

# ***SPORTS*** ***FACILITIES*** ***OVERVIEW***

*Presented By*



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# 1 Surface Designs

This chapter describes the different surface finishes (turf, gravel, sand, concrete or asphalt) to select from. Which surface is best suited for a particular site depends on which sports will be played there, the climate and soil conditions, and the availability of material and funds.

## 1.1. CHOOSING THE RIGHT SURFACE

When choosing the surface, there is no general rule that can be applied: each surface has advantages and disadvantages. Above all, the sports code, climate, and soil type

needs to be considered. These are the options you can choose from. The details of each surface and type are out-laid in the following chapters.

SURFACE TYPE	SPORTS GROUNDS	SOIL TYPE	RAINFALL/WIND	TEMPERATURE
<b>Turf Type 1</b>	Football, Handball	All soil types	Average and high rainfall area with low evaporation rate	Low temperature and average humidity areas
<b>Turf Type 2</b>	Football, Handball	All soil types	Low and average rainfall area with relatively high evaporation rate	High temperature and low humidity areas
<b>Gravel Type 1</b>	Football, Handball, Volleyball, Netball	Expansive and non-uniform soil strata and soil type	Average and high rainfall areas with low evaporation rate	All temperature and low humidity areas
<b>Gravel Type 2</b>	Football, Handball, Volleyball, Netball	Non-expansive and uniformly low graded natural soil	Low rainfall areas with high evaporation rate	All temperature and low humidity areas





<b>Sand Type 1</b>	Football, Handball	Sand and sandy soil natural ground area with coarse particles (> 6 mm)	Average and high rainfall areas and low wind pressure	All except high temperature areas
<b>Sand Type 2</b>	Football, Handball	Sand and sandy soil natural ground area with fine particles (< 6 mm)	Very low rainfall areas and average wind pressure	
<b>Sand Type 3</b>	Beach Volleyball	All soil types	All climatic conditions	All temperature areas
<b>Concrete Type 1</b>	Small size football fields, Basketball, Handball, Netball, Multipurpose	All soil types, especially for expansive soil	All climatic conditions	All temperature areas
<b>Concrete Type 2</b>	Small size football fields, Basketball, Handball, Netball, Multipurpose	All soil types, especially for non-expansive soils, sandy and rocky areas	All climatic conditions	All temperature areas
<b>Asphalt</b>	Small size football fields, Basketball, Volleyball, Handball, Netball, Multipurpose	All soil types	All climatic conditions	All temperature areas





Turf sports ground at a Sports Centre.

## 1.2. TURF

Turf sports grounds are made from planted natural grass, convenient for playing football or handball. They are comfortable to play on and can be used during all seasons. When well taken care of, turf grounds tend to be more resistant to erosion than sand or gravel. However, both

construction and maintenance are expensive – grass needs, among other things, irrigation, regular mowing and fertilisation. As grass is sensitive to climate conditions, turf grounds are only sustainable in high and moderate rainfall areas.

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### APPLICABLE FOR



Football fields



Handball courts

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### MINIMUM MAINTENANCE & REPAIR REQUIREMENTS

- Regular mowing works
- Regular watering
- Grass cutting machines
- Natural fertiliser
- Annual grass restoration works
- Planned field utilisation
- Organised maintenance team



## SURFACE AND LINE MARKINGS

A turf sports ground requires a thorough preparation of the ground and the appropriate choice of layers – according to soil and climatic conditions – to ensure sustainable growth of the grass.

For line markings, calcium carbonate (white gypsum) can be used. Please make sure to **not use any herbicide product** for line marking as it may put players and the environment at risk.

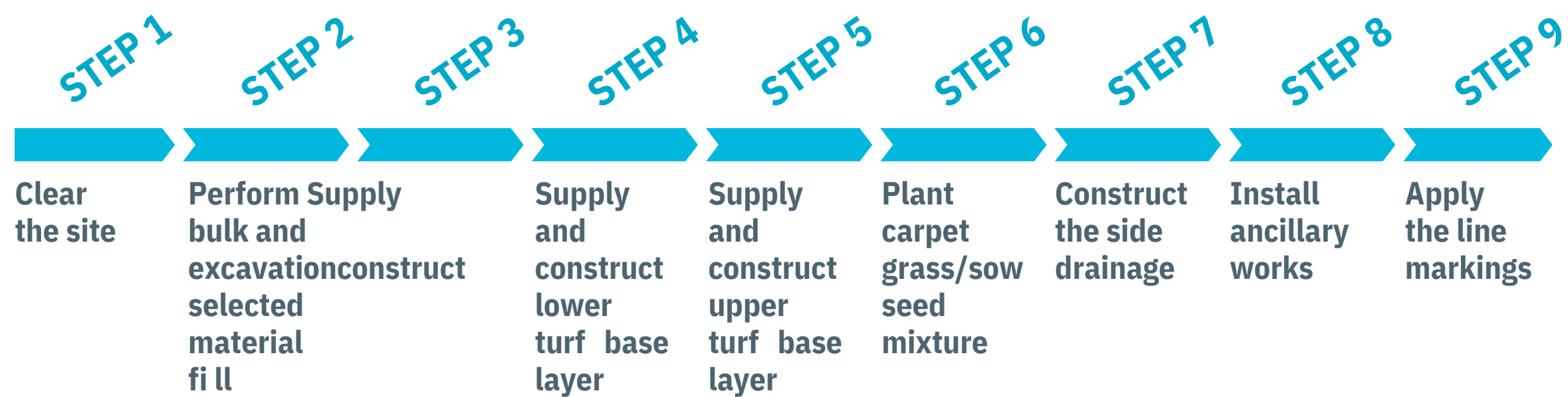
### TIP

Test the load bearing capacity of the in situ soil. The deformation should be at least  $E_{v2} \geq 45 \text{ MN/m}^2$  or more. If the deformation modulus is less than  $45 \text{ MN/m}^2$ , soil improving measures will be required.

➔ Make sure to consider a slope of 0.1–0.5%, depending on the amount of rainfall in the region.

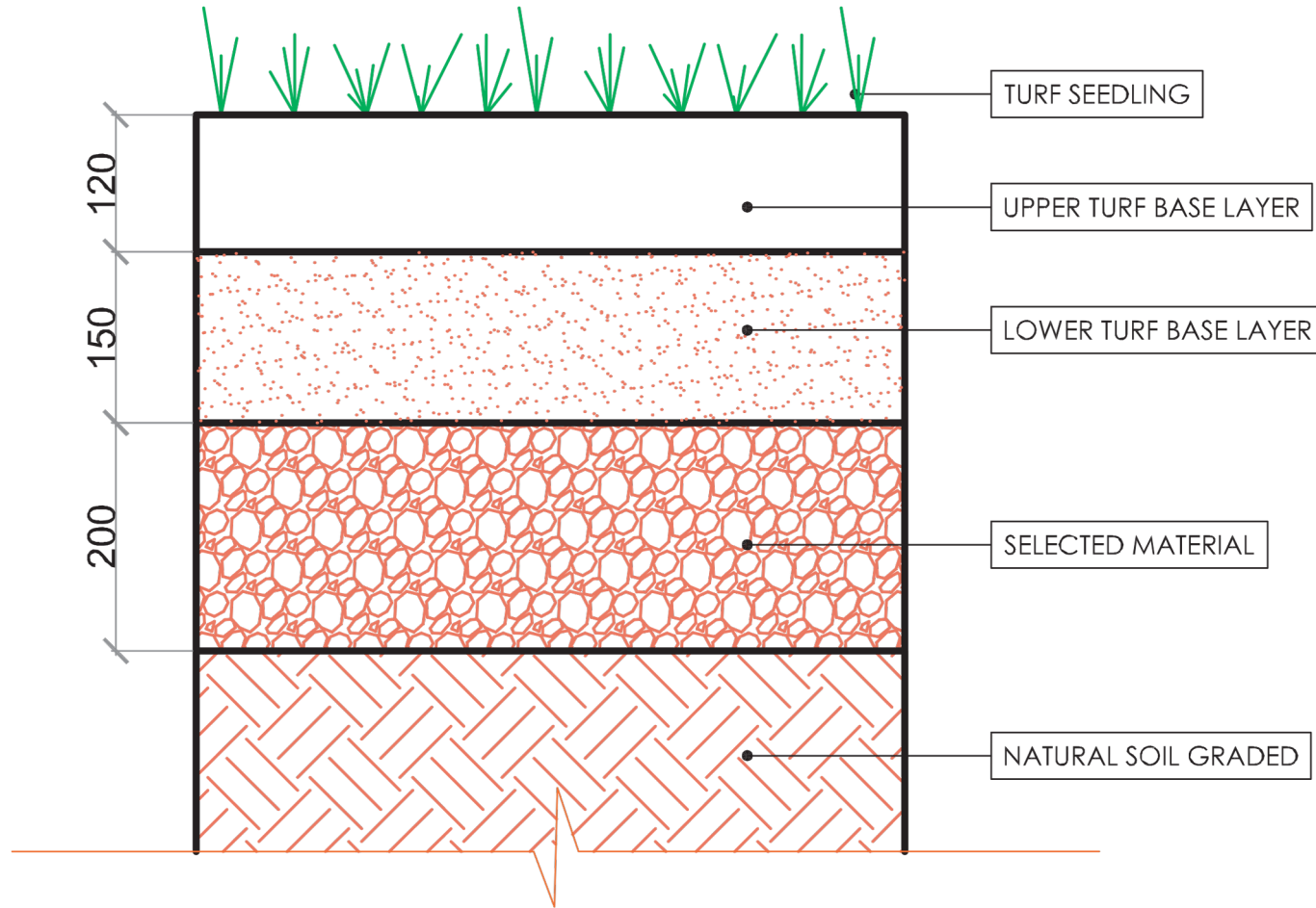
## TO BUILD A TURF SPORTS GROUND

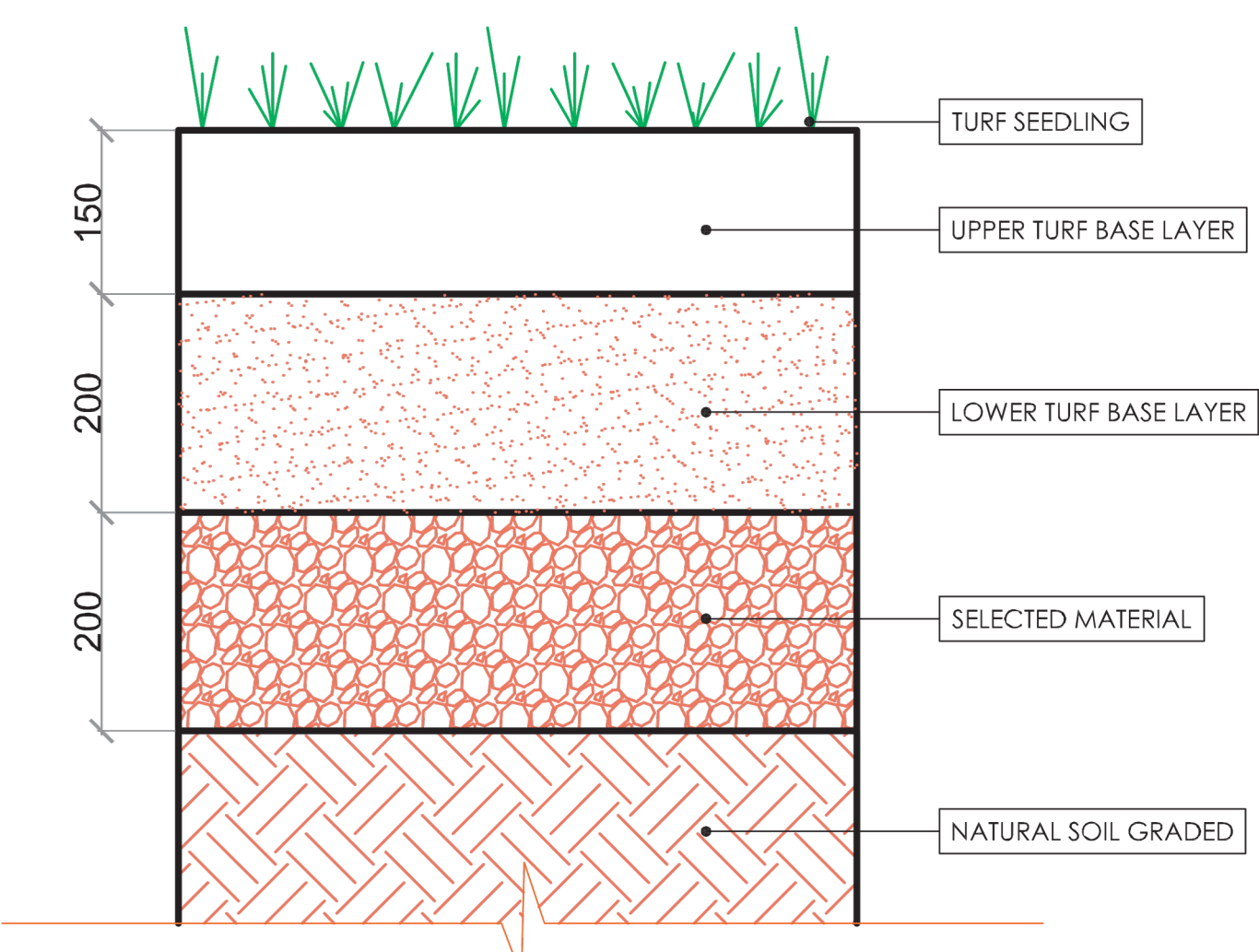
### THE CONTRACTOR NEEDS TO13



## SECTIONS

2 types of turf surface have proven to be suitable, according to the prevailing climatic conditions: type 1 is suitable for environments with expansive soil and high rainfall; type 2 is for very expansive soil with average to high rainfall. To account for these differences, the thickness of the layers for the two turf types must be adjusted:

TURF TYPE 1	SOIL, RAINFALL AND CLIMATE CONDITIONS
	<ul style="list-style-type: none"> <li>• All soil types</li> <li>• Average and high rainfall area with low evaporation rate</li> <li>• Low temperature and average humidity areas</li> </ul>

TURF TYPE 2	SOIL, RAINFALL AND CLIMATE CONDITIONS
	<ul style="list-style-type: none"> <li>• All soil types</li> <li>• Low and average rainfall area with relatively high evaporation rate (lower turf layer retains more moisture)</li> <li>• High temperature and low humidity areas</li> </ul>





Gravel sports ground at Kakuma refugee camp, Kenya .

## 1.3 GRAVEL

Gravel sports grounds are made from natural binding soil, convenient for playing football, handball, volleyball and netball. They are suitable for all dry areas with a high evaporation rate, sandy soil, and for all temperature conditions. They are particularly suitable for intensive sports

field utilisation. On the other hand, gravel is quite susceptible to erosion by water and wind, and thus needs regular maintenance. If the necessary building material is available locally, the construction of gravel sports grounds is relatively cheap.

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### APPLICABLE FOR



Football fields



Handball courts



Volleyball courts



Netball courts

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### MINIMUM MAINTENANCE & CARE REQUIREMENTS

- Seasonal levelling and compacting works

## SURFACE AND LINE MARKINGS

A gravel sports ground requires a solid foundation. If the existing soil is expansive (e.g. black cotton soil), an additional base layer from compacted material has to be provided.

Use local material for the surface layer, unless it does not conform to the finishing and compaction requirements.

For line markings, calcium carbonate (white gypsum) can be used. Please make sure to **not use any herbicide product** for line marking as it may put players and the environment at risk.

**TIP**

If no suitable material can be found locally, consider whether it is still cost effective to purchase and transport material from distant sources.

➔ **Make sure to consider a slope of 0.1–0.5%, depending on the amount of rainfall in the region.**

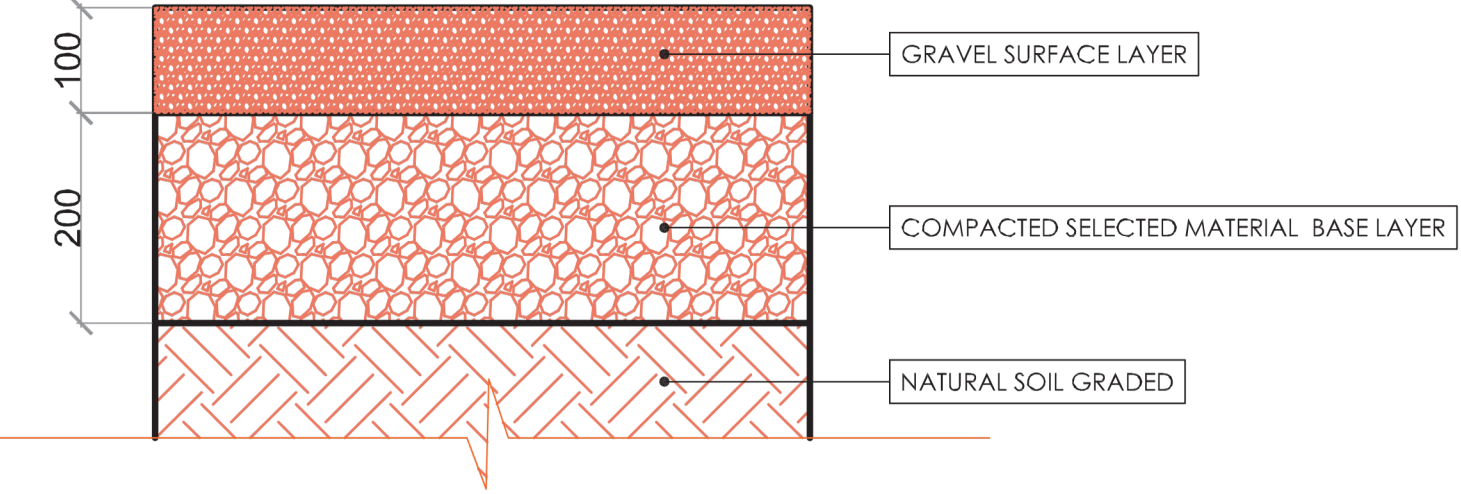


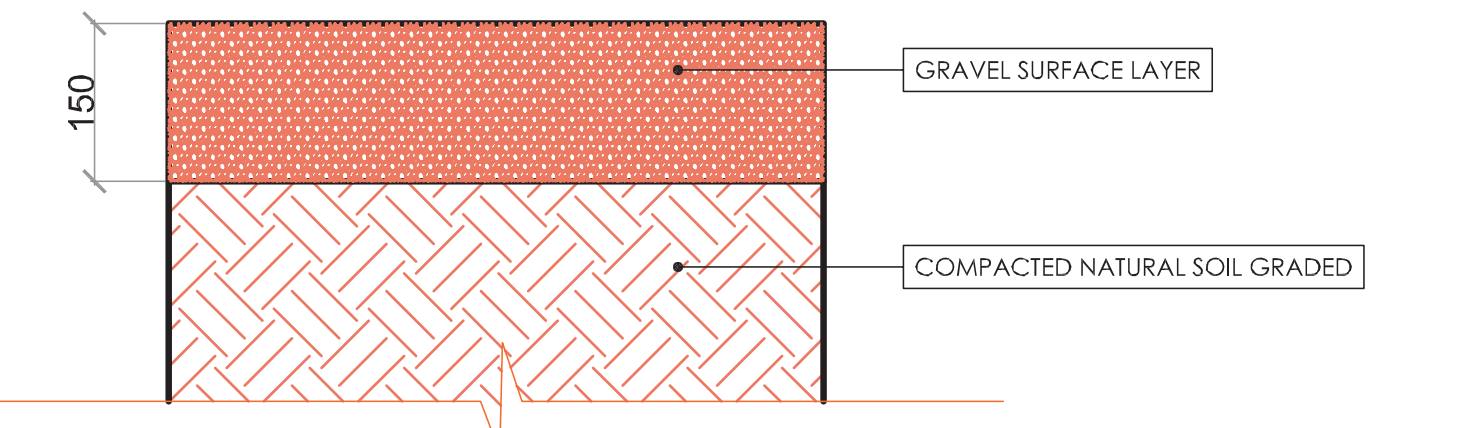
## SECTIONS

There are two different types of gravel surface designs: type 1 is suitable for areas with expansive and non-uniform soil formations, type 2 for non-expansive and uniformly low graded natural soil areas.

Detailed Bills of Quantity can be provided upon request. Applicable for gravel type 1 only.



GRAVEL TYPE 1	SOIL, RAINFALL AND CLIMATE CONDITIONS
	<ul style="list-style-type: none"> <li>• Expansive and non-uniform soil strata and soil type</li> </ul>
	<ul style="list-style-type: none"> <li>• Average and high rainfall areas with low evaporation rate</li> </ul>
	<ul style="list-style-type: none"> <li>• All temperature and low humidity areas</li> </ul>

GRAVEL TYPE 2	SOIL, RAINFALL AND CLIMATE CONDITIONS
	<ul style="list-style-type: none"> <li>• Non-expansive and uniformly low graded natural soil</li> </ul>
	<ul style="list-style-type: none"> <li>• Low rainfall areas with high evaporation rate</li> </ul>
	<ul style="list-style-type: none"> <li>• All temperature and low humidity areas</li> </ul>

**TIP** In general, gravel surfaces are significantly less expensive than concrete or turf surfaces. However, if gravel material needs to be imported, the difference in price will be much lower. It is best to do a cost analysis between surface types of concrete, turf and gravel before deciding on the surface finish.



Netball Court at a Vocational Training Centre.

## 1.5 CONCRETE

A concrete sports ground surface is made from a mixture of sand, cement, building stone and water. It is best for basketball and multipurpose courts, but also convenient for playing handball, volleyball, netball and small size court-yard football games. They can be built on all soil types and in all climatic conditions. Compared to other surfaces, con-

crete sports grounds – if constructed properly – need relatively little maintenance. They are especially suitable for intensive utilisation. On the other hand, construction costs are high, especially in remote areas with limited access to materials. Therefore it is important that the construction requirements and specifications are strictly adhered to.

### PLEASE NOTE

If constructed properly, concrete sports grounds are very robust and resilient. However, if they do get seriously damaged, it can be extremely difficult to repair them. That's why it is crucial to meet the required construction standards and to maintain them regularly in order to keep small degradations from turning into major problems.

### APPLICABLE FOR



Football fields



Handball courts



Volleyball courts



Netball courts



Basketball courts



Multipurpose courts



## MINIMUM MAINTENANCE & REPAIR REQUIREMENTS

- Seasonal maintenance work

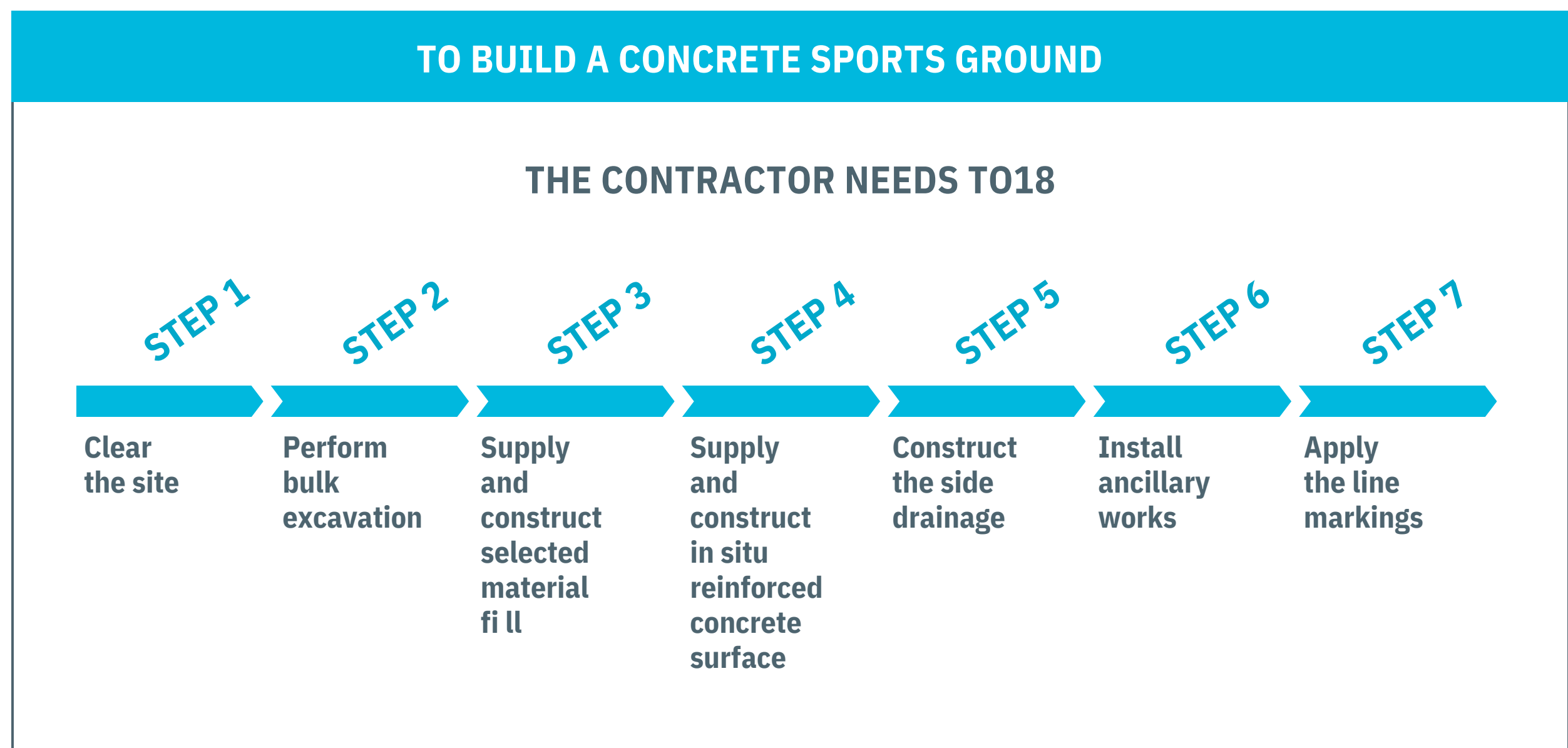
## SURFACE AND LINE MARKINGS

A concrete sports ground requires thorough preparation and construction. Do not forget the expansion joints! S4DA recommends a distance of 5 m between the joint cuttings. Line markings are painted on to the concrete surface using water based outdoor acrylic line paint according to the required colour specification.

### TIP

The surface itself can also be painted. However, S4DA advises against it: not only is it more expensive, but the paint degrades quickly, thus increasing maintenance costs significantly.

- ➔ **Make sure to consider a slope of 0.1–0.5 %, depending on the amount of rainfall in the region.**

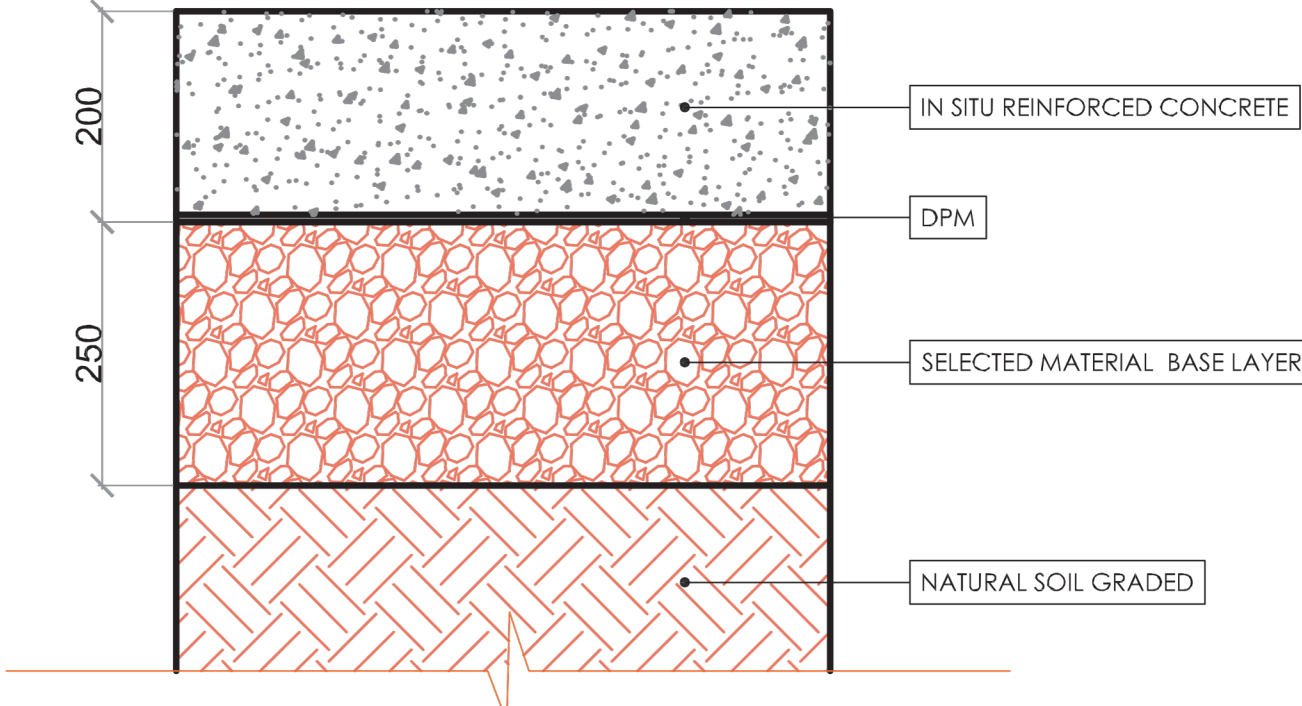


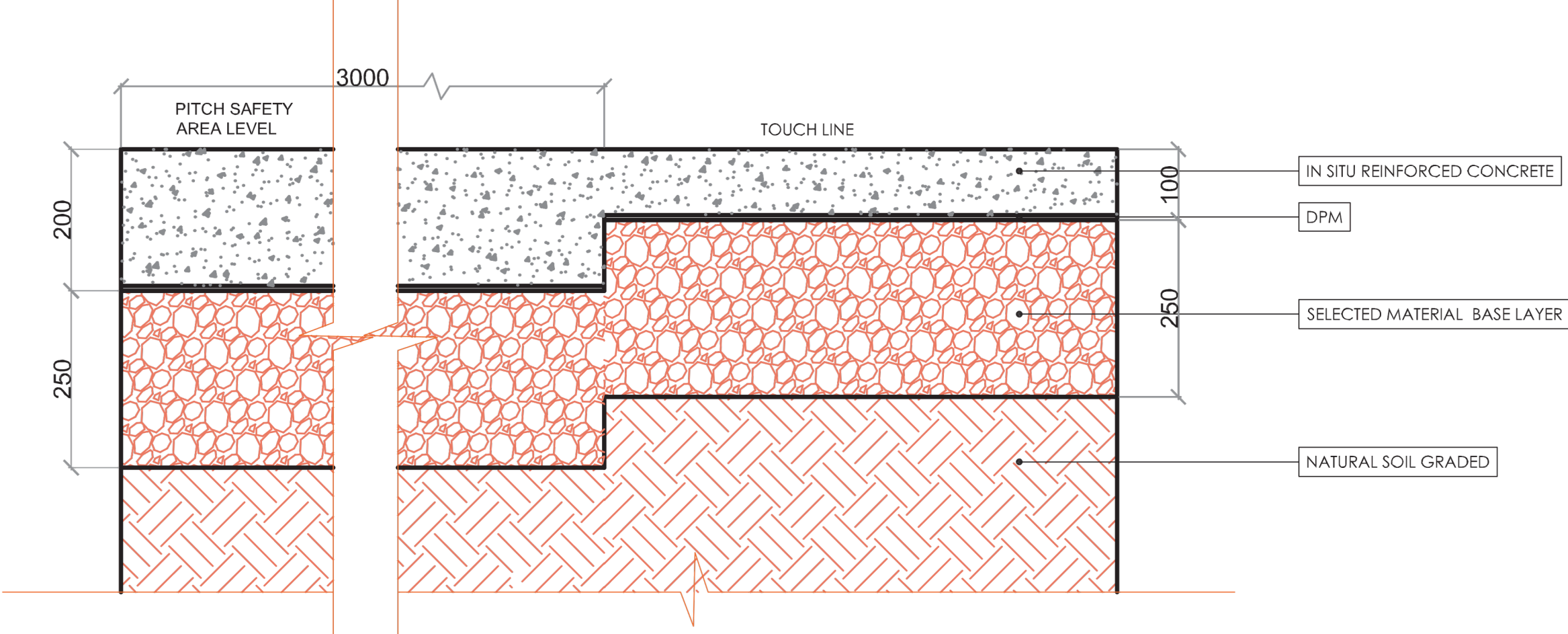
### TIP

S4DA suggests not painting the entire surface, only the line markings. Otherwise, you will increase the maintenance cost significantly: the colour may look nice at first, but it will not last long, and you will have to paint it over and over again.

## SECTIONS

There are two types of concrete surface designs. Type 1 is suitable for locations where the base soil strata is unstable or where it is difficult to determine its characteristics. Type 2 can only be built on stable soil strata such as sand or rocky locations.

CONCRETE TYPE 1	SOIL, RAINFALL AND CLIMATE CONDITIONS
	<ul style="list-style-type: none"> <li>• All soil types, especially for expansive soil</li> <li>• All climatic conditions</li> <li>• Slab-thickness: 200 mm</li> <li>• Expansion joint depth: 100 mm</li> <li>• Recommended distance between the joint cuttings: 5 m</li> </ul>

CONCRETE TYPE 2	
	
SOIL, RAINFALL AND CLIMATE CONDITIONS	
<ul style="list-style-type: none"> <li>• All soil types, especially for non-expansive soils, sandy and rocky areas</li> </ul>	<ul style="list-style-type: none"> <li>• Slab-thickness: 200 mm at the peripheral sides/100 mm in the middle</li> <li>• Good surface finish quality required</li> <li>• Expansion joint depth: <ul style="list-style-type: none"> <li>– 100 mm for 200 mm concrete thickness</li> <li>– 50 mm for 100 mm concrete thickness</li> </ul> </li> <li>• Recommended distance between the joint cuttings: 5 m</li> </ul>
<ul style="list-style-type: none"> <li>• All climatic conditions</li> </ul>	



Asphalt sports ground at a Refugee Service Centre,.

## 1.6 ASPHALT

Asphalt is a suitable surface for multipurpose courts and convenient for football, handball, volleyball, netball, or basketball. Asphalt surfaces can be built in all climatic and soil conditions, where high utilisation and various purposes are required (e.g. if the space is also used for public events such as school ceremonies). Asphalt is robust, easy

to maintain and simple to paint, yet usually cheaper and more adaptable than concrete. That is why it is a common construction material for sports grounds, especially if they are also used as schoolyards and for activities such as school events, ceremonies or community gathering places.

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### APPLICABLE FOR



Football fields



Handball courts



Volleyball courts



Netball courts



Basketball courts



Multipurpose courts



## MINIMUM MAINTENANCE & REPAIR REQUIREMENTS

- Seasonal maintenance work

## SURFACE AND LINE MARKINGS

An asphalt sports ground requires the removal of the top soil which has to be replaced with two layers of base material. Make sure they are well compacted as per specifications. The surface consists of a mixture of dark bitumen with sand or gravel, designed for surfacing works of roads, flooring, etc. For line markings, use water based outdoor acrylic line paint according to the required colour specification.

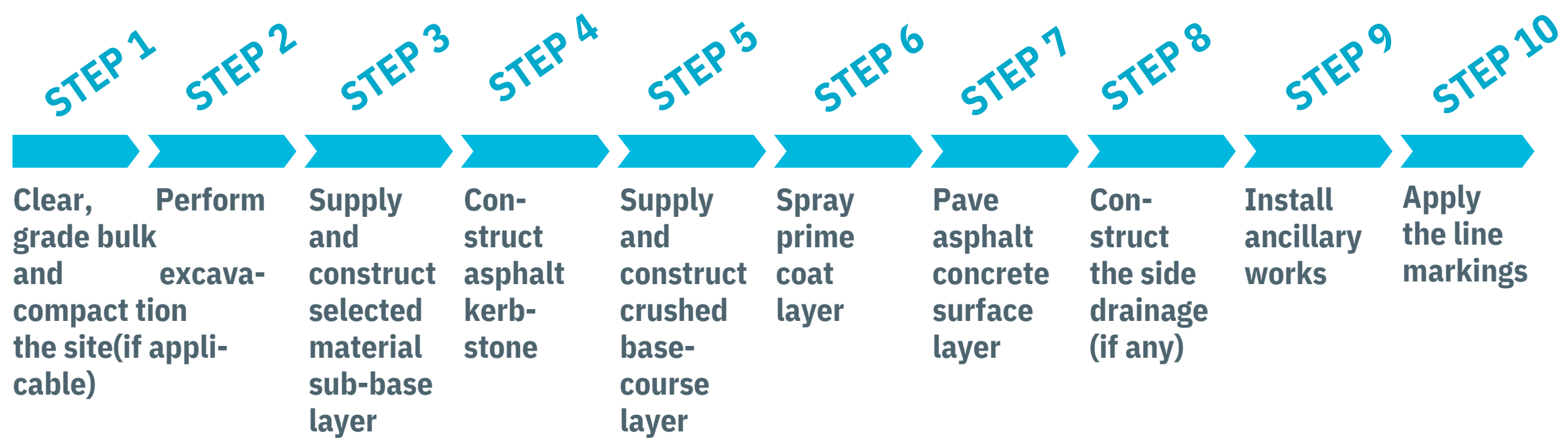
### TIP

The surface can also be painted. However, S4DA advises against it: not only is it more expensive, but the paint degrades quickly, thus increasing maintenance costs significantly.

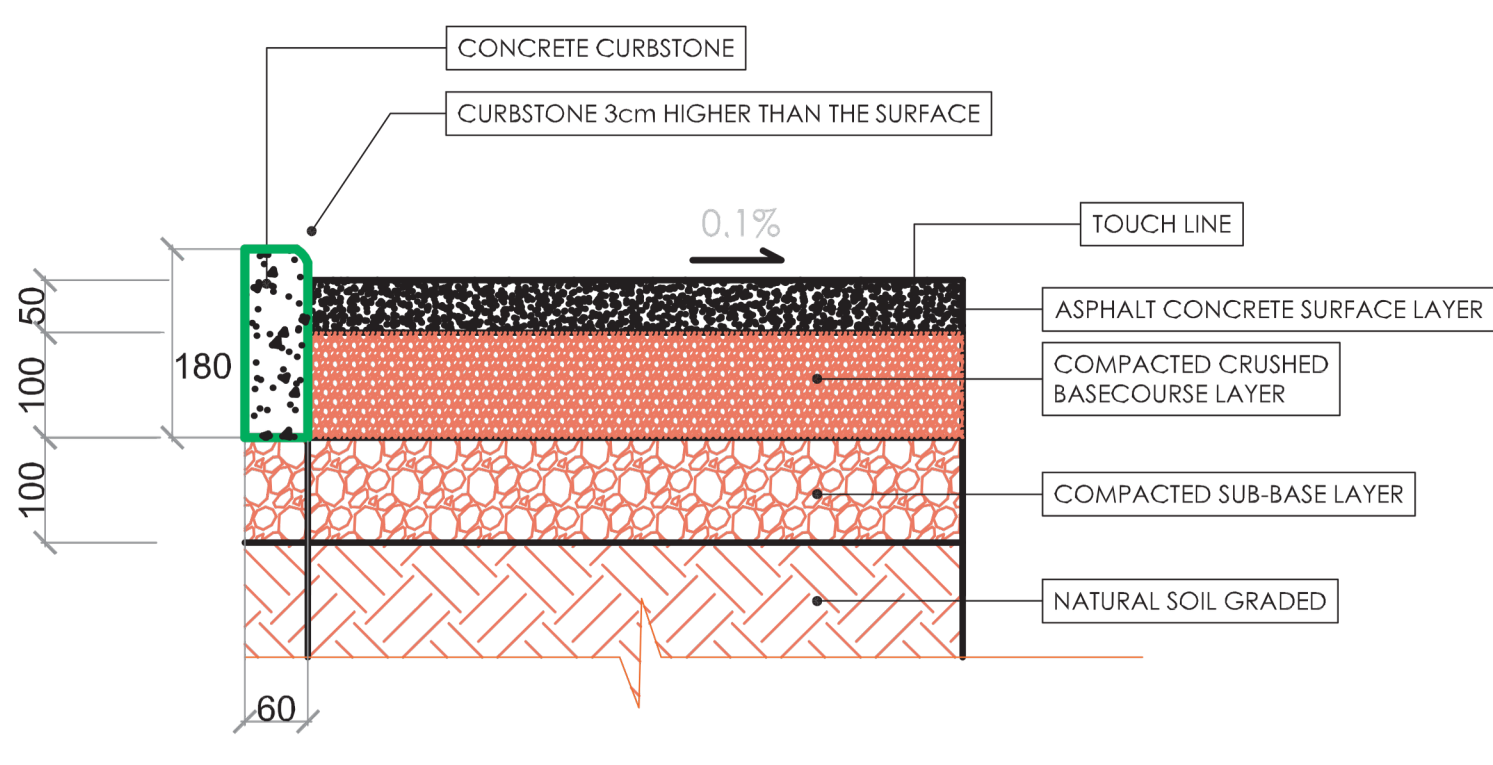
- ➔ **Make sure to consider a slope of 0.1–0.5%, depending on the amount of rainfall in the region.**

## TO BUILD AN ASPHALT SPORTS GROUND

### THE CONTRACTOR NEEDS TO19



## SECTION

ASPHALT	SOIL, RAINFALL AND CLIMATE CONDITIONS
	<ul style="list-style-type: none"> <li>• All soil types</li> <li>• All climatic conditions</li> <li>• Applicable for courtyard sports grounds. Mainly for schools</li> </ul>

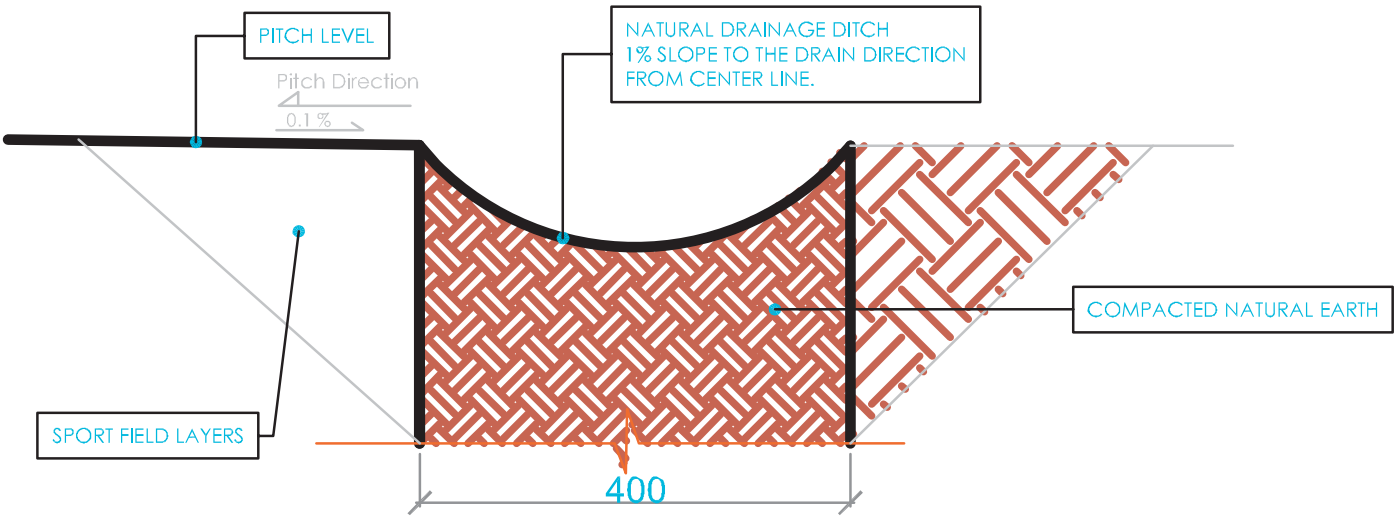
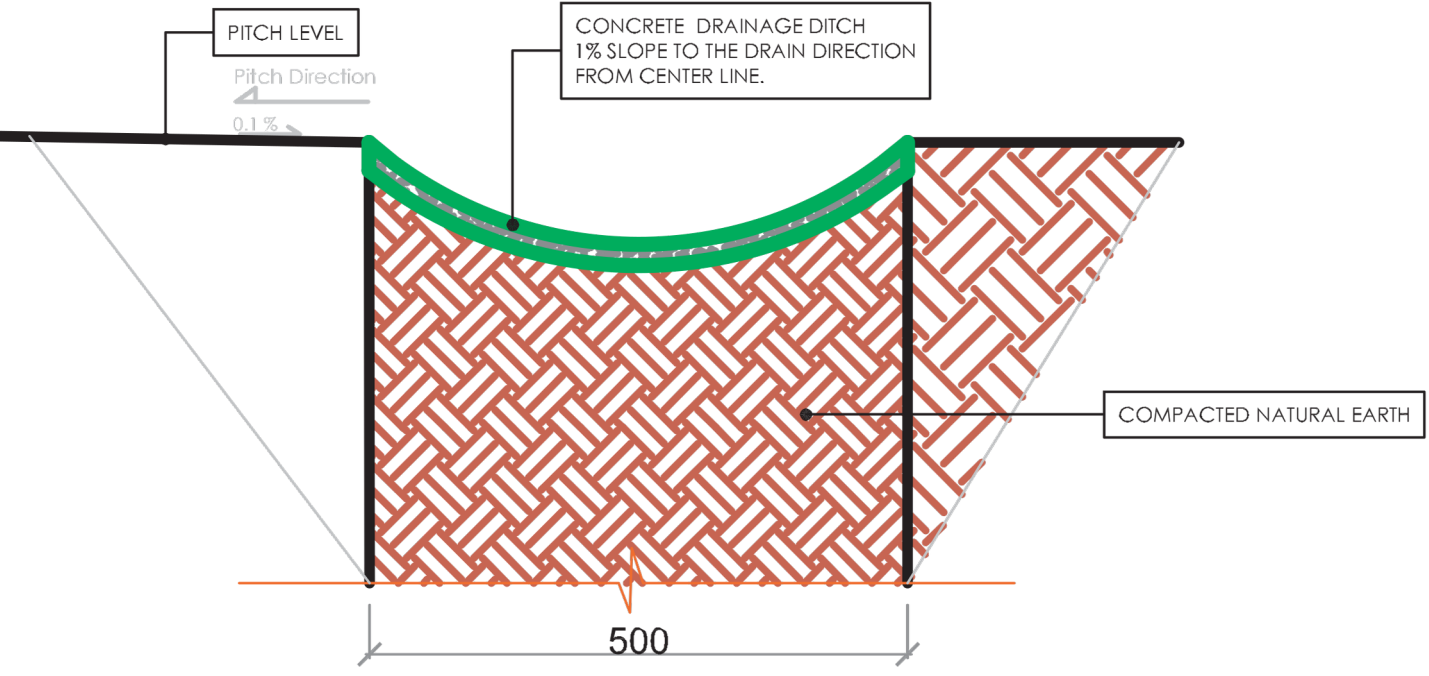


# 2 Complementary Elements

## 2.1 DRAINAGE SYSTEMS

Drainage systems protect a structure by removing excess water from a given location, thus ensuring long lasting usage. They are crucial for sport facilities.

Below you will find a series of the drainage systems to choose from. Check the rainfall situation in your area and consider which drainage type is most appropriate.

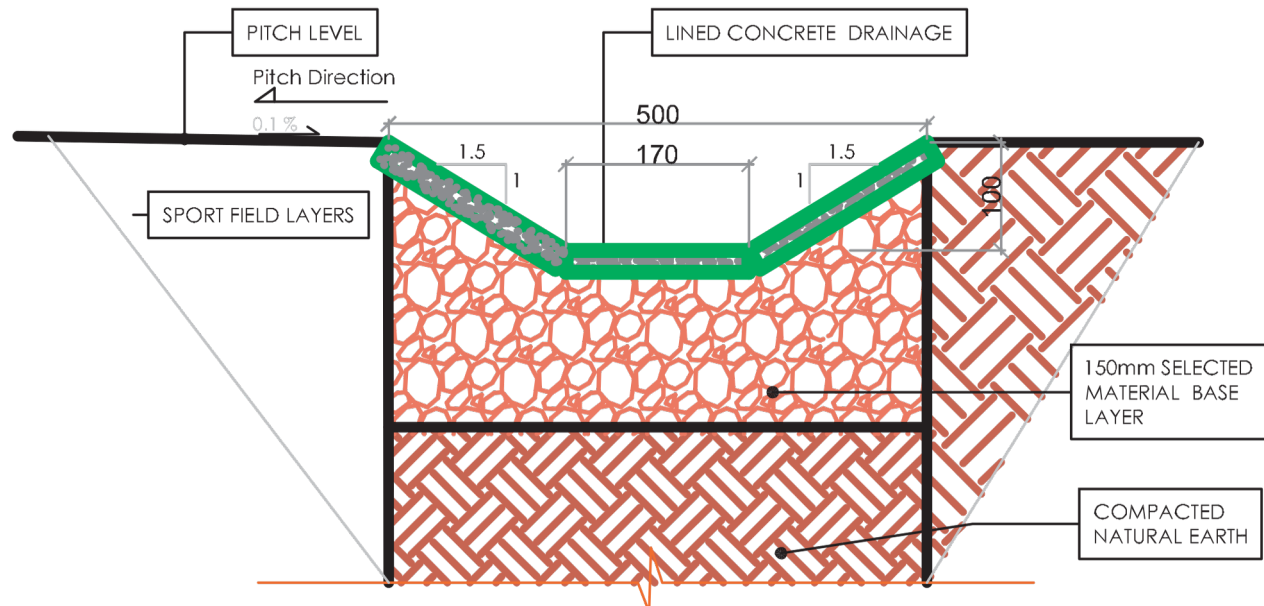
DRAINAGE TYPE 1 – NATURAL EARTH CHANNEL	RECOMMENDED APPLICATION
 <p>PITCH LEVEL Pitch Direction 0.1%</p> <p>NATURAL DRAINAGE DITCH 1% SLOPE TO THE DRAIN DIRECTION FROM CENTER LINE.</p> <p>SPORT FIELD LAYERS</p> <p>400</p> <p>COMPACTED NATURAL EARTH</p>	<ul style="list-style-type: none"> <li>• For all sports grounds in <b>low rainfall locations</b></li> <li>• For turf and sand sports grounds</li> </ul>
DRAINAGE TYPE 2 – CONCRETE DRAINAGE DITCH	RECOMMENDED APPLICATION
 <p>PITCH LEVEL Pitch Direction 0.1%</p> <p>CONCRETE DRAINAGE DITCH 1% SLOPE TO THE DRAIN DIRECTION FROM CENTER LINE.</p> <p>COMPACTED NATURAL EARTH</p> <p>500</p>	<ul style="list-style-type: none"> <li>• For all sports grounds in <b>high rainfall locations</b></li> <li>• Requires relatively large space and loose soil surroundings</li> </ul>

<p style="text-align: center;"><b>DRAINAGE TYPE 3 – GRAVEL DRAINAGE WITHOUT PERFORATED PIPE</b></p>	<p style="text-align: center;"><b>RECOMMENDED APPLICATION</b></p>
<p>The diagram shows a cross-section of a sports field drainage system. From top to bottom, the layers are: SPORT FIELD LAYERS, a top layer of gravel (5-20mm), a middle layer of gravel (20-32mm), and a base of compacted natural earth. A 0.1% pitch is shown sloping to the right. Labels include: PITCH LEVEL, Gravel size 5 - 20mm (400mm x 150mm), Gravel size 20 - 32mm (400mm x 250mm), SPORT FIELD LAYERS, and COMPACTED NATURAL EARTH. A 'Pitch Direction' arrow points right with '0.1%' below it.</p>	<ul style="list-style-type: none"> <li>• For sports grounds where the drainage channel should not be visible due to safety concerns</li> <li>• For all (except sand) sports grounds in <b>average and minimum rainfall areas</b></li> </ul>

<p style="text-align: center;"><b>DRAINAGE TYPE 4 – GRAVEL DRAINAGE WITH PERFORATED PIPE</b></p>	<p style="text-align: center;"><b>RECOMMENDED APPLICATION</b></p>
<p>The diagram shows a cross-section of a sports field drainage system with a perforated pipe. From top to bottom, the layers are: SPORT FIELD LAYERS, a top layer of gravel (5-20mm), a middle layer of gravel (20-32mm), a PVC Perforated pipe (Ø160mm), and a base of compacted natural earth. A 0.1% pitch is shown sloping to the right. Labels include: PITCH LEVEL, Gravel size 5 - 20mm (400mm x 150mm), Gravel size 20 - 32mm (400mm x 250mm), PVC Perforated pipe Ø160mm, SPORT FIELD LAYERS, and COMPACTED NATURAL EARTH. A 'Pitch Direction' arrow points right with '0.1%' below it.</p>	<ul style="list-style-type: none"> <li>• For sports grounds where the drainage channel should not be visible due to safety concerns</li> <li>• For all (except sand) sports grounds in <b>high rainfall areas</b></li> </ul>



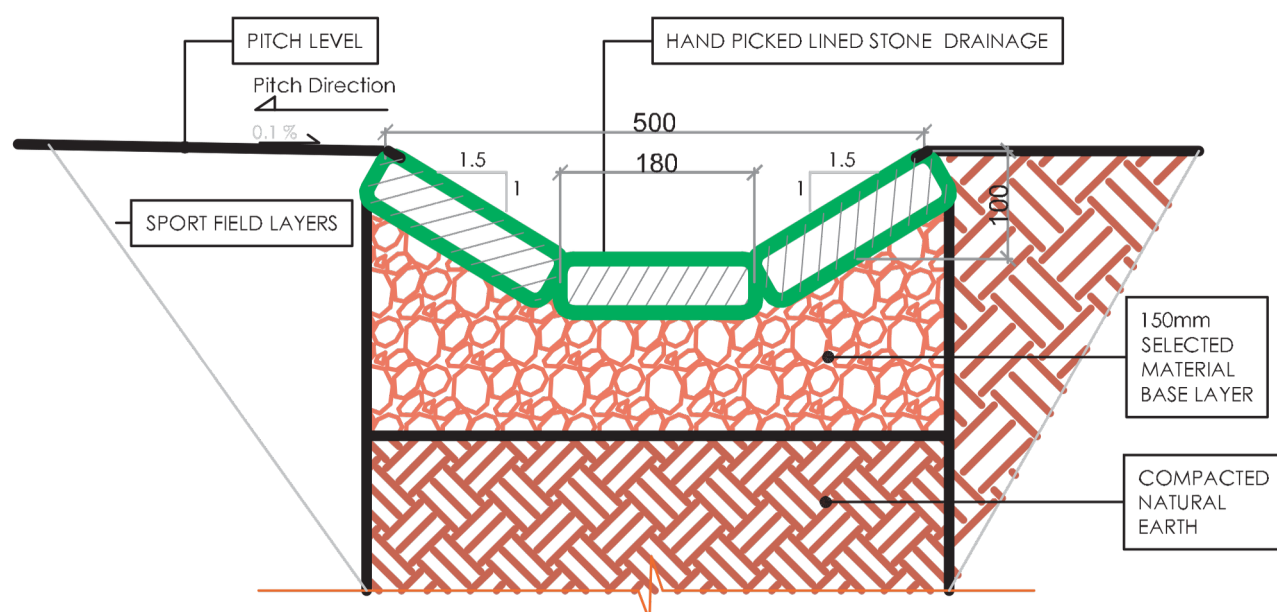
### DRAINAGE TYPE 5 – PRECAST CONCRETE DITCH



### RECOMMENDED APPLICATION

- For all sports ground types and soil conditions in **high rainfall areas**, if precast concrete is easily available

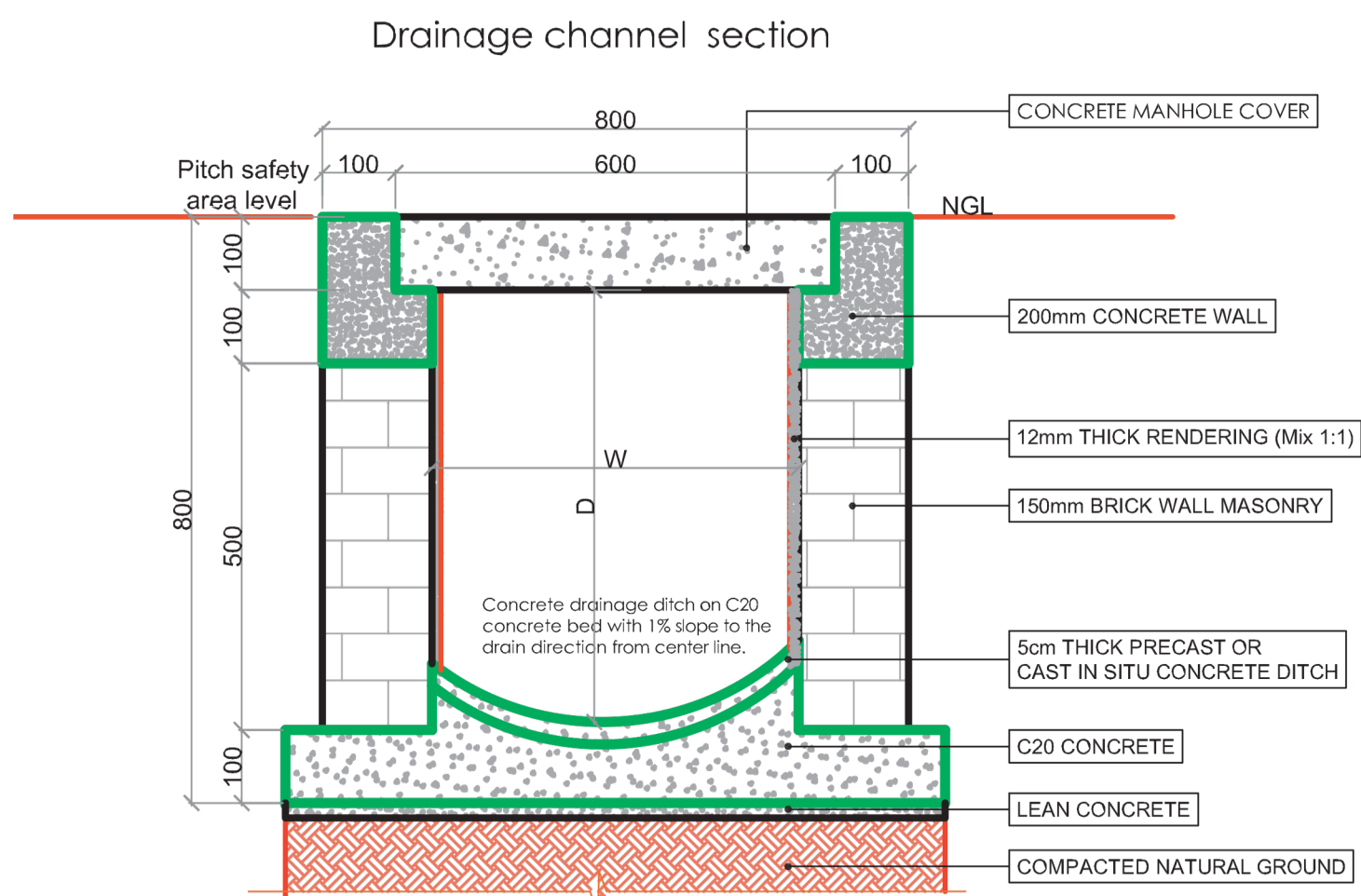
### DRAINAGE TYPE 6 – STONE DRAINAGE



### RECOMMENDED APPLICATION

- For all sports ground types and soil conditions in **high rainfall areas**, if dressed stones are easily available

### FIGURE 38: DRAINAGE TYPE 7 – MASONRY DITCH (with manhole and connection channel to the public drainage system)



### RECOMMENDED APPLICATION

- For all sports grounds in high rainfall areas where spectator seats are located around the court.

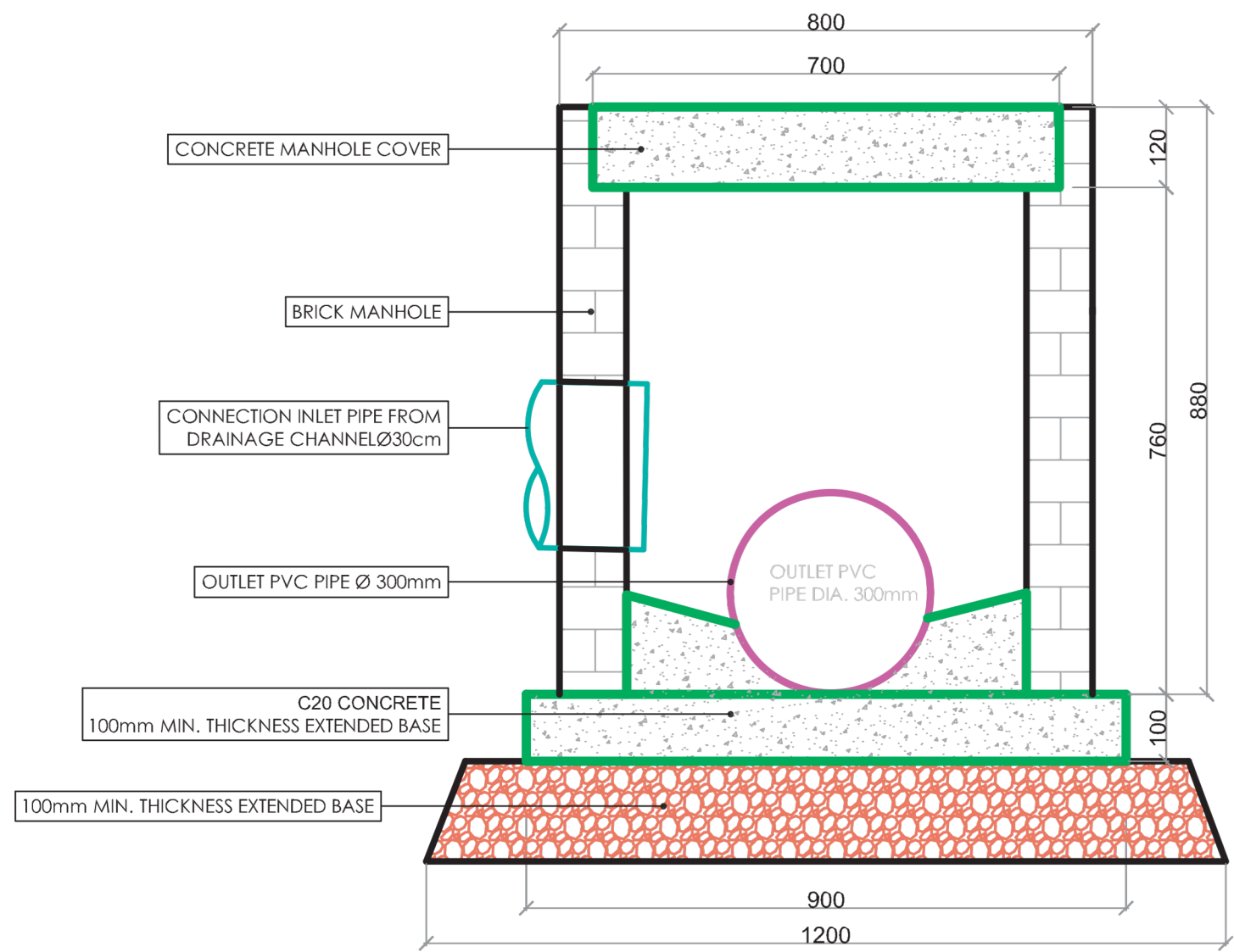
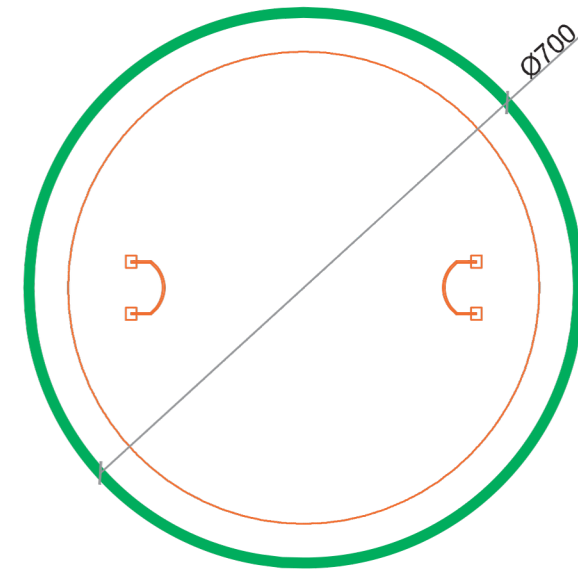
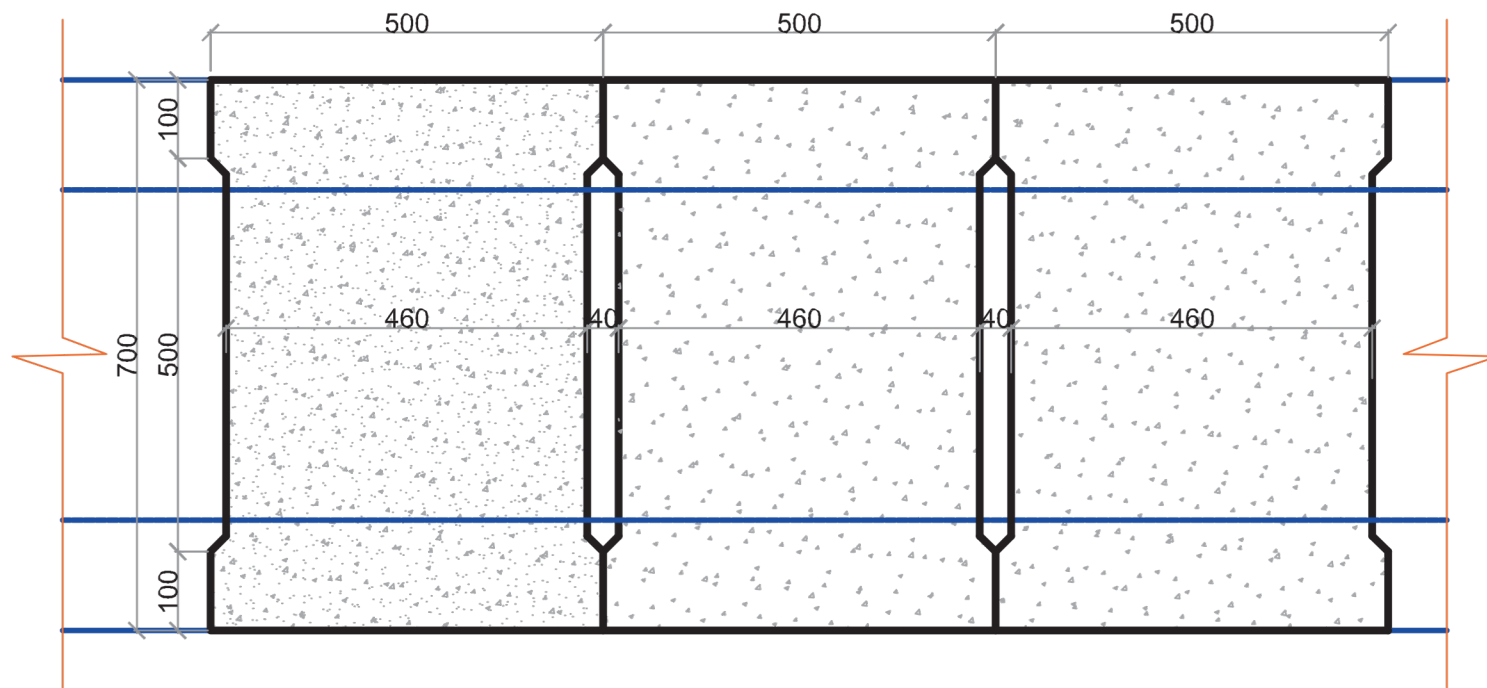
- For high rainfall areas

TYPE	DEPTH (m)	WIDTH (m)
Brick Masonry Ditch	0.10 - 0.60	0.5

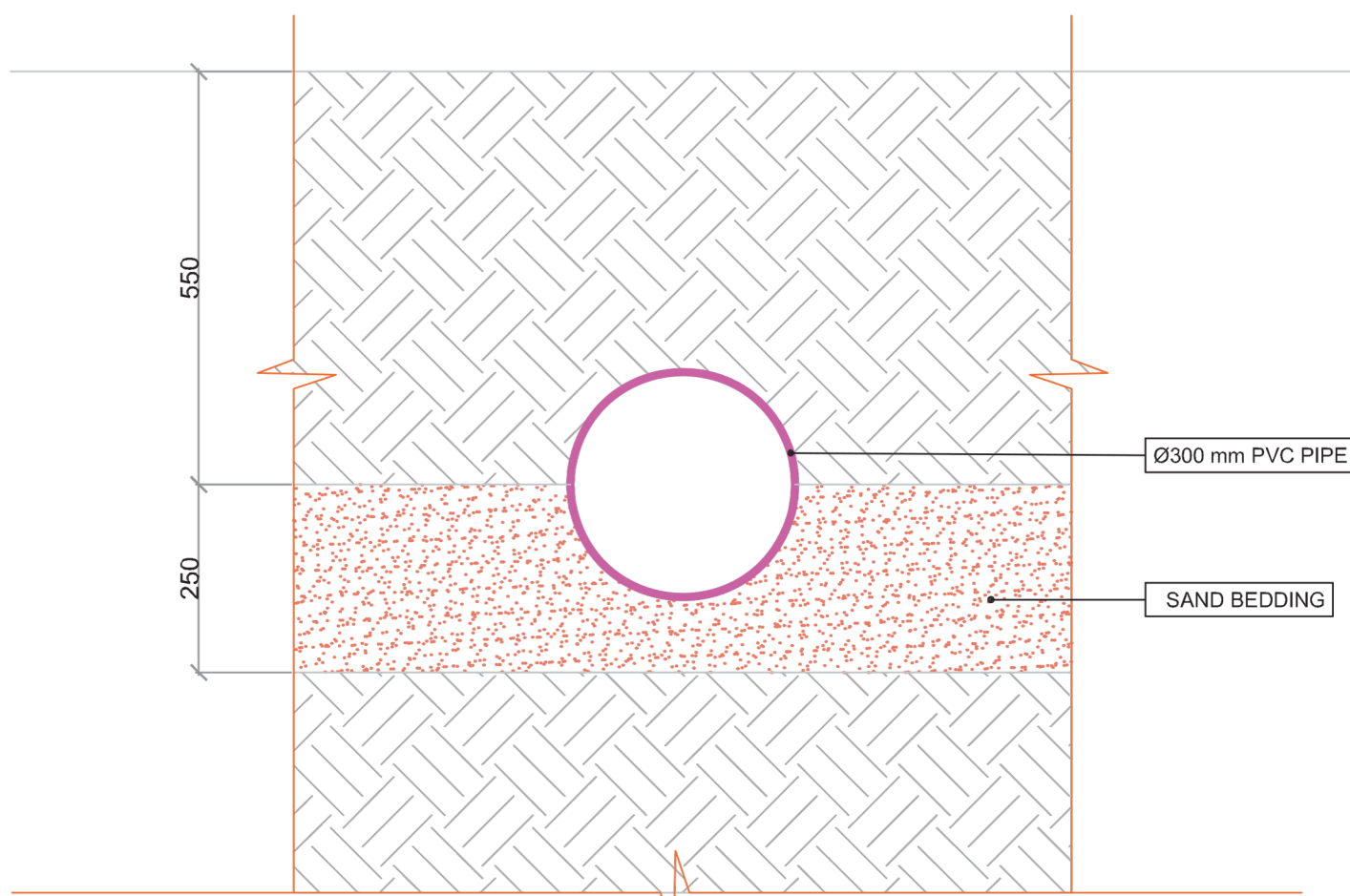




Concrete Drainage Channel Cover Detail



Connection Manhole Detail



Drainage pipe Section C - C





Natural earth channel (drainage type 1) filled with excess water at a Polytechnic College.

## OVERVIEW: RELATION OF SURFACE TYPES AND DRAINAGE SYSTEM

SURFACE TYPE	DRAINAGE TYPE 1 natural earth drainage ditch	DRAINAGE TYPE 2 concrete drainage ditch	DRAINAGE TYPE 3 gravel drainage without perforated pipe
Turf (type 1)	☺	☺	☺
Turf (type 2)	☺	☺	☺
Gravel (type 1)		☺	☺
Gravel (type 2)		☺	☺
Sand (type 1)	☺	☺	
Sand (type 2)	☺	☺	
Sand (type 3)			
Concrete (type 1)		☺	☺
Concrete (type 2)		☺	☺
Asphalt		☺	☺





SURFACE TYPE	DRAINAGE TYPE 4 gravel drainage with	DRAINAGE TYPE 5 precast concrete drainage ditch	DRAINAGE TYPE 6 stone drainage ditch
Turf(type 1)	😊	😊	😊
Turf (type 2)	😊	😊	😊
Gravel (type 1)	😊	😊	😊
Gravel (type 2)	😊	😊	😊
Sand (type 1)		😊	😊
Sand (type 2)		😊	😊
Sand (type 3)			
Concrete (type 1)	😊	😊	😊
Concrete (type 2)	😊	😊	😊
Asphalt	😊	😊	😊



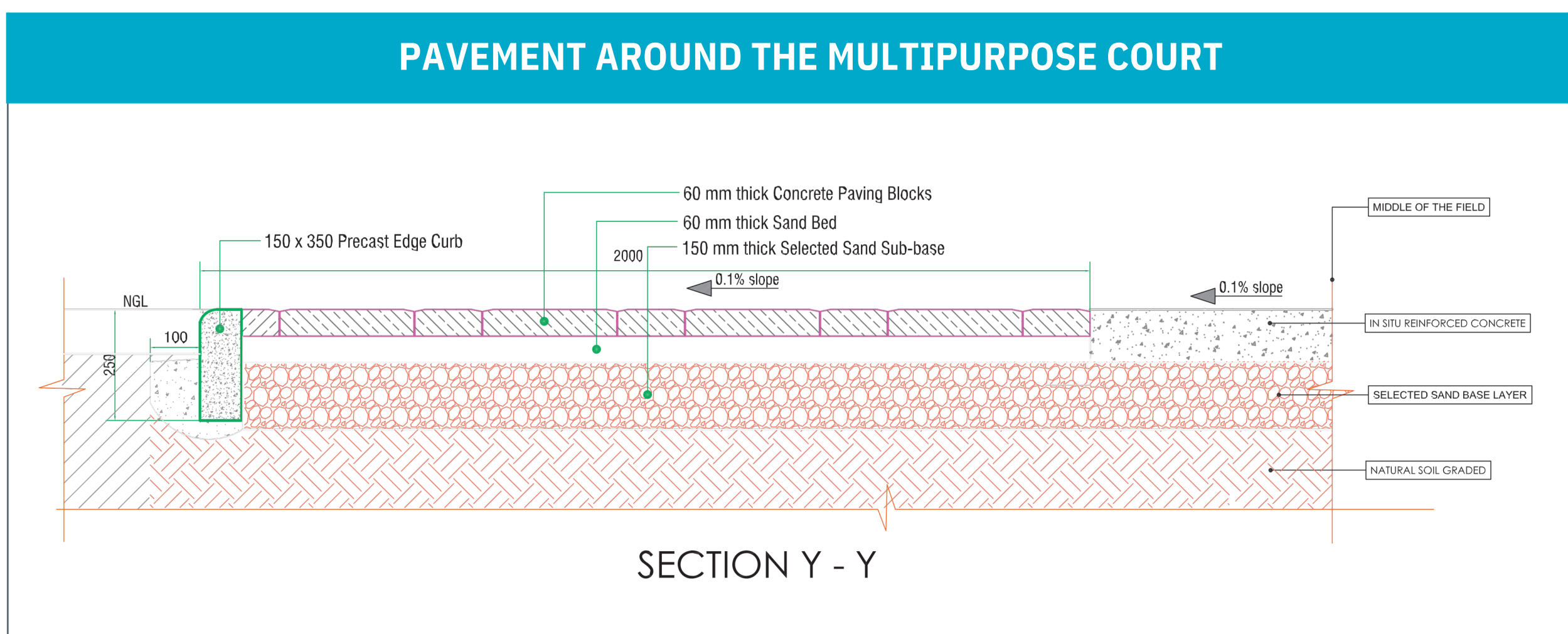


Pavement around a basketball court in Shimoni.

## 2.2 PAVEMENT

It is advisable to build a pavement on the safety area around multipurpose, basketball, handball and netball courts because it allows for clear differentiation between

the playing field and the safety area. Furthermore, it prevents erosion of the field margins and dirt entering the playing field.



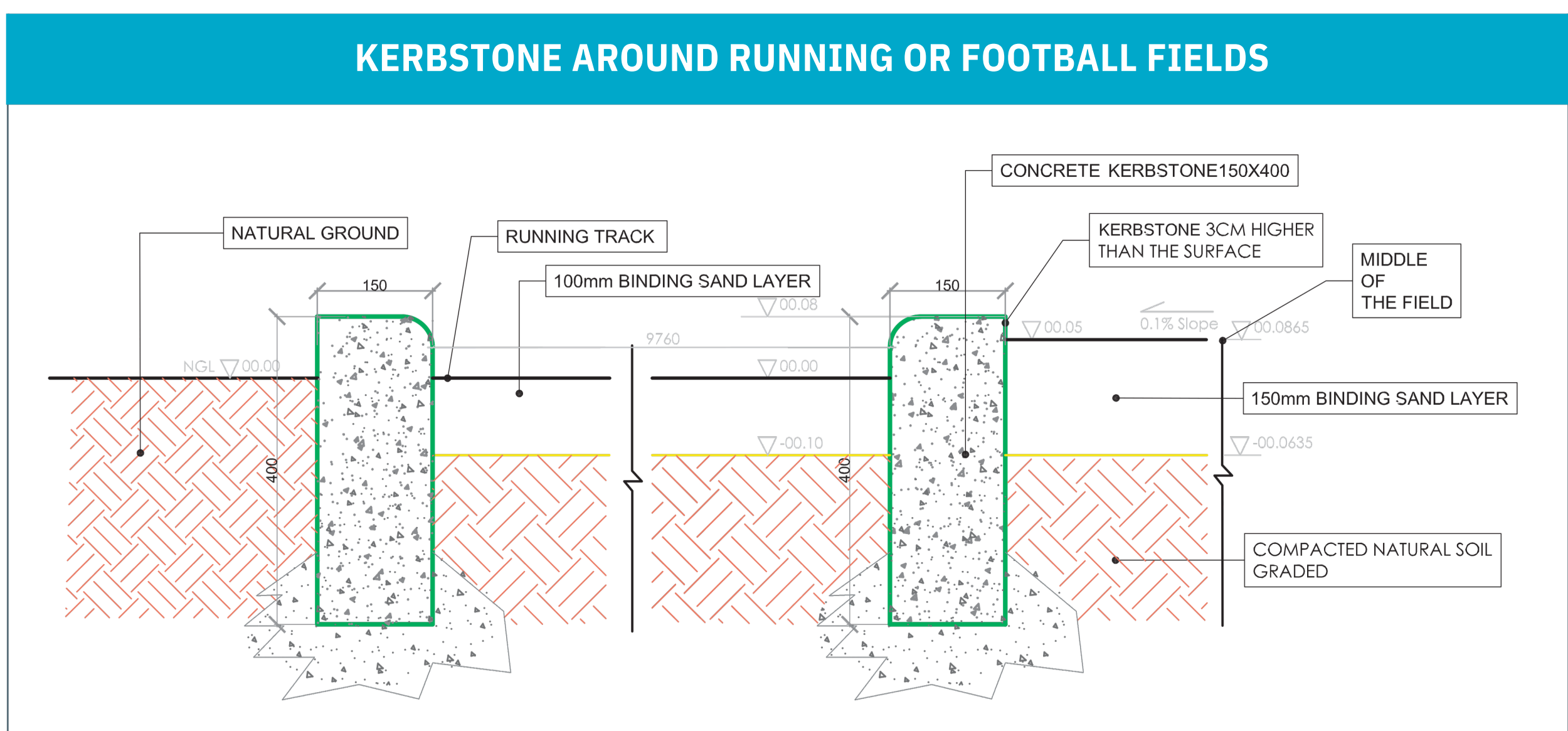


Kerbstone around a volleyball field in Shimoni.

## 2.3 KERBSTONE AROUND THE FIELD

A kerbstone, or kerb, is a physical or a visual delineation of a sports ground edge, mainly used for turf, gravel, sand or asphalt surfaces. It helps to contain the various layers

of the sports ground and provides protection in the absence of a drainage system.







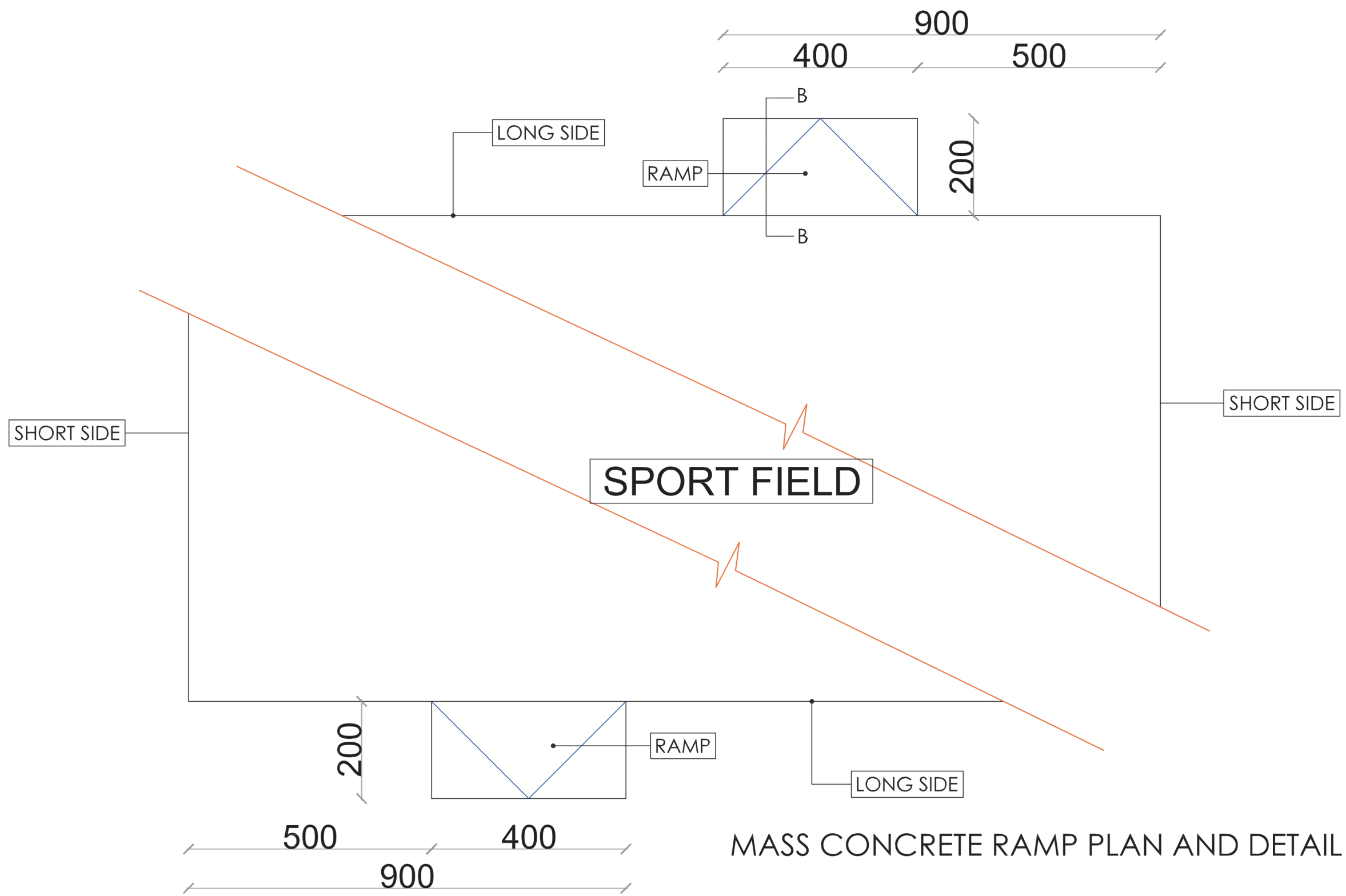
Asphalt sports ground with ramps for disabled persons to ensure accessibility.

## 2.4 CONCRETE RAMP FOR PLAYERS WITH LIMITED MOBILITY

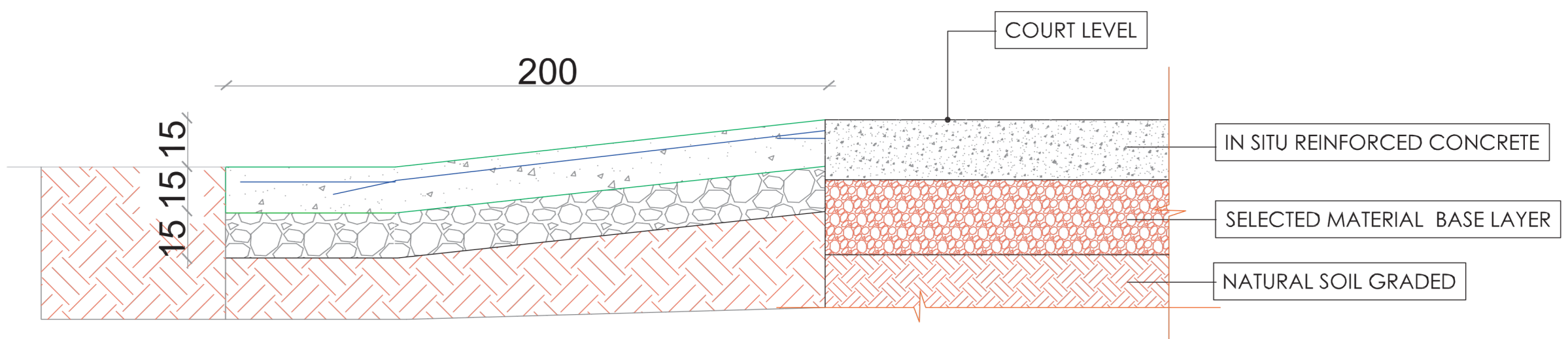
Concrete sports grounds with an elevated playing surface can be difficult to access for players with limited mobility. With ramps, this obstacle can be removed. The ramps shall

be 4 m long and 2 m wide and positioned 5 m from the goal line on both sides.

### CONCRETE RAMP DETAILS



MASS CONCRETE RAMP PLAN AND DETAIL



SECTION B - B  
Scale 1:2





Fence type 1 around a basketball court in Nairobi.

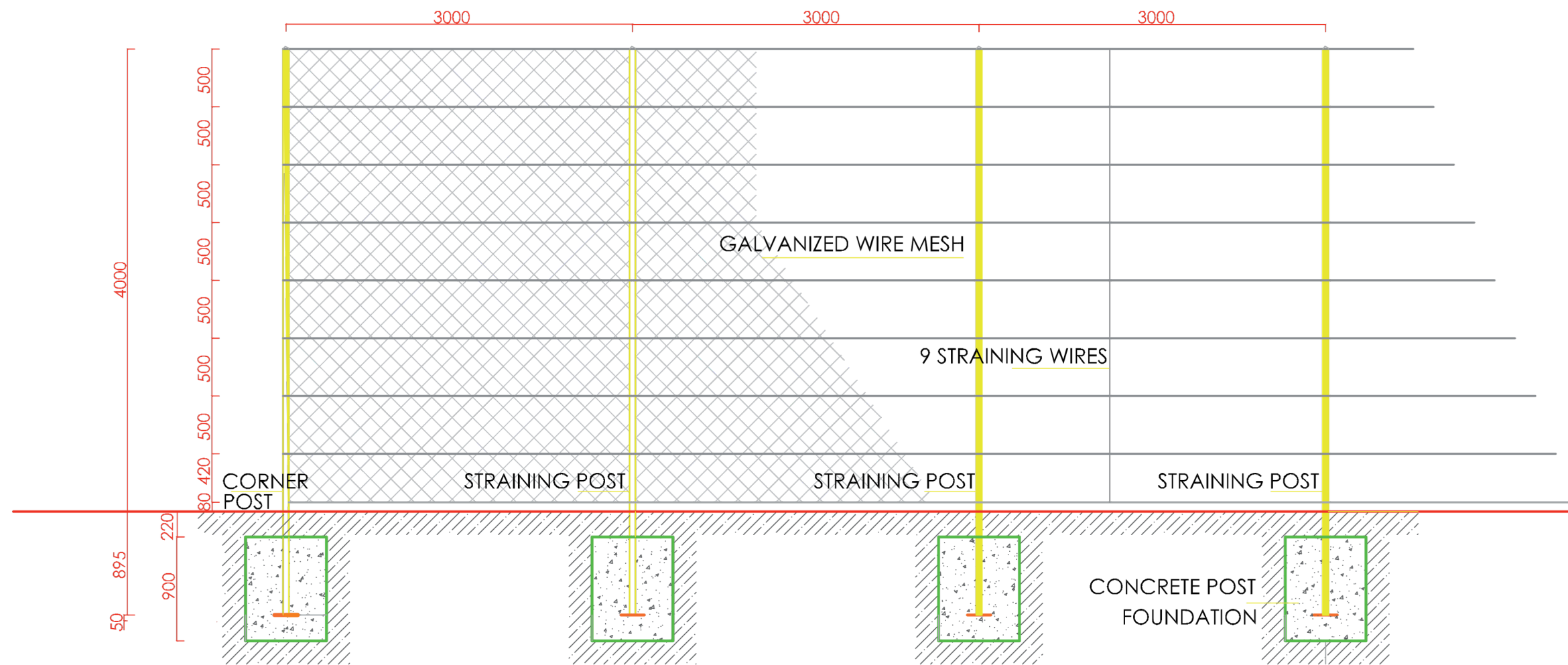
## 2.5 FENCES

Fences may be needed to protect the sports ground and ancillary works against damage from animals, cars and theft (especially if they are located in a public space), or to prevent the ball from leaving the premises. Fences are

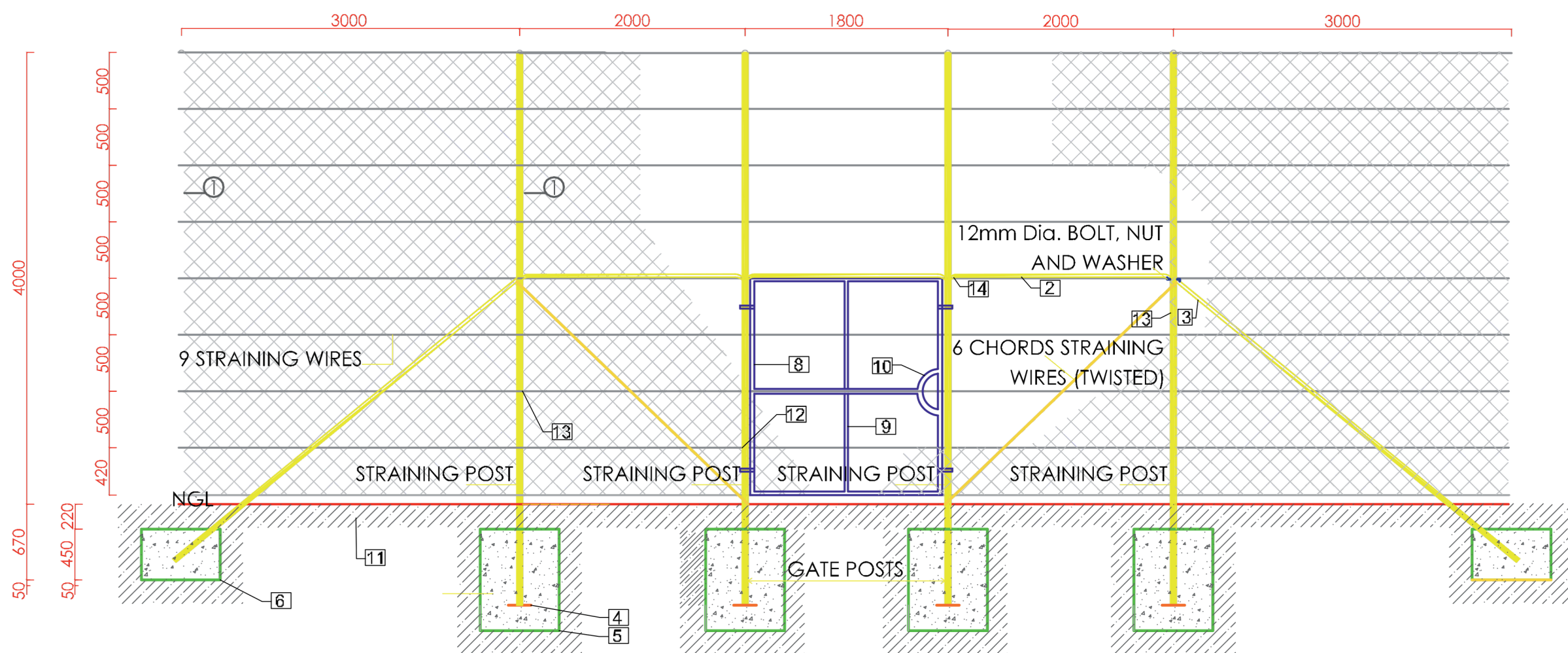
additional structures in grassroots sports grounds construction, which can be built if necessary and if the funds are available.



## FENCE TYPE 1 – BASKETBALL AND MULTIPURPOSE COURT FENCES



FENCING AND CORNER UNIT



PEDESTRIAN GATE FOR FENCING

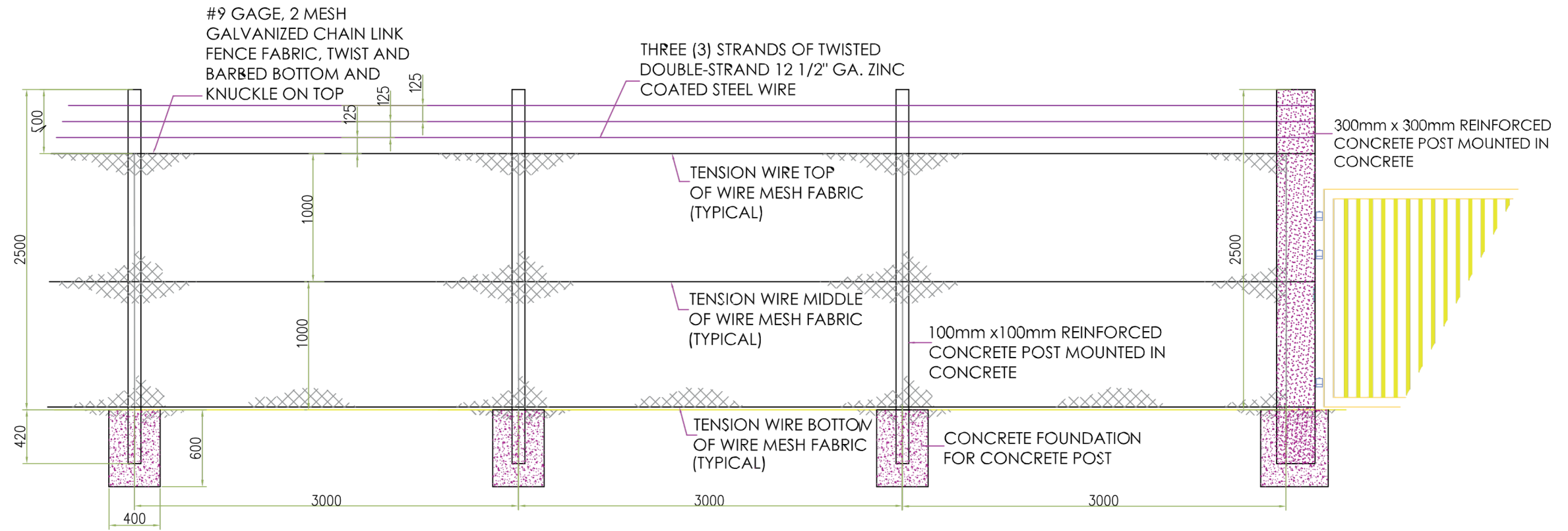
**NOTE FOR THE PEDESTRIAN GATE:**

1. CORNER AND GATE POSTS: 76mm OUTSIDE DIAMETER PIPE WITH 2.0mm WALL THICKNESS AND PRESSED STEEL OR CAST-IRON CAP
2. HORIZONTAL STRUTS: 48.5 mm OUTSIDE DIAMETER PIPE WITH 2.0mm WALL THICKNESS FLATTENED AND DRILLED ON BOTH ENDS AS PER DETAIL ON THIS DRAWING
3. STAYS: 48.5mm OUTSIDE DIAMETER PIPE WITH 2.0mm WALL THICKNESS FLATTENED AND DRILLED ON ONE END AS PER DETAIL
4. FOOTPLATES: 200x200x5mm MILD STEEL PLATES WELDED TO PIPES.
5. 600x600x900mm CONCRETE FOOT GS FOR POSTS IN CLASS C25 CONCRETE.
6. 600x600x450mm CONCRETE FOOT GS FOR STAYS IN CLASS C25 CONCRETE
7. DIAMOND MESH: MADE FROM 2.0MM DIAMETER MILD STEEL GALVANIZED WIRE WITH AN APERTURE SIZE NOT MORE THAN 50x50mm, AND TIED TO STRAINING WIRES AT 500mm CENTRES BY USING STANDARD 1.6mm DIAMETER TYING WIRE.
8. FRAME: 48mm OUTSIDE DIAMETER PIPE WITH 2.0mm WALL THICKNESS UNLESS OTHERWISE SPECIFIED IN THE PROJECT SPECIFICATIONS
9. BRACING: 48mm OUTSIDE DIAMETER PIPE WITH 2.0mm WALL THICKNESS UNLESS OTHERWISE SPECIFIED IN THE PROJECT SPECIFICATIONS.
10. CLOSING MECHANISM FOR PEDESTRIAN GATE AS SHOWN ON DRAWING
11. SHORT LENGTHS OF HORIZONTAL FENCING WIRES, SECURELY WRAPPED TWICE AROUND POSTS, TO EXTEND BETWEEN GATE AND STRAINING POSTS. THESE WIRES MUST BE INSTALLED AND TIGHTENED BEFORE STRAINING OF FENCE LINE BEGINS.
12. HORIZONTAL FENCING WIRES TO BE SECURELY WRAPPED TWICE AROUND STRAINING POSTS AND SECURED AGAINST SLIPPING BY TYING THE ENDS TIGHTLY AROUND WIRES BY MEANS OF SIX SNUG-TIGHT TWISTS.
13. 12mm DIAMETER MILD STEEL BOLT, NUT AND WASHER.

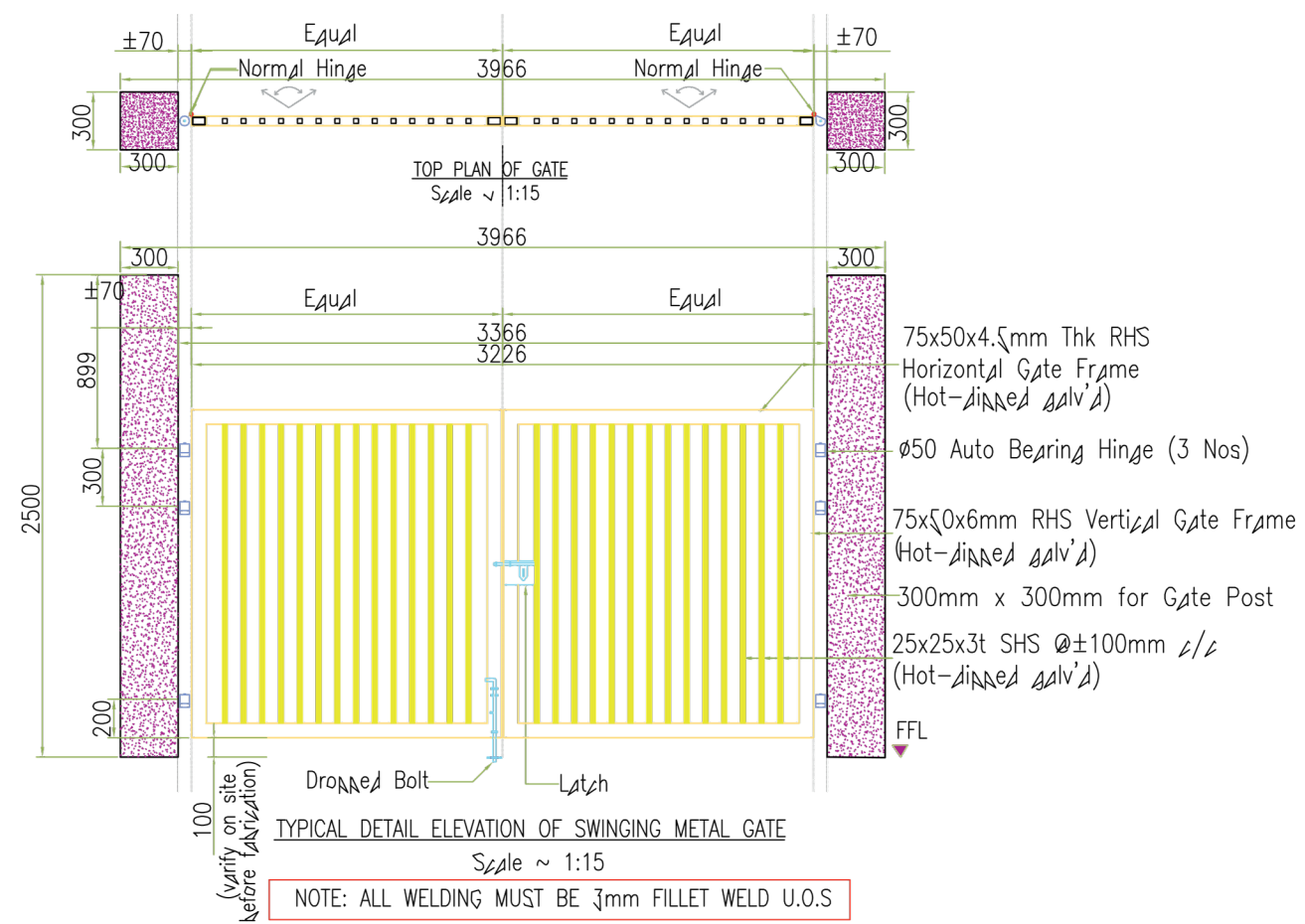
Type 1 fence can be used for basketball and multipurpose courts in an area where fencing is mandatory for safety reasons and for blocking bouncing balls.



## FENCE TYPE 2 – SPORTS GROUND FENCES



TYPICAL DETAIL ELEVATION OF WIRE MESH FENCING  
Scale ~ 1:15



Type 2 fence can be used for football fields, handball and netball courts in an area where fencing is mandatory for safety reasons.



A proposed basketball court at Mavoko .

## BASKETBALL

When basketball was first played, a peach basket with the bottom still intact was used; now a metal hoop with a net is standard. Basketball is a sport played between two teams of five players each. Its rules are set by the International Basketball Federation (FIBA).<sup>3</sup>

While professional or organised basketball is played indoors – usually on highly polished **wood**, often **maple** –, outdoor surfaces are generally made from standard paving materials such as **concrete** or **asphalt**. Surfaces such as turf, gravel or sand are not suitable for basketball.

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### PLAYING FIELD

According to the FIBA the basketball playing court ‘shall have a flat, hard surface free from obstructions with dimensions of 28 m in length by 15 m in width measured from the inner edge of the boundary line. (...) Any obstruction (...) shall be at least 2 m from the playing court’.<sup>4</sup> Thus, you need a space of min. 32 x 19 m to build a basketball court.

#### TIP

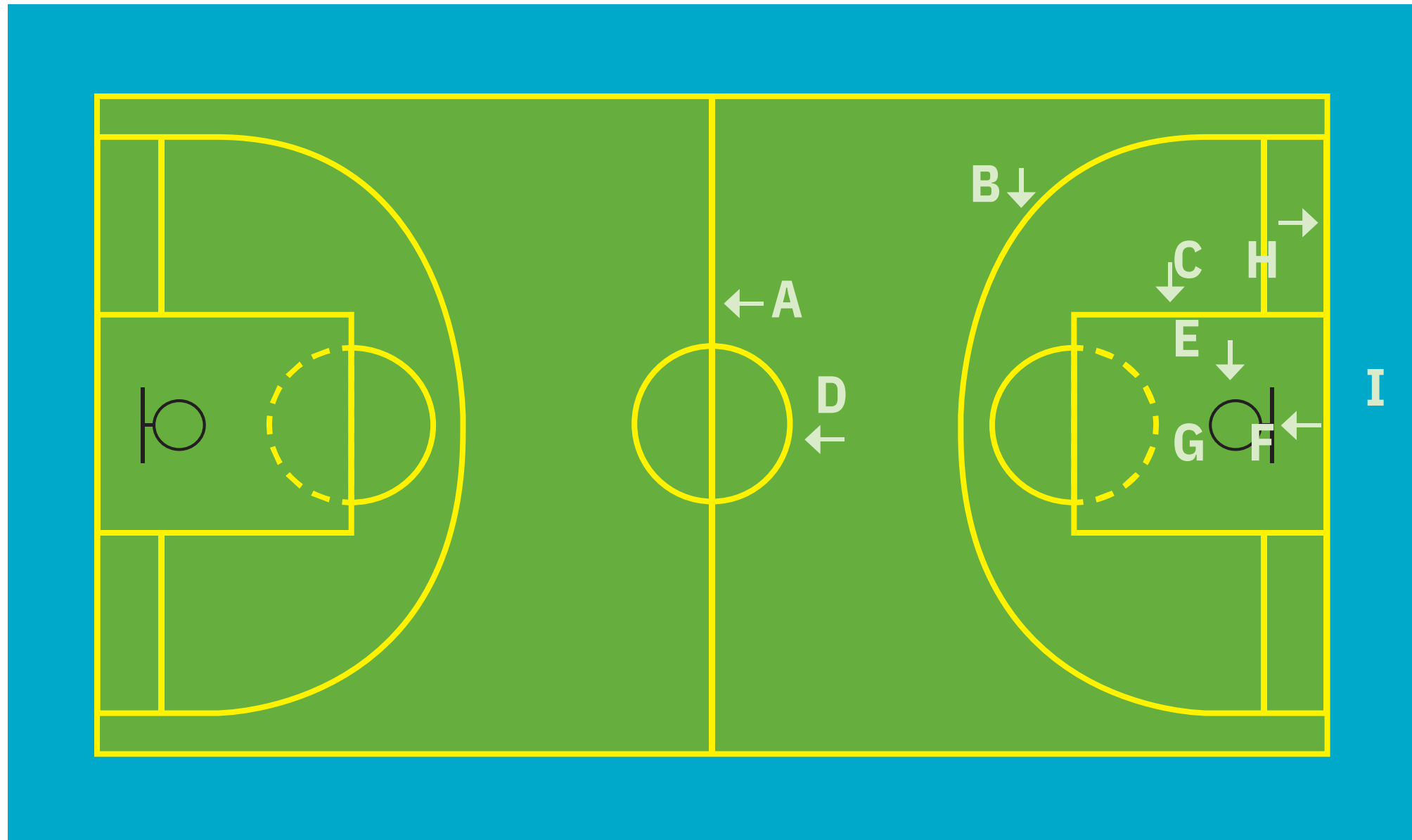
Basketball court sizes may vary across different leagues and governing bodies. However, S4DA recommends adhering to FIBA specifications.

<sup>3</sup> FIBA: *Official Basketball Rules 2018*.

<sup>4</sup> FIBA: *Official Basketball Rules 2018*.



**FIGURE 1: BASKETBALL COURT PLAYING SURFACE (28 M X 15 M) AND ITS ANNOTATION**

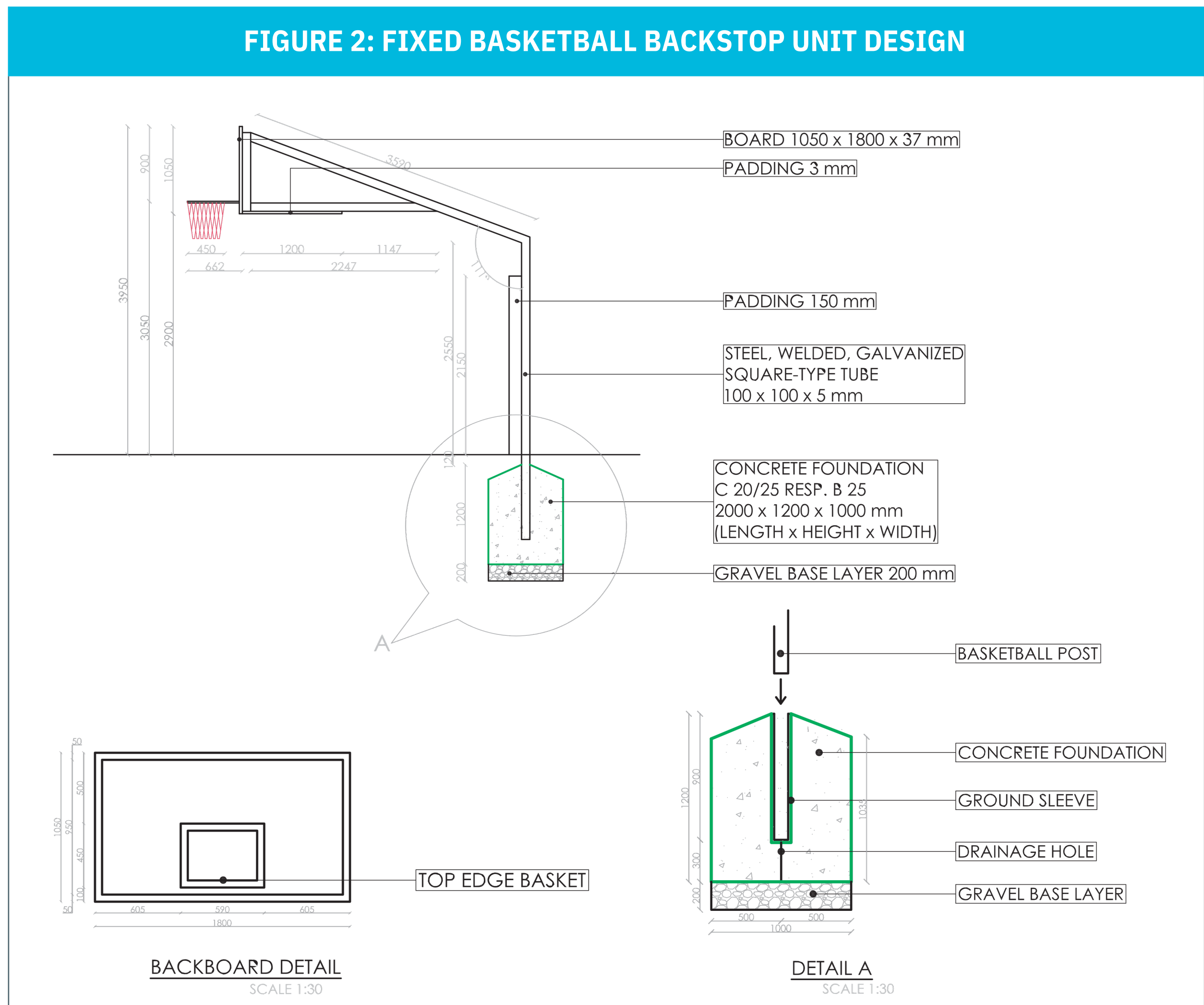


ANNOTATION	DESCRIPTION	REMARK
<b>A</b>	Mid court line	Marked parallel to the end lines from the midpoint of the side lines.
<b>B</b>	Three-point line	The two parallel lines extending from and perpendicular to the end-line, with the outer edge 0.90 m from the inner edge of the side lines.  An arc of radius 6.75 m measured from the point on the floor beneath the exact centre of the opponents' basket to the outer edge of the arc.
<b>C</b>	Free throw line	Drawn parallel to each end line. Its furthest edge is 5.81 m from the inner edge of the end line and is 4.9 m long. Its midpoint lies on the imaginary line joining the midpoint of the two end lines.
<b>D</b>	Centre circle	The centre circle is marked in the centre of the playing court and has a radius of 1.80 m measured to the outer edge of the circumference.
<b>E</b>	Basket	See description below.
<b>F</b>	Backboard	See description below.
<b>G</b>	Free throw lane 'the	The area bounded by the free throw lines.
<b>H</b>	paint' Base line (end line)	The shortest boundary lines.
<b>I</b>	Safety area	Min. 2 m around the playing surface.

## BACKSTOP UNITS, BACKBOARDS, RING AND NET

A simple backstop unit consists of a backboard, a basket – comprising a ring and a net – and a backboard support structure with padding.

S4DA suggests to use the following type of basketball backstop design:



**TIP**

Backstop units should be installed by the contractor as per the drawings. Basketball posts that are sold by shops are often not designed for matches, but only for training purposes and therefore do not comply with the specifications needed.



## BACKSTOP UNITS, BACKBOARDS, RING AND NET



**TIP**

Basketball court sizes may vary across different leagues and governing bodies. However, S4DA recommends adhering to FIBA specifications.



**TIP**

Backstop units should be installed by the contractor as per the drawings above. Basketball posts that are sold by shops are often not designed for matches, but only for training purposes and therefore do not comply with the specifications needed.







A Swimming Pool at a Sports Complex .

## SWIMMING POOL

Swimming pools are a significant investment for property owners seeking to create a relaxing oasis. Understanding the construction costs and materials involved is crucial for making informed decisions. This report provides an overview of swimming pool construction costs and the pros and cons of various construction materials.

### CONSTRUCTION COST

Based on the 2023-2024 Kenyan construction cost book, the cost of constructing a swimming pool in Kenya varies based on factors such as pool type, size, construction materials, site conditions, design complexity, filtration systems, permits, labor costs, and contingency budget. A basic residential swimming pool in Kenya can range from approximately KES 1.8 million to KES 6 million or more, depending on these factors

#### TIP

For detailed project-specific cost estimates and material selection, consult as for a further detailed professional swimming pool construction.





A recently completed Swimming Pool.



A Swimming Pool under construction at a Residential Premise in Nairobi.

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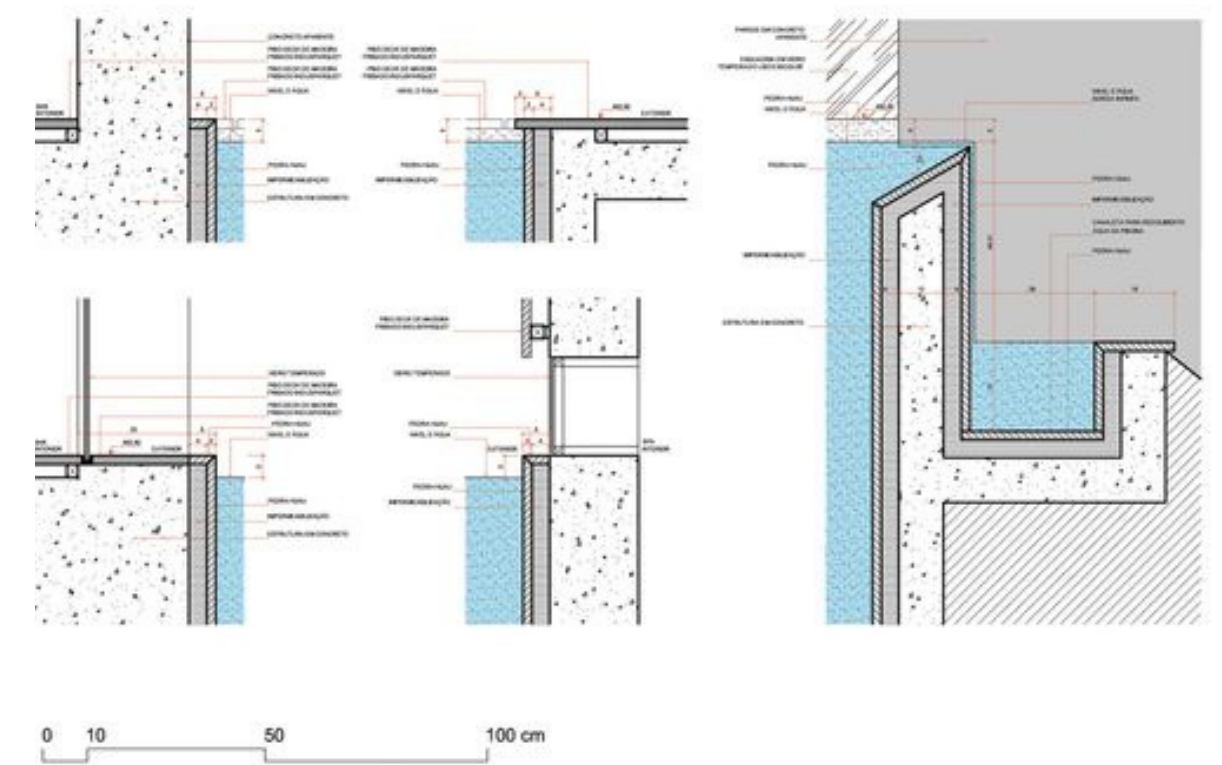
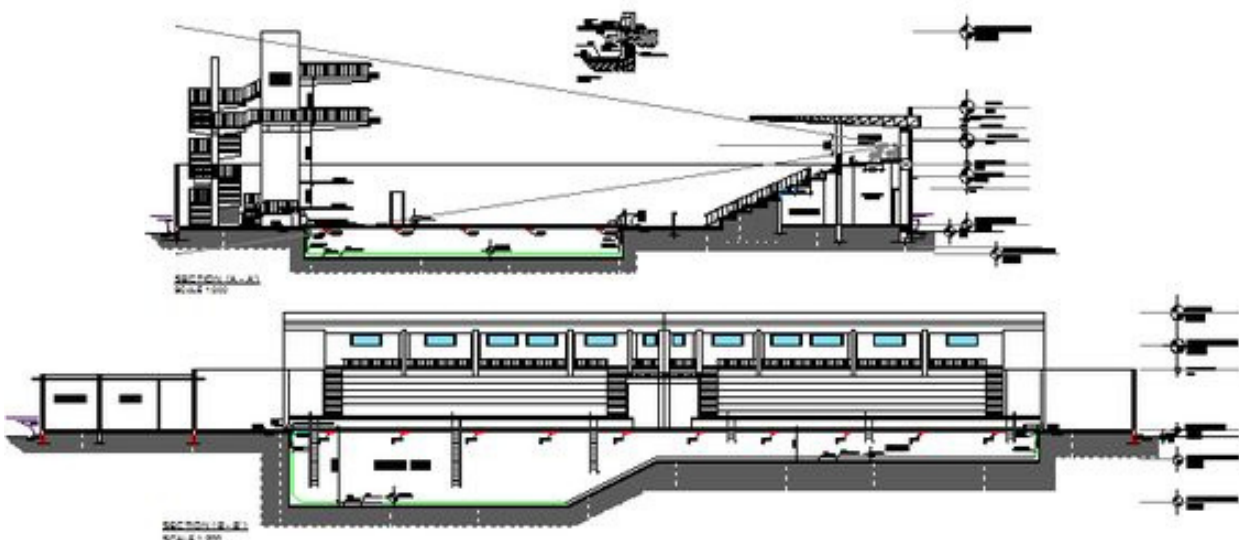
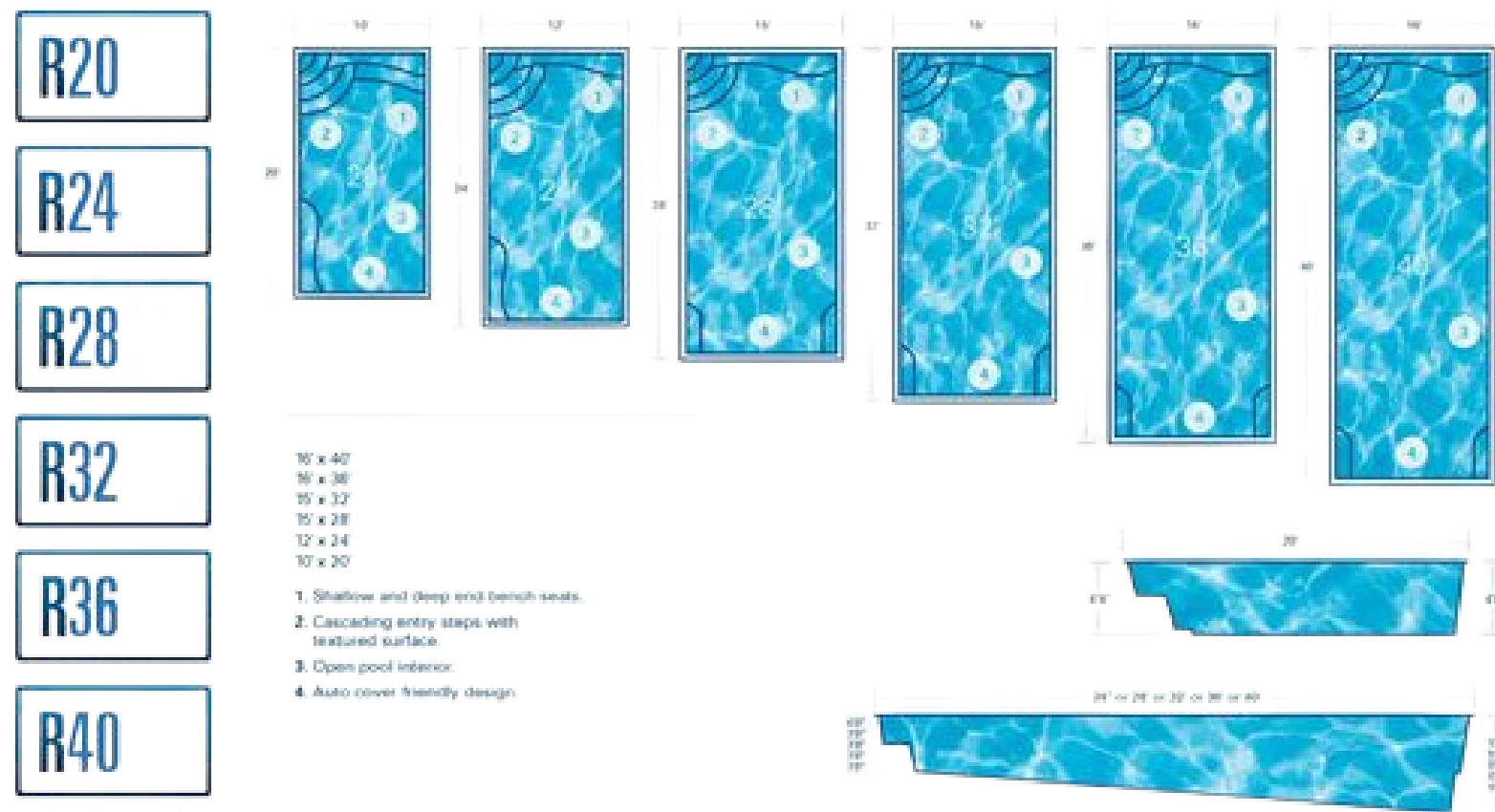
### Construction Materials and Cross-Section Diagrams

**TIP**

Understanding the cost and materials involved in swimming pool construction is essential for property owners in Kenya. Each construction material has its own set of advantages and limitations, and the choice of material should align with the owner's preferences, budget, and long-term maintenance considerations.



## Construction Materials and Cross-Section Diagrams



### CONCRETE

**Pros:**

- Durable and long-lasting
- Can be customized in various shapes and designs
- Suitable for all types of pools, including in-ground and above-ground

**Cons:**

- Initial construction cost can be higher compared to other materials
- Prone to cracking if not properly maintained

### MOSAIC TILES

**Pros:**

- Aesthetic appeal and luxurious finish
- Resistant to chemical and UV damage
- Offers a wide range of design options

**Cons:**

- Higher initial cost
- Requires regular maintenance to prevent grout discoloration

### FIBERGLASS

**Pros:**

- Quick installation process
- Smooth surface that resists algae growth
- Low maintenance and lower lifetime cost

**Cons:**

- Limited design flexibility
- Susceptible to surface staining if not properly maintained

### VINYL LINER

**Pros:**

- Lower initial cost compared to other materials
- Smooth and non-abrasive surface
- Easy to clean and maintain

**Cons:**

- Prone to punctures and tears
- Lifespan is shorter compared to other materials

**TIP** Understanding the cost and materials involved in swimming pool construction is essential for property owners in Kenya. Each construction material has its own set of advantages and limitations, and the choice of material should align with the owner's preferences, budget, and long-term maintenance considerations.





# THANK YOU

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