

## SUMMARIES OF CONSTRUCTION STANDARDS TO BE TRANSLATED INTO KINYANRWANDA

### I.CEMENT BLOCKS AND BRICKS – SPECIFICATION: RS 568:2012

#### 1 SCOPE

The standard specifies performance requirements related to dimensional accuracy, density, strength, water absorption, shrinkage and moisture movement for hollow blocks and solid cement blocks and bricks.

#### 2 DEFINITIONS AND NOMINAL DIMENSIONS

**2.1 Brick** is a masonry unit with the following nominal dimensions:

- length between 200 mm and 300 mm;
- width between 100 mm and 130 mm;
- height between 75mm and 120 mm.

**2.2 Block** is a masonry unit, either hollow or solid, with the following dimensions:

- length between 300 mm and 500 mm;
- width between 100 mm and 300 mm;
- height between 100 mm and 300 mm.

**2.3 Solid block** is a block which has solid material not less than 75 percent of the total volume of the block calculated from the overall dimensions.

## INCAMAKE Y'AMABWIRIZA NYARWANDA Y'UBUZIRANENGE KU BIKORESHO BY'UBWUBATSI.

### I. IBWIRIZA NYARWANDA RY'UBUZIRANENGE No 568: 2012 RIGENA IMITERERE YA BUROKE N'AMATAFARI BIRIMO SIMA.

#### 1 IBIKUBIYEMO

Iri bwiriza rigena ibisabwa bijyanye n'ingero, ireme bwite, ubukomere, igipimo cyo kunywa amazi, kugabanuka mu bipimo bitewe no gukamuka ndetse no kwiyongera bitewe no kunywa amazi kwa buroke zitoboye, izidatoboye ndetse n'amatafari birimo sima.

#### 2 IBISOBANURO BY'AMAGAMBO N'IBIPIMO NGENDERWAHO

**2.1 ITAFARI:** ni igikoresho cy'ubwubatsi gifite ibipimo ngenderwaho bikurikira:

- Uburebure buri hagati ya mm200 na mm 300;
- Ubugali buri hagati ya mm 100 na mm 130;
- Ubuhagarike buri hagati ya mm 75 na mm 120.

**2.2 BUROKE:** ni igikoresho cy'ubwubatsi gifite imyenge cyangwa kidatoboye, gifite ibipimo ngenderwaho bikurikira:

- Uburebure buri hagati ya mm 300 na mm 500;
- Ubugali buri hagati ya mm 100 na mm300;
- Ubuhagarike buri hagati ya mm 100 na mm300.

**2.3 BUROKE IDATOBOYE:** ni buroke idafite imyenge cyangwa imyobo ikaba ishobora kugira imihoro cyangwa utunogo ku



**2.4 Hollow (open or closed cavity) block** is a block having one or more large holes or cavities which either pass through the block (open cavity) or do not effectively pass through the block (closed cavity) and having the solid material between 50 and 75 percent of the total volume of the block calculated from the overall dimensions.



**2.5 Cellular block** is a blocks which contain one or more formed voids which do not fully penetrate the block



buryo nibura 75 ku ijana by'ingano y'umubyimba wa buroke yose uba ari imbumbe.

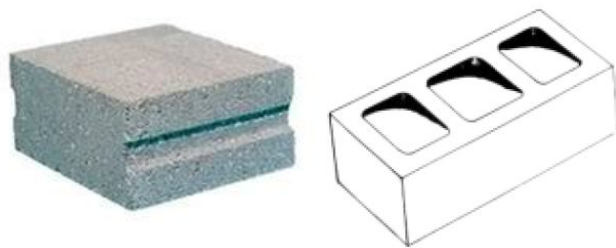


**2.4 BUROKE ITOBOYE:** ni buroke ifite imyenge cyangwa imyobo, ishobora kuba umwe cyangwa myinshi yahuranya cyangwa itahuranya buroke yose, ku buryo hagati ya 50 na 70 ku ijana by'umubyimba wa buroke yose ari imbumbe.



**2.5 BUROKE IFITE UTUNOGO:** ni buroke ifite akanogo kamwe cyangwa twinshi tutinjiramo imbere cyane.



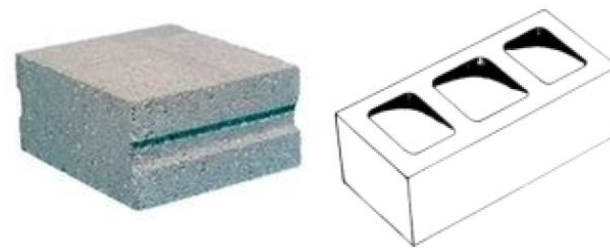


## 2.6 Thickness of the Face Shell And WEB

The thickness of the face shell and the web shall be not less than the values given in the Table below:

Table 1- Minimum face shell and web thicknesses (all dimensions in mm)

| Nominal block width | Face shell thickness | Thickness of web |
|---------------------|----------------------|------------------|
| 100 or less         | 25                   | 25               |
| Over 100 to 150     | 25                   | 25               |
| Over 150 to 200     | 30                   | 25               |
| Over 200            | 35                   | 30               |

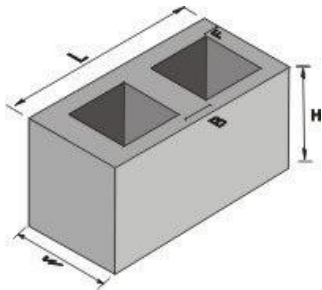


## 2.6 UMUBYIMBA W'UMUKANDARA N'UW'UDUKUTA TW'IMBERE BYA BUROKE ITOBOYE

Umubyimba w'umukandara wa buroke ndetse n'uw'udukuta tw'imbere bya buroke itoboye ntugomba guca muni y'ingero zigaragara mu mbonerahamwe ya mbere.

**Imbonerahamwe ya 1- ingero zo hasi ntarengwa z'umubyimba w'umukandara n'iz'udukuta tw'imbere.**

| Ibipimo ngenderwaho by'ubugali bwa buroke (mm) | Umubyimba w'umukandara (mm) | Umubyimba w'udukuta tw'imbere (mm) |
|------------------------------------------------|-----------------------------|------------------------------------|
| muni cyangwa bingana n'ijana (100)             | 25                          | 25                                 |
| Hejuru y'100 kugera ku 150                     | 25                          | 25                                 |
| Hejuru y'150 kugera kuri 200                   | 30                          | 25                                 |
| Hejuru ya 200                                  | 35                          | 30                                 |



L:length  
W:width  
H:highth  
B:thickness of the Web  
F:Thickness of Face shell

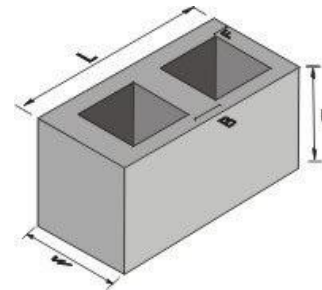
### 3. RAW MATERIALS, CLASSIFICATION AND APPLICATION OF CEMENT BLOCKS AND BRICKS

The raw material for cement blocks and bricks are:

- Cement
- River sand with particles of maximum 1mm and coarse river sand of maximum 5mm
- Stone with a maximum size of 13 mm for bricks or solid blocks and 10mm for hollow and cellular blocks
- Portable Water

### 4. AGGREGATES GRADING FOR MAKING CIMENT BLOCKS AND BRICKS

Aggregates without any foreign matter or if any, not exceeding 10%. Guidelines for grading are given in table 2.



L: uburebure  
w: ubugali  
H:ubuhagarike  
B :umubyimbaw'akumba  
F :umubyimbaw'umukandara

### 3. IBIKORESHO NKENERWA MU GUKORA BUROKE N'AMATAFARI BIRIMO SIMA N'UBURYO BIKORESHWA

Ibikoresho nkenerwa mu gukora buroke n'amatafari arimo sima ni:

- Sima
- Umucanga muto utarengeje mm 1 ndetse n'umucanga munini utarengeje mm 5
- Igaraviye itarengeje mm 13 ku matafari cyangwa buroke zidatoboye, na mm10 kuri buroke zitoboye ndetse n'izifite utunogo;
- Amazi meza

### 4. INGERO Z'UMUCANGA UKORESHWA MU GUKORA BUROKE N'AMATAFARI BIRIMO SIMA

Umucanga ntukwiye kugaragaramo umwanda uwo ari wo wose, ariko igihe ugaragayemo ntugomba kurenga 10 %. Imbonerahamwe ya 2 igaragaza ingano y'umucanga.

Table 2- Recommended aggregates grading for making cement blocks and bricks

| Sieve size<br>mm | Percentage by mass of aggregates<br>passing<br>% |
|------------------|--------------------------------------------------|
| 4,75             | 70-85                                            |
| 2,36             | 50-65                                            |
| 1,18             | 35-50                                            |
| 0,60             | 25-40                                            |
| 0,30             | 10-25                                            |
| 0,15             | 5-15                                             |
| 0,075            | 0-10                                             |

## 5 REQUIREMENTS

### 5.1 Hollow and cellular cement blocks

The hollow blocks shall conform to the following two grades:

a) **Grade A** — These are used as load bearing units and shall have a minimum density of 1500 kg/m<sup>3</sup>

b) **Grade B** — these are used as non- load bearing units and shall have a block density less than 1 500 kg/m<sup>3</sup>, but not less than 1 000kg/m<sup>3</sup>.

### 5.2 Solid cement blocks and bricks

The solid cement blocks and bricks shall conform to the **grade C** and used as load bearing units and shall have a density not less than 1 800 kg/m<sup>3</sup>.

## Imbonerahamwe ya 2 – Ingero z’umucanga zikoreshwa mu gukora buroke n’amatafari birimo sima

| Ingano z’amaso<br>y’akayunguruzo (mm) | Ijanisha mu biro,<br>by’umucanga wanyuze mu<br>kayunguruzo |
|---------------------------------------|------------------------------------------------------------|
| 4,75                                  | 70-85                                                      |
| 2,36                                  | 50-65                                                      |
| 1,18                                  | 35-50                                                      |
| 0,60                                  | 25-40                                                      |
| 0,30                                  | 10-25                                                      |
| 0,15                                  | 5-15                                                       |
| 0,075                                 | 0-10                                                       |

## 5. IBISABWA

### 5.1 Buroke itoboye n’ifite utunogo

Buroke zitoboye zigabanyijemo ibyiciro bibiri bikurikira:

a) **Icyiciro cya mbere (A)** — izi ni buroke zikoreshwa mu nkuta zikorera, zigomba kugira ireme bwite ritari muni ya kg 1500/mm<sup>3</sup>.

b) **Icyiciro cya kabiri (B)** — izi ni buroke zikoreshwa mu nkuta zitikorera, zigomba kugira ireme bwite riri hejuru cyangwa ringana na kg 1000 m<sup>3</sup> ariko riri muni ya kg 1500/m<sup>3</sup>.

### 5.2 Buroke zidatoboye n’amatafari birimo sima

Buroke zidatoboye n’amatafari birimo sima biba mu cyiciro cya **gatatu (C)**, agakoreshwa mu nkuta zikorera kandi bigomba kugira ireme bwite ritari muni ya kg 1800/m<sup>3</sup>.

Table 3 – Physical requirements

| Type of unit                 | Grade            | Density of block<br>Kg/m <sup>3</sup>  | Minimum average compressive strength of units<br>N/mm <sup>2</sup> | Minimum average compressive strength of individual units<br>N/mm <sup>2</sup> |
|------------------------------|------------------|----------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Hollow load bearing unit     | A(3,5)           | Not less than 1 500                    | 3,5                                                                | 2,8                                                                           |
|                              | A(4,5)           |                                        | 4,5                                                                | 3,6                                                                           |
|                              | A(5,5)           |                                        | 5,5                                                                | 4,4                                                                           |
| Hollow non-load bearing unit | B(2,5)<br>B(3,0) | Less than 1500, but not less than 1000 | 2,5<br>3,0                                                         | 1,75<br>2,4                                                                   |
| Solid load bearing unit      | C(5,0)           | Not less than 1800                     | 5,0                                                                | 4,0                                                                           |
|                              | C(7,0)           |                                        | 7,0                                                                | 5,6                                                                           |

## 6 MIX PROPORTIONS

- For high strength blocks and bricks:**

One (1) bag of cement to three (3) level wheelbarrows of aggregate

- For lower strength blocks or bricks:**

One (1) bag of cement to five (5) level wheelbarrows of aggregate

## Imbonerahamwe ya 3 – Ibisabwa ku miterere ya buroke n’amatafari

| Imiterereya buroke/ itafari         | Icyiciro           | Ireme bwite rya buroke muri kg/m <sup>3</sup> | Ikigereranyo cyo hasi cyo gukomera kwa buroke zifatiwe hamwe N/mm <sup>2</sup> | Ikigereranyo cyo hasi cyo gukomera kwa buroke imwe imwe N/mm <sup>2</sup> |
|-------------------------------------|--------------------|-----------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Buroke itoboye yo kwikorera         | A (3,5)            | guhera ku 1500 kujyana hejuru                 | 3,5                                                                            | 2,8                                                                       |
|                                     | A (4,5)            |                                               | 4,5                                                                            | 3,6                                                                       |
|                                     | A (5,5)            |                                               | 5,5                                                                            | 4,4                                                                       |
| Buroke itoboye itikorera            | B (2,5)<br>B (3,0) | Hejuru y’1000 kugera ku 1500                  | 2,5<br>3,0                                                                     | 1,75<br>2,4                                                               |
| Buroke idatoboye /itafari byikorera | C (5,0)            | Guhera ku 1800 kujyana hejuru                 | 5,0                                                                            | 4,0                                                                       |
|                                     | C (7,0)            |                                               | 7,0                                                                            | 5,6                                                                       |

## 6. IBIPIMO BYEMEWE MU GUKORA IMVANGE YA SIMA N’UMUCANGA

- Buroke n’amatafari bikomeye cyane:**

Umufuka umwe (1) wa sima ku ngorofani 3 z’umucanga

- Buroke n’amatafari bidakomeye cyane:**

Umufuka umwe (1) wa sima ku ngorofani 5 z’umucanga.

For equal batching equipments for cement and aggregate:

The cement /aggregate ratio should be of 1:8 i.e. 8 wheelbarrows of aggregate with 1 wheelbarrow of cement.

- The water/cement ratio should be 0.4 for dry materials.
- The wet mix should not be allowed to stand for more than half an hour to avoid the loss of strength of the final products when working in hot weather.

## **7 CURING**

- Blocks and bricks shall be cured to ensure that sufficient moisture is available and that the temperature is suitable for the chemical reaction (hydration) between cement and water to occur.
- Curing process should start 24 hours after demoulding and be continued for at least 7 days in normal weather (20 °C to 25 °C).

## **8 DRYING SHRINKAGE**

The drying shrinkage of the units when unrestrained being the average of three units shall not exceed 0.1 percent

## **9 MOISTURE MOVEMENTS**

The moisture movement of the dried blocks on immersion in water, being the average of three units shall not exceed 0.09 percent.

Iyo imvange ikozwe hifashishijwe igikoreshe kimwe (ingorofani, umufuka...)

Ikigereranyo cya sima ku mucanga kigomba kungana na 1:8, ni ukuvuga ingorofani 1 ya sima ku ngorofani 8 z'umucanga.

- Ikigereranyo cy'amazi/sima kigomba kungana na 0,4 muri buroka/amatafari byumye
- Mu gihe cy'ubushyuhe, imvange ya sima n'umucanga bigitose ntibyangombye kurenza iminota mirongo itatu (igice cy'isaha) bitarakoreshewa kugira ngo hirindwe ko gukomera kwa buroka/amatafari kwaduhuka

## **7 KUHIRA**

- Buroka/amatafari bigomba kuhirwa mu rwego rwo kubungabunga ububobere buhagije hamwe n'igipimo cy'ubushyuhe gikwiraye, kugira ngo habeho imikoranire ishyitse ya sima n'amazi mu gihe cyo gukamuka
- Gahunda yo kuhira igomba gutangira mu masaha 24 nyuma yo kuva mu rutiba igakomeza kugeza byibura ku minsi 7 mu gihe cy'ubushyuhe buri hagati ya 20°C na 25°C.

## **8 KUGABANUKA MU BIPIMO BITEWE NO GUKAMUKA**

Impuzandengo y'igabanuka mu bipimo fatizo bya buri buroka/itafari bitewe no gukamuka ntigomba kurenga 0,1 ku ijanaigihe iyo mpuzandengo y'igabanuka yafatiwe kuri buroka/amatafari atatu.

## **9 UBUBOBERE**

Impuzandengo yo kunywa amazi kuri buroka eshatu zumye iyo zinitse mu mazi ntigomba kurenga 0,09 ku ijana.

**II.PRECAST CONCRETE PAVING BLOCKS —  
SPECIFICATION  
RS 415:2009/EAS 179:2009**

**1 SCOPE**

This Standard specifies requirements for pre-cast concrete paving blocks intended for the construction of low speed roads, industrial and other paved surfaces subjected to all categories of static and vehicular loading and pedestrian traffic.

**2 GENERAL CHARACTERISTICS**

- Concrete paving block is a precast segmental concrete block used in the construction of paved surfaces.
- The blocks should be acceptably free from cracks and other defects that would adversely affect their general appearance or serviceability (or both). Concrete described as ‘natural colour’ shall contain no pigment.
- Paving blocks shall have a work size thickness of not less than 50 mm
- Water reducing admixtures, pigments and accelerating admixtures, if used, shall not contain any materials deleterious to the concrete.
- In composite paving blocks the surface layer shall be formed as an integral part of the block and shall be not less than 5 mm thick.

**II. IBWIRIZA NYARWANDA RY’UBUZIRANENGE No  
RSEAS 179:2009 RIGENA IMITERERE Y’AMAPAVE  
AKOZE MURI BETO**

**1 IBIKUBIYEMO**

Iri bwiriza ry’ubuziranenge rigaragaza imiterere y’amapave akoreshwa mu kubaka imihanda itaragenewe gukoreshwaho umuvuduko mwinshi, amapave yo gusasa mu nganda n’ahandi hantu haterekwa imizigo cyangwa ahanyura imodoka ziyikoreye ndetse n’utuyira tw’abanyamaguru.

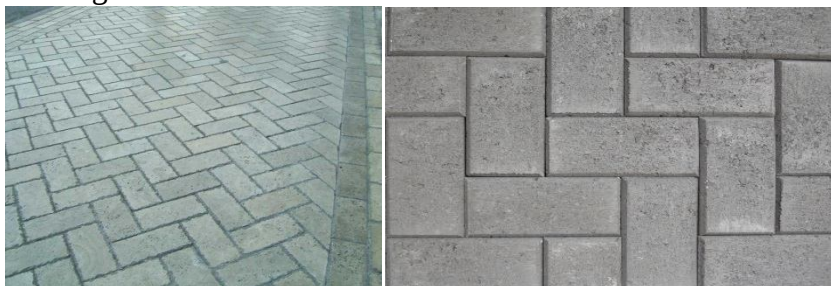
**2 IBIRANGA AMAPAVE**

- Amapave ni ibikoresho bikoze muri beto bikoreshwa mu gupavoma.
- Amapave ntagomba kuba agaragaza kwiya cyangwa afite indi nenge yagira ingaruka ku mikoresherezwe yayo yatumye agaragara nabi cyangwa se byombi.
- Amapave yumye agomba kuba afite umubyimba utari muni ya mm 50.
- Iyo hakoreshejwe utugabanyamazi, uduhindurabara n’utwihutisha gukomera kwa beto pave zikorwamo, tugomba kuba tutarimo ikintu icyo ari cyo cyose cyakwangiza imiterere n’ubukomere bwayo.
- Ipave rigizwe n’urukomatane rw’udupave, ku ipave rigizwe n’urukomatane rw’udupave indiba dufatanirijweho ibarirwa mu bigize iryo pave kandi iyo ndiba ntigomba kujya muni ya mm 5 z’umubyimba.

### 3 TYPES OF PAVING BLOCKS

Paving blocks are classified into two types, that is regular blocks (R) and special blocks (S.)

- **Type R (regular) blocks** shall be rectangular with a nominal size length of 200 mm and a nominal size width of 100 mm.



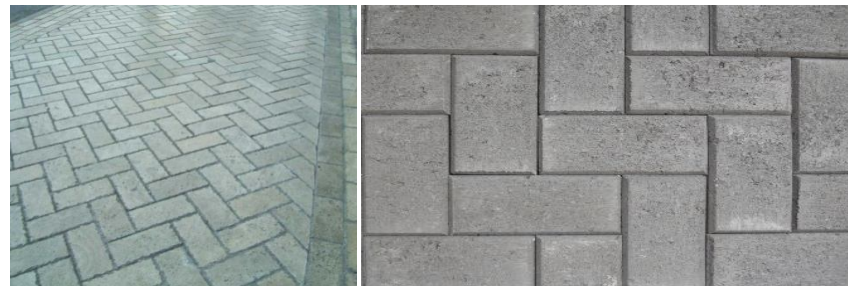
- **Type S (special) blocks** shall be of any shape fitting within a 295 mm square coordinating space and shall have a work size width not less than 80 mm.



### 3 IBYICIRO BY'AMAPAVE

Amapave arimo ibyiciro bibiri aribyo amapave asanzwe (R) n'amapave afite umwihariko (S).

- **Amapave asanzwe (R)**, agomba kuba afite impande z'ishusho y'urukiramende rufite uburebure bwa mm 200 n'ubugali bwa mm 100.



- **Amapave afite umwihariko (S)**, agomba kuba afite impande zifite ishusho itari iy'urukiramende, iyo shusho ikaba ishobora kwicara ku buso butarenze mm<sup>2</sup> 295 kandi umurambararo waryo ukaba utari munsu ya mm 80.



#### 4 RAW MATERIALS

- Cements
- Natural aggregates
- Potable water

#### 5 MARKING

The following information shall be clearly provided

- The name, trademark or other means of identification of the manufacturer;
- The number and date of this standard;
- Type of block;
- Strength grade;
- Nominal dimensions

#### 6 COMPRESSIVE STRENGTHS AND GRADING

Paving blocks shall be graded into three strength categories:

- Heavy duty (H),
- Medium duty (M) and;
- Light duty (L).

The respective compressive strengths for each grade, the thicknesses and the recommended areas of application are specified in the following Table.

#### 4 IBIKORESHO NKENERWA MU GUKORA AMAPAVE

- Sima
- Umucanga
- Amazi meza

#### 5 IBYANDIKWA KU MAPAVE

Ibi bikurikira bigomba kuba byanditse kuri buri pave ku buryo bugaragara:

- Izina, Ikirango cyangwa ubundi buryo bwo kugaragaza aho ryakorewe
- Nimeroy'iri bwiriza ry'ubuziranenge n'igihe ryatangarijwe
- icyiciro ririmo
- Ikigero cy'ubukomere
- Ibipimo ngenderwaho (uburebure, ubugari n'umubyimba)

#### 6 UBUKOMERE N'ICYICIRO CYABWO

Amapave afite ibyiciro by'ubukomere bikurikira:

- Akomeye cyane (H)
- Afite ubukomere buringaniye (M) hamwe,
- Ayoroheje (L)

Ubukomere bujyanye na buri cyiciro cy'ubukomere, umubyimba ndetse naho buri cyiciro kigomba gukoreshwa biri mu mbonerahamwe ikurikira.

**Table 1 — grading criteria and application of paving blocks**

| Grade           | Nominal thickness (mm) | Compressive strength (N/mm <sup>2</sup> ) | Application                                        |
|-----------------|------------------------|-------------------------------------------|----------------------------------------------------|
| Heavy Duty (H)  | 80mm, 60mm             | 49                                        | Main roads, heavy industrial applications          |
| Medium Duty (M) | 60mm                   | 35                                        | Estate roads, domestic driveways and parking areas |
| Light Duty (L)  | 50mm                   | 25                                        | Domestic driveways and parkings, sidewalks         |

**Imbonerahamwe ya 1- Ibigenderwaho mu gushyira mu byiciro amapave n'imikoresherezwe yayo**

| Icyiciro cy'ubukomere   | Umubyimba (mm) | Ubukomere (N/mm <sup>2</sup> ) | Aho akoreshwa                                          |
|-------------------------|----------------|--------------------------------|--------------------------------------------------------|
| Akomeye cyane (H)       | 80mm, 60mm     | 49                             | Imihanda minini, mu nganda nini                        |
| Akomeye biringaniye (M) | 60 mm          | 35                             | Mu midugudu, utuyira two mu ngo na za parikingi        |
| Ayoroheje (L)           | 50 mm          | 25                             | Utuyira two mu ngo, parikingi, utuyira tw'abanyamaguru |

### III. BURNT BUILDING BRICKS — SPECIFICATION: RS EAS 54:1999

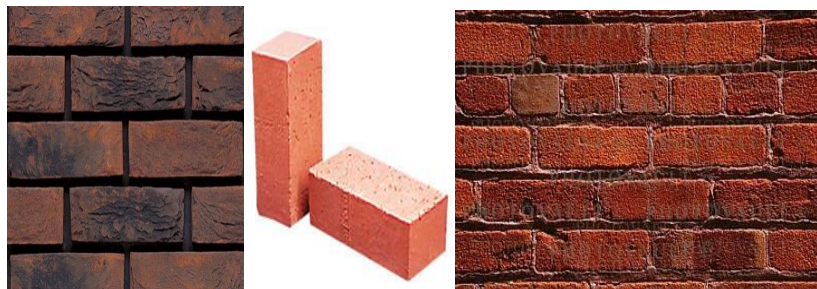
#### 1 SCOPE

This Standard specifies building bricks of burnt clay, shale or brick earth for use in buildings for decorative, structural and non-structural purposes.

#### 2 TYPES BRICKS

There are following types of bricks

- **Solid bricks** :Bricks with no perforations or holes but may have frogs or channels on the bed faces;



- **Perforated bricks**: Bricks where 25% of the brick is uniformly perforated, measured horizontal laying the aggregate thickness of solid material shall not be less than

### III. IBWIRIZA NYARWANDA RY'UBUZIRANENGE No RS EAS 54:1999 RIGENA IMITERERE Y'AMATAFARI AHIYE

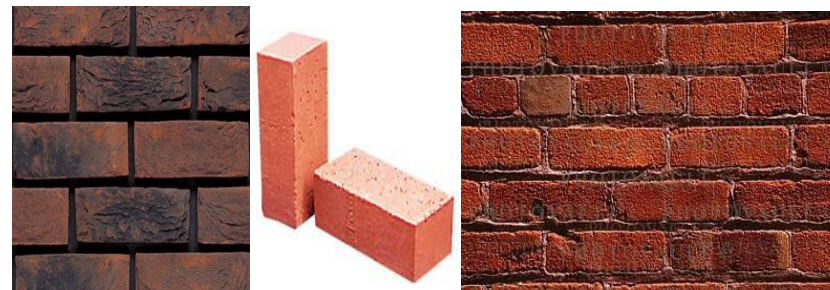
#### 1 IBIKUBIYEMO

Iri bwiriza ry'ubuziranenge rigena imiterere y'amatafari ahiye akozwe mu mabumba agenewe gukoreshwa mu mazu mu rwego rwo gutaka, kubaka inkuta z'inyubako zitandukanye n'izikenewe ahandi.

#### 2 IBYICIRO BY'AMATAFARI AHIYE

Hari ibyiciro bikurikira by'amatafari ahiye:

- **Amatafari adatoboye “Mpunyu”**  
Amatafari adatoboye ntagire n'imyobo ariko akaba ashobora kugira utunogo cyangwa imihiro.

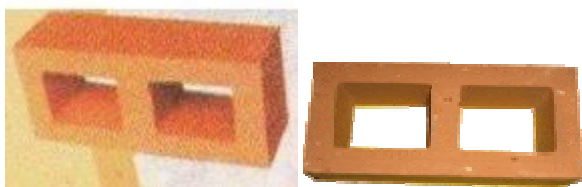


- **Amatafari atobaguye**  
Itafari ritobaguye ni itafari rifite imyenge myinshi ku buryo 25% by'ubuso bw'itafari ryose buba butoboye umujyo umwe, kandi umubyimba w'igice kidatoboye kiri hagati y'imyobo ibiri ntujye muni ya 1/3 cy' ubugali bw'itafari ryose ndetse n'ubuso bwa buri mwobo ntiburenge mm<sup>2</sup> 3000.

one third of the overall width of the brick and area of any hole shall not exceed 3000m<sup>2</sup>;



- **Hollow bricks:** Bricks wherein the perforations, which shall be uniformly distributed, exceed 25% of total volume of a brick.



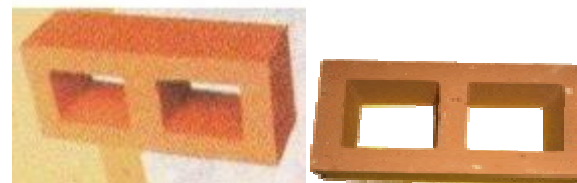
### 3 VARIETIES

There are following variety of bricks

- **Common bricks;** Bricks, which are intended for general building work where appearance is not of importance and which may be cement rendered, plastered or otherwise faced or decorated after installation.



- **Itafari ritoboye:** ni itafari rifite imyobo migari, ishobora kuba umwe cyangwa myinshi igiye umujyho umwe ikagira umubyimba ku buso butoboye urenze 25% by'umubyimba wose w'itafari.



### 3 IBYICIRO BY'IMIKORESHEREZWE Y'AMATAFARI AHIYE

Hashingiwe ku byiciro by'imikoresherezwe y'amatafari ahiye, habaho amatafari akurikira:

- **Amatafari rusange:** Ni amatafari agenewe gukoreshwa ku nyubako muri rusange aho kugaragara neza kwayo biba bititaweho cyane; ashobora kuba yakoterwa hakoreshejwe sima, guterwaho igishahuro n'igipande cyangwa agatakwa hakoreshejwe ubundi buryo.

- **Facing bricks;** Specially made to give an attractive appearance when used without rendering or plaster or other surface treatment of the wall
- **Clinkered bricks;** Bricks which are vitrified or semi vitrified, as might be suitable for damp-proof courses, when their average water absorption by weight is not exceeding 4.5 %.
- **Engineering bricks;** bricks having a comprehensive strength exceeding 50 N/mm<sup>2</sup> and average water absorption (5 hour boiling test) by weight not exceeding 7 %

Depending on durability, the bricks are classified as:

**Internal bricks** which are only suitable for interior, **ordinary bricks** which are only suitable for exterior work but less durable than special bricks and use in a building and **special bricks** durable when used in situation of extreme exposure where the structure may become saturated for long periods, such as retaining walls, sewerage plants and pavings.

- **Amatafari y'ubwiza:** Ni amatafari akoreshwa ku nyubako hakitabwa cyane ku bwiza bw'inyubako butewe n'ayo matafari kandi adakotewe, adateweho igishahuro n'igipande cyangwa ubundi buryo bwose bakwifashishwa hagamijwe kurimbisha urukuta.
- **Amatafari akorwa hongewemo ishwagara kabuhariwe (Clinker):** Ni amatafari akorwa hongewemo ishwagara agatwikwa ku bushyuhe bwo hejuru cyane ku buryo azabasha kurwanya ubukonje kandi akaba afite ubushobozi bwo kunywa amazi butatuma uburemere bwaryo bwiyongera birenze ikigereranyo cya 4,5%
- **Amatafari akomeye cyane:** Amatafari afite ubukomere bushobora kwihanganira ingufu zitsindagira zirenze megapasikari 50 (50N/mm<sup>2</sup>) kandi akaba afite ubushobozi bwo kunywa amazi (butatuma uburemere bwaryo bwiyongera birenze ikigereranyo cya 7% mu gihe cy'amasaha 5).

Hashingiwe ku burambe, amatafari arimo ibyiciro bitandukanye aribyo:

**Amatafari y'imbere,** akaba amatafari agenewe gukoreshwa mu nkuta z'imbere mu nyubako. Hakaba **amatafari rusange** ariyo agenewe gukoreshwa ku nkuta zo hanze ariko ntaramba cyane ugeranije n'**amatafari yihariye** kuko yo ubukomere bwayo buba bujyanye n'umwihariko w'aho agenewe gukoreshwa.

#### 4 PROPERTIES AND DIMENSIONS

Bricks when struck together or when struck by a steel trowel or hammer shall give out a clear ring.

The formats of bricks shall conform to the value in table 1.

Table 1 — Standard formats

| Size No. | Normal size (mm) | Work size (mm) |       |        |
|----------|------------------|----------------|-------|--------|
|          |                  | Length         | Width | Height |
| 1        | 200 x 100 x 75   | 190            | 90    | 65     |
| 2        | 200 x 100 x 100  | 190            | 90    | 90     |
| 3        | 300 x 100 x 75   | 290            | 90    | 65     |
| 4        | 300 x 100 x 100  | 290            | 90    | 90     |

Bricks shall be deemed to have conformed dimensionally to this standard when the overall measurements of 10 bricks placed side-by-side falls within the appropriate limits given in the table 2.

#### 4 IBIGIZE AMATAFARI AHIYE N'INGANO MU BIPIMO

Iyo amatafari akomanyeho, akomanzweho hifashishijwe umwiko cyangwa inyundo agomba gutanga ijwi rirangira. Amatafari agomba kugira kimwe mu rukomatane rw'ingano mu bipimo bigaragara mu mbonerahamwe ya 1.

##### Imbonerahamwe ya 1- Urukomatane rw'ingano mu bipimo by'itafari rihye

| SNo | Ibipimo ngenderwaho (mm) | Ibipimo by'itafari ryumye (mm) |         |             |
|-----|--------------------------|--------------------------------|---------|-------------|
|     |                          | Uburebure                      | ubugari | ubuhagarike |
| 1   | 200x100x75               | 190                            | 90      | 65          |
| 2   | 200x100x100              | 190                            | 90      | 90          |
| 3   | 300x100x75               | 290                            | 90      | 65          |
| 4   | 300x100x100              | 290                            | 90      | 90          |

Amatafari yujuje ibipimo bisabwa n'iri bwiriza ry'ubuziranenge agaragazwa n'uko iyo hafashwe ibipimo by'amatafari icumi (10) agapimirwa rimwe yegeranijwe atanga ibipimo ntarengwa bigaragara mu mbonerahamwe ya 2.

Table 2 — Appropriate limits of dimensions

| Size No. | Work size<br>mm | Limit of size (10 units) |              | Dimensions |
|----------|-----------------|--------------------------|--------------|------------|
|          |                 | Minimum (mm)             | Maximum (mm) |            |
| 1        | 190             | 1 860                    | 1 940        | Length     |
|          | 90              | 870                      | 930          | Width      |
|          | 65              | 630                      | 670          | Height     |
| 2        | 190             | 1 869                    | 1 940        | Length     |
|          | 90              | 870                      | 930          | Width      |
|          | 90              | 870                      | 930          | Height     |
| 3        | 290             | 2 850                    | 2 950        | Length     |
|          | 90              | 870                      | 930          | Width      |
|          | 65              | 630                      | 670          | Height     |
| 4        | 290             | 2 850                    | 2 950        | Length     |
|          | 90              | 870                      | 930          | Width      |
|          | 90              | 870                      | 930          | Height     |

The compressive strength shall be as provided in Table 3

Table 3— Minimum compressive strength

| Designation                         | Grade | Minimum compressive strength<br>(N/mm <sup>2</sup> ) |
|-------------------------------------|-------|------------------------------------------------------|
| Engineering bricks                  | A     | 48.5                                                 |
| Special bricks — facing and common  | B     | 28                                                   |
| Ordinary bricks — facing and common | C     | 7                                                    |
| Internal bricks                     | D     | 3                                                    |

## Imbonerahamwe ya 2 - Ibipimo ntarengwa

| No | Ibipimo by'itafari ryumye | Igipimo cy'amatafari 10 |                    | Igipimwa    |
|----|---------------------------|-------------------------|--------------------|-------------|
|    |                           | Igipimo cyo hasi        | Igipimo cyo hejuru |             |
| 1  | 190                       | 1860                    | 1940               | Uburebure   |
|    | 90                        | 870                     | 930                | Ubugari     |
|    | 65                        | 630                     | 670                | ubuhagarike |
| 2  | 190                       | 1869                    | 1940               | Uburebure   |
|    | 90                        | 870                     | 930                | Ubugari     |
|    | 90                        | 870                     | 930                | ubuhagarike |
| 3  | 290                       | 2850                    | 2950               | Uburebure   |
|    | 90                        | 870                     | 930                | Ubugari     |
|    | 65                        | 630                     | 670                | ubuhagarike |
| 4  | 290                       | 2850                    | 2950               | Uburebure   |
|    | 90                        | 870                     | 930                | Ubugari     |
|    | 90                        | 870                     | 930                | ubuhagarike |

Ubukomere bw'amatafari bugaragara mu mbonerahamwe ya 3

## Imbonerahamwe ya 3 –Igipimo ntarengwa cy'ubukomere bwo hasi

| Inyito                                      | Icyiciro cy'ubukomere | Igipimo cyo hasi cy'ubukomere |
|---------------------------------------------|-----------------------|-------------------------------|
| Amatafari akomeye cyane                     | A                     | 48,5                          |
| Amatafari yihariye (y'ubwiza n'aya rusange) | B                     | 28                            |
| Amatafari asanzwe (y'ubwiza n'aya rusange)  | C                     | 7                             |
| Amatafari akoreshwa mu nkuta z'imbere       | D                     | 3                             |

## **5 ORDER AND SUPPLY CONDITIONS**

- The manufacturer or his representative shall state on his delivery document the strength grade, sizes of bricks and the number of bricks supplied.
- The manufacturer shall also provide a certificate stating that the bricks have been tested for compliance with this standard.

## **5. INYANDIKO NKENERWA HAGATI Y'UGURA N'UGURISHA**

- Ukora amatafari cyangwa umuhagarariye agomba guha umuguzi inyandiko ziherekeza amatafari zikagaragaza icyiciro cy'ubukomere, umubare w'amatafari agurishije ndetse n'ibipimo byayo.
- Ukora amatafari kandi agomba guha umuguzi icyemezo cy'uko amugurishije amatafari yapimwe kandi ko yujuje ibisabwa n'iri bwiriza ry'ubuziranenge.

#### IV. BURNT CLAY BUILDING BLOCKS — SPECIFICATION; RS EAS 94: 1999

##### 1 SCOPE

This Standard specifies requirements for type, quality, dimensions and other physical characteristics, of burnt clay, shale or brickearth building blocks for use in buildings for structural and non-structural purposes.

##### 2 TYPES AND PROPERTIES

- **Blocks:** Walling or flooring unit which any one of the dimensions, that is, length, width or height with 300 mm x 100 mm x 100 mm nominal size.
- **Perforated blocks:** Blocks where 25% of the block is uniformly perforated, measured horizontal laying the aggregate thickness of solid material shall not be less than one third of the overall width of the block and area of any hole shall not exceed 3000mm<sup>2</sup>.



#### IV. IBWIRIZA NYARWANDA RY'UBUZIRANENGE No RSEAS94: 1999 RIGENA IMITERERE YA BUROKE ZIHIYE ZIKOZE MUIBUMBA

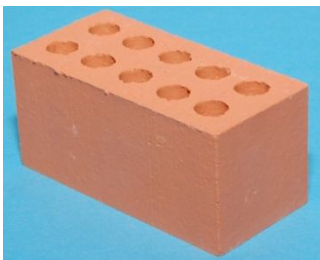
##### 1 IBIKUBIYEMO

Iri bwiriza rigena ibisabwa ku mabumba akoreshwa mu gukora buroke zihiye, ibyiciro bya buroke zihiye, ikigero cy'ubwiza, ingano mu bipimo no ku bindi biziranga.

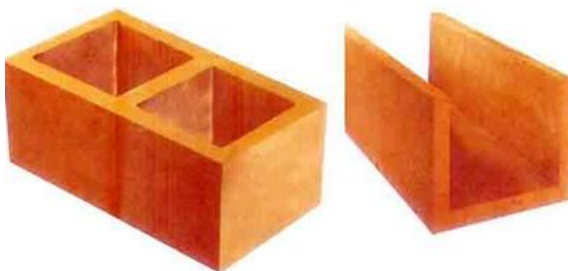
##### 2 IBYICIRO BYA BUROKE ZIHIYE N'UKO ZIKOZE

- **Buroke:** ni igikoresho cy'ubwubatsi gikoreshwa mu kubaka inkuta cyangwa amadari aho usanga gifite rumwe mu bipimo fatizo bikurikira, uburebure bwa mm 300, ubugari bwa mm 100 cyangwa se ubuhagarike bwa mm 100.
- **Buroke itobaguye:** ni buroke ifite imyenge myinshi ku buryo 25% by'ubuso bwa buroke yose butoboye umujyo umwe, kandi umubyimba w'igice kidatoboye kiri hagati y'imyobo ibiri ntujye munsu ya 1/3 cy' ubugali bwa buroke ndetse n'ubuso bwa buri mwobo ntiburenge mm<sup>2</sup> 3000

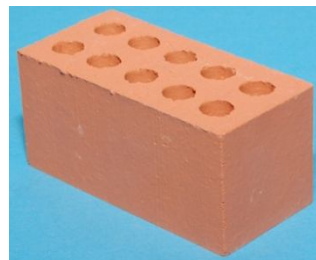
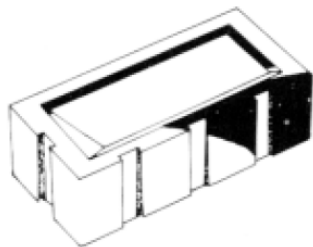




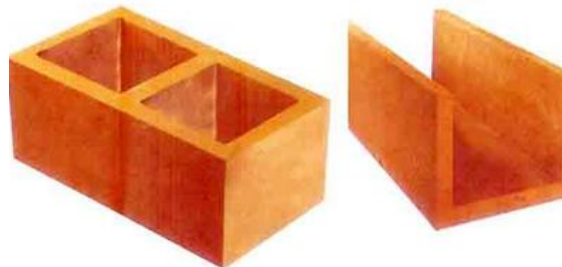
- **Hollow blocks:** Blocks wherein the perforations that shall be uniformly distributed, exceed the limits specified for perforated blocks.



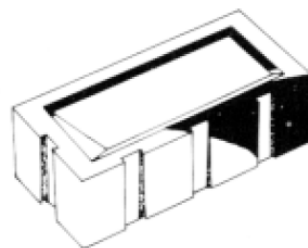
- **Cellular blocks:** Blocks where in cavities, (holes closed at one end) do not exceed 20 % of the volume of the block.



- **Buroke itoboye:** ni buroke ifite imyobo migari, ishobora kuba umwe cyangwa myinshi igiye umujyho umwe ikagira umubyimba ku buso butoboye urenze 25% by'umubyimba wose wa buroke, ndetse buri mwobo ukaba urengeje ubuso bwa mm<sup>2</sup> 3000.



- **Buroke ifite utunogo:** ni buroke ifite akanogo kamwe cyangwa twinshi tutinjiramo imbere cyane kandi umubyimba w'ubuso butoboye nturange 20 % by'umubyimba wose wa buroke.



### 3 BLOCKS FOR WALLING

The compressive strength of blocks shall be not less than 1.4 N/mm<sup>2</sup> for non-load bearing blocks, not less than 3.0 N/mm<sup>2</sup> for load bearing internal wall and not less than 14.0 N/mm<sup>2</sup> for structural floors and roofs.

### 4 DIMENSIONS

The thickness of any shell shall not be less than 10 mm and that of the web shall not be less than 8mm.

Sizes of blocks for structural floors shall conform to the value in Table 1.

### 3 BUROKE ZISHOBORA KUBAKA INKUTA

Buroke zavuzwe haruguru zishobora kubaka inkuta zigomba kuba zifite ubukomere butari muni ya:

- 1,4N/mm<sup>2</sup> ku nkuta zitikorera,
- 3,0N/mm<sup>2</sup> ku nkuta zikorera (WLB),
- 14,0N/mm<sup>2</sup> ku madari n'ibisenge.

### 4 INGANO MU IBIPIMO

- Umubyimba w'umukandara wa buroke ntugomba kujya muni ya mm10, uw'udukuta tw'imbere muri buroke ntugomba kujya muni ya mm 8.

Imbonerahamwe ya 1 igaragaza ingano mu bipimo bya buroke zikoreshwa mu kubaka amadari n'ibisenge.

Table 1 – Standard formats for structural floor blocks

| Length (mm)  |           | Width (mm)   |           | Height (mm)  |           |
|--------------|-----------|--------------|-----------|--------------|-----------|
| Nominal Size | Work Size | Nominal Size | Work Size | Nominal Size | Work Size |
| 200          | 195       | 300          | 295       | 100          | 100       |
| 225          | 220       | 375          | 370       | 125          | 125       |
|              |           |              |           | 150          | 150       |
|              |           |              |           | 175          | 175       |
|              |           |              |           | 200          | 200       |
|              |           |              |           | 225          | 225       |
|              |           |              |           | 250          | 250       |
|              |           |              |           | 275          | 275       |
|              |           |              |           | 300          | 300       |

**Imbonerahamwe ya 1 ingano mu bipimo bya buroke zikoreshwa mu kubaka amadari ibisenge**

| Uburebure(mm)       |                          | Ubugari(mm)         |                          | Ubugarike(mm)       |                          |
|---------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|
| Ibipimo ngenderwaho | Ibipimo bya buroke yumye | Ibipimo ngenderwaho | Ibipimo bya buroke yumye | Ibipimo ngenderwaho | Ibipimo bya buroke yumye |
| 200                 | 195                      | 300                 | 295                      | 100                 | 100                      |
| 225                 | 220                      | 375                 | 370                      | 125                 | 125                      |
|                     |                          |                     |                          | 150                 | 150                      |
|                     |                          |                     |                          | 175                 | 175                      |
|                     |                          |                     |                          | 200                 | 200                      |
|                     |                          |                     |                          | 225                 | 225                      |
|                     |                          |                     |                          | 250                 | 250                      |
|                     |                          |                     |                          | 275                 | 275                      |
|                     |                          |                     |                          | 300                 | 300                      |

**Imbonerahamwe ya 2 igaragaza ibipimo bya buroke zikoreshwa mu kubaka inkuta.**

Sizes for walling blocks shall conform to the value in Table 2.

Table 2 – Standard formats for walling blocks

| Length (mm)  |           | Height (mm)  |           | Width (mm)   |           |
|--------------|-----------|--------------|-----------|--------------|-----------|
| Nominal Size | Work Size | Nominal Size | Work Size | Nominal Size | Work Size |
| 300          | 290       | 225          | 225       | 75           | 65        |
|              |           | 300          | 300       | 100          | 90        |
|              |           | 400          | 400       | 150          | 140       |
|              |           |              |           | 200          | 190       |
|              |           |              |           | 225          | 215       |

## Imbonerahamwe ya 2 – Ibipimo fatizo bya buroke zikoreshwa mu kubaka inkuta

| Uburebure(mm)        |                          | Ubugari(mm)          |                          | Ubugarike(mm)        |                          |
|----------------------|--------------------------|----------------------|--------------------------|----------------------|--------------------------|
| Ibipimo ngender waho | Ibipimo bya buroke yumye | Ibipimo ngender waho | Ibipimo bya buroke yumye | Ibipimo ngender waho | Ibipimo bya buroke yumye |
| 200                  | 290                      | 225                  | 225                      | 75                   | 75                       |
|                      |                          | 300                  | 300                      | 100                  | 90                       |
|                      |                          | 400                  | 400                      | 150                  | 140                      |
|                      |                          |                      |                          | 200                  | 190                      |
|                      |                          |                      |                          | 225                  | 215                      |

### 5 ORDER AND SUPPLY

- The manufacturer or his representative shall state on his delivery document the type and sizes of blocks supplied.
- The manufacturer shall also provide a certificate stating that the blocks have been tested for compliance with this standard.

### 6 MARKING

Blocks shall be legibly and indelibly marked with the following:

- Manufacture's name or trade mark;
- WLB — for load bearing wall blocks.

### 5 INYANDIKO NKENERWA HAGATI Y'UGURA N'UGURISHA

- Ukora buroke cyangwa umuhagarariye agomba gutanga inyandiko ziherekeza buroke agurishije zikagaragara icyiciro n'ingano byazo.
- Ukora buroke agomba kugaragaza kandi icyemezo cy'uko buroke agurishije zapimwe kandi ko zujuje ibisabwa n'iri bwiriza ry'ubuziranenge.

### 6 IBYANDIKWA KURI BUROKE

Buroke zigomba kuba zanditseho ku buryo bugaragara kandi budasibangana ibi bikurikira:

- Izina ry'uzikora cyangwa ikirango cye,
- Inyuguti “WLB” kuri buroke zikoreshwa mu kubaka inkuta zikorera.