SPECIFICATIONS

1. PVC PIPE

A. **DELIVERY.** PIPE MUST BE DELIVERED TO JOB SITE BY MEANS WHICH WILL ADEQUATELY SUPPORT IT AND NOT SUBJECT IT TO UNDUE STRESSES. IN PARTICULAR, THE LOAD SHALL BE SO SUPPORTED THAT THE BOTTOM ROWS OF PIPE ARE NOT DAMAGED BY CRUSHING. PIPE SHALL BE UNLOADED CAREFULLY AND STRUNG OR STORED AS CLOSE TO THE FINAL POINT OF PLACEMENT AS IS PRACTICAL.

B. **STORAGE.** PVC PIPE MUST BE STORED SO AS TO BE PROTECTED FROM PROLONGED HEAT OR DIRECT SUNLIGHT. ANY PROTECTIVE COVERING MAY BE USED WHICH WILL NOT ABSORB MUCH HEAT AND WHICH WILL DEFLECT THE DIRECT RAYS OF THE SUN. VENTILATION SHOULD BE PROVIDED WITH ANY TYPE OF COVER USED. PVC PIPE WHICH IS CRACKED, BROKEN, CRUSHED, OR WHICH HAS DEEP SCRATCHES INVOLVING A 10 PERCENT PENETRATION SHALL BE REMOVED FROM THE JOB SITE.

C. **MATERIALS PVC PIPE (ASTM D2241).** WHERE NOTED ON THE PLANS, PROVIDE PVC PIPE MEETING THE REQUIREMENTS OF ASTM D2241, STANDARD SPECIFICATION FOR PVC PRESSURE RATED PIPE (DR SERIES). THE MATERIAL USED SHALL CONFORM TO ASTM D1784, STANDARD SPECIFICATION FOR RIGID PVC AND CHLORINATED PVC COMPOUNDS, CLASS 12454-B (PVC 1120) AND SHALL MEET THE REQUIREMENTS OF NSF FOR POTABLE WATER. UNLESS OTHERWISE SHOWN, THE MINIMUM THICKNESS OF THE BARREL OF THE PIPE SHALL BE SDR 17.

D. **PAINTED RING.** THE PLAIN END OF ALL PVC PIPE SHALL HAVE A PAINTED RING. THE RING IS TO ALLOW FOR FIELD CHECKING OF THE SETTING DEPTH OF THE PIPE TO INDICATE PROPER POSITION OF THE PIPE IN THE COMPLETED JOINT ASSEMBLY.

F. **FITTINGS.** FITTINGS SHALL BE DUCTILE IRON.

G. **PUSH-ON PIPE JOINTS.** PUSH-ON JOINTS SHALL BE DESIGNED FOR CONNECTING PIPE AND FITTINGS USING FLEXIBLE ELASTOMERIC GASKETS MEETING THE REQUIREMENTS OF ASTM F477. THE JOINTS SHALL CONFORM TO ASTM D3139 PUSH-ON TYPE.

H. **RESTRAINED JOINT PIPE JOINTS.** RESTRAINED JOINTS SHALL UTILIZE A SPLINE TYPE COUPLING SYSTEM. JOINTS SHALL MEET ASTM D3139. RUBBER RINGS SHALL MEET ASTM F477. PIPE UTILIZING THE SPLINE TYPE COUPLING SHALL BE FURNISHED BY THE SAME MANUFACTURER OF THE COUPLING. RESTRAINED JOINT PIPE SYSTEM SHALL BE CERTAINTEED YELOMINE PVC OR EQUAL. PIPE PRESSURE CLASS SHALL EQUAL OR EXCEED THE PRESSURE CLASSES AS SHOWN ON THE PLANS.

I. **TRACER WIRE.** THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE AND INSTALL A TRACER WIRE SECURED TO THE PIPE BARREL OVER THE ENTIRE LENGTH OF THE WATER MAIN. THE WIRE SHALL BE A MINIMUM 12-GA. COPPER, SINGLE STRAND, INSULATED. SECTIONS OF WIRE SHALL BEGIN AND END AT A VALVE BOX FOR EACH VALVED SECTION OF WATER MAIN WITH SUFFICIENT LENGTH OF WIRE AVAILABLE TO EXTEND THE ENDS OF THE WIRE 2 FEET ABOVE THE TOP OF EACH VALVE BOX. ALL SPLICES SHALL BE SOLDERED AND WRAPPED TO PROVIDE INSULATION EQUAL TO THE WIRE INSULATION.

J. **EXCAVATION AND CONSTRUCTION MATERIALS.** ALL EXCAVATED MATERIAL AND ALL CONSTRUCTION MATERIALS USED IN PROSECUTION OF THE WORK SHALL BE DEPOSITED SO AS NOT TO ENDANGER THE WORK, CREATE UNNECESSARY ANNOYANCE TO THE PUBLIC, OR INTERFERE WITH NATURAL DRAINAGE COURSES. DURING THE PROCESS OF THE WORK, ALL MATERIAL PILES SHALL BE KEPT TRIMMED UP AND MAINTAINED IN A NEAT, WORKMANLIKE MANNER.

K. **TRENCH SUPPORT.** UNSUPPORTED OPEN CUT FOR MAINS WILL NOT BE PERMITTED WHERE TRENCHING MAY CAUSE UNNECESSARY DAMAGE TO STREET PAVEMENT, TREES, STRUCTURES, POLES, UTILITIES, OR OTHER PRIVATE OR PUBLIC PROPERTY.

L. **TRENCH DEPTH IN EARTH.** THE TRENCH SHALL BE EXCAVATED TO THE DEPTH REQUIRED, SO AS TO PROVIDE A UNIFORM AND CONTINUOUS BEARING AND SUPPORT FOR THE PIPE BARREL ON SOLID AND UNDISTURBED GROUND AT EVERY POINT BETWEEN JOINTS, EXCEPT THAT IT WILL BE PERMISSIBLE TO DISTURB THE FINISHED TRENCH BOTTOM OVER A MAXIMUM LENGTH OF 18 INCHES NEAR THE MIDDLE OF EACH LENGTH OF PIPE BY THE WITHDRAWAL OF PIPE SLINGS OR OTHER LIFTING TACKLE. WHEN REQUIRED, BELL HOLES SHALL BE PROVIDED. THE FINISHED TRENCH BOTTOM SHALL BE ACCURATELY PREPARED BY MEANS OF HAND TOOLS.

M. **TRENCH DEPTH IN ROCK.** WHERE EXCAVATION IS MADE IN ROCK OR BOULDERS, THE TRENCH SHALL BE EXCAVATED 6 INCHES BELOW THE PIPE BARREL FOR PIPE 24 INCHES IN DIAMETER OR LESS, AND 9 INCHES FOR PIPE LARGER THAN 24 INCHES IN DIAMETER. ALL LOOSE MATERIAL SHALL BE REMOVED FROM THE TRENCH BOTTOM. AFTER PREPARATION OF THE TRENCH BOTTOM, A PIPE BED SHALL BE PREPARED USING CRUSHED STONE OR CRUSHED GRAVEL.

N. **PIPE LAYING.** PIPE SHALL BE LAID WITH BELL ENDS FACING IN THE DIRECTION OF LAYING, UNLESS OTHERWISE DIRECTED BY THE ENGINEER/ARCHITECT. AFTER PLACING A LENGTH OF PIPE IN THE TRENCH, THE SPIGOT END SHALL BE CENTERED IN THE BELL AND THE PIPE FORCED HOME. ALL PIPE SHALL BE LAID WITH ENDS ABUTTING AND TRUE TO LINE AND GRADE. DEFLECTION OF PIPE JOINTS IN EXCESS OF THE MANUFACTURER'S RECOMMENDATIONS WILL NOT BE PERMITTED. A WATERTIGHT PIPE PLUG OR BULKHEAD SHALL BE PROVIDED AND USED TO PREVENT THE ENTRANCE OF FOREIGN MATERIAL WHENEVER PIPE LAYING OPERATIONS ARE NOT IN PROGRESS. THE CONTRACT OR SHALL INSPECT CAST METAL PIPE AND FITTINGS FOR CRACKS BY RINGING WITH A LIGHT HAMMER WHILE SUSPENDED.

O. **PIPE CUTTING.** THE CUTTING OF PIPE FOR INSTALLING VALVES, FITTINGS, OR HYDRANTS SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER WITHOUT DAMAGE TO THE PIPE OR LINING. THE END SHALL BE SMOOTH AND AT RIGHT ANGLES TO THE AXIS OF THE PIPE. FLAME CUTTING OF METAL PIPE BY MEANS OF AN OXYACETYLENE TORCH SHALL NOT BE PERMITTED. ALL PIPE CUTTING SHALL BE AT THE CONTRACTOR'S EXPENSE.

P. **PUSH-ON JOINTS.** THE SURFACES WITH WHICH THE RUBBER GASKET COMES IN CONTACT SHALL BE THOROUGHLY CLEANED JUST PRIOR TO ASSEMBLY. THE GASKET SHALL THEN BE INSERTED INTO THE GROOVE IN THE BELL. BEFORE STARTING JOINT ASSEMBLY, A LIBERAL COATING OF SPECIAL LUBRICANT SHALL BE APPLIED TO THE SPIGOT END. WITH THE SPIGOT END CENTERED IN THE BELL, THE SPIGOT END IS PUSHED HOME.

Q. **MECHANICAL JOINTS.** MECHANICAL JOINTS FOR METAL PIPE REQUIRE THAT THE SPIGOT BE CENTRALLY LOCATED IN THE BELL. THE SURFACE WITH WHICH THE RUBBER GASKET COMES IN CONTACT SHALL BE THOROUGHLY CLEANED JUST PRIOR TO ASSEMBLY. THESE CLEAN SURFACES SHALL THEN BE BRUSHED WITH A SPECIAL LUBRICANT JUST PRIOR TO SLIPPING THE GASKET OVER THE SPIGOT END AND INTO THE BELL. THE LUBRICANT SHALL ALSO BE BRUSHED OVER THE GASKET PRIOR TO INSTALLATION TO REMOVE THE LOOSE DIRT AND LUBRICATE THE GASKET AS IT IS FORCED INTO ITS RETAINING SPACE.

R. **RESTRAINED JOINTS.** ASSEMBLE AND INSTALL THE PUSH-ON JOINT ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. THE JOINT SHALL BE THOROUGHLY CLEANED AND LUBRICATED. CHECK THE RETAINER RING FASTENER.

S. TRENCH BACKFILL.

i. **BACKFILL TO CENTERLINE OF PIPE BARREL.** ALL TRENCH EXCAVATIONS SHALL BE BACKFILLED IMMEDIATELY AFTER PIPE IS LAID. COMPACTED SELECTED TRENCH MATERIAL SHALL BE USED TO BACKFILL THE TRENCH FROM THE BOTTOM OF THE PIPE BARREL TO THE CENTERLINE OF THE PIPE BARREL. THE SELECTED MATERIAL SHALL BE PLACED IN UNIFORM 6 INCH LOOSE LAYERS AND EACH LAYER COMPACTED SO AS TO ELIMINATE THE POSSIBILITY OF SETTLEMENT, PIPE MISALIGNMENT, OR DAMAGE TO JOINTS. SELECTED TRENCH MATERIAL SHALL BE FREE FROM CINDERS, REFUSE, ORGANIC MATERIAL, BOULDERS, ROCKS, OR OTHER MATERIAL THAT IS UNSUITABLE. NO BACKFILL SHALL BE MADE WITH FROZEN MATERIAL.

ii. **BACKFILL TO 12 INCHES OVER PIPE BARREL.** FROM THE CENTERLINE OF THE PIPE BARREL TO A LEVEL OF 12 INCHES OVER THE TOP OF THE PIPE BARREL, SELECTED EXCAVATED TRENCH MATERIAL SHALL BE USED AS BACKFILL MATERIAL. CARE SHALL BE TAKEN TO AVOID INJURING OR MOVING THE PIPE. SELECTED TRENCH MATERIAL SHALL BE FREE FROM CINDERS, REFUSE, ORGANIC MATERIAL, BOULDERS, ROCKS, OR OTHER MATERIAL THAT IS UNSUITABLE. NO BACKFILL SHALL BE MADE WITH FROZEN MATERIAL.

iii. **REMAINING TRENCH BACKFILL.** FROM 12 INCHES ABOVE THE PIPE BARREL TO THE SURFACE, EXCAVATED TRENCH MATERIAL MAY BE USED AS BACKFILL MATERIAL. NO MATERIAL SHALL BE USED FOR BACKFILL THAT CONTAINS FROZEN EARTH, DEBRIS, OR EARTH WITH AN EXCEPTIONALLY HIGH VOID CONTENT. THE CONTRACTOR MAY USE MECHANICAL EQUIPMENT TO PLACE THE BACKFILL. THIS SHALL BE DONE IN SUCH A MANNER THAT THE MATERIAL DOES NOT FREE FALL, BUT SHALL BE SO PLACED THAT IT WILL FLOW ONTO THE PREVIOUSLY PLACED MATERIAL. THE CONTRACTOR SHALL CONSOLIDATE THE BACKFILL IN SUCH A MANNER AS WILL ENSURE THE MINIMUM POSSIBLE SETTLEMENT AND THE LEAST INTERFERENCE WITH TRAFFIC. NO COMPACTING OF THE BACKFILL WITH MECHANICAL EQUIPMENT, SUCH AS WHEELED VEHICLES, WILL BE PERMITTED UNLESS SUFFICIENT COVER IS PROVIDED OVER THE PIPE TO PREVENT DAMAGE TO THE PIPE.

2. **PIPE COUPLINGS.** CONNECTIONS TO EXISTING MAINS PERFORMED BY CUTTING IN SHALL BE MADE USING DUCTILE IRON COUPLINGS WITH SYNTHETIC RUBBER GASKETS AND CORROSION RESISTANT, HIGH STRENGTH, LOW ALLOY STEEL BOLTS AND NUTS PER AWWA C111. VERIFY ALL PIPE OUTSIDE DIAMETERS PRIOR TO INSTALLATION. COUPLINGS SHALL BE DESIGNED FOR CONNECTING VARIOUS PIPING MATERIALS AND SHALL BE AS MANUFACTURED BY JCM INDUSTRIES, ROMAC INDUSTRIES, OR EQUAL.

3. FLUSH HYDRANTS.

A. **TWO-INCH FLUSH HYDRANTS.** FLUSH HYDRANTS SHALL BE "ECLIPSE NO. 2" HYDRANTS AS MANUFACTURED BY THE JOHN C. KUPFERLE FOUNDRY CO., OR APPROVED EQUAL. THE HYDRANTS SHALL HAVE A 2-INCH MECHANICAL JOINT INLET CONNECTION, A 2-3/16" MAIN VALVE OPENING AND TWO 2 1/2" HOSE NOZZLES. BOTH OUTLET NOZZLES SHALL HAVE NATIONAL STANDARD THREADS. HYDRANTS SHALL BE FURNISHED WITH A 4-FOOT BURY LENGTH.

B. **SETTING HYDRANTS.** HYDRANTS SHALL BE LOCATED AS SHOWN ON THE PLANS. THE LOCATION SHALL PROVIDE COMPLETE ACCESSIBILITY AND MINIMIZE THE POSSIBILITY OF DAMAGE FROM VEHICLES OR INJURY TO PEDESTRIANS. WHEN PLACED BEHIND THE CURB, THE HYDRANT BARREL SHALL BE SET SO THAT NO PORTION OF THE PUMPER OR HOSE NOZZLE CAP WILL BE LESS THAN 12 INCHES FROM THE GUTTER FACE OF THE CURB. ALL HYDRANTS SHALL STAND PLUMB WITH THE PUMPER NOZZLE FACING THE ROAD. HYDRANTS HAVING TWO HOSE NOZZLES 90 DEGREES APART SHALL BE SET WITH EACH NOZZLE FACING THE ROAD AT AN ANGLE OF 45 DEGREES. HYDRANTS SHALL BE SET TO THE ESTABLISHED GRADE, WITH NOZZLES AT 12 INCHES ABOVE THE GROUND AS SHOWN. UNLESS OTHERWISE SHOWN, EACH HYDRANT SHALL BE CONNECTED TO THE MAIN WITH A BRANCH CONNECTION CONTROLLED BY AN INDEPENDENT GATE VALVE OF THE SAME SIZE OF THE HYDRANT BEING INSTALLED. THE GATE VALVE SHALL BE OF THE RATED WORKING PRESSURE AS SPECIFIED UNDER "BURIED VALVES".

C. **SUMP.** A DRAINAGE SUMP TWO FEET IN DIAMETER AND TWO FEET DEEP SHALL BE EXCAVATED BELOW EACH HYDRANT AND FILLED WITH COARSE GRAVEL OR STONE, COMPACTED IN PLACE, UNDER AND AROUND THE SHOE OF THE HYDRANT AND TO A LEVEL OF 6 INCHES ABOVE THE WASTE OPENING. NO DRAINAGE SUMP SHALL BE CONNECTED TO A SANITARY SEWER.

5. VALVES.

A. **GATE VALVES.** GATE VALVES SHALL BE RESILIENT SEAT TYPE CONFORMING TO AWWA C509 AND SHALL BE IRON BODY, CAST IRON WEDGE WITH RUBBER SEAT PERMANENTLY BONDED TO AND ENCASING THE WEDGE. THE BONDING PROCESS SHALL MEET THE TEST REQUIREMENTS OF ASTM D429. THE RUBBER SEAT SHALL BE RESILIENT, NICK FREE, ABRASIVE RESISTANT POLYURETHANE, SBR, OR BUNA-N-RUBBER. THE VALVES SHALL OPEN BY TURNING COUNTERCLOCKWISE. ALL VALVES SHALL HAVE OPENINGS THROUGH THE BODY OF THE SAME CIRCULAR AREA AS THAT OF THE PIPE TO WHICH THEY ARE ATTACHED. VALVES SHALL HAVE MECHANICAL JOINT ENDS UNLESS OTHERWISE SHOWN ON THE PLANS. ALL VALVES SHALL BE DESIGNED FOR A WORKING PRESSURE OF 150 POUNDS PER SQUARE INCH (PSI) UNLESS OTHERWISE NOTED ON THE PLANS. AN EXTENSION STEM SHALL BE FURNISHED, IF REQUIRED, TO BRING THE OPERATING NUT WITHIN 3 1/2 FEET OF FINISHED GRADE. EXTENSION STEMS SHALL BE SECURELY FASTENED TO THE VALVE STEM. THE CONTRACT OR SHALL MAKE ALL VALVES TIGHT UNDER THEIR WORKING PRESSURES AFTER THEY HAVE BEEN PLACED AND BEFORE THE MAIN IS PLACED IN OPERATION.

B. **SETTING VALVES.** VALVES SHALL BE SET ON A FIRM FOUNDATION SO THAT NO LOAD WILL BE TRANSFERRED TO THE CONNECTING PIPE. VALVES IN WATER MAINS SHALL, WHERE POSSIBLE, BE LOCATED ON THE STREET PROPERTY LINES EXTENDED, UNLESS OTHERWISE SHOWN ON THE PLANS. A VALVE BOX SHALL BE PROVIDED FOR EVERY VALVE. THE VALVE BOX SHALL NOT TRANSMIT SHOCK OR STRESS TO THE VALVE AND SHALL BE CENTERED AND PLUMB OVER THE OPERATING NUT OF THE VALVE. THE BOX COVER SHALL BE SET FLUSH WITH THE SURFACE OF THE FINISHED PAVEMENT UNLESS OTHERWISE SHOWN.

6. **VALVE BOXES.** ALL VALVES SHALL BE PROVIDED WITH VALVE BOXES. VALVE BOXES SHALL BE OF STANDARD, ADJUSTABLE, HEAVY PATTERN, CAST IRON EXTENSION TYPE, THREE PIECE, 5 1/4 INCH SHAFT, SCREW TYPE, AND OF SUCH LENGTH AS NECESSARY TO EXTEND FROM VALVE TO FINISHED GRADE. TOPS SHALL BE SET AT ESTABLISHED GRADE, AND THE VALVE BOX COVER MARKED "WATER."

VALVE SIZE	BASE
4" AND SMALLER	ROUND, 8" IN HEIGHT, 10 7/8" DIAMETER AT BOTTOM
6" AND 8"	ROUND, 11" IN HEIGHT, 14 3/8" DIAMETER AT BOTTOM

7. **DUCTILE IRON FITTINGS.** DUCTILE IRON STANDARD AND SPECIAL FITTINGS SHALL CONFORM TO ANSI/AWWA C110/A21.10 OR ANSI/AWWA C153/A21.53.

A. **WORKING PRESSURES.** FITTINGS SHALL BE SUITABLE FOR THE FOLLOWING WORKING PRESSURES UNLESS OTHERWISE NOTED:

SIZES	PRESSURE POUNDS PER SQUARE INCH
3" – 24"	350
30" – 48"	250

B. **COATING AND LINING.** THE FITTINGS SHALL BE COATED OUTSIDE WITH A BITUMINOUS COATING IN ACCORDANCE WITH ANSI/AWWA C110/A21.10 OR ANSI/AWWA C153/A21.53 AND LINED INSIDE WITH CEMENT MORTAR AND SEAL COATED IN ACCORDANCE WITH ANSI/AWWA C104/A21.4.

C. **JOINTS.** MECHANICAL JOINTS INCLUDING ACCESSORIES SHALL CONFORM TO ANSI/AWWA C111/A21.11. BOLTS SHALL BE HIGH STRENGTH CAST IRON TEE HEAD WITH HEX NUTS.

8. **CORPORATION STOPS.** CORPORATION STOPS FOR USE WITH PE TUBING SHALL HAVE AWWA THREAD INLET AND SHALL BE FORD SERIES FB1000 OR APPROVED EQUAL.

9. **SERVICE CLAMPS.** SERVICE CLAMPS SHALL BE DESIGNED FOR USE WITH THE SPECIFIC TYPE OF MAIN AND HAVE AWWA CORPORATION STOP THREADS. THE CLAMPS SHALL BE EQUIPPED WITH AN "O" RING SEAL CEMENTED TO THE BODY OF THE CLAMP, MARKED WITH THE SIZE RANGE ON THE SADDLE OF THE CLAMP, AND SHALL BE FORD S70 SERIES OR APPROVED EQUAL.

10. **CURB STOPS.** CURB STOPS SHALL BE FORD Z44 SERIES OR APPROVED EQUAL.

11. **TUBING.** PE TUBING SHALL BE COPPER TUBE SIZE (CTS), CONFORMING TO ASTM D2737, AND RATED AT 200 PSI MINIMUM WORKING PRESSURE.

12. **CURB BOXES.** CURB BOXES SHALL BE STANDARD, ADJUSTABLE, HEAVY PATTERN, CAST IRON EXTENSION TYPE WITH 2 1/2" SHAFT. THE BOXES SHALL BE ADJUSTABLE IN HEIGHT FROM 42 INCHES TO 60 INCHES, AND SHALL HAVE THE WORK "WATER" CAST NEATLY AND LEGIBLY ON THE LID WHICH SHALL BE HELD IN PLACE BY A BRONZE OR BRASS STANDARD BOLT.

13. **CUSTOMER SERVICE RECONNECTIONS.** THE CONTRACTOR SHALL RECONNECT ALL CUSTOMER SERVICES AS INDICATED BY THE MAYSVILLE REGIONAL WATER DISTRICT. THE RECONNECTIONS SHALL INCLUDE TAPPING THE MAIN, SERVICE CLAMP, CORPORATION STOP, PE TUBING, AND ALL TRANSITION FITTINGS AS NECESSARY TO CONNECT TO THE EXISTING WATER SERVICE. THE SERVICE TUBING SHALL BE BURIED A MINIMUM OF 2.5 FEET DEEP. WATER SERVICE LINES CROSSING HIGHWAYS SHALL BE BORED A MINIMUM OF 4 FEET UNDER THE HIGHWAY SURFACE.

14. **LEAKAGE TEST.** PERFORM ALL WORK TO PROVIDE LEAKAGE TESTS AND DISINFECTION IN COMPLIANCE WITH ALL FEDERAL, STATE, LOCAL CODES AND REGULATORY AGENCIES. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH AWWA C600 AND C605 AND AS MODIFIED HEREIN. PVC PIPE SHALL NOT BE PRESSURE TESTED WHEN THE TEMPERATURES OF THE PIPE IS OVER 80° FAHRENHEIT (°F.). ALL TESTS PERFORMED FOR EACH PIPE TEST SECTION, SHALL BE WITNESSED AND APPROVED BY THE MAYSVILLE REGIONAL WATER DISTRICT. NO EXTERIOR BURIED WATER PIPELINES WILL BE ACCEPTED UNTIL THE LEAKAGE IS NOT IN EXCESS OF 11.6 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS.

A. **TEST PROCEDURE.** EACH VALVED SECTION OF WATER MAIN TO BE TESTED SHALL BE SLOWLY FILLED WITH WATER AND THE SPECIFIED TEST PRESSURE SHALL BE APPLIED BY MEANS OF A PUMP CONNECTED TO THE PIPE IN A SATISFACTORY MANNER. BEFORE APPLYING THE SPECIFIED TEST PRESSURE, ALL AIR SHALL BE EXPELLED FROM THE PIPE. THE WATER PRESSURE SHALL BE BROUGHT TO 200 POUNDS PER SQUARE INCH, UNLESS OTHERWISE NOTED ON THE DRAWINGS, AND MAINTAINED FOR AT LEAST 2 HOURS. LEAKAGE WILL BE DETERMINED BY MEASURING THE QUANTITY OF WATER TO BE SUPPLIED TO MAINTAIN THE SPECIFIED TEST PRESSURE.

15. **CLEANING.** WATER PIPES DESIGNED TO CARRY WATER FOR DOMESTIC CONSUMPTION SHALL BE THOROUGHLY CLEANED, FLUSHED, AND DISINFECTED BEFORE BEING PUT IN SERVICE AND BEFORE ACCEPTANCE BY THE MAYSVILLE REGIONAL WATER DISTRICT.

16. **DISINFECTION.** DISINFECTION SHALL BE DONE BY THE ADDITION OF SUITABLE AMOUNTS OF CHLORINE IN THE FORM OF LIQUID CHLORINE OR HIGH TEST HYPOCHLORITE OF LIME. THE APPLICATION SHALL BE AS APPROVED BY THE MAYSVILLE REGIONAL WATER DISTRICT AND IN ACCORDANCE WITH AWWA C651. DISPOSAL OF HEAVILY CHLORINATED WATER SHALL BE IN ACCORDANCE WITH AWWA C651 AND AWWA C651 APPENDIX B, AND SHALL NOT BE DISPOSED TO A SANITARY SEWER OR THE ENVIRONMENT UNLESS DECHLORINATED SUFFICIENTLY TO NOT INTERFERE WITH TREATMENT OF SANITARY SEWAGE OR THE ENVIRONMENT.

17. **ANCHORING.** ALL PLUGS, CAPS, TEES, AND BENDS SHALL BE PROVIDED WITH A CONCRETE BACKING UNLESS NOTED OTHERWISE ON THE PLANS. IF SHOWN OR SPECIFIED, MOVEMENT SHALL BE PREVENTED BY ATTACHING SUITABLE METAL RODS, CLAMPS, OR RESTRAINED FITTINGS.

A. **CONCRETE BACKING.** CONCRETE BACKING SHALL BE 4,000 POUNDS PER SQUARE INCH CONCRETE. BACKING SHALL BE PLACED BETWEEN UNDISTURBED GROUND AND THE FITTING TO BE ANCHORED. THE AREA OF BEARING ON THE FITTING AND ON THE GROUND IN EACH INSTANCE SHALL BE THAT SHOWN HEREIN. THE BACKING SHALL, UNLESS OTHERWISE SHOWN, BE SO PLACED THAT THE PIPE AND FITTING JOINTS WILL BE ACCESSIBLE FOR REPAIR.

18. **SPECIAL AND GRANULAR BACKFILL.** STATION LOCATIONS FOR SPECIAL AND GRANULAR BACKFILL ARE APPROXIMATE ONLY, AND SHOULD BE CONFIRMED IN THE FIELD.

A. SPECIAL BACKFILL IS EXCAVATED TRENCH MATERIAL, COMPACTED IN 6 INCH LAYERS BY MECHANICAL MEANS TO MEET OR EXCEED THE DENSITY OF THE SURROUNDING MATERIAL. SPECIAL BACKFILL SHALL BE PROVIDED FOR ALL WATER MAIN INSTALLED IN GRAVEL DRIVES.

B. GRANULAR BACKFILL IS GRAVEL, CRUSHED GRAVEL OR CRUSHED STONE, AND SHALL BE COMPACTED IN 6 INCH LAYERS BY MECHANICAL MEANS TO MAKE A SATISFACTORY SUBGRADE, AND SHALL BE PROVIDED FOR ALL WATER MAIN CONSTRUCTED UNDER ASPHALT AND CONCRETE PAVEMENTS AND CONCRETE WALKS.

STATE OF OHIO ... PROFESSIONAL ENGINEER

QUANTITIES

ITEM DESCRIPTION	QUANTITY	UNIT
4" SDR 17 PVC WATER MAIN	11,100	LF
4" HIGHWAY CROSSING (TUNNEL OPTION 1)	110	LF
4" GATE VALVE AND BOX	9	EA
2" FLUSH HYDRANT ASSEMBLY	2	EA
3/4" MANUAL AIR RELEASE	1	EA
CUSTOMER SERVICE RECONNECTIONS	5	EA
GRANULAR BACKFILL	50	CY
SPECIAL BACKFILL	200	CY
PAVEMENT REPLACEMENT, TYPE C	25	SY
PAVEMENT REPLACEMENT, TYPE D	200	SY
GRADING AND SEEDING	14,000	SY

NO.	REVISIONS	DATE	BY	CHK.

Burgess & Niple, Limited — Parkersburg, WV

BURGESS & NIPLE

MAYSVILLE REGIONAL WATER DISTRICT
WATER DISTRIBUTION SYSTEM IMPROVEMENTS
LENT ROAD
CONTRACT 03-1

JOB NO.	32541
DESIGNED BY:	AMH
DRAWN BY:	DRD
CHECKED BY:	AMH
APPROVED BY:	AMH
DATE:	DEC 2002

SPECIFICATIONS AND QUANTITIES

SCALE: NO SCALE

SHEET NO. 3 OF 8

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