EuroPHit

D3.9_Overall Refurbishment Plan

Project: OP23_Treviana Social Housing_Madrid

INTELLIGENT ENERGY – EUROPE II

Energy efficiency and renewable energy in buildings

IEE/12/070

EuroPHit

[Improving the energy performance of step-by-step refurbishment and integration of renewable energies]

Contract N°: SI2.645928

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Technical References

Project Acronym	EuroPHit
Project Title	Improving the energy performance of step-by-step refurbishment and integration of renewable energies
Project Coordinator	Jan Steiger Passive House Institute, Dr. Wolfgang Feist Rheinstrasse 44/46 D 64283 Darmstadt jan.steiger@passiv.de
Project Duration	1 April 2013 – 31March 2016 (36 Months)

Deliverable No.	D3.9
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Lead beneficiary	04_MosArt
Contributing beneficiary(ies)	07_PEP
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Co-author(s)	Mercedes Sánchez Materos
Date	31 03 2016
File Name	EuroPHit_3.9_OP23_TrevianaSocialHousing.pdf

EnerPHit Retrofit Plan

#¡REF!

EuroPHit

Object:	Treviana Social Housing		
Street:	Treviana 3		
Postcode/city:	28043	End-of-terrace Passive House	
Province/country:	Madrid		Passivhaus-Reihenendhaus
Object type:	Residencial		
Climate data set:	ES0001b-Madrid		
Climate zone:	4: Warm-temperate	Altitude of location:	695

Owner:	Marcos García Caravantes		
Street:	C/Treviana, 3		
Postcode/city:		Madrid	
Province/country:	Madrid		ES-Spain

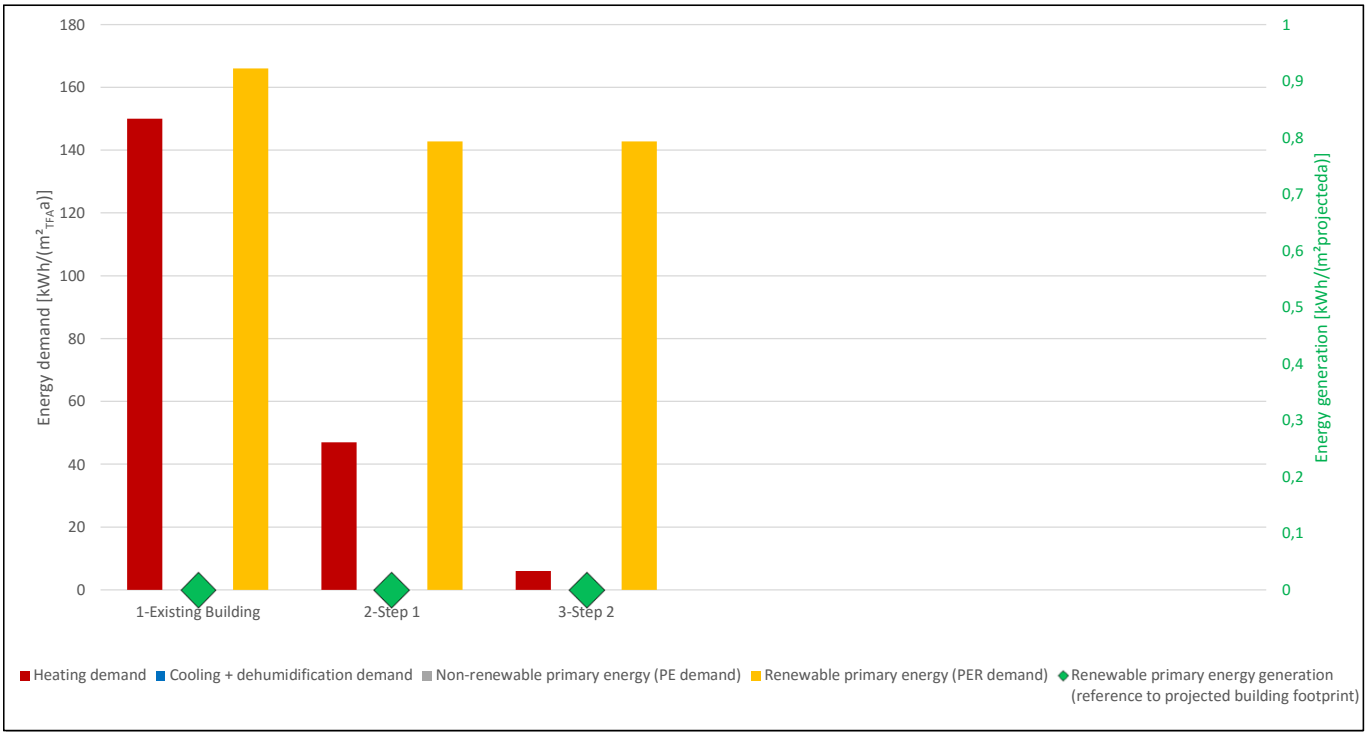
Architecture:	VAND Arquitectura		
Street:	C/ Villablanca, 85		
Postcode/city:	28032	Madrid	
Province/country:	Madrid		ES-Spain

Tech. systems:	Altertechnica		
Street:	Av. Gernández Ladreda, 10 2ºB		
Postcode/city:	40001	Segovia	
Province/country:	Segovia		ES-Spain

Energy consulting:	VAND Arquitectura		
Street:	C/Villablanca, 85		
Postcode/city:	28032	Madrid	
Province/country:	Madrid		ES-Spain

Certification:			
Street:			
Postcode/city:			
Province/country:			

Year of construction:	1970	Interior temp. winter [°C]:	20,0	Interior temp. summer [°C]:	25,0
Number of dwelling units:	1	Treated floor area:	77,6	No. of occupants	4,0



I confirm that the values given herein have been determined following the PHPP methodology and based on the characteristic values of the building. The PHPP calculations are attached to this verification.

First name	Last name	Signature

Company	Issued (date)	City

, 0.1.1900

Dear building owner,

in the next few years you intend to modernise your building and to improve stepwise its level of thermal protection. This "EnerPHit Retrofit Plan" will help you to make the right decisions at each step.

EnerPHit Standard

In the case of refurbishments of existing buildings, it is not always possible to fully achieve the Passive House Standard with reasonable effort. The reasons for this lie e.g. in the unavoidable thermal bridges due to existing basement walls. For such buildings, the Passive House Institute has developed the EnerPHit Standard. With the use of Passive House components, EnerPHit retrofitted buildings offer almost all the advantages of a Passive House building with optimum cost-effectiveness at the same time:

• Comfortable living with uniformly warm walls, floors and windows
• Draughts, condensation and mould growth are no longer a problem
• Permanent supply of fresh air with a pleasant temperature
• Independence from energy price fluctuations
• Financial profits from the very first year on due to up to 90 % reduced heating costs
• Climate protection due to decreased CO2 emissions of the same scale

EnerPHit Retrofit Plan

Most buildings are modernised in a step-by-step way when the respective building component needs to be renewed. Advantage can be taken of such opportunities to carry out future-oriented improvements to the thermal protection of the building. For example, if the façade already needs to be renewed anyway, the extra effort for thermal protection of the exterior wall to the Passive House quality at the same time will be manageable. Nevertheless, many interdependencies exist between individual energy efficiency measures, so that a good standard of thermal protection can only be achieved cost-effectively if an overall concept is prepared for the entire building prior to the first modernisation step. With the modernisation route planner, such an overall concept will be worked out for you by your Passive House Designer or energy consultant. This offers you the following advantages:

• Preparing for future steps already with today's measures will save costs on the whole and will ensure an optimal final outcome.
• An excellent final outcome can only be achieved if each individual step is implemented with the appropriate quality (EnerPHit-Standard).
• Once the overall concept has been prepared, it is available for every further step and thus facilitates the planning process (you don't have to start from the beginning every time).
• The energy demand is stated for each step.
• The approximate time points for upcoming refurbishment measures are stated in the general plan. This serves as a valuable aid for personal finance planning.

The modernisation route planner as well as other relevant documents can be checked by a PHI accredited certifier for additional quality assurance. If the examination shows that the EnerPHit Standard will be achieved with the implementation of all planned measures, then the first step can be carried out. After this a preliminary EnerPHit certificate can then be issued for the building. If quality assurance is continued accordingly for each step, then the full EnerPHit certificate will be issued for the building upon completion of the last step. A preliminary certificate increases the value of your building because its potential is clearly demonstrated. It also increases the credibility of the refurbishment concept in the context of talks with the bank e.g. because the achievable cost saving is available in a reliably calculated way. Apart from that, you can demonstrate to the outside world that you are committed to climate protection.

I wish you every success with your retrofit project!

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Scheduler

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Retrofit steps:				1											2		3								
Assemblies	Last renewal	1950	1955	1963	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010	2016	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Facade cleaning	1963																								
Balconies/Loggias	2015																								
Exterior door	2015																								
Window	2015																								
Blinds / sun screens	2015																								
Boiler	2015																								
Ventilation	2015																								
Airtightn. test: X, Leakage search: (X)																									

Initial condition	Main-tenance	Extensive Repairs
X Retrofit dates	Smaller Repairs	Immediate replacement

Overview of measures

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Retrofit step No.		1-Existing Building	2-Step 1	3-Step 2				Criteria	Alternative criteria
Year		Until 2014	2015	2025					
Measures									
Occasion ("anyway measure")	1		Painting and decorating	Facade improvement					
Energy-saving measure			Interior wall insulation	ETICS					
Occasion ("anyway measure")	2		None						
Energy-saving measure			Heat recovery ventilation						
Occasion ("anyway measure")	3		Heating systems replacement						
Energy-saving measure			High efficiency heating systems						
Occasion ("anyway measure")	4		Windows - replacement						
energy-saving measure			Windows - Passivhaus						
Occasion ("anyway measure")	5								
energy-saving measure									
Occasion ("anyway measure")	6								
energy-saving measure									
Occasion ("anyway measure")	7								
energy-saving measure									
Occasion ("anyway measure")	8								
energy-saving measure									
Component characteristics									
Wall to ambient air, ext. insulation (U-value)	[W/(m²K)]								
Roof (U-value)	[W/(m²K)]								
Building envelope to ambient (U value)	[W/(m²K)]							#¡REF!	-
Wall to ground, ext. insulation (U-value)	[W/(m²K)]								
Basement ceiling / floor slab (U-value)	[W/(m²K)]								
Building envelope to ground (U-value)	[W/(m²K)]							#¡REF!	-
Wall, int. insulation to ambient air (U-Value)	[W/(m²K)]	1,03	0,53	0,22				#¡REF!	-
Wall, int. insulation to ground (U-Value)	[W/(m²K)]							#¡REF!	-
Flat roof (solar reflection index, SRI)	[W/(m²K)]							#¡REF!	-
Inclined and vertical external surface (SRI)	[W/(m²K)]	19	19	19				#¡REF!	-
Windows / doors ($U_{installed}$)	[W/(m²K)]	6,64	1,11	1,11				#¡REF!	-
Windows ($U_{W,installed}$)	[W/(m²K)]							#¡REF!	-
Windows ($U_{W,installed}$)	[W/(m²K)]							#¡REF!	-
Glazing (g-value)	[]	0,70	0,35	0,35				#¡REF!	-
Glazing/sun protection (max. solar load)	[kWh/(m²a)]	208	64	32				#¡REF!	-
Ventilation (effective heat recovery efficiency)	[%]	0	90	90				#¡REF!	-
Ventilation (effective humidity recovery efficiency)	[%]	0	0	0				#¡REF!	-
Airchange at press. test n_{50}	[1/h]							#¡REF!	-
Building characteristics									
Heating demand	[kWh/(m²a)]	150	47	6				#¡REF!	####
Heating load	[W/m²]	72	33	18				#¡REF!	####
Cooling + dehumidification demand	[kWh/(m²a)]							#¡REF!	####
Cooling load	[kWh/(m²a)]							#¡REF!	####
Frequency of overheating (> 25 °C)	[%]	9	7	6				#¡REF!	-
Frequency of exc. high humidity (> 12 g/kg)	[%]							#¡REF!	-
Non-renewable primary energy (PE demand)	[kWh/(m²a)]							#¡REF!	-
Renewable primary energy (PER demand)	[kWh/(m²a)]	166	143	143				#¡REF!	####
Renewable primary energy generation (reference to projected building footprint)	[kWh/(m²a)]							#¡REF!	####
#¡REF!									
Costs									
Energy-related invest. (interest+repayment)	[€/year]								
Expected energy costs (total of all energy use in the building)	[€/year]								
Total cost (investment+energy)	**[€/year]**								

Investment and maintenance costs

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

	Retrofit step No.	1-Existing Building	2-Step 1	3-Step 2			
	Year	Until 2014	2015	2025			
1	**Occasion ("anyway measure")**		**Painting and decorating**	**Facade improvement**			
	Investment costs		**200 €**				
	Maintenance costs		**0 €**				
	Energy-saving measure		**Interior wall insulation**	**ETICS**			
	Investment costs		**1.650 €**				
	Financial support (present value)		**0 €**				
	Maintenance costs		**0**				
	Service life [years]		50				
	Present value factor	0 €	0 €	0 €	0 €	0 €	0 €
	Annuity factor	0 €	0 €	0 €	0 €	0 €	0 €
	Annuity ("anyway measure")	0 €	0 €	0 €	0 €	0 €	0 €
	Annuity (Energy saving measure)	0 €	0 €	0 €	0 €	0 €	0 €
	Annuity (energy-related)	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**
2	**Occasion ("anyway measure")**		**None**				
	Investment costs		**0 €**				
	Maintenance costs		**0 €**				
	Energy-saving measure		**ventilation**				
	Investment costs		**2.700 €**				
	Financial support (present value)		**0 €**				
	Maintenance costs		**0 €**				
	Service life [years]		**50**				
	Present value factor	0 €	32 €	0 €	0 €	0 €	0 €
	Annuity factor	0 €	0 €	0 €	0 €	0 €	0 €
	Annuity ("anyway measure")	0 €	0 €	0 €	0 €	0 €	0 €
	Annuity (Energy saving measure)	0 €	86 €	0 €	0 €	0 €	0 €
	Annuity (energy-related)	**0 €**	**86 €**	**0 €**	**0 €**	**0 €**	**0 €**
3	**Occasion ("anyway measure")**		**Heating systems replacement**				
	Investment costs		**880 €**				
	Maintenance costs		**0 €**				
	Energy-saving measure		**High efficiency heating systems**				
	Investment costs		**880 €**				
	Financial support (present value)		**0 €**				
	Maintenance costs		**0 €**				
	Service life [years]		**50**				
	Present value factor	0 €	32 €	0 €	0 €	0 €	0 €
	Annuity factor	0 €	0 €	0 €	0 €	0 €	0 €
	Annuity ("anyway measure")	0 €	28 €	0 €	0 €	0 €	0 €
	Annuity (Energy saving measure)	0 €	28 €	0 €	0 €	0 €	0 €
	Annuity (energy-related)	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**
4	**Occasion ("anyway measure")**		**Windows - replacement**				
	Investment costs		**4.253 €**				
	Maintenance costs		**0 €**				
	Energy-saving measure		**Windows - Passivhaus**				
	Investment costs		**6.862 €**				
	Financial support (present value)		**0 €**				
	Maintenance costs		**0 €**				
	Service life [years]		**40**				
	Present value factor	0 €	27 €	0 €	0 €	0 €	0 €
	Annuity factor	0 €	0 €	0 €	0 €	0 €	0 €
	Annuity ("anyway measure")	0 €	155 €	0 €	0 €	0 €	0 €
	Annuity (Energy saving measure)	0 €	250 €	0 €	0 €	0 €	0 €
	Annuity (energy-related)	**0 €**	**95 €**	**0 €**	**0 €**	**0 €**	**0 €**
5	**Occasion ("anyway measure")**						
	Investment costs						
	Maintenance costs						
	Energy-saving measure						
	Investment costs						
	Financial support (present value)						
	Maintenance costs						
	Service life [years]						
	Annuity (energy-related)	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**
6	**Occasion ("anyway measure")**						
	Investment costs						
	Maintenance costs						
	Energy-saving measure						
	Investment costs						
	Financial support (present value)						
	Maintenance costs						
	Service life [years]						
	Annuity (energy-related)	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**
7	**Occasion ("anyway measure")**						
	Investment costs						
	Maintenance costs						
	Energy-saving measure						
	Investment costs						
	Financial support (present value)						
	Maintenance costs						
	Service life [years]						
	Annuity (energy-related)	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**
8	**Occasion ("anyway measure")**						
	Investment costs						
	Maintenance costs						
	Energy-saving measure						
	Investment costs						
	Financial support (present value)						
	Maintenance costs						
	Service life [years]						
	Annuity (energy-related)	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**	**0 €**
	Total annuities (energy-related)	0 €	181 €	0 €	0 €	0 €	0 €
	Cumulated sums	**0 €**	**181 €**	**181 €**	**181 €**	**181 €**	**181 €**

Boundary conditions: Nominal interest rate 3,0% Inflation 1,0% Real interest rate 2,0%

Building assemblies (U-values)

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Assembly: **03ud-Floor** Area: #¡REF! m²

Areas with this assembly: **Floor_6889_D**

Retrofit step: **1-Existing Building** Until 2014

Subarea 1	λ [W/(mK)]	Subarea 2 (optional)	λ [W/(mK)]	Subarea 3 (optional)	λ [W/(mK)]	Thickness [mm]
Timber floor	0,170					12
Morter	1,000					30
Reinforced concrete floor structure	0,938					300
Plaster	0,570					15

Fraction subarea 1	Fraction subarea 2	Fraction subarea 3	Total
100%	0%	0%	**35,7** cm

U-value supplement: 0 W/(m²K) **U-value:** W/(m²K)

▼ subsequent steps

Retrofit step: **2-Step 1** 2015

Subarea 1	λ [W/(mK)]	Subarea 2 (optional)	λ [W/(mK)]	Subarea 3 (optional)	λ [W/(mK)]	Thickness [mm]
Timber floor	0,170					12
Morter	1,000					30
Reinforced concrete floor structure	0,938					300
Plaster	0,570					15

Fraction subarea 1	Fraction subarea 2	Fraction subarea 3	Total
100%	0%	0%	**35,7** cm

U-value supplement: 0 W/(m²K) **U-value:** W/(m²K)

▼ subsequent steps

Assembly: **03ud-Floor**

Advice

Plan / sketch / image

STEP 1 and 2: No modifications

Building assemblies (U-values)

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Assembly: **01ud-Exterior wall** Area: #¡REF! m²

Areas with this assembly: **Wall_7025_W, Wall_7018_S, Wall_7073_E**

Retrofit step: **1-Existing Building** Until 2014

Subarea 1	λ [W/(mK)]	Subarea 2 (optional)	λ [W/(mK)]	Subarea 3 (optional)	λ [W/(mK)]	Thickness [mm]
Enlucido	0,570					15
LHD	0,320					80
Cámara de aire	0,270					50
1/2 pie ladrillo	0,350					120
	0,000					0
	0,000					0

Fraction subarea 1	Fraction subarea 2	Fraction subarea 3	Total	
100%	0%	0%	**26,5**	cm

U-value supplement 0 W/(m²K) **U-value:** W/(m²K)

▼ subsequent steps

Retrofit step: **2-Step 1** 2015

Subarea 1	λ [W/(mK)]	Subarea 2 (optional)	λ [W/(mK)]	Subarea 3 (optional)	λ [W/(mK)]	Thickness [mm]
Enlucido	0,250					15
LHD	0,250					46
Cámara de aire	0,035					40
1/2 pie ladrillo	0,350					120
	0,000					0
	0,000					0

Fraction subarea 1	Fraction subarea 2	Fraction subarea 3	Total	
100%	0%	0%	**22,1**	cm

U-value supplement 0 W/(m²K) **U-value:** W/(m²K)

▼ subsequent steps

Assembly: **01ud-Exterior wall**

Advice

Plan / sketch / image

STEP 1 (Outside-Inside): 120mm brick layer + 40 mm mineral wool + 46 mm air layer + 15 mm plasterboard mm particle board + 50 mm systems + 10 mm plasterboard STEP 2 (Outside-Inside): 100mm ETICS + 120mm brick layer + 40 mm mineral wool + 46 mm air layer + 15 mm plasterboard mm particle board + 50 mm systems + 10 mm plasterboard

Building assemblies (U-values)

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Assembly: **02ud-Boundary wall** Area: #¡REF! m²

Areas with this assembly: **Wall_7032_N, Wall_7053_E, Wall_7060_N, Wall_7046_N, Wall_**

Retrofit step: 1-Existing Building — Until 2014

Subarea 1	λ [W/(mK)]	Subarea 2 (optional)	λ [W/(mK)]	Subarea 3 (optional)	λ [W/(mK)]	Thickness [mm]
Plaster	0,570					15
Brick layer	0,320					40
Systems	0,270					40
Brick layer	0,320					40
Plaster	0,570					15

Fraction subarea 1	Fraction subarea 2	Fraction subarea 3	Total
100%	0%	0%	**15,0** cm

U-value supplement: 0 W/(m²K) **U-value:** W/(m²K)

◀ subsequent steps

Retrofit step: 2-Step 1 — 2015

Subarea 1	λ [W/(mK)]	Subarea 2 (optional)	λ [W/(mK)]	Subarea 3 (optional)	λ [W/(mK)]	Thickness [mm]
Plaster	0,570					15
Brick layer	0,320					40
Systems	0,270					40
Brick layer	0,320					40
Plaster	0,570					15

Fraction subarea 1	Fraction subarea 2	Fraction subarea 3	Total
100%	0%	0%	**15,0** cm

U-value supplement: 0 W/(m²K) **U-value:** W/(m²K)

◀ subsequent steps

Assembly: **02ud-Boundary wall**

Advice

Plan / sketch / image

STEP 1 and 2: No modifications

Building assemblies (U-values)

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Assembly: **04ud-Ceiling** Area: #¡REF! m²

Areas with this assembly: **Roof_6982_H**

Retrofit step: **1-Existing Building** Until 2014

Subarea 1	λ [W/(mK)]	Subarea 2 (optional)	λ [W/(mK)]	Subarea 3 (optional)	λ [W/(mK)]	Thickness [mm]
Plaster	0,570					15
Reinforced concrete floor structure	0,938					300
Morter	1,000					30
Timber floor	0,170					12

Fraction subarea 1	Fraction subarea 2	Fraction subarea 3	Total	
100%	0%	0%	**35,7**	cm

U-value supplement: 0 W/(m²K) **U-value:** W/(m²K)

Retrofit step: **2-Step 1** 2015

Subarea 1	λ [W/(mK)]	Subarea 2 (optional)	λ [W/(mK)]	Subarea 3 (optional)	λ [W/(mK)]	Thickness [mm]
Plaster	0,570					15
Reinforced concrete floor structure	0,938					300
Morter	1,000					30
Timber floor	0,170					12

Fraction subarea 1	Fraction subarea 2	Fraction subarea 3	Total	
100%	0%	0%	**35,7**	cm

U-value supplement: 0 W/(m²K) **U-value:** W/(m²K)

Assembly: **04ud-Ceiling**

Advice

Plan / sketch / image

STEP 1 and 2: No modifications

Window (glazing and frame)

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Window type:	**a-Upper pane-double window**	#¡REF! m²

Retrofit step	Year	Glazing	U_g	Frame	U_f
1-Existing Building	Until 2014	03ud-Vidrio sencillo	#¡REF!	03ud-Marco aluminio	5,7

Retrofit step	Year	Glazing	U_g	Frame	U_f
2-Step 1	2015	02ud-Vidrio triple con argón	#¡REF!	02ud-Deceunnick	0,98
preparation for subsequent steps:					
1-THERMAL INSULATION ON THE OUTSIDE	**Prepare for subsequent thermal bridge minimised connection of the wall insulation**				

Advice
Plan / sketch / image
2-Step 1

Window (glazing and frame)

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Window type:	**b-V9-V12**	#¡REF! m²

Retrofit step	Year	Glazing	U_g	Frame	U_f
1-Existing Building	Until 2014	03ud-Vidrio sencillo	#¡REF!	03ud-Marco aluminio	5,7

Retrofit step	Year	Glazing	U_g	Frame	U_f
2-Step 1	2015	02ud-Vidrio triple con argón	#¡REF!	02ud-Deceunnick	0,98
preparation for subsequent steps:					
1-THERMAL INSULATION ON THE OUTSIDE	**Prepare for subsequent thermal bridge minimised connection of the wall insulationIZQUIERDA($I12;ENCONTRAR("-";$I12)-1);IZQUIERDA($A12;ENCONTRAR("-";$A12)-1));"")**				

Advice
Plan / sketch / image
2-Step 1

Window (glazing and frame)

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Window type:	**c-Lower pane-double window**	#¡REF! m²

Retrofit step	Year	Glazing	U_g	Frame	U_f
1-Existing Building	Until 2014	03ud-Vidrio sencillo	#¡REF!	03ud-Marco aluminio	5,7

Retrofit step	Year	Glazing	U_g	Frame	U_f
2-Step 1	2015	02ud-Vidrio triple con argón	#¡REF!	02ud-Deceunnick	0,98
preparation for subsequent steps:					
1-THERMAL INSULATION ON THE OUTSIDE	**Prepare for subsequent thermal bridge minimised connection of the wall insulationIZQUIERDA($I12;ENCONTRAR("-";$I12)-1);IZQUIERDA($A12;ENCONTRAR("-";$A12)-1));"")**				

Advice
Plan / sketch / image
2-Step 1

Window (glazing and frame)

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Window type:	**d-Upper pane-doble window+single window**	#¡REF! m²

Retrofit step	Year	Glazing	U_g	Frame	U_f
1-Existing Building	Until 2014	03ud-Vidrio sencillo	#¡REF!	03ud-Marco aluminio	5,7

Retrofit step	Year	Glazing	U_g	Frame	U_f
2-Step 1	2015	02ud-Vidrio triple con argón	#¡REF!	02ud-Deceunnick	0,98
preparation for subsequent steps:					
1-THERMAL INSULATION ON THE OUTSIDE	**Prepare for subsequent thermal bridge minimised connection of the wall insulationIZQUIERDA($I12;ENCONTRAR("-";$I12)-1);IZQUIERDA($A12;ENCONTRAR("-";$A12)-1));"")**				

Advice
Plan / sketch / image
2-Step 1

Ventilation systems

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Retrofit step	Year	Ventilation type	Ventilation unit	Heat recovery efficiency	Humidity recovery efficiency	Electric efficiency
1-Existing appartment	Until 2014	3-Only window ventilation	-	-	-	-

Retrofit step	Year	Ventilation type	Ventilation unit	Heat recovery efficiency	Humidity recovery efficiency	Electric efficiency
2-Step 1	2015	1-Balanced PH ventilation with HR	0327vs03-Zehnder - ComfoAir200, ComfoD250, WHR920	0,84	0	0,31

Retrofit step	Year	Ventilation type	Ventilation unit	Heat recovery efficiency	Humidity recovery efficiency	Electric efficiency

Advice

Plan / sketch / image

Heating & cooling

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

	Retrofit step:	1-Existing appartment		Until 2014	
		Type	**Type**	**Heating fraction**	**DHW fraction**
Heating	**Primary heat generator**	-	#¡VALOR!		100%
	Secondary heat generator	-	-	#¡VALOR!	0%
		used?	**Seasonal performance factor**		
Cooling	**Supply air cooling**	-	-		
	Recirculatio cooling	-	-		
	Additional dehumidification	-	-		
	Panel Cooling	-	-		

	Retrofit step:	2-Step 1		2015	
		Type	**Type**	**Heating fraction**	**DHW fraction**
Heating	**Primary heat generator**	-	#¡VALOR!		100%
	Secondary heat generator	-	-	#¡VALOR!	0%
		used?	**Seasonal performance factor**		
Cooling	**Supply air cooling**	-	-		
	Recirculatio cooling	-	-		
	Additional dehumidification	-	-		
	Panel Cooling	-	-		

Advice Heating & cooling
Plan / sketch / image
Description

Photovoltaics

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Step	Technology	Module field area [m²]	Location	Annual electricity yield after inverter	
				absolute [kWh/a]	reference to projected building footprint [kWh/($m^2_{projected}$a)]
1-Existing appartment	**None**				

Step	Technology	Module field area [m²]	Location	Annual electricity yield after inverter	
				absolute [kWh/a]	reference to projected building footprint [kWh/($m^2_{projected}$a)]
2-Step 1	**None**				

Step	Technology	Module field area [m²]	Location	Annual electricity yield after inverter	
				absolute [kWh/a]	reference to projected building footprint [kWh/(m²projecteda)]
3-Step 2	**None**				

Advice Photovoltaics

Plan / sketch / image

Other advice

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Retrofit step:	1-Existing Building	Until 2014
Advice: ...		

Retrofit step:	2-Step 1	2015
Advice: ...		

Retrofit step:	3-Step 2	2025
Advice: ...		

Retrofit step:		
Advice: ...		

Retrofit step:		
Advice: ...		

Retrofit step:		
Advice: ...		

Attachments

Source file: 'OP23_PHPP_V9.3a_EN_Variants.xlsm' (PHPP version: 9.3)

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

Page	Phase	Type	Area	Name of document/plan
1				
2				
3				
4				
5				
6				
7				
8				
9				
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11				
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13				
14				
15				
16				
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38				
39				
40				

Interrelations

EnerPHit Retrofit Plan: Treviana Social Housing, Madrid, Spain

	current step	subsequent steps						
		1-Thermal insulation on the outside	2-Insulation of the wall on the inside	3-Pitched roof insulation	4-Flat roof insulation	9-Window/entrance door replacement	10-Boiler	12-Ventilation system
1	**Thermal insulation on the outside**			Provide the possibility of later connection to the pitched roof insulation without any gaps	Extend insulation over top of roof parapet, so that the roof insulation can be connected without interruption later on, and without interfering with the finished facade. Extend tin covering of the roof parapet sufficiently to the inner side, so that subsequent insulation of the roof parapet from the inner side is possible.	Prepare for later window/door installation in a thermally optimal position (in the insulation layer).	If necessary, decrease the forward flow temperature	Possibly already create penetrations in the exterior wall for fresh air and exhaust air ducts
2	**Insulation of the wall on the inside**					Prepair interior insulation for subsequent thermal-bridge-reduced window installation. Later on the window should be installed as close to the regular interior insulation layer as possible. Intermediate state: Insulate reveal all the way to the old window frame. Reveal insulation will have to be destroyed again for subsequent window replacement.	If necessary, decrease the forward flow temperature	Possibly already create penetrations in the exterior wall for fresh air and exhaust air ducts
3	**Pitched roof insulation**	Provide an adequate roof overhang for later insulation of the façade. Provide temporary cladding of the underside of the roof overhang, keep in mind the thickness of the later wall insulation for connection of the downpipe to the ground				In case of insulation on rafters and roof terrace insulation, execute these preferably at the same time, as otherwise windows will have to be installed twice	If necessary, decrease the forward flow temperature	Ensure airtightness, provide for fresh air and exhaust air outlets, in case these are necessary later on

4	**Flat roof insulation**	Make horizontal covering of roof parapet already wide enough to accommodate façade insulation later on.					If necessary, decrease the forward flow temperature	Ensure airtightness, provide for fresh air and exhaust air outlets in the flat roof waterproofing in case these are necessary later on
9	**Window/entrance door replacement**	Prepare for subsequent thermal bridge minimised connection of the wall insulation	Prepare for subsequent thermal bridge minimised connection of the wall insulation				If necessary, decrease the forward flow temperature	To avoid mould formation, a ventilation system should be installed at the same time, in case sufficient ventilation (4 times a day) via windows is not possible
10	**Boiler**			Install solar collectors only after the roof insulation.	Install solar collectors only after the roof insulation.			Check the possibility of air heating by means of the boiler via a hydraulic post heating coil
12	**Ventilation system**							