

Design Guidelines
SAWS Water Work Joint Bid Projects
Governmental Engineering Department
June 2008

SAWS is providing this information to the Consultant to provide some assistance in preparing SAWS plans. The Consultant is ultimately responsible for the design of the project and should use this information on an as needed basis.

I. General Design Guidelines for Water Mains, Service Lines, and Meter Box Adjustments:

- A. SAWS will determine the replacement of existing water mains. SAWS will also determine if any installation of new water mains will be included with the joint bid project.
- B. The Consultant shall determine if existing water mains are in conflict with the proposed storm drain facilities, street work, or other utilities and will provide recommendation on adjustment of the water main. .
 - 1. Existing water mains under the pavement can be considered for adjustment if the existing top of pipe elevation of the water main is less than 30 inches below the proposed subgrade elevation of proposed roadways.
 - 2. Existing water mains in the parkway can be considered for adjustment if the existing top of pipe elevation of the water main is less than 30 inches below the proposed driveway or parkway proposed final grade.
 - 3. Existing top of pipe elevation can be determined by the following:

Gate Valves

When gate valves are present, calculate the top of pipe elevation by adding the field-measured existing valve stem depth below the existing grade and the stem length. .

Valve stem lengths:

Valve size (inches)	6	8	10	12	16	20	24	30
Valve stem length (<1963) feet	1.51	1.84	2.22	2.50	3.25	3.95	4.65	5.54
Valve stem length (=> 1963) feet	1.26	1.51	1.79	2.00	2.58	3.31	3.63	4.40

Butterfly Valves

For butterfly valves, the location of operating nut may not be considered as Top of Pipe (TOP) elevation Contact the valve manufacture for specific dimensions.

Design Guidelines
SAWS Water Work Joint Bid Projects
Governmental Engineering Department
June 2008

4. The Consultant shall request in writing a pothole action plan of existing water facilities to identify potential conflict with proposed design work. If SAWS determines that this work will be done by SAWS forces SAWS will coordinate any excavation if necessary. Consultant must take into consideration that potholing done by SAWS crews will take a minimum of four weeks. Therefore, pothole request should be done in advance to avoid any delays in the design schedule.
 5. Consultant can also submit a proposal to SAWS and obtain a sub consultant to perform the potholing and surveying required for potholes.
 6. Water main extension will require SAWS approval.
 7. SAWS water block maps are for information purposes only. Consultant to verify depth and location of existing water mains using surface features available (gate valves or butterfly valves).
 8. Visit SAWS web page at www.saws.org for the latest specification and revisions for water and sanitary sewer construction and Standard details.
- C. General Design Guideline for proposed water main work.
1. Proposed water mains alignments must comply with TCEQ, SAWS rules and Regulations and any other governing entity ordinance or codes. These agencies' requirements supersede any of the requirements listed on these guidelines.
 2. Proposed water mains shall not go beyond the project limits of street reconstruction. Approval to construct outside the project limit must be provided in writing from the governing entity (COSA) and SAWS.
 3. Consultant is to recommend pipe material to be used for each project that has been approved by SAWS Standards Committee.

Design Guidelines
SAWS Water Work Joint Bid Projects
Governmental Engineering Department
June 2008

4. Consultant when designing a water main replacement or adjustment must take into consideration maintaining a 3-foot minimum separation distance between the outside diameter of new water main and the outside diameter of the existing water main. PLEASE note outside diameter not center of pipe to center of pipe.
5. Consultant should also consider the location of the existing or proposed power poles when determining an alignment for the proposed water main. Consultant shall also consider existing fences etc at the ROW and to make sure that adequate distance is available for the construction of the water main.
6. Consultant shall design plans that can be constructed without a need for a temporary construction easement. If a temporary construction easement is required consultant to notify SAWS early in the design phase so that adequate time is available for real estate acquisition and the necessary plat and field notes.
7. Consultant shall design the proposed water mains under channels, rivers, creeks or multibox drainage structures to include a steel casing.
8. Consultant to perform a scouring analysis if proposing a water main crossing a river, creeks etc.. to determine the adequate proposed depth of water main.
9. Whenever possible, the new water main shall be aligned a minimum of 4 feet from the face of curb within the proposed pavement section or in accordance to the governing entity's ordinances or codes.
10. All mains 12 inches or larger are to have the appropriately sized air release valves at the high point of the main. Consultant shall determine the appropriate location and design the size of the air release valve.
11. Same size on size tapping sleeve and valves are not allowed. Use cut-in tees for same size on size mains.
12. A temporary blow-off is required at the end of 25 feet or longer pipe sections.

Design Guidelines
SAWS Water Work Joint Bid Projects
Governmental Engineering Department
June 2008

13. Maintain a 2-foot vertical clearance when the water main crosses under existing and proposed utilities.
14. Steel or RCP Casing shall be utilized where water mains cross under Multi Box Culverts or Large Storm Drain Pipes. Casing sizes shall be in accordance with SAWS Specifications.
15. During the design Consultant must consider the need to maintain constant water service to residential and commercial establishments. Consultant may recommend temporary water main plan or non-standard working hours subject to SAWS approval.
16. Use Fire hydrants at the end of dead end mains instead of permanent blow-offs.
17. Gate valves shall be placed every 1,000 feet per SAWS criteria and at locations necessary to isolate the water distribution system.
18. Water mains that are not part of an interconnecting system must be a minimum, 8-inch water main. The size of this main will be determined by the Consultant and must meet SAWS' Criteria for dead end mains.
19. For High Pressure Zone please see SAWS specification for the appropriate pressure rated pipe.
20. All proposed water mains shall utilize joint restraints.. Plans should show the limits of the restrained system.
21. The location of valves shall be designed so that sections of the main can isolated utilizing the least amount of valves.
22. Consultant to refer to SAWS Rules and Regulations for double valving water main for large services.

Design Guidelines
SAWS Water Work Joint Bid Projects
Governmental Engineering Department
June 2008

- D. Water service lines are installed, relayed, relocated, or replaced as described below.
1. Replace substandard service lines.
 2. Relay long and short service lines when the water main is proposed for replacement.
 3. If the existing water main is under a proposed street reconstruction and is not being replaced, long and short services shall be relayed.
 4. Single lots should be provided with an unmetered $\frac{3}{4}$ -inch single service line.
 5. Two abutting lots in which each lot is 50 feet in width or less can be served with a 1-inch dual service line.
 6. Platted lots 50 feet or wider located within the project limits, presently not serviced, are to be provided with a new unmetered service line.
NOTE: Width of lot measured along the length of the street.
- E. Meter Boxes are to be relocated or replaced (with meter) as described below:
1. From on-site field investigations, existing meter boxes within private property, behind fences, and those that are in conflict with proposed sidewalks, street widening/improvements must be relocated.
 2. A damaged or substandard meter box (i.e., round or plastic) must be replaced with a standard cast iron oval meter box plastic box enclosure to include standard load bearing weights.
 3. Meter boxes shall not be designed to be placed in the driveways.

Design Guidelines
SAWS Water Work Joint Bid Projects
Governmental Engineering Department
June 2008

II. Water Distribution Plan:

The Consultant shall assure that the following criteria are met prior to submitting plans for review: Plans submitted to SAWS must meet all of the SAWS rules and regulations and any of TCEQ rules and regulations that apply to the project.

- A. A SAWS cover sheet with the applicable general water notes, job numbers, location map and any other notes pertinent to the project. The location map must show the project limits.
- B. Estimated quantities on each sheet and a summary quantity sheet on the cover sheet to be submitted with the plans.
- C. SAWS project number shall be shown on all plans.
- D. Plans must show NCB, Block No., Lot No., R.O.W., and addresses.
- E. SAWS legend is located at the lower right-hand corner of each water plan sheet and includes the water block map numbers, section numbers, budget numbers, and job numbers.
- F. The length of the proposed water main is indicated from tie-in to tie-in or matchline to matchline and should be rounded off to the nearest 5-foot increment.
- G. Plans must have match lines that correspond to the proposed mains on other sheets.
- H. Plans must indicate locations of tie-in and call out tie-ins with tie-in notes.
- I. The water service line and meter box adjustments are correctly shown with the appropriate symbol as shown on SAWS legend.

Design Guidelines
SAWS Water Work Joint Bid Projects
Governmental Engineering Department
June 2008

- J. Include in the general notes: “SAWS shall machine chlorinate new water mains” if the water main length is greater than 750 feet. Or, include “Contractor shall chlorinate new mains with HTH” if the water main length is 750 feet or less.

NOTE: The length refers to the length of interconnecting new mains and not necessarily the total length of the new main.

- K. Indicate on the plans “HTH” for sections of mains that will be chlorinated by the contractor.
- L. Show tap numbers and addresses for each corresponding service line on the plans.
- M. Show the address for all vacant lots. SAWS will provide the necessary tap numbers for new unmetered services. (Job numbers as tap numbers will no longer be allowed).
- N. Size of service lines larger than ¾-inch shall be indicated for each service line and the appropriate fitting note called out.
- O. Consultant to submit Change of Service form(s).
- P. Show all property lines, existing and proposed easements, existing and proposed utilities, storm drain facilities.
- Q. Show limits of asphalt work and sidewalk work.

Design Guidelines
SAWS Sanitary Sewer Joint Bid Projects
Governmental Engineering Department
Revised June 2008

- I. General Design Guidelines for Sanitary Sewer Mains, Service Laterals, and Sanitary Sewer Manholes:
 - A. SAWS will determine the replacement of existing sewer mains. SAWS will also determine if any installation of new sewer mains will be included with the joint bid project.
 - B. The Consultant shall determine if existing sewer mains are in conflict with the proposed storm drain facilities, street work, or other utilities and will provide recommendation on adjustment of the sewer main.
 1. If existing sanitary sewer is shallow (less than 3 feet of cover from the top of sewer pipe to the proposed subgrade elevation) then adjustment should be recommended.
 2. If existing sanitary sewer is located under the proposed curb and does not require replacement and is not in conflict with the proposed drainage structures then consultant needs to see if offset manholes can be constructed to avoid the proposed curb and leave the existing sewer in place.
 3. Sanitary sewer main extension will require SAWS approval.
 4. Request for clearing of existing sanitary sewer manhole covers - in order to obtain sanitary sewer inverts shall be requested by the Consultant in writing. Please submit request a minimum of four weeks in advance of when the information is required in order to avoid delays in the design schedule.
 - C. General Design Guidelines for proposed sanitary sewer main.
 1. Proposed sanitary sewer mains alignments must comply with TCEQ, SAWS Rules and Regulations, and any other governing entity ordinance or codes. These agencies' requirements supersede any of the requirements listed on these guidelines.
 2. Curvature of sewer mains are not allowed.
 4. Consultant shall insure that all house laterals can be laid at a minimum of 2% slope without being exposed at subgrade.

Design Guidelines
SAWS Sanitary Sewer Joint Bid Projects
Governmental Engineering Department
Revised June 2008

5. Consultant to determine the type of proposed pipe material that has been approved by SAWS Standards Committee.
 6. Lift stations should comply with TCEQ rules and regulations and meet SAWS Liftstation guidelines as found at SAWS.org. Consultant shall contact TCEQ to obtain information on lift station requirements.
 7. For joint bid projects, proposed sanitary sewer work shall not go beyond the project proposed street reconstruction limits. Approval to construct outside the project limits must be provided in writing from the governing entity and SAWS.
 8. The Consultant is to determine if either an approved adapter or manhole can be utilized when tying a proposed sanitary sewer main into an existing sanitary sewer main at the project limit.
 9. For proposed sewer mains or existing sewer mains that parallel a proposed or existing storm structure, all lateral services shall have a minimum of 2% slope and can not conflict with the existing/proposed storm structures.
 10. Consultant is to field verify the existing sanitary sewer elevations.
- D. Sanitary Sewer laterals shall be installed or replaced as described below:
1. Replace laterals if the sewer main is to be replaced.
 2. Insure all platted lots are provided with a sewer lateral (to the property line).
 3. If sanitary sewer main does not require replacement, check with SAWS contact person to determine if laterals need replacement.
 4. Provide one way cleanout for each service lateral.

Design Guidelines
SAWS Sanitary Sewer Joint Bid Projects
Governmental Engineering Department
Revised June 2008

- E. Proposed and existing sanitary sewer main and laterals are to be protected as follows:
1. Use concrete encasement if there is less than 3 feet of cover between the top of proposed sewer main to the proposed subgrade if sewer main cannot be lowered. Use concrete saddle if there is less than 3 feet of cover between the top of an existing sewer main to the proposed subgrade.
 2. Use concrete encasement if there is less than 2 feet between the outside walls of the proposed sanitary sewer and the storm sewer. Use a concrete saddle or a concrete cradle if there is less than 2 feet between the outside walls of the existing sanitary sewer main and the storm sewer.
- F. Sanitary sewer manholes are replaced, installed, or adjusted as follows:
1. Existing sanitary sewer manholes are to be adjusted/reconstructed/replaced if located within the proposed street reconstruction boundaries.
 2. Install a manhole at the end of a proposed sewer main. (Clean outs are no longer acceptable). Please verify that a manhole can be constructed at the end of the proposed sewer main because it might not be a standard manhole.
 3. Install a manhole at each angle point.
 4. Install a manhole every 400 feet. .
 5. Where applicable, investigate the possibility of eliminating any unnecessary manholes in the proposed line, while meeting the above criteria.

Design Guidelines
SAWS Sanitary Sewer Joint Bid Projects
Governmental Engineering Department
Revised June 2008

II. Sanitary Sewer Plans

The consultant shall insure prior to submitting plans for review the design meets all of TCEQ and SAWS rules and regulations.

- A. A North arrow is shown on all plan sheets.
- C. Plans and Profiles are drawn from low point to high point and left to right
- D. Inverts are shown every 50 feet and in and out flow elevations are shown in the profile view.
- E. Stationing shown at every 50 feet intervals and at each manhole.
- F. Street names, NCB, R.O.W., Block No., Lot Numbers, and Addresses are shown on plan views.
- G. Existing and proposed sanitary sewer, storm sewer, and all other utilities are shown on plan view
- H. Indicate sewer main lengths, slope and distances, flow arrows between manholes on plan and profile sheets.
- I. A SAWS cover sheet with applicable general sanitary sewer notes, job number, and location map showing project limits is required. If Consultant does not have a job number, contact SAWS personnel and a job number will be provided.
- J. Contractor notes and Trench Excavation Safety protection notes shall be shown on each plan sheet.
- K. All proposed manholes shall be noted as watertight except where vented manholes are required by TCEQ.
- L. Show all existing and proposed sanitary sewer easements on plans. Additionally, show all property lines, ROW lines, utility, access, etc., easements on the plans.

Design Guidelines
SAWS Sanitary Sewer Joint Bid Projects
Governmental Engineering Department
Revised June 2008

- M. Show temporary construction easements on plans.
- N. Submit all necessary recorded field notes and any pertinent forms for ROW submittals.
- O. Where the proposed line is to be tied into existing manhole, add a note: "Tie to existing manhole." (No separate pay item).
- P. Whenever a manhole is to be removed, add note: "Remove existing manhole." (No separate pay item.)
- Q. Provide drop manholes when the difference between the inlet and outlet elevations is 30 inches or more and attach a detail to the plan set.
- R. Plans should indicate matchline from one sheet to the next sheet, indicating stationing and sheet number. Example: Matchline Station 5+00 (see Sheet xx of xx).
- S. Provide location of survey benchmarks or monuments.

Design Guidelines
SAWS Sanitary Sewer Joint Bid Projects
Governmental Engineering Department
Revised June 2008

- I. Bid Packages should include the following:
 - A. SAWS proposals (Separate water and sewer proposals.)
 - B. Two-year contractor warranty document is to be added to bid proposal.
 - C. Reference to SAWS specifications and Standard Details
 - D. Special Specifications if necessary
 - E.. Mobilization and Preparation of Right of Way are to be included on bid proposal for water and sewer work.
 - F. Contract Addendum (where applicable).

- II. Payment, and Bid Documents:
 - A. Invoices should be submitted separately, one invoice for water and one invoice for sewer work. Do not combine both water and sewer work in one invoice.

 - B. Invoices should be submitted to SAWS and COSA for review and approval prior to submitting into the COSA Portal System.