LESSON 4: KEY CONCEPTS

Modern Pipe Materials (1800 to 1900)

Advances in technology and manufacturing led to systems with multiple materials

- Orangeburg – wood with tar pitch
- Cast Iron – Versailles 1664, Philly 1810
- Vitrified Clay – (Babylon) skill, weight, location
- Concrete – 1940's
- Ductile – 1950's
- Plastics – invented in 1860; 1950-60's

Pros and Cons of Modern Drainpipe

Orangeburg (18-1900)

- Wood Fibers & Pitch
- Life – very short
- Pro – lightweight and ease of installation
- Con – brittle and destructible

Clay (1900-today)

- Clay fired to ceramic
- Life – potentially long
- Pro – inert material resistant to corrosion
- Con – root intrusion

Concrete (1940-today)

- Limestone cement
- Life – 100- 1,000 years
- Pro – strong and large
- Con – weight and cost effectiveness

Cast Iron (1900-today)

- Poured molten iron
- Typical Lifespan is 80-100 years. However, the lifespan may be shorter depending on the soil type.
- Pros – strength, sound dampening, fireproof
- Cons – prone to rust and heavy

Galvanized (1930-1990)

- Treated Steel
- Life – 80-100 years
- Pros – strength
- Cons – rust at fittings, discoloration, lead

ABS (1950-banned)

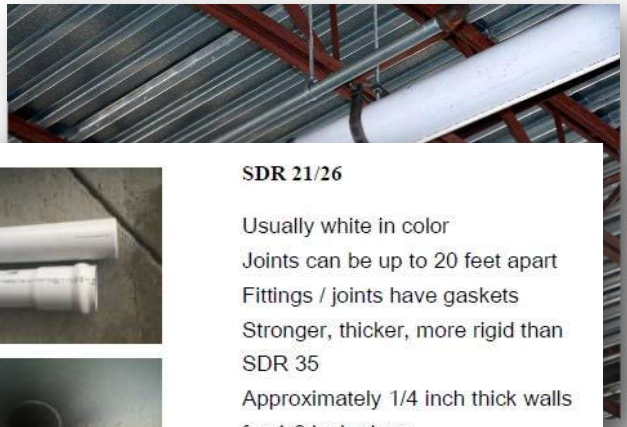
- Acrylonitrile Butadiene Styrene
- Life – 80-100 years
- Pros – cost, installation, non-toxic, corrosive resistant
- Cons – not at durable; UV light deterioration

PVC - Polyvinyl Chloride

- Life – 1980's to Today (Still to be determined)
- Pros:
  - Cost and Ease of Installation
  - High-Pressure Threshold
- Cons:
  - Heat intolerance
  - Pliable and warp
  - DIY installation
- Schedule 40 – common drainpipe
- Schedule 80 – cold supply lines

- CPVC – chlorinated and heat resistant

Other Types of Plastic Pipe



SDR 35

Usually light green in color

Usually uses white PVC fitting

Joints can be up to 20 feet apart

Fittings / joints can be glued or have gaskets

Approximately 1/8-3/16 inch thick walls for 4 -6 inch pipes

Life expectancy 50-500 years

Late 1970's to present

SDR 21/26

Usually white in color

Joints can be up to 20 feet apart

Fittings / joints have gaskets

Stronger, thicker, more rigid than SDR 35

Approximately 1/4 inch thick walls for 4-6 inch pipes

Life expectancy 50-500 years

Late 1990's to present

Cast Iron Drain Lines

Typical Problems

- Rust from inside-out
- Scaling & Grooving
- Cleaning - Sulfuric Acid
- Elastic Soils – retain moisture
- Brittleness

Life Expectancy

- 1930/40s – near end of life
- North Texas – 40 years

New Home Drain Deficiencies

New Construction

- Obstructions – construction debris, drywall, compound, wood, trash
- Separations – improper adhesive, careless backfilling, heavy equipment
- Slopes & Bellies – improper installation, warping
- Damage – crushed, collapse

Renovations

- Mixed Materials – cast iron trunks/trees, envelop vs yard
- Installation – joint connections, flippers and masking
- Structural Movement – foundation, soil, tree removal

