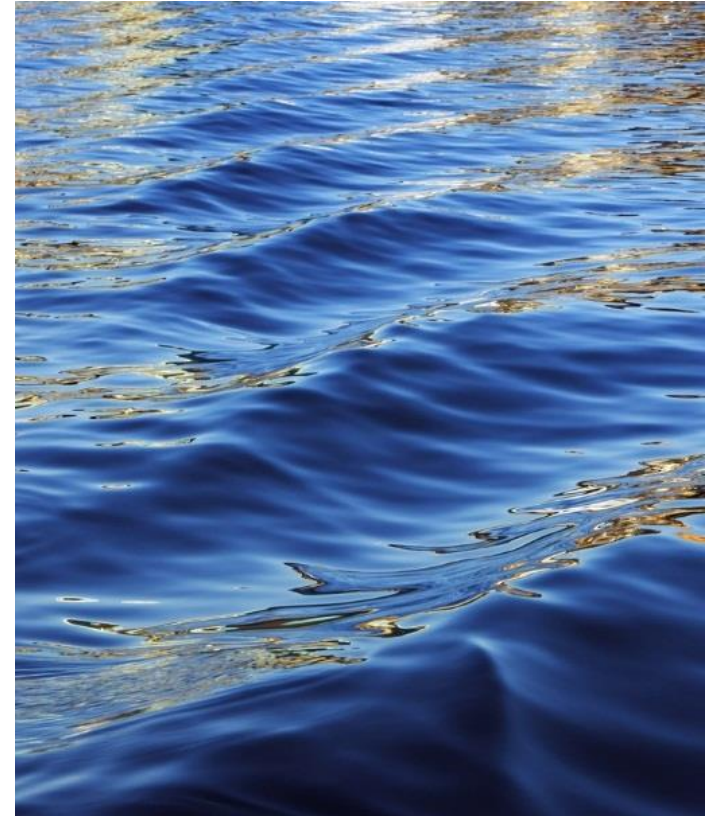


ENV 101: Environmental Issues in Real Estate

Topic 3: Sewerage System

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Elements of a Sewerage System

- Collection
- Transportation
- Treatment
- Disposal

Terms Related to Sewerage System

- **Domestic/ Sanitary Sewage:** It is the **liquid waste** originating from the sanitary conveniences, e.g. urinals, water closets (basin), bath, sinks etc. It is also known as *Black Water*.
- **Sludge:** It is the **solid or semi-solid** portion of the sewage
- **Sullage:** It is the liquid discharge from only kitchen or wash basins, excluding discharge from urinals. Sullage is known as *Grey Water*.
- **Storm Water:** It is the **surface runoff** during and immediately after rainfall, which enters into sewers through inlets.
- **Sewer:** It is the pipes that carry sewage.
- **Sanitary sewer:** It is the pipes that only carries sanitary sewer, excluding storm water.
- **Storm sewer:** It carries only storm water.
- **Sewerage:** Sewerage refers to **the entire system** of collection, treatment, and disposal of sewage.

Types of Collection System

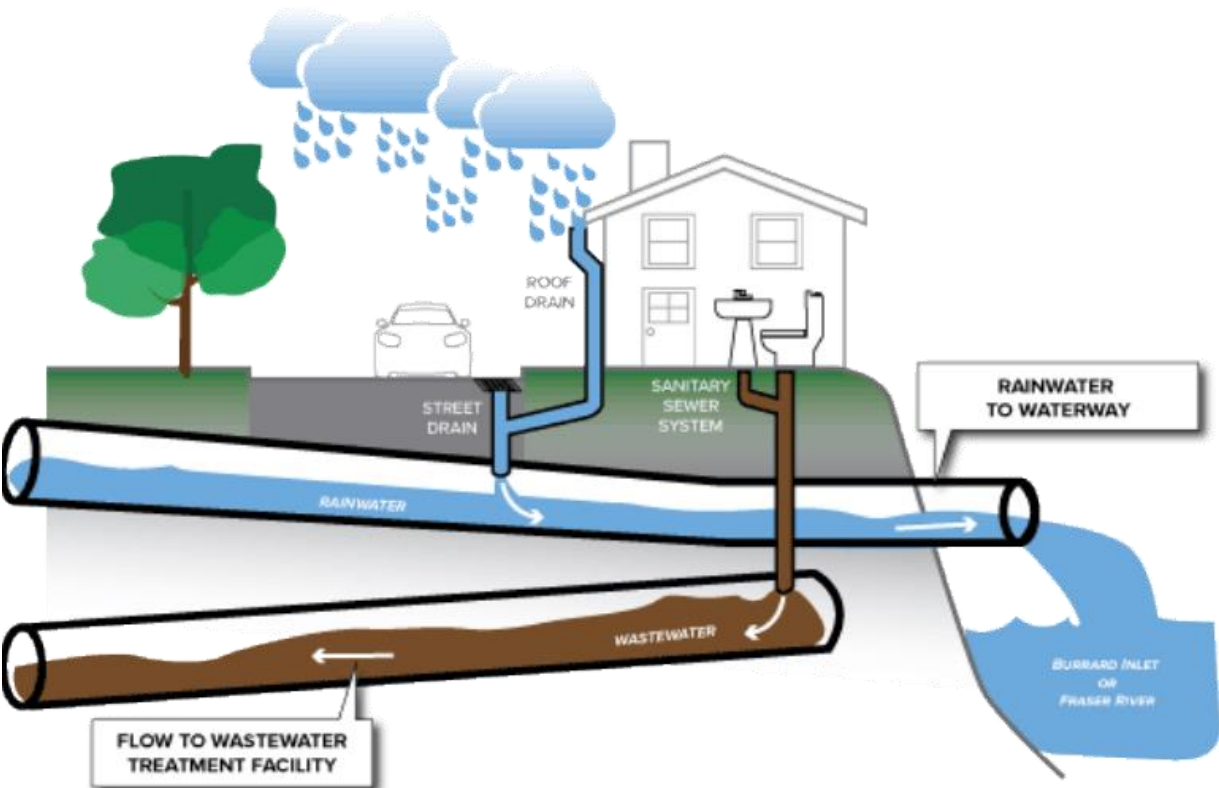
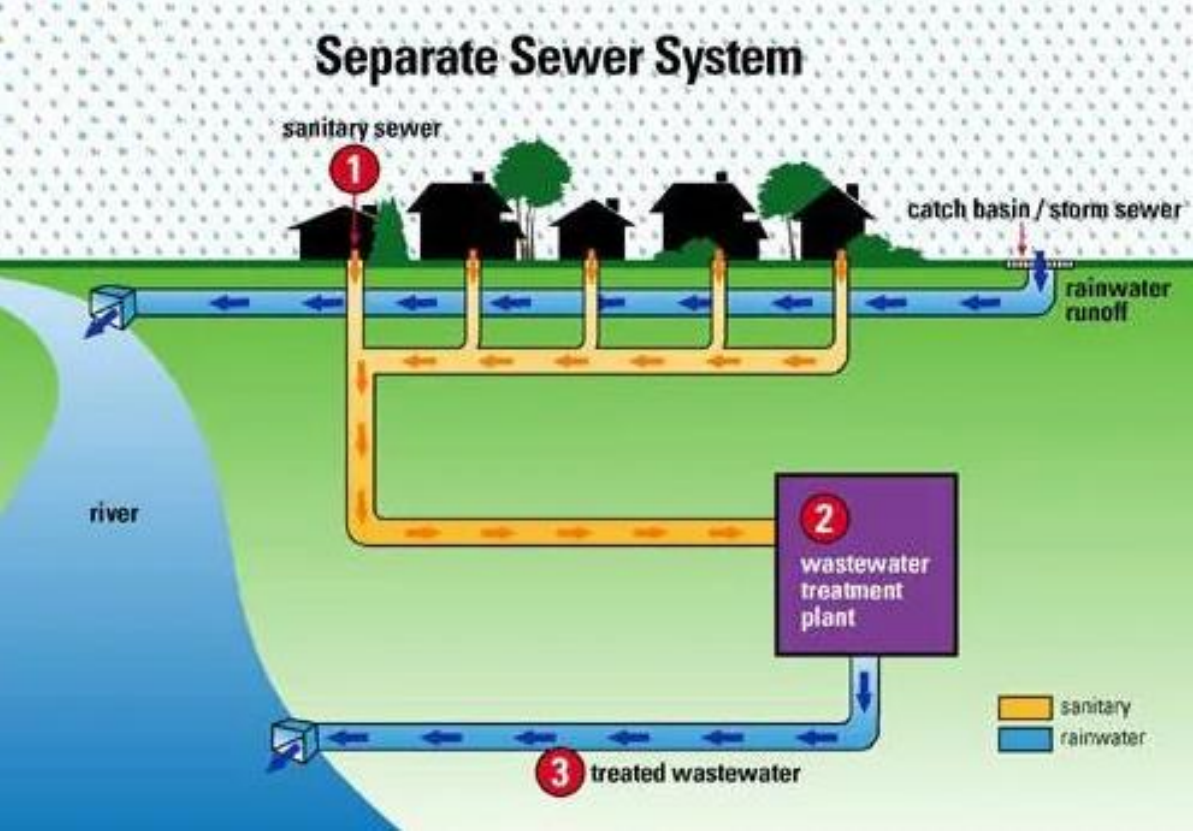
- **Separate Sewer System**

- Sanitary sewer system: Wastewater discharged to treatment plant
- Storm sewer system: Wastewater discharged to water body

- **Combined Sewer System**

- **Partially Separate/ Partially Combined Sewer System**

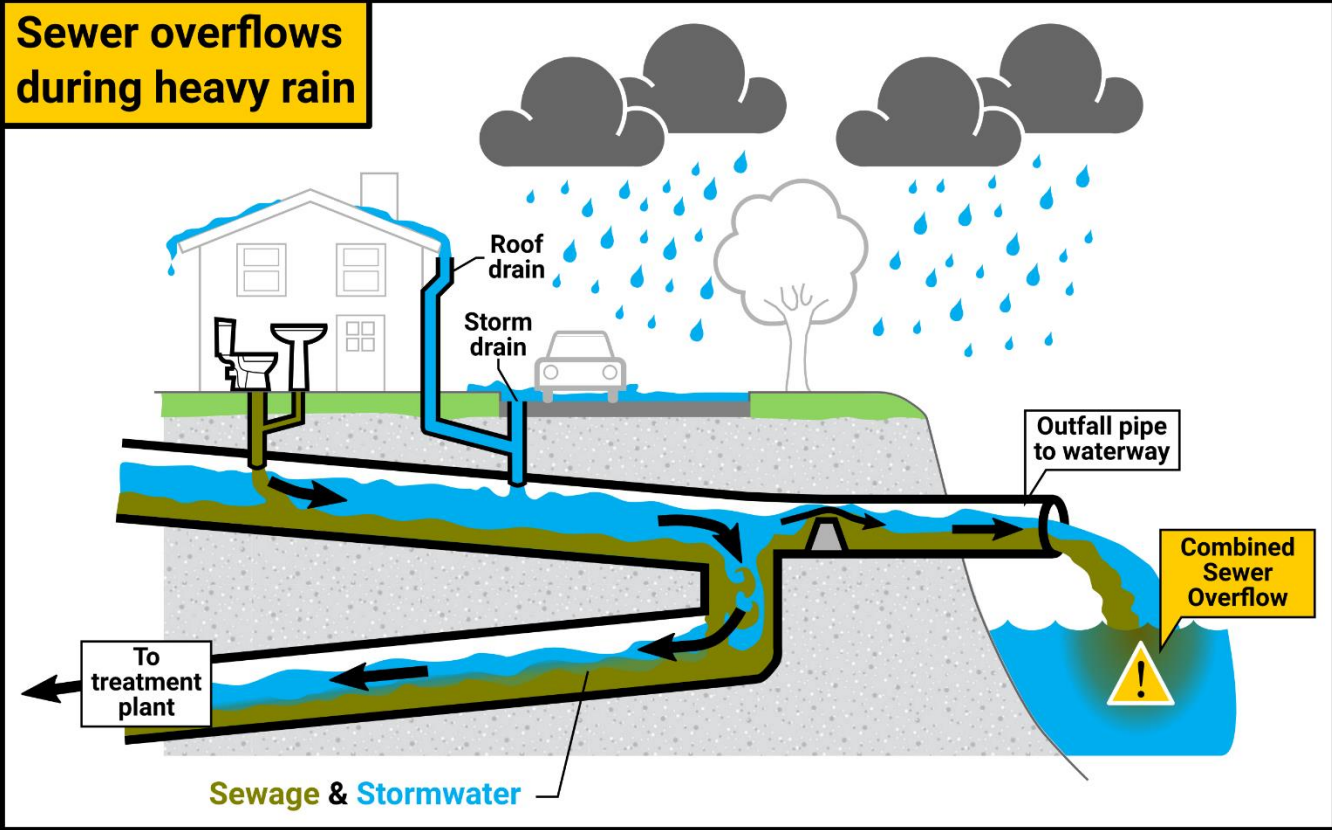
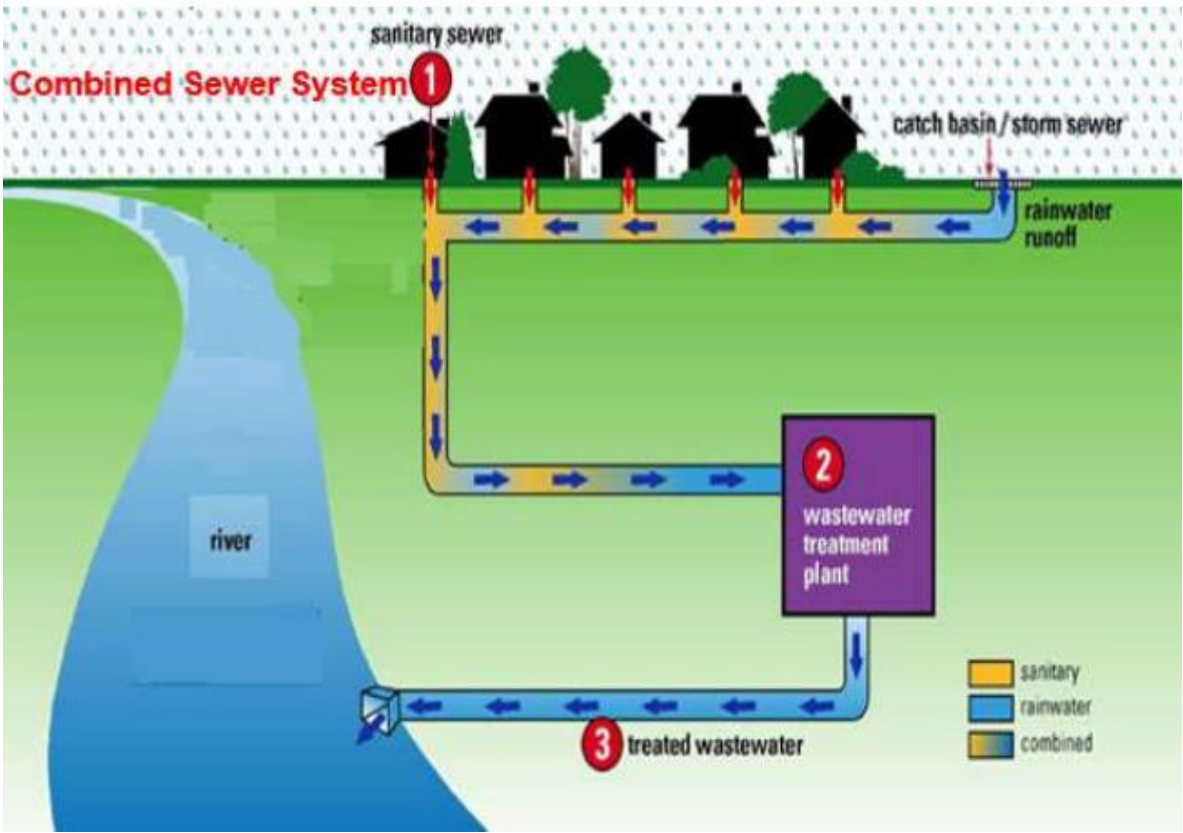
Separate Sewer System



Separate Sewer System

- As sanitary and storm sewage collected separately, the pipelines (sewer) are narrow.
- Only sanitary sewage is treated, Storm water is discharged without treatment. It reduces the treatment cost.
- Two different sets of pipeline (sewer) is required, which increases the cost.

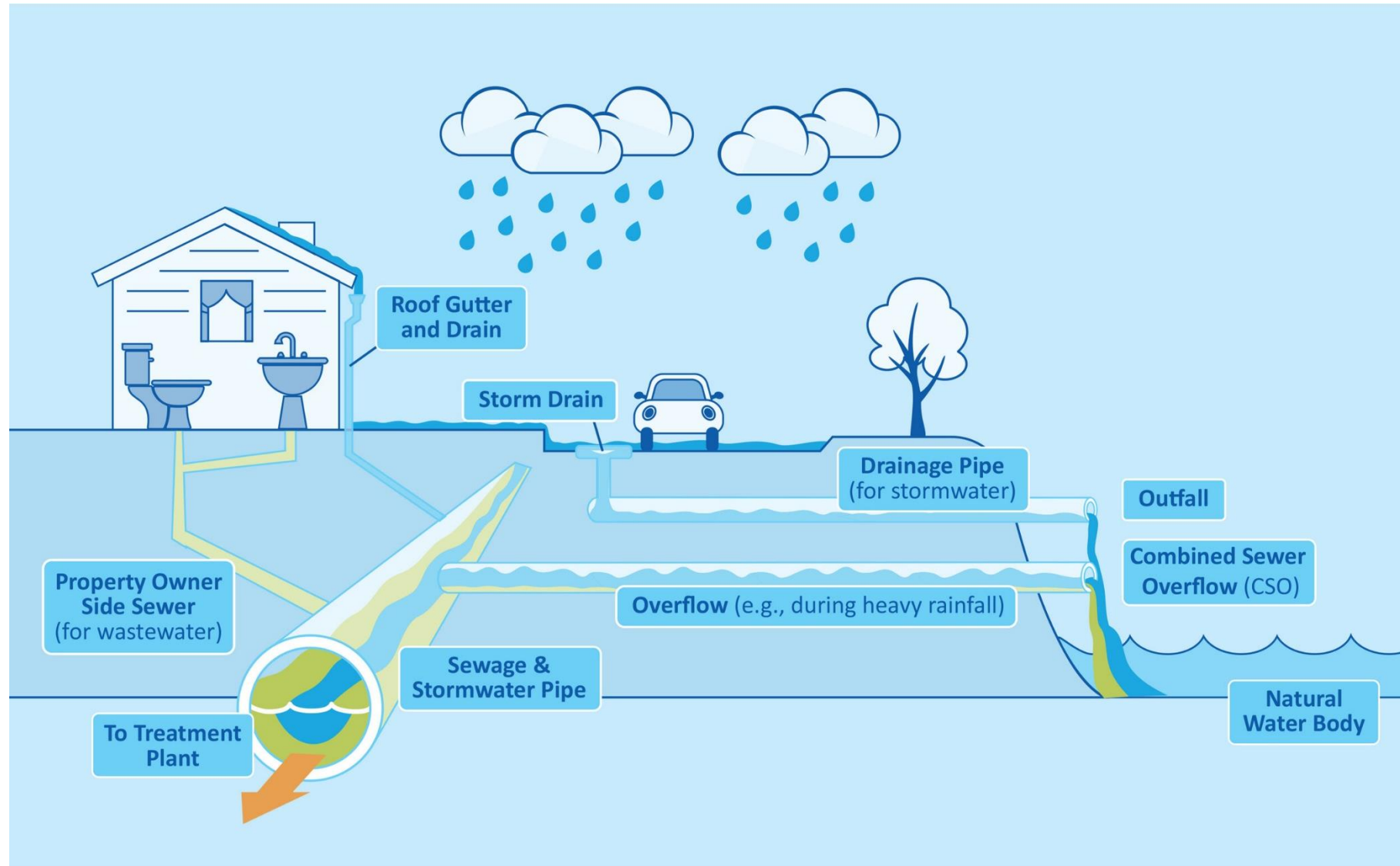
Combined Sewer System



Combined Sewer System

- Wide/ large sewer required as it carries large volume of sewage (sanitary+storm).
- Larger sewers are easy to clean. One set of sewer required, which reduces cost.
- Increased load on treatment plant. Storm water is polluted unnecessarily.
- Heavy rains may cause overflow.
- During dry season, low flow compared to sewer size may cause difficulties.

Partially Separated/ Partially Combined Sewer System



Partially Separated/ Partially Combined Sewer System

- This system is a compromise between separate and combined system, ensuring the advantages of both systems.
- In this system, sewage and storm water of buildings are carried by one set of sewers, while the storm water from roads, pavements are carried by other sewers (usually open drains)
- Size of sewers is not very large.
- Flow velocity low during dry season, and increased load on treatment plant during wet season.

THANK YOU!

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