

## Chapter 2: Creating paved areas in your garden

### Topics to be covered in this chapter

- I. Why create paved areas?
- II. Paving materials that are readily available in Jordan
- III. Joints between tiles
- IV. General considerations

### Definitions

**Hardscaping:** the inorganic components of the landscape design (paved areas).

**Softscaping:** the planted areas of the landscape.

**Water harvesting:** capturing rainfall to store it for irrigation and for different domestic uses.

### Introduction

Whenever possible, consider using paved areas instead of the high water-consuming lawns. Paved areas provide almost maintenance-free surfaces that can serve various utilitarian and recreational purposes. A wide variety of paving materials that come in a wide range of prices and that provide a diversity of effects, is available in the market. By carefully selecting and applying these materials, you will obtain attractive and functional solutions for your landscaped area.

### I. Why create paved areas?

- Paved areas provide relatively maintenance-free surfaces that consume almost no water.
- The combination of different colors and textures of softscaped and hardscaped surfaces can provide for a very powerful visual effect.
- Hard, dry, non-slip surfaces serve various utilitarian and recreational purposes such as sitting, playing, or parking of vehicles.
- Hardscaped surfaces function as an integral part of a water harvesting system by collecting and channeling rainwater.
- Certain landscape design ideas can be emphasized through hardscaping such as suggesting direction, indicating focal points, or drawing attention to changes in level.



**Fig. 2.1: Combining hardscaped areas with softscaped edges gives the garden a lush look without having to use too many plants.**



**Fig. 2.2: Hardscaped surfaces serve to collect and channel rainwater as part of a water harvesting system.**

**Ask the following questions**

What is the budget I have for creating the paved area?

What are the available materials in the market that fit my budget?

Do the materials I chose help achieve the overall effect I want in my landscaped area?

**Gardener's checklist**

Paving material characteristics

- Color
- Texture
- Safety
- Light reflectivity
- Accumulation of dust
- Water drainage
- Composition of the bedding that supports the paving surface

**II. Paving materials that are readily available in Jordan**

**1. Concrete:**

Availability: Easily available since it is manufactured locally.

Cost: Moderately priced.

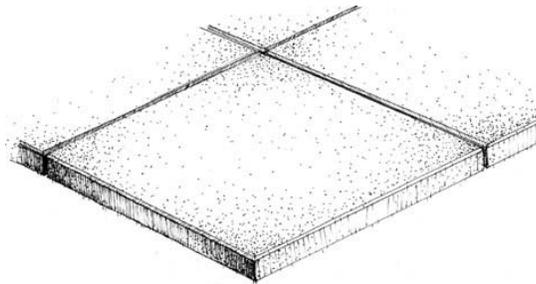
Use:

- Available in a wide range of possibilities in terms of thickness, shape, and color.
- Provides a highly durable surface.
- Can be made to resemble other materials such as stone or brick.

Types of concrete paving systems differ according to the methods of casting:

a. Pre-cast concrete tiles:

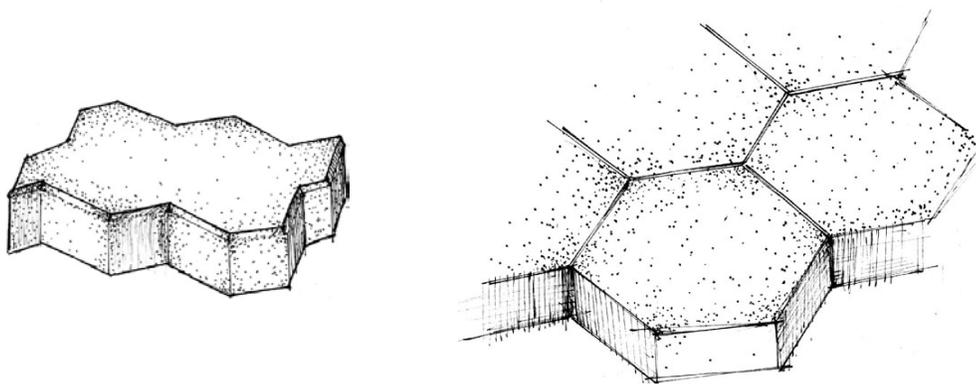
- Available in different shapes, textures, and colors.
- Provide a variety of tile textures that result from adding aggregates of different sizes to the concrete mix.



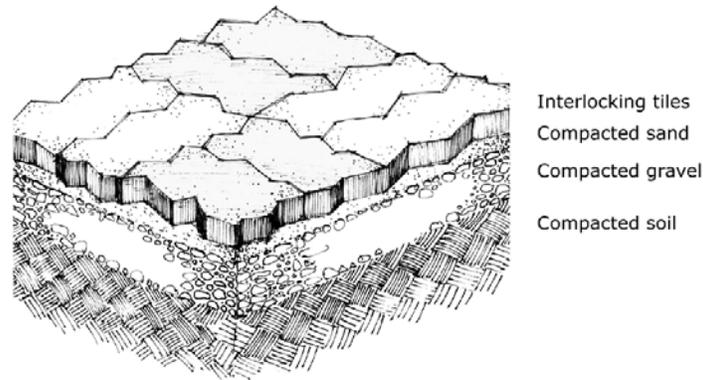
**Fig. 2.3: Pre-cast concrete tiles.**

b. Interlocking concrete tiles:

- Available in different shapes and colors.
- The interlocking nature of these tiles strongly binds the paving units, thus preventing any lateral movement amongst them.
- Because mortar is not required to bond paving units together, some of the excess water seeps through the open joints to the soil below, thus reducing water-ponding problems.
- Because of the strong bonding created between the individual paving units, and the thickness of the units, interlocking paving systems do not require a concrete bedding and can be placed directly on a compacted layer of sand.
- Tiles easily can be removed and reused again in the same location (if maintenance work is to be carried out), or can be placed in a different area.



**Fig. 2.4: Interlocking concrete tiles.**



**Fig. 2.5: Section showing composition of the bedding that supports the interlocking tile paving surface.**

c. Cast-in-place concrete pavements:

- Available in various patterns, colors, and textures, and can be used to pave areas of just about any shape.
- Require the placement of contraction joints at six-meter intervals to avoid the cracking of the pavement.



**Fig. 2.6: Cast-in-place concrete pavements.**

**2. Stone:**

Availability: Jordan has a wide variety of quarries that produce very high-quality stones.

Cost: Comes in a wide range of prices. Initial costs for materials and installation are relatively high, but maintenance costs are very low.

Use:

- Allows for a wide diversity in terms of thickness, texture, shape, and color. Stone pieces may consist of geometrically cut pieces - usually square or rectangle - or of irregular pieces.
- Has a long life span and requires minimal maintenance.
- Irregular stone paving tiles usually consist of leftover pieces resulting from the stone cutting process, and can be obtained at relatively low prices.



**Fig. 2.7: Stone paving.**

#### **Stone weathering**

Natural weathering works unevenly on stone surfaces and tends to produce attractive effects. Stone also can be weathered artificially, usually through applying acid to the stone surface. Other artificial weathering techniques include breaking the edges of the stone paving units, or sand blasting the stone surface. These techniques can be used in addition to, or, in place of, applying acid.

### **3. Ceramic Tiles:**

**Availability:** Both locally produced and imported ceramic tiles are available in the market. Most of the imported tiles available in Jordan are manufactured in the United Arab Emirates, Italy, or Spain.

**Cost:** Available in a wide range of prices.

**Use:**

- Provide for a wide diversity in terms of texture, color, and size of units.
- If using ceramic tiles, it is advised to buy extra quantities and to store them, in case there is a need to replace any of the original tiles. The continuous availability of a given type of ceramic tiles is not guaranteed.



**Fig. 2.8: Ceramic tiles.**

#### **4. Brick:**

Availability: Local and imported bricks are available in the market. Most of the imported bricks available in Jordan are manufactured in the United Kingdom.

Cost: Both locally produced and imported bricks are relatively expensive.

Use:

- Offers considerable flexibility in layout because of the small size of the individual brick units.
- If using bricks, it is advised to buy extra quantities and to store them, in case there is a need to replace any of the original bricks. The continuous availability of a given type of brick is not guaranteed.



**Fig. 2.9: Brick paving.**

#### **5. Mosaics:**

Availability: Custom-made locally according to the required design.

Cost: Relatively expensive, and therefore it is advised to limit the use of mosaic surfaces to very small areas.

Use:

- Allows for a wide diversity in terms of color, shape, and size.

### **Jordan overview**

Jordan contains some extremely impressive historical mosaic panels. These are found in historical sites throughout the country, including Madaba, Jerash, and Pella.



**Fig. 2.10: The sixth-century AD Sweifieh floor mosaic in Amman.**

### **6. Inorganic loose materials:**

**Availability:** Available in a wide range of materials and sizes. Inorganic loose materials include decomposed gravel, river run rocks, crushed terra cotta, or pumice stone (locally known as *touf*).

**Cost:** Relatively inexpensive in terms of material and installation costs.

**Use:**

- Life span differs from one material to another and depends on the frequency and type of use for the covered areas. Most surfaces need replenishment every few years.
- Loose materials may be laid directly on the soil, or on a compacted layer of sand. A netting material may be laid underneath to keep particles from becoming embedded in the soil.
- Need to be contained within clearly defined physical edges to restrain the horizontal movement of individual pieces.



**Fig. 2.11: Crushed stone ground cover combined with a Lavender (*Lavandula angustifolia*) border. Inorganic loose materials can be easily worked into curving shapes that naturally complement adjacent planting materials.**

#### **Jordan overview**

In Jordan, while ten square meters of lawn may need 80 cubic meters of water annually, the same area of paving material may collect up to 4.75 cubic meters of water during the same period, depending on the location of the site within the country. This means that at least 50 JD worth of water could be saved annually for every ten square meters of paving used instead of lawn.

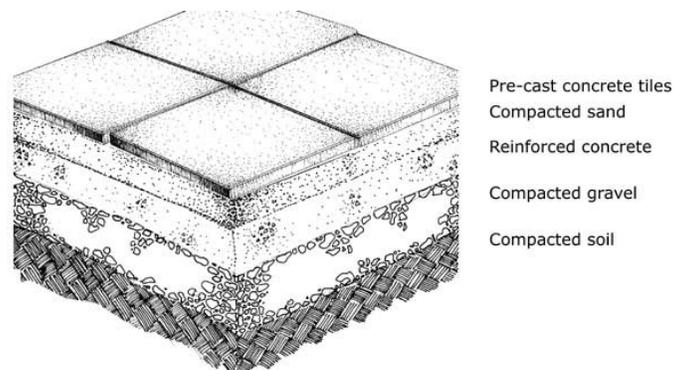
### **III. Joints between tiles**

The manner in which the joints between individual paving units are treated greatly influences the character of paved areas. For best results, consider the following tips:

- The joints between individual tiles can be used to provide effective touches that articulate outdoor paved surfaces. Mortar of a different color than the individual paving units, and also wide mortar joints, may be used to emphasize the individual units. Also, soil may be placed between the tiles instead of mortar, and can be planted with grass to create the pleasant effect of paved areas articulated with planted strips.
- Joints can be almost completely done away with by using unfilled, tight joints that provide the effect of a single continuous surface. However, such a treatment is only possible with units of regular size and shape.
- Mortar should be brushed dry into the joints and then watered. This method reduces the risk of having the mortar stain the paving tiles.

#### IV. General considerations

- The composition of the bedding that supports the paving surface is as important as the paving material itself. The choice of bedding depends on many factors such as the type of soil originally located on the site, and the nature of the use intended for the paved area. Most paving materials require a sub-layer of concrete bedding that is placed over a compacted layer of sand.
- Make sure that the paved area slopes gently away from adjacent structures, and towards planted areas or a water cistern. This will prevent drainage problems and will save water for the dry season. A slope of 1.5 - 2% is suggested, and steeper slopes can be used, if the surface is not to be used for utilitarian purposes, especially for seating. When using highly textured paving materials such as pre-cast aggregate concrete tiles, a minimum slope of 3% is recommended.
- When mixing different paving materials, consider using ones with similar thickness, so as to unify the bedding thickness and to simplify the installation process.
- Keep in mind that surfaces paved with highly textured paving materials, although aesthetically attractive, cannot comfortably accommodate many uses such as walking, running, or bicycle riding.
- The choice of color for paved surfaces is a very important design decision. Colors add interest to overcast areas that get limited sunshine during the winter months. On the other hand, light colored materials cause glare in summer.
- Keep the outline of paved areas simple, to minimize costs. Complexly shaped paved areas require too much cutting of individual units, thus considerably raising costs.
- Although paved areas require limited maintenance, it is advised to carry out certain maintenance activities on a regular basis. These include cleaning and sealing joints, repairing broken segments or settled areas, and sweeping surfaces to remove accumulated particles and dust.



**Fig. 2.12: Section showing composition of the bedding that supports the paving surface.**

**Hardscaping suppliers:**

For a list of suppliers of paving materials in Jordan, see the Suppliers list in the Water Conserving Landscapes section of the CSBE web site (<http://www.csbe.org>).