

## Analysis on construction technology of building HVAC

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### Abstract

At present, the construction industry has developed rapidly in China, with continuous production of construction projects, the implementation of various construction techniques used in building a wide range of concerns, only in construction technology is guaranteed to make the construction quality of building works in accordance with the national standard, and further realization of the function of buildings. Building HVAC construction is an important part of building construction and project completion acceptance has a decisive impact on the quality of. This paper on the key problems of construction technology of building HVAC analysis and discussion.

### Keywords

Construction, construction technology, HVAC, problems.

### 1. Introduction

At present, with the development of construction industry in China, people of their own living environment was also increasing, and HVAC construction quality of buildings directly affect the living standards of households. In construction, HVAC construction is a complex process, it involved more, and system performance is quite strong, and HVAC engineering difficulties as well. Early during construction must be approved for HVAC construction drawings precisely, construction conditions and ensure all preparations complete according to the code of conduct and the unique design requirements for the orderly management of the construction process, HVAC construction late in the construction work smoothly. If ventilation during the construction process, cannot guarantee the HVAC engineering possess a high level of quality, or HVAC construction problems, such as repair works, or even result in indoor and outdoor walls, surface damage. Construction on indoor air quality and HVAC engineering quality problems, it is likely to result in poor building ventilation effect [1]. Meanwhile, China's increasing investment in urban construction, building energy consumption has attracted the attention of the community. In improving the quality of construction works on the basis of how to reduce energy consumption, improve energy efficiency, became an important part of modern low-carbon sustainable development. Construction HVAC construction common in this paper analyses the problems and difficulties, can effectively reduce the disadvantages of building HVAC construction, reducing energy consumption, and also has a certain significance in guaranteeing the engineering quality.

### 2. HVAC construction technique analysis

#### 2.1 HVAC piping installation

In HVAC engineering during construction, HVAC duct construction link of the installation is important, and its installation quality directly affects the quality of the overall HVAC [2]. On installation in the pipeline, first for duct installation, riser, install and connect with the installations, HVAC equipment. Air conditioning piping installation within the room you need to first install a bracket and install the pipe. At the time of construction of pipe cutting, to ensure clean, protect the inside into the debris. Upon termination of the temporary, to block the pipeline. Pipe connections to ensure the interface position accurately and to avoid problems when docking interface. Horizontal installation, to ensure as far as possible the hand wheel towards, keep the hand wheel is installed on, if there are special circumstances cannot guarantee the hand wheel facing up when installing, installed

by hand wheel down. When the pipeline welding and installation of equipment, instruments, try to prepare before the pipe installation. To keep the surface of the pipe clean before welding, and ensure quality. During installation of the pipe once pipeline construction quality problems, to make timely repairs and related records, provide the basis for future construction and maintenance. For pipeline design and installation to ensure rationality, so as to provide a reasonable line of gas and drainage conditions, avoid installation problems, cause of HVAC Heating and cooling impacts.



Figure 1 -rise building HVAC piping installation

## 2.2 Heating and adjustment

HVAC Heating methods in the construction of buildings, including warm water heating, plumbing is the most popular heating mode, is a kind of radiant floor heating, electric heating is of greater advantage over [3]. Plumbing works by circulating hot water pipes, use of floor heating radiation old uniform heating of thermal coal in the ground, ground their own thermal energy storage function the law of heat conduction radiation and heat up, achieve the purpose of heating. But the heating cannot be applied to insulation in the House, because the heat is circulated through the floor to an outdoor, leading to loss of heat. This method of heating area, comfort-related, according to flexible use. In addition, at the beginning of heating, heating network in order to guarantee their independence, and used in conjunction with other systems. When water in heating systems, to guarantee the stability of the injection rate, avoid the water too fast, causing internal exhaust pipes appeared obstacles. In addition, when you do water, blow down valve for proper operation of the water, after the air out, and timely closing. When pressure in heating pipeline injection, to arrange down the plan, construction personnel to conduct on-site monitoring. Prior to heating, you should debug. At the time of injection, water injection speed should be controlled, avoid excessive exhaust air system into not working properly. In addition, the injection should pay attention to release the lookout on the water valve, thermal systems, such as excluded after closing out all the water in the valve. In addition, the floor heating system in the water is in general the units or in units of single storey injection, so construction workers should strictly check the inlet and water valve is opened, until after the system into water, confirming warm the normal operation of the system to meet the heating requirements of the residents.

## 2.3 Outlet installation

HVAC construction , outlet installation is the basis of building air conditioning systems up and running. Outlet prior to installation, to check against the construction design of construction drawings and, and for complex building, to do the air coordination arrangements and architectural interiors. While air inlet installation inside the building to keep the outlet closed, complete the design and

drawings after triage, then open the outlet. In addition, to ensure that the air inlet adjusted within a reasonable range, and after a supervisor of audits, avoided for aesthetic reasons and allowed to modify wind affect the normal operation of building HVAC systems.



Figure 2 central air conditioning air outlet installation

#### 2.4 Thermal insulation construction

HVAC engineering and construction is the key to keeping warm construction, if poor construction technique of warm, when the system is running may cause condensation water leak, affecting the normal operation of the system. Among them, the difficulty is the water systems HVAC insulation construction technology and construction. Therefore, the construction should be strictly in accordance with the procedural requirements and the supervision of the supervisor, at the request of the installation ceiling joist before and pipes pressure test after passing the insulation [4]. Thermal insulation construction is conducted in part to focus on wood, observe the gaps between the wood and the pipeline is too large or the wood and insulation bonding closely, note also that time plugging holes through walls and floors reserved. Thermal insulation construction is the key for HVAC engineering construction, but also the good basis of the HVAC system. If there is insufficient thermal insulation construction technology in HVAC engineering, construction quality can not be guaranteed, it will in the HVAC system runs, resulting in condensation water leak, waste energy, and affect the normal operation of the HVAC system. Construction of heating systems, construction of water systems with high degree of difficulty, must be under the supervision of the supervisor of construction personnel and implemented strictly in accordance with the established design of insulation construction. To strictly control engineering quality in construction to ensure insulation covering up is expected to take. Meanwhile, reserved for works not used hole, plugging in a timely manner.



Figure 3 insulation construction of high-rise building

### 3. HVAC construction difficulties

HVAC engineering is very important in the construction project, its construction quality has a direct impact on construction engineering quality level. However during construction construction technology for all types of problems often occur, therefore construction must identify the root cause and seek effective solutions.

#### 3.1 Drawings of the normative

The design drawings of the project scientific and reasonable, for projects carried out correctly with immediate and effective impact. However, construction project drawings design of many not standard issue, description of key parts or design drawings lack the necessary; and some drawings did not accurately calculate specifications, resulting in tremendous waste construction materials are in addition to, there is content of the drawings does not match the calculated. This will have an adverse effect on HVAC construction progress, or even have a direct impact on the results of the whole project, building quality is substandard or unsafe.

#### 3.2 Pipeline design

To follow the principle of comprehensive design of pipeline engineering in construction and reasonable layout of a variety of professional line, pay attention to the rational use of building space, leaving room for later construction job lined up. To pipe in the building construction process based on the properties and uses of the pipeline carefully classified. Among them, water channels, including supply and fire-fighting water pipes, and, excluding sewage and waste water discharge pipe, addition, air ducts including duct as well as the compressed air hose. Power supply line include power distribution, lighting, power distribution and distribution of light current system and so on. Building construction must follow the principle of comprehensive design of pipeline project, ensure the quality of construction [5]. Should be based on the performance and the use of different, refined the breakdown of water supply pipes including water, fire water. Drainage channels, including sewage, wastewater and other drainage. Pipelines, including heating, water supply, air conditioning and air handling equipment required for steam or hot water. Air line : include ventilation, air duct of air conditioning systems, as well as some of the equipment required for the production of compressed air pipe. Power supply lines or cables : include power distribution, lighting, power distribution and distribution of light current system, including weak part including sharing television antennas, communications, broadcasts and fire alarm systems. Reasonable layout of the professional pipeline, and increase effective use of space leaving room for future job lined up.

#### 3.3 Coordination among the various sectors of construction

HVAC jobs in engineering construction drawings, although a detailed construction steps and materials to carry, but does not completely for all HVAC construction processes and materials for detailed tagging, so would make construction difficult. This requires mutual communication and coordination between the various professional and technical jobs to be able to carefully follow equipment drawings, installation equipment and component specifications, and construction jobs drawings were performed, successfully complete the HVAC construction jobs and ensure HVAC construction effects [6]. Building HVAC construction is a complicated systematic project, it requires more of the construction sector, collaboration, for the construction of different construction work together to complete a task. Piping layouts within the complex of buildings, construction coordination if not reasonable, it will cause space to be occupied, reducing the area of fair use. HVAC jobs, construction drawings of the main location of the pipeline and equipment indicated is not clear, and there is no arrangement of piping, high standard for detailed tagging, would create a construction schedule in construction is not unified, construction process influence each other, and so on. In the course of construction, it is necessary to strengthen communication and coordination between the different organizations and timely contact with project owners to avoid miscommunication during the construction, rework caused by, and so on.



### 3.4 On-site supervision and management

Building HVAC construction is part of the construction, strengthen construction quality control for HVAC needs from the construction site management. As soon as the progress of the construction site management, supervision and management problems, will seriously affect HVAC construction. Current HVAC construction schedule control of construction site management are often ineffective on-site supervision was not obvious, and so on. For example, building construction project in civil engineering construction in the by consumption of time greatly over design programme in the by provides of time, led to left warm pass construction of time is less than design requirements of time, to reduced construction process on building project of economic brings effect, construction Party greatly speed up has warm pass construction of time, led to warm pass construction failed to guarantee its construction quality, while also effect warm pass construction with other construction project of coordination sex, not conducive to whole building construction of quality management, so, Must be HVAC construction site supervision work [7].

### 4. Concluding remarks

To sum up, building HVAC construction as an important part of the construction, its quality directly under the influence of construction technology. In order to meet requirements for building HVAC engineering, and constantly improve people's living conditions, realize the role of HVAC engineering, must constantly improve HVAC engineering construction technology. Therefore, HVAC construction departments should first focus on HVAC design drawings design and review, in order to improve the good basis for HVAC engineering construction quality and second to ensure quality HVAC construction materials, ensure the quality of HVAC engineering, finally to strengthen coordination and communication between departments, promote the construction of HVAC technology to a higher level of development.

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