NYCHA Capital Projects Fact Sheet: UNDERGROUND STEAM DISTRIBUTION

1. **Scope Overview**
   - A steam boiler distribution system refers to the network of piping required to distribute clean steam from a boiler room or plant through pipes to heat buildings on a campus.
   - Property Management will track when steam valves within a development are ruptured and leaking steam. The NYCHA Emergency Service Unit notes how often steam leakages occur and may provide a temporary steam reducer to address immediate issues. Additionally, if a development has recently had or is slated to have a boiler replacement, an underground steam replacement may be prioritized.
   - A&CM completes 1-3 Underground Steam Distribution System Renovations a year. This is based on need and funding; renovations can average between $1M -$20M, depending on the development size.

2. **Key Terms**
   - Clean steam: Steam that is free of physical contaminants and gases such as carbon dioxide, oxygen and other gas which can combine to contaminate steam. Deaerator, water softener, and chemicals added to steam and care taken during the construction process can prevent physical contaminants.
   - Carbon steel piping: Steam pipes are installed inside a carbon steel pipe that is usually buried in the ground below the frost line (the lowest depth that the ground freezes during the coldest part of the winter). The most commonly used is a black steel pipe made of masonry cement, galvanized iron, and steel. The carbon steel is usually sealed with FOAMGLAS cellular glass insulation or some other type of sealer to prevent water from getting into the insulation and other deterioration.
   - Trenching: The bottom of the trench for the carbon steel pipe should be filled with coarse gravel or broken rock to provide support and adequate water drainage. When water is allowed to collect, it seeps into the pipe through porous openings in the sealer. This wets the distribution system insulation and causes it to lose much of its insulation abilities.

Left: Before and After Photos of Steam Piping at Taft Houses; Right: Trenching

3. **Why is this capital project needed? Why is it important?**
   - Strong steam output makes boilers more efficient by saving on fuel and maintenance costs, as well as the reduced negative impact on the environment.
   - The full impact of a new, highly efficient boiler system may not be felt by residents in apartment interiors if the distribution system is suboptimal.

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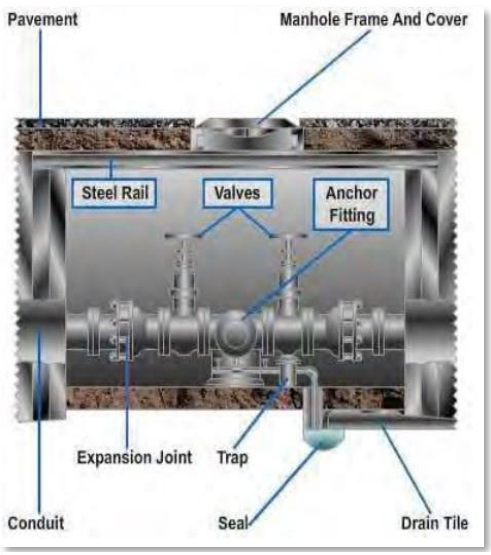
4. Scope of Work Details

- The basic steps of underground steam distribution projects are:
  1. Planning and design: Determine the capacity, pressure, and temperature requirements of the steam distribution system and conduct a detailed survey of the area to identify potential obstacles.
  2. Site Preparation: Dig trenches along the planned route, ensuring proper depth and width to accommodate the steam piping system. Include drainage systems to prevent water accumulation in the trenches, which can damage insulation and piping.
  3. Installation: Lay pipes in sections, ensuring proper alignment. Wrap pipes with thermal insulation to minimize heat loss and prevent external condensation. Build access point manholes at key intervals for inspection, maintenance, and drainage.
- Steel rail: Carbon steel designed to withstand heavy loads.
- Anchor fitting: Used to restrain the movement of pipes in distribution systems.
- Expansion joint: Designed to hold parts together while safely absorbing temperature-induced expansion and contraction of carbon steel piping.
- Trap: A self-contained valve which automatically drains the condensate from steam pipes and allows steam to flow at a controlled rate.
- Drain tile: A system of perforated pipes that channel groundwater away from the steam system.
- Conduit: Serves to protect and insulate the steam pipe, and can be constructed out of cement, iron, and/or steel and sealed with tar. Additional insulation can be made from molded diatomite.

Carbon steel piping

Supporting infrastructure



Typical Underground Steam Distribution Cross-Sectional

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5. Construction Trades & Other Roles Involved

Type	Possible Roles	
Trade	• Asbestos & Lead Handler • Carpenter • Concrete Worker	• Electrician • Steamfitter
Non-Trade	• Admin	• Supervisor

6. Typical Project Timeline

- The construction period is typically 20-30 months; this can vary depending on the amount of steam pipe being replaced, and whether this replacement affects multiple buildings in a development.

7. What to Expect During Construction?

- Steam outages occur for 8 hours per building at a development for one day. Residents are notified one week prior to the planned outage.
- Excavation in this project can limit walkways. All walkways are measured to ensure emergency vehicles can still mobilize where necessary.

8. Common Stakeholder Concerns

- Seasonal Considerations: Excavation and pope installation cannot be done in the rain or snow. During construction, workers vacuum the water from inclement weather constantly to ensure that pipes remain dry through a process called vacuum suction relapse.
- Pests: Concerns regarding rodents are plentiful; due to this project being underground there is a chance this may increase. NYCHA Project Managers and the General Contractor are responsible for ensuring that an exterminator is at the development on a consistent basis.
- Service Outages: Outages occur when the contractor hooks up temporary steam and puts new steam back online. Residents must be made aware of these planned outages at least 7 days prior to construction. Signs must be posted in common spaces.