

【DESCRIPTION】**【Invention Title】**

PREFABRICATED STEEL ASSEMBLY FOR STEEL CONCRETE
COMPOSITE COLUMN WITH PERMANENT FORM

【Technical Field】

The present invention relates to a prefabricated steel assembly for a steel concrete composite column with permanent forms that is capable of rapidly and easily coupling the permanent forms thereto, irrespective of positions of support bars for connecting shape steel members.

【Background Art】

A form is a structure temporarily installed to build concrete having fluidity to a given shape and a given size during a short period of time in which the concrete is cured to some degree, and formwork is necessarily needed in a concrete structure like a reinforced concrete structure, a steel framed reinforced concrete structure, and so on.

Basically, the form includes a form panel for forming a concrete surface and support frames for supporting the form panel to maintain stiffness of the form, and during the formwork, further, temporary supports are needed to support the form.

Accordingly, a great number of materials for the formwork are required, and in addition, a lot of time and cost for assembling and disassembling the form or supports have been consumed.

In case of an ultra large column having a sectional size more than 3 m, particularly, it is impossible to use precast concrete (PC) members due to limitations in lifting, and accordingly, reinforced concrete construction has to be used.

In this case, works for installing or removing the temporary materials are carried out at high altitudes, so that there is a big possibility that safety accidents of workers may occur, and further, a construction cost may increase due to lots of temporary materials.

In the conventional formwork, also, a release agent is applied to the panel surface of the form to remove the form from concrete, thereby undesirably causing environmental pollution.

After the removal of the form, in addition, separate concrete surface grinding has to be inconveniently carried out.

So as to solve the problems occurring in the conventional formwork, a conventional technology as shown in FIG.1 relates to a prefabricated column frame with rib deck forms (which is disclosed in Korean Patent No.10-1490748). According to the conventional practice, the forms are fastened to horizontal support members having high stiffness by means of self drilling screws and are then coupled to a prefabricated frame, so that advantageously, no temporary supports are needed and a thickness of a form panel can be minimized.

However, the positions of the horizontal support members for coupling the forms should be accurately recognized, and also, the self drilling screws have to be one by one fastened, thereby undesirably requiring lots of time for attaching the forms to the horizontal support members. Besides, concrete paste may leak from portions of the self drilling screws to the outside.

Another conventional technology as shown in FIG.2 relates to a deck form fixing structure for slidably moving

a deck form to an upper side from a lower side thereof to a prefabricated frame (which is disclosed in Korean Patent No.10-1618798). According to the conventional practice, advantageously, the form can be easily coupled to the prefabricated frame, irrespective of the positions of fixing bars, and form installation time can be greatly reduced because no self drilling screws exist.

However, the deck form has to be moved to the upper side of a member from the lower side thereof, thereby needing a spare space for building the deck form on the lowermost portion of the column. Accordingly, the lower portion of the column should be finished inconveniently with a separate form. Besides, positions of first fixing bars as horizontal support members have to accurately correspond to the positions of second fixing bars coupled to the deck form, thereby requiring high accuracy in making the column.

【Disclosure】

【Technical Problem】

Accordingly, the present invention has been made in view of the above-mentioned problems occurring in the prior art, and it is an object of the present invention to provide a prefabricated steel assembly for a steel concrete composite column with permanent forms that is capable of rapidly and easily coupling the permanent forms thereto, irrespective of positions of support bars for connecting shape steel members.

【Technical Solution】

To accomplish the above-mentioned object, according to the present invention, there is provided a prefabricated steel assembly for a steel concrete composite column with permanent forms, including: a plurality of shape steel

members having sections of shapes corresponding to corners of the steel concrete composite column having a polygonal shape in such a manner as to be internally spaced apart from the column surfaces on the corners of the steel concrete composite column to build the steel concrete composite column; a plurality of support bars coupled to outer surfaces of the shape steel members to connect the neighboring shape steel members to each other, each support bar having a 'L'-shaped section to allow a web to be fixedly coupled to the shape steel members; and the permanent forms disposed on the column surfaces and coupled to outer ends of lower flanges of the support bars, each permanent form having a flat plate adapted to build an outer surface of the column, protrusions having 'L'-shaped sections in such a manner as to protrude from the inner surface of the flat plate in a longitudinal direction of the column, a bent corner portion bent vertically from one side end of the flat plate toward the neighboring column surface, and an outer protrusion having a 'L'-shaped section, protruding from the inner end of the bent corner portion in the longitudinal direction of the column, and laid on top of a protrusion formed on an outermost position of the permanent form coupled to the neighboring column surface, wherein the lower flange of each support bar has 'L'-shaped locking holes whose inlet are larger than widths of the protrusions, so that the protrusions of the permanent form are inserted into locking holes on the front surfaces of the locking holes and are then slidingly moved laterally and locked onto the locking holes.

According to the present invention, desirably, the lower flange of each support bar has an extended support extended from one end thereof toward the bent corner portion in such a

manner as to be inserted into the inside of the corresponding protrusion to support the corresponding protrusion.

According to the present invention, desirably, corner stiffeners are coupled to the inside of the bent corner portion.

According to the present invention, desirably, each corner stiffener comprises a first extended portion extended from a protrusion side end portion thereof in such a manner as to surround the corresponding protrusion and a second extended portion extended from an outer protrusion side end portion thereof in such a manner as to be inserted into the inside of the outer protrusion.

According to the present invention, desirably, each corner stiffener has support wings bent vertically from sides coming into contact with the bent corner portion in such a manner as to be supported against the surfaces of the bent corner portion.

According to the present invention, desirably, the shape steel members located at the corners facing each other are connected to each other by means of bracing members.

【Advantageous Effects】

According to the present invention, the prefabricated steel assembly has the following advantages.

Firstly, the shape steel members and the support bars are coupled to the permanent forms, so that the prefabricated steel assembly can be in advance prepared, thereby greatly reducing time and costs required to construct and deconstruct the forms.

Secondly, the permanent forms are supported against the shape steel members by means of the support bars located inside the column, thereby requiring no separate temporary

supports for supporting the forms, and if it is desired to construct a large-sized column additionally during the use of an existing building or land, accordingly, there is no obstacle in using the building or land.

Thirdly, the support bars serve as the support frames for the permanent forms, so that thicknesses of the forms can be minimized, which gives an economical advantage, and further, the permanent forms can be more lightweight than the existing forms, thereby being easily handled by a worker.

Fourthly, the protrusions formed in the longitudinal direction of the column on the inner surface of the permanent form are inserted into the locking holes of the support bars of the prefabricated steel assembly on the front surface of the column, and next, the permanent form is slidingly moved in the transverse direction of the column and is thus locked onto the locking holes of the support bars, so that the permanent form can be rapidly and easily coupled to the prefabricated steel assembly, irrespective of the positions of the support bars, and moreover, there is no need to form any spare space on the end portion of the column to insert the permanent form.

Lastly, the bent corner portion is extended unitarily from the permanent form of the column surface on the corner of the column, and the bonding portion of the permanent form to the neighboring permanent form is moved to the column surface, so that the permanent form can be stably resistant to the lateral pressure on the corner thereof.

【Description of Drawings】

FIG.1 is a perspective view showing a conventional prefabricated column with a rib deck form.

FIG.2 is a sectional view showing a form moving upward and thus coupled to a prefabricated frame in another conventional practice.

FIG.3 is a perspective view showing a prefabricated steel assembly for a steel concrete composite column with permanent forms according to the present invention.

FIG.4 is a perspective view showing the permanent form according to the present invention.

FIG.5 is a perspective view showing support bars according to the present invention.

FIGS.6A and 6B are plan views showing coupling processes of the permanent form to the support bar of FIG.5.

FIG.7 is a plan view showing a coupled state of the permanent form to a corner of a column according to the present invention.

FIGS.8A and 8B are plan views showing coupling processes of the permanent forms to the surfaces of the column according to the present invention.

FIG.9 is a perspective view showing a corner stiffener according to the present invention.

FIG.10 is a perspective view showing the permanent form to which the corner stiffeners are coupled according to the present invention.

FIG.11 is a plan view showing an example where the corner stiffener is adopted according to the present invention.

FIG.12 is a perspective view showing a coupling relation of a bracing member according to the present invention.

【Mode for Invention】

Hereinafter, the present invention will be in detail explained with reference to the attached drawing.

FIG.3 is a perspective view showing a prefabricated steel assembly for a steel concrete composite column with permanent forms according to the present invention, FIG.4 is a perspective view showing the permanent form according to the present invention, FIG.5 is a perspective view showing support bars according to the present invention, FIGS.6A and 6B are plan views showing coupling processes of the permanent form to the support bar of FIG.5, and FIG.7 is a plan view showing a coupled state of the permanent form to a corner of a column according to the present invention.

As shown in FIGS.3 to 7, there is provided a prefabricated steel assembly for a steel concrete composite column with permanent forms, including: a plurality of shape steel members 1 having sections of shapes corresponding to corners of the steel concrete composite column having a polygonal shape in such a manner as to be internally spaced apart from the column surfaces on the corners of the steel concrete composite column to build the steel concrete composite column; a plurality of support bars 2 coupled to outer surfaces of the shape steel members 1 to connect the neighboring shape steel members 1 to each other, each support bar 2 having a 'L'-shaped section to allow a web 21 to be fixedly coupled to the shape steel members 1; and the permanent forms 3 disposed on the column surfaces and coupled to outer ends of lower flanges 22 of the support bars 2, each permanent form 3 having a flat plate 31 adapted to build an outer surface of the column, protrusions 32 having 'L'-shaped sections in such a manner as to protrude from the inner surface of the flat plate 31 in a longitudinal direction of the column, a bent corner portion 33 bent vertically from one side end of the flat plate 31 toward the neighboring column

surface, and an outer protrusion 34 having a 'L'-shaped section, protruding from the inner end of the bent corner portion 33 in the longitudinal direction of the column, and laid on top of a protrusion 32' formed on an outermost position of the permanent form 3' coupled to the neighboring column surface, wherein the lower flange 22 of each support bar 2 has 'L'-shaped locking holes 221 whose inlet are larger than widths of the protrusions 32, so that the protrusions 32 of the permanent form 3 are inserted into locking holes 221 on the front surfaces of the locking holes 221 and are then slidingly moved laterally and locked onto the locking holes 221.

The prefabricated steel assembly can be in advance made in a factory so as to build the polygonal steel concrete composite column.

The prefabricated steel assembly includes the shape steel members 1, the support bars 2, and the permanent forms 3.

The shape steel members 1 have sections of shapes corresponding to corners of the column and are disposed on corners of the column.

The shape steel members 1 are internally spaced apart from the column surfaces by a given distance.

The column may have a section close to a circle according to arrangements of the shape steel members 1.

If the column has a square section, $\sqcap$ -shaped steel members 1 may be adopted.

If the column is an octagonal column whose corner has an obtuse angle, flexural stiffness of the shape steel members 1 may be insufficient, and in this case, desirably, the shape

steel members 1 are additionally bent inward from both sides thereof to increase section modulus thereof.

The support bars 2 are coupled to outer surfaces of the shape steel members 1 to connect the neighboring shape steel members 1.

Each support bar 2 has a 'L'-shaped section and includes the web 21 and the lower flange 22.

The web 21 of the support bar 2 is fixed to the shape steel members 1 by means of rivets, bolts, welding, and so on.

The lower flange 22 of the support bar 2 is located toward the outside of the column.

The support bars 2 are directly coupled to the permanent form 3 in such a manner as to be spaced apart from each other in the longitudinal direction of the column.

So as to increase stiffness of the support bar 2, in some cases, a Z-shaped steel member, a $\square$ -shaped steel member, or a lightweight steel frame may be used as the support bar 2.

In this case, an end portion of an upper flange 23 of the support bar 2 is cut on a portion where the shape steel member 1 and the support bar 2 come into contact with each other, so that the support bar 2 can be coupled to the shape steel member 1, without any interference (See FIG.5).

The permanent forms 3 are located on the respective column surfaces.

The permanent forms 3 are coupled to the outer end portions of the lower flanges 22 of the support bars 2.

As shown in FIG.4, each permanent form 3 includes the flat plate 31 adapted to build an outer surface of the column and the protrusions 32 having 'L'-shaped sections in such a manner as to protrude from the inner surface of the flat plate 31 in the longitudinal direction of the column.

Further, as shown in FIG.7, each permanent form 3 includes the bent corner portion 33 bent vertically from one side end of the flat plate 31 toward the neighboring column surface and the outer protrusion 34 having the 'L'-shaped section, protruding from the inner end of the bent corner portion 33 in the longitudinal direction of the column, and laid on top of a protrusion 32' formed on an outermost position of the permanent form 3' coupled to the neighboring column surface.

Further, the lower flange 22 of the support bar 2 has the 'L'-shaped locking holes 221 whose inlets are larger than widths of the protrusions 32.

The locking holes 221 are portions where the protrusions 32 of the permanent form 3 are locked.

The locking holes 221 are spaced apart from each other in a longitudinal direction of the support bar 2, that is, in a transverse direction of the column.

The protrusions 32 may be spaced apart in a plurality of columns from each other in the transverse direction of the column, like the locking holes 221 of the lower flange 22 of the support bar 2.

Since stiffness of a section of the column increases through an I value raised by the formation of the protrusions 32, the permanent form 3 can ensure excellent resistance for a lateral pressure upon concrete casting.

The protrusions 32 are buried in concrete after the concrete casting so that they become integral with the concrete.

The protrusions 32 of the permanent form 3 are inserted into the locking holes 221 of the support bar 2 on the front sides of the locking holes 221 and are then slidingly moved

laterally, so that the permanent form 3 can be fixed to the support bar 2.

Upon concrete casting, generally, a lateral pressure of the concrete is intensively generated from corners of the column. According to the present invention, therefore, the permanent form 3 is configured to have the bent corner portion 33 extended unitarily from the flat plate 31 on the corner of the column, and a bonding portion of the permanent form 3 to the neighboring permanent form 3' is moved to the column surface, so that the permanent form 3 can be stably resistant to the lateral pressure on the corner thereof.

The outer protrusion 34 has the 'L'-shaped section in such a manner as to be laid on top of the other side outermost protrusion 32' of the permanent form 3' coupled to the neighboring column surface.

As shown in FIG.7, flare welding is carried out with a designed welding length on a portion where the outer protrusion 34 and the other side outermost protrusion 32' of the permanent form 3' coupled to the neighboring column surface, so that the protrusion 34 and the other side outermost protrusion 32' can be fixed to each other. As a result, a bonded portion can be prevented from being open in the transverse direction of the column due to a concrete casting pressure.

The permanent form 3 is formed of one flat sheet bent unitarily to the flat plate 31, the protrusions 32, the bent corner portion 33 and the outer protrusion 34.

The permanent form 3 may be in advance attached to the support bars 2 coupled to the shape steel members 1, and otherwise, it can be attached thereto in a construction site.

If the column has a large width, the permanent form 3 is segmented into a plurality of permanent forms, and the plurality of permanent forms 3 can be coupled to one surface of the column.

As shown in FIGS.6A and 6B, the inlets of the locking holes 221 are larger than the widths of the protrusions 32.

Accordingly, the protrusions 32 can be inserted directly into the front surface of the support bar 2, thereby allowing the permanent form 3 to be coupled directly to the front surface of the column.

In detail, the permanent form 3 comes into close contact with the front surface of the support bar 2 so as to insert the protrusions 32 into the locking holes 221, and next, the permanent form 3 is slidably moved in a horizontal direction, so that the protrusions 32 can be easily locked onto the locking holes 221.

Moreover, the corner of the column is built by means of the bent corner portion 33 extended from the flat plate 31, and the outer protrusion 34 formed on the end portion of the bent corner portion 33 has a corresponding shape to the other side outermost protrusion 32' of the permanent form 3' coupled to the neighboring column surface, so that it is laid on top of the other side outermost protrusion 32'.

So as to prevent the permanent form 3 after installed from sliding in the longitudinal direction of the column, the support bars 2 and the permanent form 3 can be welded to each other on one or more positions per one.

As mentioned above, after the protrusions 32 of the permanent form 3 are inserted into the locking holes 221 on the front surface of the column, the permanent form 3 is slidably moved in the transverse direction of the column, so

that the protrusions 32 can be locked onto the locking holes 221. Accordingly, there is no need to form any spare space on the end portion of the column to insert the permanent form 3, and the permanent form 3 having the 'L'-shaped protrusions 32 can be used over the whole surface of the column.

Moreover, the permanent form 3 is supported against the shape steel members 1 through the support bars 2 located inside the column, so that no separate temporary supports for supporting the form are required. If it is desired to construct a large-sized column additionally during the use of an existing building or land, accordingly, there is no obstacle in using the building or land.

Also, the support bars 2 serve as support frames for the form, so that a thickness of the form can be minimized, which gives an economical advantage. Further, the permanent form can be more lightweight than the existing form, thereby being easily handled by a worker.

As shown in FIG.7, an extended support 24 is extended from one end of the lower flange 22 toward the bent corner portion 33 in such a manner as to be inserted into the inside of the corresponding protrusion 32 so as to support the corresponding protrusion 32.

If the extended support 24 extended from one end of the lower flange 22 of the support bar 2 is inserted into the inside of the corresponding protrusion 32 of the permanent form 3 to support the corresponding protrusion 32, the permanent form 3 can be prevented from being deformed outward due to the lateral pressure of the concrete on the corner of the column.

FIGS.8A and 8B are plan views showing coupling processes of the permanent forms to the surfaces of the column.

Now, the coupling processes of the permanent forms 3 to the surfaces of the column will be explained with reference to FIGS.8A and 8B.

First, as shown in FIG.8A, the 'L'-shaped locking holes 221 are formed on the outer ends of the lower flanges 22 of the support bars 2, and accordingly, the permanent form 3 comes into close contact with the support bars 2 on one surface of the column, so that the protrusions 32 of the permanent form 3 can be inserted into the locking holes 221 on the front surfaces of the support bars 2.

After that, the permanent form 3 is slidably moved in the transverse direction of the column, so that the protrusions 32 can be locked onto the locking holes 221.

Next, the permanent form 3' is built on the neighboring surface of the column surface in the same order as shown in FIG.8A (See FIG.8B).

At this time, the outer protrusion 34 protruding from the bent corner portion 33 of the permanent form 3 is laid upon top of the other side outermost protrusion 32' of the permanent form 3' coupled to the neighboring column surface.

As a result, the corner of the column can be finished, without any interference therein, at the time when the permanent form 3 horizontally slides.

After that, the permanent forms 3 of the remaining surfaces of the column are coupled sequentially, thereby finishing the construction of the permanent forms 3.

FIG.9 is a perspective view showing a corner stiffener according to the present invention, FIG.10 is a perspective view showing the permanent form to which the corner stiffeners are coupled according to the present invention,

and FIG.11 is a plan view showing an example where the corner stiffener is adopted according to the present invention.

As shown in FIGS.9 to 11, corner stiffeners 4 are coupled to the inside of the bent corner portion 33.

If a size of the column is large or a one-time casting height of concrete is high, a substantially strong lateral pressure is applied to the corners of the column.

So as to allow the strong lateral pressure to be stably supported against the corners of the column, accordingly, the corner stiffeners 4 are coupled to the inside of the bent corner portion 33.

The corner stiffeners 4 are spaced apart from each other in the longitudinal direction of the column, and their installation distance is determined according to a one-time casting height of concrete.

Upon concrete casting, on the other hand, air is caught at a lower portion of the corner stiffener 4, so that the concrete is not cast compactedly, and so as to avoid such a problem, accordingly, the corner stiffener 4 desirably has an air hole 41 formed thereon.

Further, the corner stiffener 4 has a first extended portion 42 extended from the protrusion side end portion thereof in such a manner as to surround the protrusion 32 and a second extended portion 43 extended from the outer protrusion side end portion thereof in such a manner as to be inserted into the inside of the outer protrusion 34.

The first extended portion 42 has a shape of a 'L'-like hook, surrounds the protrusion 32, and is then fixed to the protrusion 32 by means of welding W.

At this time, the first extended portion 42 is adapted to surround the protrusion 32, so that the corner stiffener 4

can be rigidly fixed to the protrusion 32 only by means of spot welding.

The second extended portion 43 is lockedly inserted into the inside of the outer protrusion 34.

The second extended portion 43 serves to prevent the bent corner portion 33 from being open outward due to the lateral pressure of the concrete upon the concrete casting.

The protrusion 32' formed on the outermost position of the permanent form 3' of the neighboring column surface is locked onto the outer protrusion 34 supported rigidly against the second extension portion 43 of the corner stiffener 4, so that it can be stably supported against the outer protrusion 34.

In detail, one end of the permanent form 3 is supported against the corner stiffener 4, and the other end thereof is supported in such a manner as to allow the outermost protrusion 32' to be locked onto the end portion of the permanent form 3' of the neighboring column surface, so that both ends of the permanent form 3 can be supported rigidly.

Since the bent corner portion 33 is reinforced by means of the corner stiffeners 4, moreover, rigid coupling on the corners of the column can be maintained, without any separate corner beads or clips for connecting the permanent forms 3 thereon.

Further, the corner stiffener 4 has support wings 44 bent vertically from the sides coming into contact with the bent corner portion 33 in such a manner as to be supported against the surfaces of the bent corner portion 33.

When the corner stiffener 4 is inserted into the bent corner portion 33 and is fixed thereto by means of welding, the support wings 44 are adapted to allow the corner

stiffener 4 in position to be fixed to the bent corner portion 33 and to allow a horizontal level of the corner stiffener 4 to be maintained.

The support wings 44 are formed on both of two end portions coming into contact with the bent corner portion 33, so that they can be fixed in position in two directions.

Accordingly, the corner stiffener 4 is fixed rigidly to the bent corner portion 34 by means of the two-directional support of the support wings 44, thereby allowing welding for the corner stiffener 4 to be easily achieved.

FIG.12 is a perspective view showing a coupling relation of a bracing member according to the present invention.

As shown in FIG.12, the shape steel members 1 located at the corners facing each other are connected to each other by means of bracing members 5.

If the column has a large section, the shape steel members 1 may be deformed due to the lateral pressure of the concrete upon concrete casting.

So as to prevent the deformation, accordingly, the facing shape steel members 1 are supportedly connected to each other by means of the bracing members 5.

Connection plates 51 are fixedly coupled to the insides of the shape steel members 1 to connect the bracing members 5 thereto.

In this case, the connection plates 51 are fixedly coupled to ends portions of the bracing members 5 by means of bolts.

The bracing members 5 serve to prevent the shape steel members 1 from being deformed due to the lateral pressure of the concrete upon concrete casting and also to prevent the

shape steel members 1 from being buckled due to vertical loads.

【CLAIMS】**【Claim 1】**

A prefabricated steel assembly for a steel concrete composite column with permanent forms, comprising:

a plurality of shape steel members (1) having sections of shapes corresponding to corners of the steel concrete composite column having a polygonal shape in such a manner as to be internally spaced apart from the column surfaces on the corners of the steel concrete composite column to build the steel concrete composite column;

a plurality of support bars (2) coupled to outer surfaces of the shape steel members (1) to connect the neighboring shape steel members (1) to each other, each support bar (2) having a 'L'-shaped section to allow a web (21) to be fixedly coupled to the shape steel members (1); and

the permanent forms (3) disposed on the column surfaces and coupled to outer ends of lower flanges (22) of the support bars (2), each permanent form (3) having a flat plate (31) adapted to build an outer surface of the column, protrusions (32) having 'L'-shaped sections in such a manner as to protrude from the inner surface of the flat plate (31) in a longitudinal direction of the column, a bent corner portion (33) bent vertically from one side end of the flat plate (31) toward the neighboring column surface, and an outer protrusion (34) having a 'L'-shaped section, protruding from the inner end of the bent corner portion (33) in the longitudinal direction of the column, and laid on top of a protrusion (32') formed on an outermost position of the permanent form (3') coupled to the neighboring column surface,

wherein the lower flange (22) of each support bar (2) has 'L'-shaped locking holes (221) whose inlet are larger than widths of the protrusions (32), so that the protrusions (32) of the permanent form (3) are inserted into locking holes (221) on the front surfaces of the locking holes (221) and are then slidingly moved laterally and locked onto the locking holes (221).

【Claim 2】

The prefabricated steel assembly according to claim 1, wherein the lower flange (22) of each support bar (2) has an extended support (24) extended from one end thereof toward the bent corner portion (33) in such a manner as to be inserted into the inside of the corresponding protrusion (32) to support the corresponding protrusion (32).

【Claim 3】

The prefabricated steel assembly according to claim 1, wherein corner stiffeners (4) are coupled to the inside of the bent corner portion (33).

【Claim 4】

The prefabricated steel assembly according to claim 3, wherein each corner stiffener (4) comprises a first extended portion (42) extended from a protrusion side end portion thereof in such a manner as to surround the protrusion (32) and a second extended portion (43) extended from an outer protrusion side end portion thereof in such a manner as to be inserted into the inside of the outer protrusion (34).

【Claim 5】

The prefabricated steel assembly according to claim 3, wherein each corner stiffener (4) has support wings (44) bent vertically from sides coming into contact with the bent

corner portion (33) in such a manner as to be supported against the surfaces of the bent corner portion (33).

【Claim 6】

The prefabricated steel assembly according to claim 1, wherein the shape steel members (1) located at the corners facing each other are connected to each other by means of bracing members (5).