



**ANTALIA GROUP**

**E W B**

# CATALOG

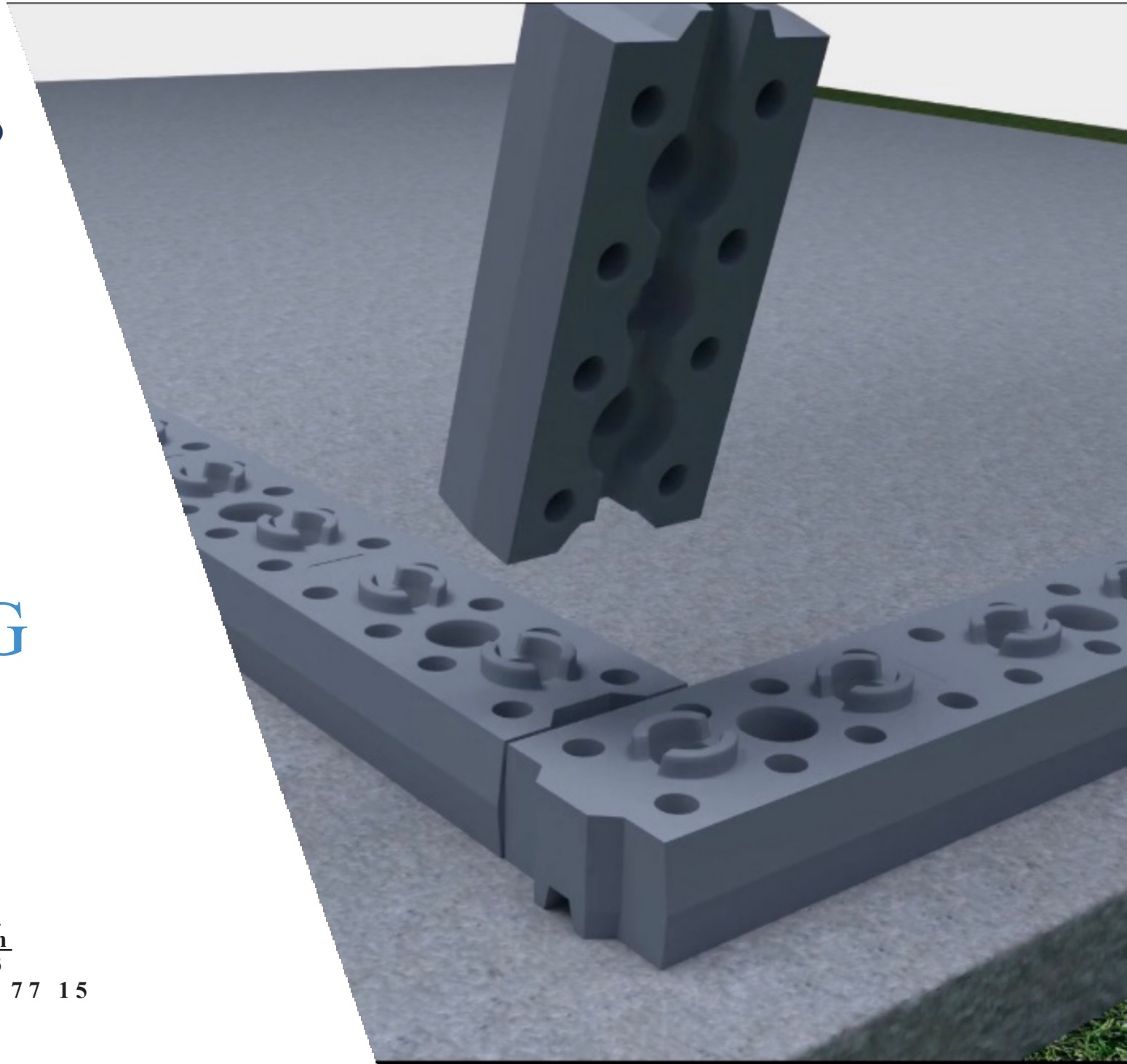
**CONTACT**

[www.antaliagroup.com](http://www.antaliagroup.com)

[info@antaliagroup.com](mailto:info@antaliagroup.com)

Gsm:+90 533 763 03 03

Whatsapp:+971 52 830 77 15





**ANTALIA GROUP**



**Innovative and  
Ecological Solutions**



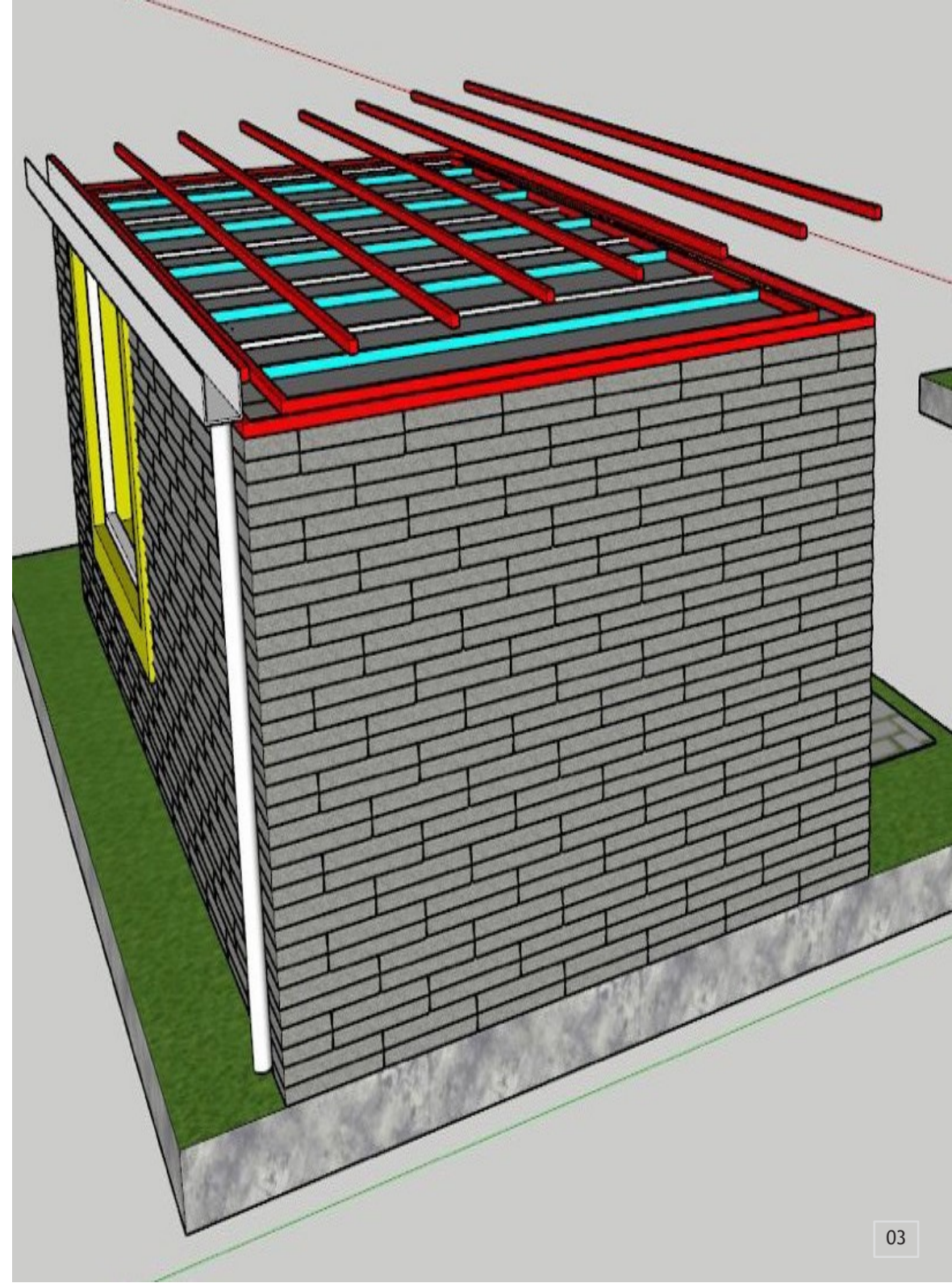


## About Us



We are a newly established team with innovative and ecological ideas. At the same time, we have devoted ourselves to recycling technology to prevent the consumption of the world's limited resources. By offering ecological, strong, durable, ergonomic and recycled lego bricks to the construction sector, we produce environmentally friendly and economical products.

- EWB is an Ecological / Environmentalist product. Heat or harmful chemicals are not used during its production.
- No foundation digging, no concrete pouring in projects that you will build with EWB lego bricks.
- EWB With Lego bricks, labor cost is almost negligible.





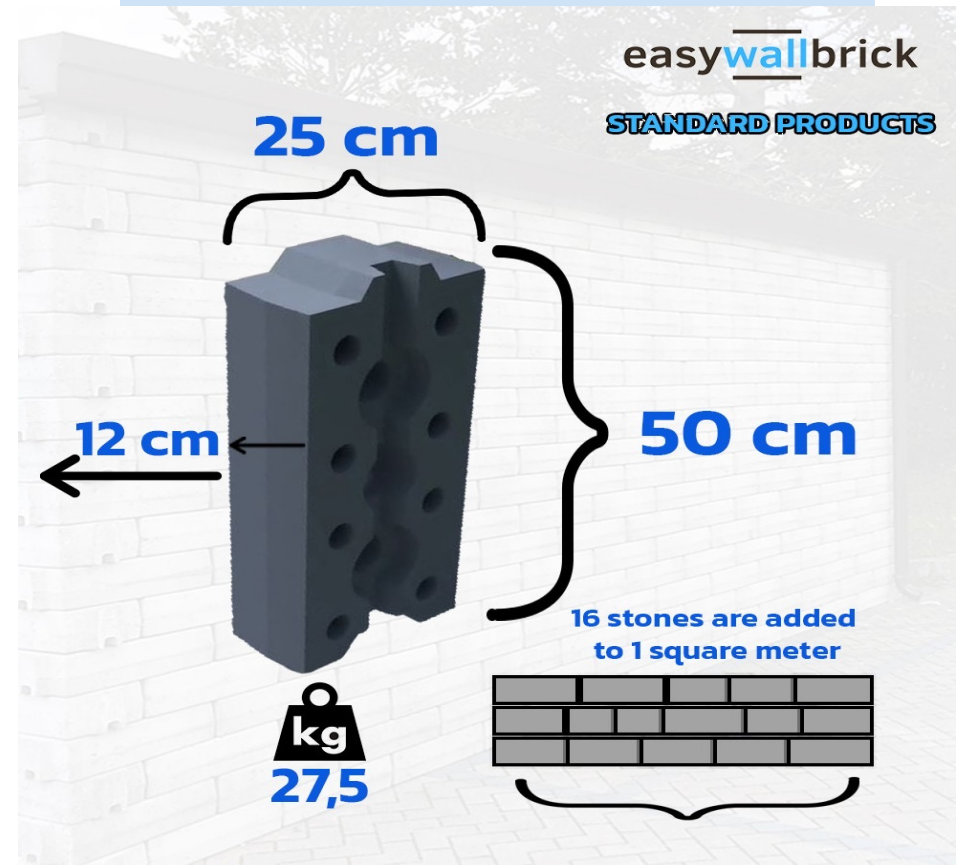


# OUR PRODUCTS

## STANDARD PRODUCTS

EWB lego bricks allow fast construction of garden walls, line walls, porches, patios and simple structures.

EWB lego bricks have the advantage of being transported. Brick (briquette) contents can be arranged according to the needs of the building. Thanks to the wet casting technology, lego brick designs are made suitable for the purpose, and they are brought together quickly thanks to their interlocking structures.







Don't limit your dreams



# BALLISTIC PRODUCTS



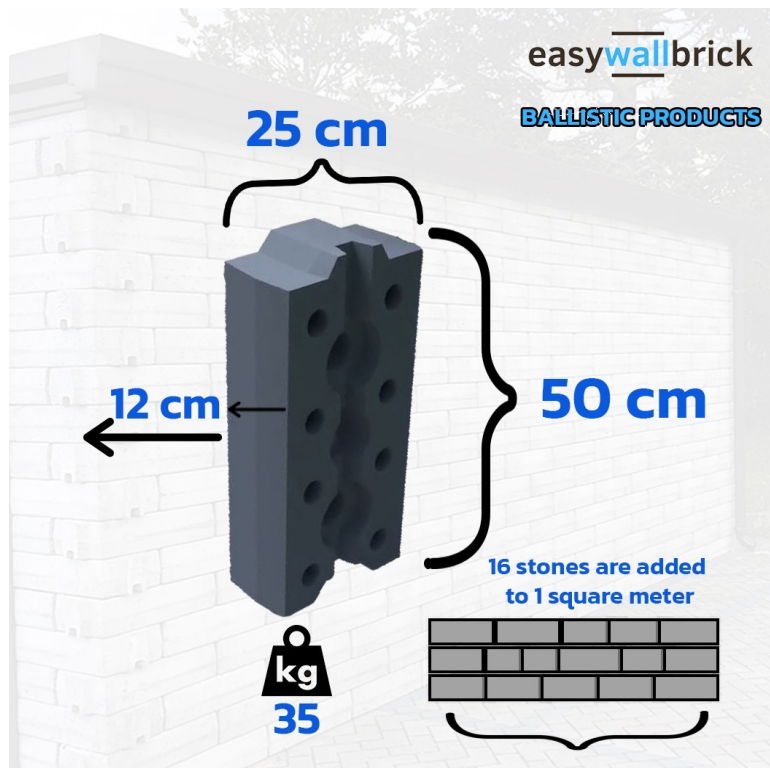
With EWB; Security cabins, checkpoints, guardianship and conversion walls can be built. All kinds of buildings where safety is at the forefront are built in as little as a day using low labor and less materials. It can be used for all building needs. Security is important. The construction phase and application

Thanks to EWB production technology (wet casting method), while legobricks (Briquette) are being prepared, additions are made to the components against ballistic interference. In this way, each EasyWall-Brick Lego brick has ballistic, bulletproof protection.



**ANTALIA GROUP**

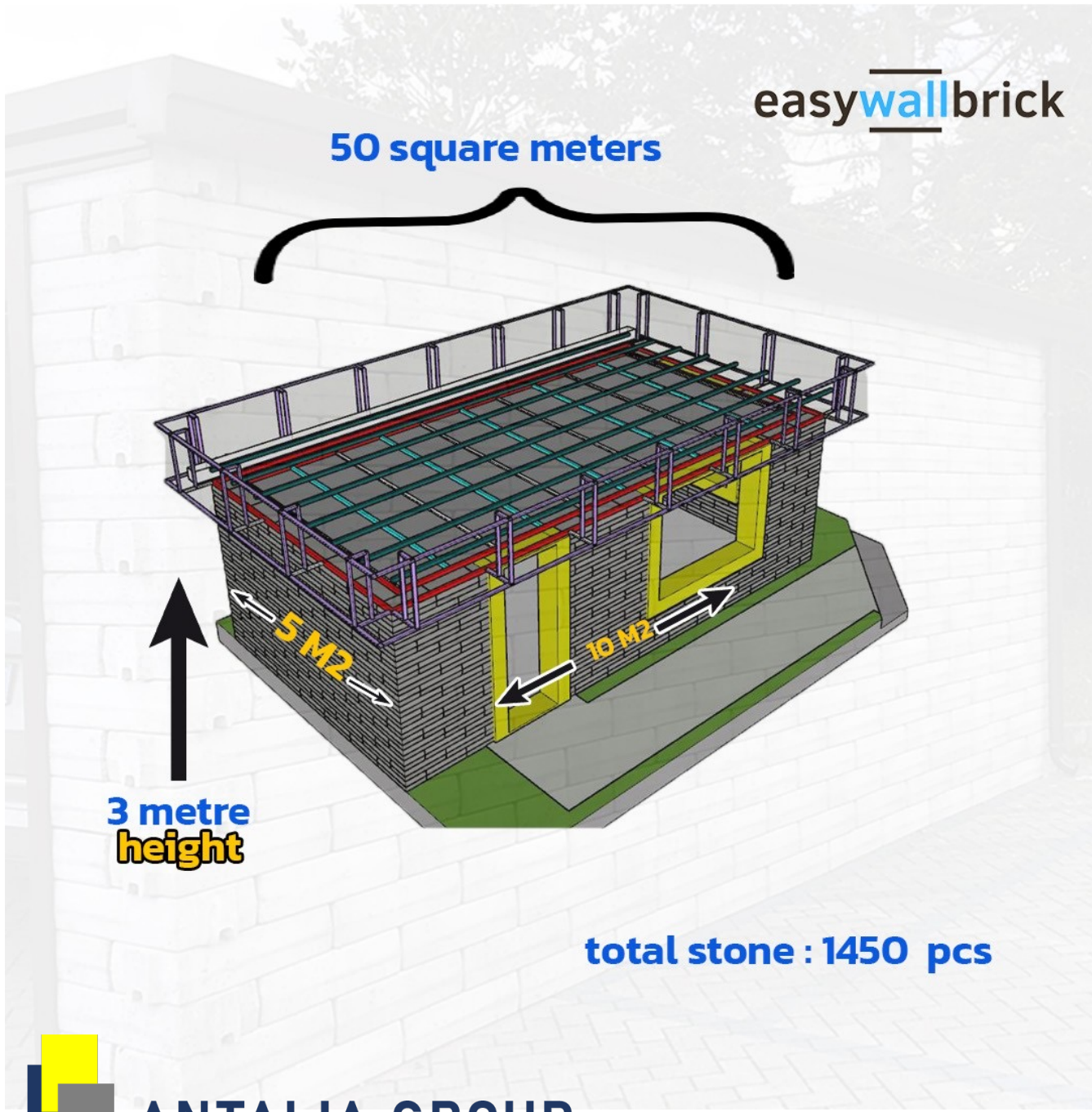




With EWB; Security cabins, checkpoints, guardianship and conversion walls can be built. All kinds of buildings where safety is at the forefront are built in as little as a day using low labor and less materials. It can be used for all building needs.



**EWB are eco-logical bricks, measuring 50 \* 25cm, with a mobile system. With them, you can design the house you want in 1 day, change the shape of your house whenever you want or else you can move it somewhere.**







## ANTALIA GROUP



General properties of EWB bricks;

There is no need for workmanship, mortar or any extra material.

It is ecological, produced with natural or recycled raw materials and is 100% recyclable.

Safe, the innovative fixing system guarantees the stability of the wall even if you do not use iron inside.

Many tests have been carried out on the Easy Wall Brick to verify that it works. Also on request it is ballistic, confirms the fire resistance and you can use it for private buildings as well.

It does not contain any substance harmful to human health.

It is economical, the easy use of Easy Wall Brick and the possibility of using a lot of time will provide you with your building.

It provides the opportunity to recover the labor cost for the workers involved in the construction, calculated per m<sup>2</sup>

the price will always be less than for a prefabricated or wooden building.







**ANTALIA GROUP**



- Ecologic: The EWB is produced with natural or recycled raw material and can be recycled 100%

- Friendly usage: The EWB can be used directly to the final customer that can create every kind of construction following his needs

- Mobile: Thanks to the innovative system of fixing you don't need any kind of glue to fix the bricks together, in this way you can move your construction any time you want



**Application Date and Number:** 22.02.2022 / 1036052

**TECHNICAL REPORT  
ON  
“EASY WALL BRICK” WALL ELEMENTS**

*In preparation of this report, the regulations of ITU Revolving Fund have been followed.*



– Prepared by–

**Prof. Dr. Fethi KADIOĞLU – Prof. Dr. Özkan ŞENGÜL**

*Istanbul Technical University  
Civil Engineering Faculty, Department of Civil Engineering*

**Application Date and Number:** 22.02.2022 / 1036052

**TECHNICAL REPORT  
ON  
“EASY WALL BRICK” WALL ELEMENTS**

**1. SUBJECT**

On behalf of the “EASY WALL BRICK” company, Nilüfer EROL DEMET requested various tests on the briquette / brick wall elements branded “Easy Wall Brick”, with the application letter dated 22/02/2022. In this letter, it was stated that there are two different types wall elements, named as standard and ballistic. In addition, it was declared that bullet resistance tests were carried out on the ballistic wall elements. The results of the bullet resistance tests have been presented to our committee for evaluation.

This report has been prepared with the approval of the ITU Faculty of Civil Engineering Dean's Office, dated 22/02/2022 and numbered 1036052. Various tests were carried out on the wall elements at ITU laboratory. In addition, the report of the bullet resistance tests, which is stated to have been made at the shooting range named “Tekno Poligon”, has been presented to us by the “Easy Wall Brick” company. Many photos and some video footage presented together with the bullet resistance test were also evaluated. This technical report has been prepared within the framework of the opinions reached based on the tests carried out at ITU and the bullet resistance test results sent to our committee.

**2. TESTS CARRIED OUT IN ITU CIVIL ENGINEERING FACULTY**

**2.1. Specimens Sent**

It has been stated by “Easy Wall Brick” company that the wall elements subject to the evaluation are of two types, standard and ballistic, both made of concrete. One sample from each type was sent to ITU and the nominal dimensions of the samples were 50×25×12.5 cm. Along the heights of the wall elements (in the shortest direction) there are eight relatively small circular holes and three





larger ones. There is also a channel on the bottom surface of the elements that continues along the long direction. On the upper surface, there are a total of four elements around two of the large holes. The wall elements described above are shown in Photo-1. Concrete cubic samples of 10×10×10 cm taken during the production of these elements were also sent to ITU along with the wall elements. It was stated that the cube samples were brought to ITU after they were taken out of the molds. Until testing, the cubes were cured in lime-saturated water at 20°C in the ITU Civil Engineering Faculty Building Materials Laboratory.



Photo-1: Wall elements

## 2.2. Tests Performed

### 2.1.1. Unit Weight

To obtain the unit weights of the wall elements, the dry weights and volumes of the samples were determined in the ITU Faculty of Construction Materials Laboratory, then the dry unit weights were calculated and the results are shown in Table-1.

Table-1. Dry unit weights of the wall elements

Sample Type	Dry unit weights (kg/m <sup>3</sup> )
Standard	2476
Ballistic	3430




### 2.1.2. Compressive Strength

Compressive strengths of the cube samples were obtained in ITU Civil Engineering Faculty Building Materials Laboratory, according to the standard TS EN 12390-3 (*Turkish Standard TS EN 12390-3: Testing hardened concrete-Part 3: Compressive strength of test specimens*). The test results are shown in Table-2.

Table-2. Compressive strengths of the wall elements

Sample Type	Sample No	Sample Sizes (mm x mm)	Failure Load (kN)	Cube Compressive Strength (N/mm <sup>2</sup> )	
Standard	1	100 × 100 × 100	491	49,1	49,2
	2	100 × 100 × 100	494	49,4	
Ballistic	1	100 × 100 × 100	592	59,2	59,3
	2	100 × 100 × 100	595	59,5	

### 2.1.3. Splitting Tensile Strength

Splitting tensile strengths of the cube samples were obtained in ITU Civil Engineering Faculty Building Materials Laboratory, according to the standard TS EN 12390-3 (*Turkish Standard TS EN 12390-3: Testing hardened concrete - Part 6: Tensile splitting strength of test specimens*). The test results are shown in Table-3.

Table-3. Splitting tensile strengths of the wall elements

Sample Type	Sample No	Sample Sizes (mm x mm)	Splitting Load (kN)	Splitting tensile strength (N/mm <sup>2</sup> )	
Standard	1	100 × 100 × 100	73,1	4,7	4,7
	2	100 × 100 × 100	75,7	4,8	
Ballistic	1	100 × 100 × 100	77,9	5,0	5,1
	2	100 × 100 × 100	81,5	5,2	




#### 2.1.4. Water Absorption by Weight

To obtain the unit weights of the wall elements, the dry and saturated weights of the samples were determined in ITU Faculty of Civil Engineering, Building Materials Laboratory. The water absorption by weight were calculated and the results are shown in Table-4.

Table-4. Water absorption of the wall elements

Sample Type	Water absorption by weight (%)
Standard	4,5
Ballistic	2,5

### 3. BULLET RESISTANCE REPORT PREPARED BY TECHNOLIGON COMPANY

The Bullet Resistance Test Report prepared by the shooting range named "Tekno Poligon" was submitted to our committee by the "Easy Wall Brick" company. In the report, it is stated that a wall was built using the "ballistic" wall elements and a Bullet Resistance test was carried out in accordance with the EN 1523 standard. Various photos are given in the appendix of the report. In addition, many photos and video footage recorded during the bullet resistance tests were also presented to our committee by the "Easywall Brick" company. It is understood from the report prepared by the "Tekno Poligon" that three successful hits were fired at the wall from various distances, using firearms of different characteristics. It has been reported that there were pop-outs on the surface of the bricks as a result of the shots made with the two of the firearms (Glock and MP5). For the shots made with the other gun (Sniper 762x51) using two different types of bullets, it was mentioned that pits reaching a depth of approximately 1.5 cm were formed on the concrete surfaces. It is stated in the report that no bullets pierced the ballistic wall elements. The Bullet Resistance Test Report prepared by "Tekno Poligon" shooting range is summarized in Table- 5.




5

Table-5. Summary of the bullet resistance report prepared by "Tekno Poligon" for the wall named "Ballistics"

Type of weapon and bullet diameter	Bullet exit velocity (m/sn)	Test range (m)	Observation after the shot
Glock – 9 mm hand gun	370	5	Pop out on the surface
		10	Pop out on the surface
		15	Pop out on the surface
MP5 – 9 mm (fmj) weapon	400	5	Pop out on the surface
		10	Pop out on the surface
		15	Pop out on the surface
Sniper 762x51 rifle – soft point	800	15	Pit with 1.5 cm depth
Sniper 762x51 rifle – full metal jacket	800	15	Pit with 1.5 cm depth

### 4. EVALUATION

When the test results obtained at ITU Faculty of Civil Engineering are examined, it can be seen from Table-2 that the 28-day concrete cube compressive strength of the briquette/brick wall elements named "standard" was 49.2 MPa. It can be said that the values such as the unit weight, splitting tensile strength and water absorption obtained on these samples were in the range of expected values and the test results are compatible with each other. According to these test results, it is understood that the concrete classes in the samples coded as "standard" were at the level of C40 concrete class. In addition, as seen in Table-1, the unit volume weight of these concretes was 2476 kg/m<sup>3</sup>, which is equal to or slightly higher than normal concrete unit weights. Unit weight indirectly reflects the placement of concrete. The surfaces of the tested samples were examined after the splitting tensile tests and it was observed that the concretes did not contain pores, which indicates that the concrete production and placing in the molds were done properly.




6



It has been concluded that the compressive strength of approximately 50 MPa obtained from the "standard" samples can be considered to be in the C40 concrete class, and this strength is sufficient for the wall applications to be made using these elements.

It is seen that the dry unit weight of the wall element branded "ballistic" is 3440 kg/m<sup>3</sup>. According to the TS EN 206 (Turkish Standard TS EN 206: Concrete - Specification, performance, production and conformity) standard, concretes with a dry unit volume weight higher than 2600 kg/m<sup>3</sup> are classified as heavyweight concrete. When evaluated in this respect, it can be concluded that the wall elements called "ballistic" are in the heavyweight concrete class. It has also been observed that this type of concrete was also properly placed.

The 28-day cube compressive strength of the samples named "ballistic" was approximately 60 MPa. It is understood that the strengths of these concretes were higher, and the split tensile strength and water absorption values were compatible with this compressive strength. It is seen that the samples with higher compressive strength have higher splitting strength and lower water absorption. This is due to the microstructure of the concretes and with the reduction of the water/cement ratio a more compact concrete is obtained and the strength increases. Within the limits of these tests, it has been concluded that the concrete properties are sufficient and suitable for wall element applications.

It has been observed that a wall can be obtained by stacking the briquette/brick wall elements on top of each other. The walls made with these briquette/brick materials are shown in Photo-3. It has been understood that the wall elements can be stacked on top of each other due to their shape, uniformity can be achieved between different wall elements, the geometry of the elements provide the connection of the elements to each other, and it is possible to make a 90-degree turn in the corners by placing the elements in a vertical direction when necessary. In addition, due to the holes on the briquette / brick wall elements, it provides an advantage to allow the desired cable / pipe passage through the walls to be built.



Photo-2: Some photos of a wall made with the elements

The Bullet Resistance Test Report prepared by the shooting range named "Tekno Poligon" was sent to our committee by the "Easywall Brick" company. In the report, it has been stated that the bullet resistance test was carried out on a sample wall made with the product named "ballistic" and that no bullet could pierce the "ballistic" bricks in the shots made. According to the results of these tests, it is understood that the wall made with ballistic bricks is resistant to bullets within the limits of the firearms and bullets used, and that the bullets cannot pass through wall.

It can be said that the compressive strength and unit weights of the "ballistic" bricks play a role in the bullet resistance test results. In addition, when the photos taken during and after the bullet resistance tests are examined, it has been observed that there are ribbed reinforcements in the bricks. It can be said that the reinforcement might have a contribution both to the bullet resistance of the bricks and to the protection of their integrity during the bullet impact.




7




8

It can be seen from the report prepared by the "Tekno Poligon" shooting range that a Bullet Resistance test was carried out in accordance with the TS EN 1523 standard on a wall built with bricks named "Ballistics". The evaluation of these test results is made according to the TS EN 1522 standard. The classification of the test results according to the TS EN 1522 standard is shown in Table-6.

Table-6. Classification and requirements for testing with hand guns and rifles

Class	Type of weapon	Calibre	Bullet		Test condition	
			Type	Mass g	Test range m	Bullet velocity m/s
FB1	rifle	22 LR	L/RN	2,6 0,1	10 0,5	360 10
FB2	hand gun	9 mm Luger	FJ <sup>1</sup> /RN/SC	8,0 0,1	5 0,5	400 10
FB3	hand gun	357 Mag.	FJ <sup>1</sup> /CB/SC	10,2 0,1	5 0,5	430 10
FB4	hand gun	357 Mag.	FJ <sup>1</sup> /CB/SC	10,2 0,1	5 0,5	430 10
	hand gun (see note)	44 Rem. Mag.	FJ <sup>2</sup> /FN/SC	15,6 0,1	5 0,5	440 10
FB5	rifle	5,56 × 45*	FJ <sup>2</sup> /PB/SCP1	4,0 0,1	10 0,5	950 10
FB6	rifle	5,56 × 45*	FJ <sup>2</sup> /PB/SCP1	4,0 0,1	10 0,5	950 10
	rifle (see note)	7,62 × 51	FJ <sup>1</sup> /PB/SC	9,5 0,1	10 0,5	830 10
FB7	rifle	7,62 × 51**	FJ <sup>2</sup> /PB/HC1	9,8 0,1	10 0,5	820 10


The classes FB1 to FB7 in the TS EN 1522 standard shown in Table 6 are given in order of increasing resistance to perforation. Class FB1 represents the lowest bullet resistance, and class FB7 the highest e.g. FB4 includes FB3, FB2, FB1. When the TS EN 1522 standard bullet resistance classes shown in Table 6 are compared with the bullet resistance report prepared by the "Tekno Poligon" shown in Table 5, it is observed that the test results obtained are compatible with the FB7 class.

## 5. RESULT

When the results of the tests made on the briquette/brick wall elements branded as "Easy Wall Brick" and the bullet resistance report presented to our committee are evaluated, our opinions are summarized as follows:

- There are two types of briquette/brick wall elements named as Standard and Ballistic, and compressive strength, splitting tensile strength, water absorption and unit weight test results of these samples are compatible with each other.
- The compressive strengths and other material properties obtained in the tests are considered to be sufficient for the wall elements.
- A wall can be obtained by arranging the wall elements on top of each other.
- Bullet Resistance Report prepared by the shooting range "Tekno Poligon" was presented to our committee by the "Easywall Brick" company. According to this report, shooting tests were carried out on the wall made with "ballistic" bricks, and as a result of the shots made with different firearms, the bullets could not penetrate the wall.
- In cases where various structures such as walls or security structures are likely to be under the influence of similar firearms, they may be constructed using these briquette/brick wall elements.

  
Prof. Dr. Fethi KADIOĞLU

  
Prof. Dr. Özkan ŞENGÜL

Istanbul Technical University, Civil Engineering Faculty, Department of Civil Engineering



**Appendix:** Bullet Resistance Report, prepared by the shooting range named "Tekno Poligon"





**ANTALIA GROUP**

**THANK YOU**

**CONTACT**

[www.antaliagroup.com](http://www.antaliagroup.com)

[info@antaliagroup.com](mailto:info@antaliagroup.com)

Gsm:+90 533 763 03 03

Whatsapp:+971 52 830 77 15

