIMENSION SHALL BE AS REQUIRED TO SATISFY THE EQUATION "L"x"H"="A".

SAMPLE CALCULATION

FOR 8" 45° BEND WITH SOILS PRESSURE OF 1500 LBS/SF
FROM CHART REQUIRED "A"=12x0.8=9.6 S.F.
USE "W"=3' THEN"L"="A"(9.6)/"W"(3')=3.2'.
"L" AND "W" MAY BE VARIED TO MEET FIELD CONDITIONS SO LONG AS "L"x"H"="A"



SECTIONAL ELEVATION



SECTION B-B

VERTICAL ANCHOR BLOCK

PIPE DIA.	BEND ANGLE	"W"	"D"
6"	11 1/4°	2'-0"	1'-0"
6"	22 1/2°	2'-0"	1'-3"
6"	45°	2'-0"	2'-6"
8"	11 1/4°	2'-8"	1'-2"
8"	22 1/2°	2'-8"	1'-4"
8"	45°	2'-8"	2'-8"
12"	11 1/4°	4'-0"	1'-2"
12"	22 1/2°	4'-0"	1'-4"
12"	45°	4'-0"	2'-8"
18"	11 1/4°	6'-0"	1'-2"
18"	22 1/2°	6'-0"	1'-4"
18"	45°	6'-0"	2'-8"

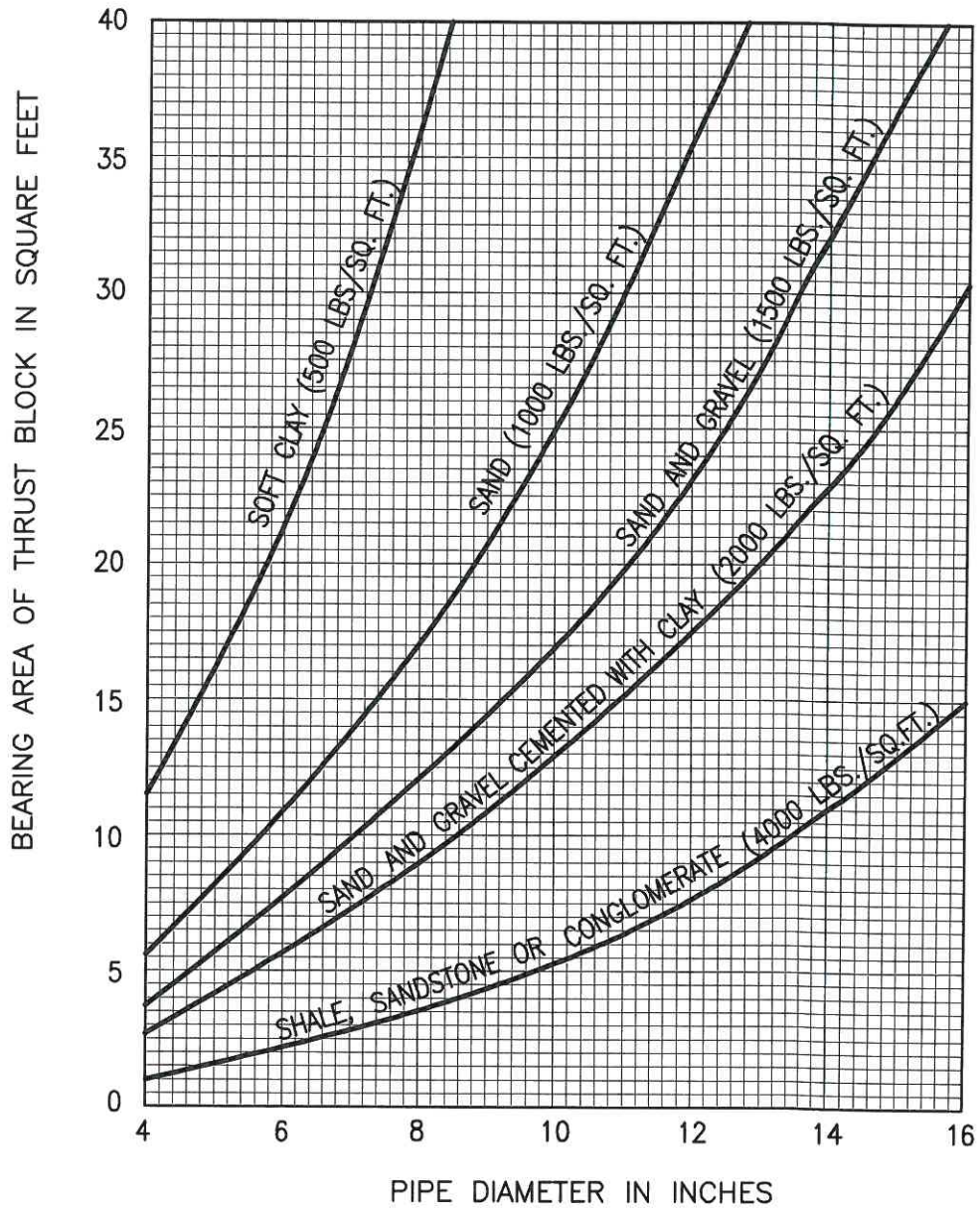
MSWD
Mission Springs Water District

VERTICAL
THRUST BLOCKS

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 4/27/12

DRAWING No.
W-08A



NOTES:

1. BASED ON A 225 PSI TEST PRESSURE AND BEARING VALUES OF DRY SOILS.
2. VALUES FROM CURVES ARE FOR TEES AND DEAD ENDS I.E. STRAIGHT LINE THRUST.
   FOR 90° BENDS: 1.4 x VALUE FROM CURVE
   FOR 45° BENDS: 0.8 x VALUE FROM CURVE
   FOR 22 ½° BENDS: 0.4 x VALUE FROM CURVE
3. FOR CONDITIONS NOT COVERED BY CURVES, THRUST DEVICES MUST BE APPROVED BY THE ENGINEER.
4. FOR LOCATION OF THRUST BLOCKS, SEE STANDARD DRAWING W-8 OR W-08A.
5. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED OF CONCRETE PER APPROVED MATERIALS LIST.

MSWD
Mission Springs Water District

THRUST BLOCK BEARING AREAS

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/22/08

DRAWING No.
W-08B

REQUIRED LENGTH OF RESTRAINED JOINTS

PIPE SIZE	END OR VALVE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4"	18'	11'	5'	2'	1'
6"	27'	16'	7'	3'	2'
8"	35'	21'	9'	4'	2'
10"	42'	25'	10'	5'	3'
12"	48'	29'	12'	6'	3'
14"	45'	34'	14'	7'	3'
16"	63'	38'	16'	8'	4'
18"	70'	42'	17'	8'	4'
20"	77'	46'	19'	9'	5'
24"	90'	54'	22'	11'	5'
30"	109'	65'	27'	13'	6'
36"	125'	75'	31'	15'	7'

NOTES:

1. THE ABOVE REQUIREMENTS ARE FOR USE IN ADDITION TO REQUIRED THRUST BLOCKS.
2. RESTRAINED JOINTS WILL BE REQUIRED AT ALL FITTINGS, VALVES, AND ANY ADDITIONAL JOINT OCCURRING TO THE FIRST JOINT BEYOND THE LENGTH SPECIFIED IN THE TABLE.
3. THE PIPE LENGTHS SHOWN ARE BASED ON A 100 PSI WORKING PRESSURE. FOR HIGHER PRESSURES, INCREASE THE LENGTH BY THE HIGHER PRESSURE RATIO TO 100.

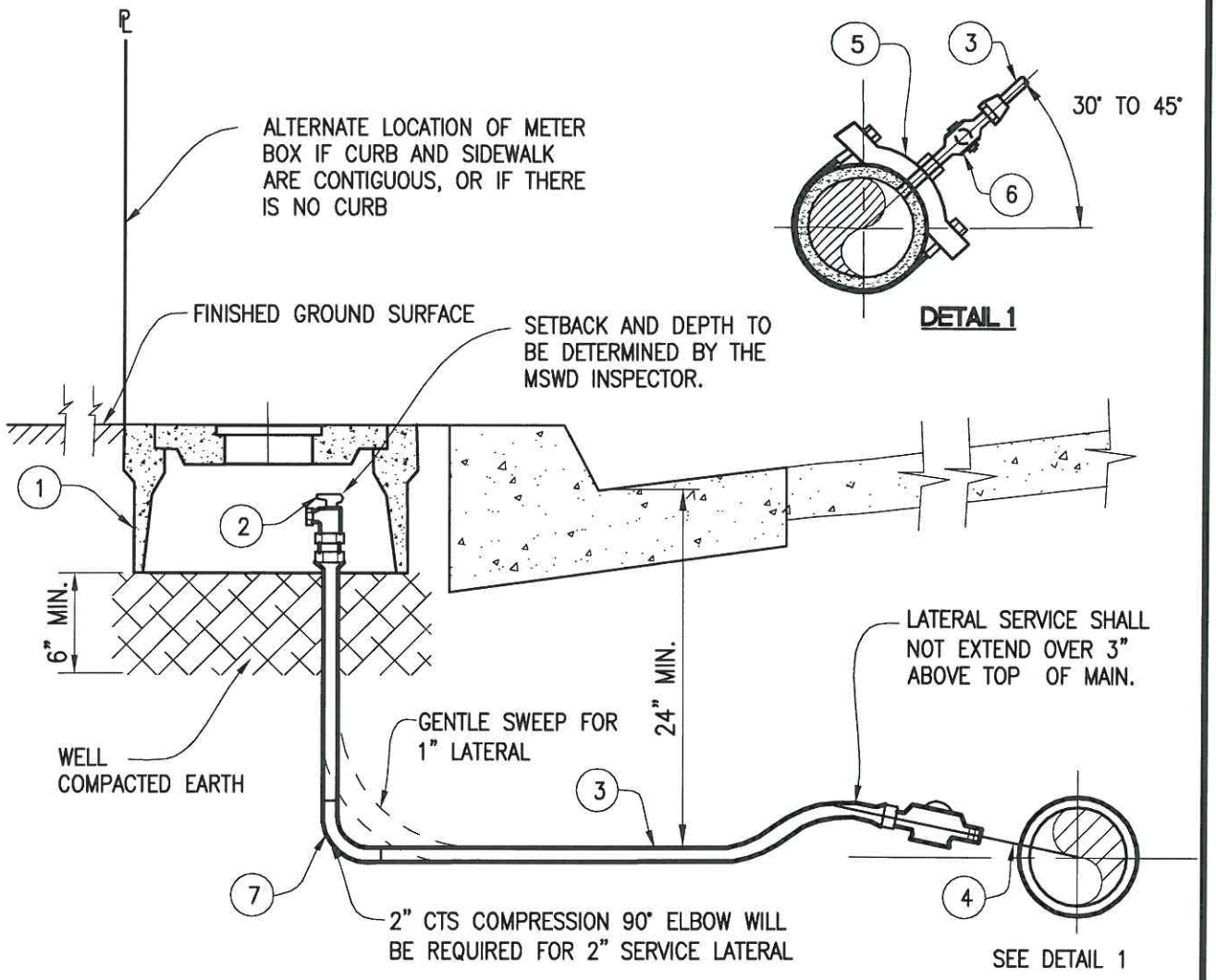
MSWD
Mission Springs Water District

RESTRAINED JOINT REQUIREMENTS

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 4/27/12

DRAWING No.
W-08C



ITEM	No. Req'D.	DESCRIPTION	Mtl. #
(1)	1	CONCRETE METER BOX WITH COVER & CONCRETE READING LID	G-01 G-02
(2)	1	1" or 2" BALL ANGLE METER STOP	C-05 C-06
(3)	VARIABLE	1" or 2" x REQUIRED LENGTH TYPE "K" SOFT TEMPER COPPER	A-04
(4)	1	1"or 2" SERVICE CONNECTION. SEE DETAIL 1	N/A
(5)	1	BRONZE SERVICE SADDLE	L-01
(6)	1	1" OR 2" BALL CORP STOP, M.N.P.T. INLET x CTS OUTLET	C-01 C-02
(7)	1	2" CTS COMPRESSION ELBOW REQUIRED FOR 2" SERVICE	M-01

NOTE:
PIPE THREADS SHALL BE CLEAN AND SHARP AND SEALED WITH AN APPROVED JOINT COMPOUND.

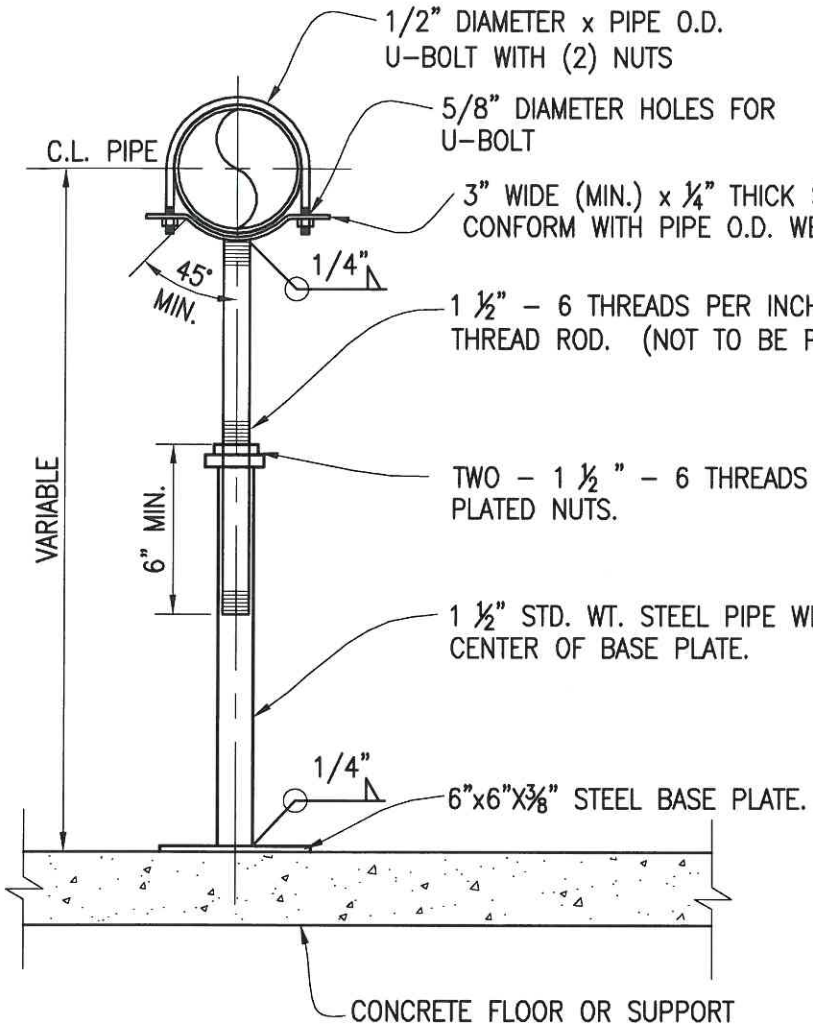
MSWD
Mission Springs Water District

1" AND 2" DIAMETER SERVICE LATERAL INSTALLATION

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 6/24/11

DRAWING No.
W-09



NOTE:

1. 3"x¼" STEEL STRAP SHALL BE FORMED TO HAVE FULL & UNIFORM CONTACT FOR ENTIRE LENGTH.
2. PAINT IN ACCORDANCE WITH SPECIFICATIONS.

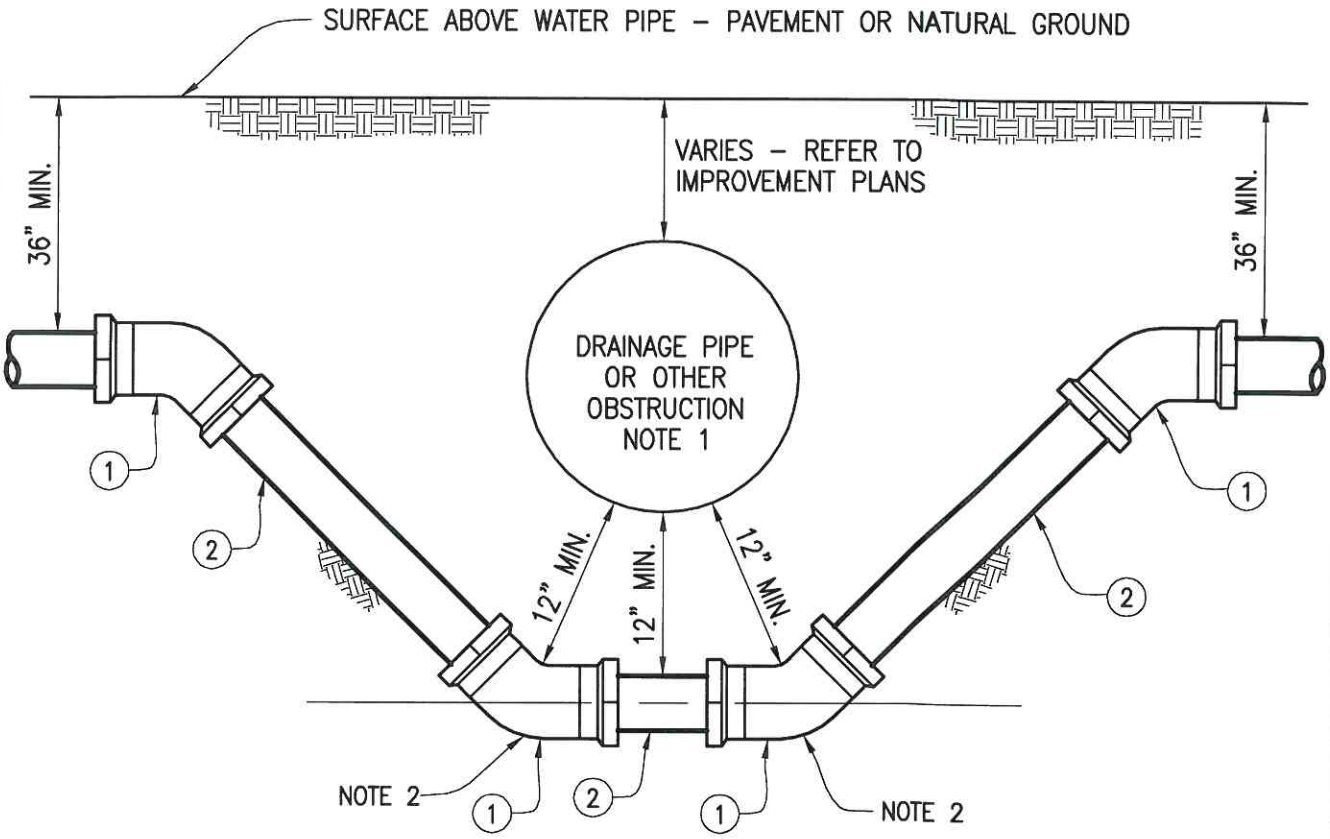
MSWD
Mission Springs Water District

PIPE SUPPORT DETAIL

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/14/08

DRAWING No.
W-10



ITEM	No. Req'D.	SIZE & DESCRIPTION	MTL. LIST NO.
(1)	4	45° ELBOW – PIPE SIZE PER WATER PLAN	E–03
(2)	3	WATER PIPE – SIZE PER PLAN (LENGTH AS REQ'D)	A–03

NOTE:

1. DIMENSIONS AND DESCRIPTION AS SHOWN ON IMPROVEMENT PLANS AND/OR WATER PLANS. ALL FITTINGS SHOULD BE RESTRAINED JOINT M.J./PUSH–ON OR FLANGED.

2. PROVIDE THRUST BLOCKS PER STANDARD DWG NO. W–8 AND W–8A.

3. SPECIAL CROSSING AS SHOWN SHALL BE PROVIDED WHEREVER NOTED ON WATER PLANS OR WHERE CROSSING OVER OBSTRUCTION SHALL RESULT IN LESS THAN 36" MINIMUM COVER OVER WATER MAIN.

4. 2" BLOW–OFF SHALL BE PROVIDED PER STD. DWG. W–03 AT ALL UNDER–CROSSINGS. AIR VALVE WILL BE REQUIRED IF UNDER–CROSSING CAUSES A HIGH POINT IN MAIN.

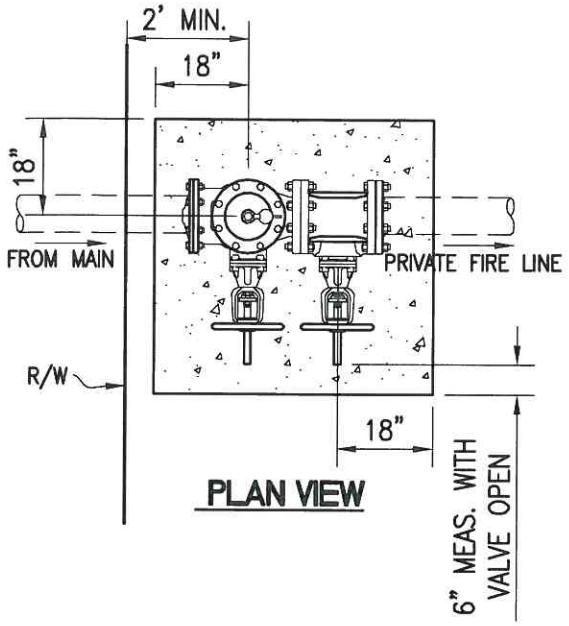
MSWD
Mission Springs Water District

OBSTRUCTION UNDER CROSSING

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/14/08

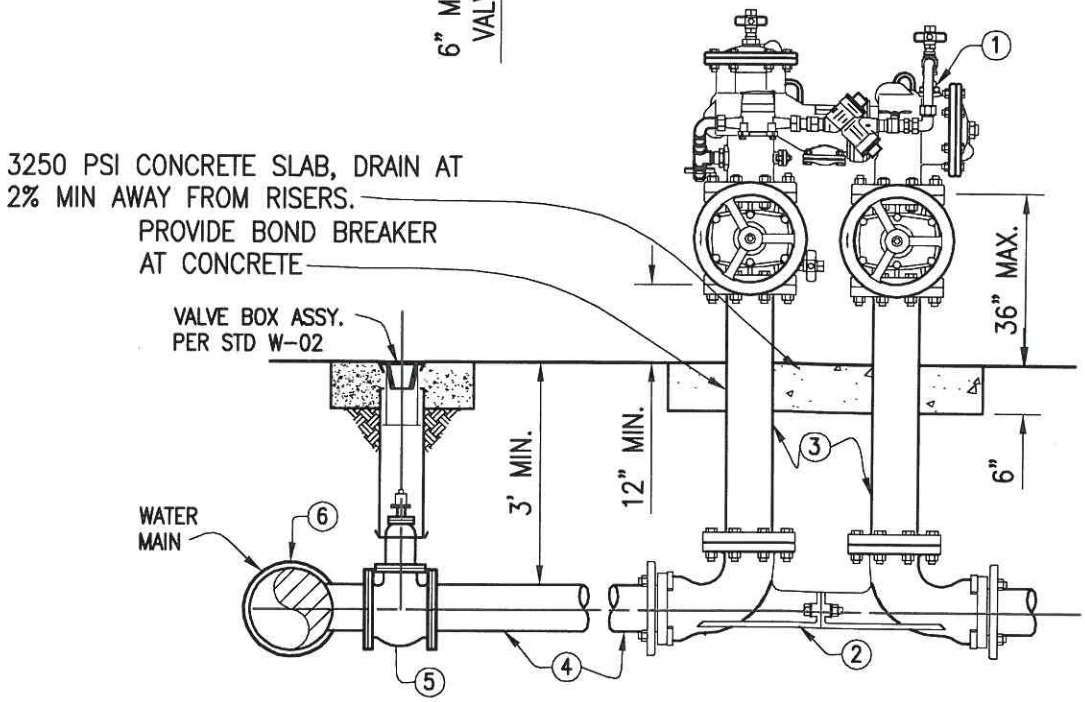
DRAWING No.
W–11



PLAN VIEW

NOTES:

1. DETECTOR CHECK ASSEMBLY SHALL BE LOCATED ON PRIVATE PROPERTY OUTSIDE OF THE PUBLIC RIGHT-OF-WAY.
2. AREA WITHIN 2' OF VALVE ASSEMBLY SHALL BE MAINTAINED CLEAR OF ANY OBSTRUCTIONS TO ALLOW FOR INSPECTION AND MAINTENANCE.
3. DETECTOR CHECK ASSEMBLY BELONGS TO THE PRIVATE PROPERTY OWNER BUT WILL BE TESTED AND MAINTAINED BY THE DISTRICT AT THE OWNER'S EXPENSE.
4. MASK ALL COPPER, BRASS, NAME PLATES, AND METER ASSEMBLY AND PAINT DUCTILE IRON TAN AND VALVE HANDLES BRIGHT RED PER MSWD SPECIFICATIONS.



DETAIL SECTION

ITEM	No. Req'D.	DESCRIPTION	Matl. List#
①	1	4", 6", 8", OR 10" DOUBLE CHECK DETECTOR VALVE ASSEMBLY INCLUDING O.S.&Y. GATE VALVES	K-03
②	1	D.C.D.A. SIZE & MFR VALVE SETTER ASSEMBLY	K-03
③	2	D.C.D.A. SIZE D.I.P. FLANGED SPOOL, LENGTH AS REQUIRED	A-03
④	VARIES	D.C.D.A. SIZE DUCTILE IRON PIPE, LENGTH AS REQUIRED	A-03
⑤	1	D.C.D.A. SIZE GATE VALVE	B-01
⑥	1	MAIN SIZE x D.C.D.A. SIZE TEE	E-03

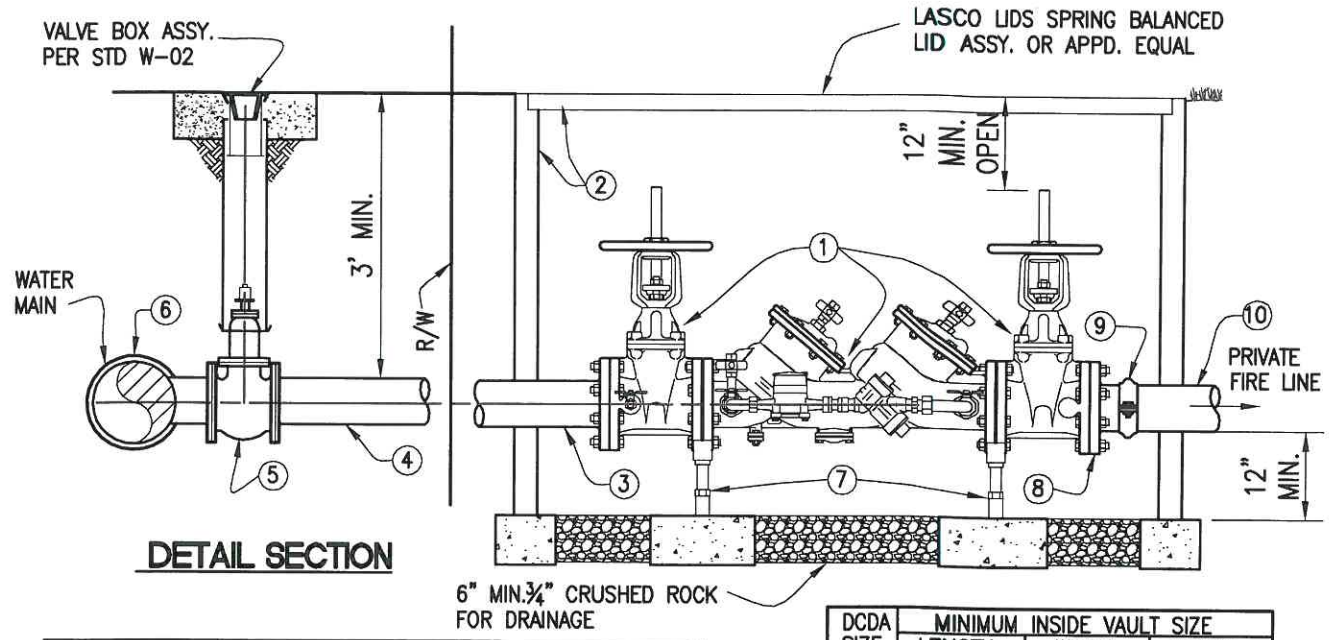
MSWD
Mission Springs Water District

4", 6", 8", OR 10" DOUBLE CHECK DETECTOR VALVE ASSEMBLY FOR ABOVE GRADE INSTALLATIONS

Approved: _____
Arden Wallum
General Manager

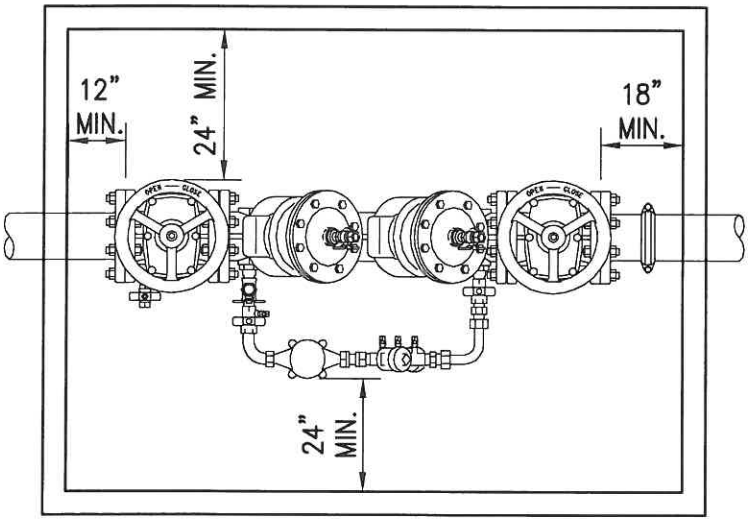
Drawn: Heitec Inc. Date: 5/7/12

DRAWING No.
W-12



DETAIL SECTION

DCDA SIZE	MINIMUM INSIDE VAULT SIZE		
	LENGTH	WIDTH	DEPTH
4"	6'-2"	5'-2"	4'-2"
6"	7'-0"	5'-4"	4'-10"
8"	7'-9"	5'-6"	5'-6"
10"	8'-5"	5'-8"	6'-5"



PLAN VIEW

NOTES:
1. DETECTOR CHECK ASSEMBLY SHALL BE LOCATED ON PRIVATE PROPERTY OUTSIDE OF THE PUBLIC RIGHT-OF-WAY.
2. AREA WITHIN 2' OF VAULT SHALL BE MAINTAINED CLEAR OF ANY OBSTRUCTIONS TO ALLOW FOR INSPECTION AND MAINTENANCE.
3. DETECTOR CHECK ASSEMBLY BELONGS TO THE PRIVATE PROPERTY OWNER BUT WILL BE TESTED AND MAINTAINED BY THE DISTRICT AT THE OWNERS EXPENSE.

ITEM	No. Req'D.	DESCRIPTION	Matl. List#
①	1	4", 6", 8", OR 10" DOUBLE DETECTOR CHECK VALVE ASSEMBLY INCLUDING O.S.&Y. GATE VALVES	K-03
②	1	PRECAST CONCRETE VAULT AND LID, SIZED PER TABLE	G-05
③	1	D.C.D.A. SIZE D.I.P. FLANGED SPOOL, LENGTH AS REQUIRED	A-03
④	VARIES	D.C.D.A. SIZE IRON PIPE, LENGTH AS REQUIRED	A-03
⑤	1	D.C.D.A. SIZE GATE VALVE	B-01
⑥	1	MAIN SIZE x D.C.D.A. SIZE TEE	E-03
⑦	2	PIPE SUPPORTS PER STD. DWG. W-10, (USE FLANGE O. D.)	A-03
⑧	1	D.C.D.A. SIZE DUCTILE IRON FLANGE x VICTAULIC TYPE GROOVE ADAPTER	A-03
⑨	1	D.C.D.A. SIZE VICTAULIC TYPE COUPLING	N-19
⑩	1	D.C.D.A. SIZE GROOVED DUCTILE IRON SPOOL, 5' MIN. LENGTH	E-03

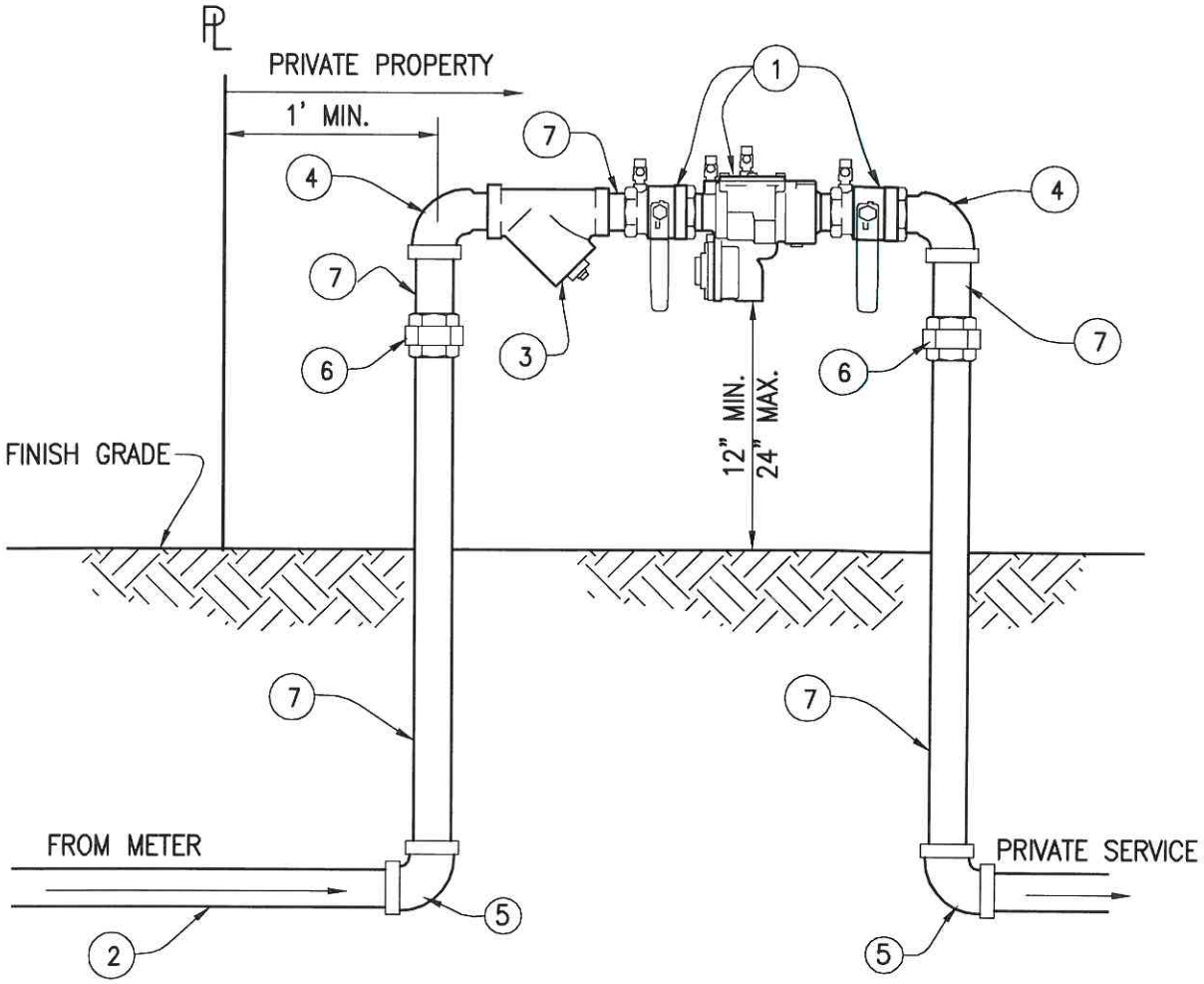
MSWD
Mission Springs Water District

DOUBLE CHECK DETECTOR ASSEMBLY UNDERGROUND VAULT INSTALLATION

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 01/14/08

DRAWING No.
W-13



NOTE: ALL PIPE AND FITTINGS TO BE THE SAME SIZE AS THE BACKFLOW PREVENTER ASSEMBLY.

ITEM	# REQ'D	DESCRIPTION	MTL. #
①	1	REDUCED PRESSURE BACKFLOW PREVENTER ASSYEMBLY	K-02
②	VAR.	BRASS PIPE OR TYPE "K" SOFT COPPER WATER TUBE	A-04
③	1	BRONZE WYE STRAINER	M-08
④	2	STD. WT. DOM. BRASS 90° STREET ELBOW	E-04
⑤	2	STD. WT. DOM. N.P.T. BRASS 90° ELBOW	E-04
⑥	2	STD. WT. DOM. BRASS UNION	E-04
⑦	5	STD. WT. DOM. BRASS PIPE NIPPLE N.P.T. x. VARIES	A-05

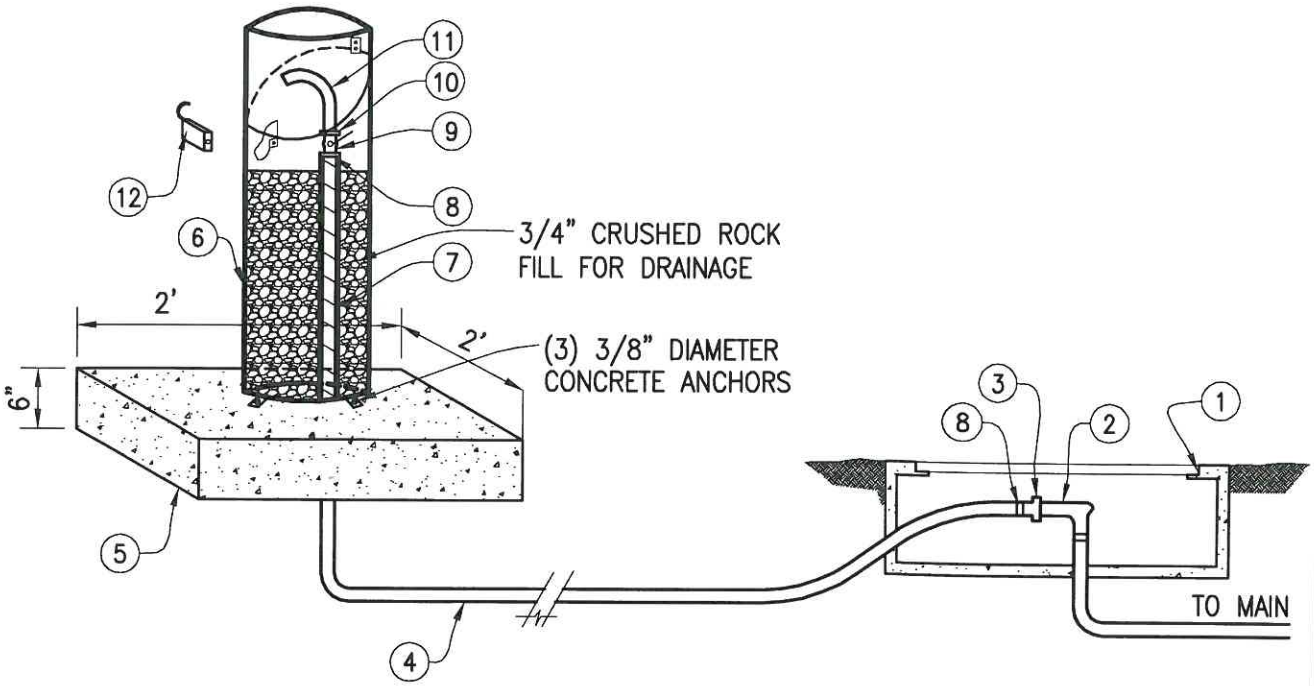
MSWD
Mission Springs Water District

¾", 1", 1½", OR 2" REDUCED PRESSURE BACKFLOW PREVENTER

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 5/1/12

DRAWING No.
W-14



ITEM	# REQ'D	DESCRIPTION	MTL. #
①	1	CONCRETE METER BOX	G-01
②	1	1" BALL ANGLE STOP	C-05
③	1	1"x ¾" BRASS METER ADAPTER	P-04
④	VARIES	¾" TYPE K COPPER TUBE	A-04
⑤	1	24" x 24" x 6" 3250 PSI CONCRETE PAD	N-02
⑥	1	SAMPLE STATION CANISTER, WTS 858 OR EQUAL	P-02
⑦	VARIES	PLUMBING INSULATION	N-20
⑧	2	¾" M.P.T. x ¾" CTS FERRULE FITTING	P-07
⑨	1	¾" FULL PORT BRASS BALL VALVE	P-03
⑩	1	¾" M.P.T. x 3/8" CTS FERRULE FITTING	P-01
⑪	1	⅜" COPPER GOOSE NECK	A-04
⑫	1	MASTER PADLOCK SUPPLIED BY MSWD	N/A

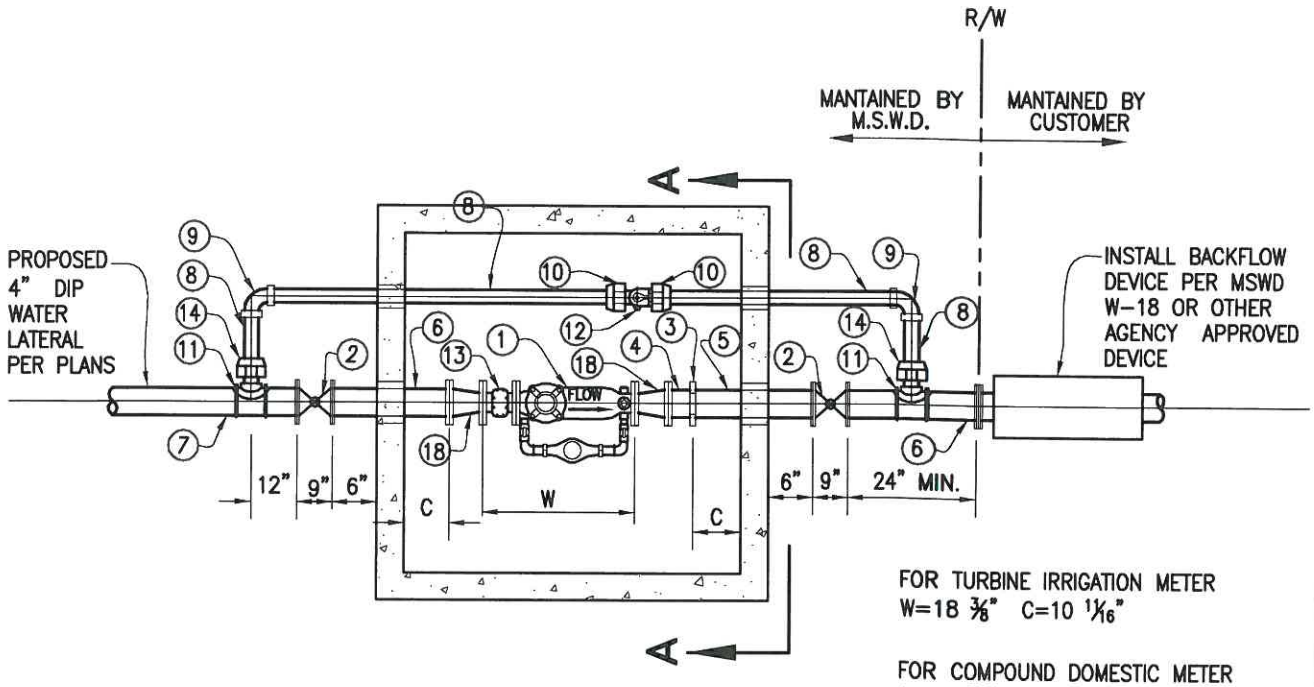
MSWD
Mission Springs Water District

BACTERIOLOGICAL SAMPLE STATION DETAIL

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 5/1/12

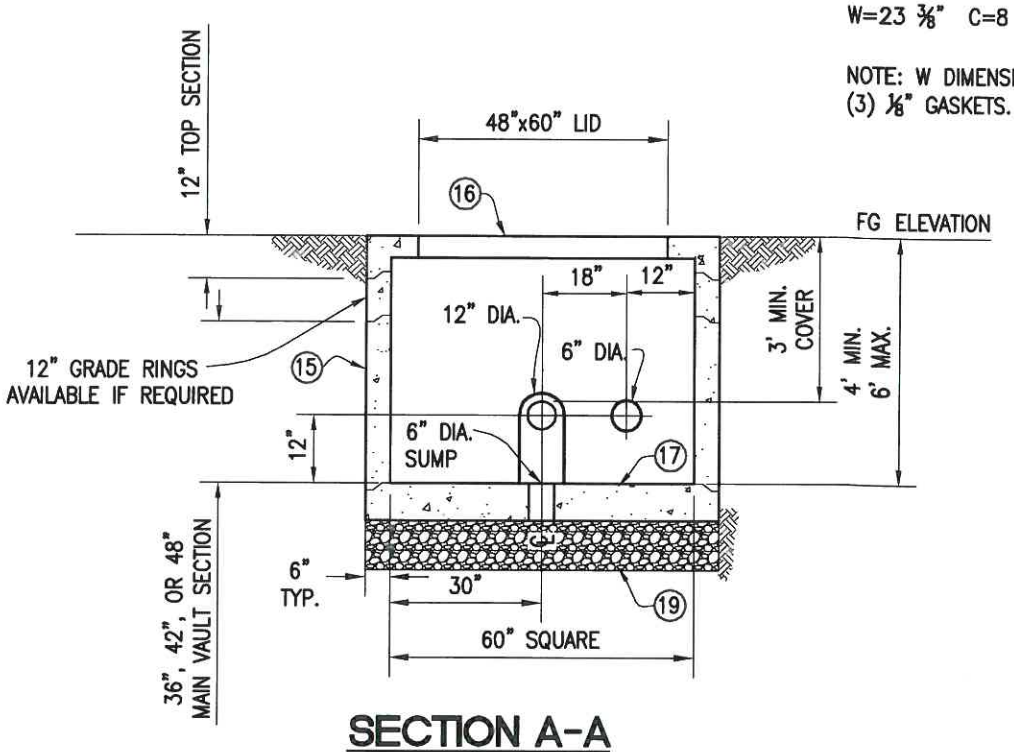
DRAWING No.
W-15



FOR TURBINE IRRIGATION METER
W=18 3/8" C=10 1/16"

FOR COMPOUND DOMESTIC METER
W=23 3/8" C=8 3/16"

NOTE: W DIMENSION INCLUDES (3) 1/8" GASKETS.



SECTION A-A

SEE W-16A FOR NOTES AND MATERIAL LIST

MSWD Mission Springs Water District

MSWD VAULT DETAIL
3" WATER METER INSTALLATION

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. 6/22/11

DRAWING No.
W-16

MATERIAL LIST

ITEM	QTY.	DESCRIPTION	MATL. LIST #
①	1	METER PER PLANS FURNISHED BY MSWD	
②	2	4" RESILIENT SEAT FLANGED GATE VALVE	
③	1	4" STYLE 77 VICTAULIC COUPLING	
④	1	4" DIP FLG. x VICTAULIC SPOOL x 6" LONG	
⑤	1	4" DIP FLG X VICTAULIC SPOOL (LENGTH VARIES)	
⑥	2	4" FLANGED DIP SPOOL (LENGTH VARIES)	
⑦	LF	4" DIP PIPE (FLANGED END)	
⑧	15±	2" COPPER TUBING TYPE K	
⑨	2	2" x 90° BRONZE CTS COMPRESSION	
⑩	2	2" BRONZE CTS COMPRESSION x 2" MALE IRON PIPE THREAD (MIPT) ADAPT.	
⑪	2	4" x 2" BRONZE DOUBLE STRAP SERVICE SADDLE PER MSWD W-09	
⑫	1	2" BRASS CURB BALL STOP – FIPTxFIPT	
⑬	1	WATER METER STRAINER FURNISHED BY MSWD	
⑭	2	2" MIPT x 2" CTS COMPRESSION BALL CORP. STOP	
⑮	1	60"x 60" ID UTILITY BOX/VAULT	
⑯	1	TORSION SPRING 2-PC LID: PARKWAY OR TRAFFIC COVER (ALUMINUM). ROADWAY APPLIC. TO MEET AASHTO H-20 DIRECT TRAFFIC RATING (STEEL)	
⑰	1	PRECAST CONCRETE BASE W/6" SUMP	
⑱	2	4" x 3" ECCENTRIC DIP FLANGED REDUCER	
⑲	36 CF	12" THICK 3/4" CRUSHED ROCK BASE	

NOTES:

1. PROVIDE METER SUPPORT AS REQUIRED.
2. METER DIMENSIONS MAY VARY. CONTRACTOR SHALL VERIFY METER DIMENSIONS AND VARY CLEARANCE DIMENSIONS TO CENTER METER ASSEMBLY IN UTILITY BOX WITH SPECIFIED CLEARANCES.
3. METER SUPPLIED BY MSWD.
4. VAULT SHALL BE 60"x 60" J&R PRODUCTS NO. 1289 OR APPROVED EQUAL.
5. VAULT LID TO BE "U.S.F." 4' x 5' TPD, ALUMINUM DIAMOND PLATE, SPRING ASSIST PARKWAY COVER WITH S.S. STANDARD HARDWARE & OVERSIZED RECESSED PADLOCK HASP. OR APPROVED EQUAL.
6. ALL MATERIALS PER MSWD APPROVED MATERIAL LIST.
7. DEPTH OF METER SHALL BE 5 FT. MAX. FROM VAULT LID TO TOP OF METER.

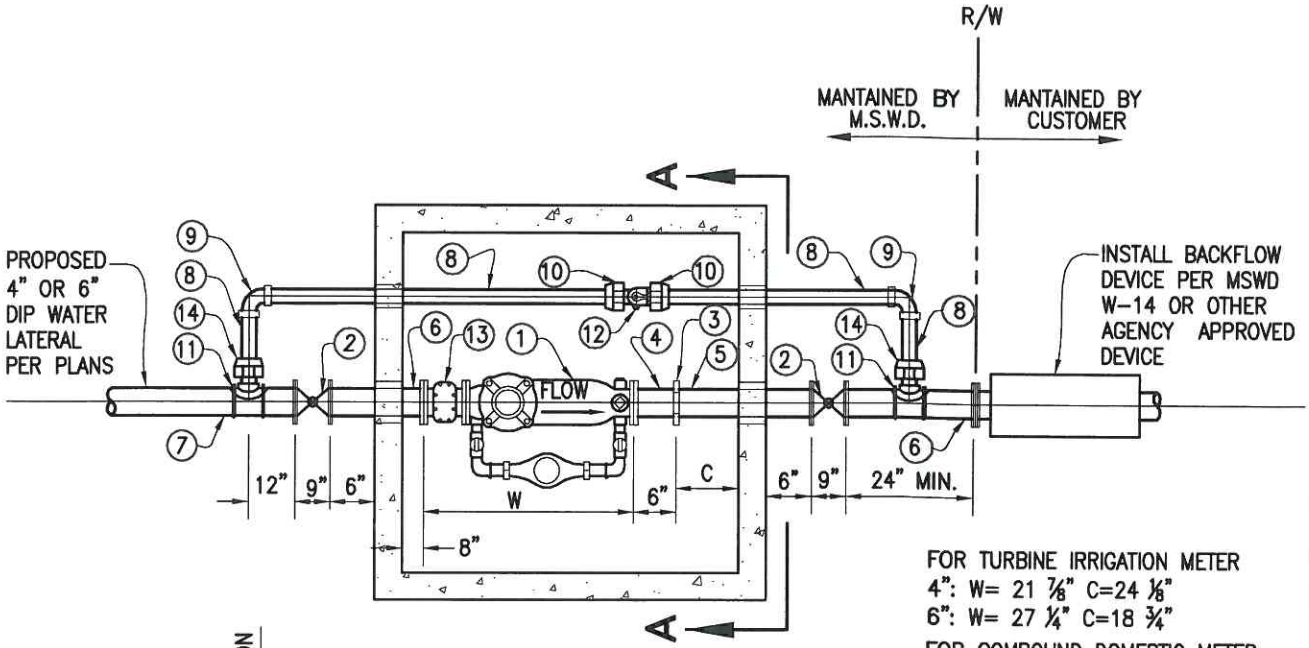
MSWD
Mission Springs Water District

MSWD VAULT DETAIL
3" WATER METER INSTALLATION
NOTES AND MATERIAL LIST

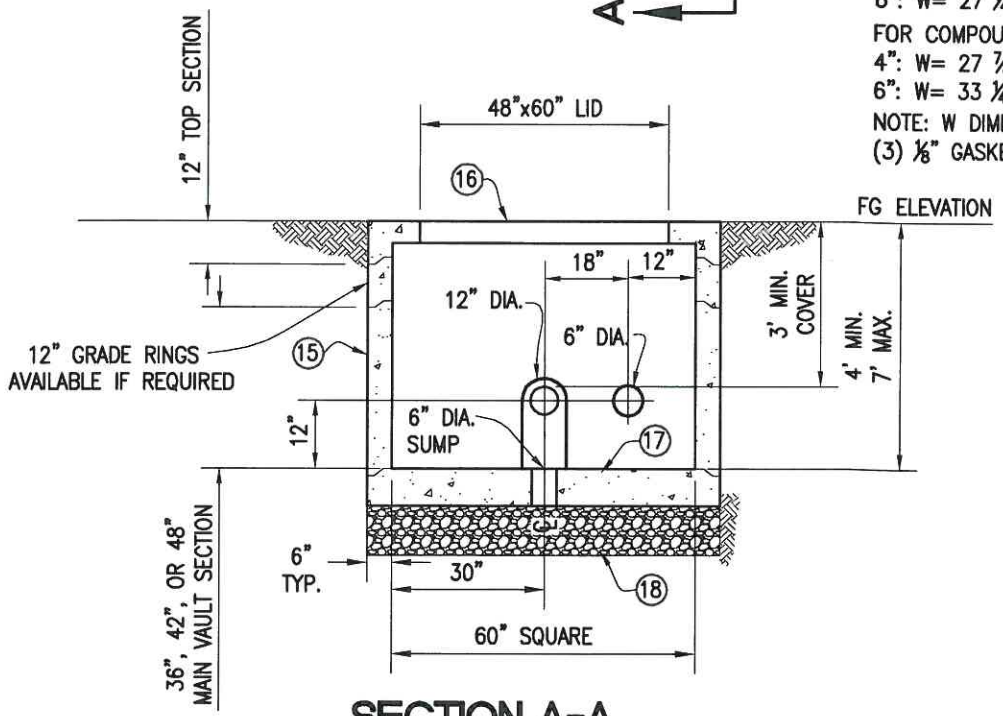
Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 6/22/11

DRAWING No.
W-16A



FOR TURBINE IRRIGATION METER
4": W= 21 7/8" C=24 1/8"
6": W= 27 1/4" C=18 3/4"
FOR COMPOUND DOMESTIC METER
4": W= 27 7/8" C=18 1/8"
6": W= 33 1/4" C=12 3/4"
NOTE: W DIMENSION INCLUDES (3) 1/8" GASKETS.



SECTION A-A

SEE W-17A FOR NOTES AND MATERIAL LIST

MSWD Mission Springs Water District

MSWD VAULT DETAIL
4" OR 6" WATER METER
INSTALLATION

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 6/22/11

DRAWING No.
W-17

MATERIAL LIST

ITEM	QTY.	DESCRIPTION	MATL. LIST #
①	1	METER PER PLANS	
②	2	4" OR 6" RESILIENT SEAT FLANGED GATE VALVE	
③	1	4" OR 6" VICTAULIC COUPLING	
④	1	4" OR 6" x 6" LONG FLG. X VICTAULIC DIP SPOOL	
⑤	1	4" OR 6" DIP FLG X VICTAULIC SPOOL (LENGTH VARIES)	
⑥	2	4" OR 6" FLANGED DIP SPOOL (LENGTH VARIES)	
⑦	LF	4" OR 6" DIP PIPE (FLANGED END)	
⑧	15±	2" COPPER TUBING TYPE K	
⑨	2	2" x 90° BRONZE CTS COMPRESSION	
⑩	2	2" BRONZE CTS COMPRESSION x 2" MALE IRON PIPE THREAD (MIPT) ADAPT.	
⑪	2	4" x 2" BRONZE DOUBLE STRAP SERVICE SADDLE PER MSWD W-09	
⑫	1	2" BRASS CURB BALL STOP - FIPTxFIPT	
⑬	1	WATER METER STRAINER	
⑭	2	2" MIPT x 2" CTS COMPRESSION BALL CORP. STOP	
⑮	1	UTILITY BOX/VAULT **	
⑯	1	TORSION SPRING 2-PC LID: PARKWAY OR TRAFFIC COVER (ALUMINUM). ROADWAY APPLIC. TO MEET AASHTO H-20 DIRECT TRAFFIC RATING (STEEL)	
⑰	1	PRECAST CONCRETE BASE W/8" SUMP ****	
⑱	36 CF	12" THICK 3/4" CRUSHED ROCK BASE	

NOTES:

1. PROVIDE METER SUPPORT AS REQUIRED.
2. METER DIMENSIONS MAY VARY. CONTRACTOR SHALL VERIFY METER DIMENSIONS AND VARY CLEARANCE DIMENSIONS TO CENTER METER ASSEMBLY IN UTILITY BOX WITH SPECIFIED CLEARANCES.
3. METER REGISTERS TO READ IN CUBIC FEET.
4. VAULT SHALL BE 60"x 60" J&R PRODUCTS NO. 1289 OR APPROVED EQUAL.
5. READ HOLES ARE TO BE POSITIONED OVER METER REGISTER AFTER METER IS INSTALLED.
6. VAULT LID TO BE "U.S.F." 4' x 5' TPD, ALUMINUM DIAMOND PLATE, SPRING ASSIST PARKWAY COVER WITH S.S. STANDARD HARDWARE & OVERSIZED RECESSED PADLOCK HASP. OR APPROVED EQUAL.
7. ALL MATERIALS PER MSWD APPROVED MATERIAL LIST.
8. METER TYPE SHALL BE APPROVED BY MSWD.
9. DEPTH OF METER SHALL BE 5 FT. MAX. FROM VAULT LID TO TOP OF METER.
10. PROVIDE A MINIMUM OF 4" CLEARANCE BETWEEN PIPE AND KNOCK OUT HOLE WITH A MINIMUM OF 6" CLEARANCE ABOVE THE VAULT FLOOR.

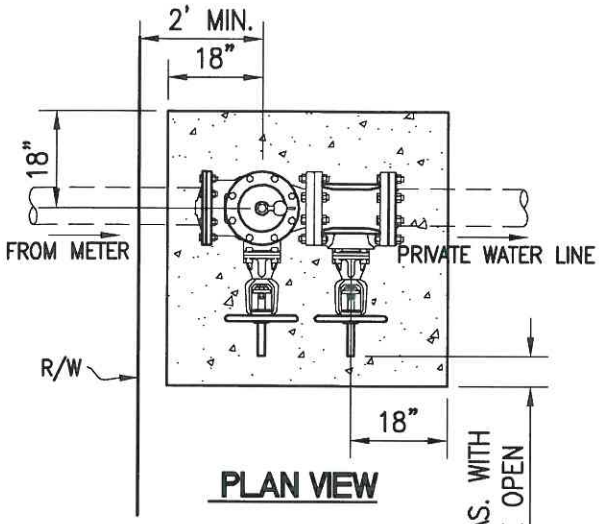
MSWD
Mission Springs Water District

MSWD VAULT DETAIL
4" OR 6" WATER METER
INSTALLATION NOTES AND
MATERIAL LIST

Approved: _____
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 6/22/11

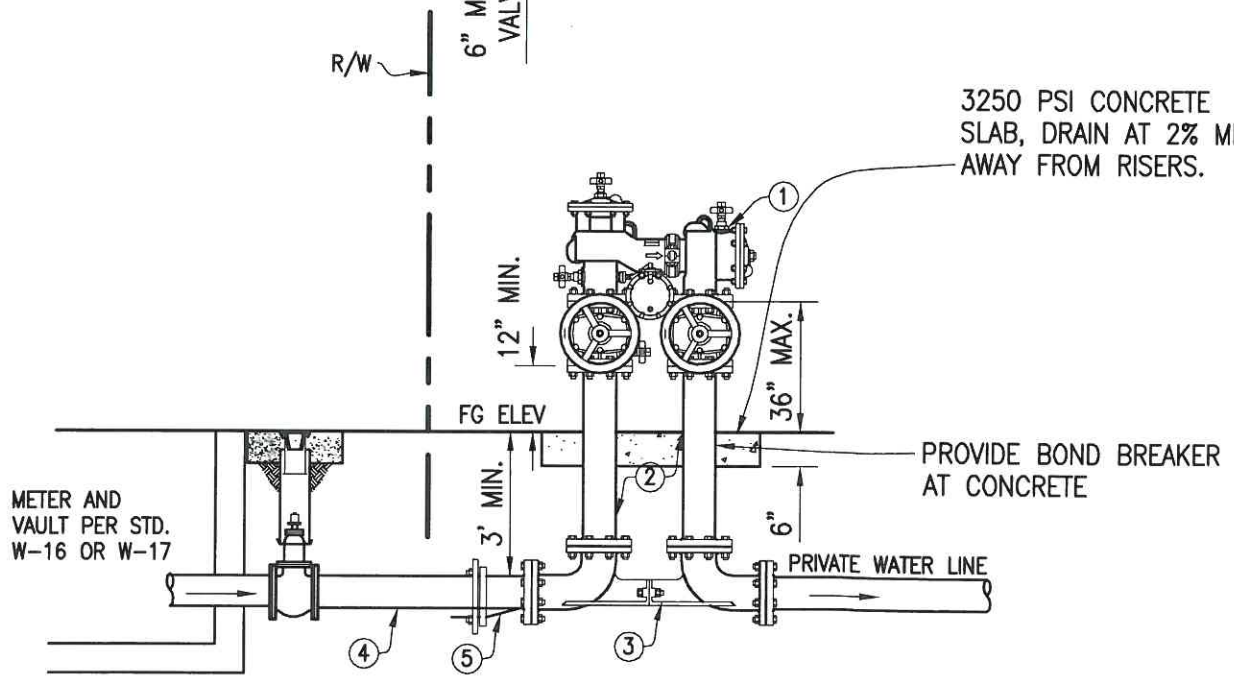
DRAWING No.
W-17A



PLAN VIEW

NOTES:

1. REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY SHALL BE LOCATED ON PRIVATE PROPERTY OUTSIDE OF THE PUBLIC RIGHT-OF-WAY.
2. AREA WITHIN 2' OF VALVE ASSEMBLY SHALL BE MAINTAINED CLEAR OF ANY OBSTRUCTIONS TO ALLOW FOR INSPECTION AND MAINTENANCE.
3. R.P. ASSEMBLY BELONGS TO THE PRIVATE PROPERTY OWNER BUT WILL BE TESTED AND MAINTAINED BY THE DISTRICT AT THE OWNER'S EXPENSE.
4. MASK ALL COPPER, BRASS, NAME PLATES, AND METER ASSEMBLY AND PAIT DUCTILE IRON TAN PER MSWD SPECIFICATIONS.



SECTION

ITEM	No. Req'D.	DESCRIPTION	Matl. List#
①	1	METER SIZE REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY	K-02
②	2	METER SIZE DUCTILE IRON FLANGED SPOOL, LENGTH AS REQUIRED	A-03
③	1	METER SIZE FLG.xFLG. VALVE SETTER ASSEMBLY (BY R.P. MFR.)	K-02
④	VARIES	METER SIZE OR 4" MIN. D.I.P PIPE SPOOL, LENGTH AS REQUIRED	A-03
⑤	1*	4"x 3" D.I. ECCENTRIC REDUCER TOP FLAT, FOR 3" METER SIZE ONLY	E-03

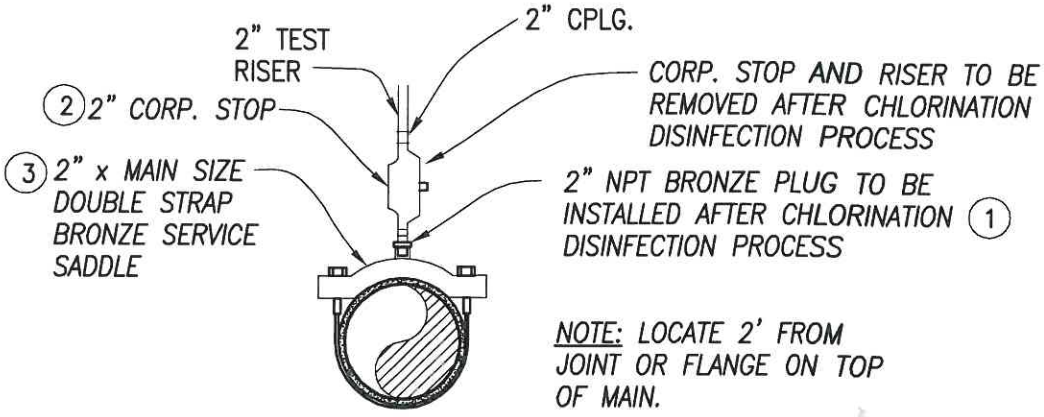
MSWD
Mission Springs Water District

3" THROUGH 6" REDUCED PRESSURE BACKFLOW PREVENTER

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 5/7/12

DRAWING No.
W-18



ELEVATION VIEW

ITEM	No. Req'D.	DESCRIPTION	Matl. List#
(1)	1	2" M.N.P.T. BRONZE PLUG	
(2)	1	2" BALL CORP STOP, M.N.P.T. INLET AND OUTLET	C-02
(3)	1	2" x MAIN SIZE DOUBLE STRAP BRONZE SERVICE SADDLE	L-01

NOTES:
1. PIPE THREADS SHALL BE CLEAN AND SHARP AND SEALED WITH AN APPROVED JOINT COMPOUND.
2. RISER SHALL INCLUDE SHUT-OFF VALVE AND FITTINGS AS NEEDED.
3. ASSEMBLY SHALL BE PROTECTED WITHIN PVC RISER CAPPED WITH A TRAFFIC COVER AS APPROVED BY THE MSWD INSPECTOR WHEN LOCATED WITHIN A STREET OR OTHER AREA SUBJECT TO TRAFFIC.

MSWD
Mission Springs Water District

TEMPORARY CHLORINATION POINT
(T.C.P.)

Approved:
Arden Wallum
General Manager

Drawn: Heitec Inc. Date: 5/3/12

DRAWING No.
W-19

10.0 SSMP GUIDELINES

See Mission Springs Water District Sewer System Management Plan (SSMP Development Guide), available on our website at www.mswd.org.