

LONG PLATFORM GUY-WIRE HANGING BASKET AND CONSTRUCTION METHOD FOR MAIN GIRDER SECTION

Field of the Invention

The present invention relates to the technical field of bridge construction device, in particular to a long platform guy-wire hanging basket (guyed form traveler) and a construction method for a main girder section.

Background of the Invention

In the cantilever casting construction of the main girder of the prestressed concrete stayed-cable bridge, if the size of the girder body and the earth volume of the concrete of a standard section are large, the construction device of the guy-wire hanging basket is generally used. At present, the common guy-wire hanging basket structure is generally composed of basic systems such as a load-bearing platform, a guy-wire anchoring system, a hanging lifting running system, and a shearing system.

In order to adapt to the change of the vertical and horizontal angle of the cable surface of the stay cable, the common guy-wire hanging basket usually adopts an arc-shaped head structure at the front end of the load-bearing platform of the hanging basket. This kind of structural design solves the problem of the universality of the angle of the stay cable. However, the cable force of the stay cable has a large variation range, and the minimum cable force value is several times different from the maximum cable force value, in the design process of the arc-shaped head structure, the principle of "taking the big ones and leaving behind the small ones" must be followed, resulting in diseconomy of the arc-shaped head structure. At the same time, due to the limited range of the contact surface of the anchoring point of the stay cable on the arc-shaped head, the arc-shaped head has the problem of stress concentration, and it is easy to have insufficient safety reserves of local structure, and have a safety risk.

In addition, the stay cable is connected with the arc-shaped head of the guy-wire hanging basket by means of guy-wire rods to form the front fulcrum of the guy-wire hanging basket, after the main girder concrete is cast, tensioned and prestressed, the guy-wire rods need to be dismantled, and the cable force of the stay cable needs to be converted from the arc-shaped head to the concrete main girder. The process is complicated, and during this "system conversion" process, there will be great

instantaneous cable force, which can easily damage the structure.

In order to ensure that the elevation and line shape of the main girder are uniform, generally when the concrete is cast halfway, it is necessary to adjust the cable force of the stay cable once, and then continue to cast the concrete, which has complicated construction process and requires extremely high control during the construction process.

Summary of the Invention

In view of the defects existing in the prior art, the purpose of the present invention is to provide a long platform guy-wire hanging basket and a construction method for a main girder section, which solves the problems that: when the stay cable is connected with the arc-shaped head of the guy-wire hanging basket by means of guy-wire rods, after the main girder concrete is cast, tensioned and prestressed, the guy-wire rods need to be dismantled, and the cable force of the stay cable needs to be converted from the arc-shaped head to the concrete main girder, and during the "system conversion" process, there will be great instantaneous cable force, which can easily damage the structure.

In order to achieve the above purpose, the present invention adopts the following technical solution.

On the one hand, the present invention provides a long platform guy-wire hanging basket, comprising:

- a load-bearing mechanism, which comprises a load-bearing end, the load-bearing mechanism is arranged below a cast concrete section, and the load-bearing end can extend out of the cast concrete section;

- a padlock mechanism, which comprises:

- at least one precast anchor block, which is arranged above an end portion of the load-bearing end, and a cable conduit configured to install a stay cable is provided in the precast anchor block;

- an anchoring part, which connects the precast anchor block and the load-bearing end; and

- a shearing mechanism matched with the precast anchor block, two ends of which resist on the cast concrete section and the precast anchor block.

On the basis of the above technical solution, the long platform guy-wire hanging basket further comprises a running mechanism, which is configured to extend the

load-bearing end of the load-bearing mechanism from below the cast concrete section.

On the basis of the above technical solution, the running mechanism comprises:

two slideways, which are configured to be respectively arranged on two sides above the erected concrete section;

two C-shaped hooks, each of which comprises a sliding end and a connecting end, wherein the connecting end is connected with the middle portion of the load-bearing mechanism, and the sliding end is slidably arranged on the corresponding slideway; and

a pushing part, which is configured to push the C-shaped hooks to slide on the slideways so as to make the load-bearing end extends out of the cast concrete section.

On the basis of the above technical solution, the load-bearing mechanism comprises:

two load-bearing trusses arranged at intervals, which extend along a length direction of the cast concrete section;

a plurality of connecting trusses arranged at intervals, which are arranged between the two load-bearing trusses, and the two ends are respectively connected with the two load-bearing trusses; and

two pairs of truss brackets, which are respectively arranged on outer sides of the two load-bearing trusses, and the connecting ends of the C-shaped hooks are connected with the truss brackets.

On the basis of the above technical solution, the long platform guy-wire hanging basket further comprises: a hanging mechanism, one end of which is arranged at the end portion of the cast concrete section, and the other end is connected with the load-bearing mechanism after the load-bearing end extends out of the cast concrete section, and can adjust a height of the load-bearing mechanism.

On the basis of the above technical solution, the hanging mechanism comprises two sets of hanging units which are respectively arranged on two sides of the cast concrete section, and each set of the hanging units comprises:

an anchor hanger, one end of which is connected with the load-bearing mechanism, and the other end passes through the cast concrete section; and

a jacking part, which is arranged at one end of the anchor hanger passing through most of the anchor hangers, and can lift or lower the anchor hanger to adjust the height of the load-bearing mechanism.

On the basis of the above technical solution, the shearing mechanism comprises:

a suspension mandrel, which is arranged between the cast concrete section and the precast anchor block; and

two length-adjustable adjustment devices, which are respectively arranged at two ends of the suspension mandrel, and respectively resist on the cast concrete section and the precast anchor block.

On the basis of the above technical solution, when the number of the precast anchor block is one, the precast anchor block is arranged in a middle portion of the transverse direction of the cast concrete section, and when the number of the precast anchor blocks are two, the two precast anchor blocks are respectively arranged below flange plates on two sides of the cast concrete section.

On the other hand, a construction method for a main girder section, comprising the following steps:

extending the load-bearing end of the load-bearing mechanism out of the cast concrete section to set a position and anchoring same;

hoisting the precast anchor block to the preset position above the load-bearing end, connecting the precast anchor block and the load-bearing end by means of the anchoring part, and providing the shearing mechanism between the cast concrete section and the precast anchor block; and

once the stay cable is installed to the cable conduit and tensioned, casting concrete between the cast concrete section and the precast anchor block to complete the casting of the main girder section.

On the basis of the above technical solution, extending the load-bearing end of the load-bearing mechanism out of the cast concrete section to the set position and anchoring same, comprising the following steps:

adopting the running mechanism to extend the load-bearing end of the load-bearing mechanism from below the cast concrete section to the set position;

connecting the load-bearing mechanism with the end portion of the cast concrete section by means of the hanging mechanism; and

adopting the hanging mechanism to adjust the height of the load-bearing mechanism and then removing the running mechanism.

Compared with the prior art, the present invention has the advantages that: when adopting the guy-wire hanging basket, firstly, extending the load-bearing end of the load-bearing mechanism out of the cast concrete section to the set position and anchoring same; then hoisting the precast anchor block to the preset position above

the load-bearing end, connecting the precast anchor block and the load-bearing end by means of the anchoring part, and providing the shearing mechanism between the cast concrete section and the precast anchor block; and after the stay cable is installed to the cable conduit and tensioned, forming a front fulcrum of the hanging basket, and casting the next concrete section between the cast concrete section and the precast anchor block. The precast anchor block and the cable conduit are integrated in the factory. Compared with the existing cast-in-place construction concept of the guy-wire hanging basket, the force transmission guy-wire rod between the arc-shaped head of the traditional guy-wire hanging basket and the stay cable is omitted, so that the present invention has the characteristics of simple and clear structure force, and after the construction is completed, there is no problem of "system conversion" of the cable force of the stay cable, which simplifies the construction process. At the same time, because the precast guy-wire anchoring system of the present invention installs the stay cable and adjusts the cable after the precast guy-wire anchoring system is installed, the cable force for the first tension of the stay cable will be higher than that of the stay cable of the existing guy-wire hanging basket, even if the precast guy-wire anchoring system of the present invention does not adjust the cable force for the first tension of the stay cable during the concrete casting process, the elevation and line shape of the main girder can also meet the requirements, which greatly reduces the difficulty of construction control of the main girder of the prestressed concrete stayed-cable bridge, improves the construction efficiency, achieves "zero" damage to the girder body of the main girder, optimizes the construction process, and is easy to operate.

Brief Description of the Drawings

In order to better illustrate the technical solution in the embodiments of the present application, the following will briefly introduce the drawings needed in the description of the embodiments, and it is obvious that the drawings in the following description are part of embodiments of the present application, for those of ordinary skill in the art, other drawings may also be obtained based on these drawings without any inventive effort.

Fig. 1 is a process state diagram of S1 of a construction method for a main girder section in the embodiment of the present invention;

Fig. 2 is a cross-sectional view of Fig. 1 in the embodiment of the present

invention;

Fig. 3 is a process state diagram of S2 of a construction method for a main girder section in the embodiment of the present invention;

Fig. 4 is a cross-sectional view of a padlock mechanism in Fig. 3 in the embodiment of the present invention;

Fig. 5 is a front view of a connection between a load-bearing mechanism and a hanging mechanism in the embodiment of the present invention;

Fig. 6 is a cross-sectional view of a connection between a load-bearing mechanism and a hanging mechanism in the embodiment of the present invention;

Fig. 7 is a structural diagram of a padlock mechanism in the embodiment of the present invention;

Fig. 8 is a structural diagram of a shearing mechanism in the embodiment of the present invention.

In the figures: 1-load-bearing mechanism; 11-load-bearing truss; 12-connecting truss; 13-truss bracket; 2-cast concrete section; 3-padlock mechanism; 31-precast anchor block; 311-cable conduit; 32-anchoring part; 4-shearing mechanism; 41-suspension mandrel; 42-adjustment device; 5-stay cable; 6-running mechanism; 61-slideway; 62-C-shaped hook; 7-hanging mechanism; 71-anchor hanger; 72-jacking part.

Detailed Description of the Embodiments

In order to make the purpose, technical solutions and advantages of the embodiments of the present application clearer, the technical solutions in the embodiments of the present application will be described clearly and completely in combination with the drawings in the embodiments of the present application. Obviously, the described embodiments are only a part of the embodiments of the present application, not all of the embodiments. Based on the embodiments in the present application, all other embodiments obtained by a person of ordinary skill in the art without inventive efforts shall fall within the protection scope of the present application.

The present invention will be further described below in detail with reference to the drawings in combination with the embodiments.

As shown in Fig. 3, Fig. 4 and Fig. 7, the present invention provides a long platform guy-wire hanging basket, comprising: a load-bearing mechanism 1, which

comprises a load-bearing end, the load-bearing mechanism 1 is arranged below a cast concrete section 2, and the load-bearing end can extend out of the cast concrete section 2. The guy-wire hanging basket further comprises a padlock mechanism 3, which comprises: at least one precast anchor block 31, which is arranged above an end portion of the load-bearing end, and a cable conduit 311 configured to install a stay cable 5 is provided in the precast anchor block 31. The padlock mechanism 3 further comprises an anchoring part 32, which connects the precast anchor block 31 and the load-bearing end. The guy-wire hanging basket further comprises a shearing mechanism 4 matched with the precast anchor block 31, which resists on the cast concrete section 2 and the precast anchor block 31, and is configured to bear the horizontal component force of the precast anchor block 31 after the stay cable 5 is installed.

When the long platform guy-wire hanging basket is adopted, firstly, the load-bearing end of the load-bearing mechanism 1 is extended out of the cast concrete section 2 to the set position and anchored; then the precast anchor block 31 is hoisted to the preset position above the load-bearing end, the precast anchor block 31 is connected with the load-bearing end by means of the anchoring part 32, and the shearing mechanism 4 is arranged between the cast concrete section 2 and the precast anchor block 31; and after the stay cable 5 is installed to the cable conduit 311 and tensioned, a front fulcrum of the hanging basket is formed, and the next concrete section is cast between the cast concrete section 2 and the precast anchor block 31. The precast anchor block 31 and the cable conduit 311 are integrated in the factory. Compared with the existing cast-in-place construction concept of the guy-wire hanging basket, the precast guy-wire anchoring system of the present invention adopts the factory precast construction concept, which provides a better working environment and is more conducive to construction quality control. Furthermore, a set of external positioning brackets can be repeatedly used in the factory to fix the cable conduit, compared with the existing guy-wire hanging basket which must use internal positioning brackets (which cannot be reused when being cast in concrete), the present invention can recycle the positioning brackets, which greatly saves construction costs. The force transmission guy-wire rod between the arc-shaped head of the traditional guy-wire hanging basket and the stay cable is omitted, so that the present invention has the characteristics of simple and clear structure force, and after the construction is completed, there is no problem of "system conversion" of the cable

force of the stay cable, which simplifies the construction process. At the same time, because the precast guy-wire anchoring system of the present invention installs the stay cable and adjusts the cable after the precast guy-wire anchoring system is installed, the cable force for the first tension of the stay cable will be higher than that of the stay cable of the existing guy-wire hanging basket, even if the precast guy-wire anchoring system of the present invention does not adjust the cable force for the first tension of the stay cable during the concrete casting process, the elevation and line shape of the main girder can also meet the requirements, which greatly reduces the difficulty of construction control of the main girder of the prestressed concrete stayed-cable bridge, improves the construction efficiency, reduces the workload of construction personnel, achieves "zero" damage to the girder body of the main girder, optimizes the construction process, is easy to operate, has a wide range of application, not only can be used for concrete main girder cable-stayed bridge, but also for the steel-concrete composite girder structure cable-stayed bridge, reduces a large number of on-site operation links and a large number of high-altitude operations of construction personnel, saves manpower and material resources and cost, and improves construction efficiency.

In the present embodiment, the precast anchor block 31 reserves a connection interface of the steel bars of the concrete main girder during the precast production process, and the number and specification of the connection interface of the steel bars reserved for the precast anchor block 31 are subject to the design drawings and specification requirements. The connection method of the steel bars is generally welding or sleeve connection. The specification and size of the precast anchor block 31 are also determined by the hoisting capacity of the deck derrick crane and the load-bearing capacity of the flat-chord load-bearing mechanism 1. The precast anchor block 31 also reserves a mounting hole for the vertical anchoring part 32 during the precast production process. The mounting hole does not interfere with ordinary steel bars and prestressed steel bars, and is performed closing treatment after the construction of the whole bridge is completed. The positioning of the cable conduit 311 adopts an external positioning bracket, and the outline size of the external positioning bracket is slightly larger than that of the precast anchor block 31 and does not have a relationship with the precast anchor block 31. The anchoring part 32 typically adopts large-diameter prestressed finish rolled threaded steel bars.

As shown in Fig. 1 and Fig. 2, in some alternative embodiments, the long

platform guy-wire hanging basket further comprises a running mechanism 6, which is configured to extend the load-bearing end of the load-bearing mechanism 1 from below the cast concrete section 2.

Preferably, the running mechanism 6 comprises: two slideways 61, which are configured to be respectively arranged on two sides above the erected cast concrete section 2; two C-shaped hooks 62, each of the C-shaped hooks 62 comprises a sliding end and a connecting end, wherein the connecting end is connected with the middle portion of the load-bearing mechanism 1, and the sliding end is slidably arranged on the corresponding slideway 61; and a pushing part, which is configured to push the C-shaped hooks 62 to slide on the slideways 61 so as to make the load-bearing end extends out of the cast concrete section 2.

In this embodiment, the sliding end and the connecting end are at right angle. The sliding end is arranged on two sides above the erected cast concrete section 2, and the connecting end is connected with the middle portion of the load-bearing mechanism 1. At the starting position, the load-bearing end of the load-bearing mechanism 1 is also located below the cast concrete section 2, and after the C-shaped hook 62 is connected with the load-bearing mechanism 1, the pushing part is adopted to push the C-shaped hook 62 to slide on the slideway 61 so as to extend the load-bearing end out of the cast concrete section 2. Of course, in other embodiments, other types of running mechanisms 6 can also be selected, which can mount the load-bearing mechanism 1 and make the load-bearing portion of the load-bearing mechanism 1 extend out of the cast concrete section 2, which can also achieve the same effect.

As shown in Fig. 5 and Fig. 6, in some alternative embodiments, the load-bearing mechanism 1 comprises: two load-bearing trusses 11 arranged at intervals, which extend along a length direction of the cast concrete section 2; a plurality of connecting trusses 12 arranged at intervals, which are arranged between the two load-bearing trusses 11, and the two ends are respectively connected with the two load-bearing trusses 11; and two pairs of truss brackets 13, which are respectively arranged on outer sides of the two load-bearing trusses 11, and the connecting ends of the C-shaped hooks 62 are connected with the truss brackets 13.

In this embodiment, a plurality of connecting trusses 12 arranged at intervals are arranged between the two load-bearing trusses 11 arranged at intervals, which can be detachably connected to enhance the strength of the entire load-bearing mechanism 1.

The two pairs of truss brackets 13 are arranged outside the two load-bearing trusses 11 to facilitate the installation and matching of the C-shaped hooks 62. On the upper chord and the lower chord of the load-bearing truss 11, an installation connection interface of the hanging mechanism 7 is reserved, and the structure at the interface is reinforced with stiffening plates. Of course, other forms of the load-bearing mechanism 1 can also be selected in other embodiments, which can also achieve the same effect.

As shown in Fig. 5 and Fig. 6, in some alternative embodiments, the long platform guy-wire hanging basket further comprises: a hanging mechanism 7, one end of which is arranged at the end portion of the cast concrete section 2, and the other end is connected with the load-bearing mechanism 1 after the load-bearing end extends out of the cast concrete section 2, and can adjust the height of the load-bearing mechanism 1.

Preferably, the hanging mechanism 7 comprises two sets of hanging units which are respectively arranged on two sides of the cast concrete section 2, and each set of the hanging units comprises: an anchor hanger 71, one end of which is connected with the load-bearing mechanism 1, and the other end passes through the cast concrete section 2; and a jacking part 72, which is arranged at one end of the anchor hanger 71 passing through most of the anchor hangers 71, and can lift or lower the anchor hanger 71 to adjust the height of the load-bearing mechanism 1.

In this embodiment, the anchor hanger 71 is located at the middle and rear portion of the load-bearing mechanism 1, and the jacking part 72 is arranged on the top surface of the concrete main girder. In this embodiment, the jacking part 72 is a center-through jack, and the truss brackets 13 are located on two sides of the load-bearing mechanism 1. When the present invention is adopted to perform cantilever casting construction on the main girder of the prestressed concrete stayed-cable bridge, the load-bearing mechanism 1 is lifted by the jacking part 72 until it is in close contact with the cast concrete section 2, and then the rear anchor hanger 71 (anchor hanger 71 located at the rear portion) is locked. At this time, the weight of the load-bearing mechanism 1 is transferred from the rear anchor hanger 71 to the cast concrete section 2, and preparations for subsequent construction are started, and the stay cable and the load-bearing mechanism 1 are not directly connected. Therefore, compared with the existing design in which the load-bearing mechanism 1 of the guy-wire hanging basket needs to be directly connected with the stay cable, the

load-bearing mechanism 1 of the present invention adopts a design without an arc-shaped head, which does not need to be directly connected with the stay cable, thereby avoiding the problem of stress concentration in the arc-shaped head and improving safety of the structure.

As shown in Fig. 8, in some alternative embodiments, the shearing mechanism 4 comprises: a suspension mandrel 41, which is arranged between the cast concrete section 2 and the precast anchor block 31; and two length-adjustable adjustment devices 42, which are respectively arranged at two ends of the suspension mandrel 41, and respectively resist on the cast concrete section 2 and the precast anchor block 31.

In this embodiment, the suspension mandrel 41 is a section steel or concrete structure, with high axial bearing capacity, and the specific specifications thereof need to be designed and selected according to the maximum axial force in the construction process. For the padlock mechanism 3 of the external concrete main girder (the padlock mechanism 3 is located outside the concrete main girder structure), the suspension mandrel 41 is a single full-length structure. For the padlock mechanism 3 of the internal concrete main girder (the padlock mechanism 3 is located inside the concrete main girder structure), if there are transverse partition walls or other structures between the guy-wire anchoring systems, the number and segment length of the suspension mandrels 41 are divided according to the position and number of the transverse partition walls.

One end of the adjustment device 42 is connected with the suspension mandrel 41, and the other end is supported on the precast anchor block 31. The contact surfaces are all made of semi-rigid hard plastic for transition. The adjustment device 42 has the function of three-way position adjustment, and generally adopts the three-way jack device.

In some alternative embodiments, when the number of the precast anchor block 31 is one, the precast anchor block 31 is arranged in the middle portion of the transverse direction of the cast concrete section 2. When the number of the precast anchor blocks 31 are two, the two precast anchor blocks 31 are respectively arranged below flange plates on two sides of the cast concrete section 2.

As shown in Fig. 1 and Fig. 7 again, the present invention further provides a construction method for a main girder section, comprising the following steps.

S1: The load-bearing end of the load-bearing mechanism 1 is extended out of the cast concrete section 2 to a set position and anchored.

S11: adopting the running mechanism 6 to extend the load-bearing end of the load-bearing mechanism 1 from below the cast concrete section 2 to the set position;

S12: connecting the load-bearing mechanism 1 with the end portion of the cast concrete section 2 by means of the hanging mechanism 7; and

S13: adopting the hanging mechanism 7 to adjust the height of the load-bearing mechanism 1 and then removing the running mechanism 6.

S2: The precast anchor block 31 is hoisted to the preset position above the load-bearing end, the precast anchor block 31 is connected with the load-bearing end by means of the anchoring part 32, and the shearing mechanism 4 is arranged between the cast concrete section 2 and the precast anchor block 31.

Specifically, a small lifting tool is adopted to lift the anchoring part 32, the precast padlock mechanism 3 is firmly connected with the load-bearing mechanism 1 by making the anchoring part 32 pass through the reserved mounting hole on the precast anchor block 31, and a certain pre-tightening force is applied to the anchoring part 32, so as to ensure that the padlock mechanism 3 and the load-bearing mechanism 1 are locked firmly. After the suspension mandrel 41 and the adjustment device 42 are installed, the contact surface between the adjustment device 42 and the padlock mechanism 3 is compacted to ensure full cross-section contact, and then the adjustment device 42 is activated to ensure that the position of the suspension mandrel 41 meets the design requirements, and finally a pre-jacking force is applied to the suspension mandrel 41 as a safety reserve. The pre-jacking force is determined by means of calculation, analysis and simulation, and the construction displacement of the padlock mechanism 3 of the concrete main girder to be cast should be considered.

S3: The stay cable 5 is activated to install a traction equipment, after the stay cable 5 is installed to the cable conduit 311 and tensioned, a front fulcrum of the long platform guy-wire hanging basket without the arc-shaped head is formed, and the concrete is cast between the cast concrete section 2 and the precast anchor block 31 to complete the casting of the main girder section.

The load-bearing system of the guy-wire hanging basket of the present invention adopts the design without the arc-shaped head, which does not need to be directly connected with the stay cable, thereby avoiding the problem of stress concentration of the arc-shaped head, and improving the safety of the structure. The precast guy-wire anchoring system of the present invention comprises a precast anchor block, a cable conduit and a vertical anchoring device. The precast anchor blocks and the cable

conduit are integrated in the factory. Compared with the existing cast-in-place construction concept of the guy-wire hanging basket, the precast guy-wire anchoring system of the present invention adopts the factory precast construction concept, which provides a better working environment and is more conducive to construction quality control. Furthermore, a set of external positioning brackets can be repeatedly used in the factory to fix the cable conduit, compared with the existing guy-wire hanging basket which must use internal positioning brackets (which cannot be reused when being cast in concrete), the present invention can recycle the positioning brackets, which greatly saves construction costs.

Compared with the existing guy-wire anchoring system of the guy-wire hanging basket, the force transmission guy-wire rod between the arc-shaped head of the traditional guy-wire hanging basket and the stay cable is omitted, so that the present invention has the characteristics of simple and clear structure force, and after the construction is completed, there is no problem of "system conversion" of the cable force of the stay cable, which simplifies the construction process. At the same time, because the precast guy-wire anchoring system of the present invention installs the stay cable and adjusts the cable after the precast guy-wire anchoring system is installed, the cable force for the first tension of the stay cable will be higher than that of the stay cable of the existing guy-wire hanging basket, even if the precast guy-wire anchoring system of the present invention does not adjust the cable force for the first tension of the stay cable during the concrete casting process, the elevation and line shape of the main girder can also meet requirements, which greatly reduces the difficulty of construction control of the main girder of the prestressed concrete stayed-cable bridge, improves the construction efficiency, and reduces the workload of the construction personnel.

The shearing mechanism of the present invention comprises a suspension mandrel and an adjustment device. Compared with the precast guy-wire anchoring systems in which the suspension mandrels and the adjustment device are arranged, for the external main girder stay cable anchoring system, the structures such as the transverse partition walls are usually not arranged between the main girder stay cable anchoring systems, the suspension mandrel of the suspension-type shearing system of the present invention can be a single full-length structure; and for the internal main girder stay cable anchoring system, the structures such as the transverse partition walls are usually arranged between the main girder stay cable anchoring systems. The

suspension-type shearing system of the present invention needs to be divided into the corresponding number and length according to the position and number of the transverse partition walls. Therefore, under various structural forms of the main girder, the suspension-type shearing system of the present invention does not directly contact the girder body. Compared with the existing guy-wire hanging basket which needs to open holes on the girder body to provide shearing parts to transmit the ineffective horizontal force, the force is transmitted through the precast guy-wire anchoring system, which will not damage the structure of the girder body or weaken the section of the girder body, and ensure the safety of structure of the girder body.

In the description of the present application, it should be noted that the orientation or positional relationship indicated by the terms "upper", "lower", etc. are based on the orientation or positional relationship shown in the drawings, which is only for the convenience of describing the present application and simplifying the description, instead of indicating or implying that the pointed device or element must have a specific orientation, be configured and operated in a specific orientation, therefore it cannot be understood as a limitation of the present application. Unless otherwise clearly specified and limited, the terms "installation", "connected" and "connection" should be understood in a broad sense. For example, it may be a fixed connection, a detachable connection, or an integral connection; further may be a mechanical connection, or an electrical connection; further may be directly connected, or indirectly connected through an intermediate medium, or may be the internal communication between two components. For those of ordinary skill in the art, the specific meanings of the above-mentioned terms in the present utility model may be understood according to specific circumstances. further can be a mechanical connection, or an electrical connection; further can be directly connected, or indirectly connected through an intermediate medium, or can be the internal communication between two components. For those of ordinary skill in the art, the specific meanings of the above-mentioned terms in the present application can be understood according to specific circumstances.

It should be noted that relational terms such as "first" and "second" are only for distinguishing one entity or operation from another entity or operation in the present application, and do not necessarily require or imply any such actual relationship or order between these entities or operations. Moreover, the terms "include", "comprise" or any other variants thereof are intended to cover non-exclusive inclusion, so that a

process, method, article or device comprising a series of elements not only comprises those elements, but also comprises those that are not explicitly listed, or further comprises elements inherent to the process, method, article, or device. If there are no more restrictions, the elements defined by the sentence "comprising a..." does not exclude the existence of other same elements in the process, method, article, or device comprising the elements.

The above-mentioned are only the embodiments of the present application, so that those skilled in the art can understand or implement the present application. For those skilled in the art, various modifications to these embodiments will be obvious, and the general principles defined herein can be implemented in other embodiments without departing from the spirit or scope of the present application. Therefore, the present application will not be limited to the embodiments shown in this document, but will be subject to the widest scope consistent with the principles and novel features applied herein.

Claims

1. A long platform guy-wire hanging basket, comprising:

a load-bearing mechanism (1), which comprises a load-bearing end, the load-bearing mechanism (1) is arranged below a cast concrete section (2), and the load-bearing end can extend out of the cast concrete section (2);

a padlock mechanism (3), which comprises:

-at least one precast anchor block (31), which is arranged above an end portion of the load-bearing end, and a cable conduit (311) configured to install a stay cable (5) is provided in the precast anchor block (31);

-an anchoring part (32), which connects the precast anchor block (31) and the load-bearing end; and

a shearing mechanism (4) matched with the precast anchor block (31), two ends of which resist on the cast concrete section (2) and the precast anchor block (31).

2. The long platform guy-wire hanging basket according to claim 1, wherein the long platform guy-wire hanging basket further comprises a running mechanism (6), which is configured to extend the load-bearing end of the load-bearing mechanism (1) from below the cast concrete section (2).

3. The long platform guy-wire hanging basket according to claim 2, wherein the running mechanism (6) comprises:

two slideways (61), which are configured to be respectively arranged on two sides above the erected cast concrete section (2);

two C-shaped hooks (62), each of which comprises a sliding end and a connecting end, wherein the connecting end is connected with the middle portion of the load-bearing mechanism (1), and the sliding end is slidably arranged on the corresponding slideway (61); and

a pushing part, which is configured to push the C-shaped hooks (62) to slide on the slideways (61) so as to make the load-bearing end extends out of the cast concrete section (2).

4. The long platform guy-wire hanging basket according to claim 3, wherein the load-bearing mechanism (1) comprises:

two load-bearing trusses (11) arranged at intervals, which extend along a length direction of the cast concrete section (2);

a plurality of connecting trusses (12) arranged at intervals, which are arranged between the two load-bearing trusses (11), and the two ends are respectively

connected with the two load-bearing trusses (11); and

two pairs of truss brackets (13), which are respectively arranged on outer sides of the two load-bearing trusses (11), and the connecting ends of the C-shaped hooks (62) are connected with the truss brackets (13).

5. The long platform guy-wire hanging basket according to claim 1, wherein the long platform guy-wire hanging basket further comprises: a hanging mechanism (7), one end of which is arranged at the end portion of the cast concrete section (2), and the other end is connected with the load-bearing mechanism (1) after the load-bearing end extends out of the cast concrete section (2), and can adjust a height of the load-bearing mechanism (1).

6. The long platform guy-wire hanging basket according to claim 5, wherein the hanging mechanism (7) comprises two sets of hanging units which are respectively arranged on two sides of the cast concrete section (2), and each set of the hanging units comprises:

an anchor hanger (71), one end of which is connected with the load-bearing mechanism (1), and the other end passes through the cast concrete section (2); and

a jacking part (72), which is arranged at one end of the anchor hanger (71) passing through most of the anchor hangers (71), and can lift or lower the anchor hanger (71) to adjust the height of the load-bearing mechanism (1).

7. The long platform guy-wire hanging basket according to claim 1, wherein the shearing mechanism (4) comprises:

a suspension mandrel (41), which is arranged between the cast concrete section (2) and the precast anchor block (31); and

two length-adjustable adjustment devices (42), which are respectively arranged at two ends of the suspension mandrel (41), and respectively resist on the cast concrete section (2) and the precast anchor block (31).

8. The long platform guy-wire hanging basket according to claim 1, wherein when the number of the precast anchor block (31) is one, the precast anchor block (31) is arranged in a middle portion of the transverse direction of the cast concrete section (2), and when the number of the precast anchor blocks (31) are two, the two precast anchor blocks (31) are respectively arranged below flange plates on two sides of the cast concrete section (2).

9. A construction method for a main girder section based on the long platform guy-wire hanging basket according to claim 1, comprising the following steps:

extending the load-bearing end of the load-bearing mechanism (1) out of the cast concrete section (2) to a set position and anchoring same;

hoisting the precast anchor block (31) to the preset position above the load-bearing end, connecting the precast anchor block (31) and the load-bearing end by means of the anchoring part (32), and providing the shearing mechanism (4) between the cast concrete section (2) and the precast anchor block (31); and

once the stay cable (5) is installed to the cable conduit (311) and tensioned, casting concrete between the cast concrete section (2) and the precast anchor block (31) to complete the casting of the main girder section.

10. The construction method for the main girder section according to claim 9, wherein extending the load-bearing end of the load-bearing mechanism (1) out of the cast concrete section (2) to the set position and anchoring same, comprising the following steps:

adopting the running mechanism (6) to extend the load-bearing end of the load-bearing mechanism (1) from below the cast concrete section (2) to the set position;

connecting the load-bearing mechanism (1) with the end portion of the cast concrete section (2) by means of the hanging mechanism (7); and

adopting the hanging mechanism (7) to adjust the height of the load-bearing mechanism (1) and then removing the running mechanism (6).