Review Seismic Properties High-Rise Building Structures

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Abstract. With the continuous innovation and reform of the construction industry, the research methods of seismic performance of high-rise building structures have changed. The effect of seismic performance affects the quality and safety of high-rise buildings. For another, earthquake disasters threaten people's life and property safety, and also affect building safety. The seismic performance of buildings should be fully considered in the structural design of high-rise buildings, strictly control the key points of seismic design and improve the seismic performance of high-rise building structures. Combined with the content of seismic performance design of high-rise buildings, this paper discusses the problems existing in the design, and puts forward the corresponding solutions.

Keywords: high rise; building structure; seismic design.

1. Introduction

With the rapid development of economy and the shortage of land resources, it is feasible and necessary to construct super-high-rise structure in densely populated cities [1]. In the process of construction, we should be ensure the seismic performance of the high-rise building structure to a great extent, and the seismic design of the high-rise building structure will directly determine the seismic performance and effect of the high-rise buildings. In order to meet the development needs of global construction industry and improve the safety and stability of construction engineering, we should pay attention to the seismic design of high-rise buildings, improve the seismic design scheme of construction engineering, improve the overall design level of the project, and ensure that the construction projects meet the seismic standards stipulated in the specifications. In the process of project construction, it is not only necessary to pay attention to the application of the seismic concept, but also need to pay attention to the relationship between the seismic design and the design of the building itself, so as to improve the overall effect.

Earthquake has a certain randomness, is an unpredictable natural disaster phenomenon. In order to effectively protect the personal and property safety of high-rise building residents, under the development of The Times, must be seismic performance design into the construction, and before this, be sure to make careful analysis of the overall structure, according to the seismic needs, design a reasonable building scheme, and the application of related building materials control standards, from many aspects constantly improve the application effect of high-rise building structure design seismic performance. In the process of project construction, it is not only necessary to pay attention to the application of the seismic concept, but also need to pay attention to the relationship between the seismic design and the design of the building itself, so as to improve the overall effect. Reasonable and scientific application can not only improve the quality of the project, but also ensure personal safety.

2. Seismic Design of High-Rise Buildings

Usually when the earthquake occurs, because the longitudinal waves and horizontal waves generated by the source will cause a huge impact on the high-rise building structure, the impact will directly act on the high-rise buildings, will damage the high-rise building structure, thus reducing the safety of the high-rise buildings. The main principle of the seismic technology of high-rise buildings is to use the buffer damping device to decompose and absorb some seismic energy, and reduce the impact of the earthquake on the high-rise buildings. In seismic design, we can simplify high-rise buildings to support, using support and building components to absorb and weaken the seismic energy, so as to reduce the earthquake damage to the building, so the rational use of seismic technology in

the high-rise building structure design, can comprehensively improve the overall seismic performance of the building, to ensure the safety and stability of high-rise buildings.

Generally, before designing the seismic function of the high-rise building structure, the first thing we need to pay attention to is the rationality of the high-rise building design. Generally speaking, the high-rise building structure performance is passed through the designer's precision calculation and repeated deliberation, so you want to change the structure to improve the seismic performance of the building is a very difficult and very dangerous behavior ".In the process of improving the seismic performance of the high-rise building structure, it is obviously impossible to change the structure, but you can strengthen the layout of each position according to the construction plan, so as to ensure the overall structure quality. This improvement method can ensure the overall stability of the structure when the original design structure does not change. The principle is not reinforcement, but to ensure that the force between each force point is gradually uniform, so the deformation will not easily occur when the earthquake comes, which improves the seismic performance of the building. If the construction does not take into account the actual seismic needs in the construction process, then the subsequent seismic performance strengthening will lead to very difficult. Therefore, strengthening the seismic performance needs to stand on the overall perspective of the seismic design constraints. In the actual process, if you want to strengthen the parts in each position, the material cannot be changed, then you need to strengthen the area, which will inevitably produce a certain waste. It can be seen that in the process of seismic design, this process needs to consider a lot of problems, so it is a more complex process, which needs to consider the comprehensive design content.

3. Problems The Seismic Performance High-Rise Buildings

3.1 Height Problem High-Rise Building Structure

With the rapid economic development of our country, now many residential areas, shopping malls, administrative building construction height is higher and higher, these high-rise buildings in the real sense of "skyscraper", but due to the increasing population, the population aging serious, for the increasing population, available space is gradually decreasing. This leads to many high-rise buildings exceeding the restricted height of high-rise buildings . The height of high-rise buildings exceeds the standards stipulated by the state, a large number of developers in order to seek benefits, in the high-rise building height beyond the safety height, when the high-rise building height beyond the prescribed standards and safety design height, the overall structure will be damaged, the stability of the building will be reduced, in the event of earthquake geological disasters, will cause the overall damage and collapse. When the height of the building exceeds the seismic limit value, its seismic performance is greatly reduced, and the tall buildings collapse, cause damage to the surrounding buildings with good seismic performance, and then cause irreparable losses. Therefore, in the choice of high-rise buildings in our country height, we must do a good job in structural design, first consider the seismic performance of the building, and then consider its height and other influencing factors, so that the high-rise buildings are as safe as possible.

3.2 Site Selection Foundation Selection High-Rise Buildings

At present, many developers for the foundation choice of high-rise buildings, only to consider whether in the bustling area. Whether the space is large, and the topography, landform and other aspects of less consideration. In fact, for high-rise buildings, the foundation should be a wider and more gentle area, the soil should be dense, and as far away from the river bank as far as possible, the building cannot cross two or more types of soil, to try to avoid the sunken terrain, cliff edge and soil fault and other terrain that is not conducive to the building. If the builder chooses such an inappropriate terrain as the foundation of high-rise buildings, the seismic performance is poor, and the construction facilities will have great safety risks, and will be in a certain risk.

High-rise building structure seismic design problem also for the problem of building address selection, with the increase of urban population, the demand for building also increases, developers

driven by interests, as much as possible, in order to accelerate the development, in the choice of address ignored the geological problem, on the basis of no strict survey of building geological structure development, will have a great impact on the seismic performance of high-rise building structure [2].

3.3 Lack Seismic Performance Technical Resources High-Rise Building Structures

The overall quality of high-rise buildings has been negatively affected. Therefore, it is necessary to take into account the site personnel factors, material quality, equipment level and other factors for construction. However, under the lack of technical resources and insufficient technical level, the probability of design hidden danger is large, and it is difficult to really give full play to the seismic role of high-rise building structure, to ensure the safety of residents' living environment [3].

3.4 Material Selection Seismic Properties High-Rise Building Structures

In recent years, our country news frequently broke more high prices "tofu slag project", the media reported in 2013: Zhengzhou village villagers to new found many new problems, serious water seepage, wall skin off, the floor is not firm, cardboard red paint do door, etc.. The quality of building materials is the absolute factor affecting the seismic performance of the building. Such unqualified construction facilities, even if not encountered an earthquake, also have certain safety risks. Therefore, in the construction of high-rise buildings, we must choose the appropriate building materials. [4]

The quality of building materials is an important factor affecting the overall quality of buildings. High-rise buildings do not strictly control the choice of building materials, which will directly lead to the reduction of the overall seismic performance of the building, in the case of an earthquake. Materials that do not have seismic performance cannot withstand severe earthquake shaking, resulting in damage to high-rise buildings, and even cause serious threat of personal and property. Therefore, it is particularly important to do a good job in selecting seismic design materials for high-rise buildings, and the subsequent improvement and improvement work should pay great attention to [5].

4. Solution to strengthen the seismic performance of high-rise building structures

4.1 Survey Design The High-Rise Building Structure

Survey and design are the foundation of seismic resistance, and the common problems existing in the seismic design of high-rise building structure need to be improved. In view of the lack of design, it is necessary to adopt the whole process through, implement the seismic design concept into all stages of construction, and take effective measures to improve the effectiveness of seismic performance. According to the analysis and study of the feasibility scheme, according to the survey standards and survey requirements, select the appropriate area in the comparison and analysis for the construction of high-rise buildings.

In addition, the investigation unit should give a reasonable site selection suggestion. Master the conditions and requirements of engineering geology, including the landform, terrain and geological characteristics in the built area, and conduct a comprehensive analysis of the site, formation and other geological conditions. The possible disaster problems caused by adverse geological effects should be emphasized. Focus on the factors in the geological conditions that may affect the seismic performance effect of the high-rise building structure. Preliminary design activities of high-rise buildings, through careful investigation of the formation structure, geological structure, geotechnical characteristics, groundwater burial conditions, analysis, record the cause of adverse geological effects, scale distribution, development research and discussion, clear specific adverse geological effect, according to the relevant data of the site stability, master the foundation classification, combined with soil and water on possible corrosion of building materials.

At the same time, the specific project survey requirements should also be clarified. To evaluate the geotechnical engineering of the construction foundation, including the analysis of its nature, foundation type, geotechnical uniformity, foundation form, foundation treatment, foundation pit support and the prevention and control of adverse geological effects. Focus on checking the harm degree and action trend of adverse geology, take effective rectification plans and measures, run the seismic design of high-rise building structure through the early survey, preliminary design and specific construction, and emphasize the optimization of [6] of seismic design performance.

4.2 Stability of The Structural Performance of High-Rise Buildings

The overall stability of the structural performance of high-rise buildings is the key to determine the seismic design performance of high-rise buildings. The reasonable and effective measures should be taken to improve the overall design effect of the building and form a complicated hinge inside the building. Improve the integrity of the building structure and the ability of earthquake disaster prevention. At the same time, the seismic design of the high-rise building structure also needs to take into account the prevention of the damage problem, reduce the risk of the lack of delayed shear, reasonably handle the components, take measures to strongly weaken the bending, and improve the design level. The shear damage and non-seismic shear damage components are different, and the high-rise buildings should emphasize the ductility. Enhance the seismic performance, do a good job in the seismic design, improve the ductility effect of the structure. For example, in the beam and column of the steel and other components, the reinforcement rate of the pulled steel bars is reasonably controlled, so as to achieve the purpose of improving the building structure, strengthen the seismic performance of high-rise building structure, improve and optimize the seismic structure form of high-rise building, and improve the precision of the design. Finally, it is necessary to strictly control the compaction of high-rise buildings, ensure the stability of the foundation, improve the overall carrying capacity of the foundation to the building, and reasonably conduct the optimal design of the structure scheme. Set up the seismic wall, enhance the ability of buildings to deal with the horizontal shear stress of the building by strengthening the beam and column nodes. The key to quality and performance effect, in the construction of high-rise construction projects, for the structural seismic design and construction quality control, we should emphasize the reasonable choice of construction materials, to ensure that the construction materials used in the construction meet certain standards and requirements. High-rise building engineering is a systematic and large-scale project, which is applied to a large number of building materials, involving a wide variety of materials, so choosing materials need to consider many factors, to achieve the purpose of strengthening the seismic performance of high-rise building structure. During the construction process, the local environment and geological conditions should be analyzed according to the site project construction conditions, and the reliable quality construction materials that can meet the seismic needs should be selected. Especially in parts of our country there are multiple earthquake disasters, concrete high-rise building structure seismic design to choose composite materials, emphasize the stability of high-rise building structure, improve the resistance to earthquake disasters, to reduce the overall weight of the building, ensure the reliable quality effect**,** prevent earthquake disasters, improve the safety of residents living [7] - [8].

4.3 Aquate preparation for early construction of high-rise buildings

In the process of high-rise building construction, we must pay attention to the early work, in order to better ensure the seismic performance of high-rise buildings, sufficient preparations must be carried out in the early stage.First of all, the site must be determined before the construction, the geological conditions of the construction site should be fully explored, and the appropriate site should be selected for the construction. In addition, the construction of the management system must also be strengthened.Currently with the continuous development of science and technology, some enterprises have realized the importance of management for the whole project, but their management system is

mostly for some advanced experience, lack of their own understanding in it, so in the management system construction is must combine the actual situation to specific formulation.

The upper leadership to play a leading role, combined with the actual situation, and listen to the voice of the grass-roots staff, formulate a scientific and reasonable management system, and in the specific construction of these management systems into practice, so that we can better let the project proceed smoothly, to ensure the seismic performance of the high-rise buildings.

4.4 Reasonable selection of seismic design method

In the construction, we must also reasonably choose the seismic design method.At present, the seismic design method of high-rise building structure mainly used in the industry is mainly the bottom shear method, which is considered a reasonable method after a long time of practice to determine the total seismic force of the structure.If the high-rise building structure has a relatively complex system, then it is necessary to apply this method, and calculate and obtain the action force in the earthquake according to the relevant principles.If the building structure has irregular space, it is necessary to apply the elastic analysis method. In general, when determining the design method, the actual situation must be analyzed specifically, using the most appropriate method to carry out the construction, to ensure the safety of the construction.

5. Conclusion

Current in the process of global high-rise building structure, although has made certain achievements, make high-rise building seismic performance significantly improved, but overall there are still many problems we need to solve these problems, must be specific analysis, combined with the actual situation to solve the problem, reasonable layout, let high-rise building seismic performance is more and more high, people can live and work in peace and contentment.

Earthquake is one of the natural disasters of force majeure, and has unpredictable characteristics. If there is an earthquake disaster, it will have a serious impact on the construction and people's safety and property. Therefore, in order to effectively reduce the impact of the earthquake on high-rise buildings, in the high-rise building structure design, the relevant departments should fully consider the seismic resistance of high-rise building structure, designers in the design to choose seismic performance good building materials, in strict accordance with the regulations, avoid safety hidden danger, comprehensively improve the seismic resistance of high-rise building structure in our country and safety.

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