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8. **SANITARY SEWER**

- UNLESS OTHERWISE SHOWN, SANITARY SEWER PIPE SHALL BE ASTM D-3034 PVC, MINIMUM SDR 35.
- ALL PRECAST MANHOLES SHALL BE PROVIDED WITH INTEGRAL RUBBER BOOT MANHOLE PIPE ADAPTER. WHERE MANHOLES WITH INTEGRAL MANHOLE PIPE ADAPTERS ARE NOT USED, A SHEAR JOINT SHALL BE PROVIDED ON ALL MAINLINES WITHIN 1.5-Feet of the OUTSIDE FACE of the MANHOLE. TAMPER-PROOF MANHOLE COVERS ARE REQUIRED ON ALL MANHOLES OUTSIDE of PUBLIC RIGHT-OF-WAY.
- OPENINGS FOR CONNECTIONS TO EXISTING MANHOLES SHALL BE MADE BY CORE-DRILLING THE EXISTING MANHOLE STRUCTURE AND INSTALLING A MANHOLE PIPE ADAPTER. CONNECTIONS TO BE WATERTIGHT AND SHALL PROVIDE A SMOOTH FLOW INTO AND THROUGH the MANHOLE. SMALL CHIPPING HAMMERS OR SIMILAR LIGHT TOOLS WHICH WILL NOT DAMAGE OR CRACK the MANHOLE BASE MAY BE USED TO SHAPE CHANNELS. USE of LARGE PNEUMATIC JACKHAMMERS SHALL BE PROHIBITED. UNLESS OTHERWISE APPROVED IN WRITING BY the CITY ENGINEER, MANHOLE STEPS SHALL BE INSTALLED IN ANY MANHOLE TAPPED WHICH DOES NOT HAVE EXISTING STEPS.
- LEAKAGE TESTING. SANITARY SEWER PIPE AND APPURTENANCES SHALL BE TESTED FOR LEAKAGE. LEAKAGE TESTS SHALL INCLUDE AN AIR TEST OF ALL SEWER MAINS AND LATERALS PRIOR TO PAVING, AND A SEPARATE AIR TEST OF ALL SEWER MAINS AND LATERALS FOLLOWING EXCAVATION AND BACKFILLING OF ANY FRANCHISE UTILITY TRENCHES OR OTHER UTILITY WORK THAT CROSSES SANITARY SEWER LATERALS. ALL MANHOLES SHALL BE VACUUM TESTED FOLLOWING COMPLETION OF PAVING OR FINAL SURFACE RESTORATION. ALL TESTING SHALL CONFORM TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
- CLEANING. PRIOR TO MANDREL TESTING AND/OR CCTV INSPECTION, FLUSH AND CLEAN ALL SEWERS, AND REMOVE ALL FOREIGN MATERIAL FROM THE MAINLINES AND MANHOLES. FAILURE TO CLEAN ALL DIRT, ROCK AND DEBRIS FROM PIPELINES PRIOR TO TV INSPECTION WILL RESULT IN THE NEED TO RE-CLEAN AND RE- CCTV THE SEWER LINES.
- MANDREL TESTING. CONTRACTOR SHALL CONDUCT DEFLECTION TEST OF FLEXIBLE SANITARY SEWER PIPES BY PULLING AN APPROVED MANDREL THROUGH the COMPLETED PIPE LINE FOLLOWING TRENCH COMPACTION. THE DIAMETER OF THE MANDREL SHALL BE 95 PERCENT OF THE INITIAL PIPE DIAMETER. TEST SHALL BE CONDUCTED NOT MORE THAN 30 DAYS AFTER THE TRENCH BACKFILLING AND COMPACTION HAS BEEN COMPLETED.
- CCTV INSPECTION. UPON COMPLETION OF ALL SEWER CONSTRUCTION, TESTING AND REPAIR, the CONTRACTOR SHALL CONDUCT A COLOR CLOSED-CIRCUIT TELEVISION (CCTV) ACCEPTANCE INSPECTION OF ALL MAINLINES IN ACCORDANCE WITH the STANDARD CONSTRUCTION SPECIFICATIONS TO DETERMINE COMPLIANCE WITH GRADE REQUIREMENTS. THE CCTV INSPECTION SHALL BE CONDUCTED BY AN APPROVED TECHNICAL SERVICE WHICH IS EQUIPPED TO MAKE AUDIO-VISUAL RECORDINGS OF THE CCTV INSPECTIONS ON DVD (VHS VIDEO TAPE ACCEPTABLE ONLY UPON PRIOR WRITTEN APPROVAL BY CITY ENGINEER). UNLESS OTHERWISE REQUIRED BY the AGENCY WITH JURISDICTION, A STANDARD 1-INCH DIAMETER BALL SHALL BE SUSPENDED IN FRONT OF THE CAMERA DURING the INSPECTION TO DETERMINE the DEPTH OF ANY STANDING WATER. SUFFICIENT WATER TO REVEAL LOW AREAS OR REVERSE GRADES SHALL BE DISCHARGED INTO the PIPE IMMEDIATELY PRIOR TO INITIATION OF the CCTV INSPECTION. THE DVD AND WRITTEN REPORT SHALL BE DELIVERED TO the CITY ENGINEER.
- ALL SANITARY SERVICE LATERAL CONNECTIONS AT the MAIN ARE TO BE TEES, UNLESS OTHERWISE NOTED.
- ALL SEWER SERVICE LATERALS SHALL EXTEND A MINIMUM OF 5-Feet BEYOND PUE INTO EACH LOT. THE MINIMUM GRADE FOR LATERALS SHALL BE 2 PERCENT EXCEPT WHERE APPROVED BY CITY. SANITARY SEWER SERVICE LATERALS SHALL BE 4-INCH DIAMETER UNLESS OTHERWISE NOTED ON the PLANS.

9. **STORM DRAIN**

- CONTRACTOR SHALL USE UNIFORM PIPE MATERIAL ON EACH PIPE RUN BETWEEN STRUCTURES UNLESS OTHERWISE DIRECTED OR APPROVED. JOINTED HDPE PIPE SHALL NOT BE USED FOR SLOPES EXCEEDING 12 PERCENT.
- CATCH BASINS AND JUNCTION BOXES SHALL BE SET SQUARE WITH BUILDINGS OR WITH the EDGE OF the CURB, PARKING LOT, AND STREET WHEREIN they LIE. STORM DRAIN INLET STRUCTURES AND PAVING SHALL BE ADJUSTED SO WATER FLOWS INTO the STRUCTURE WITHOUT PONDING WATER.
- UNLESS OTHERWISE APPROVED BY the CITY ENGINEER, ALL STORM DRAIN CONNECTIONS SHALL BE BY MANUFACTURED TEES OR SADDLES.
- STORM DRAINS SHALL BE LAID ON A STRAIGHT ALIGNMENT WITH UNIFORM GRADE BETWEEN STRUCTURES AND LAID UPGRADE WITH SPIGOT ENDS POINTING IN DIRECTION OF FLOW. ALL STORM PIPE JOINTS SHALL BE WATERTIGHT REGARDLESS OF SPECIFIED OR SELECTED MATERIAL.
- UNLESS OTHERWISE SPECIFIED OR DIRECTED, INSTALL STORM DRAIN PIPE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION GUIDELINES.
- CLEANING. PRIOR TO MANDREL TESTING OR FINAL ACCEPTANCE, FLUSH AND CLEAN ALL STORM DRAINS, AND REMOVE ALL FOREIGN MATERIAL FROM the MAINLINES, MANHOLES AND CATCH BASINS.
- MANDREL TESTING. CONTRACTOR SHALL CONDUCT DEFLECTION TEST OF FLEXIBLE STORM SEWER PIPES BY PULLING AN APPROVED MANDREL THROUGH the COMPLETED PIPE LINE FOLLOWING TRENCH COMPACTION. THE DIAMETER OF the MANDREL SHALL BE 95 PERCENT OF the INITIAL PIPE DIAMETER. TEST SHALL BE CONDUCTED NOT LESS THAN 30 DAYS AFTER the TRENCH BACKFILLING AND COMPACTION HAS BEEN COMPLETED.

10. **STREET LIGHTS**

- STREET LIGHTS SHALL BE INSTALLED AFTER ALL OTHER EARTHWORK AND PUBLIC UTILITY INSTALLATIONS ARE COMPLETED AND AFTER ROUGH GRADING OF the PROPERTY IS ACCOMPLISHED TO PREVENT DAMAGE TO the POLES.
- STREET LIGHT POLES SHALL BE SET TO A DEPTH AS SPECIFIED BY the MANUFACTURER, BUT NOT LESS THAN 5-Feet.
- STREETS LIGHT POLES AND ARMS SHALL CONFORM TO the STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DRAWINGS. POLES SHALL BE INSTALLED WITHIN ONE (1) DEGREE OF PLUMB.

11. **FRANCHISE UTILITIES**

- UNLESS OTHERWISE SHOWN ON the PLANS AND APPROVED IN WRITING BY ALL JURISDICTIONS HAVING AUTHORITY, NEW AND RELOCATED PRIVATE UTILITIES (POWER, CABLE, TELEPHONE AND GAS) SHALL BE INSTALLED UNDERGROUND IN CONJUNCTION WITH the DEVELOPMENT.
- CONTRACTOR SHALL COORDINATE WITH GAS, POWER, TELEPHONE, AND CABLE COMPANY FOR LOCATION OF CONDUITS IN COMMON TRENCHES, AS WELL AS LOCATION OF VAULTS, PEDESTALS, ETC. UNLESS OTHERWISE APPROVED IN WRITING BY the CITY, ALL ABOVE-GRADE FACILITIES SHALL BE LOCATED IN PUES (WHERE PUES EXIST OR WILL BE GRANTED BY the DEVELOPMENT), AND OTHERWISE SHALL BE PLACED IN A LOCATION OUTSIDE the PROPOSED SIDEWALK LOCATION. INSTALLATION OF PRIVATE UTILITIES IN A COMMON TRENCH WITH OR WITHIN 3 FEET HORIZONTALLY OF PARALLELING WATER, SANITARY SEWER OR STORM DRAINS IS PROHIBITED.
- POWER, TELEPHONE AND CABLE TRENCHING AND CONDUITS SHALL BE INSTALLED PER UTILITY COMPANY REQUIREMENTS WITH PULL WIRE. CONTRACTOR SHALL VERIFY WITH UTILITY COMPANY FOR SIZE, LOCATION AND TYPE OF CONDUIT PRIOR TO CONSTRUCTION, AND SHALL ENSURE THAT TRENCHES ARE ADEQUATELY PREPARED FOR INSTALLATION PER UTILITY COMPANY REQUIREMENTS. ALL CHANGES IN DIRECTION OF UTILITY CONDUIT RUNS SHALL HAVE LONG RADIUS STEEL BENDS.
- CONTRACTOR SHALL NOTIFY AND COORDINATE WITH PRIVATE UTILITIES FOR RELOCATION OF POWER POLES, VAULTS, ETC. TO AVOID CONFLICT WITH CITY UTILITY STRUCTURES, FIRE HYDRANTS, METERS, SEWER OR STORM LATERALS, ETC.

12. **COMPACTION AND DENSITY REQUIREMENTS**

- COMPACTION SHALL BE BY MECHANICAL MEANS FOR ALL TYPES OF MATERIALS. COMPACTIONS EQUIPMENT FOR GRANULAR MATERIALS SHALL BE VIBRATORY PLATE OR VIBRATORY DRUM COMPACTORS AND SHALL BE ADEQUATE TO OBTAIN the AMOUNT OF COMPACTIONS SHOWN. COMPACTION EQUIPMENT SHALL BE OPERATED IN STRICT ACCORDANCE WITH the MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS AND SHALL BE MAINTAINED IN SUCH CONDITION THAT IT WILL DELIVER the MANUFACTURER'S RATED COMPACTIVE EFFORT.
- ALL COMPACTION AND IN-PLACE DENSITY AND MOISTURE TESTS SHALL BE IN ACCORDANCE WITH the MOST CURRENT EDITION OF the ODOT/APWA STANDARD CONSTRUCTION SPECIFICATIONS AND AASHTO STANDARD SPECIFICATIONS.

ENGINEERED FILL:  
MINIMUM PERCENT COMPACTION REQUIRED 95 PERCENT  
TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY AASHTO T-180  
FREQUENCY OF DENSITY TESTING 8-INCH LIFTS, 3 TEST FOR EACH 2-Feet OF FILL PLACED

ROAD SECTION – EMBANKMENT:  
MINIMUM PERCENT COMPACTION REQUIRED 95 PERCENT  
TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY AASHTO T-180  
FREQUENCY OF DENSITY TESTING OF EMBANKMENT 8-INCH LIFTS, 3 TESTS FOR EACH 2-Feet OF EMBANKMENT PLACED

ROAD SECTION – SUBGRADE:  
MINIMUM PERCENT COMPACTION REQUIRED 95 PERCENT  
MINIMUM PERCENT COMPACTION REQUIRED TO WHAT 12-INCHES  
DEPTH BELOW SUBGRADE  
TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY AASHTO T-180  
FREQUENCY OF DENSITY TESTING OF SUBGRADE AS NEEDED

ROAD SECTION – AGGREGATE BASE:  
MINIMUM PERCENT COMPACTION REQUIRED 95 PERCENT  
TEST METHODS REQUIRED TO DETERMINE MAXIMUM DENSITY AASHTO T-180  
FREQUENCY OF DENSITY TESTING OF AGGREGATE BASE 8-INCH LIFTS, 150-Feet INTERVALS OR AS NEEDED

ROAD SECTION – ASPHALT PAVEMENT:  
MINIMUM PERCENT COMPACTION REQUIRED 91 PERCENT  
TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY AASHTO T-209  
FREQUENCY OF DENSITY TESTING OF ASPHALT PAVEMENT 5 TESTS MINIMUM\* AVERAGE DENSITY

FULL TIME INSPECTION OR SPOT CHECKING OF COMPACTION SPOT, OR AS SHOWN ON PLANS

UTILITY TRENCH: (BENEATH PAVEMENT AND SIDEWALK)  
MINIMUM PERCENT COMPACTION REQUIRED FOR BEDDING AND PIPE ZONE 90 PERCENT  
MINIMUM PERCENT COMPACTION REQUIRED FOR TRENCH BACKFILL ABOVE THE PIPE ZONE 92 PERCENT BELOW TOP 5-Feet OF TRENCH BACKFILL  
95 PERCENT WITHIN TOP 5-Feet OF TRENCH BACKFILL  
90 PERCENT

MINIMUM PERCENT COMPACTION REQUIRED IN UNIMPROVED, NON-ENGINEERED FILL AREAS

TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY AASHTO T-180

FREQUENCY OF DENSITY TESTING OF UTILITY TRENCH BACKFILL 1 TEST FOR EVERY 2-FOOT VERTICAL AT INTERVALS OF 200 LINEAL FEET OF TRENCH OR AS DIRECTED. PERFORM A MINIMUM OF 1 TEST FOR TRENCH LENGTH LESS THAN 200 LINEAL FEET.

ADDITIONAL INFORMATION/COMMENTS:  
\*WHEN USING NUCLEAR GAUGE, TWO READINGS AT EACH SITE, THE SECOND AT RIGHT ANGLES TO the FIRST. THE TWO READING WILL BE AVERAGED TO OBTAIN TEST DENSITY.

13. **EROSION CONTROL NOTES**

A. **GENERAL**

- APPROVAL OF the EROSION/SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
- THE IMPLEMENTATION OF the ESC PLANS AND the CONSTRUCTION, MAINTENANCE, REPLACEMENT AND UPGRADING OF these ESC FACILITIES IS the RESPONSIBILITY OF the APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
- THE BOUNDARIES OF the CLEARING LIMITS SHOWN ON the PLANS SHALL BE CLEARLY FLAGGED IN the FIELD PRIOR TO CONSTRUCTION. DURING the CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND the FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY the APPLICANT/CONTRACTOR FOR the DURATION OF CONSTRUCTION.
- THE ESC FACILITIES SHOWN ON the PLANS MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER the DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
- THE ESC FACILITIES SHOWN ON the PLANS ARE the MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING the CONSTRUCTION PERIOD, these ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE the SITE.
- THE ESC FACILITIES SHALL BE INSPECTED DAILY BY the APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE their CONTINUED FUNCTIONING.
- THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN the 48 HOURS FOLLOWING A STORM EVENT.
- AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. the CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO the DOWNSTREAM SYSTEM.

B. **SEDIMENT FENCES**

- THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO the LENGTH OF the BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO the POST.
- THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW the CONTOURS WHERE FEASIBLE. the FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO the GROUND A MINIMUM OF 18 INCHES.
- THE STANDARD STRENGTH FILTER FABRIC SHALL BE FASTENED SECURELY TO STITCHED LOOPS INSTALLED ON the UPSLOPE SIDE OF the POSTS, AND 6-INCHES OF the FABRIC SHALL BE EXTENDED INTO the TRENCH. the FABRIC SHALL NOT EXTEND MORE THAN 30-INCHES ABOVE the ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO the EXISTING TREES.
- SEDIMENT FENCES SHALL BE REMOVED WHEN they HAVE SERVED their USEFUL PURPOSE, BUT NOT BEFORE the UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
- SEDIMENT FENCES SHALL BE INSPECTED BY APPLICANT/CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

C. **GRAVEL CONSTRUCTION ENTRANCES**

- STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT the BEGINNING OF CONSTRUCTION AND MAINTAINED FOR the DURATION OF the PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR the DURATION OF the PROJECT.
- THE AREA OF the ENTRANCE SHALL BE CLEARED OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. the ROCK SHALL BE PLACED TO the SPECIFIED DIMENSIONS, BUT SHALL BE MINIMUM 8 INCHES THICK AND AT LEAST 50 FEET IN LENGTH. WIDTH SHALL BE the FULL WIDTH OF the VEHICLE INGRESS AND EGRESS AREA.
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHT-OF-WAY.
- IF the ROCK PAD DOES NOT ADEQUATELY REMOVE DIRT AND MUD FROM VEHICLE WHEELS SUCH THAT MUD AND DIRT TRACKING IS EVIDENT OFF SITE, ADDITIONAL MEASURES MUST BE TAKEN. SUCH MEASURES MAY INCLUDE HOSING OFF WHEELS BEFORE VEHICLES LEAVE the SITE OR OTHER CONSTRUCTION TECHNIQUES/WORK OPERATIONS MODIFICATION. WHEEL WASHING SHOULD BE DONE ON the ROCK PAD AND WASH WATER SHOULD DRAIN THROUGH A SILT-TRAPPING STRUCTURE PRIOR TO LEAVING the CONSTRUCTION SITE.
- ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY STRUCTURES USED TO TRAP SEDIMENT.
- SUB-GRADE STABILIZATION FABRIC SHALL BE USED UNDER ROCK PADS.
- ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

GENERAL  
CONSTRUCTION  
NOTES

PHILLIPS ESTATES  
CONSTRUCTION  
PHASE III

NO CHANGES, MODIFICATIONS OR REVISIONS TO BE MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION FROM THE DESIGN ENGINEER.  
DIMENSIONS & NOTES TAKE PRECEDENCE OVER GRAPHICAL REPRESENTATION.

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