CIP Entrepreneurship and Innovation Programme

PAPIRUS

Public Administration Procurement Innovation to Reach Ultimate Sustainability

Technical Specifications

Sestao Berri 2010 S.A. (ES)

TECHNICAL SPECIFICATIONS
SESTAO

BUILDING OF 18 NEW HOMES IN TXABARRI 33 & 35

This English translation of the Spanish original is provided only for easier reading purposes.

In case of any discrepancies between these versions, the Spanish version shall prevail.

OPEN INVITATION TO TENDER
AWARDING OF A PUBLIC SUPPLY CONTRACT

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TECHNICAL SPECIFICATIONS

1 Introduction

The building sector has enormous impacts on our environment and the influence of building performance on broader sustainability is widely acknowledged and based on indisputable facts. Buildings consume about 40% of total final energy requirements in Europe and represents about 1/3 of Europe's CO_2 emissions. This tender is part of a European project determent to develop the role of public procurers. The overall objective of the cross-border PAPIRUS project is to promote, implement and validate innovative solutions for the achievement of sustainable construction through new Public Procurement process, focusing on Nearly Zero Energy Buildings.

This tender focuses on the following challenges:

Reduced energy losses through vertical building opaque envelope

Buildings' envelope is one of the main causes of thermal energy losses and contributes significantly to heating and cooling demands. Buildings can improve significantly their final consumption by increasing insulation levels in their envelope.

To reach the high energy performance targets set, the traditional solution is to add additional layers of traditional insulation. This reduces the net floor area of the building and might in some cases be difficult to apply. Our aim is to purchase innovative products enabling us to build thinner outer walls while at the same time obtaining good insulation properties.

Windows with reduced solar gains in summer and increased in winter

Windows provide natural light, fresh air and allow solar radiation to enter the building. However, they represent one of the major sources of heat losses in winter and unwanted heat gains in summer, contributing significantly to heating or cooling loads depending on the climate. The use of better energy performance window systems will reduce building energy consumption and increase indoor comfort, thus allowing us to design buildings with increased glazed areas. However, larger windows will increase solar gains through windows during summer and the risk of overheating the indoor spaces.

Our aim is to purchase windows that make use of the seasonal change, reducing energy losses in winter, increasing solar gains in winter, and reduce solar gains in summer.

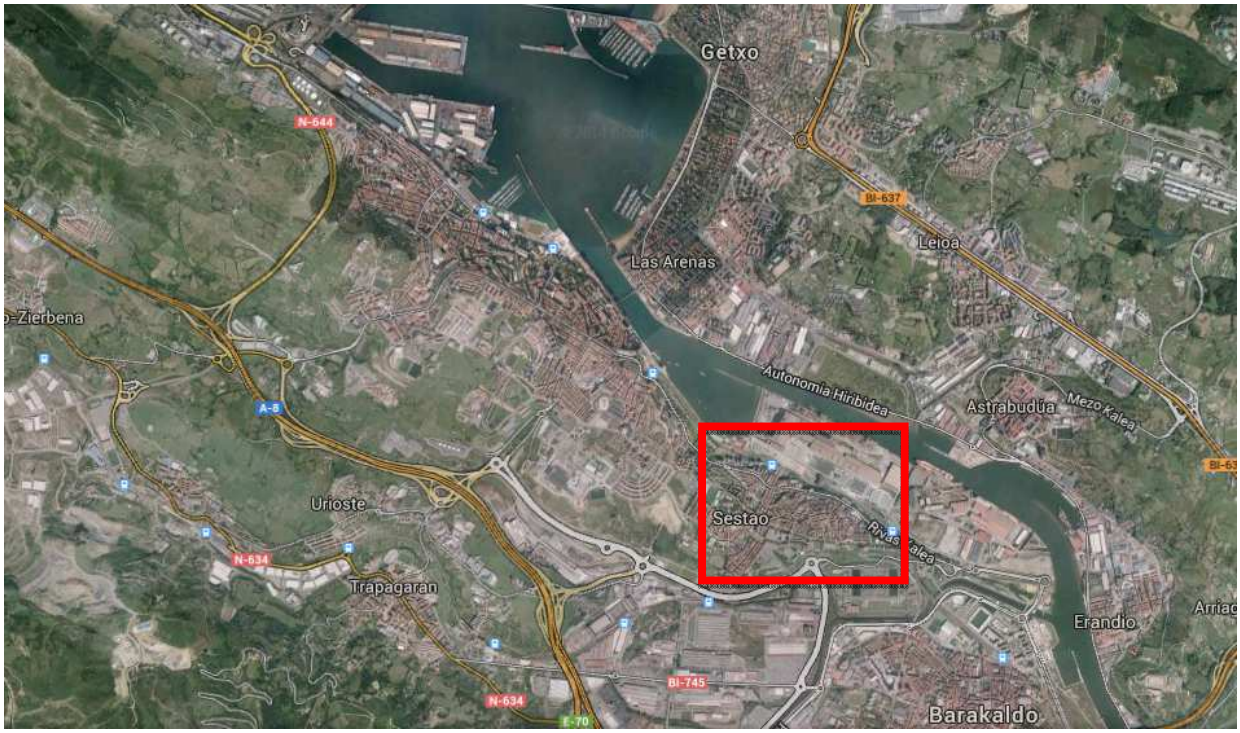
2 General description of the buildings

2.1 Summary of the pilot project in Sestao

The Project in Sestao includes two pilot buildings. The two existing buildings will be demolished to build two new residential buildings under the PAPIRUS project framework.

2.2 Location

Sestao is an industry-oriented town, located near the mouth of the estuary and with a population of about 28,000 inhabitants.



Location of Sestao

The buildings are located at numbers 33 and 35 Txabarri street in the town of Sestao in Spain (43.3N; 2.99W). This is a residential area where housing for workers was built a hundred years ago, so it is located near the industrial platform of the municipality. A special reform plan has been drafted to promote

rehabilitation in the area. According to this plan, many buildings have recently been rehabilitated or demolished in order to build new ones.

These two buildings are located at the end of a row of residential buildings. They are bordered to the north by Txabarri Street, and to the east by a leafy square, to the south by a pedestrian space and to the west by the adjoining building. Attached to the building at Txabarri 33 is a staircase that connects Txabarri street with the pedestrian space to the south, situated on a raised area (almost 4 meters) above Txabarri street.

The sizes of the plots are as follows:

- Txabarri 33: 10.30m x 14.00m
- Txabarri 35: 9.68m x 14.00m

Location of the buildings at numbers 33 and 35 Txabarri Street

2.3 Functionality

The two buildings are designed to accommodate social housing, therefore its use is residential.

Current state of Txabarri 33 and the plot of Txabarri 35

2.4 Architectural characteristics

TXABARRI 33: 9 flats and 9 storerooms **Ground floor:** Entrance + 1 flat + 9 storerooms **1st, 2nd, 3rd, 4th floors**: two flats per floor, one with north-east orientation and one with south-east orientation. **5th floor:** shared spaces (boiler room and community space) **Built area:** 786m^2	**TXABARRI 35: 9 flats and 9 storerooms** **Ground floor:** Entrance + 1 flat + 1 storeroom + boiler room **1st, 2nd, 3rd, 4th floors**: two flats per floor, with north and south orientations each of them. **5th floor:** 8 storerooms **Built area:** 742m^2

Roof: Sloping; tiled

Façades

Txabarri 33:

The Txabarri street façade consists of four levels with rows of two windows that correspond to the bedrooms and a bay window in Txabarri 33 near the corner corresponding to the living room. The ground floor has the same layout of spaces as the upper floors.

The rear façade has a lower height than the Txabarri façade due to the difference of almost four meters existing between El Sol Park and Txabarri Street. It is laid out like the Txabarri façade, with a lower height, the difference being that the living room bay windows start on the 2nd floor.

The east façade has a central lattice to hide the clotheslines and two openings on either side to illuminate the lounge.

The materials foreseen are a stone base on the ground floor and the façade in colour, with an insulation system in the exterior for the rest of the floors.

Txabarri 35:

The Txabarri Street façade consists of four levels with two rows of windows and two central bay window that correspond to the bedrooms. The ground floor has the same layout of spaces as the upper floors.

The rear façade has a lower height than the Txabarri façade due to the difference of almost four meters existing between El Sol Park and Txabarri Street. It consists of four levels with four rows of windows which correspond to the living room and a central row wich correspond to the court.

Planned materials are a socle of stone in ground floor and facade in color with an insulation system on the outside for the rest of heights.

Projected buildings

3 Purpose of the contract

This tender is a tender for supply and installation and aims to purchase and fit innovative products that will be installed in the new construction of 18 flats at numbers 33 and 35 of Txabarri Street in Sestao.

The call for tender is divided into two lots:

LOT 1: Solutions to reduce energy loss through the opaque building envelope.

LOT 2: Solutions to reduce energy loss in winter and solar gains in summer through the windows.

4 Description of the lots:

4.1 General description of the project and its construction:

The general description of the project can be found in the following files attached to the documentation of this tender:

Annexes 1-11: Txabarri 33 - Report and plans

Annexes 12-20: Txabarri 35 - Report and plans

4.2 General conditions

The technical proposal of the bidder for each lot must meet the following standards and regulations (Spanish). Some of these requirements may not be directly related to the lots described, but can have an impact on them.

1. Technical Building Code (TBC: Technical Building Code): http://www.codigotecnico.org/web

2. Local regulations regarding the Special Rehabilitation Plan for the Txabarri-El Sol area. (ARI)

3. Order of February 12, 2009 by the Minister of Housing and Social Affairs approving Regulations of Design of Subsidised Housing (BOPV, Official Bulletin of the Basque Country No. 43, dated March 3, 2009).

2.- Local regulations regarding the Special Rehabilitation Plan for the Txabarri-El Sol area. (ARI):
Section V - Aesthetic conditions:

Article 72: Materials

1. Coatings: Ground floors.

They will be treated in conjunction with the rest of the building façade.
Recommended coating materials for the ground floor are natural (unpolished) stone, at least in the bases, with the rest being treated with the materials and general finishes of the rest of the façade.

2. Coatings: Upper floors.
The façade will be provided with a unitary solution as a whole.
For façade panels the use of coating materials such as painted plaster, stucco, natural (unpolished) stone, etc. is recommended.

3. Window frames.
The outer frames, even bay windows and the furnishing of shop windows on the ground floor, should be resolved with unified design and materials.

10. General points.
Imitation of high-grade materials, platings and use of polished stone materials is prohibited. The design of the locks will prevent the incorporation of dissonant materials.

ARTICLE 73. FAÇADES.

1. The façades of the buildings will be designed complete, including the ground floor, leading to a unified architectural solution, so that the treatment and composition of the façade of the upper and lower floors are respected in the subsequent design of commercial premises. Access doors and shop windows shall be set back a minimum of 25cm from the façade.

2. The general solutions of the façade shall be defined by the project and no elements can be superimposed that are not provided therein.

3. Use of the balconies as storerooms, storage areas, or clotheslines is prohibited, except in unified projects for the entire building in which they are equipped with protected views. To this end, in all new building projects, for each flat, a space shall be provided for drying clothes, duly protected from the exterior views.

4. Gaps in the composition of these façades shall not exceed 1.50m. wide, except bay windows and ground floor gaps. They will all be sorted in accordance with vertical axes.

5. The ground floors will retain the composition and rhythm of the rest of the façade, differentiating the gap of the entrance. Its design and implementation will be fully completed in the course of the work.

The buildings Txabarri 33 and Txabarri 35 are independent plots and therefore should be treated as isolated actions, so even if they are built at the same time, their appearance must be different. Therefore, the product offered by the bidder must be able to differentiate colour or texture for each of the buildings.

3. Regulations Regarding the Design of Subsidised Housing:

5.2.e- section 3): The gaps for lighting every room shall be provided with blinds, shutters or some system allowing darkening.

4.3 Minimum requirements for the lots

Purchase products should have innovative character. For the purpose of current tender, products should meet one of the following conditions:

- The product is not commercially available yet on a large scale
- It is a new product for the Contracting Entity (Sestao Berri 2010, S.A.)

4.4 Description of the lots

Lot 1: FAÇADES

The scope of this lot is to seek innovative solutions that reduce energy loss through the opaque envelope. The contract for this lot includes only the opaque part of the vertical exterior walls in contact with the air outside the building, i.e., external façades with north, east and south orientation, and a central courtyard.
The solutions for this lot may consist of either a single insulating material in a partial solution for the envelope or a comprehensive solution for the entire façade which also includes interior finishes.
In either case, the product description or proposed solution should be presented in the context of a comprehensive solution for the façade. To do this, if deemed appropriate, the composition of the model of façade base that is included in this document may be used.

The solution shall be applied to the façade of the two buildings, approximately 291m^2 in Txabarri 33 and 185m^2 in Txabarri 35, making a total of 476m^2 for the two buildings. The measurement is performed for the top four heights (1st floor + 2nd floor + 3rd floor + 4th floor), excluding the ground floor.

The proposed solution, whether with unique material, a partial solution or an integrated solution, must ensure that the entire envelope meets the characteristics listed below:

- Thermal transmittance: U≤ 0.18 W/m^2.K
- Sound insulation ≤ 30dB
- Fire resistance ≥ 60 minutes (EI60)
- It must incorporate the solution for the coating perimeter of the window opening, incorporating constructive detail.

- It should consider specific solutions to avoid thermal bridges in pillars, slab surfaces, shutter mechanisms, etc.
- The offered solution should include the supply and installation of the complete façade, including lintels, sills, finishes, special items, among others, and all materials required for their installation.
- The use of coating materials such as painted plaster, stucco, natural (unpolished) stone, etc. is recommended.
- The exterior finish, should it be included in the tender, should offer more than one colour or texture finish.
- The inside face of the façade shall end with a Pladur plasterboard cladding, 15mm thick, on profiles of galvanised steel of 46mm and 45mm of rock wool insulation, where pipelines will run for the flats' utilities.
- Product warranty must be greater or equal to five years ≥ 10 years.

The base façade model is provided from which the limit of thermal transmittance has been calculated:

M1 - FAÇADE				
Layer	**Material**	**L_i**	**λ_i**	**R_i**
R_{SI}	Interior surface resistivity. Horizontal flow			0.13
1	Pladur panel (15cm)	0.150	0.180	0.83
2	Rock wool (4.6cm)	0.046	0.034	1.35
3	½ ft double hollow brick (11.0cm)	0.110	0.375	0.29
4	Cement mortar (1+1cm)	0.020	1.800	0.01
5	EPS Expanded Polystyrene (0.029 W/mK) (8.0cm)	0.080	0.029	2.76
6	Waterproof cement mortar (0.4cm)	0.004	1.800	0.002
R_{SE}	Interior surface resistivity. Horizontal flow			0.04
	TOTAL THERMAL RESISTANCE			5.42
	TRANSMITTANCE U_M ($W/m^2 \cdot K$)			**0.18**

Lot 2: WINDOWS

The scope of this lot is to seek innovative solutions that reduce energy losses in winter and solar gains in summer through windows.

The agreement for this lot includes the supply and installation of windows and bay windows in the two buildings, which reach about 313m^2.

The proposed solution must meet the characteristics listed below:

- Thermal transmittance: U≤ 1.8 W/m^2.K
- Sound insulation ≤ 32 dB
- Fire resistance ≥ 60 minutes (EI60)
- The offer of bay windows shall include, in addition to the windows, all framework coatings including the necessary insulation. It should incorporate the constructive solution of said coating, and the finishes where they meet the façade.
- The glazing of fixed parts below 110cm in height will be double safety glass with PVB and translucent colour or acid-matted.
- All windows and balconies shall be fitted with blinds, shutters or some system allowing darkening.
- All windows and balconies shall be fitted with ventilation closures to ensure compliance with the TBC DB-HS standard.
- The window frames must offer more than one colour finish.
- Product warranty must be greater or equal to five years ≥ 10 years.
- The proportional part of auxiliary elements needed for installation shall be included in the tender.
- The handles, parts, locks, etc. necessary for operation shall be included in the tender.

5 ANNEXES

TXABARRI 33

00. Report
01. Location
02. Emplacement
03. Topography
04. Surface plans
05. Dimension plans
06. 5th floor and roof plan
07. Txabarri Street façade
08. South and east façades
09. Sections
10. Window frames
11. General elevations

TXABARRI 35

12. Report
13. Location and emplacement
14. Topography
15. Surface plans
16. Dimension plans
17. Façades
18. Sections
19. Window frames
20. General elevations