

## CHAPTER 7 WATER SYSTEM STANDARDS

### 7.1 SCOPE

Water pipelines and appurtenances shall be provided as shown on the plans and as specified herein. Clearing, grubbing, trench excavation and backfill, pipe material, fire hydrants, valves, cutting and replacing pavement, and removing and replacing sidewalk shall be as specified in other chapters. All applicable provisions shall be binding upon work covered in this section.

### 7.2 WATER SYSTEM DESIGN GUIDELINES:

These guidelines are based on Federal, State, and local health requirements and BJWSA design criteria. Design Criteria not indicated herein shall comply with "Ten State Standards" where applicable. All installations shall meet quality standards of the South Carolina Department of Health and Environmental Control (SCDHEC).

#### A. Water System Design Criteria:

1. Distribution Main Size: Minimum 4" diameter unless otherwise approved by the AUTHORITY. Water mains providing fire service shall be a minimum of 6" diameter.
2. Sizing of Lines: For pipelines 6" and larger, sizes shall be based on either 1/5<sup>th</sup> the instantaneous maximum flow plus the fire flow or maximum instantaneous demand, which ever is greater. The minimum design fire flow in the BJWSA system shall be 1,000 GPM with a minimum residual pressure of 20 PSI. For pipe sizes 4" and smaller, sizes shall be based on either 1/5<sup>th</sup> the instantaneous maximum flow plus the blow off flow or maximum instantaneous demand, which ever is greater.
3. Valves: Provide three (3) valves for a tee intersection, four (4) valves for a cross intersection. Sufficient valves shall be provided on water mains so that public inconvenience and sanitary hazards will be minimized during repairs. Valves should be located at not more than 500 FT intervals in commercial areas and at not more than one block or 800 FT intervals in residential areas. Valves on transmission mains and rural distribution mains shall be installed in intervals no greater than 2000 ft. Valves should be placed to minimize the number of BJWSA customers out of service due to a main break or any other maintenance operation. The AUTHORITY reserves the right to require additional valves if it is deemed in the best interest of current and future BJWSA customers.
4. Dead ends: Dead ends shall be minimized by designing mains so they are looped and interconnected at intersections. The AUTHORITY reserves the right to reject any dead end pipeline greater than 4" diameter if the possibility exists for stagnation of water due to non-use. The maximum length of 4" water pipelines shall be 1000 FT.

B. Water Pipeline Considerations: All materials and products shall meet Made in America Criteria. Materials not meeting this requirement shall only be acceptable with prior written approval from the AUTHORITY. Natural rubber or other materials, which are capable of supporting microbiological growth, may not be used in any appurtenance in direct contact with potable water. Water mains shall be located out of contaminated areas, unless using pipe materials that will protect (i.e. DIP with chemical resistant gaskets.) Reroute line if possible.

C. Waterlines 4" through 10" may be DIP or PVC. All fittings shall be DIP. Pipe Sizes of 1-1/4", 1-1/2", 2-1/2", and 3" are not approved for installation in BJWSA systems. 1" and 2" pipe shall only be approved for service taps. Asbestos cement, concrete and steel piping is not allowed. Refer to Chapter 6: Pipeline Materials and Appurtenances for relevant

material specifications.

### **7.3 FIRE HYDRANTS AND POST TYPE FLUSHING HYDRANTS:**

- A. General: Fire hydrants shall be provided as shown on the plans and as specified herein. Fire hydrants shall only be installed on 6" and larger pipelines capable of supporting fire flows of 1,000 GPM in addition to 1/5 maximum instantaneous demand. All pipelines 6" and larger shall be terminated with a fire hydrant for flushing purposes. 4" pipelines shall be terminated with a post type flushing hydrant with a single 2½" nozzle. All hydrants shall be equipped with an isolation valve to allow for servicing without interruption of system flows. All potable water appurtenances that come in contact with potable water shall bear the National Sanitation Foundation (NSF) seal of approval stating compliance with ANSI/NSF Standard 61. Post type hydrants shall not be used to support or provide fire flows.
- B. Materials: Shop drawings and related data shall be submitted electronically to the ENGINEER for review.
1. Fire Hydrants shall be the cast iron, compression type, opening against pressure, and shall conform to ANSI/AWWA C502. Hydrants shall have a minimum 6" restrained mechanical joint connections with a minimum 5-1/4" main valve. Each fire hydrant shall have two 2-1/2" hose nozzles and one 4-1/2" pumper nozzle. Post type flushing hydrant shall be equipped with a single 2-1/2" nozzle. Hose connections shall have NST threads and comply with ANSI B26, but will not have chains attaching the caps to the upper barrel. Barrel lengths shall be for a 3-1/2 FT bury, except where other lengths are necessitated by the hydrant location and approved by BJWSA. Threads and operating nuts shall be identical to that of existing hydrants on the system. Refer to Chapter 13 for a list of approved manufacturers.
  2. Hydrants shall be furnished with an O-ring sealed reservoir located in the bonnet so that all threaded and bearing surfaces are automatically lubricated when the hydrant is operated. Hydrant nozzles shall be O-ring sealed, threaded in place, and retained by stainless steel set screws or clips. Hydrant shall have a bronze seat ring that threads into a bronze drain ring. All working parts shall be removable without disconnecting the hydrant.
  3. Hydrants shall be furnished with a breakable feature designed to break cleanly upon impact and consisting of a two-part breakable safety flange or breakable lugs with a breakable stem coupling.
  4. All retaining bolts and hardware shall be stainless steel.
    - Above ground may be 304, 410, or 316
    - Below ground shall be 410 or 316
  5. All bronze or brass internal working parts in contact with service water shall be a maximum of 16% in zinc content and 79% minimum in copper.
  6. EPDM rubber shall be provided on hydrant main valves.
  7. Interior coating of shoe and main valve shall be two part thermosetting or fusion bonded epoxy coated, holiday-free to a minimum thickness of 4 mil, and conforming to "AWWA C550.
  8. Exterior casting shall indicate type, main valve size, design, date of manufacture, and location of manufacture.
  9. Opening direction (rotate clockwise or counterclockwise) shall be determined by the local fire department.

10. Exterior coating shall be factory coated and based on the opening direction as determined by the local fire department.
  - a) Hydrants which open counterclockwise or left shall be painted silver (Sherwin-Williams – Silver Bright Code – B596511) with red (Sherwin-Williams – Steel Master line #9500 Code – B56R300) bonnet and nozzle caps. Generally, such hydrants are located in the City of Beaufort, Town of Port Royal, Military Bases, and Town of Hardeeville areas.
  - b) Hydrants which open clockwise or right shall be painted Safety Yellow (Sherwin-Williams—Steel Master line #9500 Code- Safety Yellow B56Y300). Generally, these hydrants are located in areas outside the City of Beaufort, Town of Port Royal, Military Bases, and Town of Hardeeville.
  - c) Developer may choose a different fire hydrant color if developer maintains fire hydrant, and color is approved with BJWSA.
11. Post hydrants painted white and open counterclockwise.
12. All fire hydrant installations on paved roadways shall be provided with industry standard “blue hydrant reflector” installed in the center of the closest travel lane. Reflectors shall be SCDOT approved.
13. Refer to Chapter 13 for a list of approved manufacturers.

C. Installation:

1. Fire hydrants shall, in general, be set well back of the curb or ditch line at the property line, with the break ring approximately 2” above finished grade or pavement elevation.
2. Fire hydrants shall not be lifted in a manner as to damage the factory-applied coatings. Fire hydrants damaged during installation shall be rejected.
3. Each hydrant shall be connected to an individual hydrant gate valve attached to a hydrant tee on the main line. Hydrants shall be restrained, as specified in Chapter 7. Mechanical joint restraints shall be used on all fittings. Restraint rods or thrust blocking shall not be used unless approved by the AUTHORITY.
4. Pipeline from hydrant tee and gate valve assembly to fire hydrant shall be a minimum of 6-inch diameter and constructed of ductile iron.
5. A minimum of 2 cubic feet of crushed stone shall be placed under and around the bottom of each hydrant to facilitate drainage. Crushed stone for the hydrant foundation shall be #57 stone.
6. Hydrant drains shall not be connected to or installed within 10 feet of sanitary sewer systems.

#### **7.4 POTABLE WATER SERVICE CONNECTIONS:**

- A. General: Water service connections shall include tapping the main line and providing all saddles, corporation stops, fittings, piping, curb stops, meters, meter boxes and other materials required for proper installation. Maximum length of 1” service lines shall be 100 FT.
- B. Material: All material and products must comply with AWWA Section C and shall meet Made in America Criteria. Shop drawings, catalog cuts and related data for service pipe, and appurtenances shall be submitted electronically to the ENGINEER for review.
  1. Service Saddles: Service saddles shall comply with all applicable parts of ANSI/AWWA C800. Service saddles shall have fusion bond epoxy or nylon coated ductile iron body meeting the requirements of ASTM A395 with 304 stainless steel straps. Service saddles on mains greater than 8” and on 2” services shall have a minimum of 4 bolts. Seal shall consist of a nitrile o-ring gasket securely affixed to the

- body. 2" service outlets shall be tapped with AWWA iron pipe thread (FIPT). 1" outlets shall be tapped with CC threads. Refer to Chapter 13 for a list of approved manufacturers.
2. Taps: Tap diameter shall be within 1/8 inch of exiting pipe diameter.
  3. Service Termination Fitting: Service termination fitting shall allow for flushing and withstand pressure test.
  4. Service Pipe: Service pipe shall be flexible high density polyethylene PE-3408. 1" service tubing shall be iron pipe size (IPS – ID controlled) SIDR rated conforming to ASTM D2239. 2" service tubing shall be iron pipe size (IPS – OD Controlled) conforming to ASTM D-3035-SDR rated. Both size pipes shall be designated for 200 PSI. **Well pipe shall not be used.** Service pipe shall bear the manufacturer's name, pipe size, ASTM specification, NSF approval, working pressure and production code; letters shall be at least 3/16-inch high and repeated on the pipe at 24" intervals. Pipe shall be coiled and suitably packaged for protection during shipment, handling, and storage. Packages shall be labeled with the manufacturer's name, NSF seal, pipe size, coil length and part number. Service pipe to 1" and 2" shall be blue in color or designated with a longitudinal blue strip. Refer to Chapter 13 for a list of approved manufacturers.
  5. Meter Boxes: Meter Boxes shall be at the discretion of BJWSA. Refer to Chapter 13 for a list of approved manufacturers.
  6. Backflow Preventers: Dual check valve backflow devices for residential meter installation shall be provided in accordance with Chapter 13.
  7. Bypasses: Meters 3" and larger shall have a bypass line. 2" commercial meters shall have a bypass line if deemed necessary by BJWSA.
- C. Installation: Service connections shall be installed at locations as designated by the AUTHORITY. Service lines shall have a minimum of 36" cover, which shall reduce to 12" at point of connection to the meter 1-FT outside the property line. A 1/2" x 3 FT long steel rod shall be driven into the ground at each service with 1 foot protruding out the ground and encased with 24" of blue PVC sleeve. The locations and measurements of services from lot corners must appear on record drawings. Where curb and gutter storm drainage is installed in new subdivisions, each service location shall be designated by a curb marking (consisting of a minimum 3" tall "W") located perpendicular to the service location. Curb marking shall be embossed in the curb at time of installation of the curbing.
1. Taps: Appropriate size taps shall be made on the distribution line. A tapping saddle shall be used on all plastic pipe. A corporation stop, with the proper bend and pipe adapter, shall be installed in the tap.
  2. Service Pipe: Each service shall have a separate service connection, and shall run perpendicular to the roadway to its termination. Service pipe shall be cut to the required length and properly laid in the service ditch. Adequate provisions shall be made to protect against expansion and contraction. Locator wire shall be wrapped around service pipe and terminate above the ground being wrapped around locator rod. Services shall terminate in a HDPE by IPT adapter and valve.
    - a) 1" service pipe shall be connected to the service termination fitting adapter.
    - b) 2" service pipe shall be connected via a PE x male IPS grip joint or compression adapter to a 2" iron body gate valve tap off the distribution main.
  3. Meter Box with integral curb stop and ball valve (PVC Schedule 40) shall be connected to each service pipe. Meter box shall be properly installed by a utility contractor approved by the Authority and adjusted so that the top is flush with final grade. Meter

and backflow assembly shall be installed by the AUTHORITY. A brass nipple shall be used between the Meter box and the ball valve. A turf box shall be properly installed over ball valve so that top is level with the final grade.

## **7.5 WATER PIPELINE INSTALLATION:**

Piping and appurtenances shall be installed in accordance with applicable AWWA Codes, best practices, manufacturer's instructions, and ENGINEER's direction. Where the pipeline crosses under or is installed on highway or railroad right-of-way, the work shall be done in accordance with requirements specified in other sections.

- A. Locations: Piping and appurtenances shall be installed at the locations shown on the plans and to the position, alignment, and grade shown. Prior to beginning work at any location, the CONTRACTOR shall consult with the AUTHORITY and ENGINEER to determine that all rights-of-way, permits, and other legalities are in order. CONTRACTOR shall familiarize himself with all conditions and/or limitations of such rights-of-way or permits, and shall fully comply with all requirements. All work shall be confined to rights-of-way or permit limits and any encroachment beyond such limits shall be the CONTRACTOR's liability.
- B. Installation of Pipe and Appurtenances: Earthwork along pipelines shall be as specified in Chapter 2. Trenches for water lines shall follow the contour of the ground so as to provide a minimum cover of 36" and a maximum cover of 60", unless otherwise noted. Pipelines installed under berms, hardscaped areas, decorative signs, or fences shall be installed in casing as specified in Chapter 5 for a distance of 5' beyond the area in question. Where allowed by the AUTHORITY, pipe and appurtenances shall be hauled to the work site and distributed neatly along the trench prior to laying. Pipe shall be carefully handled to prevent damage by using mechanical hoists or other approved methods. All damaged pipe and appurtenances shall be rejected and removed from the work site. Installation shall proceed as follows:
  1. Pipe and appurtenances shall be kept clean and open ends securely plugged when pipe laying is not in progress. The inside of pipe, bells and spigots shall be thoroughly inspected and cleaned prior to lowering into the ditch. Care shall be exercised after the pipe is in place to prevent dirt or other extraneous material from getting into the pipe, bells, and spigots.
  2. Spigots shall be seated in bells per manufacturers instructions and the pipe shall be uniformly bedded on the bottom of the trench for its entire length, with bells laying in previously dug bell holes sufficiently large to allow for proper bedding and jointing. Pipe shall be cut where necessary. After jointing, a reasonable amount of deflection may be made in the joint. Such deflection shall not exceed 50% of the maximum allowable amount recommended by the manufacturer of the pipe.
  3. Pipe on piers or supported from bridge shall be ductile iron unless otherwise noted, and shall be properly installed in accordance with the details shown on the plans. Pipe shall be carefully placed in position to the required line and grade. Pipe shall be adequately supported and anchored, accessible for repair or replacement, and protected from damage and freezing if a freezing risk exists. Joints shall be flanged or restrained mechanical joints unless otherwise noted, and shall be watertight and trouble-free. All fittings and connections, including transition pieces, shall be provided as required for a complete installation. All hangers, supports, straps, bracing, anchors, and other appurtenances shall be provided as detailed or required for proper alignment and support of the pipe.
  4. River crossing pipe shall be laid as shown on the plans. Trenching shall be as shown and shall produce a suitable bearing surface for the pipe throughout the length of the

trench. After pipe laying has been completed, the trench shall be backfilled.

Installation of river crossing pipe shall proceed as follows:

- a) Concrete anchor collars, where approved, shall be constructed in accordance with the plans.
  - b) Appropriate end of the run fittings shall be provided at each end of the river-crossing run to mate with the pipe approaching and leaving the river.
  - c) A minimum cover of 48" shall be provided over the pipe. When crossing water courses that are greater than 15 FT in width, the following shall be provided:
    - i) The pipe shall be ductile iron of special construction having flexible watertight joints or fuse butt-welded polyethylene with concrete anti-flotation collars. DIP shall be used for any lines being installed in rock.
    - ii) Valves shall be provided at both ends of the water crossing so that the section can be isolated for testing or repair. The valves shall be easily accessible and not subject to flooding.
    - iii) Adequately sized blow-offs shall be provided downstream of the source to allow for flushing and sampling.
    - iv) Permanent taps shall be made on each side of the valve on the source side to allow insertion of a small meter to determine leakage and for sampling purposes.
  - d) Refer to Chapter 5, for installation procedures for drilling, boring and jacking or water mains.
5. Fittings, valves, fire hydrants and other appurtenances shall be installed where shown on the plans or as directed by the ENGINEER. Fittings and hydrants shall be well restrained as specified in Chapter 6.
  6. Flushing hydrants shall be provided where shown on the plans or directed by the ENGINEER and shall be carefully installed in accordance with applicable portions of these specifications. All pipelines shall be provided with a readily accessible means of flushing at a minimum velocity of 2.5 FPS while maintaining a minimum pressure of 20 PSI on lines with fire flow and 25 PSI on lines without fire flow. Pipelines 6" and larger shall be flushed via a standard fire hydrant at its termination. Pipelines less than 6" shall be provided with a post type flushing hydrant.
  7. Connections to existing facilities shall be made where shown on the plans or where directed by the ENGINEER. All connections to existing system shall be performed in the presence of the AUTHORITY Inspector unless prior written approval is granted. The CONTRACTOR must make arrangements with THE AUTHORITY to install a jumper and meter at one end of each connection to existing system. Under no circumstances shall the interconnecting valve be opened. Only AUTHORITY personnel are authorized to open valves between existing systems and non-approved systems. **Violation of this policy will result in fines or criminal prosecution or both.** Connections shall be made with tapping sleeves and valves, except where other type connections are specifically shown.
  8. Waterlines shall be installed in accordance with "State Primary Drinking Water Regulations" Section R.61-58.4(D)(12). Where the new water line crosses under or over a sewer forcemain, sanitary sewer, or storm sewer, the waterline shall be a full joint of ductile iron pipe centered on the sewer. Whenever possible, the water main shall be located above the sewer line. Water mains crossing sewers shall be laid to provide a minimum of 18 inches between the outside of the water main and the outside of the sewer. During replacement of sewer pipe, all work shall be performed in a manner to

- cause the least interference with the operation of existing sewer lines. CONTRACTOR shall take measures to insure that at no time will raw sewage be discharged on the premises.
9. Water mains shall be laid:
    - a) At least 10 FT horizontally from any force main, sanitary sewer or sewer manhole, or
    - b) At least 18 inches above and 3' horizontally and in a separate trench from any, sanitary sewer, or sewer manhole.
    - c) At least 3' horizontally from Storm Drain structures
    - d) At least 5' horizontally from Gas Mains and underground electric utilities.
    - e) The distance shall be measured edge-to-edge.
  10. Potable water lines shall not be laid within 25 FT of any wastewater tile field or spray field.
  11. Water lines shall not pass through storm drain structures unless approved by the Authority.
  12. High point in the water mains shall be noted on the plans and air release valves shall be installed at these points. If obstructions are encountered which would require a change in the grade of the work, the AUTHORITY shall be notified immediately.
  13. Where angular deflections from a straight line or grade are made necessary by vertical or horizontal curves of offsets in the pipe, the deflection shall not exceed 50% of the manufacturers recommendation.
  14. Pipes shall be laid with the bell facing the direction of laying. For lines of appreciable grade, the joints shall be facing upgrade.
  15. Mechanical thrust restraints shall be applied on all pressure pipelines 4" in diameter or larger at all bends, tees, valves, hydrants, and plugs. Concrete blocking shall only be used if mechanical thrust restraints are not feasible. Use of concrete thrust blocking will require prior approval by the AUTHORITY.
  16. Hatch covers and vaults for manholes, pits, or vaults containing valves, blow-offs, meters, pressure reducing valves, or other appurtenances in the distribution system shall drain to the surface of the ground where they are not subject to flooding by surface water, or to absorption pits underground. All vaults, pits, etc. shall be sealed or provided with an approved sump pump. Under no circumstances shall sump pumps be connected to storm sewer system.
  17. Backfilling of trenches shall be as specified in Chapter 2.
  18. Cutting and replacing pavement shall be as specified in Chapter 4.
  19. Pipeline marking shall be as specified in this Chapter 6.
- C. Inspection and Acceptance: All work shall be subject to inspection and approval prior to final acceptance and payment.
1. Pressure and Leakage Tests shall be as specified in this Section.
  2. Disinfection of potable water lines shall be as specified in this Section.
  3. Cleanup and site restoration shall be as specified in Chapter 3.
  4. Closeout documentation, including engineer's certification, test results, as-built record drawings, easement and conveyance documents, shall be as specified in the AUTHORITY's Development Policy and Procedures Manual, latest edition.

**7.6 PIPELINE TESTING AND DISINFECTION PROCEDURES:**

The CONTRACTOR shall test all pressure piping as specified herein and as directed by the ENGINEER. Testing shall be conducted so as to minimize interference with the progress of the work.

- A. Hydrostatic Testing of Pipelines: Each pressure pipeline or valved section thereof shall be subjected to hydrostatic testing in accordance with all applicable provisions of AWWA C600 for ductile iron pipe and AWWA C605 for PVC pipe, latest edition.
1. Pressure Test: Unless otherwise specified, pressure lines shall be tested to 1.5 times the working pressure but not less than 150 PSI or greater than pressure rating of pipe based on the lowest point of the section under pressure. Before applying the test pressure, all air, dirt, and foreign matter shall be expelled completely from the line. The test shall be maintained at full pressure for two hours. All damaged or defective pipe, fittings, joints, valves, hydrants and appurtenances discovered after the pressure test shall be repaired or replaced, and the pressure test repeated until satisfactory to the ENGINEER. Pressure gauges on test apparatus shall be a minimum of 4" diameter with a minimum of 1-PSI graduations.
    - a) No leakage will be allowed. Pipeline must maintain test pressure for 2 hours.
    - b) If during the test a pressure drop occurs, the CONTRACTOR shall, at his own expense, locate, and repair all defects until there is no leakage or drop in pressure. All visible leaks shall be repaired regardless of the amount of leakage.
    - c) Water for testing will be furnished by the CONTRACTOR, who shall furnish the test pump, measuring devices and all necessary pipe or hose extensions or transportation to the point of use, and shall exercise care in the use of water.
    - d) All valves within the test section shall be exercised during the test period.
- B. Disinfection Procedures: Before placing in service, each potable water line and each tank or other structure utilized for potable water storage shall be disinfected by the CONTRACTOR in accordance with AWWA C651 and as specified herein and as directed by the ENGINEER. All chemicals or products added to the potable water supply shall be third party certified as meeting the specification of ANSI/NSF Standard 60.
1. Pipeline Disinfection: All pressure and leakage tests shall be completed prior to disinfection. When flushing, the CONTRACTOR shall make arrangements with the AUTHORITY to meter the water used. The CONTRACTOR shall be invoiced the standing wholesale rate for the amount used. The CONTRACTOR shall furnish all chemicals required for disinfection, and all necessary pipe or hose extensions or transportation to the point of use, and shall exercise care in the use of water. Disposal of water after disinfection shall be by methods acceptable to the ENGINEER.
  2. Prior to disinfection, water lines shall be thoroughly flushed at a minimum velocity of 2.5 ft/sec to remove dirt, sediment, and other foreign matter. At the CONTRACTOR's option, water lines may be disinfected in sections isolated by means of valves or other approved methods.
  3. All new potable water lines shall be thoroughly disinfected by means of sodium hypochlorite or chlorine solutions. Water from the existing distribution system shall be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The chlorine solution shall be added and dispersed in concentrations sufficient to produce a chlorine residual of at least 50 mg/l (PPM) throughout the system. The chlorine solution shall remain in the system for a period of 24 hours. At the end of the 24 hour period, the treated water in the system shall have a chlorine residual of at least 10 mg/l (PPM), or the disinfection process shall be repeated until



- results are satisfactory. After disinfection, the system shall be flushed with fresh water from an approved source until the chlorine solution is dispelled.
4. After disinfection is completed and before the water line is placed in service, DHEC certified lab personnel shall collect bacteriological samples from locations satisfactory to and plumbed in a manner satisfactory to DHEC. At least two (2) samples shall be taken. The total number of samples depends on the amount and layout of the pipe. All dead end lines shall be tested and long pipeline segments shall be sampled at a maximum distance of 1200 LF along its length to obtain a representative analysis of its water quality. Chlorine residuals must be measured and recorded at the time the sample is taken and results furnished to the ENGINEER for submission to SCDHEC. The contractor is responsible to flush lines until chlorine is present before sample is taken. All cost associated with sample collection and testing shall be paid by the CONTRACTOR.
    - a) Bacteriological Sampling:
      - i) Samples must be collected at least twenty-four (24) hours apart and must show the water line to be absent of total coliform bacteria.
      - ii) The chlorine residual must also be measured and reported. If the membrane filter method of analysis is used for the coliform analysis, non-coliform growth must also be reported. If the non-coliform growth is greater than eighty (80) colonies per one hundred (100) milliliters, the sample result is invalid and must be repeated.
  5. Disinfecting Tanks and Other Structures: Painting of tanks and structures shall be completed. Prior to disinfection, tanks and structures shall be thoroughly flushed or cleaned to remove dirt, sediment and other foreign matter.
    - a) Each tank shall be disinfected using either one of the following methods:
      - i) Contact with a chlorine solution of concentration not less than 50 mg/l (or PPM) for a minimum contact period of 24 hours.
      - ii) A thorough wetting of the surface to be disinfected by means of brush or spray application of a chlorine solution of concentration not less than 200 mg/l (or PPM) for a minimum contact time of 2 hours.
    - b) After disinfection is completed and before the tank is placed into service, at least two satisfactory bacteriological samples shall be collected 24 hours apart from the tank and tested by BJWSA or a state approved private laboratory. Samples shall be collected and tested at the CONTRACTOR's expense.
  6. Bacteriological Laboratory Test: Only personnel from a SCDHEC certified lab shall be used to collect bacteriological samples. The lab collecting the sample shall perform the required SCDHEC testing and reporting and shall be SCDHEC certified.
  7. Removal of Temporary Connections: The Contractor is responsible for removal of all construction jumpers and sampling points. BJWSA inspector is to witness the removal and plugging of temporary connection points.
    - a) Jumper removal includes the installation of a brass plug/cap on the tapping valve to the existing system and the installation of brass plug into the saddle on the new line.
    - b) Sampling points that are not service points shall be removed. Install brass plug in the tapping saddle.

*END OF SECTION*