Woodland Oaks Off-Site Sanitary Sewer Improvements

Woodland Shores Subdivision

Section 27, Township 48 North, Range 31 West

LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

1 REVISED TITLE.

INDEX OF SHEETS:

Summary of Quantities:

ITEM AND DESCRIPTION	UNIT	ESTIMATED QUANTITY
SANITARY		
12" PVC SDR 26	LF	313.89
RECONNECT SANITARY SERVICE STUB	EA	4
4' DIA Manhole	EA	1

UTILITY COMPANIES:

THE FOLLOWING LIST OF UTILITY COMPANIES IS PROVIDED FOR INFORMATION ONLY. WE DO NOT OFFER ANY GUARANTEE OR WARRANTY THAT THIS LIST IS COMPLETE OR ACCURATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES THAT MAY BE AFFECTED BY THE PROPOSED CONSTRUCTION AND VERIFYING THE ACTUAL LOCATION OF EACH UTILITY LINE. THE CONTRACTOR SHALL NOTIFY ENGINEERING SOLUTIONS AT 816.623.9888 OF ANY CONFLICT WITH PROPOSED IMPROVEMENTS.

EVERGY ~ 298-1196
MISSOURI GAS ENERGY ~ 756-5261
SOUTHWESTERN BELL TELEPHONE ~ 761-5011
COMCAST CABLE ~ 795-1100
WILLIAMS PIPELINE ~ 422-6300
CITY OF LEE'S SUMMIT PUBLIC WORKS ~ 969-1800
CITY OF LEE'S SUMMIT DEVELOPMENT ENGINEERING INSPECTION AT 816.969.1200
CITY OF LEE'S SUMMIT WATER UTILITIES ~ 969-1900
MISSOURI ONE CALL (DIG RITE) ~ 1-800-344-7483

LEGEND:

B/L – BUILDING SET-BACK
C/A – COMMON AREA
D/E – DRAINAGE EASEMENT
FND. – FOUND
L/E – LANDSCAPE EASEMENT
L.N.A. – LIMITS OF NO ACCESS
R/W – RIGHT OF WAY
SAN – SANITARY SEWER LINE
S/W – SIDEWALK
U/E – UTILITY EASEMENT
W – WATER LINE
ST – STORM SEWER LINE

ENGINEER'S CERTIFICATION:

I HEREBY CERTIFY THAT THIS PROJECT HAS BEEN DESIGNED AND THESE PLANS PREPARED IN ACCORDANCE WITH THE CURRENT DESIGN CRITERIA OF THE CITY OF LEE'S SUMMIT, MISSOURI AND THE STATE OF MISSOURI. I FURTHER CERTIFY THAT THESE PLANS WERE DESIGNED IN ACCORDANCE TO AASHTO STANDARDS.

ENGINEERING SOLUTIONS
ENGINEERING & SURVEYING
50 SE 30TH STREET
LEE'S SUMMIT, MO 64082
P:(816) 623-9888 F:(816)623-9849

Professional Registration
Missouri
Engineering 2005002186-D
Surveying 2005000319-D
Kansas
Engineering E-1695
Surveying LS-218
Oklahoma
Engineering 6254
Nebraska
Engineering CA2821

Part of the Southeast 1/4
Section 27, Township 48 North, Range 31 West
Lee's Summit, Jackson County, Missouri

Project: WOODLAND OAKS LSMO
Issue Date: March 2, 2021

Cover Sheet
Construction Plans for:
Woodland Oaks Off-Site Sanitary Sewer Improvements
Woodland Shores Subdivision
Lee's Summit, Jackson County, Missouri

STATE OF MISSOURI
MATTHEW J. SCHLICHT
NUMBER
PE-2006019708
PROFESSIONAL ENGINEER

Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226
NE PE E-14335

REVISIONS

1 REV. 5/7/2021

C.400

GENERAL NOTE:

1 ~ ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL AS ADOPTED BY ORDINANCE 5813.
2 ~ TRENCH CHECKS SHALL BE INSTALL AT ALL SANITARY WYES LOCATION.

North

GRAPHIC SCALE
0 5' 10' 20'

SANITARY SEWER GENERAL LAYOUT

SCALE: 1" = 10'

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Sanitary Sewer General Layout
Construction Plans for:
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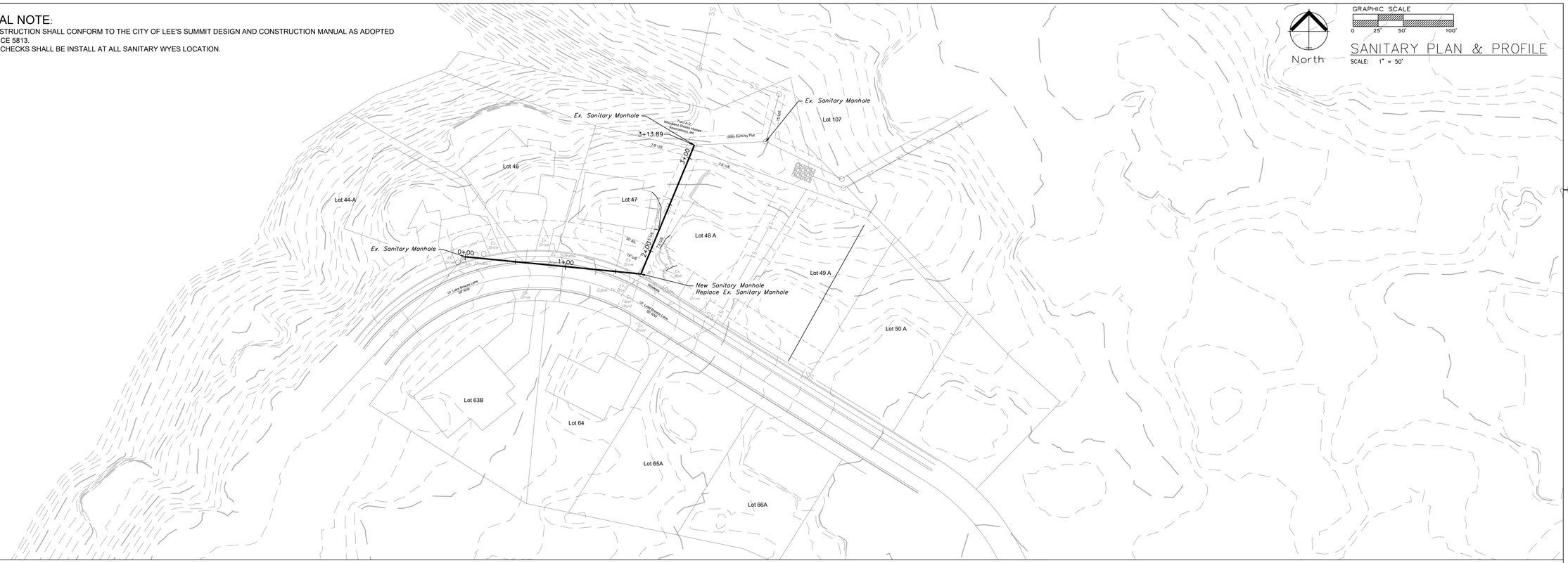
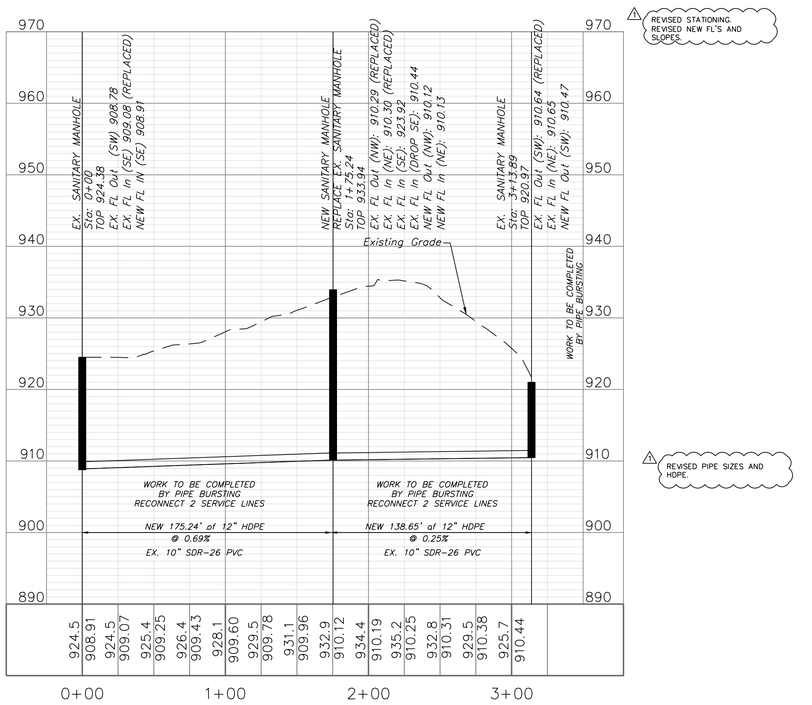


SANITARY LINE 1



1 REVISED STATIONING. REVISED NEW FL'S AND SLOPES.

1 REVISED PIPE SIZES AND HDPE.

VERT. SCALE: 1"=10'
0 5' 10' 20'

HORIZ. SCALE: 1"=50'
0 25' 50' 100'

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Section 27, Township 48 North, Range 31 West
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Sanitary Plan and Profile
Construction Plans for:
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C.402

1.2 DEFINITIONS

A. Pipe Bursting: Process of splitting or fracturing the host sewer main and forcing the fragments into the surrounding soil, for the purpose of inserting a new pipe of equal or larger diameter.
1. Accomplished by use of pneumatic, static or hydraulic bursting head, with pipe splitters as cutting wheels as needed.
2. Mole or bursting head is directionally guided by host sewer main and towed under tension by winch, chain or rod assembly.
3. New pipe towed or jacked in immediately behind mole or bursting head.

B. Host Sewer Main: Existing pipeline subject to pipe bursting system, made of vitrified clay, asbestos cement, polyvinyl chloride (PVC), cast iron, concrete, steel or lined pipe.

C. Replacement Pipe: Pipe inserted into host sewer main by pipe bursting system.

D. Continuous Pipe: Pipe, such as High Density Polyethylene (HDPE) pipe, with welded joints, assembled and inserted to form continuous section between access pits.

E. Sectional Pipe: Pipe, such as HDPE pipe, polymer pipe, or PVC pipe assembled using leak proof joints and inserted into host sewer main in sections.

F. Renew Lateral: Replace service lateral in public space or easement by pipe bursting, or if necessary by excavation and replacement.

1.3 QUALITY ASSURANCE

A. Follow ASTM standards.

B. Personnel performing pipe bursting:
1. Certified by manufacturer of pipe bursting system having successfully completed training in:
a. Operating bursting head.
b. Installing proposed replacement pipe.
c. Operation and maintenance of all equipment to be used.

C. Personnel performing fusing of HDPE pipe and fittings:
1. Certified by manufacturer of fusing equipment having successfully completed training in:
a. Handling replacement pipe materials.
b. Butt fusion of pipe joints, saddle fusion of fittings for service laterals.
c. Operation and maintenance of all equipment to be used.

2.1 PIPE BURSTING SYSTEMS

E. Pipe Insertion Method (PIM).

F. TT Technology method.

G. Tenbusch method.

H. TRS System method.

I. TTS300 methods.

J. XPANDIT method.

K. Vermeer Hammerhead mole method.

L. Nowak Pipe Reaming InneReam method.

M.Or Equal.

2.2 MATERIALS

A. General.
1. Same for mainline and lateral.
2. Minimum life span: 50 years.
3. Chemically resistant to internal exposure to sewage containing small quantities of hydrogen sulfide, carbon dioxide, methane, mercaptans, kerosene, moisture, and diluted sulfuric acid.
4. Chemically and physically resistant to external exposure of soil, bacteria, moisture, roots, and chemical attack due to material in surrounding ground.
5. Metal in saddles, clamps and appurtenances: 300 or 304 stainless steel following ASTM A240.
6. Elastomeric materials, gaskets, clamps, connectors: Oil resistant and manufactured following ASTM F477.
7. Select appropriate type pipe to maintain nominal inside diameter specified for each pipe segment.
8. Pipe and joints specifically designed for selected pipe bursting application.
a. Threaded or solvent-cement joints and connections: Not permitted.
b. Sectional pipe: Joint following manufacturer's recommendations and approved submittals for leak-proof stab joint method, using EPDM O-ring synthetic elastomeric gaskets.
9. Fittings.
a. Pressure rated and classified same as adjoining pipe.
b. Inside diameter to match inside diameter of adjoining pipe.
c. Designed for pipe bursting or pipe jacking applications.

B. HDPE pipe, joints, and fittings:
1. Polyethylene: Minimum cell classification of PE 345464C for black and PE 345464E for colors following ASTM D3350.
2. Material designation: PE 3408 following ASTM F412.
3. Hydrostatic Design Basis at 73.4 degrees F: 1,600 psi following ASTM D2837
4. Pipe.
a. Manufactured, sized and marked following ASTM F714.
a. b. Minimum wall thickness: SDR 17.
c. Measure length to provide continuous, homogeneous pipe from manhole to manhole with enough extra length to allow relaxing and finishing off at manholes.
d. Interior Pipe color:
1) Use fully bonded light-colored interior liner meeting specifications above.
e. Pipe Markings:
1) Mark following ASTM F714.
2) Legibly marked in green to identify as sewer pipe.
f. Approved Pipe Manufacturers.
1) Performance Pipe, Division of Chevron Phillips Chemical Company, LP.
2) Poly Pipe.
3) Or Equal.
5. Molded fittings.
a. Manufactured, sized and marked following ASTM D3261.
6. Field fabricated fittings.
a. Stock manufactured, sized and marked following ASTM F714.
7. Joint connection minimum requirements:
a. Continuous pipe.
1) Assemble pipe lengths in field with butt-fused joints following ASTM D2657 and approved submittals or with electrofused joints following approved submittals.
a) In case of conflicts between ASTM D2657 and approved submittals or if the ASTM reference is nonspecific, follow approved submittals.
2) Joint strength: Equal to or greater than pipe strength.
b. Excavations for pipe bursting insertion or depression removal made between manholes.
1) Joint pipe ends using butt-fused joints or electrofusion coupling.
2) With Engineer's approval, use full circle seal clamps specified herein or seal and restraint type mechanical couplings manufactured by:
a) Dresser Piping Specialties, Universal Style 90 for HDPE by HDPE, 2-inches and smaller, and Style 711 for HDPE by HDPE, 12-inches and smaller diameter pipes.
b) Smith-Blair, Inc., Maxi-Grip EZ for HDPE by HDPE 12-inches and smaller diameter pipes.
c) Or equal.

REVISED TITLE.

D. Fiberglass Reinforced Polymer Pipe and Fittings and Polymer Concrete Jacking Pipe and Fittings.
1. Fiberglass Reinforced Polymer Pipe.
a. Manufactured, sized and marked following ASTM D3262.
2. Polymer Concrete Pipe.
a. Manufactured, sized and marked following ASTM D6783.
3. Joints.
a. Following ASTM D4161.
b. Designed and manufactured so loss of compression ring does not result in leakage, root intrusion or misalignment of joint.
c. Threaded joints not permitted.
d. Join plain ends of pipe using butt joint with laminated wrap, mechanical coupling, flange with flat face gasket, polymer molded coupling or full circle elastomeric seal clamp.
4. Approved Manufacturers.
a. HOBAS Pipe.
b. Meyer Polycrete Pipe.
c. Or Equal.

E. Manhole Connection Materials.
1. Concrete:
a. High strength, non-shrink, chemical resistant.
b. Cures in presence of water.
2. Approved Manufacturers of Flexible Gasket Connector.
a. A-Lok.
b. Kor-N-Seal.
c. Fernco.
d. Or Equal.

F. Lateral Reconnections: Follow Contract Drawings.
3. Heat fusion or electrofusion saddles.
1. a. Nominal inside diameter of existing service.
d. Made of polyethylene pipe compound following ASTM D3350 and suitable for fusion welding to polyethylene pipe.
1) Branch saddle style or approved equal.
c. Approved manufacturers.
1) Molded Branch Saddle, Performance Pipe, Division of Chevron Phillips Chemical Company, LP.
2) Poly Pipe.
3) Electrofusion Branch Saddle, Central Plastics Company.
4) Or Equal.
2. Insertion connections.
a. Nominal inside diameter of existing service.
b. Approved manufacturers.
1) Inserta Fittings Co.
2) Or Equal.

G. Connection Appurtenances.
1. Use Full Circle Elastomeric Seal Clamps for joining plain ends of pipe.
a. Rubber sleeve coupling with stainless steel shear ring.
b. Follow ASTM C1173.
c. Approved manufacturers:
1) Fernco.
2) Mission Rubber Company Flex-Seal.
3) DFW by NDS.
4) Or Equal.
2. Joint lubricants.
a. Follow manufacturer recommendations.
b. Approved methods of application.
1) By brush.
2) By hand.

3.1 PUBLIC NOTIFICATION
A. All residents within 250 feet must be notified within 24 hours of work being performed

3.2 MAINLINE PREPARATION
A. Respond to project site within 2 hours of Engineer's notification of problem on site.
1. Cost incurred by the Commission due to failure to respond within time frame specified may be deducted from monies owed Contractor.

B. Bypass pumping.
1. Coordinate with City of Lee's Summit Inspector.

C. Pre-bursting inspections.
1. Confirm, locate, and identify by building address, existing lateral connections and services attached to host sewer main. Furnish log to Engineer.
2. Confirm host pipe is ready for bursting.
a. Demonstrate on CCTV recording:
1) Realigned major sags.
2) Removed obstructions, offset joints, missing or collapsed pipe that could interfere with bursting process.
4. Notify Engineer if bursting is not viable with pre-inspection CCTV recording to support assertion.

D. Locate and protect existing utilities.

E. External point repairs prior to bursting.
1. Before bursting, perform external point repair to remove sags, offset joints and bursting constrictions or obstructions that can not be removed internally, and may impede process or prevent successful completion.

G. Maintaining invert and slope.
1. Ascertain elevations of upstream and downstream manhole invert of host sewer main to be burst as well as intermediate point on mainline for verification that line and grade is maintained.

H. Vibration monitoring equipment: Placed where necessary when directed by Engineer.

3.3 MANHOLE PREPARATION
A. Enlarge manhole pipe openings to size sufficient to allow bursting head to pass without damaging manhole.

B. Remove manhole drop connections that interfere with bursting process.

3.4 BURSTING AND PIPE INSTALLATION
3.1A. Disconnect laterals from host sewer main following approved submittals.

B. Provide access pits as required to facilitate pipe bursting insertion process.
1. Locate pits where interference to vehicular traffic and inconvenience to public is minimized.
2. Use sewer lateral connection locations, changes in sewer line and grade, and sags as access pit locations, and provide access to sewer from both directions.
3. Prevent damage to adjacent areas during bursting process.

C. Do not exceed approved submittal insertion rate or force at any time. Maintain logs verifying rate and force did not exceed submitted calculations.

D. Use approved lubricant to ease installation friction. Match lubricants to soil and insertion conditions.

E. Remove irregular internal bead projections that are not uniform and rolled-back from butt-fused joints.

F. Extend DIP joints to remove slack in locking restrained joints.

G. Remove and replace improperly burst sewer mains at no additional cost to the Commission.

H. Contractor is responsible for all costs related to inaccurately located or misidentified live/active sewer lateral connections.
1. Re-connect missed or active taps and abandon erroneously opened connections at no additional cost to the Commission.

3.5 RELAX PERIOD
A. Allow inserted HDPE pipes to rest for a period of 4 hours before cutting and trimming replacement pipe or making any manhole connections.

B. If replacement pipe exhibits retraction, at end of relax period and after flexible manhole connectors' grout has set, anchor HDPE pipe at manholes following approved submittals.

C. After relax period, cut and trim replacement pipe 3 inches inside upstream and downstream manholes.

3.6 MANHOLE RECONNECTION
A. Replace exterior drops with inside drops, following Standard Details.

B. Reconnect to manhole following approved submittals.
1. Restrain and seal pipe at manhole wall.
1. 2. Use flexible gasket connector, fuse-on water stop or hydrophobic grout-soaked oakum collar embedded in concrete poured or parged across manhole wall opening.

C. Flexible gasket connector.
1. Preferred restraint and seal for precast manholes.
2. Embed flexible connector in place in manhole wall, filling all voids, front and back, for full thickness of manhole wall following Standard Details.
3. If flexible connector is not water tight, perform pipe seal with chemical grout following Section 02957.

D. Oakum Collar.
When flexible gasket connector or fused-on water stop is not used, use quick setting non-shrink concrete and embed replacement pipe with chemical grout-soaked oakum collar within manhole wall connection and add exterior bentonite collar following Standard Details.

3.7 FIELD TESTING
A. Take V-notch weir measurement of infiltration in sewer following Section 02955 after bursting and immediately after lateral re-connections to replacement pipe, while bypass is still in place.

B. Air test pipe following Section 02530 prior to reconnection of lateral connections.
1. Stabilize test pressures for replacement pipe at 4.0 PSIG with a minimum holding time of two minutes and maximum 0.5 PSIG pressure drop.
2. Repair or replace pipelines that fail air tests and re-test at no additional cost to the Commission.

C. Perform post-bursting inspection of mainline following Section 02956.

3.8 RENEW LATERALS
A. Renew laterals by pipe bursting as specified herein, within 14 days after bursting the sewer main. Follow Section 02530.
1. Pre-renewal CCTV to confirm lateral has no depressions or obstructions to prevent the bursting.
2. Laterals 20 linear feet or smaller: Pipe burst by sectional bursting.
3. Laterals over 20 linear feet: Use sectional or standard method of bursting.
4. Separate double connections.
5. Refer the following to Engineer for resolution;
a. Laterals with issues that prevent bursting.
b. Connections with less than 2 percent slope.
c. Connections that do not meet length requirements.

B. Provide elevations and logs showing confirmation of lateral grade.
A.1. Position tap location to achieve required lateral grade without going beyond downstream property limits and without going below the four o'clock or eight o'clock positions respectively, within sewer main.
6. Keep tap location in line with original lateral.
7. When grade cannot be obtained within this criteria: Refer to Engineer for resolution.

C. Install cleanout at property line. Follow Section 02955 and Standard Details.

D. Laterals recently renewed with PVC pipe and existing cleanout: Reconnect only.

E. Perform post-CTTV inspection of renewed lateral and mainline connection within 7 days. Follow Section 02956.

F. Reconnect missed or active taps and abandon erroneously opened connections at no additional cost to the Commission.

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