VIDEO CAMERA INSPECTION REPORT

INSPECTED FOR
Cynthia Sands
22137 Teri Court, West Hills
February 1, 2012

INSPECTED BY
Dionne J. Cabuguason
ACE BUILDING INSPECTORS
Certified Inspectors • Engineers • Gen. Contractor

ACE BUILDING INSPECTORS

Commercial & Residential

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February 1, 2012

TO: Cynthia Sands
23941 Windward Lane
Valencia, CA 91355

FROM: ACE BUILDING INSPECTORS
7657 Winnetka Avenue, #239
Canoga Park, CA 91306

SUBJECT: Waste and Sewer Pipeline Video Inspection at 22137 Teri Court, West Hills

Madam:

At your request, I conducted the above subject on February 1, 2012. The purpose of this inspection is to prevent unexpected costly repairs before buying the house /verify whether the pipe has damage, misaligned or off-set pipe joints, low areas, or foreign objects. This inspection was performed for waste pipe and sewer pipe lines only. Waste pipelines carry waste from toilets and greywater (waste water from domestic activities such as laundry, dishwashing, and bathing) and allow wastes to flow freely toward the sewer line. Sewer line is part of the drainage system that extends from the end of the building waste pipeline and conveys its discharge to a public sewer, private sewer, individual sewage disposal system or other point of disposal.

The findings of this inspection are based on the opinions and education of the inspector and reflect the conditions discovered at the time of the inspection only. The inspection report is narrative type with pictures of defects. Each defect is described, given an approximate distance from the specific clean-out, explain the cause of problem, and the solution to the problem. General limitations and exclusions is also noted in the report.

Thank you for asking ABI to perform this important inspection for you. If you have any questions regarding this inspection and report after carefully reviewing it, please contact our office at (818) 882-9590.

Very truly yours,

Dionne J. Cabuguason, P.E., M.ASCE, ACI
Certified Building Inspector/Assessor

WASTE AND SEWER PIPELINES VIDEO INSPECTION REPORT

CLIENT & SITE INFORMATION:

Date of Inspection: February 1, 2012

Time of Inspection: 3:00 PM

Client Name: Cynthia Sands

Property Address: 22137 Teri Court, West Hills

Parties Present: Seller's & Buyer's agent, Buyer

BUILDING CHARACTERISTICS:

Type: Single Family

Style: 1 Story

Year Built (Approximate): 1950

Building Front: East

Building status: Owner Occupied

PIPELINE DESCRIPTION:

Type of material: Vitrified clay pipe is about 60' long from public sewer and cast-iron pipe from the vitrified pipe connection to the toilet where the video camera was inserted.

Waste pipeline size, length: 3"Ø, 20 feet

Sewer pipeline size, length: 4"Ø, 149 feet

Total length of pipeline inspected: 205 feet

OBSERVATIONS:

Access: The pipelines were accessed through the toilet in full bathroom, because the 3"Ø main sewer pipe cleanout is not accessible in crawlspace and the 3" Ø vent stack has ¼ bend short sweep joint not accessible by the camera.

Pipe in fair condition: Total length of pipeline in fair condition with water flowing properly at the time of inspection is about 95 feet from the toilet.

Broken or collapsed pipe: About 4 feet of pipe is broken or collapsed and leaking due to ground settlement.

Blocked pipe: About 30 feet of pipe from the public sewer inlet is partially blocked with foreign objects and grease.

Misaligned or offset pipes: The cast-iron and vitrified clay pipes joint is offsetted by about ½", about 115 feet from the toilet.

Cracked pipe: There is no visible cracked pipe.

Corroded pipe: About 95 feet long cast-ion pipe from the connection with vitrified pipe is moderately corroded.

Bellied or sagging pipe: About 8 feet long pipe is bellied or sagging by about $\frac{1}{3}$ of the pipe diameter and about 22 feet from the public sewer inlet due to ground settlement.

Leaking pipe joints: Leaking pipe joint about 22 feet from the public sewer inlet.

Root infiltrated pipes: About 22 feet long of pipe from public sewer inlet onward is heavily infiltrated with tree roots. Large tree and several shrubs were planted nearby.

Ground characteristics over the pipes:From street curb, 4' wide of grass, 3' wide of concrete sidewalk, 2' wide concrete block wall fence foundation, 60' of grass and plants, 80' of concrete driveway, 10' plants and 10' concrete flatwork .

RECOMMENDATIONS:

Access: Install two way clean-out in front of the house so the house waste and sewer pipes both ways and shorted span.

Broken or collapsed pipe: Ground shall be excavated to expose the pipe and repair with ABS plastic pipe, flexible rubber connector and stainless steel pipe clamp.

Clogged pipe: Remove the foreign debris with power rodding equipment.

Misaligned or offset pipes: Offsetted cast-iron and vitrified clay pipes joint is not necessary to be repaired at this time but possibly in the future when it gets worst where debris could get blocked and clogged the pipe.

Corroded pipe: It is not necessary to replace the pipe at this time.

Bellied or sagging pipe: It is not necessary to replace the bellied or sagging pipe at this time but possibly in the future when it gets worst where debris could accumulate and clogged the pipe.

Leaking pipe joints: Leaking pipe is not necessary to be replaced at this time, but possibly in the future when it gets worst where waste water and foul smell rises up above the ground.

Root infiltrated pipes: Remove tree roots from sewer drain pipes by using a drain auger or high pressure hydro water drain jetting system. Remove the tree and shrubs if possible.

Ground and flatworks: About 4' x 6' and 4'x4' of concrete driveway and flatwork will be removed and re-concreted to replace the broken or collapsed pipe and installing two way clean-out respectively.

COST ESTIMATES:

Repair and unclogging costs: It is important to use qualified licensed sewer or plumbing contractor to perform this kind of work. Due to the location and depth of the damage, and the length of pipe to unclog, the cost could be as listed below:

1. Install two way clean-out in front of the house, that includes excavation and re-concreting of the affected area.– $1,400
2. Replace the broken or collapsed pipe, that includes ground excavation and re-concreting of the affected area. – $3,500
3. Remove the foreign debris with power rodding equipment. – $450
4. Remove tree roots from sewer drain pipes by using a drain auger or high pressure hydro water drain jetting system. – $650

MAINTENANCE:

Treat the sewer pipes with an enzyme-based drain cleaner on a regular basis by pouring it down the toilet nearest the sewer– It will dissolve clogs resulting from the buildup of hair, grease and dirt safely without harming the environment. Avoid pouring grease down any of your drains, putting hair or solid objects down the drains or flushing them down the toilet, or anything that isn't biodegradable. Clear the waste system periodically by filling all the tubs and sinks with water then opening all the drains at once while you flush all the toilets at the same time– the large flow of water will flush away any clogs that have begun to form in the drain lines before they have a chance to block the pipes.

The most common way to remove tree roots from sewer drain pipes is by using a drain auger to cut roots from the drains –it uses a rotating auger at the end of a long flexible cable to slice roots away. Another common method for removing tree roots from sewer drains is by using a high pressure (about 4,000 psi) hydro water drain jetting system, which blows away roots and other obstructions from your sewer or footer drains.

The roots can also be killed by using copper sulfate crystals. Copper in the copper sulfate crystals creates a poison zone within the soil outside the pipe.

PHOTOS: Photos taken from video

Photo #1

Tree roots infiltration in sewer pipe, 22 feet long

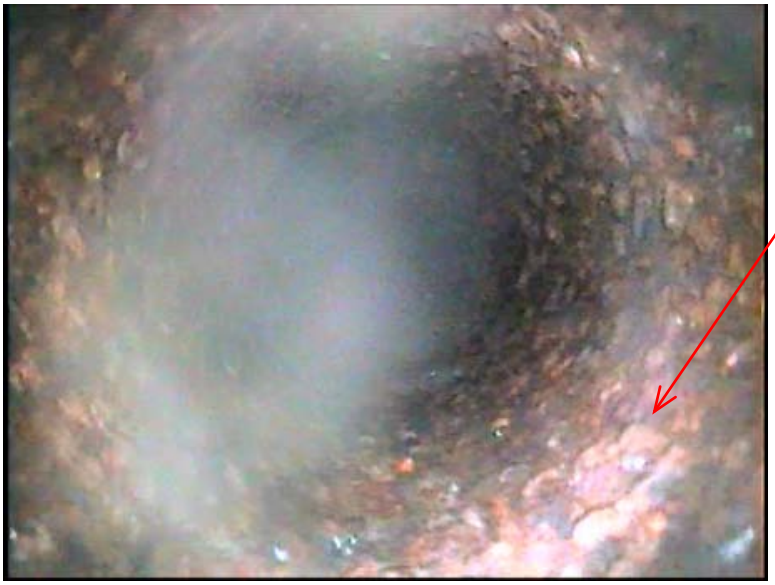

Photo #2

Moderately corroded cast-iron pipe, 95 feet long from the connection with vitrified clay pipe

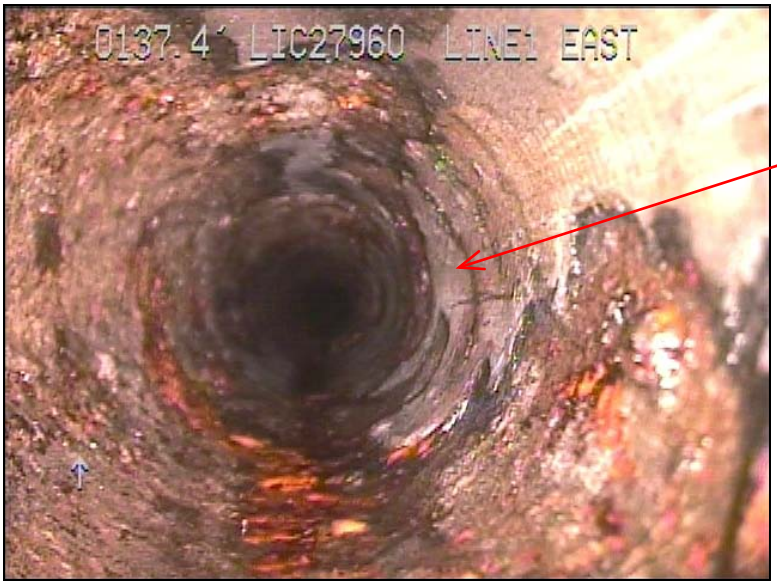

Photo #3

Heavily corroded cast-iron pipe

COMMON PROBLEMS IN SEWER SYSTEM

Root infiltration:

Tree roots are a very common problem for sewer lines constructed prior to the early 1980's. This is because these sewer lines were built using VCT (vitreous clay tile) pipe. Clay tile pipe tends to leak water at the joints. When originally installed, plumbers "sealed" the numerous joints in the clay tile sewer line with materials such as concrete, coal tar, oakum, or rubber gaskets. Unfortunately, all these sealing materials deteriorate over time, allowing water to escape, beginning an underground "drip system" attracting tree roots. Once tree roots get between the joints, they continue to grow, spreading the joint. As the joint spreads, it leaks more water. If tree roots are allowed to grow large enough, they will eventually break the clay tile pipe. Inside the clay tile pipe joint, tree roots initially act as a filter, allowing water to pass through while straining out other products sent through the line. As soon as the roots have trapped enough material, all water flow is stopped, resulting in sewage backup.

Misaligned or off set pipes:

Underground pipes are installed in sections or segments ranging from 2' to 20' or more. When connected sections do not line up perfectly with one another, they are referred to as being "off-set." Sewer lines built from the 1800's up to the mid 1980's were constructed using a large number of short sections, typically 2' to 4' in length, of VCT (vitreous clay tile) pipe. These sewer lines are particularly subject to off-sets due to their large number of joints. During construction, the joints were sealed with products such as concrete, coal tar, oakum, rubber gaskets, and on occasion, nothing at all. Over time, these sealants erode away, allowing the pipe to then settle down into the "hub" of a connected pipe creating a slight offset. In most clay pipe, off-sets will not exceed 1/4" unless the pipe is broken at the hub.

Broken or collapsed pipe:

Although properly installed PVC pipes are supposed to have a lifespan of well over 100 years, older pipes are usually made from clay tile, steel, or some other material that may only last 50 or 60 years. If you have an older home that was built before the late 1980s, there's a good chance you're dealing with clay pipes. It's common for tree roots to wedge their way into pipes. Trees love the moisture! After a while the roots grow so dense and matted that they plug up the pipe completely. Sewer pipes can also get clogged up with an accumulation of grease, muck, and other nasty stuff that gets washed down there day after day. And sometimes sewer lines just plain break, collapse, or rot away. Tree roots have a way of hastening this process.

Foreign objects blockage:

Foreign objects frequently work in conjunction with oily deposits to create a clog. Inside a clean pipe, a foreign object, such as a child’s toy, will easy flush out of your home, into the city sewer or septic. However, unless they have been recently cleaned, few homes’ sewer pipes are 100% clear of deposits. Once in the sewer pipe, a foreign object will likely become embedded in the oily deposit. Like a grain of sand that finds its way into an oyster, the foreign object provides additional surface area for the fatty deposits to build upon. In the end, the deposits reduce the functional diameter of your sewer line until they become a clog.

Bellied or sagged pipes:

Under normal conditions, sewers are installed with a fall of 1/4" per every one foot of length. Under difficult circumstances a bare minimum of 1/8" fall per foot is acceptable, although not preferred. A low area can be identified by seeing the sewer continue to hold water after the flow has stopped. Problems begin when incoming water is flushed down the sewer line, and it hits a "blockage" of standing water. Severe low areas cause the water (along with the debris it is transporting) to lose speed and settle in the low area, eventually causing a clog. Low areas can be caused by a number of factors, such as: shifting soil, poor soil compaction, poor installation, or a broken pipe (usually at a joint) which is settling. Unfortunately, the only way to correct a low area is to excavate the affected area and re-install the pipe at the proper grade. Since this corrective action is so extreme and often costly, it should only be corrected if it is truly causing an actual problem, not just "lacking perfection" for a short distance.

Leaking pipe joints or cracked pipe:

Clay pipes can leak or crack as they deteriorate with age and also by earth movement and tree roots infiltration. Cast-iron pipes cracks most likely due to the hydrogen sulfide gas collecting in concentration and the resulting acidic attack weakening the pipe wall.

Corroded cast-iron pipes:

Cast iron pipe is subject to corrosion when the pH level inside the pipe drops to below 4.3 for an extended length of time. When cast iron waste pipes fail, it's usually due to corrosion from within. As a result of what runs through waste lines, hydrogen sulfide gas can form. This can oxidize and produce sulfuric acid, which corrodes cast iron. Some drain cleaners also contain sulfuric acid and, if used continuously, can accelerate the corrosive action and shorten the life of the cast iron piping system.

METHODS FOR REHABILITATION OF SEWER PIPES

Rehabilitation methods of sewer pipes can be summarized as follows:

- Chemical grouting: A soil sealing process which employs a two-part liquid chemical grout that solidifies after curing. The grout is remotely applied under pressure to leaking joints or laterals and small cracks in sewers and manholes to seal the voids within the soil surrounding the exterior of the pipe at the point of leakage.
- CIPP (cured-in-place) lining: An internal liner is formed by inserting a resin-impregnated felt tube through the manhole into the sewer. The liner is then expanded against the inner wall of the existing pipe and allowed to cure.
- Fold and form liner: A folded thermoplastic pipe is pulled into place through a manhole and then rounded, using heat, steam and air pressure to conform to the internal diameter of the existing pipe.
- Slip lining: An access pit is excavated adjacent to an existing sewer and a liner pipe of slightly smaller diameter is slid into the existing pipe to create a continuous, watertight liner between the two manholes.
- Pipe bursting: An access pit is excavated adjacent to an existing sewer and the pipe is broken outward by means of an expansion tool. A flexible liner pipe of equal or larger diameter is pulled behind the bursting device as a replacement sewer.