

124. MATERIALS:

The Contractor shall furnish all pipe and appurtenant materials required for the Contract. When referenced specifications are used, they shall be considered as referring to the current edition or latest issue.

124.1 **Water Main Pipe:** The ductile iron pipe shall be manufactured in accordance with AWWA Specification C151 (ANSI A21.51), thickness Class 54 of the sizes shown on the plans and shall meet standard NSF 61. All pipes shall be lined with a standard thickness cement mortar lining sealed with a bituminous seal coat in accordance with AWWA Specification C104 (ANSI A21.4), unless otherwise specified. The outside of the pipe shall be coated with the standard bituminous seal. The metal thickness class, net weight of the pipe without lining, the nominal size and the manufacturer's identifying symbol shall be clearly marked on each length of pipe.

124.11 **C-900 and C-905:** Fusible C-900 and C-905® pipe meet all applicable industry standards: AWWA C900 and C905 NSF-61 Certification for Drinking Water Components, ASTM cell classification 12454, and formulation requirements of Plastics Pipe Institute TR-2. Pressure pipe is tested in accordance with AWWA C900 and C905 requirements, meets the same ASTM cell classification and PPI formulation requirements, and is NSF-61 certified when used for potable water. PVC pipe shall meet NSF-14 and bear the NSF-pw mark on the exterior pipe.

124.12 **Corrugated Steel Pipe Galvanized with Asphalt Coating** The corrugated steel pipe shall be galvanized materials coils meeting the requirement of AASHTO M218 or ASTM A928. It shall be manufactured in accordance with current AASHTO M-36 or ASTM A760 standard. The pipe sizes, gauges and corrugations shall be in accordance to the project plans. Backfill material shall be selected material and must be in accordance with City of Dearborn Standard S-1 "Storm Sewer Standard." Installation shall be in accordance with ASTM A798 standard.

124.2 **Water Main Fittings:** Fittings shall have the mechanical joint restraint system. Fittings for ductile iron pipe shall be of ductile iron and shall have a working pressure of three hundred fifty (350) pounds per square inch (psi) that meets the requirements of AWWA C110 (ANSI A21.10), or AWWA C153 (ANSI A21.53) for compact fittings with cement mortar lining. Cement mortar lining shall meet AWWA C104 (ANSI A21.4) specification for a double thickness lining with a bituminous seal coat.

124.3 **Water Main Joints:** Joints for ductile iron pipe shall be push-on type conforming to AWWA C111 (ANSI A21.11). Mechanical or flanged joints will be allowed for special applications subject to approval of the Engineer. Sealing gaskets, retainer glands and lubricants for joints shall meet the pipe manufacturer's specifications.

124.4 **Bolts and nuts** used on gate valves and mechanical joint fittings shall be of "Corten" or "Stainless" Steel.

124.5 **Gate Valves:** Valves shall be manufactured and tested to meet the requirements of ANSI/AWWA C515. Valves shall meet or exceed the requirements of Underwriters Laboratories Standard UL262. The rated working pressure of the valve shall be 250 psi.

The body, bonnet and seal plate shall be made of ductile iron in accordance with ASTM A536. The wedge shall be ductile iron in accordance with ASTM A536 and shall be totally encapsulated in rubber. The rubber coating shall be permanently bonded to the ductile iron wedge

casting and shall meet ASTM D429 tests for rubber to metal bonding. No paint shall be allowed in the wedge and the wedge must not be hollow. Containment of the stem nut must only be on two sides to facilitate easy removal.

The stem and stem nuts shall be made of high strength manganese bronze. The stem must have an integral thrust collar. Stainless steel stems are not acceptable. There shall be three stem seal o-rings; two in the seal plate which shall be replaceable with the valve in the full open position at rated working pressure, and one under the stem thrust collar. All gaskets shall be o-ring seals. O-rings set in a cartridge shall not be allowed. A stem seal must be present above the seal plate to prevent dirt intrusion.

Valves must have two thrust washers, one above and one below the thrust collar.

All fasteners are to be stainless steel. Socket head bolts shall not be allowed. If only two bolts are used to secure the seal plate, the bolts must be fastened to the bonnet with a drilled and tapped hole in the bonnet.

The body, bonnet and seal plate shall be epoxy coated in accordance with ANSI/AWWA C550. This coating shall be on the interior and the exterior of the valve. The manufacturer's name, valve size, year of manufacture, pressure rating ("250W"), C515, and "DI" shall be cast on the valve.

The bottom of the wedge guides must be a minimum of 25 degrees in order to promote flushing.

Each valve shall be tested in accordance with ANSI/AWWA C515, UL262 and FM 1130. This shall include hydrostatic pressure testing at 500psi. A certification of manufacture and testing shall be provided at the purchaser's request.

Valves shall be East Jordan Iron Works Flowmaster, or approved equal.

Any valve to be considered must be manufactured, assembled and tested in the contiguous United States of America. Letters of certification must accompany any and all products.

Apply "Trenton #1 Wax Tape" to the proposed gate valves and fire hydrant valves in accordance with the manufacturer specification. Encase the proposed gate valves and fire hydrant valves with polyethylene encasement.

Contact the City of Dearborn Assistant Superintendent of Water and Sewerage Division for proper submittal procedures.

124.6 **Oversize water main fittings and sleeves** where required for connections to the existing water main system shall be considered incidental to construction. The connections to existing water mains with lead joints shall be replaced with mechanical fittings.

124.7 **Fire Hydrants:** The fire hydrants shall be the City of Dearborn, Fire Department Standard East Jordan Model 5-BR250, Product #54978D. Hydrants shall open counterclockwise. Hydrants shall be controlled by 6 inch gate valves in boxes, which shall open clockwise. Hydrants shall meet AWWA standard C502. Weep / drain holes plugged .

124.8 **Tapping Sleeve Valves:** Tapping sleeve valves, if required, shall include a gate valve,

meeting the requirements of AWWA C500, with seat rings of a larger diameter to permit entry of the tapping machine cutters, and a tapping sleeve, which will allow a wet tap. The tapping sleeve shall be suited to the existing pipe material. The tapping valve shall be furnished with the types of ends required by the conditions of installations.

124.9 **Valve Boxes**: The valve box shall be made of cast iron conforming to the requirements for Class No. 20 of the specifications ASTM Designation 48. Each box shall be screw type and consist of five sections: base, center, extension, top, and cover (marked "Water"). Valve boxes shall be used for valves larger than 3 inches and less than or equal to 6 inches in size.

124.10 **Water Service Pipe, Connections and Fittings**: The water service lines 3 inches in diameter or smaller that are to be transferred from the old to the new water main shall be ASTM B-88-Type K Copper Pipe and those fittings necessary for this work shall be as manufactured by Mueller Company, Decatur, Illinois or an equal approved by the City of Dearborn Water Division. Identification numbers listed below are from Mueller Catalog W103 and A.Y. McDonald OS-11.

- a. Corporations shall be H-15000. Stops shall be of all brass construction with the types of ends as required by the conditions of installation. Stops shall open counterclockwise. 1 inch diameter Mueller threads shall be placed on each side of each line gate valve, on the inlet side of each blow-off gate valve and on the inlet side of each outlet gate valve.
- b. Flare couplings shall be H-15400 (3/4" and 1") copper to copper
- c. Compression couplings shall be H-15403E (1-1/2", 2") and 3" copper to copper
- d. Curb stop shall be Mueller H-15204 for copper to copper
- e. Curb stop shall be Mueller H-10051 and H-15174 for copper to lead
- f. Curb stop boxes shall be Tyler E 100
- g. Road box shall be Tyler size D
- h. Ball style curb stop shall be -6104 (A.Y. McDonald) (Flat head Minneapolis pattern)
- i. A.Y. McDonald Minneapolis curb box shall be 5622
- j. Mueller Minneapolis box
- k. A.Y. McDonald copper compression to lead compression shall be 4758-22-67
- l. A.Y. McDonald copper flare lead to compression shall be 47586-67

Services larger than 3 inches in diameter are considered Water Mains and shall be constructed in accordance with water main pipe and appurtenant requirements prescribed elsewhere in this special provision.

124 .10A **Lead Water Service Replacement Specifications**

The existing lead water services shall be replaced from the City watermain to at least 18 inch inside the basement.

Intended as a guide of minimum requirements for replacement of lead water services from the curb stop to the water meter.

The contractor's plumber is to apply for an individual plumbing permit for each residence requiring internal plumbing modifications on an address by address basis. Any cost for these plumbing permits will be borne by the City, any violations written upon the city inspecting and subsequent modifications and permit costs will be borne by the contractor.

Water service is to be ran in “K” copper tubing, no smaller diameter than the size of the water distribution piping immediately downstream of the existing water meter, ran in one piece with no connections or joints prior to the inlet shut off valve within the residence (Except you may connect the new service below grade, with an approved coupling or fitting, to an existing copper line provided from the existing curb stop). In no case shall the water service supply line be smaller than ¾” diameter, with no kinks or restrictions at any bends. Water service line and curb stop to be minimum of 60” below ground at all locations (54” if specific obstruction present and upon concurrence of the Engineering Inspector). Inlet water shut off valve to be placed within 18” of entrance into structure with a horizontal meter setting within 12” after water inlet valve unless otherwise approved by Water Department. Meter setting location to be spaced sufficiently away from walls or obstructions to allow proper installation of the appropriately sized a water meter. No meters or plumbing are to be placed into or thru an unheated space subject to freezing. (Specific plans and methods of running a water service thru an unheated space (under a porch or through a cellar or a crawl space) are to be reviewed and decided on a case-by-case basis with the City).

Water service shall be placed (a) by drilling a three and half inch , (3 ½ inch) hole through an existing cinder block and /or concrete basement wall and the hole shall be grouted into the wall with non-shrinking cement grout and non-shrinking polyurethane system (Mountain Grout) or equal , or (b) by directional drilling 24 inch under the basement footing by saw cutting, removing 12 inches by 12-inch concrete basement floor and pulling the new copper service through the floor , place 12 inch by 12 - inch concrete 4 inch thick.

Inlet valve shall be a full opening ¼ turn ball valve of stainless steel and or lead-free brass construction with female threads and rated for 150 psi potable water, sized the same as the water service size.

All threaded connections are to be treated with a Teflon pipe thread sealant. All other connections are to be with lead free solder. All below ground copper to copper connections are to be made with approved lead free brass flared or compression couplings of an approved manufacturer and style acceptable to the City.

After the new service is installed and connected externally with a new interior valve installed, the water shall be turned on at the curb stop, and the service line and valve checked for leaks, the water service is to be flushed and cleared before continuing.

Meter setting shall be installed with lead free brass couplings on each side of the water meter setting. Meter setting size including couplings shall be plumbed for the same size meter as the outlet piping, but in no case, no smaller than a ¾” water meter. If the existing outlet coupling is less than the proposed new meter size, or the outlet shutoff valve is not a full opening gate valve or full opening ball valve, or is broken, a new outlet valves the same size and style as the inlet valve along with a new outlet coupling is required to be plumbed in. Plumbing shall be reconnected to existing distribution inlet plumbing or extended to other suitable connection point, and if so, former distribution inlet connection point is to be terminated properly to prevent stagnant dead headed piping.

All meter settings are to have a properly attached bare ground “jumper” wire of #4 braided copper attached with proper grounding clamps, attached each side of the meter outside of the couplings. Grounding clamps are to be attached to locations where the piping has been sanded bare for positive contact.

If any existing grounding jumper wires are in place extending back away from the meter and have to be removed, they are to be re-attached to the plumbing system and re-attached to a continuous #4 jumper wire extended to the inlet side of the meter within 18” of the meter service entrance into the building.

The old water meter is to be drained and left on the floor with the radio or radio wires still attached for retrieval by Water Department Meter Service personal when they remove the rigid meter sized template and install a new water meter.

The old water service is to be turned “off” at the curb stop and the contractor will leave the water off at the existing interior inlet valve, and the opening side of the outlet of the valve or pipe will be appropriately plugged with a threaded plug, until the main is “killed” at which time the old service is to be cut flush with the floor or wall and filled with non-shrinking polyurethane caulking.

The plumber is required to turn on the plumbing and check thoroughly for leaks and verify good water pressure at plumbing fixtures within the residence before leaving and is to notify the Water Department of the need to install a water meter and to collect the old water meter.

All interior and exterior work sites are to be left in a clean and safe manner. Holes in or through walls are to be core drilled, holes in floors are to be neatly and carefully broken out to minimize damage or disruption and are to be repaired with approved concrete after backfilling and tamping.

124.11 **Storm sewer and precast manhole tee for “Tee Manholes”** shall conform to reinforced concrete pipe meeting the current A.S.T.M. C76 Specifications and shall meet the design requirements for Class IV or Class III reinforced concrete pipe.

Joints for circular concrete sewer pipe using rubber gaskets as called for in the Bid shall meet the current A.S.T.M. C443 specifications.

124.12 **Sanitary sewer** shall conform to the following requirements:

- Polyvinyl Chloride (P.V.C.) Schedule 40 for Sewer Leads
- Polyvinyl Chloride (PVC) SDR 26 for sizes 8" through 15" dia. per A.S.T.M. Specification D-3034, Material Cell Class 12454B per A.S.T.M. D-1784 or

- Polyvinyl Chloride (P.V.C) Composite Pipe (Truss) per A.S.T.M. Specification D-2680-90 (or latest revision) or for sizes 8” through 15” diameter.
- SDR 11 High Density Polyethylene (HDPE) Pipe only for horizontal directional drilling method of sewer construction and shall meet the requirements of AWWA C-900, AWWA C-905, NSF-61 and ASTM all specifications 12454. No pipe other than P.V.C. shall be used for sanitary construction.
- Polyvinyl Chloride (P.V.C.) Gravity sewer per ASTM F679, for sizes 18” diameter to 24” diameter.
- Fusible C-900 PVC pipe only for directional drilling and shall meet the requirements of AWWA C900 and AWWA C-905.
- No pipe other than P.V.C. shall be used for sanitary sewer construction.

124.13 **Precast storm sewer manhole** shall conform to current A.S.T.M. C478 specifications, provided with modified groove tongue with super seal gasket and steel reinforced plastic manhole step meeting the requirements of A.S.T.M. 21460-68 under Type II, Grade 49108. All manholes shall have eccentric cone section. Precast manhole tees shall conform to MDOT standard plan No R-3-B and as attached if required for this contract.

124.14 **Precast sanitary sewer manholes** shall conform to current A.S.T.M. C478 specifications, provided with modified groove tongue with super seal gasket, and Kor-N-Seal flexible joint connections. All manholes shall have eccentric cone section.

124.15 **Adapters for joining dissimilar pipe** shall be BAND-SEAL couplings with transitional bushings and stainless steel shear rings, as manufactured by Clow Corporation, Fernco Flexible Couplings with stainless steel clamps, or approved equal.

124.16 **Fittings for connecting P.V.C. pipe** to existing manholes shall be P.V.C. manhole adapters with silica-impregnated surface as manufactured by GPK Products, Inc.

124.17 **All new structures shall have new castings.** All castings shall meet the requirements of the current specifications A.S.T.M. Designation: A-48 and shall have the same minimum strength as provided for #30 gray iron castings.

124.18 **Portland Cement Concrete Pavement Concrete for full width pavement curb to curb and intersection to intersection, concrete curb and gutter construction (6’ wide and 2’ wide)** from intersection to intersection and concrete for all sidewalks and aprons shall contain 6 sacks of cement per cubic yard and test 3,500 psi at 28 days (5%-8% air). Coarse aggregate shall be 6AA. Concrete for pavement spot repairs and curb and gutter spot repairs shall contain 7 sacks of cement per cubic yard and test 4000 PSI at 28 days (5%-8% air).

124.181 **Materials.** All concrete used shall meet the requirements of the MDOT 2020 Standard Specifications for Construction, Grade P1 unless otherwise noted. In addition, all concrete furnished shall be resistant to excessive expansion caused by ASR (Alkali Silica Reactivity). For the roadways within MDOT rights of way, the Contractor shall use Grade P-NC concrete mix (seven (7) sacks of cement per cubic yard of concrete) with non-chloride accelerator. Only aggregates from an MDOT certified pit or quarry that has been tested within the last two (2) years by MDOT and have been determined to be non-reactive shall be used.

124.182 Supply Portland cement concrete from certified stationary concrete batch plant facilities meeting the requirements of the National Ready Mixed Concrete Association (NRMCA) Certification program for automatic Control and Authentic System. The NRMCA stationary concrete batch plant shall meet the requirements of the 2020 MDOT Standard Specifications for Construction.

124.183 Ground granulated blast-furnace slag (GGBFS) may be used as an optional portion of the cementing material with Type 1A or Type 1 Portland Cement meeting the requirements of Section 121.41.

124.184 The concrete for all full width pavement, curb to curb and street intersection to street intersection and for full length curb and gutter construction (2', 4' and 6' wide) shall be air-entrained and contain 6 sacks of cement per cubic yard and testing 3,500 psi at 28 days. Concrete shall meet the requirements of Grade P1 Concrete of the 2020 MDOT Standard Specifications for Construction. Air entrainment in the mix shall be between 5% - 8% air. Coarse aggregate for concrete shall be 6AA meeting the requirement of the MDOT 2020 Standard Specifications for Construction. The term "sack" refers to a 94 pound sack of cement. Do not exceed a slump of 3.0 inches or the slump indicated in the Contractor's approved mix design. MDOT 2020 Grade P-NC concrete with non-chloride accelerator is required for the roadways within MDOT rights of way.

124.185 The concrete for pavement spot repairs and curb and gutter spot repairs shall contain 7 sacks of cement per cubic yard and test 4,000 psi at 28 days (5%-8% air). Seven sack cement of per cubic yard of concrete is applicable on city wide street pavement spot repair contracts.

124.19 **Concrete** in concrete encasements and/or thrust blocks shall be Class 4 concrete or better.

124.20 **Asphaltic Concrete Paving:** The Contractor's attention is directed to Sections 302 and 903 of these specifications regarding materials for asphalt paving. Contractor's attention is called to the application of bond coat to the surface of concrete or bituminous pavements. The surfaces of curbs, gutters, vertical faces of existing paving and all structures which shall be in actual contact with the resurfacing materials shall be coated with a thin uniform coating of SS-1h asphalt emulsion at a rate of 0.10 gal/s.y. at an application temperature between 85°-135° F. Application of SS-1h asphalt emulsion shall be incidental to bituminous surfacing.

124.21 **Precast reinforced concrete gate well sections** shall conform to the A.S.T.M. Designation C-478 with concentric opening, provided with modified groove tongue with super seal gasket and Kor-N-Seal flexible joint connections or an approved equal. Precast base shall be grooved base.

124.22 **Reinforcing steel** shall be Deformed Billet Steel Grade 60 and conform to A.S.T.M. A-615 Specifications.

124.23 **Vitrified Clay Pipe** shall conform to the current A.S.T.M. Designation C-700 standard specification and shall have the compression joint meeting the A.S.T.M. Designation C 425.

124.24 **Pipe Underdrain** shall be perforated polyvinyl chloride (PVC) pipe wrapped with geotextile fabric meeting the requirements of A.A.S.H.T.O. M278 or perforated bituminized fiber drainage pipe, wrapped with geotextile fabric, meeting the requirements of A.A.S.H.T.O. M172 or A.S.T.M. D2311.

124.25 **Topsoil** must be visually inspected for organic contamination and cleanliness at the source by the Engineer prior to transport to the project site. Topsoil must not be contaminated and may not be a mixture of natural underlying soils, subbase materials or other materials. It must consist of natural loam, sandy loam, silty loam or clay loam humus-bearing soils adapted to the sustenance of plant life. Topsoil must be neither excessively acidic nor excessively alkaline. It must be of mineral origin, exclusive of any peat or muck.

124.26 **Seed** mixture shall be Kentucky Blue Grass with the following specifications:

Purity, minimum	98%
Germination	85%
Seeding Rate	220 lb/acre

Furnish seed in durable bags, each marked by the supplier of the blended mix with a tag giving name, lot number, net weight of contents, purity and germination.

124.27 **Sod** shall be turf grass sod grown from a state certified nursery or plant dealer and free of objectionable grasses and broadleaf weeds.

124.28 **Portland Cement** shall meet the requirements of Section 901 of the 2020 MDOT Standard Specifications for Construction.

124.29 **Aggregate** shall meet the requirements of Section 902 of the 2020 MDOT Standard Specifications for Construction.

124.30 **Masonry Unit** shall meet the requirements of Section 913 of the 2020 MDOT Standard Specifications for Construction.

124.31 **Temporary Traffic Control Materials** shall meet the requirements of Section 922 of the 2020 MDOT Standard Specifications for Construction.

124.32 **Admixtures and Curing Materials** shall meet the requirements of Section 903 of the 2020 MDOT Standard Specifications for Construction.

124.33 **Steel Reinforcement** shall meet the requirements of Section 905 of the 2020 MDOT Standard Specifications for Construction.