

SECTION 13

CONSTRUCTION - INSPECTION REQUIREMENTS

13.0 INSPECTION REQUIREMENTS

The SBMWD has detailed inspection requirements to perform during construction. An example of an "Inspection Checklist" can be found in Appendix 'N'. The checklist is roughly in chronological order and serves as a reminder of the key elements of field inspection.

Make observations regarding the progress of the construction and document the construction as needed.

Some inspection details to pay attention to are as follows:

- Track the progress of the project, especially during the time period immediately prior to the requested start date. Verify that the construction items to be witnessed prior to construction have actually been done.
- While working in an existing street, verify that proper traffic control and warnings are given to the motoring public and pedestrians. Consult the "Work Area Traffic Control Handbook" or WATCH Manual. Each inspector should have a copy of the WATCH Manual.
- Verify any Underground Service Alert (USA) marks. Note the positions and trends of other marked utilities.
- Witness any potholing done on the existing distribution system and adjacent utilities in the immediate area of the anticipated work, if the potholing has not been done in advance of construction. Verify that water crossings can be made with respect to the proper separation of the adjacent utilities. If problem arise, stop the work until the properly engineered solutions can be made. Do not allow contractors to make unsafe decisions or allow unsafe construction practice that will impact the improvement work in the present or affect the improvement work in the future. This applies to other utilities as well as the water improvement work.

- The procedure of hot tapping requires a two day advance warning period. Notify SBMWD Distribution and Operations Staff in writing, as appropriate.
- The position of the contour nozzle for tapping is not allowed on a welded pipe seam or other pipe joint.
- Arrange for a SBMWD welder, lead-person, or supervisor to inspect (spot verify) that the welds are adequate. Notify this individual of the pending inspection.
- Verify that there are no leaks in the gate valve, tapping saddle (or welded contour nozzle), and tapping equipment assembly prior to allowing the tap to be made. Typically, the assembly should hold air pressure of at least the amount measured in the existing main. One and a half times the anticipated working pressure is recommended for this test. A soapy water solution is usually applied to indicate the sites of serious or pinhole leaks.
- Field verify that the proper disinfection of the gate valve, tapping saddle (or welded contour nozzle), and tapping equipment occurs. Common household bleach (approximately 5 percent solution) is appropriate. Do not allow the use of chlorine of a higher concentration or with other added chemicals (surficants, silicates, etc). Disinfect the assembly immediately prior to hot tapping.
- Retain the coupon from the hot tapper. Beware of the sharp and jagged edges. Label the coupon for future reference.
- Verify that a physical disconnect or test plate is used. If a physical disconnect is used, verify that the end of the pipe is within a few feet of the tapping valve (or future connection point). Long runs of new piping are difficult to disinfect by swabbing.

- If a trench is greater or equal to five feet in depth, verify that proper shoring techniques are used. Any portion of the trench at a depth greater or equal to five feet will require that shoring methods be used.
- Keep the work site safe for installation and inspection purposes. If piping shall be assembled at the surface and lowered into a deep trench (greater than five feet), make sure the piping is inspected prior to installing it. If piping at a depth greater than five feet needs to be inspected, verify that shoring methods are used and in place prior to entering the trench for inspection.
- Pipe grade is perhaps the most important inspection criteria to witness and verify during construction. Check the grade often, prior to laying pipe. Make note of the pipe grade and the position of existing utilities crossed well in advance of the pipe being laid. Mitigate minor problems and identify major problems prior to experiencing situations that will be difficult or impossible to field remedy. Stop the construction work if major problems with respect to grade are encountered until a properly engineered solution is identified and approval by the SBMWD Principal Engineer is obtained. The engineered solution shall be presented in writing by the Owner's Engineer of Record (per a modified plan and profile). Approval shall also be in writing. Potholing in advance of construction is highly advisable and preferred, but not always possible. Record the amount of separation between utilities and the water improvements.
- Verify that piping is installed per plan, with all air capable of easily exiting the pipe runs via an air release valve, if one is necessary. Verify that each stick of pipe is at the proper slope.
- Review the soils test report prior to construction, if a report is available. Pay attention to soil type and pH.

- Field verify the sand equivalent (SE) of the imported or native to ensure SE 30 sand. Bedding the pipe in sand must be done prior to laying the pipe.
- With respect to depth, the pipe should be installed per plan (as much as practical). Verify a minimum of 3.0' of cover material and that this minimum depth of cover shall be maintained at all cross-gutters. The size of commonly available pipeline components installed (i.e., fire hydrant burys) will have to be considered with respect to pipeline depth. Additionally, the correct slope of pipe shall be maintained.
- Verify that the proper restraints are used. Each field-lok gasket installation shall be witnessed. Verify that all Mega-lug type restraints are properly tightened and that all "twist-off" nuts are removed. Restraint bolts shall be long enough such that threads show past the nuts. Apply bitumastic material in to all bolts and hardware. Never apply bitumastic materials to megalug bolts prior to removing the twist-off nuts. Never apply anything that will interfere with the proper tightening of a megalug restraint bolt.
- Be on the look out for inexperienced personnel engaging in improper installation techniques. The SBMWD requires that only personnel under the supervision of an experienced foreman work on water improvements that will be transferred to the SBMWD. Shut the job down if improper installation techniques are observed.
- Verify that an adequate number of temporary chlorination points and flushing ports exist. All ports shall be within ten feet of all tie-in points. Record the locations of these temporary port saddles for future reference.
- Verify that a valid discharge permit exists prior to discharging any water on or off the site.
- Know how much water it will take to initially fill the line and verify that three times the pipeline volume is flushed through the line prior to disinfecting any

part of the new line. Verify the amount by noting the construction meter reads (before and after) or number of water truck loads.

- Pressure testing prior to disinfecting the line is required per Section 3.0 of SBMWD's Standard Specifications. The pressure test shall be done at 1.5 times the highest working pressure measured in the existing system or anticipated in the new line. During the two hour duration of the test, the amount of leakage shall not exceed the allowable amount. Calculate the allowable leakage amount prior to the test. The amount of water introduced to the new line during the test shall be measured with an approved meter, or preferably with a fixed amount equal to the amount of allowable leakage in a container. The pipeline contractor shall be encouraged to do their own pressure pretest to identify and repair any leaks in the new line. Pay attention to what type of repairs are done, how many, how long it takes to prepare the line for the actual pressure test, etc.
- Consult with SBMWD Water Quality personnel with regard to any and all disinfection issues of the water improvement work.
- Test plates or physical disconnects shall remain in place until favorable BACT results are obtained. Gain permission to remove the plates from the SBMWD Principal Engineer. If a physical disconnect is used, likewise seek permission for the installation of the appropriate tie-in fittings/piping. Always verify that any new piping or fittings are properly disinfected. Consult with SBMWD Water Quality on acceptable swabbing techniques.
- Obtain rough draft field compaction test reports. Note where testing personnel have taken samples, if possible, comparing these notes with the reports. Also verify rough draft reports against final draft reports.
- Verify valve can alignment. Easy access with a gate valve key is required. Access during all phases of

construction is desirable since these valves will need to be accessible immediately after inevitable damage to the new line occurs.

- Upon the final connection of the new line with the existing distribution system and after initial paving (but prior to the final paving "lift"), gate valve can alignment shall be checked again and all gate valve cans shall be easily accessible (exposed). If there will be minimal impact to adjacent construction activities, it may be a good time to verify that each of the gate valves are fully open prior to vigorously flushing each fire hydrant (4-inch diffuser, momentarily wide open).
- Testing each air release valve requires that the lateral supplying the valve be shut down, the body of the valve emptied of water, then refilled. Verify that the air release valve releases air and holds water without leakage. Then verify that the supply valve is fully open and accessible.

The "Inspection Checklist" is a nonexhaustive list. A project is likely to have more criteria than is listed. Therefore, additional notes and documentation of the work will be required.