



# City of Ann Arbor

## PLANNING & DEVELOPMENT SERVICES — CONSTRUCTION SERVICES

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### **“ORANGEBURG” SEWER PIPING (BITUMINOUS FIBER PIPE)**

The type of piping material used in a sewer drainage system is an important consideration when determining potential solutions to drainage problems. In the event the piping material is bituminous fiber pipe, commonly referred to as “Orangeburg,” the complete removal and replacement of all or part of the piping may be the only solution.

Persons purchasing buildings should also be diligent so that unexpected and unwanted expenses do not occur due to the presence of “Orangeburg” pipe. Bituminous fiber piping systems have experienced numerous failures over the years, and many systems have needed complete piping replacement.

The sanitary sewer system handles drainage from fixtures such as sinks, lavatories, bathtubs and showers, toilets, laundry tubs, and floor drains. (Modern codes require a separation between sanitary drainage and storm drainage. Storm drainage systems handle rainwater, surface water, and subsurface water.) Drainage problems in the sanitary system are usually the result of a blockage or other types of failures within the piping system. When that occurs, the system may run very slowly or may actually back up through a fixture or floor drain.

The following information has been assembled to help understand some facts about “Orangeburg” sewer piping and to help answer some of the typical questions that are asked. It includes empirical information based in part on discussions with the local construction community and inspectors.

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#### **WHAT IS “ORANGEBURG” SEWER PIPE?**

Many houses in Ann Arbor were constructed using a sewer pipe material commonly referred to as “Orangeburg.” Technically, the term “Orangeburg” is the brand name of a sewer pipe made by the Orangeburg Manufacturing Co., Inc. of Orangeburg, New York.

The generic name for this type of pipe is “bituminous fiber pipe.” The pipe is made of a combination of cellulose and asbestos fibers impregnated with a bituminous (coal tar) compound. Bituminous fiber pipe was manufactured with either a homogenous wall or a multiple-ply laminated wall. The ends of the pipe were tapered and fitted together using a butt joint.

Two national standards regulated the bituminous fiber pipe manufacturing process. Standard ASTM D-1861 covered homogenous pipe while ASTM D-1862 covered the laminated wall variety. Both standards were promulgated by the American Society for Testing and Materials (ASTM) and contained requirements for testing resistance to flattening, crushing, strength, permeability, absorption and chemical resistance.

The Orangeburg Company, and others like it, were very active during the years of the Second World War and after. The scarcity of cast iron and other metals, as well as the rationing of metal building products, created the opportunity for the development of alternatives to traditional building products. Companies which also manufactured bituminous fiber pipe included: The Fiber Conduit Company, KYOVA Fiber Pipe Company, Central Fiber Pipe Company, Line Material Company, and Brown Company (BERMICO Pipe).

#### WHEN WAS "ORANGEBURG" PIPE USED?

There are no specific records that can be used to fix the exact time span for the use of this type of pipe in Ann Arbor. In general, a range of the early 1950's to the early 1970's is a reasonable assumption, although some contractors report seeing it in homes built as early as 1949. There is also a high probability that it was not used after the early-70's, when plastic piping materials began to be more commonly used, and when communities such as Ann Arbor began to restrict its use.

#### HOW DO I KNOW IF I HAVE "ORANGEBURG" PIPE?

There appears to be no consistent pattern of buildings with, or without, bituminized fiber pipe. It may show up anywhere in the City, sometimes consistently on specific streets, and other times in isolated instances. The City does not have records listing all "Orangeburg" houses.

The City has, however, since the mid-80's, been keeping a record of addresses of homes where sewer pipe has been replaced in total or in-part. Checking that data for a home you wish to purchase, or for addresses on the same street or immediate vicinity of your home or one you wish to purchase may give you a general idea of what to expect. All records of sewer replacements are not "Orangeburg", but many certainly are.

There are two ways to search for this information:

- 1) A historical list (mid-1980's thru 2004) can be found using this link: [Orangeburg List](#)
- 2) For more recent records you can use the [eTRAKIT](#) system to search Permits by address

Taking that information, you may also wish to look at files of similar houses in the City's microfilm file to see if similar construction dates, similar plumbers, or similar builders were involved. The microfilm files can be used during normal office hours and are located in the offices of Construction Services on the 1st floor of City Hall, 301 E Huron St. in Ann Arbor, Michigan. Please have a list of addresses you wish to check on.

There are several other ways to investigate, but all involve contact with the piping itself. This usually involves plumbers or sewer installers and may take a variety of forms:

- A television/video scan of the pipe may be possible if the line can be accessed. This can give a picture of what is happening inside the pipe and may yield clues sufficient to identify the type of pipe, such as interior pipe damage patterns.
- A "roter", "snake" or mechanical cutter may be able to be inserted to clean the line. Again, it may yield clues (such as bringing back piping materials) that will help in identification, but also may further damage the pipe.
- Digging down to the pipe on the exterior will give positive identification of pipe type but is extremely disruptive to the yard. Unfortunately, in many "Orangeburg" cases it will eventually be necessary.

#### WHY DOES "ORANGEBURG" FAIL?

Though sewer pipes of cast iron or plastic also fail, the preponderance of failures of sewer pipes in Ann Arbor over the past twenty years or so has been associated with bituminized fiber piping. The system may fail for several reasons:

- The bedding around the piping may shift or be disturbed over time, causing the pipes to shift and break apart (generally at the joints).

- Tree roots may invade the pipes, usually at the joints, and as they do, loosen or break apart pipe sections and restrict flow.
- The piping material itself may deteriorate over time. As the material deteriorates, it flattens due to the earth pressure around it and loses its circular cross section. This circular shape is particularly needed at the bottom of the pipe where most material will flow.
- The deterioration may be caused by age, but in many cases may be caused by the effects of improper disposal of cleaners and solvents. Since the piping material is held together with bitumen, any type of solvent, paint thinner, mineral spirits or adhesive cleaner dumped into the pipes will cause deterioration. Especially where laminated piping is concerned, this has the effect of weakening the pipe bottom, causing it to bow upward from the bottom due to earth pressure and reducing (or eliminating) the ability of the pipe to properly flow. Ironically, in this failure mode the interior layers fail first and the pipe then continues to “rot” from the inside out.
- City inspectors have seen, in fact, bituminous fiber piping which still maintained a circular outer shape but with an interior cross section out of round and failing. The inside-to-out failure mechanism seems to be particularly unique to bituminous fiber piping.

#### WHY WAS THIS MATERIAL APPROVED FOR USE?

The State of Michigan Plumbing Board accepted bituminized fiber piping as of November 1, 1949. The approval at that time was for the brand name “Orangeburg”. Additional products were approved in October and November, 1955. The material was accepted under the State Plumbing Code at least since the 1949 date.

The City of Ann Arbor was enforcing the State Plumbing Code as early as fiscal year 1948-49. In 1954 the City adopted the 1950 BOCA Building Code and provisions of the State Plumbing Code.

Bituminized fiber piping was approved within the City’s jurisdiction until approximately 1970. In an ordinance which became effective in May, 1970, the City removed this material from the list of approved sewer materials. The City continued to exclude this material from use from that point on.

During the time period this material was approved for use (1949-1970) the City was still reluctant to approve the material but once it was given State approval, the City did not prohibit its usage. After documentation of several failures, however, the Attorney’s office felt there were sufficient grounds to prohibit the material and did so. Though the State did not immediately follow suit, and continued to approve its use at the State level, it did approve the City’s code amendment restriction from 1970 on.

#### HOW DO I FIX THE PROBLEM?

There are essentially only two ways to fix a sewer problem: Either clear the obstruction and hope the pipe is still in good shape or, failing that, repair or replace the piping.

The obstruction may be cleared a variety of ways, but is usually done with a “snake” with a cutting tool attached to the leading portion. This will usually clear the obstruction but with bituminous fiber pipe may cause damage to the pipe itself. It may also only clear the obstruction on a temporary basis since the failure mechanism will likely resume once the current area of failure is cleared. It is certainly less expensive than replacing the pipe but may only be borrowing time.

Aside from cutting, water jetting is sometimes used to clean a line, but for most blockages the area inside the pipe must have a reasonably circular shape established for smooth flow and cutting will probably be required.

In some cases, cutting will not even work, especially if the length of failed pipe is extensive. Unfortunately, in many cases involving “Orangeburg”, pipe replacement is the only viable option.

#### WHAT IF I NEED TO REPLACE THE PIPING?

In most houses, the bituminized fiber pipe was “probably” used from a point about 5 feet outside of the foundation wall all the way to the City main in the street. Beneath the basement slab other material was usually used. In the

street, the pipe probably was taken to the sewer, but in some areas short “stubs” of iron, concrete, or clay sewer leads came off the main and were connected to the bituminized pipe at the end of the stub/lead. (Individual situations may vary from the typical scenario described above.)

The standard method used to replace bituminized fiber pipe involves digging a large and probably deep trench to remove the old pipe and install replacement material. Though so-called “trenchless” technology is used in commercial applications, it is fairly new to residential cases but may soon be a practical alternative to trenching. This latter method may be referred to as “pipe-bursting” technology, or some similar term, and is designed to replace material without digging the entire line. It does require large holes at each end of the sewer for the equipment used to pull the new pipe, but may help save landscaping if that is a consideration. The City does not recommend any particular method of repair or replacement. The method selected must be based on individual needs and budget considerations.

*DISCLAIMER: This material presents information on bituminous fiber pipe gathered from records, construction literature, building and plumbing codes, inspector interviews, contractors, and other sources of empirical data. Material herein is not warranted to be consistent for all locations and addresses. The intent is to help people understand the bituminous fiber pipe problem and present the address list as potential source of reference in addressing sewer drainage problems.*