

VENICE

urban maintenance

and physical protection

ing. arch. Ivano Turlon Insula spa dott.ssa Raffaella Rizzetto Veritas spa



physical and chemical deterioration factors

- erosion caused by high and low tides
- capillary rising damp in the walls
- sedimentation and silting of the canals

human activity factors

- discharge of sewage into the canals; Venice water basin farms and industrial activity
- washout caused by motor-powered boat propellers'
- underground utilities network (pipes for water and gas, electricity and
- telephone grids which run under the paving).

urban maintenance in Venice

1 dredging the canals (called *rii*) inside the city: dredging in the water and dredging dry canals

2 restoration and consolidation of quaysides, foundations and bridges

3 reorganising and restructuring the drains to prevent hygienic conditions degeneration

4 local defence against medium and high tides

5 rationalisation and renewal of underground utility facilities



canal dredging

canal dredging



restoration of embankment walls



restoration of embankment walls



restoration of embankment walls



maintenance of bridges



maintenance of bridges



maintenance of bridges



protection from high tide



state administration

Venezia Lido inlet

Malamocco inlet

Adriatic Sea





Chioggia inlet



defence from medium tide



municipal administration







underground utilities network



underground utilities network



underground utilities network



Venice sewerage system



The sewerage system in Venice has been created during the 18th century by the Serenissima Republic and is still in use; it consists of an intricate network of underground conduits (called "gatoli") where wastewater from buildings is collected and then discharged into the nearest canal or into the



The *gatoli* are the masonry conduits collecting wastewater from buildings and then discharged into the nearest canal. They are located under the average sea level (-0.75 m)

This is a rudimentary sewage system where the anaerobic process take place inside the conduits. "Gatoli" are not downslope so they function as septic tanks until the next high tide flushes them.

The aerobic process takes place in the canals and in the lagoon.

Disinfection is naturally operated by sea water.

Dredging canals periodically.





This simple system of disposal has been very efficient through centuries

The industrial and economic development in the late 19th had a negative effect in the lagoon environment:

•pollutants discharged in the lagoon without treatment;

•as industrial activities have ceased or diminished, tourism has increased, reaching more than 20 million visitors/year;

•life style has changed, resulting into variations of the composition of waste water;

•the attempt of constructing a centralized sewerage system able to convey wastewater to the mainland's plants resulted not easy and not sustainable.







