International Core Journal of Engineering Volume 7 Issue 5, 2021
ISSN: 2414-1895 DOI: 10.6919/ICJE.202105_7(5).0055

Research and Application of the Protective Device for the End of the Reserved Pipe of Building Electricity

Junqing Zhang

Beijing Urban Construction Sixth Construction Group Co., Ltd., Beijing 101500, China.

Abstract

In order to solve the problem of poor protection effect at the ends of electrical pipelines during the construction process, a protection device for building electrical reserved pipes is adopted and applied to improve the protection quality of the finished product of building electrical reserved pipe ends. The steel pipe diameter of the device should be larger than the diameter of general electrical professional pipelines, and can be used for electrical reserved pipes of different specifications. The device solves the problem of protecting the end of the reserved pipeline in the electrical profession, and avoids the phenomenon that the pipeline is blocked due to falling debris and concrete in the later stage. The research results show that the end protection device of the reserved pipe for building electrical has solved the common problem of end products. In addition, the device is easy to operate, and the ends of different pipe diameters can be recycled.

Keywords

Electrical Reserved Pipe; End; Protection Device.

1. Introduction

During the on-site construction process, the building electrical major will install electrical reserved pipes in the concrete roof or wall, so that the reserved pipe ends will pass through the ground[1]. Only in the secondary structure and decoration phases will the ends be connected to lay the pipelines. During this period, the protection measures are not in place, which will lead to blockage of the later electrical pipelines. In addition, construction workers usually wrap a layer of yellow tape on the end of the exposed electrical pipeline to protect it. Although it has a temporary protective effect, with the change of construction and weather, the yellow tape will fall off and damage to different degrees. This exposes the ends of the electrical lines. If you don't pay attention, debris, concrete, etc. will enter the pipeline from the end of the electrical pipeline, and eventually cause the pipeline to be blocked. You can only manually pick the wall or roof to clear the pipeline, wasting time and energy. Structural performance will also be affected. At the same time, there are many electrical pipelines in the structure, which are protected by yellow tape. The yellow tape used is a one-time material, which wastes materials and generates more garbage in the later period.

In order to solve the problem of poor protection effect at the end of electrical pipelines at this stage, the pipeline will be blocked due to debris falling into the pipeline in the later stage, the construction cost is high, the construction efficiency is low, and the cost is high. The technicians at the construction site of the project developed a technical plan and studied a protective device. At the same time, it is applied to improve the protection quality of the finished product of the reserved pipe end of the building electrical.

2. New type of protection device for reserved pipe end of building electrical

The protective device for the end of the reserved electrical pipe of the building includes a vertical steel pipe, a set of holes and grooves arranged symmetrically along the longitudinal direction of the

ISSN: 2414-1895 DOI: 10.6919/ICJE.202105_7(5).0055

vertical steel pipe, a sliding piece arranged in the hole and grooves, a top plate arranged on one end of the vertical steel pipe, and a rubber pad, And the V-shaped limit piece set in the vertical steel pipe. The opening of the V-shaped limiting piece is downward, and the top of the V-shaped limiting piece is fixedly connected with the lower end surface of the top plate. There are two rubber pads and they are symmetrically arranged at the bottom of the V-shaped stopper, and abut against the inner side of the vertical steel pipe. The sliding piece is U-shaped. The top plate is round. The outer diameter of the circular top plate is compatible with the outer diameter of the vertical steel pipe.

The rubber pad on the device is sawtooth on the side facing the vertical steel pipe. The wall thickness of the vertical steel pipe is 2mm.The length of the vertical steel pipe is 60mm.The diameter of the vertical steel pipe is 5mm larger than the line pipe on each side. The V-shaped limit piece is welded by two rectangular steel sheets. The length of the steel sheet is 15mm.The slot length is 40mm and the width is 15mm.The width of the sliding piece is 10mm.

The height of the bottom of the device hole is higher than the height of the bottom of the V-shaped stopper. The protection device for the end of the reserved electrical pipe of the building includes a vertical steel pipe, a set of holes and grooves symmetrically arranged along the longitudinal direction of the vertical steel pipe, a sliding piece arranged in the hole and groove, a top plate arranged on one end of the vertical steel pipe, and a rubber pad , V-shaped limit piece set in the vertical steel pipe. The wall thickness of the vertical steel pipe is 2mm.The length of the vertical steel pipe is 60mm.

Among them, the sliding piece is U-shaped; the width of the sliding piece is 10mm. The top plate is round.

The outer diameter of the circular top plate is compatible with the outer diameter of the vertical steel pipe.

The opening of the V-shaped limiting piece on the device is downward, and the top of the V-shaped limiting piece is fixedly connected with the lower end surface of the top plate. There are two rubber pads and they are symmetrically arranged at the bottom of the V-shaped stopper, and abut against the inner side of the vertical steel pipe. The side of the rubber pad facing the vertical steel pipe is zigzag. The V-shaped limit piece is welded by two rectangular steel sheets. The length of the steel sheet is 15mm.The slot length is 40mm and the width is 15mm.The height of the bottom of the hole is higher than the height of the bottom of the V-shaped stopper.

The vertical steel pipe with a wall thickness of 2mm on the device is 60mm in length. The top plate is sealed. The vertical steel pipe is provided with a V-shaped limit piece, which is welded by two steel sheets with a width of 15mm, which has a better elastic effect. The opening of the V-shaped limit piece is downward, and the top plate is welded to the top plate of the steel pipe. There are two rubber pads and they are symmetrically arranged at the bottom of the V-shaped stopper, and abut against the inner side of the vertical steel pipe. The side of the rubber pad facing the vertical steel pipe is zigzag, the steel sheet is angled in the steel pipe, and the rubber pad should be close to the inner wall of the steel pipe.

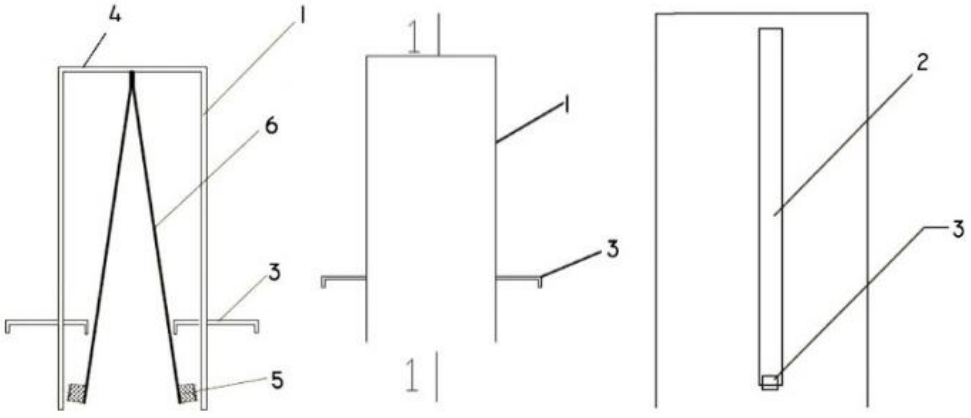

Figure 1. Preserved pipe end protection device for building electrical

ISSN: 2414-1895 DOI: 10.6919/ICJE.202105_7(5).0055

The device has a set of holes and slots symmetrically arranged along the longitudinal direction of the vertical steel pipe, the slot length is 40mm, and the width is 15mm.A "U"-shaped steel sheet with a width of 10mm is arranged in the hole groove, and the "U"-shaped steel sheet can slide up and down in the steel pipe hole groove.

The steel pipe diameter of this device should be larger than the diameter of general electrical professional pipelines, and can be used for electrical reserved pipes of different specifications.

3. Application of protection device for reserved pipe end of building electrical

When in use, the "U"-shaped steel sheet of the device is pressed into the steel tube to reduce the angle of the two steel sheets in the steel tube. Then insert the two steel sheets from the end of the electrical reserved pipe and loosen the "U"-shaped steel sheet. The two steel plates return to the original angle under the elasticity, and are stuck in the electrical reserve pipe that needs to be protected. Then press the steel pipe down to make the double steel sheet deeper into the electrical reserved pipe. When the device needs to be removed during the decoration phase, press the "U"-shaped steel sheet and pull it out.

After the pipeline layout is completed, the construction personnel press the "U"-shaped steel sheet into the steel pipe to reduce the angle of the two steel sheets in the steel pipe, then insert the two steel pieces from the end of the electrical reserve pipe, and loosen the "U"-shaped steel piece. The two steel pieces return to the original angle under the elasticity and are stuck in the electrical reserve pipe to be protected, then press the steel pipe down to make the double steel sheet deeper into the electrical reserved pipe. When the device needs to be removed during the decoration stage, press the "U"-shaped steel sheet and pull it out. Special personnel will take care of it and store it in special storage. It can be reused in the project.

4. Conclusion

The protection device for the end of the building electrical reserved pipe has simple structure, ingenious design, strong practicability and controllable cost. More importantly, this device solves the problem of the protection of the end of the pipeline reserved by the electric professional, so that the end of the electric pipeline that is exposed to the ground is better protected. It avoids the phenomenon that the pipeline is blocked due to the falling debris and concrete in the later stage, which saves time, manpower and materials. It is relatively simple to operate, durable and practical, and can be recycled for electrical reserved pipes of different pipe diameters, with good protection effect and avoiding the phenomenon of pipeline blockage in the later period.

Through the research and application of this device, the common quality problem of the finished product of the end of the building electrical reserved pipe in the field of construction in my country is solved, and good economic and social benefits have been achieved.

References

[1] GB50303-2015 Code for acceptance of construction quality of building electrical engineering [s]. Beijing: China Standard Press, 2015.

[2] DB11/T1074 Building Structure Great Wall Cup Project Quality Evaluation Standard[s] Beijing: Beijing Engineering Construction Quality Management Association, 2003.

[3] Implementation Guidelines for the Great Wall Cup Project of Beijing's Creation and Evaluation of Building Structure[s].

[4] DBJ/T01-26-2003 Construction process specification for sub-projects of building installation[s] Beijing: China Market Press, 2003.