TRUSS STRUCTURE HAVING AN OPEN-SECTION UPPER CHORD MEMBER AND A PRODUCTION METHOD FOR THE SAME, AND A TRUSS BRIDGE USING THE TRUSS STRUCTURE HAVING AN OPEN-SECTION UPPER CHORD MEMBER AND A METHOD FOR CONSTRUCTING THE SAME

Cross-reference to related application

This application claims the benefit of Korean Patent Application No.10-2010-0093079, filed on September 27, 2010 in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

Technical Field

[1] The present invention relates to a truss bridge, and in particular to a truss structure having an open-section upper chord member and a production method for the same, and a truss bridge using the truss structure having an open-section upper chord member and a method for constructing the same which make it possible to save steel materials and to improve constructability in such a way to form an open-section upper chord member of a truss structure supporting a truss bridge in a U-shape the upper side of which is open upwards for thereby filling concrete therein, and a truss bridge is constructed using a truss structure in which a steel material installed in the interior of the open-section upper chord member is tensioned.

Background Art

[2] Generally speaking, a truss bridge is a type of bridge which can be widely applied to a bridge with middle or long pillar intervals of 50-200M. The truss bridge has a high cross section efficiency because all elements are configured to resist against an axial direction force.

[3] However, the conventional truss bridge forming a rectangular cross section using a steel plate has a very hard and complicated manufacture process due to a steel plate cutting process, an installation of a reinforced material in the interior of the cross section, a welding of each side, a connection of members, a manufacture of a gusset plate at a joint point and a complicated process of a slope member, and a manufacture of it extends, and a manufacture cost increases, so economic feasibility becomes bad. Subsequently, it is hard to obtain the better advantages of a truss bridge.

Disclosure of Invention

[4] Accordingly, the present invention is made to improve the above mentioned problems encountered in the conventional art. It is an object of the present invention to provide a truss structure having an open-section upper chord member and a production method for the same, and a truss bridge using the truss structure having an open-section upper chord member

and a method for constructing the same which have features in that a manufacture efficiency of a truss structure is enhanced so that a slope member with a straight cut end and a vertical member can be easily welded on an open-section upper chord member the upper side of which is open, and the change of a section dimension is made possible, which was impossible in a closed section upper chord member formed of steel pipes, which results in an economic bridge design, and the height or width of a section can increase at the open-section upper chord member of each point interval, so it is possible to increase the section strength by filling concrete into the interior of the open-section upper chord member without wasting materials which are necessary to increase the dimension of the open-section upper chord member.

[5] It is another object of the present invention to provide a truss structure having an open-section upper chord member and a production method for the same, and a truss bridge using the truss structure having an open-section upper chord member and a method for constructing the same which have features in that a steel material is connected to an open-section upper chord member of a truss structure mounted in the inner side between both end points, a lower chord member of a truss structure of an inter-pillar center portion between both end points and each inner point and a joint unit connected to the same and is tensioned, so it is possible to enhance the load resistances with respect to a tensional cross section force, and concrete is filled in the lower chord member of the truss structure mounted in the inner point and the joint unit connected to the same, which results in enhancing the load resistances with respect to a compression sectional force.

[6] It is further another object of the present invention to provide a truss structure having an open-section upper chord member and a production method for the same, and a truss bridge using the truss structure having an open-section upper chord member and a method for constructing the same which have in that concrete is filled in the lower chord member of the truss structure mounted in the inner point and the joint unit fixed to the same for thereby enhancing the internal force with respect to the compression sectional force.

[7] To achieve the above objects, there is provided a truss structure having an open-section upper chord member, comprising a plurality of lower chord members formed of hollow steel pipes with circular sections; a hollow slope member with a circular section one side end of which is formed of a curved surface for the sake of a fixed connection to the lower chord members, respectively, the hollow slope member being straight cut for the other side end to come into contact with the open-section upper chord member and to be fixed; a hollow vertical member with a circular section one side end of which is formed of a curved surface for the sake of a fixed connection to the lower chord members, respectively, the hollow vertical member being straight cut for the other side end to come into contact with the open-section upper chord member and to be fixed; and a U-shaped open-section upper chord member the upper side of which is open to match with a steel member section for concrete to be filled in a state that a slope member and a vertical member are fixedly connected to the other side end which is cut straight.

[8] In addition, to achieve the above objects, there is provided a production method for a truss structure having an open-section upper chord member, comprising a step for connecting a steel member of a tensioning part and tensioning the same so that a compression section force is formed at a lower chord member positioned at an inter-pillar center portion between the end points of both sides and an inner point and between inner points and at a joint unit fixedly connected to the same; a step for installing a support plate of a filling part at the lower chord member mounted in the inner point and the joint unit fixedly connected to the same; a step for installing a stud bolt and a stirrup for the sake of a front end connection to the concrete in the interior of the U-shaped open-section upper chord member the upper side of which is open; a step for installing an engaging plate and a reinforcing rib and a sheath pipe for the sake of a forced insertion in the interior of the open-section upper chord member positioned at the top of the inner point; a step for casting and curing concrete in the interior of the open-section upper chord member so that a block out section is formed at both sides of the steel member; a step for first tensioning the steel member through the block out section after the steel member is engaged in the interior of the sheath pipe when the concrete is cured; a step for mounting and fixedly connecting a plurality of lower chord members each formed of the tensioning part and the filling part at a cut point support part; a step for filling and curing the concrete in the filling part; a step for fixedly connecting one side end portion of a slope member, the other side end of which is straight cut, at the top of the lower chord member; a step for fixedly connecting one side end portion of a vertical member, the other side end of which is straight cut, at the top of the lower chord member; and a step for fixedly mounting an open-section upper chord member at the other side end of each of the slope member and the vertical member.

[9] To achieve the above objects, there is provided a truss bridge using a truss structure having an open-section upper chord member, comprising an end point and an inner point between the end points which are installed opposite to each other so as to support a truss structure in which a U-shaped open-section upper chord member is installed; a truss structure in which a U-shaped open-section upper chord member mounted in the end point and the inner point is installed; a first floor plate in which a sheath pipe engaged with a steel-reinforced bar and a steel member is installed at the top of the open-section upper chord member of the truss structure of the top of the inner point, and concrete is cast and cured so that the sheath pipe, the steel-reinforced bar and the stirrup fixed at the open-section upper chord member can be buried, and the steel member is engaged to the sheath pipe and is tensioned; a second floor plate in which steel-reinforced bars are installed at the top of the truss structure between the end point and the inner point and between the inner points for the block out section to be formed at both sides of the first floor plate, and concrete is cast and cured so that the installed steel-reinforced bars and the stirrup fixed at the open-section upper chord member can be buried; and concrete which is cast and cured in the block out section.

[10] To achieve the above objects, there is provided a method for constructing a truss bridge using a truss structure, comprising a step for mounting a truss structure formed of a U-

shaped open-section upper chord member at end points of both sides and the inner points between the end points; a step for second tensioning a steel member engaged to a sheath pipe of the truss structure through a bock out section; a step for installing a mould which forms the first floor plate at the top of the open-section upper chord member in which the steel member is tensioned; a step for installing, in the interior of the mould, a sheath pipe to which a steel-reinforced bar and a steel member will be engaged; a first floor plate formation step in which concrete is cast and cured in the mould so that the stirrups fixed at the steel-reinforced bar and the sheath pipe and the open-section upper chord member can be buried, and the moulds are disassembled; a step for engaging a steel member to the sheath pipe of the first floor plate; a step for tensioning the steel member engaged to the sheath pipe of the first floor plate in a tensioning device through a block out section; a step for installing a mould forming a second floor plate at the top of the truss structure between the end point and the inner point and between the inner points for a block out section to be formed at both sides of the first floor plate; a second floor plate formation step in which steel-reinforced bars are installed in the interior of the mould, and concrete is cast and cured for the steel-reinforced bars and the stirrups fixed at the open-section upper chord member to be buried, and the moulds are disassembled for thereby forming the second floor plate; and a step for casting and curing the concrete in the block out section after the tensioning device is removed from the block out section.

Advantageous Effects

[11] According to the present invention, the vertical member getting close to the open-section upper chord member the upper side of which is open and the other side end of the slope member are straight cut for thereby simplifying the manufacture process and saving the manufacture costs thanks to the decreased processes at the curved surfaces of the end portions of the vertical member and the slope member. Since the cutting process and welding process at the end portion of the slope member are easy, the manufacture efficiency of the truss structure can be enhanced, and the change of the section dimension is made possible, which was impossible in the open-section upper chord member of the steel plate, so more economic bridge design is possible, and the height or width of the sections at the open-section upper chord member at each point interval can be adjusted, so over consumption of the material of the open-section upper chord member can be prevented, and concrete is filled in the interior of the open-section upper chord member instead, thus enhancing the sectional power and sectional strength and simplifying the construction processes, which results in more efficient constructions. The steel materials of the open-section upper chord member can be saved, thus enhancing economic feasibility.

[12] According to the present invention, since a steel material is connected to the lower chord member of the inter-pillar center portions between both end portions and inner points and the inner points where big tensional force occurs in the truss structure or the inner side of the joint unit fixedly connected at the lower chord member and is tensioned, the section

stress is limited within an allowable range without increasing the thickness of the member, and concrete is filled in the lower chord member of the upper side of the inner point where big compression force occurs in the truss structure or the joint unit fixedly connected to the lower chord member, by which the compression section force is shared by the steel material and the concrete for thereby limiting the sectional stress within an allowable range and achieving economical construction.

[13] According to the present invention, a first floor plate is formed with the aid of the tension of the steel material at the top of the truss structure of which steel material is tensioned, so the horizontal cracks in the floor plate can be prevented with the aid of the tensional force which occurs in the perpendicular direction while maintaining a complete combination between the truss structure and the first floor plate for thereby enhancing the durability of the floor plate and prolonging the service life. Since the concrete filled in the steel material and the truss structure is not exposed to the outside, a good-looking truss bridge construction is possible.

Brief Description of Drawings

[14] Figure 1 is a separated perspective view of the present invention.

[15] Figure 2 is a side view of the construction of Figure 1.

[16] Figure 3 is a front cross sectional view of Figure 1.

[17] Figure 4 is a side cross sectional view of the present invention.

[18] Figures 5 to 8 are views illustrating a construction procedure of a truss bridge using a truss structure of the present invention.

[19] * Legends of Key Elements of the Drawings*

[20] 100; truss structure 110: lower chord member

[21] 120: slope member 130: vertical member

[22] 140: open-section upper chord member

150: tensioning part

[23] 160: filling part 170: steel material

[24] 180: stirrup 200: truss bridge

[25] 210, 210': end points 220: inner point

[26] 230: first floor plate 240: second floor plate

Best modes for carrying out the invention

[27] A preferred embodiment of the present invention will be described with reference to the accompanying drawings. Figure 1 is a separated perspective view of the present invention. Figure 2 is a side view of the construction of Figure 1. Figure 3 is a front cross sectional view of Figure 1. Figure 4 is a side cross sectional view of the present invention.

[28] The truss structure having an open-section upper chord member according to the present invention has features in that a plurality of lower chord members 110 made of hollow steel pipes with circular sections are provided, and one side end is formed of a curved surface

to be fixed at the lower chord member 110, and the other side end is formed of a slope member 120 with a hollow, circular section which is cut in a straight line shape for it to fixed and to come into close contact with the open-section upper chord member 140. One side end is formed in a curved shape to be fixedly connected with the lower chord member 110, and the other side end is formed of a hollow vertical member 130 with a circular section which is cut in a straight line shape for it to fixedly come into contact with the open-section upper chord member140, and a U-shaped open-section upper chord member 140 the upper side of which is open to match with the open section is provided as the slope member 120 and the vertical member 130 are fixedly connected at the other side end which is straight cut, and concrete is filled.

[29] It is preferred that the joint unit 110' is fixedly connected between the lower chord members 110 for the sake of a connection of the lower chord member 110.

[30] In addition, there are further provided a tensioning part 150 functioning to counter the tensional section force in such a way that the steel material 152 is connected to between the end points 210 and 210' and the inner point 220 and to the lower chord member 110 of the inter-pillar center truss structure 100 between the inner points 220 and the joint unit 110' fixedly connected to the lower chord member 110 and is tensioned, and a filling part 160 functioning to counter the compression cross force in such a way to fill concrete in the lower chord member 110 of the truss structure 100 mounted in the inner point 220 and the joint unit 110' fixedly connected to the lower chord member 110.

[31] The tensioning part 150 comprises a mounting plate 151 installed in either the lower chord member 110 of the truss structure 100 of the upper side of the inner point 220 or the joint unit 110' fixedly connected to the lower chord member 110, and a steel material 152 which is engaged to a mounting hole 151a of the mounting plate 151 and is tensioned.

[32] The filling part 160 comprises a support plate 161 which is installed in the interior of either the lower chord member 110 of the truss structure 100 of the upper side of the inner point 220 or the joint unit 110' fixedly connected to the lower chord member 110, and a filling hole 162 which is formed in a through shape for concrete to be filled in either the lower chord member 110 of the truss structure 100 of the upper side of the inner point 220 or the joint unit 110' fixedly connected to the lower chord member 110.

[33] It is preferred that a plurality of stud bolts 163 are fixed in a radial shape in the interiors of the lower chord member 110 of the truss structure 100 in which the support plate 161 is installed and the joint unit 110' fixedly connected to the lower chord member 110.

[34] There is further provided a sheath pipe 170' to which the steel material 170 is engaged in the interior of the open-section upper chord member 140 of the truss structure 100 in which the inner point 220 is mounted.

[35] There is further provided a stirrup 180 which more protrudes than the open-section upper chord member 140 for the sake of a front end connection of each of the first and second floor plates 230 and 240 in the open-section upper chord member 140.

[36] The truss bridge using a truss structure having an open-section upper chord

member has features in that there are provided opposite end points 210 and 210' supporting the truss structure 100 in which the U-shaped open-section upper chord member 140 is installed, and a truss structure 100 in which the U-shaped open-section upper chord member 140 mounted in the end points 210 and 210' and the inner point 220. At the top of the open-section upper chord member 140 of the truss structure 100 of the top of the inner point 220 is installed a sheath pipe 233 to which a steel-reinforced bar 231 and the steel material 232 are engaged. The concrete is cast and cured so that the sheath pipe 233, the steel-reinforced bar 231 and the stirrup 180 fixed at the open-section upper chord member 140 can be buried, and the first floor plate 230 is tensioned by engaging the steel material 232 to the sheath pipe 233. The steel-reinforced bars 241 are set so that a block out section S' can be formed at both sides of the first floor plate 230 on the top of the inter-pillar center portion truss structure 100 between the end points 210 and 210' and the inner point 220 and between the inner points 220, and the second floor plate 240 is provided in such a way that the concrete is cast and cured so that the set steel-reinforced bars 241 and the stirrup 180 fixed at the open-section upper chord member 140 can be buried. There is further provided concrete which is cast and cured in the block out section S'.

[37] The manufacture procedure and the construction procedure of the present invention will be described.

[38] As shown in Figures 5 to 8, a plurality of inner points 220 are made between the end points 210 and 210' of both sides and the end points 210 and 210' about the length of the truss bridge 200, and a truss structure 100 mounted on the end points 210 and 210' and the inner point 220.

[39] The truss structure 100 is temporarily assembled in a no-stress state by mounting the lower chord member 110, which is made of a hollow steel pipe with a circular section, on the top of each of the cut point support parts (not shown) which are provided at regular intervals. One side end of each of the hollow slope member 120 with a circular section and the vertical member 130, namely, one side end formed of a curved surface comes into close contact with the top of the lower chord member 110 and is temporarily assembled. The open-section upper chord member 140 the upper side of which is open is mounted at the other side end portion of each of the slope member 120 and the vertical member 130, namely, at the straight-cut other side end portion and is temporarily assembled.

[40] The joint unit 110' may be fixedly connected between the lower chord members 110 for the sake of a connection of the lower chord member 110 mounted at each cut point support part. At the joint unit110' may be temporarily assembled one side end which is formed of the curved surfaces of the slope member 120 and the vertical member 130.

[41] At this time, before the lower chord member 110 and the truss structure 100 connecting the joint unit 110' thereto are temporarily assembled, the mounting plate 151 of the tensioning part 150 is installed between the end points 210 and 210' and the inner point 220 and the inner points 220 where a big tensional section force is applied in the lower chord member

110 of the truss structure 100, namely, at the lower chord member 110 of the inter-pillar center portion or the joint unit 110' connected to the lower chord member 110. For the purpose of reinforcing the mounting plate 151, the reinforcing rib 151b is fixed at the lower chord member 110 or in the interior of the joint unit 110'.

[42] When the mounting plate 151 is fixed at the lower chord member 110 and in the interior of the joint unit 110', the lower chord member 110 forming the tensioning part 150 and the joint unit 110' connected to the same are welded and fixed in a state that a steel material 152 made of a steel wire or a steel rod is engaged to the mounting hole 151a of the mounting plate 151, and the welded elements are tensioned by a tensioning device (not shown). Since the mounting plate 151 and the reinforcing rib 151b fixed in the interior of the lower chord member 110 or the joint unit 110' share and support, the tensioning force of the steel material 152 made of a steel wire or a steel rod, it is possible to maintain a tensioning force of the steel material 152 made of a steel wire or a steel rod.

[43] The obliquely applied load to the lower chord member 110 or the joint unit 110' connected to the lower chord member 110 of the truss structure 100 mounted in the inner point 220 produces a compression section force. Before the lower chord member 110 and the truss structure 100 connecting the joint unit 110' thereto are temporarily assembled, the support plate 161 of the filling part 160 is installed at the lower chord member 110 mounted in the inner point 220 or in the interior of the joint unit 110' connected to the lower chord member 110, and the support rib 161a may be fixedly installed at the support plate 161 and the lower chord member 110 or in the interior of the joint unit 110' for the sake of reinforcement of the support plate 161.

[44] Here, a plurality of stud bolts 163 are fixed at the support plate 161 and in the interior of the joint unit 110' connected to the same. Here, it is preferred that the stud bolts 163 are arranged in radial shapes.

[45] The slope member 120 is connected to a plurality of the lower chord members 110 and the joint unit 110' connected to the same, respectively, with its one side end surface-contacting on the upper side, with the lower chord member 110 and the joint unit 110' connected to the same, with the other side being cut straight. A vertical member 130 is connected to the lower chord member 110 and the joint unit 110' connected to the same, respectively, and is temporarily assembled with one side end surface-contacting with the same, the other side end being cut straight. The tensioning part 150 and the filling part 160 are installed as the U-shaped open-section upper chord member 140 the upper side of which is open is mounted at the straight-cut other side end portions of the vertical member 130 and the slope member 120, so the truss structure 100 with a certain length in a temporarily assembled state is welded and integrated.

[46] Concrete is filled in the filling part 160 of the interior of the truss structure 100 and cured. Concrete is also filled in the filling hole 162 passing through the lower chord member 110 and the joint unit 110' fixed to the same. The concrete is filled until the concrete being filled in the filling hole 162 is discharged through a discharge hole 162'.

[47] When concrete fills in the filling part 160, since the support rib 161a reinforces and support the fixing force of the support plate 161, it comes to possible to support the compression force of the concrete when oblique load and external force are applied in the finished system of the truss structure 100. The concrete filled in the filling part 160 is stably fixed at the previously installed stud bolt 163, thus finishing the manufacture of the truss structure 100.

[48] The procedure that the concrete is filled in the previous state that the truss structure 100 is mounted at each point in terms of the concrete of the filling part 160 has been described; however if the weight of the truss structure 100 is heavy or if there is not an enough space in a lifting equipment, it may be mounted at each point in a state that concrete is not filled in the filling part 160, and the whole bridge systems of the truss structure 100 are completed, and then concrete is filled and cured.

[49] In addition, a sheath pipe 170' engaged with the stud bolt 140' and the steel wire 170 and a plurality of stirrups 180 are fixed in the U-shaped open-section upper chord member 140 of the truss structure 100 mounted in each of the points 210, 210' and 220. The steel wire 170 is engaged to the installation plate 170a and is installed. It is preferred that the stirrups 180 are configured to accommodate the sheath pipe 170' and is fixed more protruding than the upper chord member 140 for the sake of the front end connections of the upper chord member 140 and the first and second floor plates 230 and 240. Concrete is filled in the interior of the open-section upper chord member 140 and is cured.

[50] At this time, a block out section S is formed at both side of an end portion of the sheath pipe 170', and a steel wire 170 is engaged to the sheath pipe 170' through the block out section S, and the block out section S first tensions the steel wire 170 using the tensioning device (not shown) for thereby finishing the manufacture of the truss structure 100.

[51] The installation plate 170a may be buried by the concrete cast in the block out section S. When concrete cast in the interior of the open-section upper chord member 140 becomes cured, it is possible to disassemble along with moulds.

[52] The first tensioning force of the steel wire 170 serves to limit for the compression section force generated by the tensioning of the open-section upper chord member 140 to be lower than the section load resistance force of the upper chord member before the truss structure 100 is integrally connected. At the same time, when the entire systems are completed as the truss structure 100 is mounted in each of the points 210, 210' and 220, it is preferred to adjust to the extent high enough to limit the tensional cracks of the concrete filled in the interior of the open-section upper chord member 140 of the top of the inner point 220.

[53] The construction of the truss bridge 200 using the truss structure 100 mounted in each of the points 210, 210' and 220 is performed in such a way that the steel wire 170 is second tensioned by the tensioning device (not shown) through the protruded block out section S from which the steel wire 170 of the truss structure 100 is protruded, and concrete is filled in the block out section S and is cured.

[54] When the concrete of the floor plates 230 and 240 are cast at the upper side of the

truss structure 100 and cured, it is preferred that the second tensioning force of the steel wire 170 is adjusted to the extent high enough to limit the tensional cracks in terms of the concrete filled in the interior of the upper chord member 140 of the top of the inner point 220.

[55] When the concrete filled in the block out section S of the open-section upper chord member 140 becomes cured, the moulds forming the first floor plate 230 is installed at the top of the truss structure 100, and in the interior of the moulds is installed a sheath pipe 233 in which the steel-reinforced bars 231 to which the steel member 232 of a steel wire or a steel rod are engaged, are arranged and to which the steel member 232 formed of a steel wire or a steel rod is to be engaged, and the concrete is cast in the interior of the moulds so that the steel-reinforced bars 231, the sheath pipe 233 and the stirrups 180 fixed at the open-section upper chord member 140 can be buried, and the concrete is cured, thus completing the first floor plate 230.

[56] When the first bottom plate 230 is formed, the moulds forming the concrete second floor plate 240 of the top of the filling part 160 is installed so that the first floor plate 230and the block out section S’ can be formed in a state that the moulds of the first floor plate 230 are disassembled. After the steel-reinforced bars 241 are installed in the interiors of the moulds, the concrete is cast in the interiors of the moulds so that the stirrups 180 fixed at the steel-reinforced bars 241 and the open-section upper chord member 140 can be buried and is cured, thus completing the formation of the second floor plate 240.

[57] The steel member 232 is engaged in the sheath pipe 232 buried in the first floor plate 230 before and after the formation of the second floor plate 240, and the steel member 232 is tensioned by the tensioning device (not show) in the interior of the block out section S', and the tensioning device is moved in the block out section S', and the concrete is cast in the block out section S' and is cured.

[58] As the present invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, it should also be understood that the above-described examples are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the meets and bounds of the claims, or equivalences of such meets and bounds are therefore intended to be embraced by the appended claims.

Claims:

1. A truss structure having an open-section upper chord member, comprising:

a plurality of lower chord members formed of hollow steel pipes with circular sections;

a hollow slope member with a circular section one side end of which is formed of a curved surface for the sake of a fixed connection to the lower chord members, respectively, the hollow slope member being straight cut for the other side end to come into contact with the open-section upper chord member and to be fixed;

a hollow vertical member with a circular section one side end of which is formed of a curved surface for the sake of a fixed connection to the lower chord members, respectively, the hollow slope member being straight cut for the other side end to come into contact with the open-section upper chord member and to be fixed; and

a U-shaped open-section upper chord member the upper side of which is open to match with a steel member section for concrete to be filled in a state that a slope member and a vertical member are fixedly connected to the other side end which is cut straight.

2. The structure of claim 1, wherein a joint unit to which one side end formed of the curved surfaces of the slope member and the vertical member is temporarily assembled is fixedly connected between a plurality of lower chord members.

3. The structure of claim 1, further comprising:

a tensioning part which servers to counter a tensional cross force in such a way that a steel member formed of a steel wire or a steel rod is connected to the lower chord member of the truss structure of the inter-pillar center portion between the end point and the inner point and between the inner points and the joint unit fixedly connected to the lower chord member and the connected steel member is tensioned; and

a filling part which serves to counter a compression section force in such a way to fill concrete in the lower chord member of the truss structure mounted in the inner point and the joint unit fixedly connected to the lower chord member.

4. The structure of claim 3, wherein the tensioning part comprises:

a mounting plate and a reinforcing rib which are installed in the interior of either the lower chord member of the truss structure of the top of the inner point or the joint unit fixedly connected to the lower chord member; and

a steel member which is formed of a steel wire or a steel rod and is engaged to the mounting hole of the mounting plate and is tensioned.

5. The structure of claim 3, wherein the filling part comprises:

a support plate and a support rib which are installed in the interior of either the lower chord member of the truss structure of the top of the inner point or the joint unit fixedly

connected to the lower chord member; and

a filing hole which passes through in such a way that concrete can fill in either the lower chord member of the truss structure of the top of the inner point or the joint unit fixedly connected to the lower chord member.

6. The structure of claim 5, wherein a plurality of stud bolts are fixed in radial shapes in the lower chord member of the truss structure in which the support plate is installed and the joint unit fixedly connected to the lower chord member.

7. The structure of claim 3, further comprising:

a sheath pipe provided in the interior of the open-section upper chord member of the truss structure mounted in the inner point, a steel member being engaged to the sheath pipe.

8. The structure of claim 1, further comprising:

a stirrup which is more protruded than the open-section upper chord member for the sake of the front end connections of the first and second floor plates in the interior of the open-section upper chord member.

9. A production method for a truss structure having an open-section upper chord member, comprising:

a step for connecting a steel member of a tensioning part and tensioning the same so that a compression section force is formed at a lower chord member positioned at an inter-pillar center portion between the end points of both sides and an inner point and between inner points and at a joint unit fixedly connected to the same;

a step for installing a support plate of a filling part at the lower chord member mounted in the inner point and the joint unit fixedly connected to the same;

a step for installing a stud bolt and a stirrup for the sake of a front end connection to the concrete in the interior of the U-shaped open-section upper chord member the upper side of which is open;

a step for installing a sheath pipe for the sake of an insertion of a steel member in the interior of the open-section upper chord member positioned at the top of the inner point;

a step for casting and curing an installation plate and concrete in the interior of the open-section upper chord member so that a block out section is formed at both sides of the steel member;

a step for first tensioning the steel member through the block out section after the steel member is engaged in the interior of the sheath pipe when the concrete is cured;

a step for mounting and fixedly connecting a plurality of lower chord members each formed of the tensioning part and the filling part at a cut point support part;

a step for filling and curing the concrete in the filling part;

a step for fixedly connecting one side end portion of a slope member, the other side end of which is straight cut, at the top of the lower chord member;

a step for fixedly connecting one side end portion of a vertical member, the other side end of which is straight cut, at the top of the lower chord member; and

a step for fixedly mounting an open-section upper chord member at the other side end of each of the slope member and the vertical member.

10. The method of claim 9, wherein a joint unit is fixedly connected between the lower chord members.

11. The method of claim 9, further comprising a step for fixing a plurality of stud bolts in the interior of the lower chord member before concrete is filled.

12. The method of claim 9, wherein the concrete of the filling part is filled before the truss structure is mounted at each point.

13. A truss bridge using a truss structure having an open-section upper chord member, comprising:

an end point and an inner point between the end points which are installed opposite to each other so as to support a truss structure in which a U-shaped open-section upper chord member is installed;

a truss structure in which a U-shaped open-section upper chord member mounted in the end point and the inner point is installed;

a first floor plate in which a sheath pipe engaged with a steel-reinforced bar and a steel member is installed at the top of the open-section upper chord member of the truss structure of the top of the inner point, and concrete is cast and cured so that the sheath pipe, the steel-reinforced bar and the stirrup fixed at the open-section upper chord member can be buried, and the steel member is engaged to the sheath pipe and is tensioned;

a second floor plate in which steel-reinforced bars are installed at the top of the truss structure of the inter-pillar center portion between the end point and the inner point and between the inner points for the block out section to be formed at both sides of the first floor plate, and concrete is cast and cured so that the installed steel-reinforced bars and the stirrup fixed at the open-section upper chord member can be buried; and

concrete which is cast and cured in the block out section.

14. A method for constructing a truss ridge using a truss structure with an open-section upper chord member, comprising:

a step for mounting a truss structure formed of a U-shaped open-section upper chord member at end points of both sides and the inner points between the end points;

a step for second tensioning a steel member engaged to a sheath pipe of the truss structure through a bock out section;

a step for installing a mould which forms the first floor plate at the top of the open-section upper chord member in which the steel member is tensioned;

a step for installing, in the interior of the mould, a sheath pipe to which a steel-reinforced bar and a steel member will be engaged;

a first floor plate formation step in which concrete is cast and cured in the mould so that the stirrups fixed at the steel-reinforced bar and the sheath pipe and the open-section upper chord member can be buried, and the moulds are disassembled;

a step for engaging a steel member to the sheath pipe of the first floor plate;

a step for tensioning the steel member engaged to the sheath pipe of the first floor plate in an engaging device through a block out section;

a step for installing a mould forming a second floor plate at the top of the truss structure between the end point and the inner point and between the inner points for a block out section to be formed at both sides of the first floor plate;

a second floor plate formation step in which steel-reinforced bars are installed in the interior of the mould, and concrete is cast and cured for the steel-reinforced bars and the stirrups fixed at the open-section upper chord member to be buried, and the moulds are disassembled for thereby forming the second floor plate; and

a step for casting and curing the concrete in the block out section after the tensioning device is removed from the block out section.