



Innovative steel solutions for affordable energy efficient housing in Romania





A Strategic Partnership Approach

- Direct contributions in countries where both ArcelorMittal and Habitat for Humanity present
- Employee engagement through technical and physical volunteer work of ArcelorMittal employees
- Development of steel-based solutions for safe, high-quality affordable housing for target group with HFH and future market potential
 - ‘Casa Buna’ (Good House) concept for pilot houses in Romania, demonstration Bucharest and first pilot in Moinesti, near Comanesti.
 - Mansard Roofing Program adaptation in Romania
 - Steel reinforcement and mitigation (including Haiti)





The Casa Buna Challenge

Develop a product offering comfortable energy efficient housing to lower income Romanian families

Habitat for Humanity Construction Principles :
Simple, Decent, Affordable

- Adequate for climatic & seismic conditions in Romania
- Affordable to target families
- Total housing cost approach inc. utilities
- Rising cost of energy, heating bills must be affordable to budget constrained families
- Energy-efficient & comfortable: continental climate with cold winters hot summers
- Meet HFH and Romanian technical standards





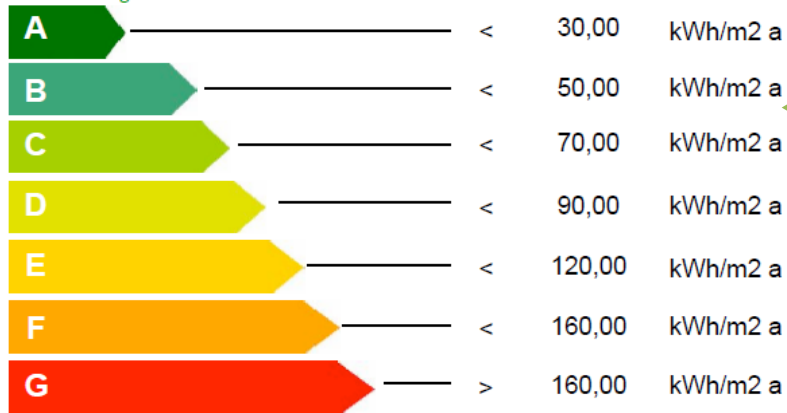
Designed for People

- HFH partner families buy and build their own home
- Non-profit affordable design – €380/m² cost v €650/m² average for commercial development
- HFH offer affordable non-profit mortgage and value ‘sweat equity’ volunteer hours
- Adaptable design to meet family need and size
- Offer usage flexibility - e.g. internal partitioning, external envelope aspect
- Volunteer-friendly self-build design – HFH homes are largely built by non-professional volunteers



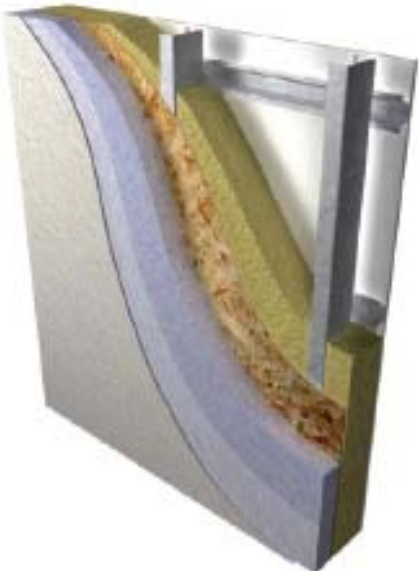
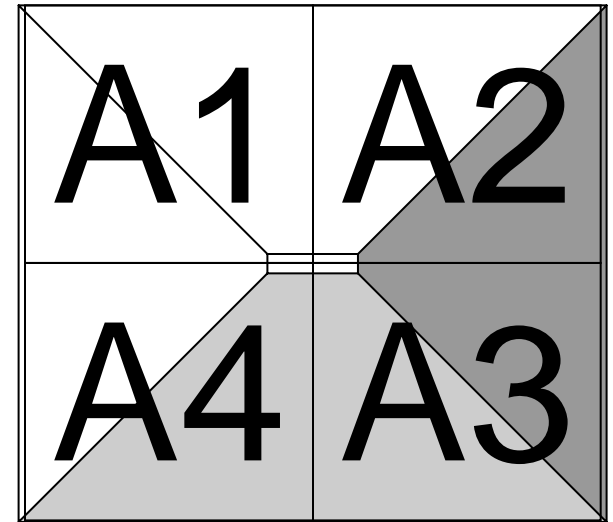
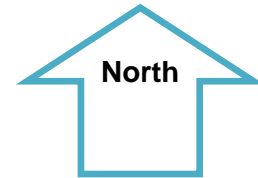
Energy Efficient Design

Space heating energy consumption calculation



Average consumption
59-67 kwh/m² a

Casa Buna



Wall components achieve a calculated R-Value of 12.3

Externally

- 12mm OSB cladding
- 80mm extruded polystyrene boards/sheets
- 5 x 5 mm mesh, nylon netting
- 2 x 5mm stucco weather-proof finish coat

Internally

- 100mm glass wool insulation(in steel frame cavity void)
- 25 x 50 mm horizontal counter battens
- 12mm drywall (plaster board)
- 2mm skim coat (finishing plaster)
- 2 coats emulsion

Consumption Kw/m²year

Apartme nt	Bucharest	Bacau county
A1	65	74
A2	65	72
A3	53	61
A4	53	62
Average	59	67



Steel based Solutions

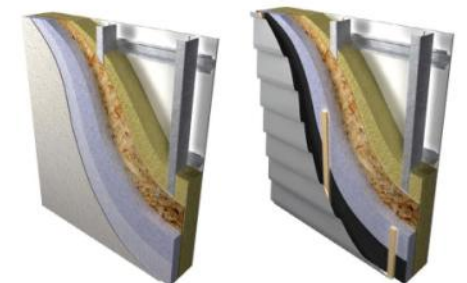
An Effective response

Light Steel Frame Structures

Light steel framing made of cold-formed steel profiles produced by roll forming. Used successfully for housing in many countries.

Advantages include :

- a dimensionally stable, consistent quality, reliable material
- resistant to natural pressures including termites, hurricanes, earthquakes
- light structures, hence reduced foundations and strong light roofing solution (including mansard additions)
- dry and clean construction works, reduced construction waste, quick erection & steel is 100% recyclable
- better control of thermal and acoustical performance, due to precise workshop preparation
- roll-forming technology easily transferable to local entrepreneurs





Steel Roofing Systems & Mansard Development

Steel roofing is commonplace in Romania. ArcelorMittal Construction Romania offers a wide range of roofing products such as steel tiles, roof decks, roofing panels and integrated rain evacuation systems. Mansard design.

Flexible Envelope Solutions

Steel framing allows various wall solutions to meet any specific requirements as to insulation, costs, and aesthetics. Examples include :

- plasterboard interior walls, insulation, OSB wood panels, external finish layer
- same concept, with steel cladding panels instead of OSB
- pre-fabricated steel + insulation sandwich panels

Fully engineered design

Casa Buna design modeled for structural, seismic and thermal behavior -in full compliance with European standards and Romanian national application codes



Casa Buna

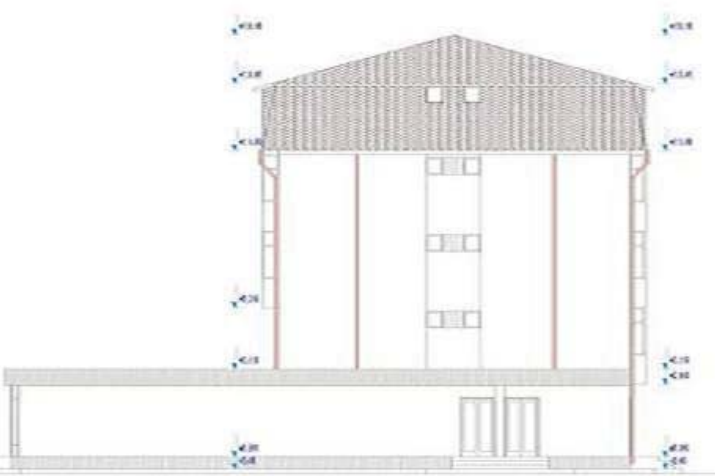


Mansard Roof Pilot












New mansard design



Legenda

-  Izolație la nivelul lașii și ULDAB, culoare gri
-  Grani teropan
-  Tencuială decorativă - culoare ocru
-  Tencuială decorativă - culoare alb
-  Tencuială decorativă - DE
-  Panouri compacte
-  Jghebur și botare din lașii vopsea culoare gri

VERIFICATOR/PROIECTANT	NUME	IMPLINIRE	CERINTA	REFERATUL PERTIZA NR./DATA
EXPERT				
	SC PERCON INSTALATII SRL IASI Str. Tudora nr. 18 TEL: 0232092142, 0232091187, 0232687192 Str. 23 Iulian voi Mare, Bloc E, AP. 3 Judet Bacau RO: 24.000000		Sertificat: AS HABITAT FOR HUMANITY Adresa: Dreptul Comunitar Str. Zepher von Haro, Bloc E, AP. 3 Judet Bacau	
SPECIFICATIE	NUME	IMPLINIRE	1:100	MANSARDARE BLOC NR. 4 JSE BUCUR, ORAS DUMBRAVITZ, Str. Chimiei, Bl. Nr. 4
Set Proiect	AN SERBANU BOCEAN			Faza DTAC
Proiectat	AN SERBANU BOCEAN			Planse nr A13
Planșat			3010	FATADA POSTERIOARA PROPUSA



Our commitment to the world around us extends beyond the bottom line, to include the people in which we invest, the communities we support and the world in which we operate. In line with these values, we are proud to partner with Habitat for Humanity in their efforts to fight poverty housing around the globe. We are eager to share our technical and design capabilities to offer comfortable, energy efficient and low-cost housing solutions.

Michel Wurth
Member of ArcelorMittal Group Management Board

Felicidad Cristobal
Managing Director, ArcelorMittal Foundation

transforming
tomorrow



A Collaborative Approach

Habitat and ArcelorMittal demonstrate innovative product development aimed at socially and environmentally sound market based strategies interlinking the 3 sectors:

The private sector

Focused on excellence, efficiency, market and product development, corporate social and environmental responsibility, long-term profit maximization, shareholder and increasingly stakeholder value

Third Sector

Focused on people, community, society, social justice, values, environment, and vulnerabilities

Public sector

Focused on regulation, social safety net, job creation, environment and policy





Invitation



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