IMPROVEMENT OF VERTICAL BUTTING SEISMIC-STABILITY LARGE-PANEL BUILDINGS

Kuldashev H.
Assistant Professor,
Samarkand State Architectural-Civil Engineering Institute

Kuldasheva A.
PhD Student of Wuhan University of Technology

Abstract

There are shown improvement of vertical butting earthquake proof of the large-panel buildings in this paper. Offered non-welding and non-curb butting join has some advantage in contrast with other butting by join. On noted constructive decision is received patent for invention.

For ensuring raised carrying abilities and perceptions of the seismic loads 8-9 rate, butting in 1/4 parts of the height is supplied by pipe with located on her stressed spiral winding of reinforcement. Herewith volume of the monolithic concrete decreases on 3/4 and curb of the work. Given variant of butting joining the panels are justified in economical attitude. At economy of the main building materials-cement and metal forms before 10 % of the average. Besides shortcut gage applicable profiles worker armature in vertical butting of the large-panel buildings and dress before 4-h units (on attitude design).

Such decision vertical butting allows the construction of the large-panel buildings seismicity 8-9 rates.

1. Introduction.

Large-panel homebuilding is conditioned its high technical-economic factor, relatively low labour content, technology idle time of their fabrication, montage and alongside with improvement design paneling buildings others, applicable in usual condition construction, are quest in principal new decisions, answering specifics of seismic influence.

Since housing problem is one of the most sharp social problems of the country. Serious attention is spared also questions of increasing technical level and quality housing construction, further development of its industrialization.

In seismic region seismic stability brick and into large pieces- paneling buildings different. Estimation consequence earthquakes show raised seismic stability of large-panel buildings by comparison buildings from stone (brick) of the laying. This is confirmed by description of the damages of the buildings, built on rate seismic construction.

Herewith follows to note that according to card micro-seismic regionalization more than 90 % territory Uzbekistan are located in seismic-active to zone [1, 6, 10].

Research of seismic stability of large-panel buildings will allow to value the actual reserves their carrying abilities, perfect the technical-economic factors. So construction of brick houses requires big labour content, materials consumption and cost of construction.

Large-panel homebuilding is not only the most industrial, but also the most cheap. Construction of the houses from small-pieces materials, it differs the reduction of the specific mass of the design on 20-25 %. General expenses of the labour on their erection decrease on 30-35 % and reduce the periods a construction in 1,5-2 times.

Known that brick-made building possess high spatial acerbity. However, it is provided only before stage of the arising the rifts in places of the intersection sewer lengthway and transverse directions and safety of acerbity disk overlapping. Toughness of the normal traction in laying of the second category forms 0,12-0,18 MPA, in that time as corresponding to toughness of the concrete on sprain in panel and butting of the large-panel buildings 0,75-1,0 MPA then in 5-6 once above. This is confirmed by examination consequence earthquakes in Tashkent (1966), in Gazli (1976), in Spitake (1988) and others [1, 6].

Checkup and examination of the large-panel buildings after these land- shaking has shown that in they did not appear no essential damages. Only rifts is discovered in vertical butting was cracks with opening 0,1-0,2 mm.

Carrier paneling building system, due to presence of the hard relationships of the shift between all pier provides the high degree their spatial interaction with the result that it possesses the big seismic, than carrier system of wireframe and other buildings. Consequence number of earthquakes once again confirm that advantage paneling buildings in seismic region, in contrast with brick, both on reliability of the provision of their stability, and on technical-economic factor, useful for paneling systems [2, 3, 6, 7, 9].

Methods.

As well known, reduction of materials consumption -one of the main reserve of increasing of efficiency building production. Main condition of reduction materials consumption of construction is a reduction of mass design that is reached by way of the critical revising of design decisions, using efficient design and material, improvement of technology production assembly reinforced concrete [3].

Done research of simplification of the constructive decisions [4, 5, 7], are directed on reduction of labour-consuming process, improvement of quality of civil and erection work and reduction of material resources on worksites directly. In particular coordinated with design institute UZLITTI, assembly-monolithic variant, device vertical butting internal wall, reduce the volume of the monolithic concrete at montage design on 2/3. Herewith reached improvement quality of vertical butting and is reduced volume of the monolithic concrete (pic. 1).

Results and discussions.

Offered non-welding and без опалубочное butting join has some advantage even in contrast with new efficient types butting non-wire-frame of the buildings with tensed and connector by join element.

However, in spite of this in non-welding and off-formwork butting join are not completely eliminated having defect, requiring scolded revising of the presentations on which are based technological processes at production product and raising the buildings.

Though are reached maximum simplification of the design butting, reduction of materials consumption produced of product and expelled labour content processes welding and curb of the work, not resolved eliminating the possibilities of the drain cement juice through cuts of armature issue under vibro-compaction of product.

Vertical butting of wall-panels of seismic stability large-panel building includes the butt wavy surface of galley proof and vertical unceasing armature. Butting on one of fourth part of its height is supplied by spiral vertical unceasing winding covering vertical armature but tooting and joint grouting of the verges were run for fourth of their heights. On noted constructive decision is received patent for invention [4].

For ensuring raised carrying abilities and perceptions of the seismic loads 8-9 rates, butting in one of fourth part of the height is supplied by pipe with located on its stressed reinforcement by spiral winding (pic. 2). Herewith volume of the monolithic concrete decreases on 3/4 and опалубочных of the work.

Thereby butting join will provide unceasing of reinforcing of core in assembly-monolithic performance on the whole height of the building and relieves the development in butting plastic deformation that greatly reduces seismic loads.

Carrier ability of monolithing butting, reduced for three-fourths heights of the floor, is provided by spiral winding of armature, but if required it is changed prestressed by spiral winding, which place in pipe.

After montage of the panels butting unceasing vertical armature 2, on it is fixed the pipe 5 with pre-stressed by spiral winding of armature 4, is realized welding issue vertical armature whereupon vertical butting за monolithing the concrete on one fourth part of the height of the floor only.

Such advanced decision vertical butting practically allows the construction large-panel vein houses of seismic 8-9 rates for seismic region. At variation carrying abilities of the buildings when increase effort from seismic load and growing number of storeys is produced to account partial stand; bear worker of armature from panels in butting of the join, which are realized in building condition and not exert on factory production.

This offer is justified in economic attitude, as the most cheap and provide reduction period of construction. At economy of the main building materials-cement and metal forms to 10 % at the average. Besides abbreviated of gage applicable profiles worker armature in vertical

butting of the large-panel buildings and доведен to 4-h units, as follows F5VR-I, F6a-III, F12a-III, F20a-III (disregarding used diameter of armature on erection loops).

Brought actions and offers else have far from exhausted all reserve of the reduction of specific consumption of materials and labour content construction large-panel vein of the houses. Necessary most further active work directed on discovery and more full use such reserve.

Analysis of the modern condition of the large-panel homebuilding witnesses that the most further reduction of working hours, and specific consumptions of materials workable only on base of the complex approach to problem on architecture-construction-technology systems, concluding in complex reciprocal-specified decision on a matter of the architecture, design and technologies production assembly of reinforced-concrete product. Accepting constructive decisions, necessary also to follow the principle, directed on reduction of specific consumptions of materials design, using efficient material (use high-performance armature, light concrete and preliminary voltage), maximum simplification of the design butting, reduction of the weight of the buildings, increasing quality factory fabrication and as effect, reduction of the seismic loads.

All this is indicative of need of the undertaking new studies of the large-panel buildings under seismic influence.

Advantage of seismic-stability large-panel houses in seismic region must be used at construction high-rise (9 and more floors) living complex that will promote the realization of the resolutions government of Republics Uzbekistan about additional measure, on support young family. Need of the renewal and expansion construction large-panel living of the houses seismic region Uzbekistan unchallengeable.

Conclusion.

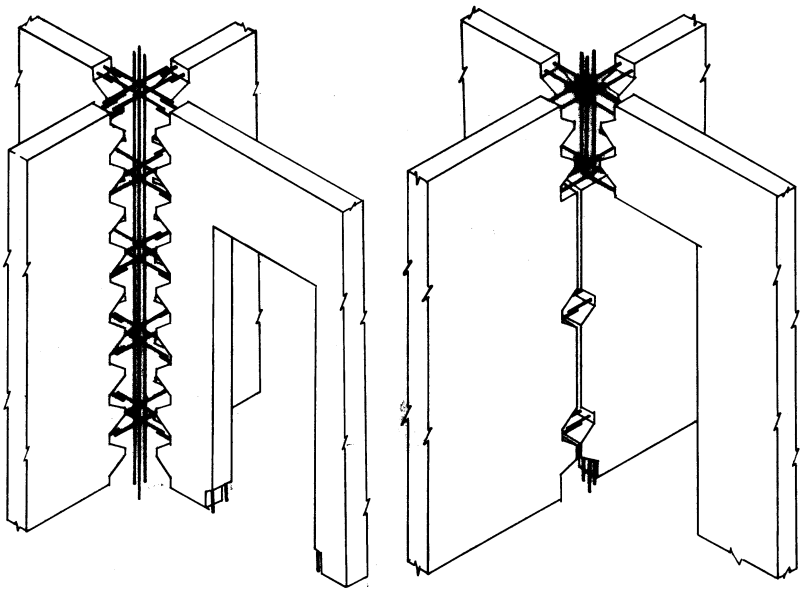
On base of the executed studies possible to do the following findings:

1. Presented research on simplification of the constructive decisions vertical butting of large-panel buildings are directed on reductions of the labour-consuming processes, reduction of the materials consumption resource and reliable provision seismic-stability butting.

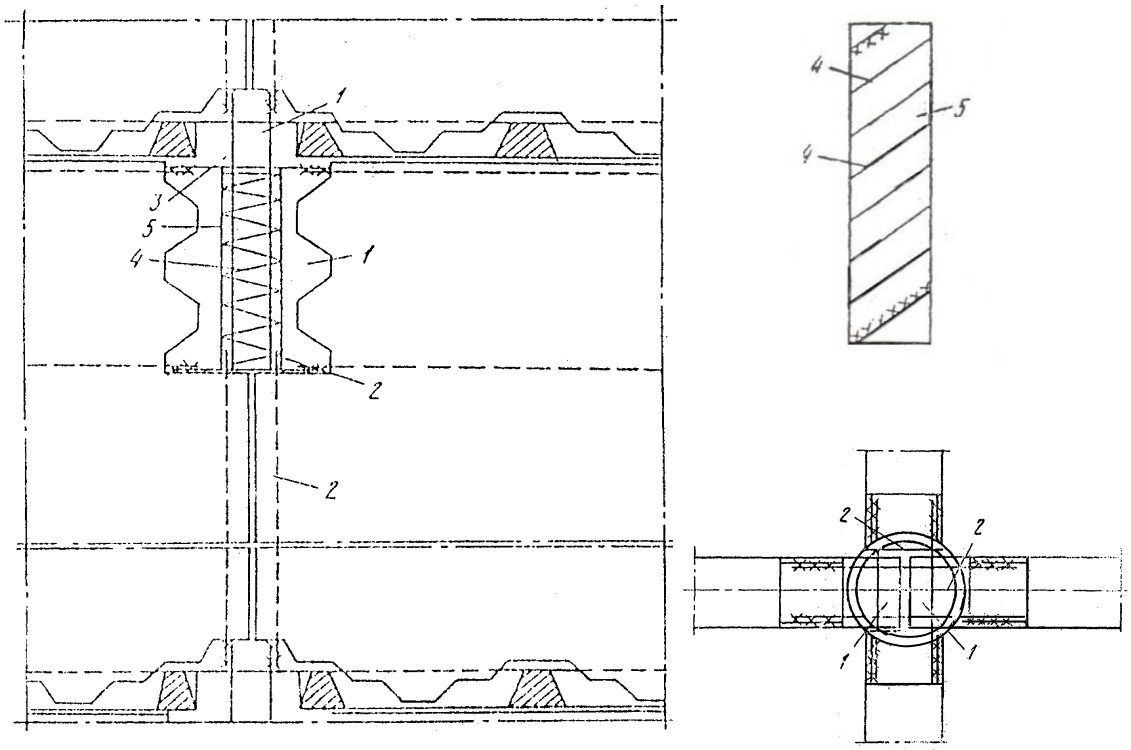
2. For ensuring raised carrying abilities and perceptions of the seismic loads 8-9 rates, butting in one fourth part of the height is supplied by pipe with located on its pre-stressed by spiral winding of armature. Herewith volume of the monolithic concrete decreases on 3/4 and curbing of the work.

3. Offered advanced decision vertical butting practically allows the construction 5-12 floor in large-panel living houses seismic 8-9 rates for seismic region. At variation carrying abilities of the buildings when increase effort from seismic load and growing number of storeys is produced to account partial stand; bear worker of armature from panels in butting join, which are realized in building condition.

4. Offered variant of butting joining of the panels is justified in economic attitude. At economy of the main building materials (the cement, metal, aggregates) forms before 10 % at the average. Besides abbreviated of gage applicable profiles worker armature in vertical butting of the large-panel buildings and developed to 4- units (disregarding used diameter of armature on erection loops).



Pic. 1. Combined butting. a-on a project; b-offered variant.



Pic. 2. Design of the vertical butting of the large-panel buildings. a-general type of the butting; b-pipe with spiral armature; c-plan butt panels. 1-monolithic part of the butting; 2-vertical armature; 3-horizontal loop; 4-beforehand tense spiral armature; 5-pipe.

Literature

1. Ashkinadze G.N., Falcon M.E., Martynova A.D., and others reinforced concrete wall in seismic stability buildings: Studies and bases of planning.-M.: Stroyizdat, 1988.-504 p.
2. Mahlivadze L.S. Seismic-stability large-panel in house-construction. –M.: Stroyizdat, 1987. -221 p.
3. Pak F.I., Kuldashev H., Ibragimov H.M. Reserves of the reduction of the expenses of the building materials in housing construction //Problems of the architecture and construction. Research journal. –Samarkand.: SAMGASI, 2008. №1. -with. 13-15.
4. Pak F.I., YUsupov Z.YU., Kuldashev H., Pak D. F., Vertical butting of wall panels of seismic-stability large-panel building. The Patent № 179150. 8.10.1992.
5. Pak F.I. Decision butting large-panel buildings of the series 148 //Housing construction. 1987. №3, -with. 28.
6. Pak F.I., Kuldashev H., Ibragimov H.M. About efficiency housing of construction in seismic region Uzbekistan// Problems of architectures and construction. Research journal. –Samarkand.: SAMGASI, 2008. №2. -with. 9-12.
7. Pak F.I., Kuldashev H., Ibragimov H.M. About improvement architectural-planning of the decisions large-panel living houses// Problems of the architecture and construction. Research journal. –Samarkand.: SAMGASI, 2009. №1. -with. 8-10.
8. Polyakov S.V., Klimnik L.SH., CHerkashin A.V. Modern methods of seismic protection of buildings. –M.: Stroyizdat, 1988. -139 p.
9. Yusupov Z.YU., Pak F.I., Ibragimov H.M. Bessvarnoe and безопалубочное стыковое joining the panels сейсмостойких крупнопанель- ных of the buildings //Concrete and reinforced concrete. 1990. №2. –p.19-20.
10. Yusupov Z.YU., Pak F.I., Kuldashev H. Way of increasing of efficiency housing construction//Housingconstruction. 1991. №6. p-2.