

Pipe work restoration

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Introduction and background

Throughout Sweden's construction history, there has been a number of "building booms". A bathroom's maximum lifetime is around 30 to 40 years, which means that over the next few years, the large housing stock built during the 60s-70s need to have their bathrooms and drains renovated. According to statistics, approximately 600 000 apartment buildings were built in Sweden between 1960 and 1970. In 2002, there were claims notified for moisture damage to insurance companies for two billion SEK. Choosing the right technical solution when doing restorations is very important because we must take into account construction, economy and the environment. Problems arise in the redevelopment of the drains, as a result of the project, the contractor and building owners not being able to coordinate the work from the outset to the same extent as for new construction projects. The traditional technique for pipe restoration has been an expensive and time-consuming project, this has resulted in technological developments being pushed forward which are newer, cheaper, more flexible and more environmentally friendly, e.g. prefabricated bathrooms, cartridges and relining.

Requirements and codes

When time, money and materials are to be saved, there is a risk that the work is not carried out professionally. In order to verify this, there are a number of laws, regulations and rules which have to be followed to ensure a good outcome. Boverkets building rules, BBR, are the rules for new buildings. In order to classify the work as professional, these rules shall be followed. When it comes to renovation you use Boverkets general advice on amending the building, BÅR. When new drains are installed in a building, you should use the requirements of the BBR.

Examples from the BBR:

6:51 General

Buildings should be designed so that moisture does not cause damage, bad odour or hygienic nuisance and microbial growth which can affect human health

6:5331 Waterproof layer

Floors and walls that will be exposed to water irrigation, water spills or leaking water, must have a waterproof layer (damp-proof course) that prevents moisture from coming into contact with the building and spaces that cannot withstand moisture. The waterproof layer (DPC) should be resistant to the alkalinity of the concrete and the mortar, water, temperature variations and movements in the foundation, and are moisture resistant. The waterproof layer must also withstand vibrations from the normal equipment found within the building. Seams, joints, attachments and lead-throughs in the waterproof layer should be water tight.

Classical pipe work restoration

A classical pipe work restoration is a major undertaking. Everything from the old bathroom is demolished and only the structure remains.

From this you build a new bathroom. When you renovate the bathroom in the classic way, there are several different options. This can include the choice of materials, technologies and the design.

It may differ depending on clients, contractors and planners. You can choose to improve ventilation, materials for sewage, water drains, luxury tiles and bricks.

Restoration can be divided into three steps.

1. Demolition

When you begin you have to tear out all the fixtures and fittings in the form of baths, toilets and sinks.

The floor and walls must be broken up in order to find all the installations. As you tear down the old pipes to make space for the new ones the bathroom cannot be in use. This imposes restrictions for the residents, requiring temporary solutions. This could be a temporary installation in the basement, or a vacant apartment at the tenant's disposal. If possible, you should not carry construction debris through the apartment, try to use a window.

2. Dehumidifying

After an extensive demolition, you can discover different moisture damage. If you find any moisture damage you have too dry it out; this can be very time consuming. To accelerate this process, use a dehumidification unit.

3. Installation

After the drying process you can install the new bathroom.

It usually begins with installing the new water and sewage drains to continue with the fixtures and fittings.

Result

Classical renovation provides an increase in the apartment's standard, all moisture damage is removed and a new bathroom installed with new drains.

Economy

- A standard increase that usually results in higher rent. Long-term investment.
- This is an expensive investment.

Environment

- New materials can provide an energy-saving bathroom.
- Large amount of waste.

Time

- If it is done well, the drains and bathroom function well for at least 30 years.
- A renovation takes about 3-4 weeks.

Relining

Relining is a new technique. As late as 1990 the first relining renovation was performed in Sweden.

This renovation is still intact, suggesting that the lifetime of these renovation techniques is at least 18 years.

Swedish rörfodring AB, has been approved by SP, Swedish Technical Research, indicating that the material is of good quality.

Today, over 15,000 renovations had been performed using relining technique, and new tests and samples are continuing to bring this somewhat questionable method to account.

When we use the relining method, we do not replace the old drains. We use the old sewagepipe to form to the new plastic pipes which are then formed inside the old drains.

The new pipes are between three to five millimetres thick.

You can reline using dimension between 32 and 160 mm in diameter.

Restoration is divided into four steps:

1. Cleaning

After the tubes are located, they are cleaned and purged from deposits by mechanical grinding. The system is flushed and after drying, the tubes are checked with a video camera. This inspection point is to ensure that all the older drains are whole before filling with the plastic mass.

Reinforcement of the older drains is performed if needed.

2. Relining

After the cleaning and inspection is completed, coating can be done. Plastic mass is pumped out through a nozzle, rotating brushes are used to make a create a smooth coating and for forming the tubes. Even here the whole process will be monitored by a video camera.

3. Inspection

The work is finalized by yet another video monitoring to ensure that the quantity of plastic the tubes received was adequate, and that nothing went wrong.

4. Mounting

Finally, all assembly is dismantled, and the work is complete.

The two different plastics used in the relining method are core plastics and polyester plastics.

Result

The relining method is under development and so far it is only possible to use the method in the renovation of sewage pipes, but not in the renovation of water drains.

The relining method can be an excellent choice if you know that the bathrooms are in good condition.

Economy

- Inexpensive interventions with the aim of gaining entirely new drains, no expenditure for housing the tenants because they can stay in their apartments during the short period of renovation; no seams occur in the pipes, and this provides a good technical solution which is good value for money.
- A short term solution. The bathroom will remain in the existing condition and restoration is not a major investment

Environment

- No waste, no noise, no dust for the tenants.
- Tempering plastic can be dangerous to health during the construction stage, the house can be a health hazard if the moisture damage is not fixed.

Time

- Pipe work renovation that takes a maximum of one week, all the tenants can live in their apartments.
- More work is postponed.

Prefabricated bathrooms

To streamline the construction process, the construction industry has taken after the car industry. The construction process has always been dependent on climate and climate is not the ultimate for construction work in Sweden, and this has had consequences. If the construction process mainly is made in factories instead, you can achieve a more organised structure in the building stage. The whole process from order to finished bathrooms will be shorter. Most prefabricated bathrooms are made for new buildings but this can also be used for specific renovations, such as "the room in room" method.

The "room in room" method is built in the old room with the aid of prefabricated walls; this minimizes demolition. It uses a ventilation column so any future moisture will be vented out. Together with the customer drawings are developed which are then used to make the prefabricated tiled walls, by a robot in the factory. The new bathroom is delivered in a container drain by drain. You often use the so-called prefab cartridge for installing new drains. The toilets are fitted in this cartridge. You can use the prefab cartridge if you have good bathrooms and only want to install new drains.

Result

Currently, there are 25,000 prefab cartridges in Sweden. There are many different kinds of systems around the country. As mentioned earlier, moisture damages is expensive, having a technology that is visible, any leakage from installations makes it possible to remedy the errors before any damage occurs. Often, there is a service hatch located so that the joints and critical areas can be inspected

Economy

- Inexpensive renovation, an increase in the apartments standard
- Bathroom reduced in size because of the cartridge, less choice in the prefabrication method.

Environment

- Less waste, good working environment and a ventilation system to prevent future moisture damage.
You need to break up the bathroom to access the moisture.

Time

- Good logistics will reduce the working hours.
- A major investigation can be done.

Conclusion

Relining involves only the renovation of sewage drains, and because this technology has not been developed further, you cannot use relining for drinking water drains. You can only use this method when the bathroom is in good condition.

Bad bathrooms are the biggest cause of moisture damage.

The so called “room in room” method feels more appropriate in a bathroom without moisture damage, furthermore, leakage can be detected directly when fitting the prefab cartridge.

The classical method, which is a huge and time-consuming project, is the method most proven and most elaborate and provides good results.

Sources

www.vvsforetagen.se