PLANNING SOLUTIONS OF SANITARY FACILITIES IN MODERN RESIDENTIAL BUILDINGS

In the article the short historical review on the design of sanitary rooms and their configurations is given. The main errors of the recent years, which led to the decrease in accommodation convenience because of the wrong approach from both the architect and engineers, are given. It is possible to use a small useful area for sanitary facilities, but it is connected with the lack of possibility of connecting washing and dishwashers.

The author considers the options of engineering equipment placement in sanitary rooms taking into account the convenience of use, safety, and also resource-saving aspect. Various solutions on the organization of heating and ventilation are provided.

The possible technical solutions allowing solving a flooding problem of the first floors in elite housing estates in case of accident are offered with the help of full waterproofing of sanitary rooms, and also the whole area of the apartment.

The main attention was focused on the improvements of sanitary rooms for one-room and two-room apartments, which are the most demanded in the modern market of real estate. Layout solutions of the reduced bathrooms on the placement of the necessary equipment with choice justification are provided.

The attention is paid to the layout solution for modern kitchens on order to increase their comfort by the use of special two-section sinks, and also a grinder of food waste in order to allow to lower the load of the systems of rubbish disposal of a building, by dumping the crushed garbage in an internal sewer network.

Various options of evolutionary development of sanitary rooms for increasing the comfort degree are given. First of all, the development should happen in the direction of not only sanitation and hygiene, but also of the maintenance of the physical health of the people living in the building. It can be carried out by increase in a useful area of sanitary rooms, installation of exercise machines, medical bathtubs and a Jacuzzi, which allows receiving good relaxation after a difficult day. Also one more direction will be the organization in occupations of an aquacycling, so-called water trainings in a special bathtub by means of exercise machines for strengthening of health of the population.

Key words: sanitary room, water folding device, receiver of sewage, water supply, water disposal, waterproofing, planning solution, heating, ventilation, rubbish disposal.

References

- 1. Naumov A.L., Brodach M.M. Resursosberezhenie v sistemakh vodosnabzheniya i vodootvedeniya [Resource-Saving in Water Supply and Water Disposal Systems]. *Santekhnika* [Sanitary Engineering]. 2012, no. 1, pp. 14—19. (In Russian)
- 2. Svintsov A.P., Gusakov S.V., Rybakov Yu.P. Ekspluatatsionnaya nadezhnost' sanitarno-tekhnicheskoy armatury [Operational Reliability of Sanitary Fittings]. *Santekhnika* [Sanitary Engineering]. 2010, no. 6, pp. 48—53. (In Russian)
- 3. Alekseev V.S. Izmeneniya i dopolneniya v Vodnyy kodeks Rossiyskoy Federatsii [Changes and Additions in the Water Code of the Russian Federation]. *Vodosnabzhenie i sanitarnaya tekhnika* [Water Supply and Sanitary Equipment]. 2013, no 12, pp. 5—10. (In Russian)
- 4. Brodach M.M. Voda istochnik zhizni i dvizhushchaya sila dlya ustoychivogo razvitiya [Water a Source of Life and a Driving Force for Sustainable Development]. Santekhnika [Sanitary Engineering]. 2009, no. 5, pp. 6—9. (In Russian)
- 5. Wang H., Hu C., Hu X., Yang M., Qu J. Effects of Disinfectant and Biofilm on the Corrosion of Cast Iron Pipes in a Reclaimed Water Distribution System. Water Research. 2012, vol. 46, no. 4, pp. 1070—1078. DOI: http://dx.doi.org/10.1016/j.watres.2011.12.001.
- 6. Orlov E.V. Sistema vnutrennego vodoprovoda. Novyy tip vodorazbornykh priborov v zdaniyakh. Avtomaty piťevoy vody [Systems of an Internal Water Supply System. New Type of Water Folding Devices in Buildings. Machine Guns of Drinking Water]. *Tekhnika i tekhnologii mira* [Equipment and Technologies of the World]. 2013, no. 1, pp. 37—41. (In Russian)
- 7. Orlov V.A. Puti obespecheniya sanitarnoy nadezhnosti vodoprovodnykh setey [Ways of Ensuring Sanitary Reliability of Water Supply Systems]. *Vestnik MGSU* [Proceedings of Moscow State University of Civil Engineering]. 2009, no. 1, pp. 181—187. (In Russian)
- 8. Varbanets M.P., Zurbrügg C., Swartz C., Pronk W. Decentralized Systems for Potable Water and the Potential of Membrane Technology. Water Research, 2009, vol. 43, no. 2, pp. 245—265. DOI: http://dx.doi.org/10.1016/j.watres.2008.10.030.
- 9. Alekseev V.S. Sovremennoe sostoyanie normativnoy bazy v oblasti vodosnabzheniya [Current State of Regulatory Base in the Field of Water Supply]. *Vodosnabzhenie i sanitarnaya tekhnika* [Water Supply and Sanitary Equipment]. 2014, no. 3, pp. 4—14. (In Russian)
- 10. Lehtola M.J., Nissinen T.K., Miettinen I.T., Martikainen P.J., Vartiainen T. Removal of Soft Deposits from the Distribution System Improves the Drinking Water Quality. Water Research. 2004, vol. 38, no. 3, pp. 601—610. DOI: http://dx.doi.org/10.1016/j. watres.2003.10.054.
- 11. Brodach M.M. Zelenoe vodosnabzhenie i vodootvedenie [Green Water Supply and Water Disposal]. *Santekhnika* [Sanitary Engineering]. 2009, no. 4, pp. 6—9. (In Russian)
- 12. Vreeburg J.H.G., Boxall J.B. Discolouration in Potable Water Distribution Systems: A Review. Water Research. 2007, vol. 41, no. 3, pp. 519—529. DOI: http://dx.doi.org/10.1016/j.watres.2006.09.028.
- 13. Orlov V.A. Taktika renovatsii vodoprovodnykh i vodootvodyashchikh setey [Tactics of Renovation of Water Supply and Water Disposal Systems]. *Vestnik MGSU* [Proceedings of Moscow State University of Civil Engineering]. 2009, no. 2, pp. 167—171. (In Russian)
- 14. Yang F., Shi B., Gu J., Wang D., Yang M. Morphological and Physicochemical Characteristics of Iron Corrosion Scales Formed under Different Water Source Histories in a Drinking Water Distribution System. Water Research. 2012, vol. 46, no. 16, pp. 5423—5433. DOI: http://dx.doi.org/10.1016/j.watres.2012.07.031.
- 15. Porshnev V.N., Novikova L.V. Meropriyatiya po energosberezheniyu i snizheniyu poter' vody v sistemakh gorodskogo vodosnabzheniya [Actions for Energy Saving and Decrease in Water Losses of City Water Supply Systems]. *Energosberezhenie* [Energy Saving]. 2005, no. 10, pp. 78—84. (In Russian)
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