ACERO FRAME

Supplier of Light Steel Frame Construction Technology

DESIGN, PRODUCTION, REALIZATION

COMPANY
Mission

ACERO FRAME

Acero Frame Sp. z o.o. was established with an idea of creating a unique, complex market solution, which would display the full range of light steel frame construction applications in housing and industrial construction with particular insight into low-energy technologies.

COMPANY

Aim

Acero Frame Sp. z o.o. – our objective is to become the leader in modelling the production and assembly market of lightweight steel structures

COMPANY
Partners

ACERO FRAME

- ✓ *Comprehensive service.*
- ✓ *We offer full scope of services, starting from the project, through construction, up to finishing buildings (turnkey construction projects).*
- ✓ *We operate as a part of consortium.*

TOBA ARCHITEKCI

HYDOR

GREEN BEAVER

KLA-MAR Prywatna Firma

We work with the best in the business.

COMPANY
Market range

ACERO FRAME

- ✓ *Headquaters in Warsaw*

- ✓ *Market range – Poland and Europe*

TECHNOLOGY
Advantages

ACERO FRAME

*We introduce technology of **Light Steel Frame Construction** – not only does it change the traditional outlook on the construction, but also replaces conventional structures from bricks, concrete and timber.*

TECHNOLOGY
Advantages

ACERO FRAME

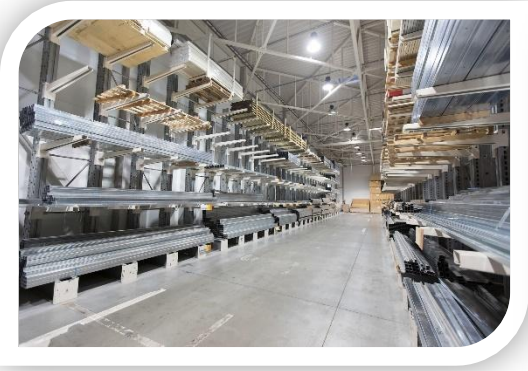
The technology is based on the modern type of construction and it is gradually gaining popularity.

TECHNOLOGY
Advantages

ACERO FRAME

Light Steel Frame Construction:

- ✓ *Short building time results in cost deacreasing in many aspects: hiring workers, construction services, security; and quicker investment return: renting of apartments, possibility of moving in or starting a business enterprise.*



TECHNOLOGY
Advantages

ACERO FRAME

Light Steel Frame Construction:

- ✓ *Possibility of construction at any time of the year (even in tough environmental conditions).*

TECHNOLOGY
Advantages

ACERO FRAME

Light Steel Frame Construction:

- ✓ *Fast and clean assembly of the structure due to a reduction in amount of wet processes and a possibility of prefabrication – decreased numer of deliveries to the construction site.*

TECHNOLOGY
Advantages

ACERO FRAME

Light Steel Frame Construction:

- ✓ *Great variety of exterior and interior finishes.*

TECHNOLOGY
Advantages

ACERO FRAME

Light Steel Frame Construction:

- ✓ *Use of ecological materials (LSFC structures may be used again).*

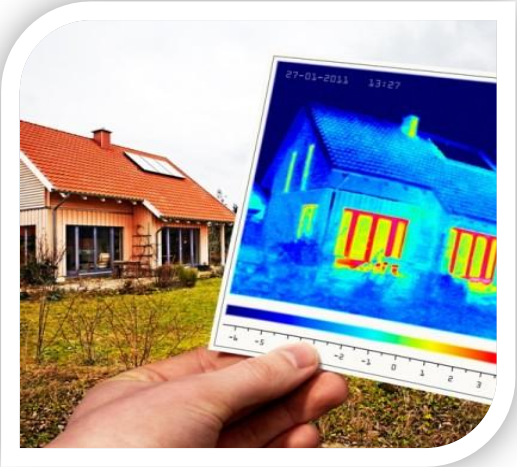
TECHNOLOGY
Advantages

ACERO FRAME

Light Steel Frame Construction:

- ✓ *High thermal efficiency due to the use of partitions with great thermal paramters.*

Thermal transmittance coefficient
U= 0.14 – 0.16 W/m²K



TECHNOLOGY
Advantages

ACERO FRAME

Light Steel Frame Construction:

- ✓ *Precision and accuracy of production – elements prefabrication.*

TECHNOLOGY
Advantages

ACERO FRAME

Light Steel Frame Construction:

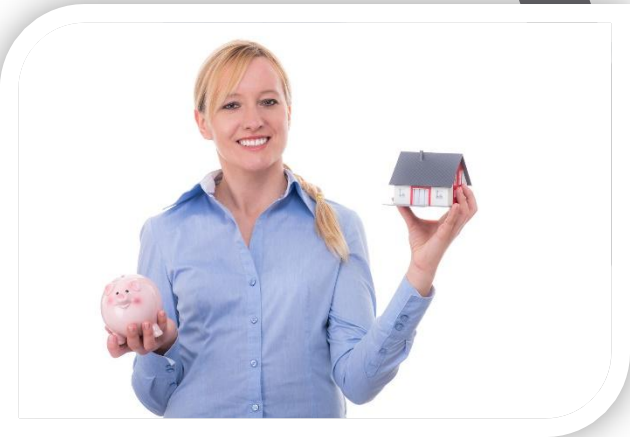
- ✓ *Possibility of gaining extra usable area since external wall thickness is only ca. 30 cm while maintaining excellent thermal resistance.*

TECHNOLOGY
Advantages

ACERO FRAME

Light Steel Frame Construction:

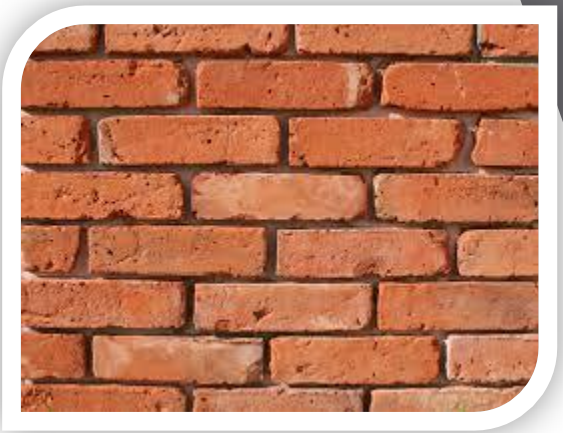
- ✓ *All the aforementioned advantages lead to the one basic benefit: decreasing of construction cost in comparison to conventional building technologies.*



TECHNOLOGY
Comparison

ACERO FRAME

Construction from bricks / clay masonry units



- ✓ *Greater amount of materials and tools.*
- ✓ *Higher transportation costs.*
- ✓ *Mortar orders, delivery dates.*
- ✓ *Higher amount of workers.*
- ✓ *Work depended on weather conditions.*
- ✓ *Long-lasting, laborious construction process.*
- ✓ *Worse values of the thermal transmittance coefficient.*

TECHNOLOGIA
Comparison

ACERO FRAME

Concrete construction

- ✓ *Need to involve highly skilled specialists and heavy equipment.*
- ✓ *Dependence on concrete deliveries.*
- ✓ *Work has to be adjusted to weather conditions.*
- ✓ *Construction is a complicated, long-drawn-out process.*
- ✓ *Heavy structure.*

TECHNOLOGY
Comparison

ACERO FRAME

Timber construction

- ✓ *Necessity to treat wood with chemical preservatives against fungi and insects.*
- ✓ *Difficulties with damp insulation.*
- ✓ *High prices of good quality timber.*
- ✓ *Waste of forests.*
- ✓ *Distortions, creaks, cracks in plaster.*
- ✓ *Highly flammable and conversely to steel, after conflagration there is nothing left to recover.*
- ✓ *Greater cross-section and weight of structural members.*

TECHNOLOGY
Description

ACERO FRAME

Structures built in Light Steel Frame Construction technology are synonymous with simple, clean and fast construction.

- ✓ *Light weight, high strength and stiffness.*
- ✓ *Greatly advanced prefabrication.*
- ✓ *Possibility of using high steel grades (high yield strength).*
- ✓ *Cold-formed steel profiles fully deserve the name of a modern, economical structural material*

TECHNOLOGY
Description

ACERO FRAME

Cold-formed steel profiles despite the small size and relatively low weight have sufficient stiffness and strength.

Compared to structures made from hot-rolled steel sections, structures made of these profiles may be called:
***"ultralightweight steel structures"**.*

TECHNOLOGY
Material

ACERO FRAME

Light Steel Frame Construction uses so called cold-formed, galvanized steel profiles with wall thickness ranging from 0.5 mm to 3 mm.

Typical application of profiles includes different type of walls: external, curtain or partition, as well as: floor joists, girders and purlins.

TECHNOLOGY
Material

ACERO FRAME

Large variety of strength parameters of these profiles allows us to optimize the amount of necessary material.

TECHNOLOGY
Material

ACERO FRAME

Profiles are produced from galvanized steel tapes of thickness ranging from 1.50 mm to 3.00 mm and of strength classes S280GD, 350GD according to PN-EN 10326.

TECHNOLOGY
Material

ACERO FRAME

Zinc coating on steel sheets used for profiles production is of class Z275 [g/m2] (total thickness of the coating) according to PN-EN 10326:2006.

TECHNOLOGY
Framework

ACERO FRAME

The complete framework consists of prefabricated elements.

Prefabricated wall, slab and roof elements and connected on the building site using self-drilling screws.

TECHNOLOGY
Framework - flexibility

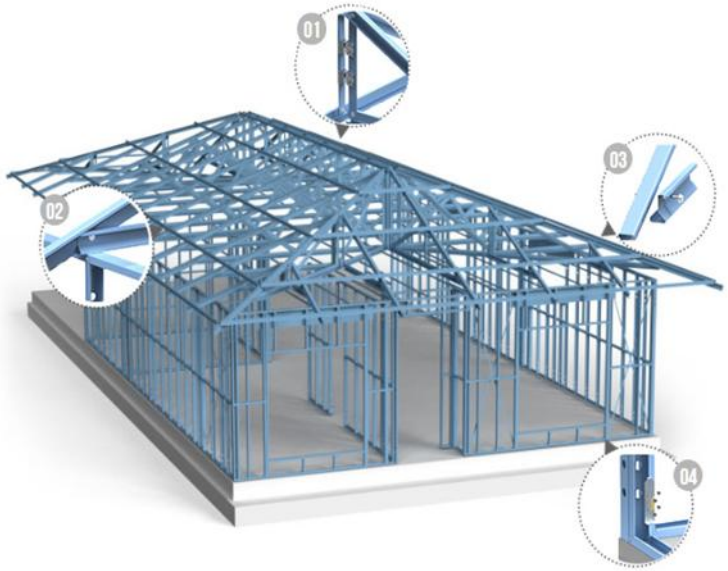
ACERO FRAME

Standard elements let us design and produce infinitely many new combinations.
Alteration and expansion of the struture is simple and quick. Acero Frame system may be successfully compared to the Lego bricks.

TECHNOLOGY
Framework assembly

ACERO FRAME

Every steel purlin, column or sheet is connected in designated, well-marked nodes.



TECHNOLOGY
Framework assembly

ACERO FRAME

Acero Frame construction crew

Only two workers and a lightweight lorry equipped with a crane are needed to build the structure even in the case of larger buildings. Our crew workers are professionals and have all necessary certificates and qualifications.

TECHNOLOGY
Framework assembly

ACERO FRAME

Building the house structure of ca. 200-300 sq. m by the crew of 4-5 qualified workers takes about 2-3 days.

TECHNOLOGY
Framework assembly

ACERO FRAME

Assembly scheme

View animation on YouTube

TECHNOLOGY
Framework assembly

ACERO FRAME

Steel framework technology does not require temporary assembly bracing. The structure is stiffened with the use of plate members such as OSB or cement bonded particleboard and internal system bracings.

TECHNOLOGY
Framework assembly

ACERO FRAME

Owing to this fact, right after setting and anchoring wall panels and installing sheathing, the assembly of roof girders or intermediate slab may start.

STRUCTURES
Software

ACERO FRAME

Vertex BD

VERTEX SYSTEMS

***BIM** software:*

- *Smooth transition and easy coordination between each project stage.*
- ***Automation** of the design process:*
  - *material reports*
  - *shop drawings*

Architecture

Structure

Production

STRUCTURES
Software

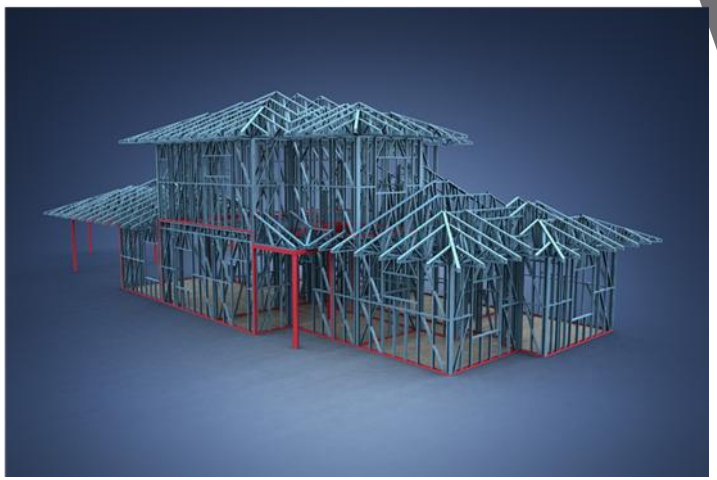
ACERO FRAME

Architectural project - renders

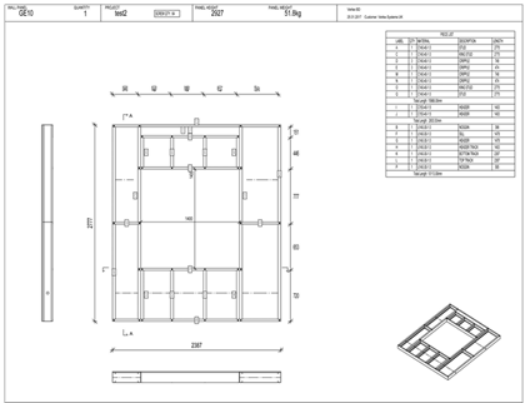
Vertex BD

VERTEX SYSTEMS

Structure project



Drawings + material reports



STRUCTURES
Animations

ACERO FRAME

Multistorey buildings

View animation on YouTube

STRUCTURES
Animations

ACERO FRAME

Single-family houses

View animation on YouTube

STRUCTURES
Animations

ACERO FRAME

Industrial buildings

View animation on YouTube

STRUCTURES
Animations

ACERO FRAME

Design of the steel structure

View animation on YouTube

STRUCTURES
Advantages

ACERO FRAME

Benefits of using lightweight steel construction technology:

- ✓ *more durable and lighter,*
- ✓ *anticorrosive protection,*
- ✓ *quality guarantee,*
- ✓ *flexibility and freedom of choice,*
- ✓ *fast assembly.*

STRUCTURES

Structural details

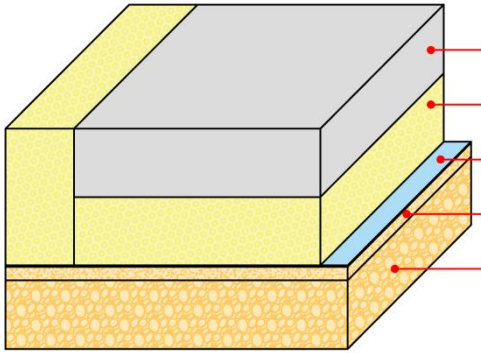
ACERO FRAME

- ✓ *Ground slab*
- ✓ *Exterior walls*
- ✓ *Interior walls*
- ✓ *Slab*
- ✓ *Roof*

STRUCTURES
Structural details

ACERO FRAME

GROUND SLAB



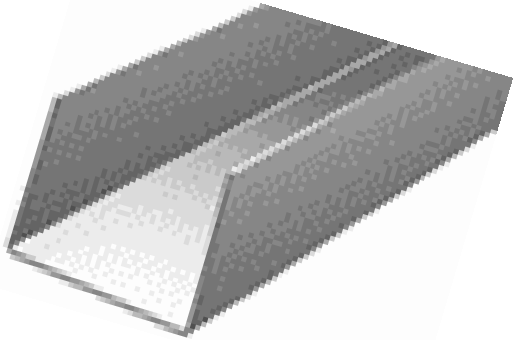
Concrete slab C25/30	250.0 mm
"IZODOM" system formwork	250.0 mm
PE membrane	
Fine sand	50.0 mm
Coarse-grained gravel	min. 500.0 mm

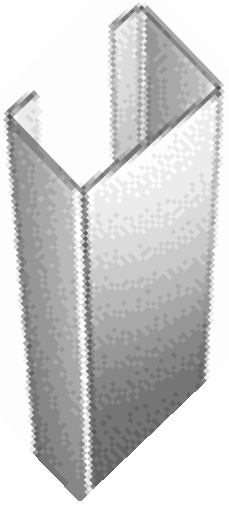
STRUCTURES

Structural details

ACERO FRAME

Wall framing is built of vertical "C" profiles spaced by 60 cm, enclosed from the top and bottom with "U" profiles.

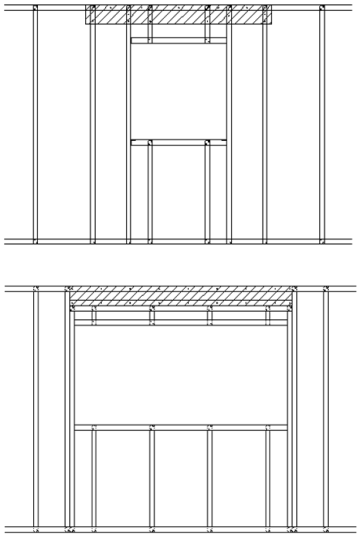




STRUCTURES
Structural details

ACERO FRAME

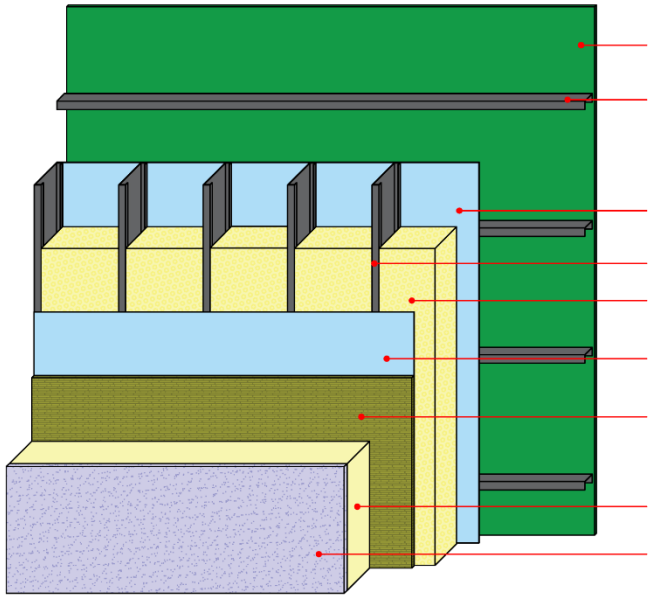
Openings for windows and doors are accounted for in the prefabricated wall panel design by the special construction of headers.



STRUCTURES
Structural details

ACERO FRAME

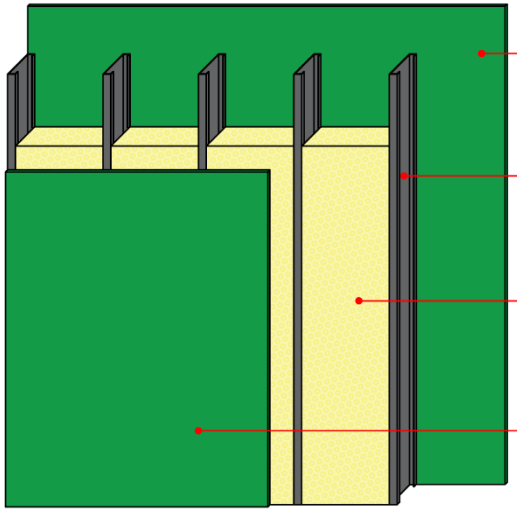
EXTERNAL WALL - layers



STRUCTURES
Structural details

ACERO FRAME

INTERIOR WALL - layers



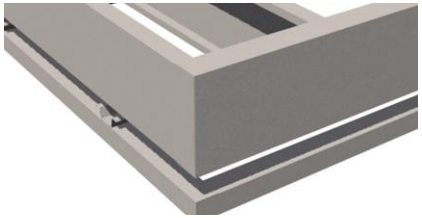
Plasterboard	12.5 mm
Steel profile C100/120	100.0/120.0 mm
Mineral wool / PIR/PUR	100.0/120.0 mm
Plasterboard	12.5 mm

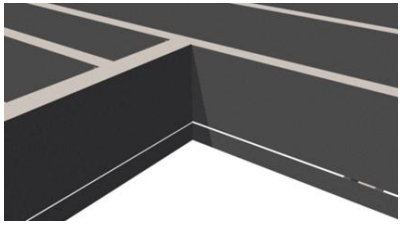
STRUCTURES

Structural details

ACERO FRAME

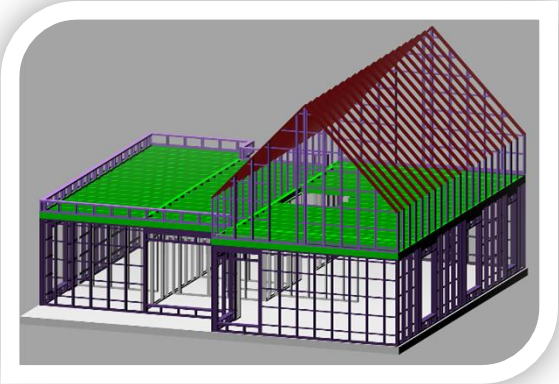
"C" and "U" profiles in various combinations are used for the slab construction. A typical joist is made of two "C" profiles connected together by a cross brace.



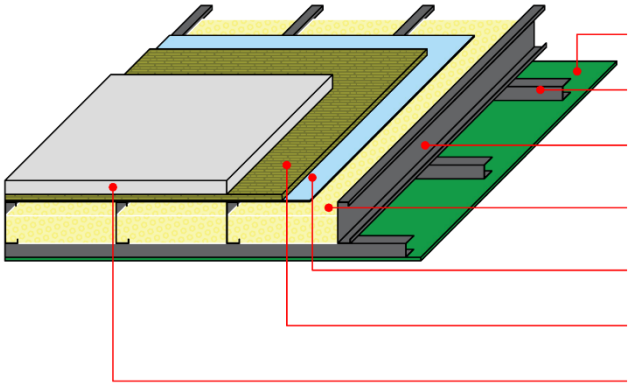


STRUCTURES
Structural details

ACERO FRAME



SLAB - layers



Plasterboard	12.5 mm
Steel profile S25/UJ50	50.0 mm
Steel profile C200	200.0 mm
Mineral wool / PIR/PUR	150.0 mm
Vapour barrier	
OSB	22.0 mm
Screed	50.0 mm

STRUCTURES
Structural details

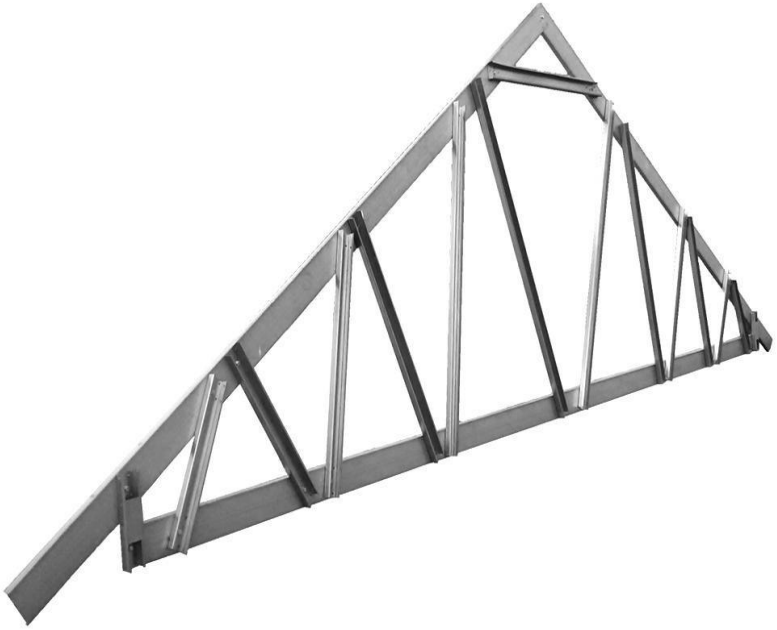
ACERO FRAME

Maximum span of the slab in residential buildings is 6.5 m (assuming the design live load to be 1.5 kN/m^2).
For greater spans girders are constructed.

STRUCTURES
Structural details

ACERO FRAME

The roof supporting structure is built of truss girders. The shape of girders is dependent on the building architecture. The typical spacing of girders is 60 cm.

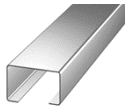


STRUCTURES
Structural details

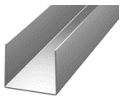
ACERO FRAME

Roof girders: standard truss

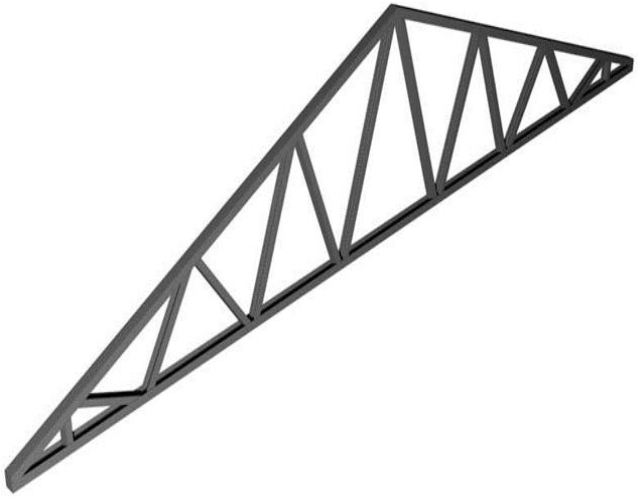
Posts and diagonals – "C" profile



Top and bottom chord – "U" profile



For large spans, the bottom chord is split into two parts connected with a post.

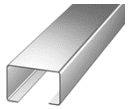


STRUCTURES
Structural details

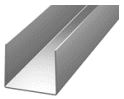
ACERO FRAME

Roof girders: Russian type truss

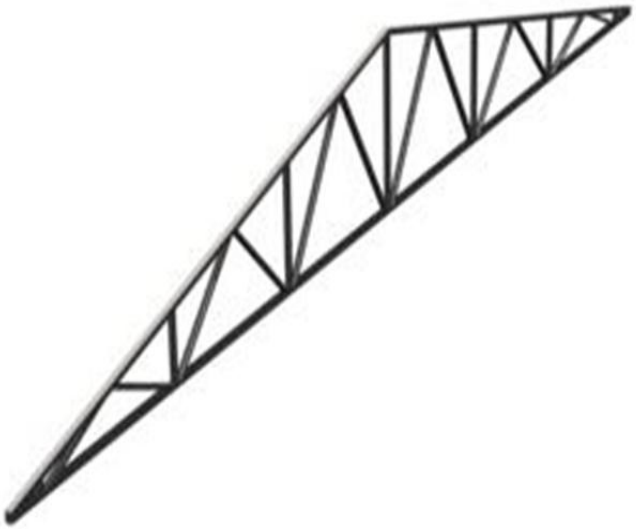
Posts and diagonals – "C" profile



Top and bottom chord – "U" profile



Construction the same as for the standard truss.



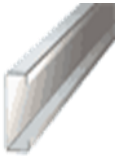
STRUCTURES
Structural details

ACERO FRAME

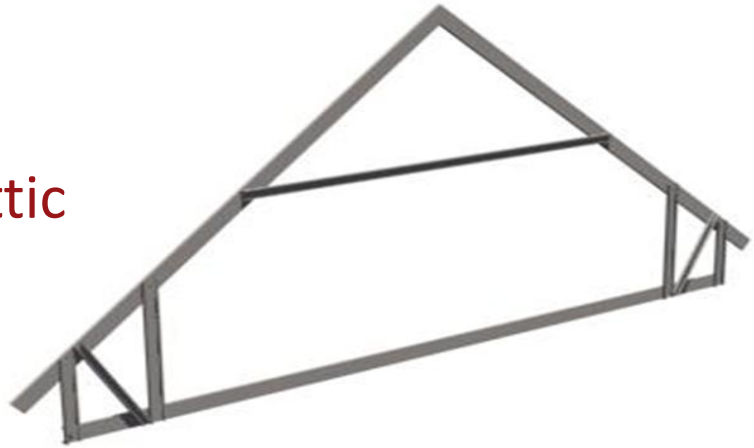
Roof girders: Swedish roof

All members made of "C" profiles

- ✓ *Rafters*
- ✓ *Joists*
- ✓ *Roof beams*
- ✓ *Knee wall posts*
- ✓ *Knee braces*



The most economical solution for the usable attic space in a single-family house.



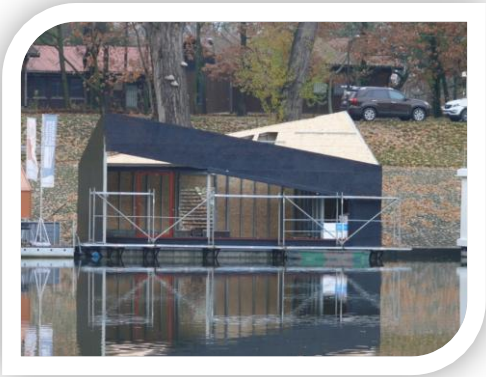
APPLICATIONS

ACERO FRAME

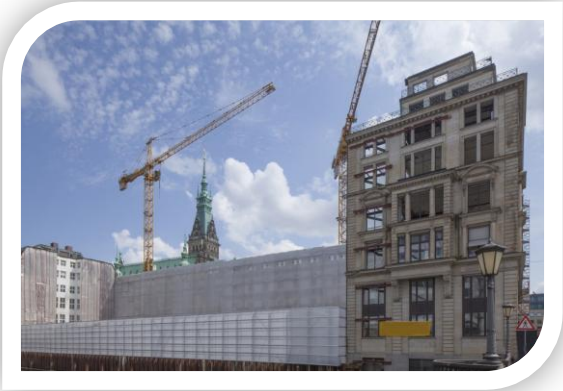
Light Steel Frame Construction technology allows us to build any type of residential buildings:

single-family houses

multi-storey residential buildings



floating houses



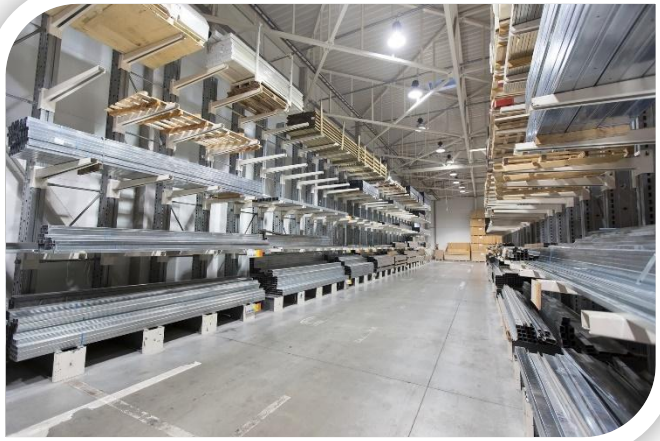
superstructures, expansions

APPLICATIONS

ACERO FRAME

Application versatility of Light Steel Frame Construction:

Residential housing



Industrial steel buildings

APPLICATIONS
Residential

ACERO FRAME

Light Steel Frame Construction technology is an energy-saving and ecological building solution.

Technology that allows us to reduce the negative impact of structures on the environment,
at the same time improving the usage comfort and significantly lowering the usage cost.

APPLICATIONS
Residential

ACERO FRAME

Modern construction – fit for the 21st century, focuses on developing building solutions that allow to minimize energy losses and maximize the useage of renewable energy.

APPLICATIONS
Residential

ACERO FRAME

Modern houses are designed individually and customized to a level that fully satisfies even the most demanding investors.

APPLICATIONS
Energy-saving buildings

ACERO FRAME

We are the only supplier of lightweight steel structures that has a guarantee of energy-efficiency from Warsaw University of Technology.

POLITECHNIKA WARSZAWSKA
WARSAW UNIVERSITY OF TECHNOLOGY

Energy-efficiency guarantee

APPLICATIONS
Energy-saving house

ACERO FRAME

- ✓ *High insulating power.*
- ✓ *Low thermal transmittance coefficient*
- ✓ *Ventilation systems use heat recovery*
- ✓ *Building is appropiately situated with regard to the cardinal directions*
- ✓ *Powered by energy from renewable sources.*

APPLICATIONS
Passive house

ACERO FRAME

- ✓ *Compact, simple shape in order to minimize heat losses.*
- ✓ *Low thermal transmittance coefficient.*
- ✓ *Windows placed properly with regard to the cardinal directions.*
- ✓ *Equipped with ventilation system with heat recovery.*
- ✓ *High tightness.*
- ✓ *Renewable energy sources, photovoltaics, heat pumps.*

APPLICATIONS
Multi-family construction

ACERO FRAME

Multi-family construction provides savings in multiple areas: building area, costs, energy.

Multi-storey residential buildings

Terraced and semi-detached houses

APPLICATIONS
Curtain walls

ACERO FRAME

Curtain walls in new large-volume buildings

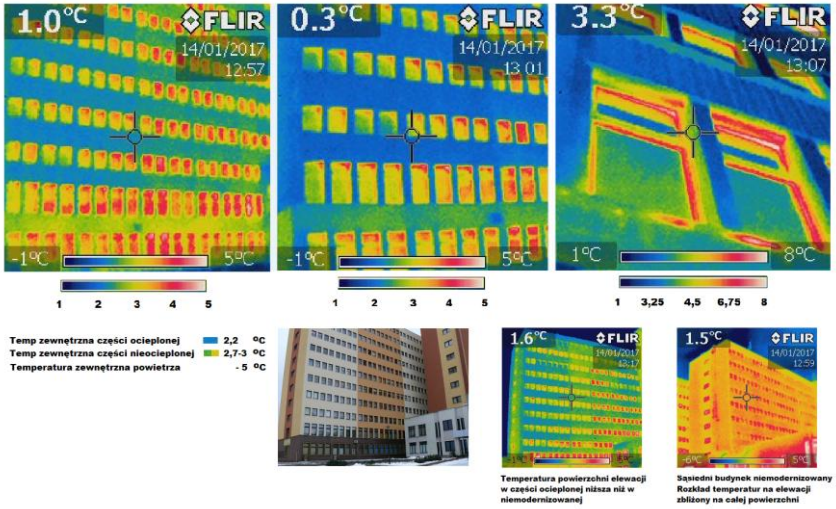
- ✓ *curtain walls*
- ✓ *partition walls*

APPLICATIONS
Curtain walls

ACERO FRAME

Replacement of curtain walls in old large-volume buildings

- ✓ *curtain walls*

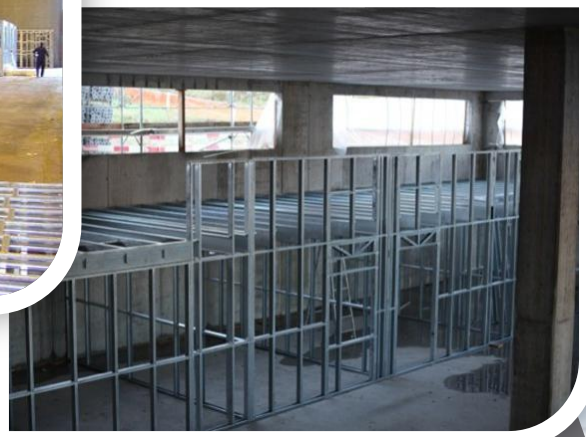


APPLICATIONS
Industrial buildings interior space

ACERO FRAME

Prefabricated elements for industrial buildings interior space development

- ✓ *curtain walls*
- ✓ *partition walls*



APPLICATIONS
Curtain walls

ACERO FRAME

Advantages of using prefabricated walls in large-volume construction:

- ✓ *acceleration of the construction process,*
- ✓ *fast and clean assembly of the structure,*
- ✓ *reduction of the bearing structure weight,*
- ✓ *improvement of the building energy effeciency – our partitions have excellent thermal parameters,*
- ✓ *possibility of gaining additional useable area.*

APPLICATIONS
Superstructures

ACERO FRAME

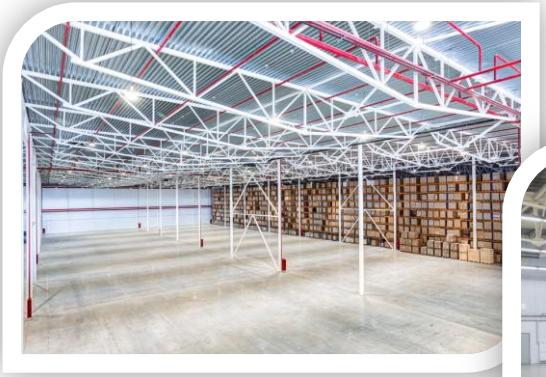
Light weight and high strength of the structure allows us to satisfy bearing capacity of ground due to only slight weight increase on the existing foundations.

- ✓ *Usable superstructures*
- ✓ *Roof reconstruction*
- ✓ *Attic reconstruction*

APPLICATIONS
Industrial buildings

ACERO FRAME

Light Steel Frame Construction technology allows us to build any type of industrial structures:



shop floors / assembly rooms / warehouses

workshops

aircraft hangars and sports halls

APPLICATIONS
Industrial buildings

ACERO FRAME

- ✓ *Shop floors*
- ✓ *Assembly rooms*
- ✓ *Warehouses*
- ✓ *Rows of shops*
- ✓ *Shops*
- ✓ *Garages*
- ✓ *Car parks*

APPLICATIONS
Agricultural buildings

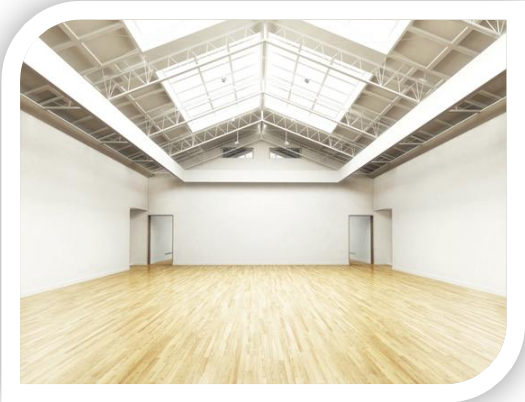
ACERO FRAME

Buildings for pig farming, cattle and poultry husbandry, barns, cold stores, food-processing plants.

APPLICATIONS
Public/social buildings

ACERO FRAME

- ✓ *Schools*
- ✓ *Sports facilities*
- ✓ *Hospitals*
- ✓ *Churches*



DESIGN
Conceptual thinking

ACERO FRAME

We follow global trends and we create them ourselves by connecting advanced functionality with modern architecture and striking design.

TOBA ARCHITEKCI

DESIGN
Formulating assumptions

ACERO FRAME

Creation of a professional investment concept is the basis of success of the whole enterprise.
We constantly consult with the investor about the functional layout, simultaneously taking into consideration optimization with regard to the technical and economical conditions.

DESIGN
Optimization

ACERO FRAME

We redesign projects into modern buildings – creatively, with imagination, professionally, effectively – based on the formula: "design and build" and a proven know-how.

We offer technically advanced solutions and experience of our team of engineers and architects.

DESIGN
Personalization

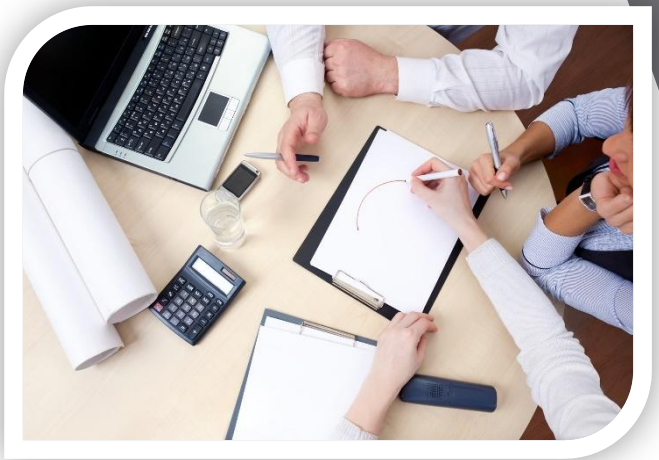
ACERO FRAME

Our experienced engineers are constantly at investor's disposal during the investment process, right from the creation of assumptions for the project.

DESIGN
Documentation

ACERO FRAME

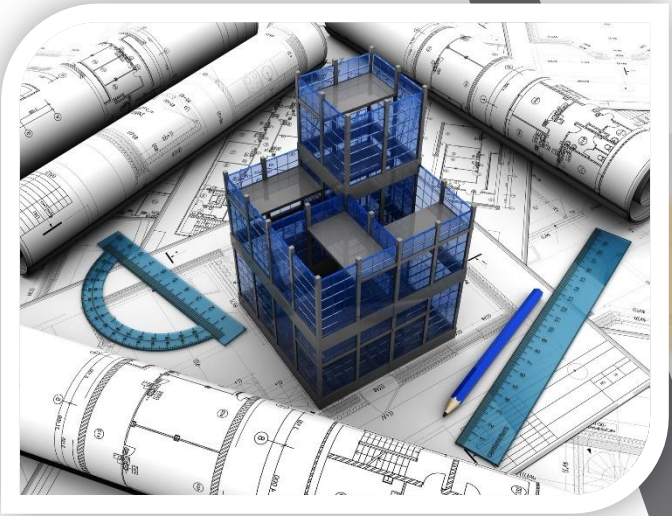
- ✓ *We consider all investor's alterations and suggestions.*
- ✓ *We present renders of buildings.*
- ✓ *We deliver expert opinion on customers projects.*
- ✓ *Conceptual thinking.*
- ✓ *Integrated approach and experience in design.*
- ✓ *We fulfill all individaul expectations.*



DESIGN
Documentation

ACERO FRAME

- ✓ *We prepare full-discipline construction projects.*
- ✓ *We complete all official formalities.*
- ✓ *We determine all technical conditions and requirements.*
- ✓ *We produce shop projects / technological designs.*
- ✓ *We prepare documents required for occupancy permit.*



DESIGN
Documentation

ACERO FRAME

Drawing up documentation required for building permit is overseen by a team of design and construction engineers.

INSTALATIONS

ACERO FRAME

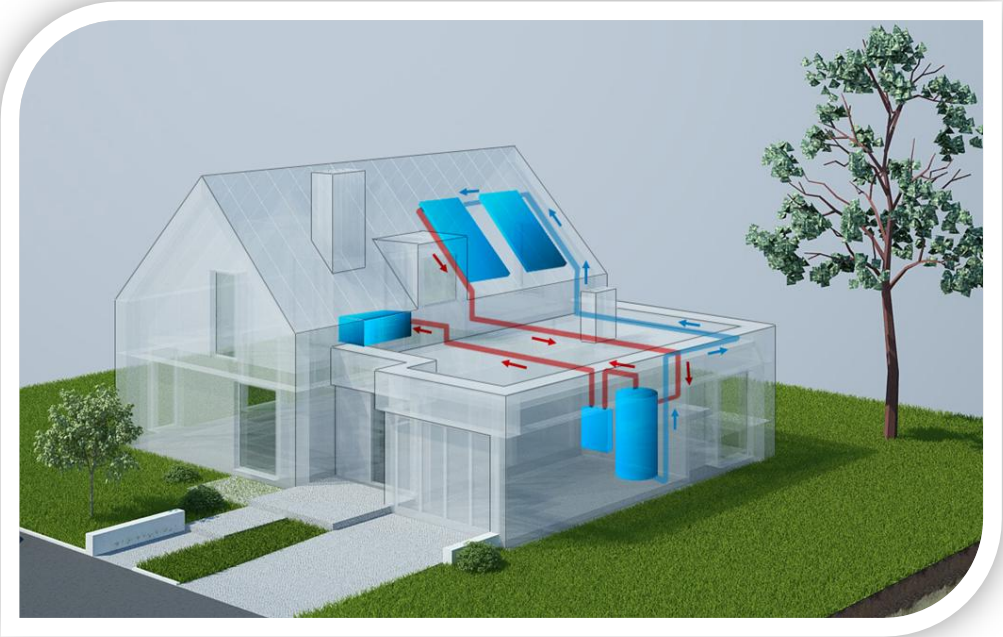
Acero Frame houses most of all have high tightness and thermal insulating properties. They are designed in a way that limits building's energy losses to a minimum.

- ✓ *solar collectors*
- ✓ *wind turbines*
- ✓ *heat pumps*
- ✓ *ventilation with heat recovery*

INSTALATIONS
Solar collectors

ACERO FRAME

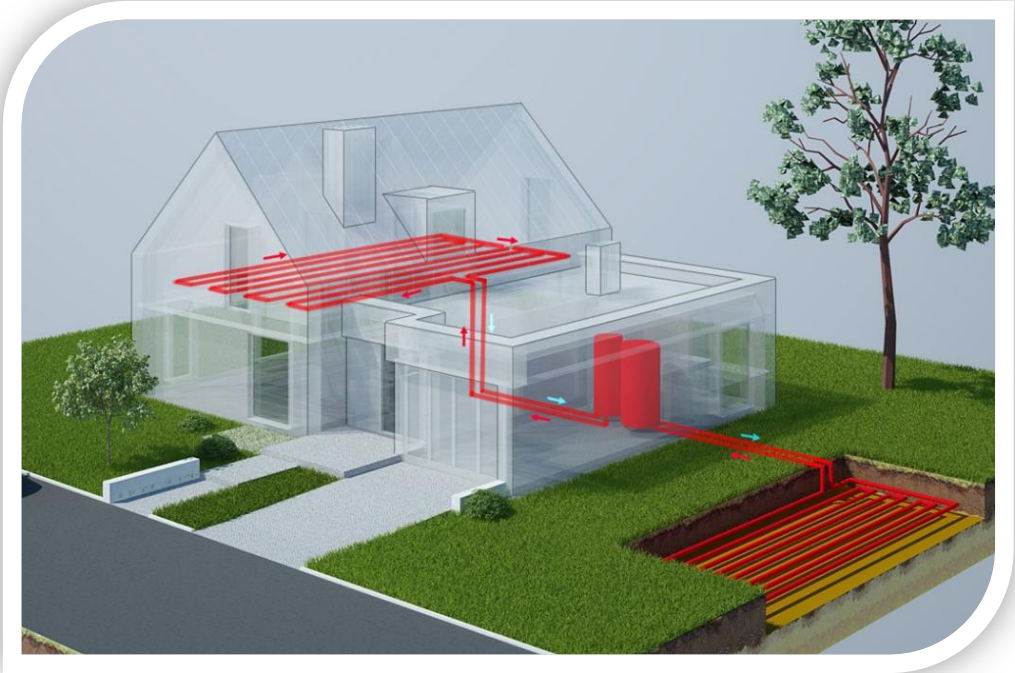
Heat from solar radiation is absorbed and used to heat hot water for house use.



INSTALATIONS
Heat pumps

ACERO FRAME

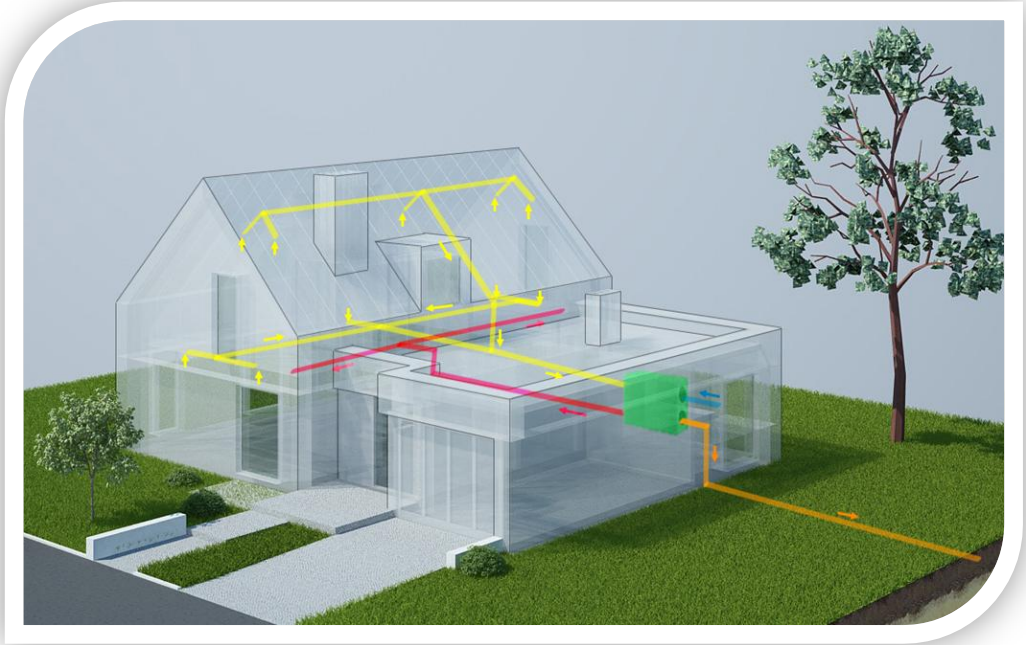
Heat energy is extracted from the ground and processed by the heat pump with low use of electrical energy.



INSTALATIONS
Heat recovery

ACERO FRAME

Ventilation system with heat recovery continually delivers fresh and cleaned air inside the building and exhausts used air.



INSTALATIONS
Animation

ACERO FRAME

View animation on YouTube

CONSTRUCTION
General contractor

ACERO FRAME

Our experienced assembly crews raise and later finish buildings on schedule according to agreed-upon scope of works.

- ✓ *Efficiently*
- ✓ *Reliably*
- ✓ *Professionaly*

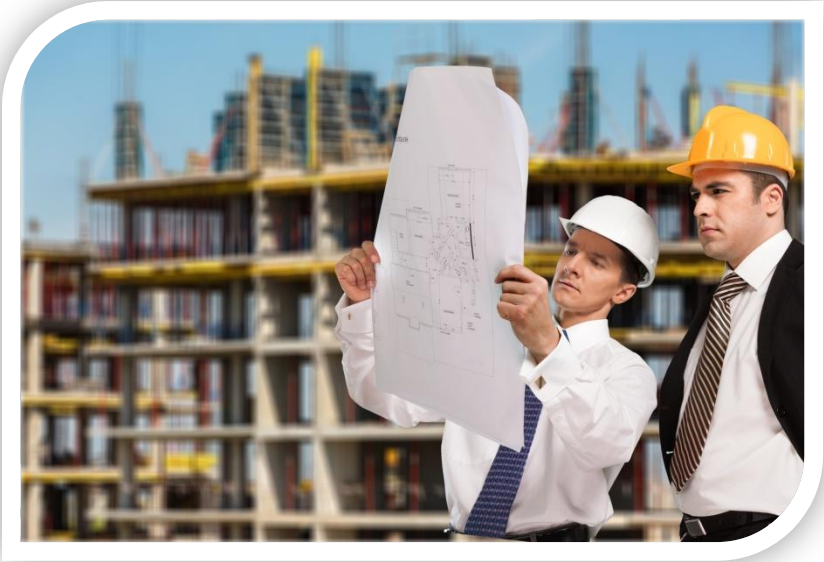
CONSTRUCTION
Investment supervision

ACERO FRAME

Taking over all investor's responsibilities, we can effectively convince that realization of large projects may be simple.

CONSTRUCTION
Investment supervision

ACERO FRAME



A team of site managers and engineers is responsible for efficient and on-schedule construction works.

WE WORK FOR
Investors

ACERO FRAME

We make every effort to satisfy even the most demanding customers.

We ensure individual approach towards each investor and guarantee professionalism, reliability and the prompt completion of works.

WE WORK FOR
Developers

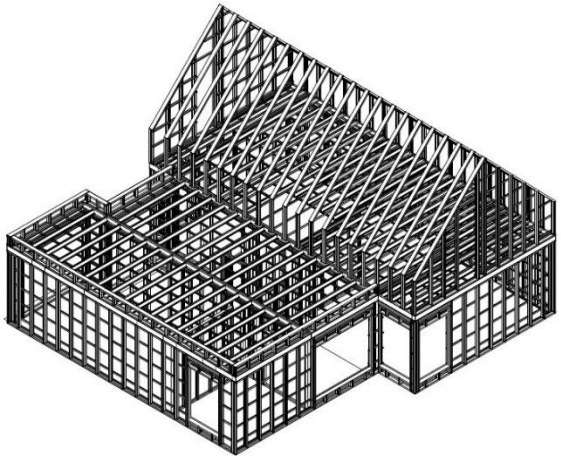
ACERO FRAME

Innovative, modern and low-cost construction technology which allows us to build an exceptional housing estate.

WE WORK FOR
Architects

ACERO FRAME

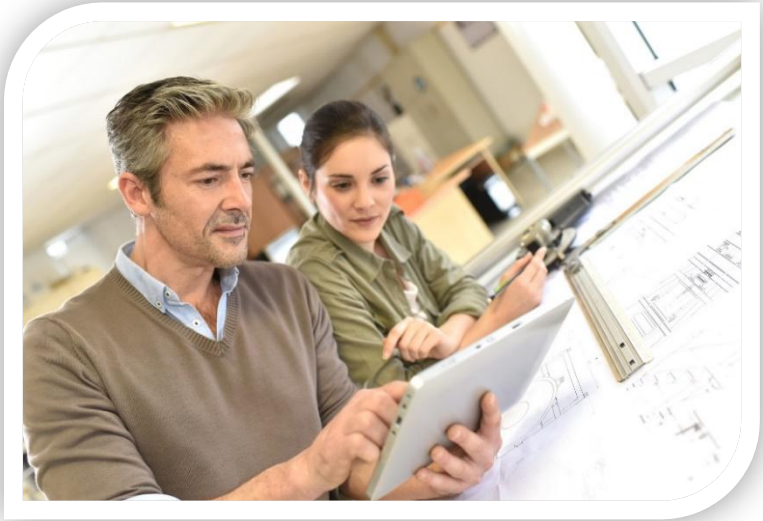
- ✓ *We can help you utilize your creative and innovative ideas with the use of our construction technology*
- ✓ *Our technology can be customized and applied to ready projects.*
- ✓ *We can develop reliable, detailed structural project including cost estimation.*
- ✓ *We use the best design tools – Vertex BD.*



WE WORK FOR
Structural engineers

ACERO FRAME

We can prepare the whole project documentation or any separate part of it including drawings or statical calculations results for steel and concrete structures.



VERTEX SYSTEMS

WE WORK FOR
Contrators

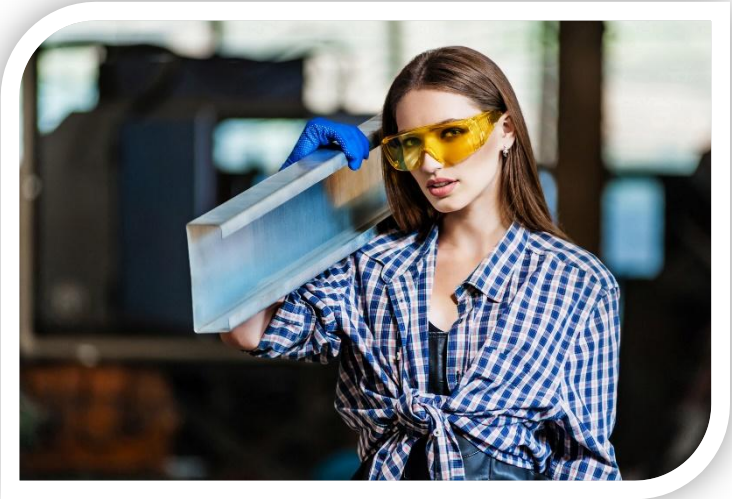
ACERO FRAME

- ✓ *We prepare accurate and clear construction projects in Light Steel Frame Construction technology.*
- ✓ *Material reports/schedules.*
- ✓ *Technical description of the structure.*
- ✓ *Drawings documentation.*

WE WORK FOR
You

ACERO FRAME

We make dreams come true



Supplier of Light Steel Frame Construction Technology

We invite you to cooperation

kontakt@aceroframe.pl