Using Green Infrastructure for Stormwater Management

Part 1: Dialogue

Sophia (Landscape Architect): We need to incorporate **green infrastructure** into this project to help with stormwater management. Have you considered using **permeable pavement** for the walkways?

Ethan (Colleague): That's a great idea. It will allow rainwater to filter through instead of creating runoff. We could also add **bioswales** along the pathways to help direct excess water.

Sophia: I like that approach. **Rain gardens** could also be useful in lower areas to absorb and filter runoff before it reaches the drainage system.

Ethan: Definitely. And for the buildings, we should look into **green roofs**. They'll help slow down stormwater and reduce the heat island effect.

Sophia: Agreed. Finally, we need a **stormwater retention pond** to temporarily hold excess rainwater. That will prevent flooding and allow gradual water absorption.

Ethan: Good call. We should also think about plant selection—native species work best for **bioswales** and **rain gardens** because they handle varying water levels.

Sophia: Yes, and they require less maintenance. Do you think we need additional drainage pipes, or will these solutions be enough?

Ethan: With proper grading, we should be fine. The combination of **permeable pavement**, **bioswales**, and a **retention pond** will distribute the water effectively.

Sophia: Sounds like a solid plan. I'll add these solutions to the site proposal and prepare visuals for the client.

Ethan: Perfect. Let's finalize the details and make sure we comply with local stormwater management regulations.

Part 2: Comprehension Questions

1. What is the purpose of **permeable pavement**?
   (A) To prevent vehicles from slipping
   (B) To allow water to pass through and reduce runoff
   (C) To create a solid walking surface
   (D) To support heavy construction equipment
2. How do **bioswales** help in stormwater management?
   (A) They store large amounts of water like a pond
   (B) They create a barrier to keep water from moving
   (C) They direct and filter runoff before it reaches drains
   (D) They increase soil erosion in dry areas
3. What is the role of a **stormwater retention pond**?
   (A) To increase soil drainage speed
   (B) To supply drinking water for communities
   (C) To hold water permanently like a reservoir
   (D) To temporarily store excess rainwater and prevent flooding
4. Why are **green roofs** useful in stormwater management?
   (A) They increase air circulation inside buildings
   (B) They provide insulation and reduce energy costs
   (C) They prevent rain from reaching the ground entirely
   (D) They direct rainwater into underground pipes

Part 3: Vocabulary with Definitions

- **Permeable pavement (透水性舗装)** – A surface material that allows water to pass through, reducing runoff and improving drainage.
- **Bioswales (バイオスウェール)** – Shallow, landscaped channels that collect, filter, and direct stormwater runoff.

- **Rain gardens (レインガーデン)** – Planted depressions that absorb and filter rainwater runoff from impervious surfaces.
- **Green roofs (グリーンルーフ)** – Roof surfaces covered with vegetation that absorb rainwater and improve insulation.
- **Stormwater retention pond (雨水貯留池)** – A pond designed to temporarily hold excess rainwater and slowly release it to prevent flooding.

Part 4: Answer Key

1. **What is the purpose of permeable pavement?**
   ✅ (B) To allow water to pass through and reduce runoff
2. **How do bioswales help in stormwater management?**
   ✅ (C) They direct and filter runoff before it reaches drains
3. **What is the role of a stormwater retention pond?**
   ✅ (D) To temporarily store excess rainwater and prevent flooding
4. **Why are green roofs useful in stormwater management?**
   ✅ (B) They provide insulation and reduce energy costs