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(54) **LOGISTIC BUILDING**

(57) The current invention relates to a logistics building comprising dry-anchoring structural elements, which structural elements also support at least one electrical network, at least two water networks and at least one refrigerant piping network, the building is further provided with at least one thermo-electric module configured to store and dispense electricity collected from renewable energy modules integrated into the building, said at least one module being further configured to provide water from a buffer tank to at least one water network and to provide heating/colling by means of a heat pump system connectable to at least one refrigerant network inside the building.

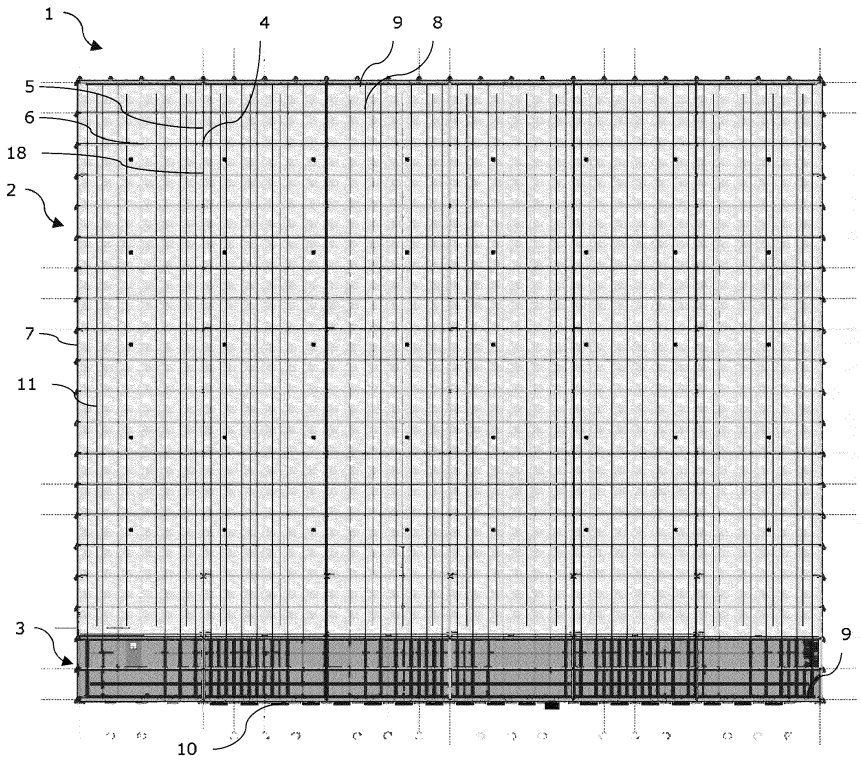

FIG. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a logistics building comprising modular elements. More in particular, the present invention relates to a logistics building comprising reusable modular elements.

BACKGROUND

[0002] Such a building according to the preamble is also known from DE3517046 (D1). D1 further describes a repeatedly convertible prefabricated building for use, for example, as a warehouse, garage or the like, of rectangular typical ground plan. The aim is to secure the edges of the individual prefabricated walls and to design the roof construction in an insulating manner. This aim is achieved by the individual walls being connected by lightweight cement tiles, which are embraced by U-shaped lightweight steel sections, in their perpendicular corner regions or in equidirectional abutting regions of a plurality of walls, in each case by means of a plurality of separable tack seams distributed over the height. However, the building described in D1 is limited to steel framed buildings.

[0003] Also known is the building from CN111287326A (D2). D2 relates to a rapidly detachable and rebuilt assembled and synthesized building and a construction method thereof. The rapidly detachable and rebuilt assembled and synthesized building comprises a plurality of prefabricated house modules; exposed steel stand column assemblies are reserved at the corners of the tops and the corners of the bottoms of the prefabricated house modules, the steel stand column assemblies at the bottoms perpendicularly correspond to the steel stand column assemblies at the tops of the prefabricated house modules on the next layer in position; horizontal connectors are clamped between adjacent top steel stand column assemblies of the adjacent prefabricated house modules on the same layer, the adjacent top steel stand column assemblies are connected with the horizontal connectors through bolts; and the adjacent steel stand column assemblies of the vertically adjacent prefabricated house modules are connected through the bolts. Due to the small size of the house modules, the building described in D2 is not suitable to be used as a warehouse.

[0004] The present invention aims to resolve at least some of the problems and disadvantages mentioned above.

[0005] The invention thereto aims to provide an easily scalable and reconfigurable logistics building, the elements of which building are easily reusable in the same or other buildings.

SUMMARY OF THE INVENTION

[0006] The present invention and embodiments thereof serve to provide a solution to one or more of above-mentioned disadvantages. To this end, the present invention relates to a logistics building according to claim 1. The structure of the building comprises prefabricated structural elements, permitting not only faster assembling of the building, but also faster disassembling of said building. The disposition and dimensions of the structural elements of the building, in combination with the geometry of its roof elements allows for a substantially more efficient placement of fire quenching fluid carrying pipes and sprinklers. The building according to the present invention permits also the reuse of at least its dry-anchoring structural elements. The dry-anchoring structural elements used allow the users to scale and customized the building and its internal spaces.

[0007] The structural elements of the building also support at least one electrical network, at least two water networks and at least one refrigerant piping network. A preferred embodiment of the invention is found in claim 12. The building according to said claim is further provided with at least one thermo-electric module configured to store and dispense electricity collected from renewable energy modules integrated into the building. Said at least one module being further configured to provide water from a buffer tank to at least one water network and to provide heating/colling by means of a heat pump system connectable to at least one refrigerant network inside the building. Said modules allow the building to operate off the grid.

[0008] The building according to the present invention permits assembly, operation, maintenance and disassembly of the building and/or any of its elements while maintaining a substantially reduced environmental impact.

DESCRIPTION OF FIGURES

[0009] The following description of the figures of specific embodiments of the invention is merely exemplary in nature and is not intended to limit the present teachings, their application or uses. Throughout the drawings, corresponding reference numerals indicate like or corresponding parts and features.

Figure 1 FIG. 1 schematically presents a top view of the inside of the logistic building.

Figure 2 shows a high angle sectioned view of the logistics building.

Figure 3 schematically presents a thermo-electric module and its connections to the storage area, office space and solar panels .

Figure 4 shows an axonometric view of the top of a pillar.

Figure 5 shows two two-anchoring point beams an-

chored to the anchoring points on the raised section of the top of a pillar.

Figure 6 shows two two-anchoring point beams and two four-anchoring point beams anchored to the top of a pillar.

Figure 7 shows a pillar placed at a corner of the building.

Figure 8 shows part of the structure of the beam supporting the roof, lighting electrical network and fire quenching fluid piping.

DETAILED DESCRIPTION OF THE INVENTION

[0010] The present invention concerns a logistics building comprising dry-anchoring structural elements, which structural elements also support at least one electrical network, at least two water networks and at least one refrigerant piping network.

[0011] Unless otherwise defined, all terms used in disclosing the invention, including technical and scientific terms, have the meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. By means of further guidance, term definitions are included to better appreciate the teaching of the present invention.

[0012] As used herein, the following terms have the following meanings:
"A", "an", and "the" as used herein refers to both singular and plural referents unless the context clearly dictates otherwise. By way of example, "a compartment" refers to one or more than one compartment.

[0013] "Comprise", "comprising", and "comprises" and "comprised of" as used herein are synonymous with "include", "including", "includes" or "contain", "containing", "contains" and are inclusive or open-ended terms that specifies the presence of what follows e.g. component and do not exclude or preclude the presence of additional, non-recited components, features, element, members, steps, known in the art or disclosed therein.

[0014] Furthermore, the terms first, second, third and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequential or chronological order, unless specified. It is to be understood that the terms so used are interchangeable under appropriate circumstances and that the embodiments of the invention described herein are capable of operation in other sequences than described or illustrated herein.

[0015] The recitation of numerical ranges by endpoints includes all numbers and fractions subsumed within that range, as well as the recited endpoints.

[0016] Whereas the terms "one or more" or "at least one", such as one or more or at least one member(s) of a group of members, is clear *per se,* by means of further exemplification, the term encompasses *inter alia* a reference to any one of said members, or to any two or more of said members, such as, e.g., any ≥3, ≥4, ≥5, ≥6 or ≥7 etc. of said members, and up to all said members.

[0017] Unless otherwise defined, all terms used in disclosing the invention, including technical and scientific terms, have the meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. By means of further guidance, definitions for the terms used in the description are included to better appreciate the teaching of the present invention. The terms or definitions used herein are provided solely to aid in the understanding of the invention.

[0018] Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases "in one embodiment" or "in an embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment, but may. Furthermore, the particular features, structures or characteristics may be combined in any suitable manner, as would be apparent to a person skilled in the art from this disclosure, in one or more embodiments. Furthermore, while some embodiments described herein include some but not other features included in other embodiments, combinations of features of different embodiments are meant to be within the scope of the invention, and form different embodiments, as would be understood by those in the art. For example, in the following claims, any of the claimed embodiments can be used in any combination.

[0019] A first aspect of the invention relates to a logistics building comprising:

a. At least one storage area with loading bay suitable for entrance and/or loading of freighter trucks;
b. Office space comprising at least one office;

characterized in that, the building includes a load bearing structure comprising a plurality of load bearing pillars disposed in a substantially vertical orientation, the bases of which pillars are disposed in a rectangular pattern upon the foundation of the building, said pillars being further connected to each other by means of load bearing beams removably attached to anchoring points at or near the top end of each pillar, each load bearing beam including at least one anchoring point located at each end of said beam, a plurality of corrugated sheet metal roof panels are provided attached to the load bearing beams, said roof panels being placed such that the corrugation channels of each roof panel run in the same direction and substantially parallel to at least one outer wall of the building, upon which wall a manifold is rigidly attached near the top of the wall, which manifold has one input end fluidly connected to a fire quenching fluid network, the manifold is further provided with a plurality of output ends distanced no more than 3 meters from each other and

no more than 1,5 meters from a wall, pillar or beam, each of said output ends being in further fluid connection to a pipe mounted between the roof panels and the load bearing beams, said pipe running inside a corrugation channel of the roof panels, each pipe being further equipped with fire quenching fluid sprinkles distanced no more than 3 meters from each other and no more than 1,5 meters from a wall, pillar or beam, the distance between the centerline of the pillars being further characterized in that their length is a multiple of 1,5 meters. The network of fire quenching fluid carrying pipes extending along the ceiling of the building, provide fire extinguishing means to both the storage and the office area. It is also possible to provide multiple networks of fire quenching fluid carrying pipes for different areas of the building or even the same areas of the building. For example, a newly installed expansion to the building may receive its own network of fire quenching fluid carrying pipes or tap into an already existing one. In this way, appropriate pressure and volume of fire quenching fluid can be provided. The distance between the sprinklers, advantageously, allows for a complete coverage of the building area. By preference, the fire quenching fluid network is a water pipe network. Since, the pipes feeding the ceiling sprinklers are installed between the support beams and the corrugated roof elements using the inside the channels of the corrugate roof elements, said pipes do not reduce any of the usable space of the building. Roof element geometry tests have shown that each pair of identical channels of corrugated roof panels are preferably spaced 0,25 meters between each other. This is particularly advantageous when combined with the distance between the centerlines of the pillars, which distance being a multiple of 1.5 meters, advantageously permits a more efficient distribution of the fire quenching fluid carrying pipes along the ceiling of the building.

[0020] By preference, the roof panel corrugation defines a channel on its underside, the transversal section of which channel defines a trapezium shape, most preferably an isosceles trapezium shape. In this way, the width of the channels formed by the corrugations of the roof panels is substantially wider that round corrugations, thus maximizing the space available for the mounting of sprinkler piping. The extra space made available by this corrugation profile advantageously helps compensate for any foreseeable linear expansion of the roof elements due to temperature changes. More preferably, the distance between the center of the trapezium shaped corrugations is between 0.25 meter and 0,5 meter, more preferably between 0.3 meter and 0,4 meter, most preferably between 0.3 meter and 0,35 meter, the distance preferably being a divider of 1.5 meters. The channels defined by the underside of the roof panels are separated by a flat section at the lowest point of the corrugation, which flat section has a width between 20mm and 100mm, more preferably between 30mm and 80mm, 35mm and 60mm, most preferably between 40mm and 50mm. The height of the trapezium shaped channels is between 80mm and 200mm, more preferably 100mm and 180mm, 120mm and 150mm, most preferably between 130mm and 140mm. This shape of the channels advantageously permits greater liberty in the placement of sprinklers and their piping while not limiting in any way the shape of the canopy of water sprayed by the sprinkles when activated. In this way it is possible to mount the sprinklers well above the base of the corrugation of the roof plates, while permitting full functionality of said sprinklers.

[0021] By preference the load bearing beams are dimensioned so as to allow a distance between pillar centerlines of 12 meters, more preferably 18 meters, most preferably 24 meters. In this way fewer pillars are used while still maintaining sufficient load structural integrity. This advantageously reduces the number of potential obstacles, facilitating movement of people, goods and vehicles inside the building.

[0022] In a further or another embodiment, the building is provided with at least one electrical network configured to distribute electrical power to at least one area and/or to the office space, at least one water pipe network configured to provide water to at least one area and/or to the office space, and at least one refrigerant network comprising at least one indoor unit with one heat exchanger capable of functioning as condenser and evaporator, said dry-anchoring elements being further configured to support said networks. In a further or another embodiment, the load bearing beams are dry anchored to complementary dry anchoring points at or near the top of the pillars. The use of prefabricated dry-anchoring elements greatly facilitate assembly, disassembly, repair and scaling the building or any of its areas. Any electrical, water and refrigerant networks are supported, by preference, releasably coupled to the dry-anchoring elements of the building. In this way, assembly, disassembly, repair and scaling of said networks is made easier. The use of dry-anchoring points very advantageously permits safe and easy reutilization of the structural elements of the building.

[0023] In a further or another embodiment, the dry anchoring connection between two construction elements is attained by means of complementary anchoring points on each of said elements, each of said anchoring points is defined by at least one hole substantially perpendicular to the surface of the anchoring point, the holes being configured to receive a cylindrical connection element. By preference, the holes of any anchoring point are oriented in a substantially vertical direction. More preferably, said holes are 2% larger than the diameter of the cylindrical connection elements, more preferably 5%, 7%, most preferably 10% larger than the diameter of the cylindrical connection elements. In this way, the structure of the building can, advantageously, withstand thermal expansion/contraction of at least one of its structural elements, some amount of soil instability, earthquakes and substantial wind forces.

[0024] In a further embodiment, the top end of each

pillar has four anchoring points. In this way up to four beams can be anchored to the top end of a pillar. This permits using the same type of pillar in the middle of a storage space, along a wall and/or a corner, thereby greatly reducing logistic complexity during assembly of the building. This type of pillar further enables easy expansion of the building since new beams can just be coupled to the beams previously defining the outer perimeter of the building. By preference, two of the anchoring points of each pillar are located at a lower level near the top of the pillar, said lower level anchoring points being located at the same height. This permits having four anchoring points on top of a pillar without having to increase the section of said pillar. This advantageously permits retaining as much of the usable area of the building as possible.

[0025] In a further or another embodiment, each pillar has at least one further anchoring point between its base and its top. this at least one further anchoring point advantageously permit adding multiple floors to the building, greatly increasing the scalability of each area of the building.

[0026] In a further or another embodiment, each load bearing beam includes at least one anchoring point located at each end of said beam. Optionally, at least one of the load bearing beams includes at least one anchoring point between each end of said beam. By preference any beam placed along the length of the ceiling and walls of the building include one anchoring point between each end of said beam. More preferably, any beam placed along the length of the ceiling and away from an outer wall of the building include two anchoring points between each end of said beam. In this way, it is possible to reduce the number of pillars while still maintaining sufficient support for the roof, sprinkler network and electricity network and lights.

[0027] In a further embodiment, the roof of the building has a slope defined by a plurality of angled shims placed at the anchoring points between the pillars and the load bearing beam sustaining the roof elements. This permits reducing the number of types of beams necessary during assembly of the building, which advantageously reduces beam production, distribution and assembly complexity and costs.

[0028] In a further embodiment, the pillars have a hollow centerline lined with a pipe configured to drain rainwater to a drainage system under the floor of the building. This permits further reducing the number of pipes attached to each pillar, leaving more usable space around said pillar. Another very advantageous effect is the elimination of most of the work necessary to install drainage pipes as most of said pipes are already part of the pillars. When combined with a sloped roof, the pillars according to the present embodiment allow the collection and funneling of rain water towards the mouth of the pipe at the top of a pillar, which water can then fall down said pipe into a drainage network under the floor of the building. By preference, the top end of the pipe is complementary to the opposite end of said pipe at the bottom end of the pillar. This advantageously permits stacking multiple pillars while maintaining the water draining capability of the pillars.

[0029] In a further or another embodiment, at least one of the storage areas is equipped with a mezzanine, the mezzanine being comprised of at least one reinforced concrete slab configured to be dry anchored to other such slabs and/or beams and/or pillars. By preference, each slab is rectangular and further equipped with anchoring points. Most preferably said anchoring points are located on opposite ends of the slab, the two remaining adjacent sides being configured to allow two slabs to be joined side-by-side by means of adhesive means, preferably silicone or epoxy based adhesives. By preference, the mezzanine is located above the loading bay. The possibility to easily add a mezzanine advantageously permits maximizing space utilization.

[0030] In a further embodiment, the building further includes:

a. At least one roof-mounted renewable energy element;
b. At least one thermo-electrical module having electrical energy storage and delivery means, water storage and delivery means and a heat pump system, the energy storage and delivery means being releasably connected to at least one roof mounted renewable energy element, the public power grid and at least one electrical network of the building, the water storage and delivery means being releasably connected to at least one water network of the building, said water network being at least a fire quenching fluid network, to the heat pump system and to a water supply, the heat pump being releasably connected to at least one refrigerant network of the building.

[0031] By preference, the roof-mounted renewable energy element is at least one wind turbine, more preferably, at least one solar panel. The at least one thermo-electrical module in combination with the at least one renewable energy module advantageously allow the building to be self-sufficient it terms of electrical energy and thermal control. The at least one thermo-electric module further provides a buffer volume of water, which volume of water provides at for least the fire-quenching requirements of the building. By preference, each thermo-electric module is comprised inside a container. This advantageously permits fast and easy deployment of the thermo-electric modules, while facilitating also removal or replacement of malfunctioning/unnecessary modules. In this way, scaling of electrical power, refrigeration/heating and water supply is made easier and faster.

[0032] However, it is obvious that the invention is not limited to this application. The building according to the invention can be used for other industrial applications, such as factories, farms, but also for non-industrial applications such as schools or exposition halls.

[0033] The invention is further described by the follow-

ing non-limiting examples which further illustrate the invention, and are not intended to, nor should they be interpreted to, limit the scope of the invention.

DESCRIPTION OF FIGURES

[0034] With as a goal illustrating better the properties of the invention the following presents, as an example and limiting in no way other potential embodiments and applications of the logistic building based on the invention, wherein:

FIG. 1 schematically presents a top view of the inside of the logistic building (1). The building (1) is shown comprising a storage area (2) and an office space (3). A row of loading bays (10) is shown disposed under the office space (3). The figure illustrates the square disposition of the pillars (4) sustaining the roof of the building (1) and floor of the office space (3). This square disposition advantageously permits the reducing the variety of beams (5, 6) used to assemble the structure of the building (1). The figure shows a plurality of pipes for fire quenching fluids (8) running from a first fire quenching fluid manifold (9) to a second fire quenching fluid manifold (9), the first and second manifolds being located in opposite ends of the building (1). A plurality of four-anchoring point beams (5), each of each beam (5) being shown anchored to a pillar (4) and each four-anchoring point beam (5) being oriented substantially parallel to the pipes for fire quenching fluids (8) along the ceiling. A plurality of two-anchoring point beams (6) are shown with each end anchored to either a pillar or an anchoring point (18) between both ends of a four-anchoring point beam (5), each two-anchoring point beam (6) being oriented substantially perpendicular to each four-anchoring point beam (5). The building (1) is shown including a lighting electrical network (11) running substantially parallel to each four-anchoring point beam. Prefabricated walls (7) are provided, each one placed between each pair of pillars (4) delimiting the perimeter of the building (1). Another view of the building (1) is provided in FIG.2.

FIG. 2 shows a high angle sectioned view of the logistics building (1). In this figure, the multiple rows of solar panels (12) are shown placed upon the roof of the building. The figure shows the office space (3) configured as a mezzanine structure above the loading bays (10) of the building (1). A thermo-electric module (13) is shown placed adjacent to the building (1). Pipes for fire quenching fluids (8) are shown running along the ceiling, said pipes being placed between the two-anchoring point beams (6)and the arches of the corrugated internal surface of the roof.

FIG. 3 schematically presents a thermo-electric module (13) and its connections to the storage area (2), office space (3) and solar panels (12). This embodiment of the thermo-electric module (13) includes a battery pack (15) connected to the solar panels (12) atop the building (1), said battery pack (15) further including a backup power grid connection (17). The battery pack (15) in the figure is shown configured to provide electrical power to the storage area (2) of the building (1). The thermo-electric module (13) further includes a heat pump system (16) providing heating/cooling to both the office space (3) and the storage area (2). A buffer tank (14) is provided to provide water to the office space (3) and the storage area (2).

FIG. 4 shows an axonometric view of the top of a pillar (4). A raised portion of the top of the pilar (4) is shown comprising two anchoring points (18). Two lower sections of the top of the pillar (4) are shown, each said section comprising a two-hole anchoring point (18) disposed to each side of the raised portion of the pillar (4). FIG. 5 shows two two-anchoring point beams (6) anchored to the anchoring points (18) on the raised section of the top of a pillar (4). Another configuration is shown in FIG. 6, wherein two two-anchoring point beams (6) and two four-anchoring point beams (5) are anchored to the top of a pillar (4). In this figure, the two two-anchoring point beams (6) are anchored to the anchoring points (18) on the raised section of the top of a pillar (4) as shown in FIG. 5. The two four-anchoring point beams (5) are anchored to the lower anchoring points (18) on each side of the raised section of the top of a pillar (4). A gap (19) is shown where all the beams converge. Said gap permits the passage of a drainpipe to fluidly connect a drainage hole on the roof and a drainage pipe running down the centerline of the pillar (4). Said drainage pipe is not shown if the figure.

FIG. 7 shows a pillar (4) placed at a corner of the building (1). In this configuration a two-anchoring point beam (6) anchored to the anchoring point (18) on the raised section of the top of a pillar (4). In this configuration, the anchoring point (18) on the raised section of the pillar (4) that is closest to a first wall (7) opposite to the beam (6) is shown connected to the wall by means of a bracket (20).

FIG. 8 shows part of the structure of the beam (5, 6) supporting the roof, lighting electrical network (11) and fire quenching fluid piping (8). The figure shows multiple four-anchoring point beams (5), each having its ends anchored to lower level anchoring points (18) near the top of the pillars (4). Every four-anchoring point beam (5) is shown positioned substantially parallel to the corrugation channels of the roof. A plurality of two-anchoring point beams (6) are shown with one end anchored either to an anchoring point (18) on the raised section of the top of a pillar (4) or

to an anchoring point (18) between the ends of a four-anchoring point beam (5). Part of the lighting electrical network (11) is shown suspended from the two-anchoring point beams (6), said lighting electrical network (11) being positioned substantially parallel to the four-anchoring point beams (5). Fire quenching fluid piping (8) is shown in fluid connection with a fire quenching fluid manifold (9), said quenching fluid piping (8) being shown supported by upper surface of the two-anchoring point beams (6) and running along the ceiling under the corrugation channels of the roof.

[0035] The present invention is in no way limited to the embodiments described in the examples and/or shown in the figures. On the contrary, buildings according to the present invention may be realized in many different ways without departing from the scope of the invention.

List of numbered items:

[0036]

1	Logistics building
2	storage area
3	office space
4	pillar
5	four-anchoring point beam
6	two-anchoring point beam
7	wall
8	fire quenching fluid piping
9	fire quenching fluid manifold
10	loading bay
11	lighting electrical network
12	solar panels
13	thermo-electric module
14	buffer water tank
15	battery pack
16	heat pump
17	backup power grid connection
18	anchoring point
19	gap
20	bracket

Claims

1. A logistics building comprising:

a. At least one storage area with loading bay suitable for entrance and/or loading of freighter trucks;
b. Office space comprising at least one office;

characterized in that, the building includes a load bearing structure comprising a plurality of load bearing pillars disposed in a substantially vertical orientation, the bases of which pillars are disposed in a rectangular pattern upon the foundation of the building, said pillars being further connected to each other by means of load bearing beams removably attached to anchoring points at or near the top end of each pillar, each load bearing beam including at least one anchoring point located at each end of said beam, a plurality of corrugated sheet metal roof panels are provided attached to the load bearing beams, said roof panels being placed such that the corrugation channels of each roof panel run in the same direction and substantially parallel to at least one outer wall of the building, upon which wall a manifold is rigidly attached near the top of the wall, which manifold has one input end fluidly connected to a fire quenching fluid network, the manifold is further provided with a plurality of output ends distanced no more than 3 meters from each other and no more than 1,5 meters from a wall, pillar or beam, each of said output ends being in further fluid connection to a pipe mounted between the roof panels and the load bearing beams, said pipe running inside a corrugation channel of the roof panels, each pipe being further equipped with fire quenching fluid sprinkles distanced no more than 3 meters from each other and no more than 1,5 meters from a wall, pillar or beam, the beams being further **characterized in that** their length is a multiple of 1,5 meters.

2. The logistics building according to previous claim 1, **characterized in that**, the corrugated roof panels have each pair of identical channels spaced 0,25 meters between each other.

3. The logistics building according to any previous claim 1-2, **characterized in that**, the building is provided with at least one electrical network configured to distribute electrical power to at least one area and/or to the office space, at least one water pipe network configured to provide water to at least one area and/or to the office space, and at least one refrigerant network comprising at least one indoor unit with one heat exchanger capable of functioning as condenser and evaporator, said dry-anchoring elements being further configured to support said networks.

4. The logistics building according to any previous claim 1-3, **characterized in that**, the load bearing beams are dry anchored to complementary dry anchoring points at or near the top of the pillars.

5. The logistics building according to previous claim 4, **characterized in that**, the dry anchoring connection between two construction elements is attained by means of complementary anchoring points on each of said elements, each of said anchoring points is defined by at least one hole substantially perpendicular to the surface of the anchoring point, the holes

being configured to receive a cylindrical connection element.

6. The logistics building according to any previous claims 4-5, **characterized in that**, the top end of each pillar has four anchoring points.

7. The logistics building according to any previous claim 4-6, **characterized in that**, each pillar has at least one further anchoring point between its base and its top.

8. The logistics building according to previous claims 7, **characterized in that**, at least one of the load bearing beams includes at least one anchoring point between each end of said beam.

9. The logistics building according to any previous claims 5-8, **characterized in that**, the roof of the building has a slope defined by a plurality of angled shims placed at the anchoring points between the pillars and the load bearing beam sustaining the roof elements.

10. The logistics building according to any previous claim 1-9, **characterized in that**, the pillars have a hollow centerline lined with a pipe configured to drain rainwater to a drainage system under the floor of the building.

11. The logistics building according to any previous claim 1-10, **characterized in that**, at least one of the storage areas is equipped with a mezzanine, the mezzanine being comprised of at least one reinforced concrete slab configured to be dry anchored to other such slabs and/or beams and/or pillars.

12. The logistics building according to any previous claim 1-11, **characterized in that**, the building further includes:

a. At least one roof-mounted renewable energy element;
b. At least one thermo-electrical module having electrical energy storage and delivery means, water storage and delivery means and a heat pump system, the energy storage and delivery means being releasably connected to at least one roof mounted renewable energy element, the public power grid and at least one electrical network of the building, the water storage and delivery means being releasably connected to at least one water network of the building, said water network being at least a fire quenching fluid network, to the heat pump system and to a water supply, the heat pump being releasably connected to at least one refrigerant network of the building.

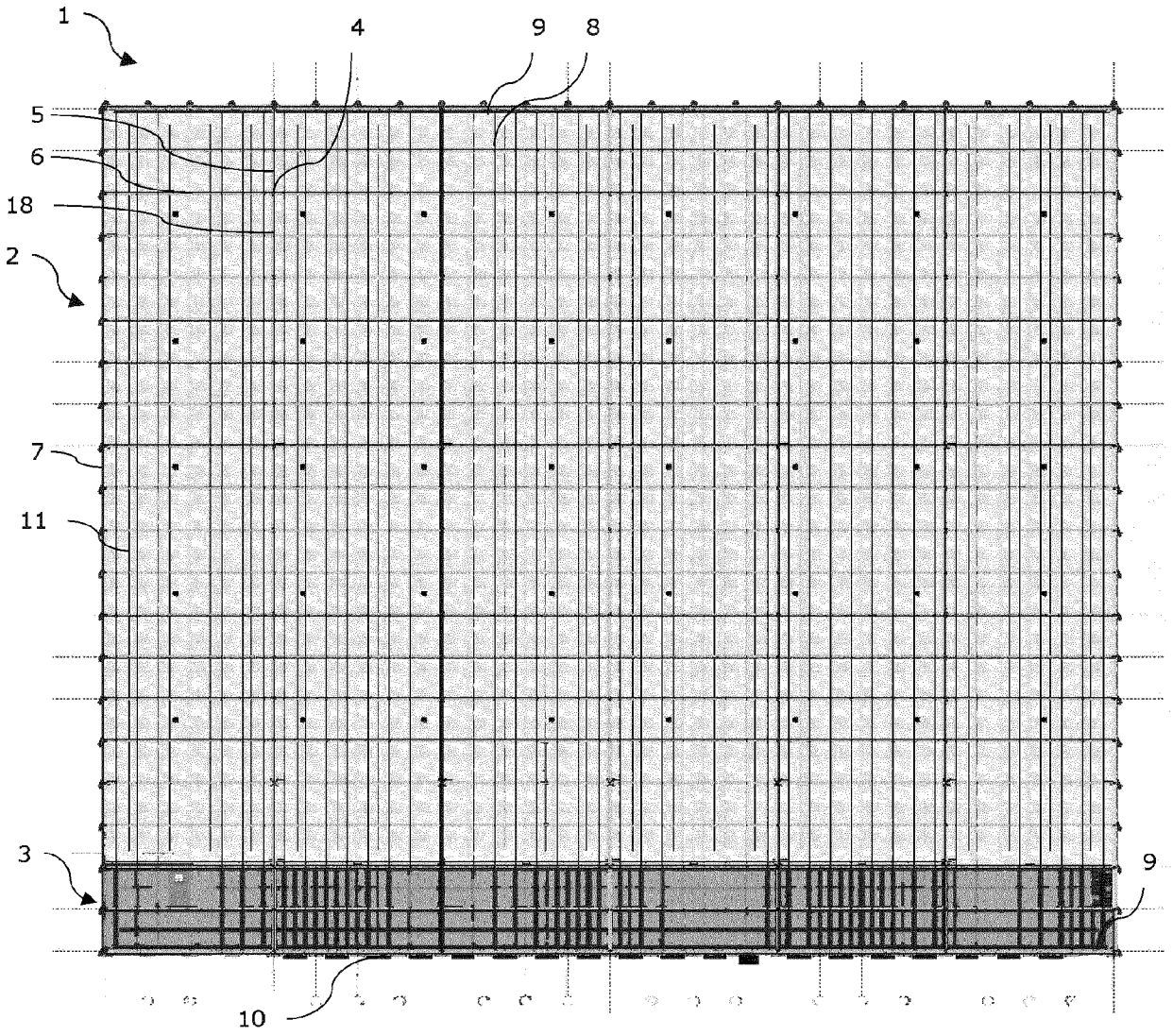

FIG. 1

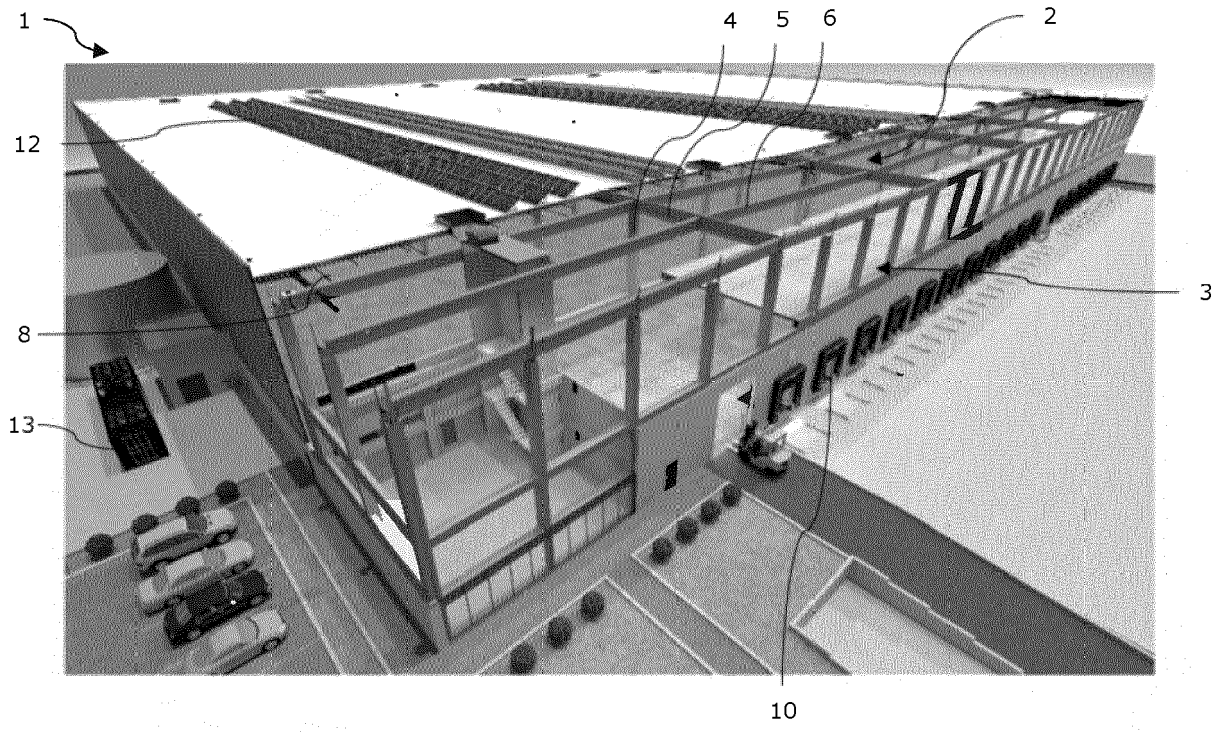

FIG. 2

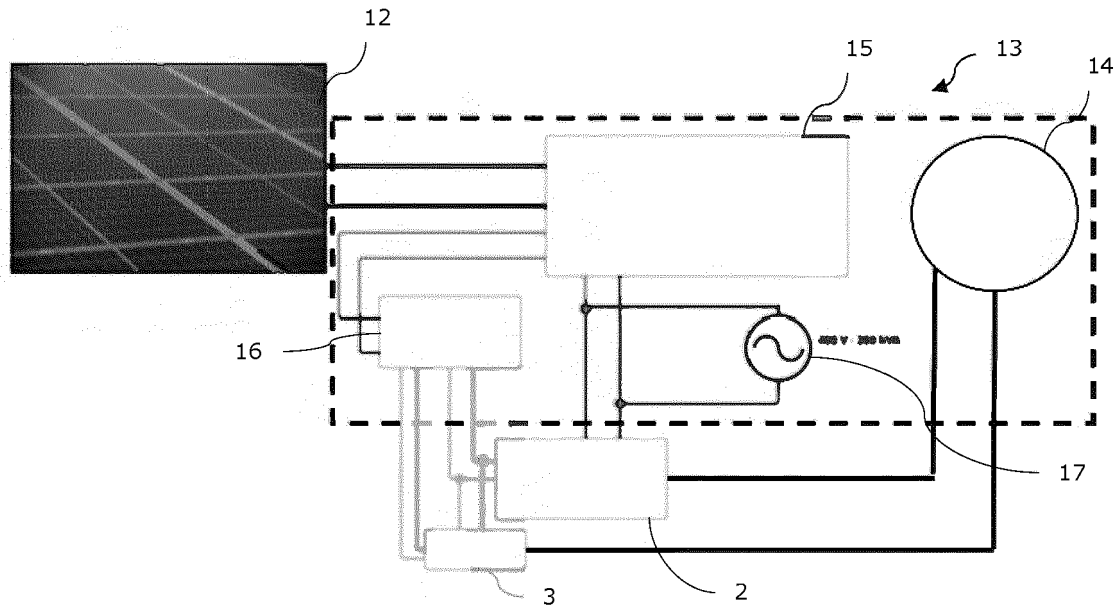

FIG. 3

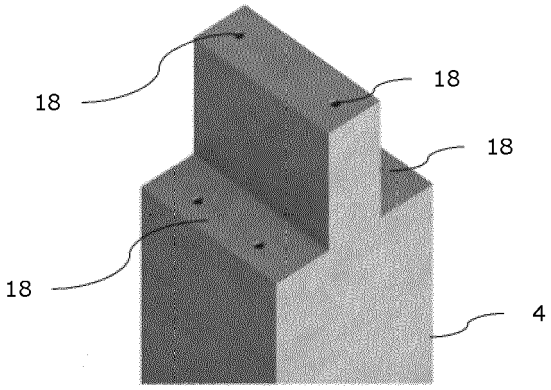

FIG. 4

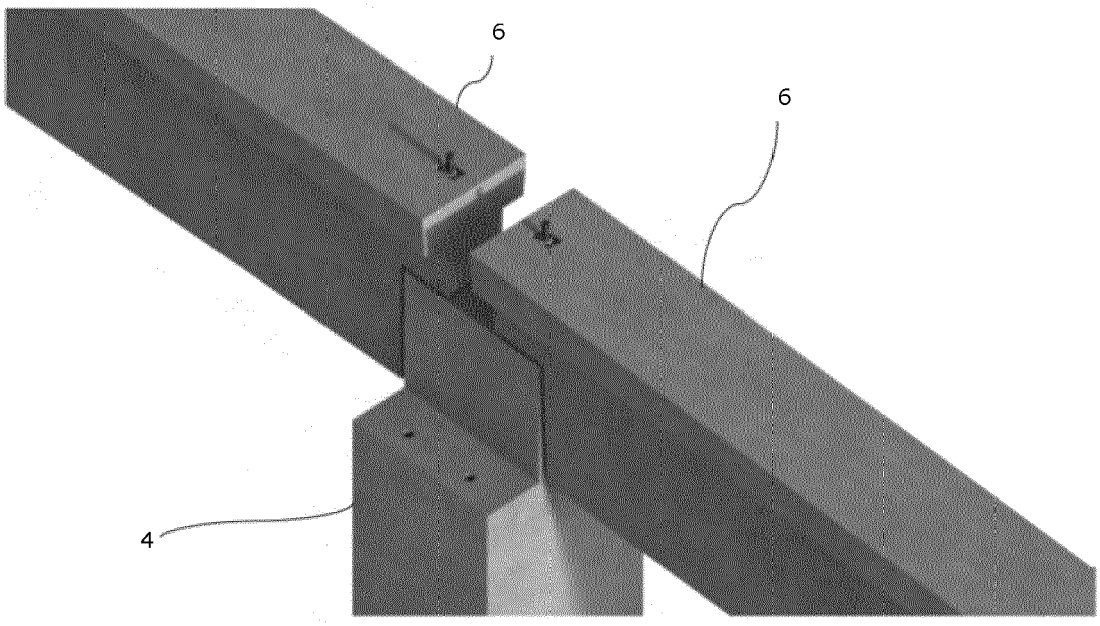

FIG. 5

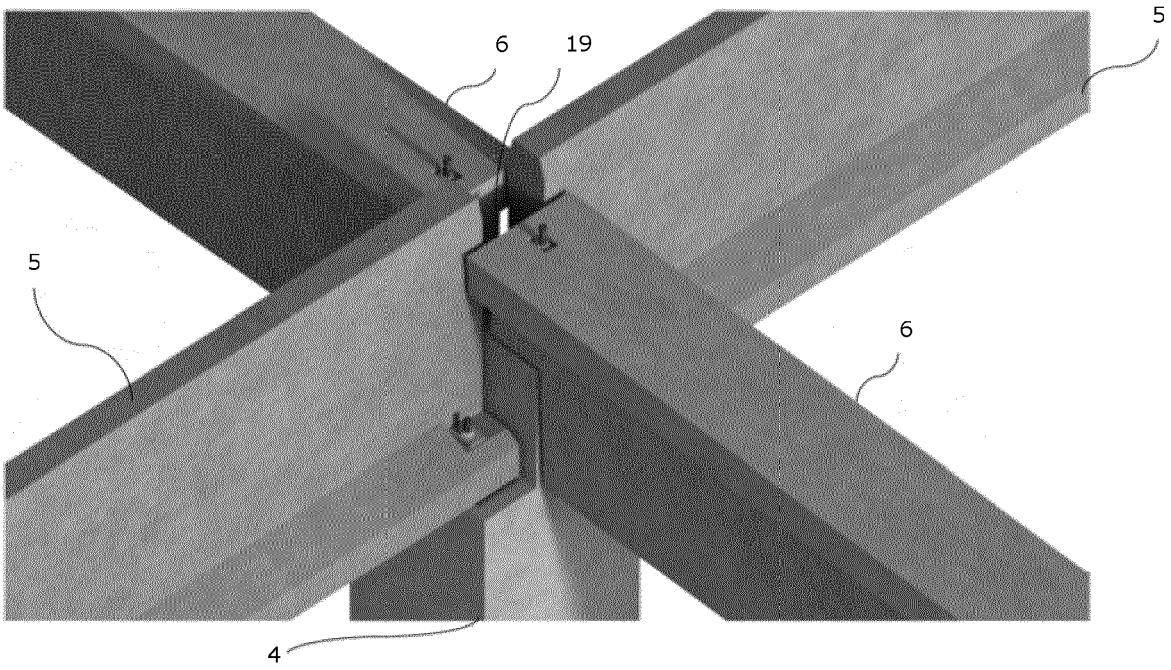

FIG. 6

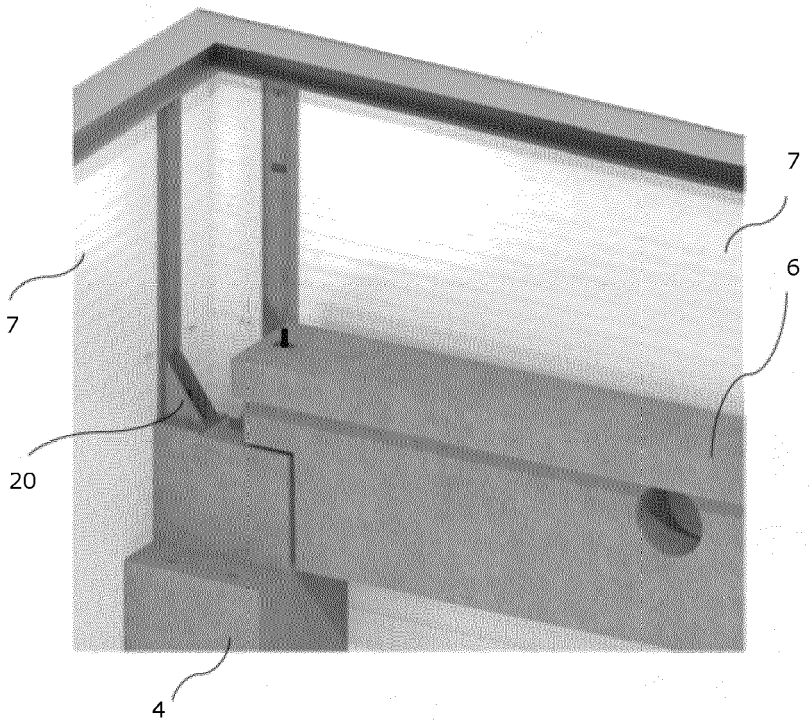

FIG. 7

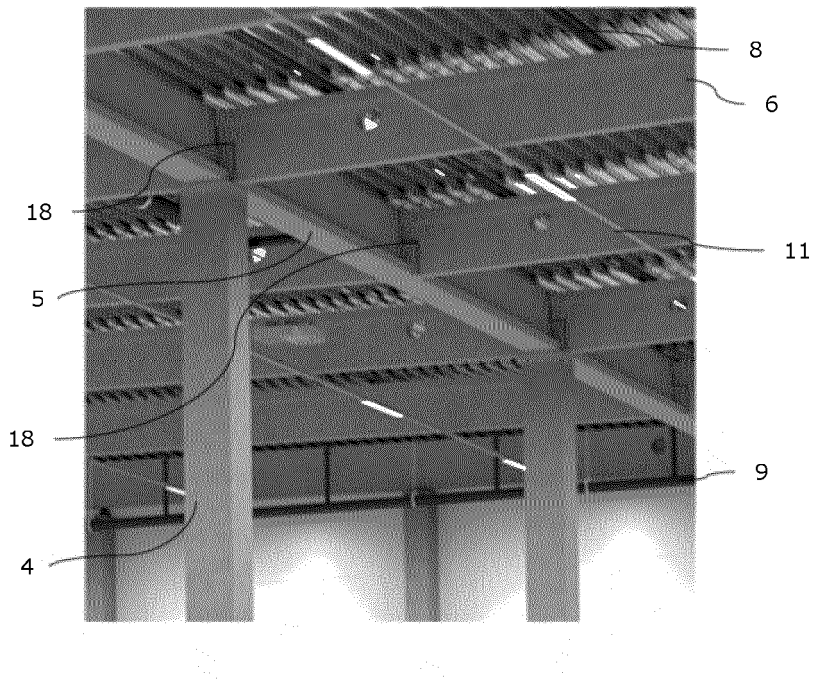

FIG. 8

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EUROPEAN SEARCH REPORT

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 September 2023	Melhem, Charbel

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