# Analysis of requirements for modern finishing materials in interior solutions for inpatient facility ward units

Alevtina Balakina<sup>1,\*</sup> and Yury Lempl<sup>1</sup>

<sup>1</sup>Moscow State University of Civil Engineering (MGSU), 26, Yaroslavskoye Shosse, 129337, Moscow, Russia

**Abstract.** This article is devoted to the detailed analysis of modern requirements for finishing materials, used in the interiors of inpatient facility ward units. The authors have studied a number of regulatory normative documents acting in the territory of the Russian Federation and analyzed the practical experience of interior decoration of ward units at the health care capital construction facilities. The authors highlight and describe the main requirements for the finishing materials for the inpatient facility ward units and point out the peculiarities of solutions in the interiors. A classification of modern finishing materials (with an indication of their technical characteristics) used in the decoration of interiors of long-term care units is made on the basis of the practical experience studied by the authors taking into account the functional purpose of the premises as well as the variants of visual design of interiors of inpatient facility ward units.

# 1 Introduction

With the development and modernization of the healthcare system in the Russian Federation, the issue of ensuring the quality and safety of medical activities carried out in health care institutions is most acute [1,2]. This is particularly true in the case of long-term care facilities, i.e. inpatient facilities.

This paper reviews the requirements for finishing materials used in the design of the interiors of inpatient facility ward units [3,4,6,7].

A number of papers and manuals [9,10,11,12] outline the general requirements for the interior decoration of health care institutions, as well as individual requirements for ward units. A special place in the interior design of health care premises is occupied by units for permanent or temporary stay of patients. In this regard, the requirements for the interiors of wards and public areas of inpatient facilities have a number of peculiarities:

- technology requirements, which in this category of premises are primarily related to furniture and engineering arrangement [11]: functionally equipped medical bedside consoles, functional beds, functional bedside tables and bedside chests, sanitary units, equipped taking into account the requirements of accessibility of the room for people with

© The Authors, published by EDP Sciences. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (http://creativecommons.org/licenses/by/4.0/).

<sup>\*</sup> Corresponding author: balakinaae@mail.ru

low mobility (the requirements are divided by the criteria of accessibility, informativeness, safety, comfort) [5], special lighting of wards [9,10].

- technical requirements engineering solutions aimed at ensuring effective and comfortable treatment, including ensuring compliance with regulatory sanitary [3] and fire requirements[8], safety requirements [2], climate control in both wards and public areas, equipment with modern doctor or nurse call systems, equipment with patient monitoring information systems, equipment of wards and other special units with medical gases and others.
- Aesthetic and psychological requirements for this category of facilities play a very important role in creating a comfortable stay and effective treatment. Modern interiors should create a feeling of home comfort and well-being for people with different types of diseases, the possibility, even while being treated in a health care institution to continue their communication with the outside world, as well as, if necessary, to continue to work on their favorite things. Preference is given to options that exclude "wet" processes in the finishing of such rooms.

# 2 Materials and methods

In this paper, the authors have analyzed a number of regulatory documents (including recommendations for interior design of hospitals), adopted in the Russian Federation, to identify typical requirements for finishing materials used in the ward units of health care institutions.

Based on these requirements, the authors studied the practical experience of implementing these requirements at capital construction health care facilities (major repairs, new construction, reconstruction), in particular with the execution of works in the ward units.

#### 3 Results

Having synthesized the obtained theoretical and practical experience of interiors decoration of inpatient facility ward units, the authors have prepared Table 1, in which finishing materials (taking into account their compliance with standards, modern technologies, recommendations on coloristic solutions) used in the finishing of inpatient facility ward units, depending on their functional purpose were selected. All offered finishing materials are classified according to the type of finishing works.

**Table 1.** Finishing materials recommended in the creation of interiors of health care institution ward units.

Description of the premises	Floor finish	Wall decoration	Ceiling finish	Lighting
Foyer	-50401 Forbo Sphera Evolution silver white pearl linoleum	HPL decorative wall panels, RAL 9010; HPL decorative wall panels with wood texture; HPL decorative wall panels with specialty color: Dulux S 1510- R80B	- Armstrong type suspended ceiling panels with concealed fixing. Dimensions: 600x1200 mm	Luminaires: - 250mm recessed ceiling spotlight; - Warton LED ceiling lamp, dimensions: 1200x200x50 mm
Lobby	- FORBO Sphera	HPL decorative wall	- Armstrong	Luminaires:

	SD 550017 ivory light grey marmoleum	panels, RAL 9010, HPL decorative wall panels with wood texture	type suspended ceiling panels with concealed fixing. Dimensions: 600x1200 mm	- 250mm recessed ceiling - Warton LED ceiling lamp, dimensions: 1200x200x50 mm -Kink Light Tor 08223.19P Pendant LED luminaire
Waiting area	- 550037 Forbo Sphera SD homogeneous China blue linoleum - 550017 Forbo Sphera SD ivory linoleum	HPL decorative wall panels with wood texture -Wall painting with specialty color: Du- lux S 1510-R80B	-Ceiling made of gypsum plasterboard painted matt RAL 9016 acrylic paint	Luminaires: Warton LED ceiling lamp, dimensions: 1200x200x50 mm -Decorative LED luminaire with frosted diffuser, D=1400 mm
Day care area	- 550037 Forbo Sphera SD homogeneous China blue linoleum - 550017 Forbo Sphera Sd ivory linoleum	HPL decorative wall panels with wood texture -Wall painting, color RAL 9016, -Wall painting with Dulux S 1510-R80B color	- Armstrong type suspended ceiling panels with concealed fixing. Dimensions: 600x1200 mm	Luminaires: -Warton LED ceiling lamp, dimensions: 1200x600x50 mm
Corridor	-50405 Forbo Sphera Evolution bronze pearl marmoleum	Wall painting with specialty color: Duluxe 90BG 56/125, Wall painting with specialty color: Dulux S 1510-R80B, -Wall painting, color RAL 9010	- Armstrong type suspended ceiling panels with concealed fixing. Dimensions: 600x1200 mm	Luminaires: -Warton LED ceiling lamp, dimensions: 1200x200x50 mm
Lift lobby	-ESTIMA Aglomerat AG 03 60x60, 120x60 ceramic granite –Kerama Marazzi Terrazzo 60x60, 120x60 (SG632400R) light grey edged ceramic granite	HPL decorative wall panels, specialized color: Dulux 90BG 56/125, - HPL decorative wall panels, color RAL 9010	- Armstrong type suspended ceiling panels with concealed fixing. Dimensions: 600x1200 mm	Luminaires: -Warton LED ceiling lamp, dimensions: 1200x600x50 mm
Ward per 1 bed	- 50432 Forbo Sphera Evolution homogeneous silver white linoleum	HPL decorative wall panels with wood texture HPL decorative wall panels with specialty	- Armstrong type suspended ceiling panels with	Luminaires: Recessed LED luminaire 1200x600x100

		color: Duluxe 50GY 66/111 -wall painting, RAL 9010	concealed fixing. Dimensions: 600x1200 mm	
Ward per 2 beds	- 550008 Forbo Sphera SD homogeneous silver grey linoleum	-HPL decorative wall panels, RAL 9010, -HPL decorative wall panels with wood texture -wall painting with specialty color: Dulux 50GY 66/111	- Armstrong type suspended ceiling panels with concealed fixing. Dimensions: 600x1200 mm	Luminaires: - Recessed LED luminaire 1200x600x100
Sanitary Unit	-Kerama Marazzi 1544 Kaleidoscope white tile	-Kerama Marazzi tile, 11120R Marceau white edged, 595x295 mm	- Armstrong type suspended ceiling panels with concealed fixing. Dimensions: 600x1200 mm	Luminaires: - 250mm recessed ceiling
Sanitary Unit for people with limited mobility	- ESTIMA AG01 light tiles, 60x60	-Kerama Marazzi tile, 90-11, Accord Beige. light facet, 8.5x28.5 – Kerama Marazzi tiles, 90-12, Accord green facet, 8.5x28.5	- Armstrong type suspended ceiling panels with concealed fixing. Dimensions: 600x1200	Luminaires: - 150mm recessed ceiling spotlight
Main inpatient facility head's office	- 550008 Forbo Sphera SD homogeneous silver grey linoleum	-HPL decorative wall panels with wood texture HPL decorative wall panels with specialty color: NCS S 1020- B10G -Wall painting, RAL 9010	- Armstrong type suspended ceiling panels with concealed fixing. Dimensions: 600x1200 mm	Luminaires: -250 mm recessed ceiling spotlight, -1200x600 recessed LED luminaire
Examination unit	- 550005 Forbo Sphera SD homogeneous dark neutral grey linoleum	-HPL decorative wall panels with wood texture HPL decorative wall panels with specialty color: DULUX 52YY 89/117	- Armstrong type suspended ceiling panels with concealed fixing. Dimensions: 600x1200	Luminaires: Recessed LED luminaire 1200x600x100 - 250mm recessed ceiling

Based on the results of the study presented in Table 1, the authors have prepared options for the interior design of the inpatient facility ward units, depending on their functional purpose, presented in Figures 1-13. The proposed interior solutions fully take into account all the requirements put forward to the design of the inpatient facility ward units [1-13].



Fig. 1. Foyer.



Fig. 2. Lobby.



Fig. 3. Waiting area.



Fig. 4. Day care area.



Fig. 5. Corridor.

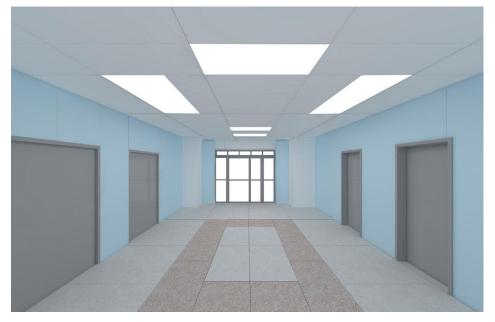


Fig. 6. Lift lobby.



Fig. 7. Ward per 1 bed.

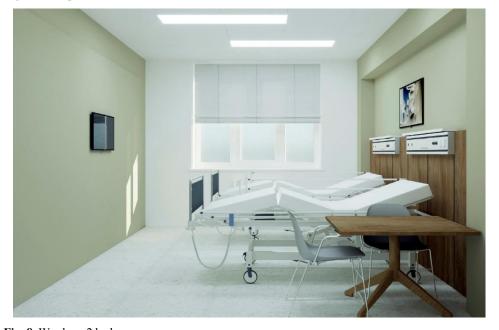


Fig. 8. Ward per 2 beds.



Fig. 9. Sanitary unit.



Fig. 10. Sanitary unit for people with low mobility.



Fig. 11. Inpatient facility head's office.



Fig. 12. Examination unit.



Fig. 13. Doctors' room.

# 4 Discussion

The results of the research allowed us to systematize the requirements for finishing materials of inpatient facility ward units, as well as to determine a pool of finishing materials that fully meet the requirements of regulatory documents, as well as used in construction projects on the capital facilities. The results obtained will simplify the search for appropriate finishing materials used in the interior design of health care institution ward units.

# References

- 1. Federal Law dated November 21, 2011, No. 323-FZ
- 2. Order of the Ministry of Health of the Russian Federation dated July 31, 2020. No. 785n
- 3. Russian Federation Standard SP 2.1.3678-20
- 4. Russian Federation Standard SP 158.13330.2014
- 5. Russian Federation Standard SP 31-102-99
- 6. Russian Federation Standard SP 118.13330.2012
- 7. Russian Federation Standard SNiP 2.08.02-89
- 8. Preventive Firefighting Regulations 07-91. Fire Safety Rules for Health Care Facilities
- 9. Y.V. Sorokina, G.I. Rabinovich. *Manual to MCCS 4.12-97 Medical and Preventive Treatment Institutions* (Moscow Research and Design Institute for Cultural, 2000)
- 10. Y.V. Sorokina, G.N. Ilnitskaya, E.S. Demina, *Manual to MCCS 4.12-97 "Healthcare and Preventive Treatment Facilities"* (SUE Moscow Research and Design Institute "Mosproject-4", 2003)

- 11. A.I. Arbakov, Manual for Design of Healthcare Facilities to SNiP 2.08.02-89. Section I General Provisions. Engineering Equipment (1989)
- 12. A.I. Arbakov, Manual for Design of Healthcare Facilities to SNiP 2.08.02-89). Section II Inpatient Facilities (1989)
- 13. GiproNIIzdrav. Recommendations for shaping the interior of hospitals