

STANDARD SEWER SPECIFICATIONS

SECTION 1 – STANDARD PROVISIONS

1.1 REFERENCES

The following specifications are incorporated into the District's Standard Sewer Specification, referred to herein as District Sewer Specification, unless otherwise indicated herein. Proposed work, materials, and execution shall be in accordance with applicable portions of these documents:

Standard Specification for Sewer & Water Construction in Wisconsin, Fifth Edition, March 1, 1988 with addendum No. 1, January 2, 1992, latest edition, referred to herein as Sewer & Water Specifications.

1.2 INCONSISTENCIES

These standard/special provisions shall govern wherever there is a conflict or discrepancy with the Sewer & Water Specifications.

1.3 ORGANIZATION

The following standard/special provisions of the district Sewer Specification shall amend or supplement requirements of the Sewer & Water Specifications, as applicable. Special provisions are organized to reference specific paragraph numbers of the applicable specification. For example, SW-4.4.1 shall modify Section 4.4.1 of the Sewer & Water Specifications.

1.4 BASIS OF MEASUREMENT AND PAYMENT

For various Bid items, the actual units used may differ from those indicated in the WDOT and Sewer & Water Specifications. For measurement and payment, the units used in the Bid tabulation take precedence over the units indicated in these specifications wherever there is a conflict.

Engineer's projection of quantities as shown in the Bid is approximate and the right is reserved by Owner to increase or decrease said quantities. The projected quantity as shown may be used as a basis for comparing bids.

1.5 WORK INCLUDED

This contract includes furnishing all labor, equipment, tools and materials (except as specified otherwise) for the complete prosecution of the work under this contract. Contractor shall remove pavement as necessary; perform all excavation needed for the work; dewater excavations prior to installation of pipelines and concrete; protect existing improvements against damage from its work; sheet, brace and support the adjoining ground or structures where necessary; provide for drainage of all ground and surface water; provide for erosion control to prevent soil deposition into waterways; provide barricades, flagmen and warning lights; install and test all sewer pipe and appurtenances; backfill and consolidate the trenches and other excavations; restore the

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roadway surface unless otherwise stipulated; remove all surplus materials and repair the site of work; and maintain street and other surfaces over the trench as specified.

Contractor shall also furnish all equipment, tools, labor and materials necessary to remove and replace or repair existing branch connections to sewers and mains.

SECTION 2 – SPECIAL PROVISIONS PART I – GENERAL CONDITIONS

The following sections of Part I of the Sewer & Water Specifications shall apply to this contract: Sections 1.1.1 and 1.2.1 through 1.2.6; 1.3.15 and 1.3.18. All other sections of Part I of the Sewer & Water Specifications shall not apply to this contract.

SW-2.1.1 INTERFERENCE OF UNDERGROUND STRUCTURES

It shall be Contractor's responsibility to verify the locations of all utilities prior to commencing with the construction. It shall also be Contractor's responsibility to protect all existing utilities from damage as a result of its construction operations. Any utility damaged as a result of Contractor's equipment or methods shall be replaced at its expense.

Underground utilities such as watermain, fiber optic lines, gas lines, telephone lines, electric lines, drain tiles, etc. shall be restored to their original condition. At all locations where utilities cross, bedding stone shall be placed under and to the spring line of the utility crossed. Costs for this bedding shall be considered incidental and included in the price bid. The filling below the existing utilities that are exposed at a 1:1 slope are required to be bedding stone.

SW-2.1.2 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

It shall be Contractor's responsibility to verify the locations of all utilities prior to commencing with the construction. It shall also be Contractor's responsibility to protect all existing utilities from damage as a result of its construction operations. Any utility damaged as a result of contractor's equipment or methods shall be replaced at its expense.

SW-2.1.3 REMOVAL OF OBSTRUCTIONS

Contractor shall be responsible for the proper replacement of all damaged street and highway signs and markers at all times during construction. Repair or replacement of signs shall be subject to review of the Engineer and municipal highway departments before final acceptance of the work.

Mailboxes shall be restored to their original locations and heights. During construction, Contractor shall provide temporary mailboxes in conformance with US Post Office standards until damaged or removed mailboxes are restored.

SW-2.1.4 PROTECTION OF PROPERTY MONUMENTS

Excepting those lot corners and survey monuments which fall within the normal trench excavation, the Contractor shall be solely responsible for the protection and/or replacement of all

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survey corners which exist throughout the work area. Normal trench excavation shall be defined as the width centered over the pipe which is equal to the depth from the existing ground surface to the top of the pipe. The actual trench width may vary from the normal trench width due to compliance with state and federal requirements. Any such lot corners and survey monuments damaged outside of the normal trench width shall be replaced by a Registered Land Surveyor at the Contractor's expense.

SW-2.1.5 PRIMARY LINE AND GRADE

Sanitary sewer shall be installed to an elevation tolerance of plus or minus 0.015 feet of the plan elevation or elevation provided on the grade sheet at any point along the main. Forcemain and watermain shall be installed to an elevation tolerance of plus or minus 0.1 feet of the plan elevation or elevation provided on the grade sheet at any point along the main.

SW-2.2.3 LENGTH OF OPEN TRENCH

Not more than 200 feet of trench shall be opened at any one time. Not more than 100 feet of trench may be opened in advance of the completed pipe laying operations; and not more than one street crossing may be obstructed by the same trench at any one time.

SW-2.2.12 DRAINAGE OF EXCAVATION

If conditions warrant, Contractor shall furnish and install well point systems or deep wells. Spacing and depth of well points or deep wells shall be adequate to lower the ground water table below the trench bottom. No extra payment will be made for dewatering of the trench whether accomplished by the use of sumps and pumps, well point systems or deep wells.

Contractor shall take all necessary precautions during the dewatering operation to protect adjacent structures against subsidence, flooding or other damage.

In areas where continuous operation of dewatering pumps is necessary, Contractor shall avoid noise disturbance to nearby residences to the greatest extent possible by using electric driven pumps, intake an exhaust silencers or housing to minimize noise.

SW-2.2.14 SALVAGED CULVERTS

Contractor shall restore all culverts removed, damaged or disturbed during construction to their original condition or they shall be replaced. Culvert removal, restoration and replacement shall be considered incidental and included in the price bid.

SW-2.4.0 JACKING

- (a) Where required on the drawings, mains shall be placed inside a casing pipe installed by trenchless installation techniques consisting of boring, jacking, boring and jacking, or other means which are reviewed by Engineer and approved by Owner. Installation shall be accomplished in accordance with federal, state and municipal laws and ordinances.

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- (b) Casing pipe shall be installed using equipment and material that cases the hole as earth is removed in order to minimize cavities at the lead end of the casing pipe. Grouting between casing pipe and soil opening shall be performed when needed to secure casing pipe, to prevent soil collapse and to fill voids between the casing pipe and native soil.
- (1) Installation of casing and carrier pipe shall proceed in such a manner as to minimize disruption of traffic and to avoid damage to adjacent roadways or railroad tracks. No equipment shall work off the pavement or shoulder of the roadway or tracks being crossed during the course of construction. Signs, barricades, flagmen and lighting shall be provided to strictly comply with all permit requirements.
 - (2) The main shall be placed inside the casing pipe on hardwood blocks which are shaped to fit both the casing pipe and main. At least three blocks shall be provided for each length of pipe. They shall be banded to the barrel of the carrier pipe so they are parallel to the longitudinal centerline. The annular space between the casing pipe and carrier pipe shall be completely filled with sand or concrete grout.
 - (3) All mains within the limits of jacking pits shall be installed to resist all loads imposed.
 - (4) Cost of tunneling under mains, services, conduits, cables, trees, curbs and similar improvements shall be included in the cost of installing the main and appurtenances as an incidental item of work.
- (c) Casing Pipe:
- (1) Casing used shall be of adequate diameter and thickness to support all loads imposed and to permit installation of the main to the designed line and grade.
 - (2) Type and minimum size of casing pipe shall be as called for on the drawings.
 - (3) Steel casing pipe joints shall be continuous circumferential welds of strength equal to pipe walls.

SW-2.6.1 GRANULAR BACKFILL

All backfill above the pipe to the ground surface should be granular. Use native materials for backfill and sufficient compaction.

SW-2.6.2 GRANULAR BACKFILL

In areas requested by the Engineer, shown on the drawings or specified, backfill material shall be granular backfill conforming to the requirements of Section 6.43.4. Payment for granular backfill requested by Engineer shall be at the unit price bid for granular backfill. Where granular backfill is shown on the drawings or specified, the payment for granular backfill shall be

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considered incidental and included in the price bid. This price for granular backfill under either case shall include the cost of hauling and disposing of the material unsuitable or not used for backfill.

SW-2.6.9 DEPTH OF COVER

The minimum depth of cover shall be 6.5 feet from the top of the forcemain to the finished ground or proposed street grade, whichever results in the greater depth unless otherwise noted on the drawings.

SW-2.6.14 CONSOLIDATION OF BACKFILL

Backfill shall not be consolidated by flooding.

Consolidation of backfill for the full width of the trench shall be required where any portion of the trench is within three feet of a paved surface, shoulder, gravel surface or driveway or as shown on the drawings or specified in accordance with Section 2.6.14(b) to 95% Standard Proctor Density. Any backfill found to be deficient in meeting the mechanical compaction requirements shall be re-excavated and reconsolidated at Contractor's expense.

In all other areas, trench backfill material shall be mechanically compacted to 90% Standard Proctor Density.

All costs for backfill consolidation shall be included in the price bid for sewer or water installation.

Excess excavated material shall be disposed of by the Contractor. Points of disposal are subject to approval of Owner.

Compaction testing shall be performed by a soil testing firm hired by the Owner. Payment for the soil testing shall be by the Contractor from the soil testing allowance listed in the bid. The allowance shall be adjusted upwards or downwards at the completion of the contract to reflect the actual soil testing costs. Retesting due to Contractor's failure to meet the compaction requirements shall be by the soils firm hired by the Owner. Costs for retesting including any additional engineering fees shall be the Contractor's responsibility and shall not be included in the soils testing allowance.

SW-2.7.0 SURFACE REPLACEMENT AND SITE RESTORATION

Contractor is cautioned that existing private and public roads, driveways and shoulders may not hold up to typical construction traffic or activities. Contractor shall repair all roads, shoulders, driveways and graveled areas damaged in accordance with this specification.

SW-2.7.2 REPLACEMENT PAID BY CONTRACTOR

Wherever any sidewalk, driveway, curb, gutter or pavement has been damaged or removed by the Contractor, whether as a normal part of construction activities, deliberately or through failure to carry out the requirements of the appropriate codes, the Contract Documents, or the specific

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direction of the Owner relative to their protection, or though failure to employ usual or reasonable safeguards, such existing improvements shall be replaced or repaired at the Contractor's expense. The Owner shall have the option of ordering the Contractor to make the necessary repair or replacement at its own expense, or to have such repair or replacement done by the Owner and the cost deducted from the amount due the Contractor.

SW-2.7.3 REPLACEMENT OF PAVEMENTS

If these pavement replacements are ordered as an extra, payment will be made in accordance with the prices listed in the Schedule of Fixed Prices.

Contractor shall remove bituminous pavement and road surface as a part of the general excavation. The width of pavement removed shall be the minimum possible, and acceptable, for convenient and safe installation of structures, utilities and appurtenances. All bituminous pavement shall be cut on neat, straight lines and shall not be damaged beyond the limits of the excavation. Should the cut edge be damaged, any new cut shall be made in neat, straight lines parallel to the original cut encompassing all damaged areas. Pavement removal shall be extended to a seam or joint if seam or joint is within three feet of damaged pavement.

All pavement and gravel replacements shall be in accordance with the Standard Specifications for Highway and Structure Construction and as follows:

Pavement replacement shall consist of 3-1/2 inch thick bituminous compacted or concrete pavement or existing thickness whichever is greater placed on 12 inches of crushed stone base or existing thickness whichever is greater.

- (a) The bituminous concrete pavement shall conform to the requirements of Section 2.7.3(b) 1, and shall be made up of a 2-inch thick binder course and a one half-inch thick surface course. If additional depth is required to match existing, it shall be made up in 2-inch lifts of binder course.
- (b) The crushed stone base shall be 6 inches of 3-1/2 inch breaker run or 6 inches of 3/4 inch crushed aggregate in conformance to the requirement of Section 6.43.7, compacted in accordance with the Standard Specifications for Highway and Structure Construction.

SW-2.7.4 REPLACEMENT OF LAWNS

All areas disturbed shall be restored using a Type "C" lawn replacement where the slopes are less than 3:1. For areas where the slope is greater than 3:1, the disturbed area shall be restored using Type "B".

Clean up and seeding shall proceed concurrently with the sewer construction. The estimated cost of restoration and clean up, up to a maximum of 15% of each Bid item, may be withheld until final clean up of the work in each Bid item.

Seeding shall be maintained by Contractor until grass is well established. Grass is well established when it covers the entire seeded area to a height of 2 inches. All costs for this work shall be included in the price bid.

SW-2.7.5 TREES AND SHRUBS REPLACEMENT

- (a) Where any trees, shrubbery, fences, poles or other property and surface structures have been damaged, removed or disturbed by Contractor, whether deliberately or through failure to carry out the contract documents, state laws, municipal ordinances, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of Contractor.
- (b) All topography, trees, surface and subsurface improvements, shown on the drawings, are located to the best knowledge of Engineer. Only those conditions near the area of construction are shown on the drawings. Prior to start of construction on any section of the work, it shall be the responsibility of Contractor to investigate the area for conditions which may be different from those shown on the drawings. No additional payment will be made for restoration of surfaces or subsurface improvements, whether shown on the drawings or not.
- (c) Trees marked for removal within street and road rights-of-way and in easements shall be removed by Contractor and disposed of. Trees within street and road rights-of-way marked for removal need not be replaced. Contractor shall replace all other removed and damaged trees and shrubs with new stock at his expense. New trees shall be located as requested by the Engineer.
- (d) Trees shall be replaced as follows. Diameters shall be measured 4 feet above the ground.

Deciduous Trees

Up to 1-1/2 inches	Like size and type
Greater than 1-1/2 inches	Min. 1-1/2 inch of like type

Coniferous Trees

Up to 6 feet tall	Like size and type
Greater than 6 feet tall	Min. 6 foot tree of like type

- (e) All bushes and shrubs removed during construction shall also be restored to their original position and condition. If the bush or shrub is damaged, or dies after restoring, Contractor shall replace it with one of same kind and size up to a height of 4 feet. Bushes and shrubs beyond this height shall be replaced by one 4 feet.
- (f) It is intended that as many trees as possible be saved during construction. No trees, except those so designated, shall be removed. Contractor shall conduct the work to protect all trees to remain. He shall provide suitable barricades of lumber and wire netting to wrap around all tree trunks within the construction area to protect trees from damage by his equipment.
- (g) Trees which are damaged during construction shall be repaired. Contractor shall retain the services of a professional nurseryman who is a member of the National

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Arborist Association to direct him on the proper repair of damaged trees. Damaged limbs and roots shall be pruned or dressed according to recommendations of the nurseryman. Backfill shall be replaced as soon as possible to reduce exposure of roots to air. Scarfed areas on trees shall be suitably dressed.

- (h) When removing trees, special care shall be taken so as not to damage surrounding private property. Costs for tree removal or replacement and construction around trees shall be included in the price bid for the work.
- (i) Contractor shall relocate, bore and jack under, or by, such trees as he desires to minimize construction damage. Cost for such construction shall be included in the price bid for the work.

SW-2.7.6 PRIVATE WELL AND SEPTIC

Where construction interrupts existing private sewer systems, it shall be Contractor's responsibility to maintain these systems or provide alternative means of disposal until the new sewer system is placed in operation or final acceptance of the work for properties to be connected to the sewer system. For properties not to be connected to the sewer system or for watermain projects, the Contractor shall repair or replace the damaged system in accordance with the Department of Commerce Plumbing Code (COMM 81-84.) Costs for this work shall be considered incidental and included in the price bid.

In the event that Contractor's operation adversely affects private water supply system, Contractor shall provide property owners with alternative potable and non-potable supplies until dewatering operations are ceased and groundwater levels return to normal. If the water in the private water supply wells is contaminated, through no fault of Contractor, after restoration of original groundwater levels, Owner will provide measures to restore water potability. Contractor is responsible for restoration of the water supply not its potability after restoration.

SW-2.8.0 EROSION CONTROL

Costs for erosion control shall be included in the price bid for sewer installation.

SW-2.9.15 PAY MEASUREMENT FOR MANHOLE AND CATCH BASIN ADJUSTMENT

No additional payment will be provided for adjusting the manholes and catch basin to the final grades as established in the field.

SW-2.9.17 PAY MEASUREMENT FOR CLEARING AND GRUBBING

Costs for Clearing and Grubbing shall be considered incidental and included in the price bid.

SECTION 3 – CONSTRUCTION STORM AND SANITARY SEWERS

SW-3.2.4 GENERAL REQUIREMENTS FOR LAYING PIPE

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See Section 2.1.5 for maximum variations in the line and grade.

SW-3.2.6 PIPE SEWER BEDDING SECTIONS

All thermoplastic sewer pipe (PVC, HDPE, etc.) shall be bedded using Class "B" bedding as shown on File No. 4 Part VII> The minimum trench width at the top of the pipe should not exceed the outside pipe diameter plus 2 feet. If the normal trench width is exceeded for any reason, the embedment shall be compacted to a point of at least 2.5 pipe diameters from the pipe on both sides of the pipe or to the trench walls, whichever is less.

SW-3.2.6 (a)

For all pipe sizes bedding material shall be crushed stone chips conforming to the gradation requirements of 6.43.2 (a) 1 Table 32 or crushed stone aggregate or crushed gravel aggregate conforming to the gradation contained in Section 6.43.2 (a) 2 Table 33.

SW-3.2.6 (b)

For all pipe sizes bedding material shall be crushed stone chips conforming to the gradation requirements of 6.43.2(1) 1 Table 32 or crushed stone aggregate or crushed gravel aggregate conforming to the gradation contained in Section 6.43.2 (a) 2 Table 33.

SW-3.2.6 (i) 1

The Standard Proctor Density should be 95%.

SW-3.2.6 (n) 1

The requirements of Chapter 4.17.0 are included.

SW-3.2.6 (n) 2

The minimum test pressure should be 100 psi.

SW-3.2.10 (a) 3 b.

Solvent – cemented joints are allowed on pipes less than 4 inches in diameter only.

SW-3.5.3 TYPES OF MANHOLES

Sanitary and storm sewer manholes shall conform to Drawing 01-975-43A.

SW-3.5.4 (e) CASTINGS

Castings shall be Neenah R-1550 with a machined frame with a Type B lid, concealed pick holes and self sealing gaskets or equal.

SW-3.5.7 (c)

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Flexible water tight connections to manholes shall be Kor-n-seal, A-lok or equal.

SW-3.6.0 CATCH BASINS, STORM WATER INLETS, AND STORM WATER DRAINS

Storm water inlets shall conform to Drawing 01-975-41A.

SW-3.7.1 GENERAL

The permitted leakage test for sewers 36 inches or less in nominal size shall be the low pressure air test.

SW-3.9.0 SURFACE WATER CROSSING

(a) Surface Water Crossings:

1. The river/stream/wetland crossings shall be installed by a method chosen by Contractor subject to review by Engineer and approval by DNR and Owner.
2. When installing the river crossing pipe, Contractor shall keep the pipe full of water until the pipe is backfilled with well graded 3-inch minimum to 6-inch maximum stone backfilled to the original river bottom profile. All work associated with trench preparation, pipe laying, bedding stone placement, and backfill with stone riprap shall be done with suitable equipment and erosion control means to prevent disturbance or silt deposition.
3. All provisions of the DNR permit and Army Corps of Engineer's permit shall be complied with by Contractor. All spoil material shall be deposited at upland sites. Contractor shall give notice to Owner and DNR no less than five days before the Work is to begin. Excavation shall be made so as to provide a relatively level bottom condition and to have side slopes at the edge of the area from which material is removed of not more than one vertical to four horizontal. The excavation of materials shall be done with suitable equipment so that there is not disturbance or deposition of silt in adjoining waterways.
4. Surface water crossings shall be by open trench methods. Contractor shall be responsible for obtaining all required permits if a method other than open trench is to be utilized.

(b) Surface Water Crossing Pipe:

1. Surface water crossing pipe shall be ductile iron. Joints on the pipe shall be the restrained type, but joint shall not be rigid. Mechanical joints with retainer glands will not be approved. Type of joint is subject to review by Engineer and approval by Owner.

SW-3.10.0 SPECIAL PIPE AND FITTINGS

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When sanitary sewer construction is within 50 feet of a potable water well, 200 feet of a municipal water well, or as requested by Engineer, ductile iron pipe conforming to requirements herein shall be used.

To transfer from pipe required under this section to pipe normally supplied, a transition pipe with suitable joints to mate the two different pipes shall be supplied. No field constructed transitions will be allowed. Construction shall not proceed until proper transition pipe is supplied. Band seal rubber couplings, as manufactured by Clow or equal with clamps, may be used for pipes 15 inches and smaller in lieu of transition pipe.

SECTION 4 – MATERIAL SPECIFICATIONS

SW-6.1.3 COST OF TESTS

All material and work is subject to testing and acceptance. In the event that any material or work does not meet these specifications, it shall be replaced or repaired by Contractor. No extra compensation will be allowed for replacement or repair of defective material or work.

Testing and acceptance of materials may be conducted by Owner or an independent laboratory employed by Owner. Contractor shall cooperate fully with all persons engaged in testing.

Owner will make no payment for tests normally conducted in the shop by materials suppliers. In general, materials suppliers shall prove, by shop testing, that all material intended for use in the work meet the specifications.

Tests may be performed in the field by Engineer as a basis for acceptance of the work. IN the event that completed work does not conform to specifications during the initial test, the work shall be corrected and retested for conformance. The entire cost of retesting completed work in the field shall be paid by Contractor. This shall include the extra cost for observation of the test which will be deducted from the final amount due Contractor.

SW-6.10.0 POLYVINYL CHLORIDE SEWER PIPE AND FITTINGS

All PVC piping shall have a T-1 wall.

SW-6.52.0 PLUG AND CHECK VALVES

6.52.1 PLUG VALVES: Plug valves in lines containing wastewater shall be DeZurik, Series 100 or equal.

- (a) Valves shall be of the non-lubricated eccentric type with resilient faced plugs and end connections as shown on the drawings. Port areas shall be at least 80% of full pipe area. Valve bodies shall be of ASTM A126, Class B cast iron. Resilient plug facings shall be of neoprene, suitable for use with wastewater.
- (b) Valves shall be furnished with corrosion resistant seats which comply with AWWA Standard C57-85 Section 7, and with AWWA Standard C504-87 Section 8. Valves shall be furnished with replaceable, sleeve-type bearings. These bearings shall

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comply with AWWA Standard C507-85 Section 8, and with AWWA Standard C504-87 Section 9. Valve shaft seals shall comply with AWWA Standard C507-85 Section 10, and with AWWA C504-87 Section 10. Valve shaft seals shall be of the type utilizing a stuffing box and pull down packing gland. Shaft seals shall be designed for replacement with the line pressurized at design pressure with the plug in both the open and closed position.

- (c) The design of the valve and stuffing box assembly shall be such that the packing can be adjusted or completely replaced without disturbing any part of the valve or operator assembly except the packing gland follower. Stuffing boxes shall have a depth sufficient to accept at least four rings of packing. Valve seating adjustment shall be accomplished without removing the valve from the pipe line and with pressure in the line.
- (d) Valve pressure ratings shall be 125 psi for valves through 12-inch and 150 psi for valves in sizes 14-inch through 24-inch. Valves shall provide drip-tight shutoff up to the full pressure rating.
- (e) Whenever possible, exposed valves in horizontal lines containing solids shall be installed on their side with the front of the plug facing the direction of flow when closed, and the plug opening upward out of the line when opened.
- (f) All plug valves 8 inches in diameter or larger shall have worm gear operator. Buried operators shall be suitable for direct burial. All other valves shall be furnished with lever operators. Supply one lever for every four valves furnished. All valves 3 inches and smaller shall have individual levers. Valves not in reach of the floor (7 feet to centerline or greater) shall have chain wheel worm gear operators. Right angle operators shall be furnished if required because of valve position.
- (g) All buried valves shall be equipped with cast iron telescopic adjustable valve boxes and covers with valve key and extended stems.
- (h) Exterior underground and buried valves shall be epoxy coated.

6.52.2 CHECK VALVES: Except where noted, check valves in ductile iron lines carrying liquid shall be Clow F-5382 (lever and weight), or equal, 150 psi, iron body, bronze trimmed, swing check. Additional weights shall be used if necessary to stop slamming.