

DRAFT

SECTION VI

**POTABLE WATER, RECYCLED WATER,
AND SANITARY SEWER SYSTEM
FACILITY CONSTRUCTION**

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FACILITY CONSTRUCTION**

A. CONSTRUCTION STEPS

All water and/or sewer facility projects shall be constructed by the Developer and inspected by District inspectors. Work performed without the knowledge or the observation of a District inspector will not be accepted. The steps required to obtain approval of construction of water and/or sewer facilities are as follows:

1. Submit the Inspection Deposit and Other District Required Fees.
2. Provide Submittals, Bonds, and Certificate of Insurance.
3. Submit Tract Phasing Plan (if applicable).
4. Attend a Mandatory Preconstruction Meeting.
5. Notify the District Regarding the Start of Construction.
6. Construct Water and/or Sewer System Facilities.
7. Test and Disinfect the Water and/or Sewer System Facilities.
8. Request Connection to Existing Water and/or Sewer System.
9. Install Permanent Meters (Water).
10. Obtain Final Construction Approval.
11. Pay Remaining Inspection Fees.
12. Provide Record Drawings, Unconditional Lien Waiver and Release, and Water System Grant Deed and/or Sewer System Grant Deed.

B. CONSTRUCTION STEP DETAILS

1. Submit the Inspection Deposit and Other District Required Fees

The inspection deposit, any other District fee, and three copies of the approved water and/or sewer construction drawings shall be submitted.

2. Provide Submittals, Bonds, and Certificate of Insurance

The Developer shall submit to District staff the following:

- a. Two copies of encroachment permits (if applicable).
- b. One copy of the recorded Tract/Parcel Map showing dedication of streets for road and public utility purposes (not required if executed Grant of Easement was provided earlier).
- c. Certificates of Insurance for Contractor.
- d. Labor and Material and Performance Bonds (if not already submitted).
- e. Two copies of construction materials.
- f. Two copies of shoring plan stamped by a Registered Civil Engineer.
- g. Three copies of cut sheets (see Item 5 below).

After the District reviews and approves all submittals, the Developer shall schedule a preconstruction meeting with the District. A one week notice is required prior to said preconstruction meeting.

3. Submit Tract Phasing Plan (if applicable)

If the Developer intends to request approval for occupancy in groups smaller than the tract as recorded, a phasing plan shall be submitted to, and approved by, the District prior to starting construction. The District will only approve homes for occupancy in accordance with the approved phasing plan. Phase separation shall occur at sewer manholes and at waterline valves; the plan shall indicate all proposed sewer plugs and closed valves.

The following work must be completed prior to the District issuing approval for occupancy:

a. Sewer

All sewer construction (sewers and manholes) within the phase and all sewer construction between the phase and the connection point to the District's system must be completed in accordance with all District standards, including air testing and videotaping. Stub outs or connections from manholes to future phases shall be plugged with an approved mechanical plug. When the Contractor is constructing future phases, all debris and water that has collected in the sewer shall be removed prior to removing the plug to the accepted sewer.

b. Water

All waterline construction (mainline, valves, valve cans, hydrants, services, etc.) within the phase and all waterline construction between the phase and the connection point to the District's system must be completed in accordance with the District's standards, including pressure testing and disinfection. Isolation valves must be installed between phases, and provisions must be made for pressure testing, disinfecting, and flushing subsequent phases before the phase to be accepted shall be installed to District standards.

If water and sewer facilities are constructed for future phases concurrent with first phase construction, the Developer may perform waterline pressure testing and disinfection, and sewer line air testing and videotaping to demonstrate compliance of all constructed facilities with District standards. However, as future phases are constructed, just prior to the District providing approval for occupancy, the Developer shall reperform air testing and videotaping of sewers and provide acceptable bacteriological test results for watermains to demonstrate no damage occurred when facilities were constructed and occupancy is requested. All water services shall be flushed prior to obtaining bacteriological samples.

Bonds shall be posted for the entire tract. If the Developer requests bonds be released after all work is completed and accepted by the District, but prior to final street paving, a cash deposit will be required to cover costs to raise manholes and valve cans to grade after final paving. After valve cans and sewer manholes have been raised to final elevations, the District will release cash deposits.

4. Attend a Mandatory Preconstruction Meeting

A preconstruction meeting shall be held at the District office or project site and shall be attended by the Developer's representative, Developer's contractor, and construction superintendent as well as by the District.

5. Notify the District Regarding the Start of Construction

The Contractor shall notify the District, in writing, a minimum of one week prior to the start of construction. Prior to construction, the Contractor shall submit three copies of the construction cut sheets for District use during construction. Waterline staking shall be at 50 foot intervals and at all water services, fire hydrants, tees, crosses, elbows, valves, air valves, blowoffs, and grade breaks. Sewer line staking shall be at 25 foot intervals and at all laterals, manholes, and cleanouts.

6. Construct Water and/or Sewer System Facilities

The water and/or sewer system facilities shall be constructed by the Developer's contractor and inspected by District inspectors. After completion of construction, Developer's contractor shall complete all items on the District's inspection list prior to testing and disinfecting the water facilities and testing and videotaping the sewer facilities. Contractor and Developer shall coordinate with District's inspector for all inspection work. The District's standard inspection procedures are provided at the back of this section as Exhibits VI-1 and VI-2.

7. Test and Disinfect the Water and/or Sewer System Facilities

After the water and/or sewer facilities are completed to the satisfaction of the District inspector, including all items on the inspector's deficiencies list, and after the Contractor furnishes evidence that compaction of trenches has been completed to the satisfaction of the City of Yucaipa, the City of Calimesa, the County of Riverside Transportation Department, or the County of San Bernardino Transportation Department (whichever has jurisdiction), and the District, the Contractor shall test the water and/or sewer facilities and disinfect the water facilities in accordance with District standards. Waterlines shall be tested and disinfected for the entire tract or phase as approved (including that portion between the tract/phase and connection to existing District facilities); sewer lines shall be tested and videotaped for the entire tract or phase as approved (including that portion between the tract/phase and connection to existing District facilities).

After the system has been tested and disinfected, the District will take samples for bacteriological analysis. Acceptable bacteriological test results must be obtained before the District will allow connections to the existing water system. Sewer video tapes shall be submitted to the District. Said video tapes, as well as sewer testing, shall be approved by the District before the District will allow connections to the existing water system.

8. Connect to Existing Water and/or Sewer System

After the water system has been disinfected to the satisfaction of the District and the District has approved the videotaping and testing of the sewer, the Contractor may request a connection of the new water and/or sewer facilities to the existing facilities. Contractor shall provide the District with one week written notification requesting a system shutdown; the District will make connections to the existing District facilities. Additionally, the Contractor shall base pave all streets to be served by the new water and/or sewer systems prior to connection to the District's existing system. Thereafter, the District will release the new water system facilities for fire protection and construction water.

Prior to shutting down existing facilities, the Contractor shall provide and distribute to all occupants affected by the shutdown printed notices, 8 1/2" x 11" in size, of the impending service disruption(s). A sample is available from the District.

9. Install Permanent Meters (Water) and Connect Service Laterals

After all of the above has been completed to the satisfaction of the District, the District will set the meters or release the permanent meters to the Contractor for installation in accordance with the approved Phasing Plan and Standard Drawings. The Developer will be responsible for any damage to the meters until the tract is accepted. Damaged meters will be replaced by the Developer at the Developer's expense. The Developer may also connect house sewer laterals to the sewer mainline.

10. Obtain Final Construction Approval

After construction is completed, the Contractor shall prepare for occupancy as follows:

- a. Verify that angle meter stops and meter boxes are set to the proper elevation and location.
- b. Verify that all facilities are constructed in accordance with District requirements.
- c. Request final inspection by the District. The District's Facilities Maintenance Division will perform a final inspection of the tract or phase; the Contractor shall make all corrections required by the Facilities Maintenance Division.

11. Pay Remaining Inspection Fees

Before the District will provide approval for occupancy, any remaining inspection fees must be paid in full.

12. Provide Record Drawings, Unconditional Lien Waiver and Release, and Water System Grant Deed and/or Sewer System Grant Deed

Before the District will accept the tract, the Contractor shall:

- a. Provide the District with the water and/or sewer system record (as-built) drawings. Record drawings shall consist of 1 set of original mylars and 1 set of prints. Preliminary record drawings shall be prepared by the Developer's engineer utilizing the Contractor's as-built drawings and shall be submitted to the District's inspector. The District's inspector will add record information not shown on the preliminary record drawings and the Developer shall add the inspector's comments to the original mylars. After the inspector's comments have been added, original mylars shall be submitted to the inspector for initialing, and mylars and prints shall then be delivered to the District.
- b. Provide and Unconditional Lien Waiver and Release for waterline and/or sewer line construction.
- c. Provide grant deed(s) for dedicating the water and/or sewer system to the District. Said grant deed will be accepted and recorded only after the final Notice of Completion for water and/or sewer system facilities is filed by the District and the 35 day waiting period has elapsed. The grant deed must be filed on the form provided by the District.

EXHIBIT VI-1

SEWER MAINS AND APPURTENANCES CONSTRUCTION INSPECTOR DUTIES / INSPECTION CHECKLIST

PRECONSTRUCTION DUTIES

1. Conduct/attend mandatory preconstruction conference with Developer, Pipeline Contractor, and District. Advise Developer and Contractor that inspections must be scheduled 48 hours in advance. Advise Developer and Contractor that each request for inspection will incur a minimum two hour inspection fee, even if Contractor is not present or is not ready for inspection. Discuss all items listed below.
2. Obtain written schedule and shop drawing submittals from the Contractor. Deliver submittals to the District for approval prior to inspecting construction materials.
3. Review Shoring Plans. Shoring Plans shall be prepared at the expense of the Developer and stamped by a registered civil engineer. One copy shall be given to the Inspector and one copy shall be maintained onsite at all times.
4. Obtain and review cut sheets with Contractor.
5. Thoroughly inspect all material delivered to the job site (perform this task immediately after delivery of materials). Verify that materials are in accordance with the approved submittals. Immediately reject in writing any defective item or materials not matching the approved submittals, not meeting District Specifications, or not in compliance with District Standard Drawings. Give a copy of the rejection report to the Contractor's or Developer's representative and make a note in the Daily Field Report of who the rejection notice was given to.

ONSITE DUTIES DURING CONSTRUCTION

1. Inspect subgrade.
 - a. Verify that subgrade is undisturbed or, if disturbed, compacted to 90% relative compaction.
 - b. Verify that subgrade materials are acceptable (no organics, saturated clays, etc).
 - c. Verify that no rocks are protruding into subgrade.
 - d. Check trench width.
2. Inspect bedding (prior to pipe installation).
 - a. Check bedding material (3/4" crushed rock – see YVWD Standard Drawings S-15 and S-17).
 - b. Check bedding depth (4" or 6" minimum required depending on pipe diameter – see YVWD Standard Drawing S-15).
 - c. Check that bedding has been well compacted.

3. Inspect pipe installation.
 - a. Observe handling of pipe.
 - b. Verify gaskets lubricated and check penetration of joint stabs.
 - c. Check line and grade of pipe (0.1' horizontal and 0.02' vertical tolerance). Use surveyor's level to check pipe elevation at 25' intervals when design grade is less than 1%. If design grade is greater than 1%, use surveyor's level to check pipe elevation at manholes and all locations where pipe appears shallow.
4. Inspect pipe zone backfill to spring line.
 - a. Check pipe zone backfill material (3/4" crushed rock – see YVWD Standard Drawing S-15).
 - b. Observe Contractor walking trench and rodding under pipe haunches to compact around pipe.
5. Inspect pipe zone backfill to 12" above pipe.
 - a. Check pipe zone backfill material (3/4" crushed rock – see YVWD Standard Drawing S-15).
 - b. Observe Contractor compacting the material in the pipe zone.
6. Continuously inspect backfill to subgrade.
 - a. This inspection may be performed by a Soils Technician retained by the District; otherwise, meet with Soils Technician and Contractor on first day of backfill operations and establish backfill techniques, moisture content, etc.
 - b. District or Developer's Soil Technician will take compaction tests at intervals not exceeding 200' along the pipe trench at various depths.
 - c. Observe backfill procedure verifying that lifts are limited to 18", rocks are limited to 6" maximum diameter, and rocks are not more than 20% by volume.
7. Inspect manhole base.
 - a. Measure excavation prior to placing concrete to verify size and bearing area.
 - b. Verify subgrade is undisturbed or, if disturbed, compacted to 95% relative compaction.
 - c. Observe concrete placement.
 - d. Verify concrete cures 24 hours before stacking manholes.
8. Inspect manhole shaft.
 - a. Verify no steps in manhole.
 - b. Observe stacking of manhole sections and cone (verify manhole shaft opening in proper location).
 - c. Observe placement of joint grout or mastic.
 - d. Verify top of cone within tolerance (12" to 24" from top of pavement).
 - e. Observe stacking of grade rings – do not allow installation of cracked or broken rings.
 - f. Inspect mortaring of section joints and grade ring joints (note: grade rings to be mortared at joints only).

- g. Verify that manhole cover matches street grade (crossfall).
 - h. Measure excavation for concrete collar prior to concrete placement.
9. Inspect sewer lateral.
- a. Verify 45° wye in proper location. Preferred location is located under a driveway approach.
 - b. Observe complete lateral installation, including subgrade, bedding, and pipe installation (slope 2% minimum to right-of-way and lateral perpendicular to sewer line).
 - c. Verify lateral has 5.0' cover at curb.
 - d. Verify electronic marker is installed at end of lateral.
 - e. Measure and plot actual lateral location on as-built record drawings.
 - f. Observe placement of slurry cut-off wall for laterals not installed under driveways.
 - g. Verify "S" is chiseled in curb face at lateral locations.
 - h. Observe connection of house sewer to lateral; connections shall be scheduled by District staff only.
 - i. Verify backwater valves installed where specified on Construction Drawings.
10. Inspect pressure testing of pipeline.
- a. Verify cleaning of pipeline.
 - b. Observe pressure and leak tests (see the Standard Specifications for Public Works Construction, Section 306-1.4.4, for test guidelines).
11. Inspect video of pipeline.
- a. Schedule video with District.
 - b. Observe videoing of pipeline – verify that videos are labeled with locations, lengths, and dates.
 - c. Deliver videos on DVD and summary report to District.

OFFSITE DUTIES DURING CONSTRUCTION

1. Prepare daily inspection reports; record times for arrival and departure from site.
2. Review field inspections and observations with District staff daily.
3. Coordinate and discuss project with utilities, neighbors, and the public, when necessary.
4. Prepare individual house certifications documenting connection to laterals.

POST CONSTRUCTION DUTIES

1. Schedule and attend a walk through with the District's representative.
2. Verify that all deficiencies (punch list items) observed by the District's representative are corrected.
3. Prepare as-built drawings and deliver same to District.
4. Make a recommendation to District for acceptance of project.

EXHIBIT VI-2

WATER MAINS AND APPURTENANCES CONSTRUCTION INSPECTOR DUTIES / INSPECTION CHECKLIST

PRECONSTRUCTION DUTIES

1. Conduct/attend mandatory preconstruction conference with Developer, Pipeline Contractor, and District. Advise Developer and Contractor that inspections must be scheduled 48 hours in advance. Advise Developer and Contractor that each request for inspection will incur a minimum two hour inspection fee, even if the Contractor is not present or is not ready for inspection. Discuss any special items such as polyethylene wrapping of watermains and services, construction staking, location of restrained joints, and OSHA permits. Discuss all items listed below.
2. Obtain written schedule and shop drawing submittals from the Contractor. Deliver submittals to the District for approval prior to inspecting construction materials.
3. Review Shoring Plans. Shoring Plans shall be prepared at the expense of the Developer and stamped by a registered civil engineer. One copy shall be given to the Inspector and one copy shall be maintained onsite at all times.
4. Obtain and review cut sheets with Contractor.
5. Thoroughly inspect all material delivered to the job site (perform this task immediately after delivery of materials). Verify that materials are in accordance with the approved submittals. Immediately reject in writing any defective item or materials not matching the approved submittals, not meeting District Specifications, or not in compliance with District Standard Drawings. Give a copy of the rejection report to the Contractor's or Developer's representative and make a note in the Daily Field Report of who the rejection notice was given to.

ONSITE DUTIES DURING CONSTRUCTION

1. Inspect subgrade.
 - a. Verify that subgrade is undisturbed or, if disturbed, compacted to 90% relative compaction.
 - b. Verify that subgrade materials are acceptable (no organics, saturated clays, etc).
 - c. Verify that no rocks are protruding into subgrade.
 - d. Check trench width.
2. Inspect bedding (prior to pipe installation).
 - a. Check bedding material (sand material with Sand Equivalent (SE) of 30 or greater required; provide certification of same).
 - b. Check bedding depth (4" or 6" minimum required depending on pipe diameter).
 - c. Check that bedding has been well compacted.

3. Inspect pipe installation.
 - a. Observe handling of pipe.
 - b. Verify gaskets lubricated and check penetration of joint stabs.
 - c. Check bolted connections for proper bolts, nuts, washers, tightening, and corrosion protection.
 - d. Observe stabbing of all restrained joints (field-lok gasket joints) and verify restrained joint lengths match plans.
 - e. Check valve installation and operator nut position.
 - f. Check air valve and blow off locations (high & low points, respectively) and installations.
 - g. Check line and grade of pipe (0.1' horizontal and 0.1' vertical tolerance). Use surveyor's level to check pipe elevation at low points, high points, connection points, and at utility crossings or interferences that may impact installation.
 - h. Verify installation of polyethylene sleeving on watermains where soils dictate (YVWD Engineering Department will advise) and on all copper services.
4. Inspect pipe zone backfill to spring line.
 - a. Check pipe zone backfill material (sand material with SE of 30 or greater required).
 - b. Observe Contractor walking trench and rodding under pipe haunches to compact around pipe.
5. Inspect pipe zone backfill to 12" above pipe.
 - a. Check pipe zone backfill material (sand material with SE of 30 or greater required).
 - b. Observe Contractor compacting the sand material in the pipe zone (no jetting allowed unless pre-authorized).
6. Continuously Inspect Backfill to Subgrade.
 - a. This inspection may be performed by a Soils Technician retained by the District; otherwise, meet with Soils Technician and Contractor on first day of backfill operations and establish backfill techniques, moisture content, etc.
 - b. District or Developer's Soils Technician will take compaction tests at intervals not exceeding 200' along the pipe trench at various depths. District or Developer's Soils Technician will take compaction tests at every blowoff, fire hydrant, air valve, and on 25% of the water services.
 - c. Observe backfill procedure verifying that lifts are limited to 18", rocks are limited to 6" maximum diameter, and rocks are not more than 20% by volume.
7. Inspect thrust block installations if required on existing system.
 - a. Measure excavation prior to placing concrete to verify size and bearing area.
 - b. Observe concrete placement.

8. Inspect fire hydrant installation.

Verify that hydrant is installed in accordance with District Standard Drawing W-18, paying particular attention to location behind curb face (24" to centerline), riser plumbness, and break away flange elevation above concrete pad (2").

9. Inspect water service installation.

- a. Observe installation of service tap (45° angle) and saddle installation.
- b. Verify that corporation stop, bedding, copper line installation (perpendicular to pipeline), polyethylene wrapping, and angle meter stop are installed in accordance with Standard Drawings prior to pipe shading.
- c. Check angle meter stop location (9" behind curb, 9" down from top of curb). Verify angle meter stop straight and plumb.
- d. Check meter box installation prior to request for meter set.

10. Inspect pressure testing and disinfection of pipeline.

- a. Observe pressure and leak tests (200 psi test for two hours at lowest point in reach). Verify all valves and service corporation stops open during testing.
- b. Observe flushing of pipeline.
- c. Observe introduction of chlorine into system for disinfection (minimum 50 ppm to maximum 100 ppm).
- d. Check residual immediately after introduction of chlorine and after 24 hour period.
- e. Observe flushing of pipeline and dechlorination of test water.
- f. Check chlorine residual (should be same as system water).
- g. Schedule bacteriological sampling by certified laboratory.

11. Inspect valve cans.

- a. Verify valve cans plumb and centered over operating nut.
- b. Verify valve key extensions installed.

OFFSITE DUTIES DURING CONSTRUCTION

1. Prepare daily inspection reports; record times for arrival and departure from site.
2. Review field inspections and observations with District staff daily.
3. Coordinate and discuss project with utilities, neighbors, and the public, when necessary.

POST CONSTRUCTION DUTIES

1. Schedule and attend a walk through with the District's representative.
2. Verify that all deficiencies (punch list items) observed by the District representative are corrected.
3. Prepare as-built drawings and deliver same to District.
4. Make a recommendation to District for acceptance of project.