

REVISED Oct. 14, 1992  
REV. 28 DEC 92  
REV. 22 JUN 99

GENERAL NOTES PERTAINING TO ALL CONSTRUCTION OPERATIONS

1. All underground utilities shown on these plans have been located from available records and information, and their locations shall be considered approximate only. The verification of the actual location of all underground utilities, whether shown or not shown on these plans, shall be the responsibility of the contractor, and the verification of the actual location shall be performed prior to beginning work.

2. All construction and work performed in accordance with specifications, drawings, plans, specifications, permits and in compliance of the laws governing municipal activities.

GRADING NOTES

1. All areas shall be cleared without authorization from the project engineer.

2. All grading work performed shall be within a 0.2 foot tolerance of the grades shown on the grading plan.

3. A Geotechnical Engineer shall be employed by the owner to be on site during grading operations.

4. A geotechnical report shall be prepared, a complete grading and compaction schedule of layers on the plans, stated in these notes, or reasonably implied therefrom, shall be provided to the project engineer.

5. Before the grading begins, the owner shall employ a competent, licensed surveyor to establish all lines and grades.

6. The contractor shall notify the Geotechnical Engineer at least two days in advance of the start of the grading operation.

EXCAVATIONS

1. Excavation includes the clearing of all stumps, trees, bushes, shrubs, and weeds, the grubbing and removal of roots and other surface obstructions from the site, and the demolition and removal of any man-made structures. The unsuitable material shall be burned (after securing permits) and/or properly disposed of. Topsoil and grass in the fill areas shall be thoroughly placed prior to the placement of any fill. The Geotechnical Engineer shall approve the dishing operation.

2. Compaction equipment shall consist of tamping rollers, pneumatic-tired rollers, vibratory rollers, or high speed impact type drum rollers acceptable to the Geotechnical Engineer. The roller shall be designed so as to avoid the creation of a layered fill without proper blending of successive fill layers.

3. Observation and Testing. The Geotechnical Engineer shall observe and test the placement of the fill to verify that specifications are met. A series of fill density tests will be determined on each lift of fill. Interim reports showing fill quality will be made to the owner at regular intervals.

4. The Geotechnical Engineer shall notify the contractor of whether or not a lift of fill or portion thereof is acceptable. The contractor shall rework the rejected portion of fill and submit notification from the Geotechnical Engineer of its acceptance prior to the placement of additional fill.

5. Filling and Compaction of Fill. All areas to receive fill shall be scarified to a depth of not less than 6 inches and then compacted to at least 85 percent of the maximum dry density as determined from the Modified Proctor Compaction Test (ASTM D-1557). Natural water content shall be verified by determining to receive all available natural moisture, water in excess of 2 percent shall be added. The water content shall be verified by the equipment used to determine the water content. The Geotechnical Engineer shall be responsible for determining the acceptability of the water content. Any unacceptable work shall be reworked at the contractor's expense.

6. The sequence of operation in the trench will be the contractor's responsibility. The rejected portion of fill and the sequence of the acceptable moisture contents during the filling operation in the trench shall be approved by the Geotechnical Engineer. The surface of the fill shall be prepared so that it will not erode under water. The surface of the work of the contractor shall be prepared so that it will not erode under water. There may be a case prior to the next working day, the surface shall be finished smooth. The surface shall be prepared before proceeding with the placement of additional fill. The surface shall be prepared in accordance with the specifications. The contractor shall continue when the temperature is such as to permit the cover under placement to freeze.

7. All fill shall be compacted to 90% of maximum density as determined by the Modified AASHTO T-1800 Compaction Test (ASTM D-1557).

8. All fill in rear yard areas only shall be compacted, but the compaction criteria may be reduced to 85% of maximum density as determined by the Modified AASHTO T-1800 Compaction Test (ASTM D-1557).

SANITARY SEWER CONSTRUCTION

1. No area shall be cleared without authorization from the project engineer.

2. The sanitary sewer contractor shall perform a complete installation as shown on the plans, stated in these notes, or reasonably implied therefrom, all in accordance with the plans and notes as interpreted by the project engineer.

3. Before sewer construction begins, the owner shall employ a competent, licensed surveyor to establish the lines and grades of the sanitary sewers being constructed. The contractor shall pick up the cut sheets at the office of the surveyor.

4. The contractor shall notify the City of O'Fallon at least two days in advance of the start of construction. Contact City of O'Fallon at telephone (314) 272-6244.

SPECIFICATIONS

1. All materials used shall meet the following specifications:

Plastic Pipe: Polyvinyl Chloride pipe conforming to the requirements of ASTM D-3034 Standard Specifications for the PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, SDR 35.

Fittings: Fittings for PVC pipe shall be of the same material and strength requirements as the sewer, as well as monolithic in construction.

Manholes: Precast reinforced concrete manholes conforming to the standard specifications for precast reinforced concrete manhole sections, ASTM-C478 and the approved Standard Details of Sewer Construction of Council Creek Sewer District. The Portland cement used shall be Type II. Manhole covers shall be concentric and base sections shall have the base riser section integral with the floor. Manhole steps shall be cast into the full depth of the wall section. Connections for inlet and outlet pipes shall be of an approved patented compression type connection. The inside diameter for riser sections shall be 42 inches for pipe sizes 8 inch through 15 inch and be 48 inches for pipe sizes larger and for inside drop manholes.

Manhole Frames and Covers: Gray Iron Castings conforming to the requirements of the specifications for Gray Iron Castings, ASTM A48. All castings shall be clean and free of scale, adhesions or inclusions. They shall be fabricated of Class 30B cast iron. Bearing surfaces between manhole frames and covers shall be such that the cover shall seat in any position onto the frame without rocking.

Joints: Type D joints shall be used with PVC pipes and shall be elastomeric gasket joints providing a water tight seal. They shall conform to the requirements of the Specifications for Joints for Drain and Sewer Plastic Pipes and Fittings Using Flexible Elastomeric Seals, ASTM C-3212.

Bedding Aggregate: Bedding Aggregate shall conform to the following and have a maximum percentage of "fines" as follows:

Sieve	% by Weight Passing	Maximum	Minimum
1 inch	100	100	100
3/4 inch	100	90	90
1/2 inch	85	35	35
# 100	10	0	0

Backfill Aggregate: Backfill Aggregate shall be crushed limestone and screenings and be 3/4 inch minus.

2. Pipe and appurtenances shall be new and unused. The type of pipe to be installed shall be as shown on the drawings. Pipe and appurtenances shall be handled in such a manner as to insure delivery to the trench in sound, undamaged condition. Particular care shall be taken to prevent damage to any pipe coating.

3. The interior of the pipe shall be thoroughly cleaned of foreign material before being lowered into the trench and shall be kept clean during construction operations. When work is not in progress, the open ends of pipe shall be securely closed so that no foreign materials will enter the pipe. Any section of pipe found to be defective before or after laying shall be replaced with sound pipe, or repaired in a satisfactory manner.

4. Pipe shall be laid on the grade as shown on the plans and as staked in the field. When connections are to be made to any existing manhole, pipe, or other appurtenance, the actual elevation or position of which cannot be determined without excavation, the contractor shall excavate for and expose the existing appurtenance before laying the continuing pipe in trench. When existing underground improvements may reasonably be expected to conflict with the line or grade established for the new sewer line, the contractor shall excavate as necessary to expose and locate such potentially conflicting underground improvements prior to laying the new pipe. Any adjustment in line or grade which may be necessary to accomplish the intent of the plans shall be made.

5. Pipe shall be laid upgrade in a continuous operation, from structure to structure, with the socket or collar ends of the pipe upgrade.

6. All PVC Sanitary Sewer Pipe shall be bedded with Bedding Aggregate. The bedding aggregate shall extend from 4 inches below the pipe to the pipe springline. All PVC Sanitary Sewer Pipe shall be backfilled with Aggregate Backfill for non-paved areas, the Aggregate Backfill shall extend from springline of pipe to 12 inches over the pipe; for paved areas the Aggregate Backfill shall extend from springline of pipe to the ground surface. Refer to detail "PIPE BEDDING CLASS 'C' (FOR ALL PIPE EXCEPT REINFORCED CONCRETE PIPE)".

7. All trench backfills shall be water jetted.

8. All sanitary sewer manholes shall be waterproofed on the exterior in accordance with Missouri Department of Natural Resources Specification 16-C5R-8.120 (7)(E).

9. All sanitary sewer construction shall be performed in accordance with the specifications for the sanitary sewer. The contractor shall assist City of O'Fallon personnel in the inspection and testing of the sanitary sewers.

10. The minimum vertical distance between the basement floor elevation and the flowline elevation of the sanitary sewer line at the corresponding house connection point shall not be less than the diameter of the sanitary sewer main plus 2-1/2 feet.

11. All manhole bases to have a minimum slope of 0.2' along the invert flowline.

12. All manhole tops shall be built to the elevations shown on the plans. If no top elevation is shown, contact the engineer for such information.

13. Provide clean-out on all laterals over 100 L.F. and at all major angle points in laterals.

STORM SEWER CONSTRUCTION

Bedding Aggregate: Bedding Aggregate shall conform to the following:

1. No area shall be cleared without authorization from the project engineer.

2. The storm sewer contractor shall perform a complete installation as shown on the plans, stated in these notes, or reasonably implied therefrom, all in accordance with the plans and notes as interpreted by the project engineer.

3. Before sewer construction begins, the owner shall employ a competent, licensed surveyor to establish the lines and grades of the storm sewers being constructed. The contractor shall pick up the cut sheets at the office of the surveyor.

4. The contractor shall notify the City of O'Fallon at least two days in advance of the start of construction. Contact City of O'Fallon at telephone (314) 272-6244.

SPECIFICATIONS

1. All materials used shall meet the following specifications:

Concrete Pipe: Concrete pipe shall be precast and shall conform to the requirements of the Specifications for Concrete Sewer Pipe, ASTM C141.

The interior surface of the pipe shall be a true cylindrical surface free from undulations or corrugations. Cement shall meet all requirements of the Specifications for Portland Cement, ASTM C150, Type II.

Reinforced Concrete Pipe: Reinforced Concrete Pipe shall be precast and shall conform to the requirements of the Specifications for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe, ASTM C76, with shell thickness designated "Wall B" and with Circular Reinforcement in Circular Pipe or to the requirements of Reinforced Concrete Elliptical Culvert Storm Drain and Sewer Pipe, ASTM C587.

Strength tests or classes shall be as noted on the Project Plans. The interior surfaces of the pipe shall be a smooth true cylindrical surface free from undulations or corrugations. Lifting holes when provided, shall be cast in the wall of the pipe to receive a precast reinforced concrete plug of such size as will allow the pipe remaining material on the site of the existing surface of the plug and will fit at least 1/8" of the manhole depth. Cement shall meet all requirements of the Specifications for Portland Cement, ASTM C150, Type II, but pipe for cutaway segments shall be of uniform cut and length along the same order and shall be marked on the pipe with "CONCRETE" and "REINFORCED CONCRETE".

2. Pipe shall be laid on the grade as shown on the plans and as staked in the field. When connections are to be made to any existing manhole, pipe, or other appurtenance, the actual elevation or position of which cannot be determined without excavation, the contractor shall excavate for and expose the existing appurtenance before laying the continuing pipe in trench. When existing underground improvements may reasonably be expected to conflict with the line or grade established for the new sewer line, the contractor shall excavate as necessary to expose and locate such potentially conflicting underground improvements prior to laying the new pipe. Any adjustment in line or grade which may be necessary to accomplish the intent of the plans shall be made.

3. Pipe shall be laid upgrade in a continuous operation, from structure to structure, with the socket or collar ends of the pipe upgrade.

4. All storm sewer construction shall be performed in accordance with the requirements of the specifications for Gray Iron Castings, ASTM A48. All castings shall be clean and free of scale, adhesions or inclusions. They shall be fabricated of Class 30B cast iron. Bearing surfaces between manhole frames and covers shall be such that the cover shall seat in any position into the frame without rocking.

5. All storm manhole, area inlet and curb inlet shall be built to the elevations shown on the plans. If no elevation is shown, contact the engineer for such information.

Joints: Type A joints shall be used with concrete pipe and reinforced concrete pipe and shall be constructed with approved compatible bituminous jointing material, in accordance with the requirements of this specification. Unless specifically required by the Project Plans, any approved bituminous sealing compound may be used. The clean, dry, surfaces of the interior of the pipe bell, groove, or socket, and the exterior of the spigot or tongue and the shoulders shall be primed and uniformly coated with an approved compatible bituminous primer, as recommended by the manufacturers of the sealing compound and the primer. It shall be done sufficiently in advance of applying the joint compound to permit proper drying and hardening and to provide a suitable uniform prepared surface for proper adhesion of the jointing material. The primer shall not be heated or diluted. When pre-mixed sealing compound is used with slip joint or tongue and groove pipe, the jointing compound shall be evenly spread on the surface of both the tongue and the groove of the joint from the tip to the shoulder in sufficient amount to completely fill and seal the joint to both surfaces of the pipe barrel when the joining pipes have been forced together to form the completed joint.

For Pipes 27 inch in diameter and smaller:			
Sieve	% by Weight Passing	Maximum	Minimum
1 inch	100	100	100
3/4 inch	100	90	90
1/2 inch	80	35	35
# 100	10	0	0

For Pipes 30 inch in diameter and larger:			
Sieve	% by Weight Passing	Maximum	Minimum
1-1/2 inch	100	100	100
1 inch	70	60	60
3/4 inch	50	35	35
1/2 inch	35	10	10
# 100	10	0	0

Backfill Aggregate: Backfill Aggregate shall be crushed limestone and screenings and be 3/4 inch minus.

Rip-Rap: Rip-Rap shall conform to the following:

Sieve	% by Weight Passing	Maximum	Minimum
12 inch	90	70	70
6 inch	30	10	10
1/2 inch	5	0	0

Grout: All grout used for grouted rip-rap shall be high slump ready-mix concrete.

2. Pipe and appurtenances shall be new and unused. The type of pipe to be installed shall be as shown on the drawings. Pipe and appurtenances shall be handled in such a manner as to insure delivery to the trench in sound, undamaged condition. Particular care shall be taken to prevent damage to any pipe coating.

3. The interior of the pipe shall be thoroughly cleaned of foreign material before being lowered into the trench and shall be kept clean during construction operations. When work is not in progress, the open ends of pipe shall be securely closed so that no foreign materials will enter the pipe. Any section of pipe found to be defective before or after laying shall be replaced with sound pipe, or repaired in a satisfactory manner.

4. Pipe shall be laid on the grade as shown on the plans and as staked in the field. When connections are to be made to any existing manhole, pipe, or other appurtenance, the actual elevation or position of which cannot be determined without excavation, the contractor shall excavate for and expose the existing appurtenance before laying the continuing pipe or conduit. When existing underground improvements may reasonably be expected to conflict with the line or grade established for the new sewer line, the contractor shall excavate as necessary to expose and locate such potentially conflicting underground improvements prior to laying the new pipe. Any adjustment in line or grade which may be necessary to accomplish the intent of the plans shall be made.

5. Pipe shall be laid upgrade in a continuous operation, from structure to structure, with the socket or collar ends of the pipe upgrade.

6. All storm sewer construction shall be performed in accordance with the requirements of the specifications for Gray Iron Castings, ASTM A48. All castings shall be clean and free of scale, adhesions or inclusions. They shall be fabricated of Class 30B cast iron. Bearing surfaces between manhole frames and covers shall be such that the cover shall seat in any position into the frame without rocking.

7. All storm manhole, area inlet and curb inlet shall be built to the elevations shown on the plans. If no elevation is shown, contact the engineer for such information.

WATER MAIN CONSTRUCTION

1. The water main contractor shall perform a complete installation as shown on the plans, stated in these notes, or reasonably implied therefrom, all in accordance with the plans and notes as interpreted by the project engineer.

2. Before water main construction begins, the owner shall employ a competent, licensed surveyor to establish the lines of the mains being constructed.

3. The contractor shall notify the City of O'Fallon at least two days in advance of the start of construction. Contact City of O'Fallon, at telephone (314) 272-6244.

SPECIFICATIONS

1. All materials used shall meet the following specifications:

Polyvinyl Chloride (PVC) Pipe: PVC Pipe shall be Class 200 SDR 21.

2. All water main construction performed shall be in accordance with the requirements of the City of O'Fallon Water Main Construction.

3. Minimum water line depth is 42".

JOINT AND VALVE CONSTRUCTION

1. The paving contractor shall perform a complete installation as shown on the plans, stated in these notes, or reasonably implied therefrom, all in accordance with the plans and notes as interpreted by the project engineer.

2. Before street paving begins, the owner shall employ a competent, licensed surveyor to establish the lines and grades of the street pavement being constructed.

3. The contractor shall notify the City Engineer at least two days in advance of the start of construction. Contact City of O'Fallon at telephone (314) 272-6244.

SPECIFICATIONS

1. All materials used shall meet the following specifications:

Resilient Sealed Gate: Resilient Sealed Gate Valves shall be furnished in accordance with AWWA Standard C509 (latest revision). Valves shall be mechanical joint, have 10" ring seals, two inch square operating nuts, clockwise rotation to close, and shall be designed for a minimum working pressure of 200 psi.

Double Disc Gate: Double Disc Gate Valves shall be furnished in accordance with AWWA Standard C500 (latest revision). Valves shall be mechanical joint, nonrising stem, with 10" ring seals, two inch square operating nuts, clockwise rotation to close, and shall be designed for a minimum working pressure of 200 psi.

Butterfly: Butterfly valves used will be 14" or larger and shall be furnished in accordance with AWWA Standard C504 (latest revision). Valves shall be mechanical joint, nonrising stem, with 10" ring seals, two inch square operating nuts, clockwise rotation to close, and shall be designed for a minimum working pressure of 200 psi.

Tapping: Valves for use with a tapping sleeve may be either of the Resilient Seated or Double Disc type gate valves, except that the end connections shall be flanged by mechanical joint. Diameter of valve opening shall be such that the tapping machine cutters shall not cause damage to the valve. Tapping sleeves shall be for 150 psi minimum working pressure.

Fire Hydrants: Fire hydrants shall be Mueller Design 4-1/2" American Design 4-1/2" and shall be furnished in accordance with AWWA Standard C502 (latest revision). Hose outlet connection threads will be National Standard Threads in all directions except as otherwise indicated. Hydrants shall have the following features: National level connection of 1/2" size mechanical joint shoe, with 4-1/2" valve opening. The 3-1/4" valve opening shall be used in all cases where accommodations require. Hydrants shall have two hose outlets, and one streamer connection. Buried depths for hydrants will be 48" minimum, but shall not be less than 4 feet. The streamer connection shall be less than 15" and greater than 24" above finish grade. The hydrant shall be installed in such a position as may be necessary to adjust hydrants to the proper height. Hydrants shall be located 2-1/2' from back of curb.

2. Pipe shall be laid on the grade as shown on the plans and as staked in the field. When connections are to be made to any existing manhole, pipe, or other appurtenance, the actual elevation or position of which cannot be determined without excavation, the contractor shall excavate for and expose the existing appurtenance before laying the continuing pipe in trench. When existing underground improvements may reasonably be expected to conflict with the line or grade established for the new sewer line, the contractor shall excavate as necessary to expose and locate such potentially conflicting underground improvements prior to laying the new pipe. Any adjustment in line or grade which may be necessary to accomplish the intent of the plans shall be made.

3. Pipe shall be laid upgrade in a continuous operation, from structure to structure, with the socket or collar ends of the pipe upgrade.

4. All storm sewer pipe shall be bedded with bedding aggregate. The bedding aggregate shall extend from 4 inches below the pipe to the pipe springline.

5. All storm sewer construction shall be performed in accordance with the requirements of the specifications for Gray Iron Castings, ASTM A48. All castings shall be clean and free of scale, adhesions or inclusions. They shall be fabricated of Class 30B cast iron. Bearing surfaces between manhole frames and covers shall be such that the cover shall seat in any position into the frame without rocking.

6. All storm manhole, area inlet and curb inlet shall be built to the elevations shown on the plans. If no elevation is shown, contact the engineer for such information.

7. Labeling Wire: No. 12 coated solid copper wire shall be looped into valve boxes.