

San Antonio Water System Standard Specifications for Construction

ITEM NO. 847

Disinfection

- 847.1 DESCRIPTION:** This item shall consist of disinfection of new mains utilizing Calcium Hypochlorite in accordance with these specifications. Machine chlorination shall be performed by SAWS as specified in the contract documents. The Contractor is required to provide all appurtenances to the main(s) to allow machine chlorination.
- 847.2 REFERENCED STANDARDS:** Reference standards cited in this Specification Item No. 847 refer to the current reference standard published at the time of the latest revision date.
1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
 2. City of San Antonio (COSA) Standard Specification for Construction
 3. Texas Commission of Environmental Quality (TCEQ)
 - a. Chapter 210 Use of Reclaim Water
 - b. Chapter 290 Public Water Systems
 - c. Chapter 213 Edwards Aquifer.
 4. American Water Works Association (AWWA)
 - a. AWWA C 651 - Standard for Disinfecting Water Mains
- 847.3 SUBMITTALS:** All submittals shall be in accordance with most recent version of SAWS's General Conditions requirements. Contractor shall submit manufacturer's product data, instructions, recommendations, shop drawing, and certifications. All submittals shall be in accordance with Engineer's requirements and submittals shall be approved prior to delivery.
- 847.4 MATERIALS:** The materials for disinfection shall conform to the appropriate specifications contained within the latest revision of SAWS' Material Specification Item No. 100-20.
- 847.5 CONSTRUCTION:** After the new mains have successfully passed the pressure test specified in Specification Item No. 841, "Hydrostatic Testing Operations," the SAWS will disinfect only those mains shown in the contract documents or otherwise indicated as "Machine Chlorination by SAWS," and in accordance with the Drawing DD-847 Drawing Series. This disinfection shall include: chlorination, flushing, and placing the mains into service. All other disinfection requirements shall be accomplished by the Contractor. Disinfection by the Contractor is limited to sections of main less than 800 feet in length.
1. Operation of Valves: During and after disinfection of mains less than or equal to 16 inches in diameter, the Contractor shall be notified by the Inspector a minimum 2 work days in advance to enable the Contractor to have a competent representative present whenever valves are to be operated that will affect the pressure in any part of the work for which the Contractor is responsible.
 2. Contractor's Personnel and Equipment: The Contractor shall supply labor and equipment necessary to make all excavations required for chlorination, equipment connections,

San Antonio Water System Standard Specifications for Construction

- subsequent flushing, and placing the mains into service.
3. Safeguarding and Backfilling Open Holes: The Contractor shall be responsible for safeguarding any open holes excavated or left open for flushing and disinfection purposes. Following completion of disinfection, the Contractor shall backfill holes in accordance with appropriate provisions of Specification Item No. 804, "Excavation, Trenching and Backfill."
 - a. If an open hole is unsafe and does not have proper trench protection, SAWS Chlorination personnel will not disinfect the required pipe and related appurtenances until acceptable trench protection is provided.
 4. General: Mains shall be disinfected with dry 70% Calcium Hypochlorite where shown in the contract documents or as directed by the Inspector, and shall not exceed a total length of 800 feet. This method of disinfection will also be followed for main repairs. The Contractor shall utilize all appropriate safety measures to protect his personnel during disinfection operations.
 5. Dosage: The Contractor shall disinfect the new or replaced mains with dry 70% Calcium Hypochlorite furnished by the Contractor. Sufficient Calcium Hypochlorite shall be used to obtain a minimum chlorine concentration of 50 ppm. Table 847-1, "Chlorine Dosage," is included for the convenience of the Contractor.
 6. Filling the Main: Those sections of main to which the dry HTH has been applied shall be filled slowly to allow for the even distribution of the disinfecting material. The manipulation of valves shall be under the supervision of SAWS Inspector in accordance with Specification Item No. 847, "Operation of Valves."
 7. Holding Time: The length of time that sections of main disinfected with HTH shall be allowed to stand undisturbed will depend upon the particular job and Texas Commission on Environmental Quality (TCEQ) criteria.
 - a. When circumstances permit a shutdown with no customers out of service, the required minimum detention time will be 24 hours with a 50 ppm chlorine dosage.
 - b. When customers are out of service during a shutdown with no leakage past valves, the required minimum detention time will be 3 hours and the chlorine dosage will be 300 ppm.
 - c. When customers are out of service with some leakage past valves, the required minimum detention time will be 30 minutes with a 500 ppm chlorine dosage.
 8. Flushing: Following the expiration of the specified holding time, the treated section of main shall be flushed thoroughly by the Contractor in accordance with the applicable provisions of Specification Item No. 841, "Hydrostatic Testing Operations." Flushing shall continue until no chlorine remains detectable by taste or odor or until the chlorine residual is less than 0.3 ppm.
 9. The Contractor must make provisions for the disposal and runoff of the flushing operations in order to minimize erosion or impact to residents.
 10. If flushing requires entrance into water way, dechlorination must be performed.
 11. Preventing Reverse Flow: Valves shall be manipulated so that the strong chlorine solution in the line being treated will be flushed out of the main and will not flow back into the line supplying the water.
 12. Supervision. All disinfection of mains shall be done under the general supervision of

San Antonio Water System Standard Specifications for Construction

the SAWS' Inspector.

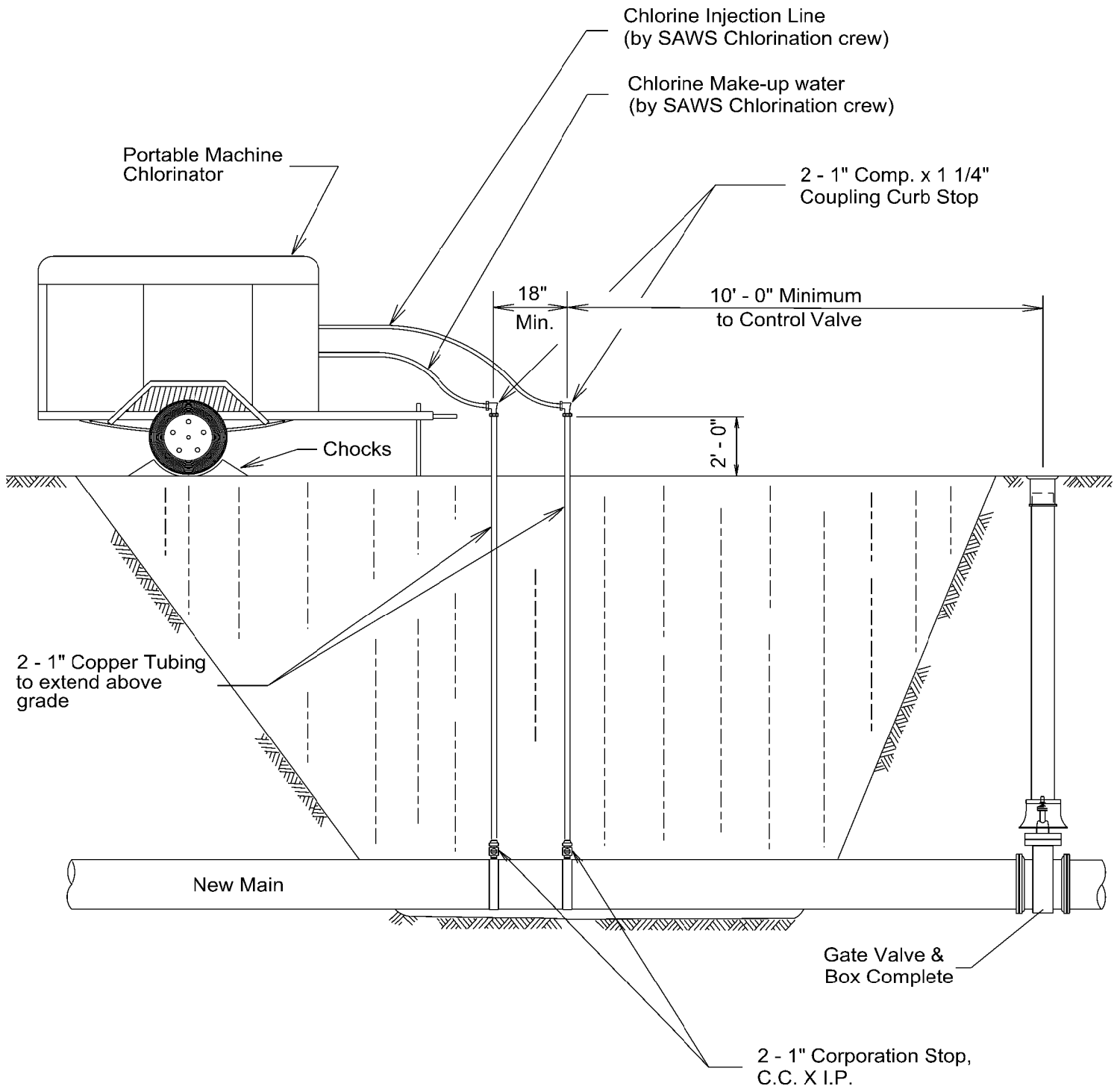
13. **Additional Treatment:** Should the new main fail to meet minimum public health standards for bacteriological quality after flushing, further treatment shall be as directed by the Inspector. If further disinfection is required, chlorination shall be done in accordance with the SAWS guidelines for Disinfection of New Mains Utilizing Machine Chlorination at no additional cost to SAWS. In no case, however, shall the new line be acceptable as complete and satisfactory until the bacteriological quality of the water taken from the main meets the standards of the TCEQ.

847.6 MEASUREMENT: Disinfection operations are considered subsidiary to the work and no separate measurement will be made by the Contractor for this work.

847.7 PAYMENT: Disinfection operations are considered subsidiary to the work and no separate payment will be made to the Contractor for this work. The Contractor is required to provide all appurtenances to the pipe to allow for machine chlorination at no additional cost or separate pay item.

TABLE 847-1	
CHLORINE DOSAGE	
Diameter of Pipe in Inches	To Obtain 50 ppm Chlorine Dosage
6	0.0138
8	0.0233
10	0.0400
12	0.0523
14	0.0708
16	0.0934
18	0.1175
20	0.1455
24	0.208
30	0.327
36	0.469
42	0.637
48	0.833
54	1.0575
60	1.308

-End of Specification-



Note:
2 - 1 1/4" Solid Cap, Thd. to be installed on Corporation Stop after chlorination