EUROPEAN JOURNAL OF LIFE SAFETY AND STABILITY (EJLSS)
ISSN 2660-9630
www.ejlss.indexedresearch.org Volume 5, 2021 ||

PROTECTIONOF SEISMIC-STABILITYOF LARGE-PANEL BUILDINGS

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ANNOTATION. *There are presented new decisions of increasing seismic-stability of high-rise large-panel buildings by way active of seismic-protection. Offered new constructive decision of the high-rise building with element active seismic-protection is in type seismic- insulation of slithering belt, located between lower and upper hard part of the building. Given decision is received author's certificate on invention.*

For ensuring of seismic-stability buildings in system are provided springy and hard limiters horizontal and vertical displacement. At earthquake in the beginning emerges in work flexible framework, but then sliding belt. Power of the slide of the belt at fluctuation of the framework have an opposite direction so occurs general extinguishing the amplitude of the fluctuations of the framework. Offered decision provides the efficient system anseismic- insulation, that is recommended at construction of the high-rise large-panel buildings, seismicity 7-8 rates.

KEY WORDS. *concrete, armature, deformation, crack, sties, seicmic, construction, butting, large-panel, buldungs, studies, floor, shaft, fluorine-plast, decrease.*

Date of Submission: 04-05-2021 ***Date Of Acceptance: 14-05-2021***

I. INTRODUCTION

Housing problem are one of the most sharp social problems of the country. Successful decision of the housing problem in a many promotes industrial homebuilding, allowing provide the high rates of construction. Herewith provided noticeably enlarge the number of objects, raised from element of the factory fabrication, greatly refine organization by construction of the paneling buildings.

Serious attention is spared also questions of increasing technical level and quality housing construction, the further development of its industrialization. At problem of the provision seismic-stability of large-panel buildings more economic facility can be solved by issue efficient of reinforced-concrete design.

Study consequence row of the earthquakes shows that building on type designs large-panel buildings possess the sufficient seismic-stability and will carry the earthquakes before 8 rate with small damages. Noted dignity of the paneling buildings are conditioned relatively by small weight, high spatial acerbity and etc. The essential role in ensuring the joint spatial functioningload-carrying system 5 and 9 floor seismic-stability large-panel buildings horizontal and vertical butt of the join.

Researches and design-construction developments of the last years are characterized taking the different systems of seismic protection, which provide reliable functioning the buildings under intensive earthquakes, reduction of the seismic loads on carrying and barrier design as well as material and labour content of the civil and erection work and etc.

Advantage and efficiency of large-panel living houses in housing construction in seismic region of Uzbekistan is noted in analysis of the condition of the large-panel homebuilding. Large-panel buildings must possess necessary toughness and stability during earthquakes, and provide the interconnected system vertical, length way and transverse sewer, forming box-type structure of high spatial acerbity [1, 3, 5, 8].

Large-panel homebuilding is conditioned his(its) high technical-economic factor, relatively low labour content, high factory readiness delivered on worksite design and product, technology idle time of their fabrication and montage.

II. METHODS.

By side with improvement of design buildings, applicable in usual condition construction, are quest in principal new decisions, answering specifics seismic influence. Unlike usually applicable measures, basically in accordance with increasing carrying abilities design, use the measures active seismic-protection [4, 7, 8, 9].

In base of the studies necessary to spare in system active seismic-protection buildings, with expansion of the applications industrial design and product, produced house-building combine with broadunification of the design decisions. Unlike usually applicable measures, majority of the methods seismic-protection allows to reduce the seismic reaction of the buildings 2-3 times that enable to lead designing with accounting seismicity on ballet below, and each system seismic-protection depends on the main design of the building and its number of storey.

One of the most long-range methods active seismic-protection is seismic-insulation. It causes the essential reduction of the seismic influence on a part of the building located above foundation, way of the installation whatever systems or element between this part of the building and foundation.

Possible greatly reduce the horizontal loads, sent on carrying elevated designs of the building if provide the possibility their slippage for foundation. A Part of the energy, reported to building, is spent herewith not on negotiation resistances of the relationships of the design, but on overcoming power of friction of the slide [2, 9].

III. RESULTS AND DISCUSSION.

Subject of the noted studies is a new constructive decision of the high-rise building with element active seismic-protection in the manner of seismic-insulation slithering belt, located between lower flexible part and upper hard part of the building (on given decision is received author's certificate on invention №1784731) [4].

Main element proposed constructive system of the large-panel building is carrying panels by size on room, installed through floor in transverse and axial directions, as well as prefabricated overlap with abut on four sides (pic. 1).

The Purpose of the invention is increasing seismic-stability and reduction of specific consumption of materials and labour content of the montage. The Specified purpose is reached that that carrying designs of the overlapping of the ground floor are executed in the manner of

reinforced concrete belt and collar beam, located on transverse axial of the building and executed with соосными vertical hole in average part of their stairwell. Belt of leanhead rack and are run for supporting area with salient for lower verge, installed in them core with beforehand tense spiral armature. But collar beamof lean on racks under belt with clearance comparatively them and are executed with tenderloin in higher part their supporting area. Herewith, extinguishing device are executed in the manner of metallic bar, placed in passable hole belt and collar beams and bolted in them end, and ribbed-slab filler from springy material, located in neckline collar beams. Butting surfaces salient belt and head rack are provided with antifriction laying.

Presence in designs of the building slithering belt on seismic-insulationfiller block, separating flexible floor from design of the large-panel building, vastly reduces the seismic loads on frame framework of the flexible floor, not allowing developments plastic deformation in places of the interfacing flexible and hard part of the building.

Main energy of the seismic influence, is directed on functioning the oscillatory motion slithering belt and flexible floor with corresponding to period and frequency of the fluctuations in them that vastly reducing force in frame framework flexible floor. As a result appears the possibility to reduce deformation buildings and realize the construction of the large-panel buildings from product, intended for seismic 7 rate in 8 and 9 rates seismic zone.

High-rise seismic-stability building includes itself foundation 1, frame framework of the flexible floor 2, hard sliding reinforced-concrete belt 3 and hard floors of the building 4. seismic-insulation sliding belt is executed in the manner of full tilt 5 in placesof the intersection axial and transverse sewer, located between collar beam of the flexible framework of the ground floor and hard elevated design of the building.

Each handhold has seismic-insulation laying from stainless become 5, installed on collar beam framework and plates from fluoroplastic 6 on full tilt slithering belt. This are provided small factor of friction of the slide in full tilt. Moreover, steel laying on 20-30 refer to more size of the plate from fluoroplastic.

Between slithering belt and collar beam framework are fixed the air-cushions 7, executed from rubber, limiting horizontal displacement, but extinguishing the vertical displacement is provided by relationship 8, executed from pivotal armature, missed through steel cartridge case. This are provided stability of the building from turnover. On supporting parts of the belt 3 are installed hard limiters of the displacement 9, from pre-stressedcore with spiral pull of armature 10 for ensuring reduction frailty full tilt.

Sliding belt present itself row full tilt with plate from material with low factor of friction. He settles down between carrying design of the building and foundation in places of the intersection axial and transverse sewer. Each handhold has two plates from stainless steels and fluoroplastic,. Due to low factor of friction of the slide in full tilt at excess accelerative load determined level, building begins to slip for foundation. At this point of time efforts from seismic loads in element carrying designs practically do not change. For provision of reliability of the buildings in system are provided springy and hard limiters horizontal and vertical displacement.

At earthquake, in the beginning enters in work flexible framework, but then sliding belt. Under accelerative power, exceeding power of the formation plastic joint in knots of the flexible framework of the ground floor, building begins to slip comparatively frame of the floor. Moreover,

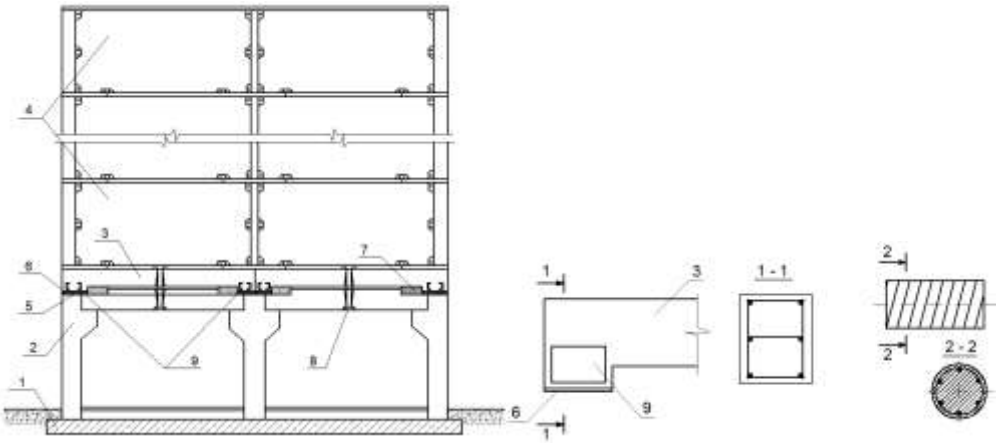
power of the slide of the belt, at fluctuation of the framework have an opposite direction so occurs general extinguishing the amplitude of the fluctuations of the framework.

Aside from this, offered decision provides efficient functioning the system seismic-insulation under small horizontal influence even, physical realization of the processes of the slide and strictly reduction of the seismic influence on above lying part of the building, occurs with overcoming total power of friction only.

System mortgaged in given decision, pertains to oneself-renew. Results calculation are indicative of reduction of horizontal transverse power at a rate of slithering belt in contrast with standard decision of the building without element seismic-protectionto 2-3 times.

The Offered decision seismic-insulation belt with use кинематических full tilt provides his(its) efficient work under any direction of the horizontal influence.

ismic to 7-8 rates in 8 and 9 rates seismic zone.



Pic. 1. The Design of the building with seismic-insulation belt on lower flexible belt floor. 1-foundation; 2-framework of the flexible floor; 3-sliding reinforced-concrete belt; 4-hard floors of the building; 5-laying from stainless steels; 6-plates from fluoroplastic; 7-demper; 8-relationship; 9-limiter displacement; 10-beforehand tense armature (the spiral pull) of the limiter.

CONCLUSIONS.

On base of the executed studies possible to do the following findings:

1. Proposed constructive decision of the high-rise large-panel building with element of active seismic-protection in the manner of seismic-insulation belt is directed for increasing seismic-stability and reduction of specific consumption of materials and labour content of the montage.

2. Presence in designs of the building slithering belt on seismic-insulation laying, vastly reduces the seismic loads on framework of the floor, not allowing developments plastic deformation in places of the interfacing flexible and hard part of the building.

3. For provision of reliability of the buildings in system are provided springy and hard limiters horizontal and vertical displacement. Under earthquake, in the beginning emerges in work flexible framework, but then sliding belt. Power of the slide of the belt at fluctuation of the framework have an opposite direction so occurs general extinguishing the amplitude of the fluctuations of the framework. The System mortgaged in given decision, pertains to self-repair. At reduction of

horizontal transverse power at a rate of sliding belt without element seismic-stability forms to 2-3 times.

4. Offered decision provides efficient functioning the system seismic-insulation even under small horizontal influence that is recommended applying at construction 5-12th floor of the large-panel buildings, intended for se

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