

SECTION 8 – SYSTEM PLAN NOTES

8.1 Water System Notes

Include the following Water System Notes on plans:

GENERAL NOTES

1. ALL WATER LINES, SYSTEM PLANS, AND CONSTRUCTION WILL CONFORM TO CURRENT SOUTHGATE WATER DISTRICT STANDARDS & SPECIFICATIONS AND THE DENVER WATER ENGINEERING STANDARDS, AND ARE SUBJECT TO CONSTRUCTION OBSERVATION BY SOUTHGATE PERSONNEL OR A SOUTHGATE REPRESENTATIVE. A COPY OF SOUTHGATE'S STANDARDS & SPECIFICATIONS MAY BE OBTAINED FROM SOUTHGATE.
2. ONLY AFTER CONSTRUCTION PLANS HAVE BEEN REVIEWED AND APPROVED BY SOUTHGATE, THE OWNER, THE OWNER'S ENGINEER OR CONTRACTOR, WILL SCHEDULE A PRE-CONSTRUCTION MEETING WITH SOUTHGATE AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION. APPROVED CONSTRUCTION PLANS, SIGNED BY THE DISTRICT MANAGER AND DISTRICT ENGINEER, WILL BE DISTRIBUTED AT THE PRE-CONSTRUCTION MEETING.
3. CONSTRUCTION WILL NOT BE PERMITTED TO START UNTIL ALL EASEMENTS ARE SIGNED AND RECORDED AND THE PRE-CONSTRUCTION MEETING HAS BEEN HELD.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE PROCUREMENT OF ALL PERMITS FOR THE CONSTRUCTION OF MAIN AND SERVICES. ALL PERMITS MUST BE APPROVED AND FEES MUST BE PAID PRIOR TO CONSTRUCTION STARTING.
5. SOUTHGATE REQUIRES 48 HOURS NOTICE PRIOR TO START OF CONSTRUCTION AND NOTIFICATION OF ANY BREAK IN CONSTRUCTION (DUE TO WEATHER, SCHEDULING, ETC.) AND WHEN CONSTRUCTION WILL RESUME.
6. SOUTHGATE REQUIRES 24 HOURS NOTICE PRIOR TO ANY OVERTIME WORKED ON A WEEKDAY. COSTS INCURRED BY SOUTHGATE ASSOCIATED WITH CONSTRUCTION OVERTIME WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. A COPY EACH OF ALL SURVEY CUT SHEETS MUST BE SUBMITTED TO SOUTHGATE AND TO THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
8. THE CONTRACTOR SHALL CONTACT ALL APPROPRIATE UTILITY COMPANIES FOR NOTIFICATION AND LOCATES PRIOR TO CONSTRUCTION COMMENCING. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES AND COSTS THAT RESULT BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES - INCLUDING SOUTHGATE UTILITIES.
9. SOUTHGATE OR ITS REPRESENTATIVE IS NOT A GUARANTOR OF THE CONSTRUCTION CONTRACTORS' OBLIGATIONS AND PERFORMANCE OF CONTRACT.
10. OBSERVATIONS OF WORK IN PROGRESS AND ON-SITE VISITS ARE NOT TO BE CONSTRUED AS A GUARANTEE BY SOUTHGATE OR SOUTHGATE'S REPRESENTATIVE OF THE CONTRACTORS' PERFORMANCE.
11. SOUTHGATE AND SOUTHGATE'S REPRESENTATIVE IS NOT RESPONSIBLE FOR SAFETY IN, ON, OR ABOUT THE PROJECT SITE, NOR FOR COMPLIANCE BY THE APPROPRIATE PARTY OF ANY REGULATIONS RELATING THERETO.
12. SOUTHGATE AND SOUTHGATE'S RESPRESENTATIVE EXERCISES NO CONTROL OF THE SAFETY OR ADEQUACY OF ANY EQUIPMENT, BUILDING COMPONENTS, SCAFFOLDING,

FORMS, OR ANY OTHER WORK AIDS USED IN OR ABOUT THE PROJECT, OR IN THE SUPERINTENDING OF THE SAME.

13. SOUTHGATE REQUIRES 48 HOURS NOTICE PRIOR TO ANY WEEKEND OR NIGHT WORK. COSTS INCURRED BY SOUTHGATE ASSOCIATED WITH WEEKEND AND NIGHT WORK WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
14. A SET OF APPROVED PLANS SHALL BE MAINTAINED BY THE CONTRACTOR AND KEPT ON SITE AT ALL TIMES. THESE PLANS SHALL BE USED TO MAKE THE "AS-CONSTRUCTED" NOTES DURING THE COURSE OF CONSTRUCTION. THESE NOTES SHALL INCLUDE BUT ARE NOT LIMITED TO, ANY DEVIATIONS FROM THE APPROVED PLANS, NOTING THE TYPES AND LOCATIONS OF THE MATERIALS IN PLACE.
15. ALL REQUIRED TESTING EQUIPMENT WILL BE SUPPLIED BY THE CONTRACTOR. SOUTHGATE REQUIRES 48 HOURS NOTICE PRIOR TO TESTING FOR SCHEDULING PURPOSES.
16. THE CONTRACTOR SHALL SCHEDULE COMPACTION TESTING WITH THE SOILS CONSULTANT. SEVERAL COMPACTION TESTS ARE REQUIRED AT INTERSECTIONS WITH OTHER UTILITIES, SERVICE STUBS, AND AT RANDOM LOCATIONS OVER THE WATER LINE. TESTING WILL BE REQUIRED WHEN SOILS MATERIAL CHANGES. TESTING WILL BE REQUIRED FOR EVERY THIRD SERVICE INSTALLATION. THE SOILS ENGINEER IS REQUIRED TO SUBMIT COMPACTION TEST RESULTS ON A DAILY BASIS. THE OWNER/DEVELOPER IS RESPONSIBLE FOR COSTS ASSOCIATED WITH COMPACTION TESTING.
17. CONSTRUCTION WATER IS AVAILABLE BY PURCHASING A PERMIT FROM SOUTHGATE AND DENVER WATER. CURRENT DENVER WATER CERTIFICATION IS REQUIRED ON ALL WATER METERS. SOUTHGATE DOES NOT SUPPLY WATER METERS.
18. PIPELINE ACCEPTANCE AND THE START OF THE WARRANTY PERIOD OF THE NEW WATER MAINS WILL NOT BE CONSIDERED UNTIL ALL REQUIREMENTS FOR ACCEPTANCE HAVE BEEN FULFILLED, INCLUDING:
 - A. SATISFACTORY CHLORINE & CLEAR WATER TESTS.
 - B. COMPLETE SET OF SIGNED COMPACTION TEST RESULTS IS SUBMITTED TO SOUTHGATE AND THE APPLICABLE CITY/COUNTY.
 - C. ALL PUNCH LIST ITEMS ARE COMPLETED TO THE SATISFACTORY OF SOUTHGATE.
 - D. FIRST LIFT OF PAVING IS COMPLETED, AT A MINIMUM.
 - E. SURVEYED RECORD DRAWINGS HAVE BEEN SUBMITTED TO AND APPROVED BY SOUTHGATE. CONTACT THE SOUTHGATE ENGINEERING DEPARTMENT FOR REQUIREMENTS PRIOR TO SUBMITTING RECORD DRAWINGS.
 - F. RECORDED ADDRESS PLAT, IF APPLICABLE, IS SUBMITTED TO SOUTHGATE.
 - G. WARRANTY FUNDS ARE SUBMITTED TO SOUTHGATE IN THE FORM OF A LETTER OF CREDIT OR CHECK EQUAL TO TEN PERCENT (10%) OF THE TOTAL COST OF WATER IMPROVEMENTS. THE LETTER OR CHECK WILL BE EFFECTIVE FOR A MINIMUM OF FIFTEEN (15) MONTHS FROM START OF WARRANTY PERIOD.
19. THEORETICAL STATIC WATER PRESSURES ARE ESTIMATED TO RANGE FROM _____ PSI AT USGS ELEVATION _____ TO _____ PSI AT USGS ELEVATION _____ BASED UPON A HYDRAULIC GRADIENT OF USGS ELEVATION _____. SOUTHGATE HAS PROVIDED ONLY THE HYDRAULIC GRADIENT ELEVATION. THIS HYDRAULIC GRADIENT, OF WHICH WAS PROVIDED AT THE TIME OF PLAN REVIEW, MAY CHANGE IN THE FUTURE AS OVERALL WATER SYSTEM OPERATIONS WARRANT.
20. THE LINE SHALL BE CHLORINATED IN ACCORDANCE WITH THE REQUIREMENTS OF THE COLORADO STATE BOARD OF HEALTH. THE PREFERRED METHOD IS TO USE SUFFICIENT CHLORINE TABLETS TO PRODUCE A 50-MG/L SOLUTION. THESE TABLETS SHOULD BE ADHERED TO THE TOP OF THE PIPE SECTION WITH PERMATHEX CLEAR RTV ADHESIVE.

21. CHLORINE TESTS BY A STATE CERTIFIED LAB WILL BE TAKEN EVERY 1000 FEET OF PIPE INSTALLED. THE RESULTS MUST BE SUBMITTED TO SOUTHGATE AND DENVER WATER.
22. ALL NEW WATER LINES WILL BE HYDROSTATIC PRESSURE TESTED. THE TESTING EQUIPMENT AND/OR ANY COSTS SHALL BE PROVIDED BY THE CONTRACTOR. THE TEST WILL BE CONDUCTED AT 50 PSI ABOVE NORMAL OPERATING PRESSURE OR AT 150 PSI, WHICHEVER IS GREATER. UPON WRITTEN RECORD OF A PASSING CHLORINE TEST, AND SATISFACTORY COMPACTION TEST RESULTS, SOUTHGATE WILL WITNESS PRESSURE TESTING AT THE CONTRACTOR'S CONVENIENCE.
23. ALL NEW WATER LINES WILL REQUIRE A CLEAR WATER TEST TAKEN BY A STATE CERTIFIED LAB FOR BACTERIOLOGICAL RESULTS. THE RESULTS MUST BE SUBMITTED TO SOUTHGATE AND DENVER WATER. CLEAR WATER TESTS WILL BE TAKEN AT THE CONTRACTOR'S EXPENSE PRIOR PIPELINE ACCEPTANCE, START OF THE WARRANTY PERIOD, AND PRIOR TO THE RELEASING TAPS OR CONNECTION TO EXISTING PIPE
24. ADDITIONAL TESTING MAY BE REQUIRED AT THE DISCRETION OF SOUTHGATE.
25. SOUTH METRO FIRE RESCUE AUTHORITY WILL ALSO INSPECT THE FIRE LINE AND WILL OBSERVE TESTING.
26. EXISTING VALVES OWNED AND OPERATED BY SOUTHGATE MAY ONLY BE OPERATED BY SOUTHGATE PERSONNEL. VALVES INSTALLED BY THE CONTRACTOR MAY BE OPERATED UNTIL SOUTHGATE ACCEPTS THE SYSTEM. COORDINATE WITH SOUTHGATE A MINIMUM OF 48 HOURS BEFORE EXISTING VALVES ARE TO BE OPERATED.
27. RELEASE OF SECURITY AND WARRANTY OF FACILITIES IS DEPENDENT UPON SUCCESSFUL COMPLETION OF A MINIMUM OF ONE (1) YEAR WARRANTY PERIOD AND CONVEYANCE OF DOCUMENTS.
28. THE OWNER IS RESPONSIBLE FOR MAINTENANCE OF THE SYSTEM FROM PIPE ACCEPTANCE TO RELEASE OF SECURITY AND WARRANTY. FAILURE TO MAINTAIN WATER LINES BY THE TERMS OF THE IMPROVEMENTS AGREEMENT MAY BE CONSIDERED GROUNDS FOR PERMANENT ABANDONMENT OF FACILITIES.
29. STUB-IN AGREEMENTS ARE AVAILABLE THRU SOUTHGATE AND DENVER WATER ONLY AFTER COMPLETED TESTING AND MAIN LINE INSTALLATION, BUT MAY BE OBTAINED PRIOR TO PIPELINE ACCEPTANCE AND START OF THE WARRANTY PERIOD.
30. WATER SERVICE TAP SALES ARE PERMITTED ONLY AFTER:
 - A. THE NEW WATER SYSTEM HAS BEEN INSTALLED, TESTED (PRESSURE, COMPACTION, CLEAR WATER, AND CHLORINE), AND CONNECTED TO EXISTING SYSTEM PER APPROVED DRAWINGS.
 - B. WARRANTY FUNDS OR LETTER OF CREDIT HAS BEEN SUBMITTED TO SOUTHGATE.
 - C. SURVEYED RECORD DRAWINGS HAVE BEEN SUBMITTED AND APPROVED BY SOUTHGATE.

CONSTRUCTION NOTES

1. ONLY THE FOLLOWING FIRE HYDRANTS AND VALVE BOXES ARE PERMITTED BY SOUTHGATE:
 - A. FIRE HYDRANTS:
 - I. MEULLER CENTURION MODEL A-423
 - II. WATEROUS PACER MODEL WB-67 WITH BRONZE BUSHED SHOE AND SHAFT COUPLING
 - B. VALVE BOXES:
 - I. TYLER SCREW-TYPE "C" CAST IRON VALVE BOX ASSEMBLY SERIES 6860 WITH NO. 160 OVAL BASE
 2. ONLY ONE (1) CONNECTION POINT IS PERMITTED TO EXISTING SYSTEM PRIOR TO COMPLETION OF TESTING.
 3. THE CONTRACTOR SHALL VERIFY ELEVATIONS OF EXISTING LINES AND CONNECTION POINTS BY MEANS OF CERTIFIED SURVEY PRIOR TO STAKING AND INSTALLATION.
 4. THE ALIGNMENT SHALL BE STAKED AND GRADED EVERY FIFTY (50) FEET. ALL FITTINGS AND VERTICAL DEPRESSIONS ARE TO BE STAKED. THE FIRE HYDRANTS WILL BE STAKED AND GRADED TO THE BOTTOM OF FLANGE FITTING. THIS GRADE WILL BE SET THREE (3) INCHES ABOVE PROPOSED GRADING FINISH ELEVATIONS. STAKE BOTH SIDES OF EASEMENTS WHERE THE WATER LINE IS NOT LOCATED IN PAVED AREAS.
 5. WATER LINES SHALL HAVE A MINIMUM OF FOUR AND ONE-HALF (4.5) FEET OF COVER.
 6. ALL WATER LINES SHALL BE LOCATED A MINIMUM OF TEN (10) FEET FROM SANITARY SEWER LINES, AND THREE (3) FEET FROM THE EDGE OF CONCRETE CURB AND GUTTER OR CONCRETE PAN.
 7. PRIOR TO INSTALLATION OF WATER MAINS, ROAD CONSTRUCTION, AT A MINIMUM, MUST HAVE PROGRESSED TO "SUB-GRADE" STAGE. SUB-GRADE IS DEFINED AS AN ELEVATION OF NO MORE THAN SEVEN (7) INCHES BELOW THE FINISHED STREET GRADE. THE CONTRACTOR SHALL ADJUST ALL VALVE BOXES AND ALL FIRE HYDRANTS TO FINAL GRADE.
 8. TRENCH COMPACTION IN STREET RIGHT-OF-WAY IS TO CONFORM TO APPLICABLE MUNICIPAL STANDARDS (ARAPAHOE COUNTY, DOUGLAS COUNTY, GREENWOOD VILLAGE, COLORADO DEPARTMENT OF TRANSPORTATION, OR THE CITY OF LONE TREE.)
 - A. SOILS HAVING AN AASHTO A-1 THROUGH A-5 CLASSIFICATION REQUIRE 95% MODIFIED PROCTOR DENSITY WITH MOISTURE CONTENT OF +/- 2% (SANDY SOILS).
 - B. SOILS HAVING AN AASHTO A-6 AND A-7 CLASSIFICATION REQUIRE 95% STANDARD PROCTOR DENSITY WITH A 0 TO +/-3 % MOISTURE CONTENT (CLAY SOILS).
 - C. ANY OTHER SOILS CLASSIFICATION REQUIRES 95% STANDARD PROCTOR DENSITY WITH A +/- 2% MOISTURE CONTENT.
 - D. PIPE ZONE, 90% STANDARD PROCTOR OR 70% RELATIVE DENSITY (PIPE BEDDING MATERIALS)
- TRENCH COMPACTION OUTSIDE THE RIGHT-OF-WAY WILL REQUIRE:
- A. 90% STANDARD PROCTOR DENSITY OR 70% RELATIVE DENSITY FOR BEDDING MATERIAL.
 - B. OUTSIDE OF ASPHALT PAVED AREAS AND IN EASEMENTS REQUIRE 90% STANDARD PROCTOR DENSITY WITH A MOISTURE CONTENT OF +/- 2 % FOR ALL SOILS.
 - C. ALL PAVED AREAS AND RIGHT-OF -WAY AREAS REQUIRES 95% STANDARD PROCTOR DENSITY WITH A +/- 2% FOR ALL SOILS.

- D. COMPACTION TESTING OF BACKFILL FOR EACH VERTICAL LIFT OF PLACEMENT MUST BE TAKEN FROM THE TOP OF PIPE BEDDING TO THE FINISH BACKFILL GRADE.
9. THE BEDDING WILL BE PER STANDARD DETAIL, I.E. 6 INCHES UNDERNEATH THE PIPE AND 12 INCHES OVER THE TOP OF THE PIPE. THE BEDDING MATERIAL WILL BE SQUEEGEE, OR APPROVED EQUAL.
 10. ALL WATER VALVES ARE TO BE SET ON THE INTERSECTION POINT OF THE EXTENDED PROPERTY LINE AND WATER LINE, UNLESS THAT POINT FALLS ON THE FLOW LINE OF A CONCRETE CROSS PAN. IN THAT CASE, THE VALVE SHALL BE LOCATED SUCH THAT SURFACE DRAINAGE DOES NOT INFILTRATE THE VALVE BOX. VALVE BOXES SHALL BE SET A MINIMUM 1/4" AND A MAXIMUM 1/2" BELOW FINISHED GRADE IN PAVED AREAS, AND SET AT FINISHED GRADE WITH CONCRETE COLLARS IN UNPAVED AREAS.
 11. ALL DEPRESSIONS USING VERTICAL BENDS AND ALL FIRE HYDRANT BRANCH INSTALLATIONS SHALL USE DUCTILE IRON PIPE - CLASS 50 OR GREATER.
 12. FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH SOUTHGATE'S DETAIL. ALL FIRE HYDRANTS ARE TO BE PAINTED YELLOW.
 13. POLYETHYLENE WRAPPING SHALL BE INSTALLED AROUND ALL DUCTILE IRON PIPE, FITTINGS, VALVES, FIRE HYDRANT BARRELS, RODS AND CLAMPS. MINIMUM THICKNESS OF POLYETHYLENE WRAPPING SHALL BE 8 MILS.
 14. KICK BLOCKS SHALL BE POURED RESTING ON UNDISTURBED SOIL FOR ALL THE FOLLOWING INSTALLATIONS:
 - A. TEES
 - B. PLUGS
 - C. HORIZONTAL BENDS
 - D. HORIZONTAL AND VERTICAL OFFSETS
 - E. FIRE HYDRANTS AT THE FIRE HYDRANT TEE AND AT THE BOOT
 15. RODDING OR RESTRAINT IS REQUIRED ON ALL REDUCERS, PLUGS, 90-DEGREE BENDS, CONDUIT CROSSINGS, FIRE HYDRANT RUNS, AND HORIZONTAL AND VERTICAL OFFSETS. VERTICAL DEFLECTIONS OF MORE THAN 1 FOOT SHALL BE MADE USING BENDS AND RESTRAINTS. THE RODDING TABLE PROVIDES INFORMATION AS TO THE MINIMUM LENGTH ALLOWED.
 16. ALL WATER LINES THAT ARE RODDED SHALL BE CLAMPED AT EACH JOINT OR AS REQUIRED.
 17. ANY AREAS WHERE THE WATER LINE PIPE IS TO BE RODDED WILL BE TIED BEHIND THE BELL ONTO THE DUCTILE IRON PIPE MATERIALS ONLY.
 18. A MINIMUM OF FOUR (4) FEET, TWO (2) FEET EITHER SIDE OF A SERVICE TAP SHALL BE EXPOSED FOR EACH CONNECTION.

8.2 PRV Notes

Include the following notes on water plans with PRVs:

PRV VAULT NOTES

1. PRESSURE REDUCING VALVE SHALL BE SINGER MODEL S106-PR, FULL PORT, ROLLING DIAPHRAGM, PRESSURE REDUCING CONTROL VALVE, CLASS 150# FLANGE BODY, C/W STAINLESS STEEL X107 POSITION INDICATOR, OXY NITRIDE STEM, STAINLESS STEEL PILOT STRAINER WITH STAINLESS STEEL BLOW-DOWN, STAINLESS STEEL ISOLATION BALL VALVES, STAINLESS STEEL BRAIDED HOSE AND FITTINGS, STAINLESS STEEL PILOT WITH 20-200 PSI SPRING RANGE, PRESSURE SET POINT AT _____ PSI.
2. ALL PIPE SECTIONS AND FLANGED FITTINGS TO BE DUCTILE IRON IN CONFORMANCE WITH ANSI/AWWA C110/A21.10 AND ANSI B16.1 CLASS 125 STANDARDS.
3. PROVIDE STAINLESS STEEL ASTM F-593 HEX BOLTS AND ASTM F-594 HEX NUTS C/W SAE STAINLESS STEEL WASHERS USED THROUGHOUT
4. ALL FLANGE GASKETS SHALL BE FULL FACE 1/8" THICK TOURSEAL FLANGE GASKETS.
5. VAULT INTERIOR SHALL BE SMOOTH FINISH THROUGHOUT WITH WHITE COATING FOR IMPROVED LIGHTING AND CLEANLINESS.
6. PROVIDE C-55 BLACK DAMP-PROOFING COATING ON EXTERIOR BOTTOM VAULT HALF.
7. PROVIDE 3" THICK R21 SPRAY-ON POLYURETHANE FOAM INSULATION ON VAULT TOP SECTION.
8. CLOSE ALL PIPE PENETRATIONS THROUGH THE VAULT WALL WITH "LINK-SEAL" STYLE SEALS.
9. PROVIDE PRESSURE GAUGES UPSTREAM AND DOWNSTREAM OF PRV. PRESSURE GAUGES SHALL BE STAINLESS STEEL AND INSTALLED THRU A SERVICE SADDLE ASSEMBLY WITH BALL VALVE ISOLATION. PROVIDE DUAL SCALE, GLYCERINE FILLED, 4" DIAMETER FACE.
10. FLANGE ADAPTERS, IF REQUIRED, SHALL BE SMITH BLAIR MODEL 911 WITH CAM-LOC JOINT RESTRAINT OR DISTRICT APPROVED EQUAL. FLANGE ADAPTERS WITH RING STYLE GASKETS ARE NOT ACCEPTABLE.
11. SERVICE SADDLES (REQUIRED AT THE PRESSURE GAUGES) SHALL BE SMITH BLAIR #372 STAINLESS STEEL WITH DOUBLE STUD.
12. ALL BALL VALVES SHALL BE APOLLO 82-100 THREADED, BRONZE, 3 PIECE, FULL PORT BALL VALVES.
13. BOLTED STEEL TRANSITIONS COUPLING (BTSC) SHALL BE A RESRAINED DISMANTLING JOINT. PROVIDE ROMAC DJ400 WITH STAINLESS STEEL NUTS, BOLTS, AND LIMITING RODS OR DISTRICT APPROVED EQUAL.

8.3 Sewer System Notes

Include the following Sewer System Notes on plans:

GENERAL NOTES

1. ALL SEWER LINES, MANHOLES, SANITARY SEWER SYSTEM PLANS, AND CONSTRUCTION WILL CONFORM TO CURRENT SOUTHGATE SANITATION DISTRICT SPECIFICATIONS AND THE CITY OF ENGLEWOOD STANDARDS, AND ARE SUBJECT TO CONSTRUCTION OBSERVATION BY SOUTHGATE PERSONNEL OR REPRESENTATIVES. A COPY OF SOUTHGATE'S SPECIFICATIONS MAY BE OBTAINED FROM SOUTHGATE.
2. ONLY AFTER CONSTRUCTION PLANS HAVE BEEN REVIEWED AND APPROVED BY SOUTHGATE, THE OWNER, THE OWNER'S ENGINEER OR CONTRACTOR, WILL SCHEDULE A PRE-CONSTRUCTION MEETING WITH SOUTHGATE AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION. APPROVED CONSTRUCTION PLANS, SIGNED BY THE DISTRICT MANAGER AND DISTRICT ENGINEER, WILL BE DISTRIBUTED AT THE PRE-CONSTRUCTION MEETING.
3. CONSTRUCTION WILL NOT BE PERMITTED TO START UNTIL ALL EASEMENTS ARE SIGNED AND RECORDED AND THE PRE-CONSTRUCTION MEETING HAS BEEN HELD.
4. ALL PERMITS AND FEES MUST BE PAID PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR THE PROCUREMENT OF ALL PERMITS FOR THE CONSTRUCTION OF MAIN AND SERVICES.
5. SOUTHGATE REQUIRES 48 HOURS NOTICE PRIOR TO START OF CONSTRUCTION AND NOTIFICATION OF A BREAK IN CONSTRUCTION (DUE TO WEATHER, SCHEDULING, ETC.) AND WHEN CONSTRUCTION WILL RESUME.
6. SOUTHGATE REQUIRES 24 HOURS NOTICE PRIOR TO ANY OVERTIME WORKED ON A WEEKDAY. COSTS INCURRED BY SOUTHGATE ASSOCIATED WITH CONSTRUCTION OVERTIME WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. A MINIMUM OF ONE COPY EACH OF ALL SURVEY CUT SHEETS MUST BE GIVEN TO SOUTHGATE AND TO THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
8. THE CONTRACTOR SHALL CONTACT ALL APPROPRIATE UTILITY COMPANIES FOR NOTIFICATION AND LOCATES PRIOR TO CONSTRUCTION COMMENCING. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES AND COSTS THAT RESULT BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES.
9. SOUTHGATE OR ITS REPRESENTATIVE IS NOT A GUARANTOR OF THE CONSTRUCTION CONTRACTORS' OBLIGATIONS AND PERFORMANCE OF CONTRACT.
10. OBSERVATIONS OF WORK IN PROGRESS AND ON-SITE VISITS ARE NOT TO BE CONSTRUED AS A GUARANTEE BY SOUTHGATE OR ITS REPRESENTATIVE OF THE CONTRACTORS' PERFORMANCE.
11. SOUTHGATE AND/OR ITS REPRESENTATIVE IS NOT RESPONSIBLE FOR SAFETY IN, ON, OR ABOUT THE PROJECT SITE, NOR FOR COMPLIANCE BY THE APPROPRIATE PARTY OF ANY REGULATIONS RELATING THERETO.
12. SOUTHGATE AND/OR ITS REPRESENTATIVE EXERCISES NO CONTROL OF THE SAFETY OR ADEQUACY OF ANY EQUIPMENT, BUILDING COMPONENTS, SCAFFOLDING, FORMS, OR ANY OTHER WORK AIDS USED IN OR ABOUT THE PROJECT, OR IN THE SUPERINTENDING OF THE SAME.

13. SOUTHGATE REQUIRES 48 HOURS NOTICE PRIOR TO ANY WEEKEND OR NIGHT WORK. COSTS INCURRED BY SOUTHGATE ASSOCIATED WITH WEEKEND AND NIGHT WORK WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
14. A SET OF APPROVED PLANS SHALL BE MAINTAINED BY THE CONTRACTOR AND KEPT ON SITE AT ALL TIMES. THESE PLANS SHALL BE USED TO MAKE THE "AS-CONSTRUCTED" NOTES DURING THE COURSE OF THE CONSTRUCTION. THESE NOTES SHALL INCLUDE BUT ARE NOT LIMITED TO, ANY DEVIATIONS FROM THE APPROVED PLANS, NOTING THE TYPES AND LOCATIONS OF THE MATERIALS IN PLACE.
15. ALL REQUIRED TESTING EQUIPMENT WILL BE SUPPLIED BY THE CONTRACTOR, INCLUDING, BUT NOT LIMITED TO, AIR MONITORING AND VENTILATION EQUIPMENT. THE CONTRACTOR MUST SUPPLY ANY ADDITIONAL EQUIPMENT REQUIRED BY OSHA FOR MANHOLE ENTRY, DURING TESTING. SOUTHGATE REQUIRES 48 HOURS NOTICE PRIOR TO TESTING FOR SCHEDULING PURPOSES.
16. THE CONTRACTOR WILL SCHEDULE COMPACTION TESTING WITH THE SOILS CONSULTANT. SEVERAL COMPACTION TESTS ARE REQUIRED AT INTERSECTIONS WITH OTHER UTILITIES, AT MANHOLES, SERVICE STUBS, AND AT RANDOM LOCATIONS OVER THE SEWER LINE. TESTING WILL BE REQUIRED WHEN SOILS MATERIAL CHANGES. TESTING WILL BE REQUIRED FOR EVERY THIRD SERVICE INSTALLATION. THE SOILS ENGINEER IS REQUIRED TO SUBMIT COMPACTION TEST RESULTS ON A DAILY BASIS.
17. ALL SEWER LINES WILL BE FLUSHED AND CLEANED PRIOR TO ANY VIDEOING ON THE PROJECT. THE WATER USED IN THE FLUSHING AND CLEANING OPERATION SHALL BE PUMPED OUT OF THE SYSTEM. WATER WILL NOT BE DISCHARGED INTO ADJOINING SYSTEM. THE PLUG AT THE DISCHARGE END OF THE PROJECT MUST REMAIN IN PLACE UNTIL THE SYSTEM HAS BEEN ACCEPTED AND NOTICE HAS BEEN GIVEN BY SOUTHGATE FOR THE SYSTEM TO BE PLACED INTO SERVICE.
18. ALL SEWER LINES MUST BE JETTED PRIOR TO THE START OF THE WARRANTY PERIOD AND MAY BE REQUIRED AGAIN PRIOR TO RELEASE OF WARRANTY BY SOUTHGATE. COSTS OF JETTING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL PUMPING ASSOCIATED WITH THE LINE JETTING.
19. CONSTRUCTION WATER IS AVAILABLE BY PURCHASING A PERMIT FROM SOUTHGATE WATER DISTRICT AND DENVER WATER DEPARTMENT. CURRENT DENVER WATER DEPARTMENT CERTIFICATION IS REQUIRED ON ALL WATER METERS. SOUTHGATE WATER DISTRICT DOES NOT SUPPLY WATER METERS.
20. PIPELINE ACCEPTANCE AND THE START OF THE WARRANTY PERIOD OF THE NEW SEWER MAINS WILL NOT BE CONSIDERED UNTIL ALL REQUIREMENTS FOR ACCEPTANCE HAVE BEEN FULFILLED, INCLUDING:
 - A. COMPLETE SET OF SIGNED COMPACTION TEST RESULTS IS SUBMITTED TO SOUTHGATE AND THE APPLICABLE CITY/COUNTY.
 - B. ALL SEWER CUT SHEETS ARE SUBMITTED TO SOUTHGATE.
 - C. ALL PUNCH LIST ITEMS ARE COMPLETED TO THE SATISFACTORY OF SOUTHGATE.
 - D. FIRST LIFT OF PAVING IS COMPLETED, AT A MINIMUM.
 - E. SURVEYED RECORD DRAWINGS HAVE BEEN SUBMITTED TO AND APPROVED BY SOUTHGATE. CONTACT THE SOUTHGATE ENGINEERING DEPARTMENT FOR REQUIREMENTS PRIOR TO SUBMITTING RECORD DRAWINGS.
 - F. RECORDED ADDRESS PLAT, IF APPLICABLE, IS SUBMITTED TO SOUTHGATE.
 - G. WARRANTY FUNDS ARE SUBMITTED TO SOUTHGATE IN THE FORM OF A LETTER OF CREDIT OR CHECK EQUAL TO TEN PERCENT (10%) OF THE TOTAL COST OF SEWER IMPROVEMENTS. THE LETTER OR CHECK WILL BE EFFECTIVE FOR A MINIMUM OF FIFTEEN (15) MONTHS FROM START OF WARRANTY PERIOD.

21. THE NEW SEWER SYSTEM WILL BE TESTED IN ACCORDANCE WITH SOUTHGATE'S SPECIFICATIONS. ALL REQUIRED TESTING MUST BE COMPLETED PRIOR TO THE START OF WARRANTY PERIOD:
 - A. VIDEO 100% OF NEW SYSTEM.
 - B. LOW PRESSURE AIR TEST 100% OF NEW SYSTEM.
 - C. DEFLECTION TEST 100% OF NEW SYSTEM
22. RELEASE OF SECURITY AND WARRANTY OF FACILITIES IS DEPENDENT UPON SUCCESSFUL COMPLETION OF A MINIMUM OF ONE (1) YEAR WARRANTY PERIOD AND CONVEYANCE OF DOCUMENTS.
23. THE OWNER IS RESPONSIBLE FOR MAINTENANCE OF THE SYSTEM FROM PIPE ACCEPTANCE TO RELEASE OF SECURITY AND WARRANTY. FAILURE TO MAINTAIN SEWER LINES BY THE TERMS OF THE IMPROVEMENTS AGREEMENT MAY BE CONSIDERED GROUNDS FOR PERMANENT ABANDONMENT OF FACILITIES.

CONSTRUCTION NOTES

1. PIPE FOR SEWER MAINS WILL BE IN ACCORDANCE WITH ASTM D-3034 SDR 35 PVC PIPE IN PAVED AREAS; AND DR 18 IN UNPAVED AREAS, UNLESS OTHERWISE SPECIFIED BY THE SOUTHGATE.
2. MANHOLE RIMS WILL BE SET AT AN ELEVATION RELATIVE TO THE PAVEMENT, IN ACCORDANCE WITH THE APPROPRIATE CITY, COUNTY, OR STATE HIGHWAY DEPARTMENT STANDARDS. REGARDLESS IF THE MANHOLE IS IN A PAVED OR UNPAVED AREA, A MINIMUM OF FOUR INCHES (4") OF CONCRETE RISER RINGS SHALL BE INSTALLED TO ADJUST RIM ELEVATIONS TO FINAL GRADE. THE MAXIMUM ACCEPTABLE VERTICAL ADJUSTMENT UTILIZING RISER RINGS IS TWELVE INCHES (12"). NOTE: CONCRETE ADJUSTMENT SECTIONS ARE ALSO APPROVED FOR USE IN VERTICAL ADJUSTMENTS OF RING AND COVER. A MINIMUM OF 1 RISER SECTION WILL BE REQUIRED FOR VERTICAL ADJUSTMENT.
3. THE CONTRACTOR SHALL PROVIDE 0.2' DROP ON ALL MANHOLES. THIS INCLUDES DEAD-END MANHOLE STRUCTURE INVERTS, ACROSS THE BASE AND FOR INSIDE INVERT ON 4' INSIDE DIAMETER STRUCTURES.
4. EXISTING PIPE AT THE POINT OF CONNECTION WILL NOT BE "BROKEN OUT" AND NO SERVICE CONNECTIONS WILL BE MADE UNTIL THE NEW SYSTEM IS ACCEPTED BY SOUTHGATE.
5. THE CONTRACTOR SHALL VERIFY INVERT ELEVATIONS OF EXISTING LINES BY MEANS OF CERTIFIED SURVEY PRIOR TO THE INSTALLATION OF BARREL AND CONE SECTION.
6. THE CONTRACTOR WILL VERIFY EXISTING MANHOLE INVERTS AT PROPOSED POINTS OF CONNECTION, PRIOR TO CONSTRUCTION STAKING.
7. THE ALIGNMENT SHALL BE STAKED EVERY 25 FEET FOR THE FIRST 100 FEET OUT OF EACH MANHOLE AND EVERY 50 FEET THEREAFTER, ALONG WITH BOTH SIDES OF THE EASEMENT. (FOR USE WITH LASER EQUIPMENT ONLY)
8. TRENCH COMPACTION IN STREET RIGHT-OF-WAY IS TO CONFORM TO APPLICABLE MUNICIPAL STANDARDS (ARAPAHOE COUNTY, DOUGLAS COUNTY, GREENWOOD VILLAGE, COLORADO DEPARTMENT OF TRANSPORTATION, OR THE CITY OF LONE TREE.)
 - A. SOILS HAVING AN AASHTO A-1 THROUGH A-5 CLASSIFICATION REQUIRE 95% MODIFIED PROCTOR DENSITY WITH MOISTURE CONTENT OF +/- 2% (SANDY SOILS).
 - B. SOILS HAVING AN AASHTO A-6 AND A-7 CLASSIFICATION REQUIRE 95% STANDARD PROCTOR DENSITY WITH A 0 TO +/- 3 % MOISTURE CONTENT (CLAY SOILS).

- C. ANY OTHER SOILS CLASSIFICATION REQUIRES 95% STANDARD PROCTOR DENSITY WITH A +/- 2% MOISTURE CONTENT.
- D. PIPE ZONE, 90% STANDARD PROCTOR OR 70% RELATIVE DENSITY (PIPE BEDDING MATERIALS)

TRENCH COMPACTION OUTSIDE THE RIGHT-OF-WAY WILL REQUIRE:

- E. 90% STANDARD PROCTOR DENSITY OR 70% RELATIVE DENSITY FOR BEDDING MATERIAL.
 - F. OUTSIDE OF ASPHALT PAVED AREAS AND IN EASEMENTS REQUIRE 90% STANDARD PROCTOR DENSITY WITH A MOISTURE CONTENT OF +/- 2 % FOR ALL SOILS.
 - G. ALL PAVED AREAS AND RIGHT-OF -WAY AREAS REQUIRES 95% STANDARD PROCTOR DENSITY WITH A +/- 2% FOR ALL SOILS.
 - H. COMPACTION TESTING OF BACKFILL FOR EACH VERTICAL LIFT OF PLACEMENT MUST BE TAKEN FROM THE TOP OF PIPE BEDDING TO THE FINISH BACKFILL GRADE.
- 9. THE BEDDING WILL BE PER STANDARD DETAIL, I.E. 6 INCHES UNDER THE PIPE AND 12 INCHES OVER THE TOP OF THE PIPE. THE BEDDING MATERIAL SHALL BE ASTM #67 CRUSHED ROCK.
 - 10. ALL MANHOLES SHALL HAVE ECCENTRIC CONES.
 - 11. ALL JOINTS (BASE TO BARREL, BARREL TO BARREL, BARREL TO CONE, CONE TO RISER, RISER TO RING, AND ALL RISER RINGS) SHALL HAVE TWO ROWS OF "RAMNEK" USED AS A WATER STOP. IN AREAS WHERE GROUNDWATER IS ENCOUNTERED, ALL OUTSIDE JOINTS SHALL BE GROUTED WITH ASTM TYPE II GROUT OR APPROVED EQUIVALENT.
 - 12. MANHOLE BASES SHALL HAVE A FULL 8-INCH DEPTH OF CONCRETE MIX UNDER THE PIPES AND BE REINFORCED WITH NO. 4 REBAR FULL ENCASEMENT CAGE.
 - 13. THE DIAMETER OF THE OUTSIDE MANHOLE BASE SHALL BE A MINIMUM OF 16 INCHES LARGER THAN THE INSIDE DIAMETER OF THE MANHOLE.
 - 14. RUBBER SEALS OR "O" RINGS GASKETS SHALL BE INSTALLED ON THE PIPE ENDS TO SEAL THEM INTO THE MANHOLE BASE AS A WATER STOP.
 - 15. BASE INVERTS SHALL BE CONSTRUCTED EQUAL TO THE OUTSIDE DIAMETER OF THE PIPE WITH A SMOOTH TROWEL OR STONE FINISH.
 - 16. MANHOLE BASE BENCHES SHALL BE SLOPED AT ONE (1) INCH PER FOOT WITH A BRUSHED, NON-SKID FINISH ON THE SURFACE OF THE FINISHED CONCRETE.
 - 17. CARE SHALL BE TAKEN TO PROPERLY SHAPE ALL MANHOLE BENCHES IN ACCORDANCE WITH SOUTHGATE SPECIFICATIONS AND AS TO ENSURE POSITIVE FLOW. THIS IS ESPECIALLY CRITICAL ON LINES INTERSECTING AT 90° ANGLES ON STEEP OR FLAT GRADES.
 - 18. MANHOLE OPENINGS ARE TO BE ALIGNED WITH THE SIDE OF THE UPSTREAM PIPE OR BETWEEN THE UPSTREAM PIPES. MANHOLE STEPS SHALL BE ALIGNED WITH THE OPENING PER THE STANDARDS.
 - 19. CONNECTION TIES INTO AN EXISTING SEWER LINE SHALL BE PLUGGED WITH A PLUMBERS PLUG IN THE UPSTREAM PIPE AND TIED OFF TO A STEP INSIDE THE MANHOLE. THIS PLUG SHALL REMAIN IN PLACE UNTIL THE NEW SYSTEM IS ACCEPTED. SOUTHGATE WILL ISSUE NOTICE FOR SERVICE CONNECTIONS AND REMOVAL OF PLUG.
 - 20. POSITION SERVICE WYES AT THE 10 O'CLOCK AND 2 O'CLOCK POSITION.
 - 21. SEWER MAINS WITH DEPTH OF COVER LESS THAN 20 FEET FROM TOP OF FINISH GRADE TO TOP OF PIPE SHALL BE A MINIMUM OF SDR 35. SEWER MAINS WITH DEPTH OF COVER 20 FEET AND GREATER SHALL BE A MINIMUM OF DR 18.