STANDARD DETAILS OF SEWER CONSTRUCTION

FOR

PIKE CREEK REORGANIZED COMMON SEWER DISTRICT
BUTLER COUNTY, MISSOURI

JANUARY, 2018
# STANDARD DETAILS OF SEWER CONSTRUCTION

PIKE CREEK REORGANIZED COMMON SEWER DISTRICT

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GENERAL REQUIREMENTS:

1. DESIGNS, PLANS AND SPECIFICATIONS OF ALL SEWERAGE WORKS PROPOSED TO BE CONSTRUCTED, ALTERED OR RECONSTRUCTED BY ANY PERSON OR CORPORATION, PRIVATE OR PUBLIC, WITHIN DISTRICT BOUNDARIES, SHALL MEET THE REQUIREMENTS OF THE PIKE CREEK REORGANIZED COMMON SEWER DISTRICT SPECIFICATIONS.

2. ALL SEWERAGE WORKS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW, REVISION, APPROVAL OR REJECTION. SUCH DESIGNS, PLANS AND SPECIFICATIONS SHALL BE PREPARED AND SEALED BY A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF MISSOURI, AND SHALL MEET THE MINIMUM STANDARDS OF THE DISTRICT AND MISSOURI DEPARTMENT OF NATURAL RESOURCES BEFORE APPROVAL IS GRANTED.

3. ALL ITEMS WITHIN THE FULL STANDARDS MUST BE FOLLOWED. HOWEVER, THE FOLLOWING ITEMS ARE HIGHLIGHTS FROM THE FULL STANDARDS THAT PROVIDE DEVELOPERS GENERIC FIRST STEP REQUIREMENTS THAT ANY DEVELOPER SHOULD CONSIDER DURING PRELIMINARY DESIGN:

   - PVC GRAVITY SEWER PIPING AND WYES: PIPE AND FITTINGS: 8” SDR-35 ASTM F 679, PVC GRAVITY SEWER PIPE WITH BELL-AND-SPIGOT ENDS AND WITH INTEGRAL ASTM F 477, ELASTOMERIC SEALS FOR GASKETED JOINTS.
   - ALL GRAVITY SEWER PIPING SHALL BE BEDDED WITH 3/4” CLEAN ROCK, AS DEPICTED IN THE ATTACHED DIAGRAMS.
   - PVC PRESSURE PIPING: PIPE: AWWA SDR-21 PVC, CLASS 200 PVC PIPE WITH BELL-AND-SPIGOT ENDS FOR GASKETED JOINTS. FITTINGS: AWWA SDR-21 PVC, CLASS 200 PVC PIPE WITH BELL ENDS. GASKETS: ASTM F 477, ELASTOMERIC SEALS.
   - LOCATOR WIRE AND TAPE SHALL BE PROVIDED FOR ALL GRAVITY LINES, SERVICE LATERALS, AND FORCEMAINS.
   - PVC HOME SERVICE LATERAL: PIPE: AWWA SDR-26 PVC. CLEANOUTS SHALL BE PROVIDED EVERY 100’ OR LESS.
   - MANHOLES: DESCRIPTION: ASTM C 478, PRECAST, BITUMINOUS-COATED REINFORCED CONCRETE, WITH JOINT WRAP AND SEALANT AND FIBERGLASS-REINFORCED PLASTIC MANHOLE STEPS. DIAMETER: 48 INCHES MINIMUM.
   - LIFT STATION: THE STATION SHALL USE 3-PHASE POWER (UNLESS A VARIANCE IS GRANTED IN WRITING BY THE BOARD); SUBMERSIBLE, NON-CLOG PUMPS WHERE PRACTICAL, CAST-IN-PLACE REINFORCED CONCRETE OR PRE-CAST CONCRETE WET WELL AND VALVE VAULTS, WITH MINIMUM 5 HP MOTOR WHEN SERVICE PROVIDED TO FIVE (5) OR MORE HOMES/BUSINESSES.
   - WET WELL VOLUME SHALL BE DESIGNED TO PROVIDE STORAGE FOR A MINIMUM OF 2 HOURS OF PEAK FLOW UNLESS ENGINEERING JUSTIFICATION CAN BE PROVIDED. ANY JUSTIFICATION MUST BE APPROVED BY THE DISTRICT.
   - AS-BUILT INFORMATION MUST BE PROVIDED TO THE DISTRICT PRIOR TO ANY CONNECTION TO THE SYSTEM. SEE AS-BUILT SECTION FOR DETAILS.
   - EASEMENTS SHALL BE PROVIDED FOR ALL GRAVITY MAINS TO BE CONSTRUCTED THROUGHOUT ANY EXTENSION.
   - ALL “CLASS A” CONCRETE SHOWN AND REFERRED TO IN THESE DOCUMENTS SHALL BE A 3000 PSI MIX WITH A SLUMP NO GREATER THAN 4”. COMpressive CYLINDERS AND SLUMP TESTING SHALL BE AT THE DISCRETION OF DISTRICT ENGINEER/INSPECTOR.

5. CONSTRUCTION PLAN SHEETS MUST INCLUDE TOPOGRAPHICAL INFORMATION WITH SUFFICIENT DETAIL TO SHOW PROPOSED CONTOURS, DRAINAGE DITCHES AND STREAMS.

6. IF ANYONE FAILS TO MEET THE DISTRICT’S SPECIFICATIONS OR FAILS TO OBTAIN THE REQUIRED INSPECTION CRITERIA, THEY ARE SUBJECT TO DISCONNECTION FROM THE SEWER SYSTEM AT THE EXPENSE OF THE CUSTOMER OR PERSON CONDUCTING WORK FOR THE CUSTOMER. PLEASE CONTACT THE DISTRICT BEFORE THE WORK BEGINS IF CLARIFICATIONS TO THESE SPECIFICATIONS ARE NEEDED.

7. IF YOU HAVE ANY QUESTIONS REGARDING THESE SPECIFICATIONS, PLEASE CONTACT PIKE CREEK REORGANIZED COMMON SEWER DISTRICT AT (573) 778-1321.
PIPING SPECIFICATION:

1. ALL GRAVITY MAINS LESS THAN 20' IN DEPTH SHALL BE SDR-35 PVC. ALL SDR 35 PIPE USED MUST HAVE AN EMBEDDED GASKET AND MEET ASTM SPECIFICATIONS. ALL GRAVITY MAINS OVER 20' IN DEPTH SHALL BE C-900 PVC OR DUCTILE IRON.
2. ALL DUCTILE IRON PIPE TO BE CL 52.
3. BELLS ON PIPE SHALL ALWAYS BE FACING OPPOSITE OF THE FLOW.
4. ALL CLOSED-PROFILE PIPE APPLICATIONS SHALL BE REVIEWED BY THE BOARD ON A CASE-BY-CASE BASIS (GENERALLY FOR LINES GREATER THAN 16" IN DIAMETER).

LATERALS, SDR-26:

1. LATERALS FROM HOMES OR BUSINESSES SHALL NOT BE CONNECTED INTO A MANHOLE.
2. ALL LATERALS MUST REMAIN UNCOVERED UNTIL APPROVAL IS GIVEN BY THE DISTRICT.
3. ALL RESIDENTIAL LATERALS CAN EITHER BE 4" OR 6". ALL COMMERCIAL LATERALS SHALL BE 6". A MINIMUM OF ONE CLEANOUT SHALL BE INSTALLED ON ALL LATERALS. A CLEANOUT SHALL BE INSTALLED A MINIMUM OF EVERY 100' OF LATERAL. ALL CLEANOUTS SHALL HAVE A CAST IRON FRAME AND TOP WITH “SEWER” INTERGALLY CAST ON TOP OF IT.
4. THE CLEANOUT SHALL NOT BE USED AS A PLUMBING VENT OR AS A DRAIN FOR STORM WATER.
5. JOIN PVC PRESSURE PIPING ACCORDING TO AWWA M23 FOR GASKETED JOINTS.
6. THE DISTRICT SHALL HAVE ACCESS TO THE TRENCH TO EXAMINE THE LATERAL. IF THE LATERAL IS IN A DEEP TRENCH, THE WALLS OF THE TRENCH MUST BE CUT BACK TO ALLOW SAFE AND EASY ACCESS OR THE TRENCH MUST BE SHORED TO OSHA STANDARDS.

BEDDING:

1. A MINIMUM OF 6" OF 3/4" CLEAN ROCK SHALL BE USED BOTH UNDER AND OVER THE PIPE BEING INSTALLED. IF THE LATERAL IS VERTICAL, THE ENTIRE PIPE SHALL BE ENCASED WITH 3/4" CLEAN ROCK, UP TO GRADE. EXCAVATED MATERIALS INCLUDING DIRT, SAND, OR CINDERS ARE NOT AN ACCEPTABLE FILL MATERIAL.
2. IN THE EVENT OF SOLID ROCK REMOVAL FOR MAIN LINE OR LATERAL INSTALLATION, 12" OF 3/4" CLEAN ROCK IS REQUIRED BOTH BELOW AND ABOVE THE PIPE.
3. ALL STREET CROSSINGS, DRIVEWAYS, AND PARKING LOTS SHALL HAVE 12" OF 3/4" CLEAN ROCK UNDER THE PIPE. THE TRENCH SHALL THEN BE FILLED TO GRADE WITH 3/4" CLEAN ROCK.
5. CONCRETE SHALL NOT BE USED TO COVER THE CONNECTION AT THE MAIN OR THE CONNECTION AT THE STRUCTURE. STANDBPIPES FOR CLEANOUTS ARE TO BE ENCASED WITH 3/4" CLEAN ROCK, UP TO GRADE.
MANHOLES:

1. MANHOLES SHALL BE PRECAST CONC. AS APPROVED BY THE DISTRICT. MANHOLES SHALL BE A WET Poured AND VIBRATED PROCESS. ALL MANHOLES SHALL BE A-LOCK OR Z-LOCK MANHOLES. ALL Z-LOCK MANHOLES SHALL BE BANDED ON THE INSIDE OF THE MANHOLE. FRAME AND COVERS SHALL BE 400 LB. MIN. WITHIN ROADWAYS AND 300 LB. MIN. IN ALL OTHER AREAS. OUTSIDE DROPS WILL BE REQUIRED WHEN INCOMING SEWER FLOWLINE IS GREATER THAN 24 INCHES ABOVE MANHOLE FLOWLINE. MANHOLES SHALL BE 48" DIA. FOR SEWERS 8" IN SIZE. MANHOLES SHALL NOT BE PLACED IN AREAS WHERE EXCESSIVE DRAINAGE MAY OCCUR. BITUMINOUS EXTERIOR COATING AND JOINT SEALS ARE REQUIRED FOR ALL MANHOLES.

2. MANHOLES UNDER CONSTRUCTION ARE TO BE COVERED AT THE END OF EACH DAY WITH SOME MATERIAL TO PREVENT DEBRIS FROM FALLING INTO THE MANHOLE.

3. MANHOLE INVERTS SHALL BE GROUTED WITH HYDRAULIC NON-SHRINK CEMENT. THIS SHALL NOT TAKE PLACE UNTIL ALL TESTING HAS BEEN COMPLETED.

4. MASONRY OR HYDRAULIC CEMENT SHALL BE USED TO GROUT INVERTS, DROPS, AND PICK HOLES.

5. MANHOLES MAY BE CORE DRILLED, BUT MUST BE APPROVED BY THE DISTRICT PRIOR TO THE WORK BEING DONE. ROTARY HAMMERS ARE NOT ALLOWED FOR CORE DRILLING. LINK SEAL SHALL BE USED WHERE THE CORE DRILLING TOOK PLACE.

6. IF NEW MAIN LINE CONSTRUCTION IS TO BE TIED INTO EXISTING MANHOLES, THE EXISTING MANHOLE SHALL BE REPLACED WITH A NEW ONE OR THE NEW LINES SHALL BE INSTALLED 6" ABOVE THE EXISTING MANHOLE BENCH.

7. ALL FRAMES SHALL HAVE A LIP OR EAR THAT PROTRUDES INTO THE CONE SECTION TO PREVENT THE FRAME FROM SLIDING ONCE IT HAS BEEN PUT INTO PLACE.

8. ALL MANHOLES MUST BE GROUTED AROUND THE LOWER 1/2 OF THE PIPE TO ALLOW FOR A SELF-CLEANING SLOPE. NON-SHRINK, NON METALLIC HYDRAULIC CEMENT SHALL BE USED.

9. ALL NEW MANHOLES SHALL HAVE AN EXTERIOR WATERPROOF COATING AND USE JOINT WRAPS AS SHOWN IN THE ATTACHED STANDARD DETAILS.

10. ALL MANHOLES LIDS SHALL HAVE “SEWER” INTEGRALLY CAST ON TOP OF THEM.

11. ON ALL NEW CONSTRUCTION, MANHOLE FRAMES SHALL BE EIGHT INCHES ABOVE FINAL GRADE.

12. MANHOLE MARKERS SHALL BE USED DURING CONSTRUCTION SHOWING THE LOCATION OF THE MANHOLE. THEY SHALL NOT BE REMOVED UNTIL THE CONSTRUCTION OF ALL STRUCTURES WITHIN THE DEVELOPMENT IS COMPLETE.

13. DISTRICT INSPECTORS SHALL REJECT MANHOLES IF SEALING SURFACE IS DAMAGED OR CHIPPED. THIS DETERMINATION IS AT THE SOLE DISCRETION OF THE DISTRICT’S INSPECTOR.

14. INSIDE DROPS ARE NOT ALLOWED.

15. WATERTIGHT FRAME AND COVERS SHALL BE USED WITHIN ANY 100 YEAR FLOODPLAIN OR OTHER AREAS PRONE TO FLOODING.
MATCH PAVEMENT GRADE & SLOPE OR AS DIRECTED.

ADJUST TO GRADE WITH APPROVED GRADE RINGS (2'-6" GRADE RINGS MAX.)

PRECAST CONICAL TOP SECTION
COPEPOLYMER POLYPROPYLEN
PLASTIC MANHOLE STEPS @ 16" C.C VERTICALLY

AREA OF CIRCUMFERENTIAL STEEL = .12 SQ. IN./LIN. FT.

2 ROWS OF 1" BUTYL ROPE

BITUMASTIC COATING FOR WATER PROOFING

PRECAST MANHOLE BASE A-LOCK OR Z-LOCK

C.I. FRAME & COVER WITH "SEWER" CAST IN COVER

LIFTING HOLE SHALL NOT PENETRATE WALL. PLUG HOLES W/ NON-SHRINK GROUT

AREA OF REINFORCING STEEL = .12 SQ. IN./LIN. FT.

5" MIN. WALL THICKNESS

MANHOLE BASE PLAN

BASE SECTION

(CERTAIN SEWERS 8" AND LARGER

NOTES:
1. FLOWLINE ELEVATION OF INCOMING PIPES SHALL BE MINIMUM ONE (1) INCH HIGHER THAN THAT OF OUTGOING PIPE FOR SELF CLEANING INVERT.
2. P.V.C. PIPE ONLY.
3. SEE A.S.T.M. C-478 FOR MIN. REQUIREMENTS.
4. TERMINAL MANHOLES SHALL HAVE A 5' STUB-OUT WITH WATERTIGHT CAP ONLY WHEN THE DISTRICT REASONABLY BELIEVES THE ADJOINING PROPERTIES WILL BE SERVED BY SUCH A STUB-OUT.
NOTES:

1. THE MINIMUM INSIDE DIAMETER FOR THE BASE AND RISER SECTIONS SHALL BE 48" FOR SEWERS LESS THAN 24" AND A MINIMUM INSIDE DIAMETER OF 60" FOR ALL SEWERS OF 24" TO 36".


3. DIAMETER OF DROP PIPE FOR COMBINED SEWERS AND SANITARY SEWERS IS SAME AS INCOMING 8", 10" OR 12" PIPE SEWER UNLESS OTHERWISE SHOWN ON PROJECT PLANS. FOR SEWERS 15" THROUGH 24", A DROP IS NOT TO BE USED. RATHER, CONNECT TO MANHOLE AT OR WITHIN 24" ABOVE IT'S FLOWLINE.

4. IF EXCAVATED SPACE OUTSIDE OF DROP PIPE EXCEEDS ONE (1) FOOT, PROVIDE 6" CLASS "A" CONCRETE ENCASEMENT ON INCOMING LINE FROM WALL OF MANHOLE TO A MINIMUM OF TWO (2) FEET INTO UNDISTURBED EARTH WITH A MINIMUM OF 4- #4 REBARS FOR LENGTH OF ENCASEMENT OR INSTALL ONE (1) LENGTH OF D.I.P. FROM "TEE" FITTING INTO UNDISTURBED EARTH.

OUTSIDE DROP MANHOLE

PIKE CREEK REORGANIZED COMMON SEWER DISTRICT

STANDARD DETAILS OF SEWER CONSTRUCTION

DATE: 04/03/17  REV: ---  SHEET: 5
JOINT SEALANT AND AN EXTERIOR JOINT SEALANT MEMBRANE SHALL BE INSTALLED ON ALL SANITARY PRECAST CONCRETE MANHOLES AND PUMP STATIONS JOINTS AS DETAILED ON THIS SHEET TO PREVENT GROUNDWATER INFILTRATION.

1. JOINT SEALANT - CLEAN ALL JOINT SURFACES (REMOVE ALL DIRT, OIL, DEBRIS AND OTHER FOREIGN ITEMS) AND PROVIDE ADDITIONAL PRIMER IF RECOMMENDED BY JOINT SEALANT MANUFACTURER. THE APPROVED JOINT SEALANT MATERIAL AND MANHOLE SURFACES SHALL BE DRY DURING INSTALLATION. JOINT SEALANT SHALL BEAPPLIED TO BOTH TOP AND BOTTOM JOINT SURFACES. THE JOINT SEALANT SHALL BE INSTALLED CONTINUOUSLY AROUND ALL JOINTS WITH THE ENDS PLACED BUTT TO BUTT (NOT OVERLAPPED AND NO OPEN GAPS BETWEEN SEALANTS). THE EXCESS JOINT SEALANT SHALL BE TRIMMED Flush TO BOTH INSIDE AND OUTSIDE SURFACES OF THE MANHOLE.

2. EXTERIOR JOINT SEALANT MEMBRANE - THE EXTERIOR JOINT SEALANT MEMBRANE SHALL BE A TWO-LAYER SYSTEM CONSISTING OF A VISCO-ELASTIC ADHESIVE LIQUID SEALANT COVERED BY A HEAT SHRINK SLEEVE CONSISTING OF A THICK-WALLED (0.98") CROSS-LINKED, HIGH DENSITY POLYETHYLENE MEMBRANE. THE EXTERIOR JOINT SEALANT MEMBRANE SYSTEM SHALL BE "RISER-WRAP" AS MANUFACTURED BY PIPELINE SEAL AND INSULATOR, INC. OR DISTRICT APPROVED EQUAL. THE HEAT SHRINK MEMBRANE SHALL ENCAPSULATE THE CAST IRON MANHOLE FRAME, CONCRETE GRADE RINGS, AND TOP PORTION OF THE MANHOLE CONE; IN ADDITION TO SEALING ALL PRECAST CONCRETE JOINTS AS DETAILED ON THIS SHEET. PREPARATION OF THE PRECAST CONCRETE SURFACES AND INSTALLATION OF THE MEMBRANE SHALL BE IN STRICT COMPLIANCE WITH THE MANUFACTURER'S FIELD APPLICATION SPECIFICATIONS.

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INFI-SHIELD UNI-BAND AND GATOR WRAP DETAIL

PIKE CREEK REORGANIZED COMMON SEWER DISTRICT

DATE: 04/03/17  
REV: ---  
SHEET: 6
Grade ring shall not be used. Bolt frame frame directly to top of precast manhole cone section.

Provide mastic sealer between cast iron frame and conc.

4-3/4" Stainless steel wedge type expansion anchors equally spaced

Watertight bolted frame & cover

Extend 3/4" clean rock backfill from top of pipe bedding to bottom of concrete anchor.

Concrete manhole anchor and watertight frame and cover

Pike Creek Reorganized Common Sewer District

Standard details of sewer construction

Date: 04/03/17

Sheet: 7
CONCRETE ENCASEMENT

PIKE CREEK REORGANIZED COMMON SEWER DISTRICT
STANDARD DETAILS OF SEWER CONSTRUCTION

DATE: 04/03/17  REV: ---  SHEET: 9

- Line of actual excavation
- Outside of pipe bell
- Outside of pipe barrel
- Plane of spring line
- Flow line
- Class "A" concrete
- (2) #4 bars continuous, top and bottom

3' minimum width
1. SPECIAL CONC. ENCASEMENT IS REQUIRED AT ALL CREEK, STREAM, OR DITCH CROSSINGS WHERE A MINIMUM 3' OF COVER BETWEEN TOP OF PIPE AND BOTTOM OF CREEK/STREAM/DITCH CANNOT BE MAINTAINED, OR AS DIRECTED BY DISTRICT.
2. SEWER PIPE SHALL BE DUCTILE IRON PIPE, CLASS 52.
3. SHEETING OR FORMWORK MAY BE REQUIRED FOR PLACEMENT OF CONCRETE ENCASEMENT.
NOTE: PIPE ANCHORS WILL NOT BE REQUIRED FOR PIPILINES INCLUDING SERVICE LATERALS UNDER 15% SLOPE. ALL OTHER PIPELINE GRADES INCLUDING SERVICE LATERALS WILL REQUIRE THE FOLLOWING:

1. 15% to 20% - ANCHORS INSTALLED EVERY OTHER PIPE SECTION
2. 20% to 25% - ANCHORS INSTALLED AT EACH PIPE SECTION
3. OVER 25% - PIPE SHALL BE DUCTILE IRON WITH CRADLES AT EACH PIPE SECTION.
NOTES:

1. STEEL ENCASEMENT PIPE SHALL BE REQUIRED AT ALL CROSSINGS OF FEDERAL, STATE, OR COUNTY ROADS AND STEEL ENCASEMENT SHALL BE REQUIRED FOR SEWERS LOCATED IN THE RIGHT-OF-WAY OF SUCH ROADWAYS WHERE FUTURE REPAIR OR REPLACEMENT OF SUCH SEWERS WOULD IMPEDE TRAFFIC OR REQUIRE THE REPLACEMENT OF PAVEMENT.

2. CASING PIPE SHALL BE SMOOTH WALL WELDED STEEL PIPE, ASTM A36 OR ASTM A570 SHEET WITH MINIMUM YIELD POINT 36,000 PSI CONFORMING TO AWWA C200.

3. MINIMUM WALL THICKNESS SHALL MEET OR EXCEED REQUIREMENTS OF ROADWAY OR RAILROAD AGENCY THAT IS BEING CROSSED.

4. ALL SANITARY SEWER PIPE RESTRAINED JOINT INSTALLED IN CASING PIPE SHALL BE DUCTILE OR PRESSURE P.V.C. PIPE INSTALLED AT A MINIMUM 1% SLOPE. THE STANDARD DETAIL SHALL BE INSTALLED OR THE ALTERNATE WITH "RACI" SPACERS SHALL BE INSTALLED IN THE CENTER OF THE CASING PIPE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

5. RESTRAINT JOINT SHALL REQUIRE NO SPECIAL TOOLS OR SHIMS TO REMOVE PIPE FROM CASING IN THE FUTURE (NO FIELD LOK GASKETS ALLOWED).
LATERAL CONNECTIONS REQUIREMENTS:

THE FOLLOWING SPECIFICATIONS MUST BE FOLLOWED TO MAKE ANY LATERAL CONNECTIONS WITHIN THE DISTRICT:

1. ALL SERVICE LATERALS SHALL BE 4” OR 6” DIAMETER EXCEPT COMMERCIAL WHICH SHALL BE 6” IN DIAMETER.

2. ALL SERVICE LATERALS SHALL BE SRD-26 PVC

3. ALL SERVICE LATERALS SHALL BE CONNECTED TO THE DISTRICT MAIN USING A 8”X4” OR 8”X6” GASKETED PVC SERVICE WYE. TEE TYPE SADDLES AND TEE TYPE IN-LINE FITTINGS ARE NOT ALLOWED.

4. AT LEAST SIX INCHES OF BACKFILL WILL BE USED, BOTH UNDER AND TO THE SPRINGLINE OF THE PIPE BEING PLACED IN THE GROUND. BACKFILL SHALL BE 3/4” CLEAN ROCK. ROAD CROSSING SHALL USE FULL-DEPTH 3/4” CLEAN ROCK.

5. ANY CONNECTIONS MADE TO THE MAIN SEWER THAT CROSSES THE PROPERTY OF ANOTHER HOME OR PROPERTY OWNER SHALL REQUIRE AND EASEMENT. THE EASEMENT SHALL BE RECORDED AT THE COUNTY COURTHOUSE. A COPY OF THE EASEMENT SHALL BE SUBMITTED TO THE DISTRICT FOR FILING PURPOSES PRIOR TO THE CONSTRUCTION COMMENCING.

6. ALL NEW LATERAL CONSTRUCTION SHALL USE AN IN-LINE WYE TYPE CONNECTION ON THE MAIN SEWER LINE. WHEN TAPPING AN EXISTING SEWER LINE A WYE WITH A GASKET SHALL BE USED. THE WYE FITTING WITH THE GASKET SHALL BE HELD IN PLACE WITH TWO STAINLESS STEEL BANDS. TO ACCESS THE MAIN SEWER, A HOLE SAW SHALL BE USED TO CUT THE PIPE. THE SPENT PIECE OF PIPE FROM THE MAIN LINE SHALL BE PRESENTED TO THE INSPECTOR AT TIME OF LATERAL INSPECTION.

7. ANYONE CONNECTING TO THE SEWER SYSTEM THAT WAS FORMERLY ON A SEPTIC TANK SYSTEM SHALL CLOSE THEIR SEPTIC TANK AT THEIR OWN EXPENSE

8. ALL TAP FEES SHALL BE PAID IN FULL BEFORE ANY CONNECTION TO THE SYSTEM SHALL BE ALLOWED. CONNECTION PRIOR TO PAYMENT SHALL BE CONSIDERED TAMPERING AND WILL BE FINED ACCORDING TO DISTRICT BY-LAWS.

9. THE APPROVAL OF THE SANITARY SEWER CONNECTION IS DETERMINED BY THE DISTRICT INSPECTOR. THE INSPECTOR, BY HIS OR HER DISCRETION, HAS THE RIGHT TO REJECT ANY SANITARY SEWER LATERAL CONNECTION.
LATERAL CLEANOUT DETAIL

NOTE:
SURFACE CONCRETE IS ONLY REQUIRED
IN PAVEMENT/ WALK AREAS.
DUPLEX LIFT STATIONS:

ENGINEERING REPORT- DESIGN PARAMETERS:

THE DEVELOPER SHALL PROVIDE A WRITTEN REPORT FOR ALL DUPLEX LIFT STATIONS TO BE CONSIDERED BY THE DISTRICT. AT A MINIMUM THE FOLLOWING INFORMATION SHOULD BE ADDRESSED IN THIS REPORT:

1. DESIGN FLOWS: CONNECTIONS X 280 GALLONS/ CONNECTION OR ENGINEER APPROVED HISTORICAL DATA
2. PEAK FLOW: 400% OF AVERAGE FLOW
3. FORCE MAIN VELOCITY: 2.0 FPS MINIMUM; 6.5 FPS MAXIMUM
4. "C" VALUE: 120
5. PROVIDE FORCE MAIN PROFILE
6. PROVIDE AIR RELEASE VALVES (ARV) AT FORCE MAIN HIGH POINTS
7. PROVIDE WET WELL STORAGE CALCULATIONS - 2 HOUR PEAK FLOW IS THE MINIMUM VOLUME ACCEPTABLE, ALTHOUGH THE DISTRICT RESERVES THE RIGHT TO INCREASE THE VOLUME TO BE AS HIGH AS 24 HOURS OF NORMAL FLOW VOLUME
8. PROVIDE PUMP HYDRAULIC CALCULATIONS AND SYSTEM CURVE VS PUMP CURVE GRAPHS
9. ALL FUTURE PHASES SHALL BE INCLUDED

DUPLEX PUMP STATION:

1. PROVIDE SUBMERSIBLE, NON-CLOG PUMPS, WHERE PRACTICAL - DISTRICT MUST PROVIDE A VARIANCE FOR ANY GRINDER STATION REQUESTS.
2. PUMPS MUST BE SIZED TO MEET ANTICIPATED DEMANDS, AS WELL AS 20% FUTURE GROWTH AS A MINIMUM
3. PUMP MOTOR SHALL BE AT LEAST 5 HP MINIMUM.
4. TWO PUMPS PER STATION (MINIMUM) - PUMPS SHALL AUTOMATICALLY OPERATE USING AN HOA CONTROL
5. WET WELL AND VALVE VAULT SHALL BOTH BE CONSTRUCTED FROM HAND POURED OR PRECAST STEEL-REINFORCED CONCRETE.
6. STATION SHALL BE 3-PHASE POWER UNLESS A VARIANCE IS GRANTED IN WRITING BY THE DISTRICT.
7. PROVIDE CONTROLS IN NEMA 4 STAINLESS STEEL BOX.
8. PROVIDE STAINLESS STEEL CABLE FOR LIFTING AND STAINLESS STEEL GUIDE RAILS. ALL HARDWARE ASSOCIATED WITH GUIDES, GUIDE RAILS, AND PUMP BASES SHALL BE STAINLESS STEEL.
9. ALL ELECTRICAL JUNCTION BOXES SHALL BE LOCATED OUTSIDE OF WET WELL. ALL ELECTRICAL INGRESS AND EGRESS SHALL BE IN CONDUIT AND SEALED BETWEEN THE WET WELL AND THE OUTSIDE OF THE STATION. EACH PUMP SHALL HAVE ITS OWN SEPARATE CONDUIT WITH JUNCTION BOX FOR THE POWER CABLES
10. THE FLOAT SYSTEM SHALL HAVE ITS OWN CONDUIT WITH JUNCTION BOX FOR THE FLOAT SWITCHES.
11. PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSION FOR THE CONTROL PANEL

FORCE MAIN REQUIREMENTS:

THE FOLLOWING ELEMENTS SHALL BE INCLUDED IN THE FORCE MAIN SYSTEM DESIGN:

1. AIR RELIEF VALVE (ARV) - AUTOMATIC COMBINATION VACUUM AIR RELIEF VALVES SHALL BE PLACED AT HIGH POINTS IN THE FORCE MAIN AS REQUIRED.
   A. THE VALVES SHALL BE EQUIPPED WITH ALL BACKWASH ACCESSORIES.
   B. THE BODY OF THE ARV SHALL BE SUPPORTED TO THE WALL OF THE STRUCTURE BY A 1-1/4" X 1-1/4" X 1/8" STAINLESS STEEL ANGLE BRACKET.
   C. ACCEPTABLE MANUFACTURER: VAL-MATIC MODEL 801SBW, APCO MODEL 445, OR ENGINEER APPROVED EQUAL
2. FORCE MAIN SHALL DISCHARGE TO THE GRAVITY SEWER SYSTEM AT A MANHOLE. THE POINT OF CONNECTION SHALL BE NO MORE THAN ONE FOOT ABOVE THE FLOW LINE OF THE RECEIVING MANHOLE. INSIDE DROPS WILL NOT BE PERMITTED.

SITE PLAN:

1. THE DEVELOPER SHALL PROVIDE A 40'X40' (MINIMUM) SITE FOR THE LIFT STATION. THE DEVELOPER SHALL DEED THE SITE TO THE DISTRICT. ALL LAND COST, LEGAL FEES, RECORDING COSTS, AND DOCUMENT CREATION COST SHALL BE BORNE BY THE DEVELOPER.
2. ELECTRICAL POWER TO THE SITE SHALL BE 3-PHASE WHEN AVAILABLE AND ALL COSTS SHALL BE BORNE BY THE DEVELOPER FOR IMPLEMENTATION.
3. THE DEVELOPER SHALL OPERATE THE SITE FOR ONE YEAR (MINIMUM) FROM TIME OF DISTRICT INSPECTION UNTIL THE SITE IS TO BE TAKEN OVER BY THE DISTRICT. THE DEVELOPER SHALL PAY FOR ALL IMPROVEMENTS, MAINTENANCE AND ELECTRICAL COSTS UNTIL SUCH TIME THAT THE SITE IS OFFICIALLY ACCEPTED BY THE DISTRICT.
4. PROVIDE OVERALL LAYOUT FOR APPROVAL PRIOR TO CONSTRUCTION (MINIMUM SCALE: 1"=10').
5. SHOW ALL PROPERTY LINES, RIGHT-OF-WAY LINES AND EASEMENT LINES.
6. FENCE TO BE 6' TALL, CHAIN LINK WITH THREE STRANDS OF BARBED WIRE ALONG PERIMETER.
7. WARNING SIGNS SHALL BE PLACED ON EACH SIDE OF FENCE AND GATE. SIGN SIZE, COLOR, MATERIAL AND WORDING SHALL BE APPROVED BY THE DISTRICT PRIOR TO CONSTRUCTION.
8. THE ENTRANCE AND FENCED AREA WITHIN THE LIFT STATION SITE SHALL UTILIZE 6 INCHES OF TYPE-1 BASE THROUGH THE ENTIRE SITE.
9. THE ENTRANCE ROAD SHALL BE AT LEAST 15' IN WIDTH AND HAVE TURNAROUND AREAS FOR SERVICE VEHICLES

TELEMETRY SYSTEM:

1. AT THE SOLE DISCRETION OF THE DISTRICT, THE DEVELOPER MAY BE REQUIRED TO PROVIDE A CELLULAR DIALER SYSTEM WITH THE LIFT STATION WHICH IS COMPATIBLE WITH THE DISTRICT'S EXISTING DIALER SYSTEM. ANY SUCH SYSTEM WOULD ALSO REQUIRE TWO YEARS OF CELLULAR SERVICE WITH THE DIALER SYSTEM.

PUMP STATION STANDARDS

PIKE CREEK REORGANIZED COMMON SEWER DISTRICT

STANDARD DETAILS OF SEWER CONSTRUCTION

DATE: 04/03/17
REV: ---
SHEET: 15
DEFINITIONS:

1. "INDIVIDUAL PRESSURE SYSTEM" IS A SEWERAGE SYSTEM THAT COLLECTS WASTEWATER FROM A DWELLING UNIT OR A NONRESIDENTIAL STRUCTURE AND THEN PUMPS THE WASTEWATER UNDER PRESSURE THROUGH A LATERAL TO A COMMON SEWER PIPE.

2. "COMMON SEWER PIPE" IS A SANITARY SEWER PIPE THAT IS DESIGNED OR USED TO COLLECT WASTEWATER FROM MORE THAN ONE DWELLING UNIT OR NONRESIDENTIAL STRUCTURE FOR CONVEYANCE TO A SEWAGE TREATMENT FACILITY FOR PROPER TREATMENT.

3. "PUMP STATION" OR "LIFT STATION" IS A SEWERAGE SYSTEM THAT COLLECTS WASTEWATER FROM MORE THAN ONE DWELLING UNIT OR NONRESIDENTIAL STRUCTURE AND THEN PUMPS THE WASTEWATER UNDER PRESSURE VIA A COMMON SEWER PIPE TO A SEWAGE TREATMENT FACILITY FOR PROPER TREATMENT.

4. "GRINDER PUMP" IS A SUBMERSIBLE INTEGRAL GRINDER UNIT AND PUMP WHICH IS CAPABLE OF MACERATING ALL MATERIAL NORMALLY FOUND IN DOMESTIC WASTEWATER (INCLUDING SOME FOREIGN OBJECTS SUCH AS SMALL WOOD, STICKS, PLASTIC, THIN RUBBER, SANITARY NAPKINS, TAMPONS, AND DISPOSABLE DIAPERS) INTO A SLURRY THAT WILL PASS THROUGH THE PUMP AND THE 1-1/4" FORCE MAIN.

APPLICATION OF REQUIREMENTS:

1. THE PROVISIONS OF THESE SPECIFICATIONS SHALL GOVERN THE INSTALLATION OF INDIVIDUAL PRESSURE SYSTEMS DESIGNED OR USED TO SERVE ONE DWELLING UNIT AND ONE NONRESIDENTIAL BUILDING. NO MORE THAN A SINGLE STRUCTURE SHALL BE CONNECTED TO A SIMPLEX STATION UNLESS EXPRESS WRITTEN CONSENT IS PROVIDED BY THE DISTRICT.

2. ALL PLANS FOR PUMP STATIONS AND LIFT STATIONS MUST BE PREPARED UNDER THE SEAL OF A MISSOURI PROFESSIONAL ENGINEER.

3. INDIVIDUAL PRESSURE SYSTEMS SHALL ONLY BE USED WHERE A RESIDENCE OR BUSINESS CANNOT BE SERVED BY GRAVITY FLOW OF SEWAGE FOR THE STRUCTURE TO A COMMON SEWER LINE.

SUBMITTALS:

1. SUBMIT PRODUCT DATA FOR LIFT STATION INCLUDING ALL COMPONENTS AND CONTROLS.

2. SUBMIT MANUFACTURER’S PUMP PERFORMANCE CURVE WITH OPERATING CONDITIONS.

3. SUBMIT A SKETCH OF THE PROPOSED INSTALLATION INCLUDING METHOD OF CONTROL PANEL SUPPORT IF NOT ATTACHED TO THE DWELLING.

4. SUBMIT A CERTIFIED COPY OF THE RECORDED EASEMENT DOCUMENTS FOR THE LIFT STATION AND FORCE MAIN AND ACCESS THERETO.

5. IF THE CONNECTION OF THE FORCE MAIN FROM THIS LIFT STATION WILL DISCHARGE INTO A COMMON FORCE MAIN, INSTALLER MUST HAVE PLANS PREPARED UNDER THE SEAL OF MISSOURI PROFESSIONAL ENGINEER.

SPECIFICATIONS:

ALL INDIVIDUAL PRESSURE SYSTEMS MUST BE IN ACCORDANCE WITH THE PROVISIONS OF THESE SPECIFICATIONS:

1. ONLY SUBMERSIBLE GRINDER PUMPS MAY BE UTILIZED IN AN INDIVIDUAL PRESSURE SYSTEM. THE GRINDER PUMP MUST BE SIZED TO MEET THE ANTICIPATED DEMANDS FOR THE DWELLING UNIT. THE MOTOR SHALL BE AT LEAST A 2 HP PUMP.

2. THE SEWAGE COLLECTION BASIN SHALL BE MOLDED OF FIBERGLASS REINFORCED POLYESTER RESIN MANUFACTURED BY THE LAY-UP SPRAY TECHNIQUE. TWENTY-FIVE PERCENT OF THE STRUCTURE SHALL BE GLASS FIBERS. THE INTERIOR SURFACE SHALL BE SMOOTH AND BASIN SHALL HAVE AN INTERIOR DIAMETER OF 2'-0". THE BASIN SHALL BE DESIGNED TO WITHSTAND A WALL COLLAPSE INDUCED BY HYDROSTATIC LOADING OF 120 POUNDS PER CUBIC FOOT WITH A 2.0 SAFETY FACTOR. THE MINIMUM BASIN DEPTH SHALL BE 6 FEET. OTHER MATERIALS MAY BE USED FOR THE SEWAGE COLLECTION BASIN WITH THE PRIOR PERMISSION OF THE DISTRICT.

3. THE BASIN SHALL HAVE A ONE-PIECE COVER OF SOLID POLYPROPYLENE CONSTRUCTION HAVING A MINIMUM THICKNESS OF 0.375 INCH. THE COVER SHALL BE BOLTED TO THE BASIN USING STAINLESS STEEL FASTENERS (BOLTS OR SCREWS). THE COVER SHALL HAVE A CLOSED-CELL, HIGH DENSITY NEOprene FOAM GASKET.

4. THE BASIN SHALL HAVE A LIFT-OUT RAIL SYSTEM WHICH SHALL PERMIT THE INSTALLATION AND REMOVAL OF THE GRINDER PUMP AND LOWER CHECK VALVE WITHOUT THE NECESSITY OF PERSONNEL ENTERING THE BASIN.

5. DISCHARGE PIPING SHALL BE 1-1/4", 1-1/2", OR 2" POLYVINYLCHLORIDE SDR-26 PVC PIPE. DISCHARGE PIPE SHALL BE CONSTRUCTED IN A TRENCH WITH A MINIMUM WIDTH OF 8 INCHES. PIPE SHALL BE PLACED WITH A DEPTH OF NOT LESS THAN 36" FROM THE SURFACE. PIPE SHALL BE BEDDED IN 1" CLEAN ROCK WITH A MINIMUM OF 4" OF ROCK BELOW THE PIPE. THRUST BLOCKS SHALL BE PROVIDED AS NECESSARY. NUMBER 12 TRACER WIRE SHALL MARK THE ENTIRE LOCATION OF THE DISCHARGE PIPE TO THE COMMON COLLECTOR LINE. A 6" WIDE MARKING TAPE SHALL BE INSTALLED 12 INCHES BELOW GRADE WHICH SHALL CONTAIN A WARNING THAT A BURIED SEWER LINE IS BELOW.

6. A CHECK VALVE SHALL BE INCLUDED IN THE BASIN.

7. INTERNAL JUNCTION BOX SHALL BE STRUCTURE PLASTIC CONFORMING TO NEMA 6 STANDARDS.

8. LEVEL CONTROL SHALL BE PROVIDED BY THREE UUCSA LISTED MERCURY TUBE FLOAT SWITCHES SUSPENDED FROM A STEEL BRACKET. CABLE SHALL BE SUFFICIENT LENGTH TO EXTEND FROM THE ASSIGNED FLOAT ELEVATION TO THE JUNCTION BOX WITHOUT A SPLICE.

9. THE CONTROL PANEL SHALL BE HOUSED IN AN ENCLOSURE MOLDED OF GLASS REINFORCED POLYESTER RESINS TO NEMA 4X STANDARDS. THE ENCLOSURE SHALL BE ONE-PIECE CONSTRUCTION AND SHALL BE UL LISTED AS AN ASSEMBLY.

10. AN ALARM LIGHT SHALL BE MOUNTED ON TOP OF THE CONTROL PANEL AND SHALL ENERGIZED IN THE EVENT THE HIGH WATER FLOAT SENSOR SWITCH IS ACTIVATED. AN ALARM HORN SHALL BE MOUNTED INSIDE THE BOX WITH A SILENCING BUTTON.

11. THE BASIN SHALL BE SECURED TO BE RESISTANT TO BUOYANT FORCES BY THE PLACEMENT OF PORTLAND CEMENT CONCRETE BALLAST EITHER AS A BASE OR A COLLAR. A MINIMUM OF 2.0 CUBIC FEET OF CONCRETE SHALL BE PROVIDED FOR EACH FOOT OF BASIN DEPTH. THE MINIMUM SLAB BENEATH THE BASIN SHALL BE 3' DIAMETER, 10" THICK OR 2'-0" DIAMETER, 12" THICK.

12. AN AGGREGATE SHALL BE USED TO PROVIDE A STABLE BASE FOR THE BASIN OF 1" CLEAN, 8" THICK AND EXTEND TO THE LIMITS OF THE EXCAVATION.
PIKE CREEK REORGANIZED COMMON SEWER DISTRICT

STANDARD DETAILS OF SEWER CONSTRUCTION

FORCE MAIN THRUST BLOCK DETAILS

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GRADING/COVER:

MINIMUM 3’ COVER

CONCRETE BLOCKS:

4”x8”x16” CLASS "A" CONCRETE (TYP.)
ALL VALVE BOX COVERS TO HAVE THE LETTERS "SEWER" EMBOSSED ON THEM

12" DIA. x 8" THICK CLASS A CONC. COLLAR

SEWER MAIN PIPE

SLIP RING x SOLVENT WELD "TEE" WITH SOLVENT WELD BUSHING x IRON PIPE THREAD

4" X 6" X 16" CONC. BLOCK (2 REQ. EACH VALVE)

4" X 8" X 16" CONC. BLOCK (UNDER VALVE)

MAIN CONNECTION AND VALVE DETAIL

FINISHED GRADE FROM RESIDUAL GRINDER PUMP

PLUG VALVE (TYP. FOR SEWER MAINS 2" IN DIA. OR LESS)

VALVE BOX (TYLER 6850 SERIES OR EQUAL)

MALE ADAPTOR

SEWER MAIN PIPE

4" X 8" X 16" CONC. BLOCK (UNDER VALVE)
TRACER WIRE:

GENERAL:
1. ALL TRACER WIRE AND ASSOCIATED PRODUCTS SHALL BE DOMESTICALLY MANUFACTURED IN THE U.S.A.
2. ALL TRACER WIRE SHALL HAVE HDPE INSULATION INTENDED FOR DIRECT BURY, GREEN COLOR COATED PER APWA STANDARD FOR SANITARY SEWER AND FORCE MAIN.

TRACER WIRE:
1. OPEN TRENCH - TRACER WIRE SHALL BE #12 AWG COPPER CLAD STEEL, HIGH STRENGTH WITH MINIMUM 450 LB. BREAK LOAD, WITH MINIMUM 30 MIL HDPE INSULATION THICKNESS.
2. DIRECTIONAL DRILLING/BORING - TRACER WIRE SHALL BE #12 AWG COPPER CLAD STEEL, EXTRA HIGH STRENGTH WITH MINIMUM 1,150 LB. BREAK LOAD, WITH MINIMUM 30 MIL HDPE INSULATION THICKNESS.

CONNECTORS:
1. ALL MAINLINE TRACER WIRES MUST BE INTERCONNECTED IN INTERSECTIONS, AT MAINLINE TEES AND MAINLINE CROSSES. AT TEES, THE THREE Wires SHALL BE JOINED USING A SINGLE 3-WAY LOCKABLE CONNECTOR. AT CROSSES, THE FOUR WIRES SHALL BE JOINED USING A 4-WAY CONNECTOR. USE OF TWO 3-WAY CONNECTORS WITH A SHORT JUMPER WIRE BETWEEN THEM IS AN ACCEPTABLE ALTERNATIVE.
2. DIRECT BURY WIRE CONNECTORS - SHALL INCLUDE 3-WAY LOCKABLE CONNECTORS AND MAINLINE TO LATERAL LUG CONNECTORS SPECIFICALLY MANUFACTURED FOR USE IN UNDERGROUND TRACER WIRE INSTALLATION. CONNECTORS SHALL BE DIELECTRIC SILICON FILLED TO SEAL OUT MOISTURE AND CORROSION, AND SHALL BE INSTALLED IN A MANNER SO AS TO PREVENT ANY UNINSULATED WIRE EXPOSURE.
3. NON LOCKING FRICTION FIT, TWIST ON OR TAPED CONNECTORS ARE PROHIBITED.

TERMINATION/ACCESS:
1. ALL TRACER WIRE TERMINATION POINTS MUST UTILIZE AN APPROVED TRACER WIRE ACCESS BOX (ABOVE GROUND ACCESS BOX OR GRADE LEVEL IN-GROUND ACCESS BOX AS APPLICABLE), SPECIFICALLY MANUFACTURED FOR THIS PURPOSE.
2. ALL GRADE LEVEL IN-GROUND ACCESS BOXES SHALL BE APPROPRIATELY IDENTIFIED WITH "SEWER" CAST INTO THE CAP AND BE COLOR CODED GREEN.
3. A MINIMUM OF 2 FT. OF EXCESS/SLACK WIRE IS REQUIRED IN ALL TRACER WIRE ACCESS BOXES AFTER MEETING FINAL ELEVATION.

GROUNDING:
1. TRACER WIRE MUST BE PROPERLY GROUNDED AT ALL DEAD ENDS/STUBS PER THE NATIONAL ELECTRIC CODE (NEC).
2. GROUNDING OF TRACER WIRE SHALL BE ACHIEVED BY USE OF A DRIVE-IN MAGNESIUM GROUNDING ANODE ROD WITH A MINIMUM OF 20FT OF #14 RED HDPE INSULATED COPPER CLAD STEEL WIRE CONNECTED TO ANODE (MINIMUM 0.5 LB.) SPECIFICALLY MANUFACTURED FOR THIS PURPOSE, AND BURIED AT THE SAME ELEVATION AS THE SEWER PIPE OR FORCE MAIN.

INSTALLATION GENERAL:
1. TRACER WIRE INSTALLATION SHALL BE PERFORMED IN SUCH A MANNER THAT ALLOWS PROPER ACCESS FOR CONNECTION OF LINE TRACING EQUIPMENT, PROPER LOCATING OF WIRE WITHOUT LOSS OR DETERIORATION OF LOW FREQUENCY (512Hz) SIGNAL FOR DISTANCES IN EXCESS OF 1,000 LINEAR FEET, AND WITHOUT DISTORTION OF SIGNAL CAUSED BY MULTIPLE WIRES BEING INSTALLED IN CLOSE PROXIMITY TO ONE ANOTHER.
2. TRACER WIRE SYSTEMS MUST BE INSTALLED AS A SINGLE CONTINUOUS WIRE, EXCEPT WHERE USING APPROVED CONNECTORS. NO LOOPING OR COILING OF WIRE IS ALLOWED.
3. ANY DAMAGE OCCURRING DURING INSTALLATION OF THE TRACER WIRE MUST BE IMMEDIATELY REPAIRED BY REMOVING THE DAMAGED WIRE, AND INSTALLING A NEW SECTION OF WIRE WITH APPROVED CONNECTORS.TAPING AND/OR SPRAY COATING SHALL NOT BE ALLOWED.
4. TRACER WIRE SHALL BE INSTALLED AT THE BOTTOM HALF OF THE PIPE AND SECURED (TAPED/TIED) AT 5’ INTERVALS.
5. TRACER WIRE MUST BE PROPERLY GROUNDED AS SPECIFIED.

PIKE CREEK REORGANIZED COMMON SEWER DISTRICT
STANDARD DETAILS OF SEWER CONSTRUCTION
DATE: 04/03/17
REV: ---
SHEET: 19
GENERAL:

AFTER THE SEWER SYSTEM HAS BEEN COMPLETED AND FLUSHED, THE MANHOLEs SHALL BE VACUUM TESTED AND THE SEWER LINES AND LATERALS SHALL BE LOW-PRESSURE AIR TESTED IN THE PRESENCE OF A DISTRICT INSPECTOR. SEWER LINES SHALL ALSO BE REQUIRED TO COMPLETE A DEFLECTION TEST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR INSTALLING THE SEWER SYSTEM TO PROVIDE ALL EQUIPMENT AND MATERIAL NECESSARY TO COMPLETE THE REQUIRED TESTING AND TO CONDUCT THE TESTING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION AND ALL REQUIRED SAFETY STANDARDS. NO SEWER SYSTEM WILL BE APPROVED OR ACCEPTED THAT HAS NOT PASSED THE MINIMUM TESTING AS REQUIRED HEREIN. ALTERNATE TESTING METHODS MAY BE UTILIZED PROVIDED SUCH TESTING IS APPROVED IN ADVANCE BY THE DISTRICT AND MUST ALSO MEET THE MINIMUM STANDARDS ADOPTED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES. AS A MINIMUM, ALL TESTING SHALL CONFORM TO THE FOLLOWING:

DEFLECTION TESTING:

1. NOT LESS THAN THIRTY (30) DAYS AFTER FINAL BACKFILL, THE CONTRACTOR SHALL PERFORM A DEFLECTION TEST WITH A DISTRICT INSPECTOR PRESENT. TESTING SHALL BE COMPLETED BY USING A RIGID BALL OR MANDRELS WITH DIAMETERS EQUAL TO NINETY-FIVE PERCENT (95%) OF THE DIAMETER OF THE PIPE. TEST SHALL BE PERFORMED WITHOUT MECHANICAL PULLING DEVICES. NO PIPE SHALL EXCEED A DEFLECTION OF FIVE PERCENT (5%).

LOW-PRESSURE AIR TESTING:

1. ALL TESTING MUST BE COMPLETED IN ACCORDANCE WITH ASTM F 1417. AFTER COMPLETION OF THE SYSTEM BUT PRIOR TO THE CONNECTION OF STRUCTURE(S), LOW-PRESSURE AIR TESTING SHALL BE PERFORMED ON SEWER LINES AND LATERALS. ISOLATE THE SECTION OF SEWER LINE TO BE TESTED. ALL BRANCHES, LATERALS, TEES, AND WYES MUST BE PLUGGED AND BRACED ADEQUATELY TO WITHSTAND THE TEST PRESSURE. AIR PRESSURE MUST BE INTRODUCED INTO THE SYSTEM TO ACHIEVE 4 PSI AND THEN STABILIZED TO A MINIMUM OF 3 1/2 PSI IN EXCESS OF GROUND WATER PRESSURE ABOVE THE TOP OF THE SEWER FOR AT LEAST TWO (2) MINUTES AND THEN THE AIR SUPPLY DISCONNECTED. THE TIME-PRESSURE DROP METHOD SHALL BE USED.

VACUUM TESTING:

1. ALL TESTING MUST BE COMPLETED IN ACCORDANCE WITH ASTM C-1244. AFTER COMPLETION OF THE SYSTEM BUT PRIOR TO THE CONNECTION OF STRUCTURE(S), A VACUUM TEST SHALL BE PERFORMED ON MANHOLEs. SEWER LINES AND LATERAL LINES WITHIN THE MANHOLE MUST BE PLUGGED DURING THE TESTING. A VACUUM OF TEN (10) INCHES OF MERCURY SHALL BE DRAWN ON THE MANHOLE, THE VALVE ON THE VACUUM LINE TEST HEAD SHALL BE CLOSED, AND THE VACUUM PUMP SHUT OFF. THE TIME SHALL BE MEASURED FOR THE VACUUM TO DROP TO 9 INCHES OF MERCURY. TEST PASSES IF VACUUM REMAINS AT 10 INCHES OF MERCURY OR DROPS TO NOT LESS THAN 9 INCHES OF MERCURY IN ONE (1) MINUTE.

NOTES:

1. SANITARY SEWERS SHALL NOT BE CONNECTED TO A LIVE SEWER LINE UNTIL AFTER THE SEWER SYSTEM HAS BEEN INSPECTED AND APPROVED BY THE DISTRICT IN ACCORDANCE WITH THE ABOVE PROVISIONS.

2. ALL PIPING, BOTH MAIN LINE AND LATERALS SHALL BE INSPECTED BY THE DISTRICT BEFORE THE PIPE IS BACK FILLED WITH ROCK. IF THE PIPE IS BACKFILLED WITHOUT BEING INSPECTED, IT WILL HAVE TO BE UNCOVERED SO THE DISTRICTS INSPECTOR CAN SEE THE ENTIRE PIPING AND THE CONNECTIONS TO THE MAIN LINE AND THE HOME.

3. THE SEWER CONTRACTOR SHALL FLUSH ALL SEWER LINES AFTER TESTING AND THE MANHOLEs HAVE BEEN GRouted. A DISTRICT INSPECTOR MUST BE PRESENT.

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<th>STANDARD TESTING REQUIREMENTS</th>
<th>PIKE CREEK REORGANIZED COMMON SEWER DISTRICT STANDARD DETAILS OF SEWER CONSTRUCTION</th>
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AS-BUILT REQUIREMENTS:

IT IS THE POLICY OF THE DISTRICT TO REQUIRE AN AS-BUILT SURVEY FOR ANY IMPROVEMENTS MADE TO THE DISTRICT BY DEVELOPERS. ACCEPTANCE OF THE PROPOSED IMPROVEMENTS BY THE DISTRICT IS CONTINGENT UPON DELIVERY OF THE AS-BUILT SURVEY AND ALL COSTS ASSOCIATED WITH THE SURVEY WILL BE BORNE BY THE PROJECT DEVELOPER. AT A MINIMUM, THE AS-BUILT SURVEY WILL CONSIST OF THE FOLLOWING:

1. MANHOLE LID LOCATIONS IN MISSOURI STATE PLANE COORDINATES (NAD83 US SURVEY FT) AND ELEVATIONS USING NAVD88 AS VERTICAL DATUM.
2. INVERT ELEVATIONS (NEAREST 0.01’)
3. DOWN-HOLE PICTURES OF EACH INVERT
4. SURFACE PICTURES OF EACH COMPLETED MANHOLE LID
5. VIDEO INSPECTION OF ALL NEW MAIN INSTALLATIONS
6. DELIVERY OF THE SURVEY WILL BE IN ALL-DIGITAL FORMAT (.DWG FOR CADD DRAWINGS)
7. DELIVERY OF THE VIDEO INSPECTION WILL BE IN .MP4 FORMAT WITH SEPARATE DIGITAL FILES FOR EACH VIDEO RUN BETWEEN MANHOLES. THE FILE NAMES FOR THE VIDEOS SHALL REFERNECE THE MANHOLE NAMING CONVENTION USED ON THE DISTRICT GIS SITE.
GREASE TRAPS:

GENERAL:
1. GREASE TRAPS SHALL BE REQUIRED FOR ALL NEW COMMERCIAL ESTABLISHMENTS OR ANY COMMERCIAL ESTABLISHMENTS WHICH REQUIRE UPGRADES, AS DIRECTED BY THE DISTRICT. EXISTING COMMERCIAL ESTABLISHMENTS BUILT PRIOR TO JANUARY 1, 2017, SHALL BE CONSIDERED GRANDFATHERED IN AND WILL NOT REQUIRE ANY NEW GREASE TRAPS UNTIL SUCH TIME THAT THEIR ESTABLISHMENT REQUIRES ANY UPGRADES FOR OPERATION.
2. GREASE TRAPS SHALL BE SIZED BY THE DEVELOPER'S ENGINEER AND SUBMITTED TO THE BOARD FOR SIZING APPROVAL. IN NO CASE SHALL ANY NEW GREASE TRAPS BE SIZED SMALLER THAN 500-GALLONS.
3. ALL GREASE TRAPS SHALL BE CONSTRUCTED OF PRECAST CONCRETE UTILIZING A MINIMUM OF TWO CHAMBERS. EACH CHAMBER SHALL HAVE A 24" MANHOLE ACCESS WITH STEEL FRAME AND LID. LIDS SHALL BE HAVE “SEWER” INTERGALLY CAST INTO THEM. MANHOLE LID AND FRAME SHALL BE A MINIMUM OF 8" ABOVE SURROUNDING AREA. FRAME SHALL BE BOLTED TO THE TOP OF THE TANK AND UTILIZE JOINT SEALANT FOR A WATERTIGHT SEAL.
4. THE OWNER OF ANY GREASE TRAP SHALL BE RESPONSIBLE FOR REGULAR CLEANING AND GREASE REMOVAL FROM THE TRAP. SHOULD THE OWNER OF TRAP NOT ADEQUATELY MAINTAIN THEIR TRAPS, THE DISTRICT RESERVES THE RIGHT TO CLEAN THE TRAP AND CHARGE THE OWNER DIRECTLY. ANY DAMAGE OR CLEANING CAUSED TO ANY LINE OR OTHER DISTRICT OWNED EQUIPMENT BY EXCESSIVE GREASE BUILDUP BECAUSE OF POOR MAINTENANCE OF ANY TRAP, SHALL BE REPAIRED AND/OR CLEANED BY THE DISTRICT AND THEN BILLED TO THE TRAP OWNER. THE DISTRICT ALSO RESERVES THE RIGHT TO INSPECT ANY TRAP.

GREASE TRAP SPECIFICATIONS
PIKE CREEK REORGANIZED COMMON SEWER DISTRICT
STANDARD DETAILS OF SEWER CONSTRUCTION

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