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REPORT

THE ESTIMATION OF INFLUENCE ON THE ENVIRONMENT

(REPAIR - CIVIL WORK OF SCHOOL BUILDINGS)

The adviser: the senior lecturer, C.B.S. Mr. A. J. Hudaibergenov

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INTRODUCTION

Estimation of influence on an environment

The purpose of an estimation of influence on environment (EIE) consists in studying influences that may render renovation - civil work on an environment, in particular, renovation work of school buildings. Thus it should be taken into account as influence on external environment in relation to a building and on internal environment (influence on environment of premises where educational process will proceed).

The estimation includes the following components:

1) the review and the brief description of the appropriate legislation, adequacy of laws and mechanisms of the control for their observance for maintenance of preservation of the environment in the way of its relation to the Project;
2) the analysis of probable influences, mitigation of influences and residual influences of various kinds of activity.

Regulatory basis

The Law on preservation of the environment provides the general basis for complex protection of the environment and usage of natural resources. The law on ecological examination (EE) gives the managing principles and necessary authority to make the remarks on the ecological estimation and to authorize for development of the project to the Ministry of ecology and extreme situations (MEES). Besides the Law on ecological examination allows MEES to give out the passport of EE in which allowable emissions and dumps of sewage for concrete object are established.

The Kyrghyz Republic is the country that has signed the most part of the important international conventions on preservation of the environment.

Conditions of realization EIE

As it is not known what particularly amounts of works and what materials will be used in each separate case, it is necessary to look at some range of opportunities for performance EIE.

The renovation - civil work themselves, as a whole are ecologically neutral. The cumulative effect from sub - projects will be positive. In result conditions of a presence of pupils and the pedagogical personnel in school buildings will be improved. Rather small amounts of works cannot cause too much infringements of surrounding internal environment of premises.

However it is necessary to provide measures on mitigation of influence that might reduce to a minimum any possible influences on an environment.

GUIDELINES ON PRESERVATION OF THE ENVIRONMENT

The important accompanying document to EIE is the set of easily observed guidelines for use by all interested parties. Guidelines contain requirements of the World Bank, formatting EIE, monitoring instructions and various control tables.

LEGAL BASES OF PRESERVATION OF THE ENVIRONMENT

The law on preservation of the environment provides the general basis for complex protection of the environment and usage of natural resources. The law " covers a wide range of issues including the establishment of nature protection norms, the legal regime of specially protected territories, rules and procedures of usage of natural resources and also the order of performance of emergency actions. Natural resources may be used according to the established limits and nature protection norms. Nature protection norms include maximum allowable concentration of polluting substances in air, water, soil and subsoil, maximum allowable dumps of sewage, emissions and radiation, the rules of use of chemicals in the agriculture and maximum allowable concentration of chemical and biological substances in consumer goods. The law forbids use of toxic chemical substances that are not decomposed and also the import of radioactive waste products and materials for storage, recycling or transit.

The law lists the principles of preservation of the environment that form a conceptual basis for protection of constitutional rights of the person on the favorable and healthy environment. These principles give a priority to the measures directed on warranting of human rights on preservation of the environment, on respect of the principle of stable development and on the comprehensive approach to the regulation of preservation of the environment and the economic activities, the transparency of decision making and participation of the Not Governmental Organizations in nature protection activity." The Organization on Issues of Economic Cooperation of the United Nations, 2000.

"Legislation on preservation of the environment is complicated and includes as the universal law on preservation of the environment (described above) and laws on natural resources (herein provided and briefly described in Appendix A). This legislation meets the standard norms of lawmaking in this region. The majority of laws represents the framework type and their implementation in life depends sometimes on development of the sets of government directives". In the same source.

Laws on preservation of the environment should be continuously updated to reflect the new developments and impacts that may render on the parties of the environment.

From the point of Project view it's necessary to mention the following laws:

· The Law "Protection of the population in case of emergency situation" dated February 24, 2000;
· The Law "The radiological safety of population" dated June 17, 1999;
· The Law "The drinking water" dated March 25, 1999;
· The Law "The sanitary and epidemiological well-being of population" dated April 17, 2000;
· The Law "The mountain territory" dated November 1, 2002;
· The Law "The strategy of preservation biological variactivity" dated August 3, 2002;
· The Land Code of KR dated June 2, 1999;

· The Forest Code of KR dated July 8, 1999;
· The Nature Protection missions and priorities for KR are generally stated in the Concept of Ecological Security, in the National Plan of action on preservation of the environment (1995-97) and the project of the national program of preservation of the environment and rational use of natural resources in the period up to 2005.

The Agreement on realization of the coordinated policy in the field of standardization, metrology and certification of the countries of the CIS, work of the appropriate technical committees of the International organization on standardization (ISO), the International organization of legislative metrology (IOLM), International electrical commission (IEC) and the International committee of measures and weights (ICMW) with its Consulting committees by various kinds of measurements are directed on maintenance of the objective estimation of control quality of the object condition of the environment.

LEGAL REGULATION IN THE FIELD OF CIVIL CONSTRUCTION

Legal base in the field of civil construction are laws of the Kyrgyz Republic, standard acts of the President and the Government of the Kyrgyz Republic on construction.

Normative documents in construction represent set of the interrelated documents accepted by competent enforcement authorities and management of construction, the enterprises and the organizations and documents used in the planning and building of the settlements, in the execution of engineering researches, at designing, construction, operation, repair and reconstruction of the buildings and constructions.

According to the Decree of the State inspection on architecture and construction at the Government of the Kyrgyz Republic the Construction norms and rules of Kyrgyz Republic (CNR) are accepted and commissioned in which item 4.2 it is underlined:

"Reasoning from the general aims of standardizations being protection of rights and protected by the law of interests of consumers and manufacturers, during creation and application of production the System of normative documents should promote the decision of tasks facing to construction to provide:

· conformity of construction production the to its assignment and creation of favorable conditions of vital function of the population;
· safety of construction production for life and health of people in the process of its manufacture and operation;
· protection of construction production and people from adverse influences in view of risk of occurrence of emergency situations;
· reliability, durability and quality of building construction and bases, systems of the engineering equipment of buildings and other constructions;
· performance of ecological requirements, rational use of natural, material, fuel and energy resources and the manpower;
· mutual understanding of participants of investment process at realization of all kinds of construction activity and elimination of technical barriers in international cooperation".

Development of normative documents in construction is carried out on the principles accepted by the State system of standardization of the Kyrgyz Republic and provides necessary harmonization and comparability to documents of the international organizations on standardization (ISO, ICMW, etc.), normative documents of technically developed foreign countries.

The following kinds of normative documents are established:
· construction norms and rules - CNiP;
· state standards in construction - KMC;
· code of rules on designing and construction - CP;
· guidelines - RDC;
· departmental construction norms - VCN;
· standards of the enterprises - CTP;
· specifications - TU.

As normative documents of the Kyrgyz Republic Interstate construction norms (MCN) and the Interstate standards (GOST) commissioned in territory of republic may be applied.

Construction norms and rules of Kyrgyz Republic (CNiP) establish the obligatory requirements determining the purposes that should be achieved and principles that's necessary to be guided during creation of construction production.

State standards of the Kyrgyz Republic in construction (KMC) establish:

· the obligatory and recommended positions determining the concrete parameters and the characteristics of separate parts of buildings and constructions, building products and materials and providing technical unity in designing, manufacture and operation of this production;

· organizational-methodical requirements to the objects of standardization, certification and normalization.

Codes of rules on designing and construction (CP) establish recommended positions in development and maintenance of obligatory requirements of construction norms and general technical standards.

For the construction norms one or several codes of rules are developed.

Recommended positions of the codes of rules become obligatory at the reference to them in contracts with customers (on manufacture of design, prospecting, construction and other works) and also at the reference to them in the design documentation.

Guidelines (RDC) establish the organizational-methodical procedures regulating process of development and application of normative documents in construction and realization of observance CNiP, GOST, KMC by the State control and realization of technical rules.

Departmental construction norms (VCN) establish the specified obligatory requirement which construction production of department should meet during its creation and operation in view of specificity of activity of the enterprises and the organizations of the given department.

Standards of the enterprises establish requirements to production, services, and the processes created and used at the given enterprise.

Specifications establish requirements to concrete production and regulate the relations between the manufacturer and the consumer of production.

Normative documents should not contradict the positions established by legislative acts of the Kyrgyz Republic and standards of the State system of standardization.

Alongside with normative documents in construction it's applied:

· state standards and other documents on standardization, metrology, certification and accreditation of Kyrgyz Standard;

· norms and rules of bodies of the state supervision;

· standards of branches, norms of technology of designing and other normative documents accepted by branch departments according to their competence.

Normative documents are based on modern achievements of a science, engineering and technology, the best practices of designing and are taken into account the international and national standards of technically advanced countries.

Construction norms and rules (CNiP) and state standards (KMC) in the field of construction are accepted and commissioned and interstate normative documents - are commissioned by the state control body on construction in the order established by it.

Normative documents are applied within the frame of the field established by every document according to positions of the present norms and rules and KMC 1.0 (for normative documents on standardization).

Interstate construction norms and rules are applied in territory of the Kyrgyz Republic as normative documents by acceptance of the appropriate construction norms and rules of the Kyrgyz Republic in established order by the state control body on construction.

International, interstate and other regional standards and also national standards of other countries are applied in construction directly as standards of the Kyrgyz Republic in the order established by KMC 1.0.

Requirements of normative documents are the subject to application by all control bodies and supervision, the enterprises and the organizations irrespective of a pattern of ownership and an accessory, the citizens who are engaged in individual labor activity or are carried out individual construction and also public and other organizations, including joint ventures with participation of foreign partners, foreign legal and physical persons.

Application of the international norms in case of absence of norms of the Kyrgyz Republic is carried out under the sanction of the state control body on affairs of architecture and construction.

Besides for the above-stated documents also the sanitary-and-hygienic statutory acts authorized by the Chief state health officer of the Kyrgyz Republic are applied:

· Sanitary-epidemiological rules and specifications “Sanitary-epidemiological requirements to residential buildings and premises”. CanPiN 2.1.2.001-03;

· Sanitary-epidemiological rules and specifications “Hygienic requirements to the organization of construction manufacture and civil works”. CanPiN 2.2.3.003-03;

· Sanitary-epidemiological rules and specifications “Sanitary zones and sanitary classification of the enterprises, constructions and others objects”. CanPiN 2.2.1/2.1.1.006-03;

· Sanitary-epidemiological rules and specifications “Hygienic requirements to conditions of training of pupils in different modern general educational institutions”. CanPiN 2.4.2-002-03;

· Sanitary-epidemiological rules and specifications “Work with asbestos and asbestos materials”. CanPiN 2.2.3.013-03;

· The guideline. “Work hygiene. Hygienic criteria of the estimation and classification of working conditions by parameters of harm and danger of factors of the industrial environment, heaviness and intensity labor process. M. 2.2.014-03;

· Sanitary-epidemiological rules and specifications “Polymer and polymer construction materials, products and designs. Hygienic security requirements”. CanPiN M. 2.1.2.012-03;

· Sanitary-epidemiological rules and specifications “Sanitary-epidemiological requirements to the organization of training-practice process in educational institutions of initial professional education”. CanPiN 2.4.3.004-03;

· Sanitary-epidemiological rules and specifications “Hygienic requirements to the enterprises manufacturing of construction materials and designs. CanPiN 2.2.3.005-03;

· Sanitary-epidemiological rules and specifications “Hygienic requirements to air ionized composition of air in industrial and public premises. CanPiN 2.2.4.006-03;

· Sanitary-epidemiological rules and specifications “Hygienic requirements to the natural, artificial and combined illumination in residential and public premises. CanPiN 2.2.1/2.1.1.004-03;

· Methodical instructions “Collection, transportation, burial ground disposal of asbestos waste. MU 2.1.7.011-03.

THE GENERAL REQUIREMENTS OF ENGINEERING ECOLOGY TO CONSTRUCTION MATERIALS AND CIVIL WORK

Speaking about influence on surrounding natural environment of construction, it is necessary to distinguish, on the one hand, construction as the major branch of a national economy and on the another hand - construction as production of this branch: the urbanized territories, highways etc. As branch of a national economy construction requires a plenty of various raw material, building materials, power, water and other resources which reception renders strong influence on an environment. Conducting works is connected to gross infringements of landscapes and environmental contamination directly on a building site. These infringements start from the clearing of construction territory, removal of a vegetative layer and performance of excavations. At the clearing of construction territory that was earlier already engaged under construction the significant amount of the waste products polluting an environment at burning are generated or these waste blocks up the territories, ditches and trenches, dumps of industrial and household waste products, holes, etc. that changes morphology of sites, worsens hydrological conditions, promotes erosion. The degree of influence on a nature depends on the materials used for construction, technology of erection of buildings and constructions, technological equipment of construction manufacture, type and quality of building machines, mechanisms and vehicles and other factors. The construction territories become a source of pollution of the next sites: exhaust and noise of machine engines, burning of waste products. The water is widely used in building processes as the component of solutions, as the heat-carrier in thermal networks; after use it is dumped polluting subsoil waters and ground.

However the construction itself is the process rather transient. More difficultly it is the influence on the nature of the objects being production of construction - the buildings, constructions and their complexes - the urbanized territories. Their influence on surrounding natural environment still is insufficiently investigated therefore all ecological actions practically have recommendatory character. As for the present results: the quantity of trees decreases, water and soil in result of industrial emissions and accumulation of household waste products become dirty. There are dustiness, the gas and thermal air pollution that results in change of a level of radiation, the precipitation, the change of air temperature, the wind mode i.e. the creation of artificial conditions in the urbanized territory.

Influence of the urbanized territories on environmental nature and quality of environment in this territory is determined, first of all, by the decisions incorporated at designing, then accordingly by quality performance and further - the conditions of operation of objects.

At a design stage the future character of mutual relation of object and natural environment is determined. The creation of the artificial environment for life and activity of the human may take place in the consent with a nature or contrary to it.

Thus the degree of ecological validity and reasonableness of projects in many respects defines not only the future condition of the environment but also the size of the future public - necessary expenses of work and means for restoration of the broken environment. Conservancy and improvement of the city environment in development of technical-ecological bases of city development, the general plan for city development, settlement, the project of a lay-out and building of rural settlement should integrally enter into the decision of the choice of territory, variants of development, functional zoning, development architectural-designing structures, etc. According to these norms the designing of the enterprises, buildings and constructions of industrial assignment are carried out with the account of objects of construction engineering

meaning on the basis of requirements of protection of the natural environment, the schemes and projects of a regional lay-out, scheme of general plans of the large enterprises, projects of a detailed lay-out authorized in established way.

At all development cycles of the design documentation, beginning from a choice of a site, the coordination of planned decisions on the chosen platform with the appropriate bodies and the organizations, the development of design assignments and finishing the development of the own design estimates for all objects the accepted decisions should determine the requirements of rational use of the grounds, the restoration of areas after erection of objects, the use of a fertile layer of ground, preservation of the environment, rational use of natural resources and an economical expenditure of material and fuel and energy resources.

Protection of natural environment should be taken into account in development of all issues of construction and should be reflected in all sections of the design documentation: the general explanatory note, the technological part, the building decisions, and the budget documentation. The basic measure directed on reduction of negative influence on the environment is the maintenance of performance of ecological norms. At each project on manufacture of works obligatory there should be a section containing actions for performance of requirements on preservation of the environment including: the constructive measures on reduction of influence and pollution of environmental territories; the substantiation of ecological expediency of application of those or other machines, mechanisms and building materials in performance of works; other positions directed on maintenance of performance of requirements on preservation of the environment at designing and rules in development of the engineering specifications, the preparation and performance of work. It would be expedient to solve issues of training of employees of the construction organizations on themes of ecological security with certification of professional skill improvement of the state sample.

The important meaning is the ecological examination of the projects – the system of the complex estimation of all possible ecological and social-economic consequences of realization of projects of objects construction and reconstruction directed on prevention of their negative influence on the environment and on the solution of the planned tasks with the minimum expense of resources and the minimal undesirable consequences. The purpose and the task of ecological examination is in interests of the present and the future generations to provide the protection, the scientifically proved rational use of the ground and its bowels, water resources, flora and fauna, the preservation in cleanliness of air and water, the reproduction of natural riches and improvement of surrounding of human being environment. The ecological examination allows to reveal at a stage of planning and designing of object and to remove the mistakes in the organization of nature management and conservancy and it should be conducted at all design stages of the documentation on construction and repair.

In the development of design assignments of industrial and town-planning complexes the presence and observance of ecological requirements to functioning objects is supervised proceeding from results of forecasting using the appropriate quantitative and qualitative criteria. The design organizations beforehand should coordinate to the ecological examination the materials about a choice of the ground areas for accommodation of the objects ecologically proved conditions of their construction. At a stage of a choice of building sites, first of all, the opportunities of use under construction the grounds unsuitable for the agriculture or unproductive grounds, the opportunity of complex use of raw material, the most rational use of water resources, an opportunity of prevention of pollution of air pool, waters, the grounds by industrial emissions and other waste products should be considered. The complex decision of questions of preservation of the environment, the introduction of highly effective technological circuits of manufacture and the new qualitative construction materials appropriate to last technical requirements and also world ecological norms of safety, the systems of the closed water use, the use of achievements of a domestic and foreign science should be provided.

Experts - ecologists, make the ecological conclusions about influence of manufacture on environment and later the methods and criteria of a complex estimation of harmful influence of objects on the environment are pawned in “Construction norms and standards”. It is necessary to develop the methods of forecasting of possible negative changes of an environment and the recommendation for duly prevention of harmful influence of activity of the human on ecosphere and in the subsequent to develop recommendations that will help to find ways of an output from the prevalent adverse situations.

It is possible to formulate three basic ecological tasks, which should be fixed in a basis of the general circuit:

1. The internal environment of premises favorable for the human.
2. Cleanliness and beauty of environmental natural space.
3. Power rationality of buildings.

Each of primary tasks includes subtasks which decision is directly connected to groups of means of optimization of ecological conditions in the building.

The offered general circuit covers a problem as a whole and shows that concepts “ecological building” and “good, healthy, high-grade building” are actually identical. It only confirms the thesis that good architecture is always the ecologically verified architecture. Not putting before themselves the task of the description of the given circuit we shall illustrate the separate characteristic connections revealing essence of a problem.

Construction represents the area of work activity of people with extremely high degree of the ecological responsibility. This circumstance is caused first of all that construction processes enter direct contact to all components of the nature actively forming anthropogenic landscapes in rather short time intervals.

Designing with the ecological responsibility takes a special place in a number of forming stages of an engineering - ecological cycle because the maintenance at this stage of necessary nature protection potential in many respects defines a pawned level of ecological safety and consequently the possible material cost on its steady preservation during functioning.

The complex construction technology is realized on the complex mixed circuit of development of the interconnected technological processes and operations. The objects of lithosphere and hydrosphere have the greatest vulnerability that form integrated losses of locally or regionally limited flora and fauna.

The real man-caused loadings on the components of geosphere at the construction of objects of industrial or civil assignment form the potential levels of anthropogenic change of biogeocenose of the regional landscape. From this point of view the extremely important value is got the task of optimization of structural - rational restrictions on construction process from the point of view of the minimal influences on a natural landscape and further the maintenance of necessary initial control-technological preconditions (concerning functioning of construction complex) on preservation of ecological balance in region.

The decision of the specified task develops on two technical directions:

1. *definition of area of optimization of construction quality* by the given ecological criteria (for example the criteria of ecological reliability of natural-technical geosystem);

2.*definition of principal conditions* of creation of a non-polluting building complex by criteria of qualitative - quantitative minimization man-caused loadings on components of a natural landscape.

Traditional methods of normalization of functional properties of separate construction objects and complex as a whole do not take into account in a due measure the requirements of ecological safety of region. Imposing of ecological restrictions on the normative rules of construction may be realized within the framework of optimum designing constructive potential of construction complex and technological process of its formation.

During formation of construction complex the ecological losses caused by two circumstances are practically inevitable:

1. *direct influence of work processes* with used productive forces (building engineering, people, energy sources, etc.) on components of a nature;

2. *necessary use of nature objects* in region of construction as additional conditions of formation of a complex (use of natural resources in a technological cycle).

The organization of the work process forming non-polluting objects is made within the framework of the **system of engineering - ecological maintenance of construction complex.**

The specified system includes:

1. ecologically proved requirements to objects of industrial and house- engineering construction;

2. · tasks of ecologically optimum designing in all forming parts;

3. · scientific - methodological study of nature protection decisions;

4. · the complex analysis of all forms building techno genesis;

5. · principles of the organization of ecologically safe construction processes;

6. · the quantitative estimation of the current and long-term consequences in regions of a disposition of construction complexes;

7. · tasks of rational nature management and the savings of natural resources, etc.

Development of the listed directions pawns the uniform methodological bases of construction ecology as independently expressed subsystem of engineering ecology.

The harmonious commonwealth of the human and nature improves processes and objects of construction.

Requirements to the quality of construction of industrial object determine potential operational characteristics (durability, stability, tightness, non-failure operation, etc.) and finally a level of ecological safety as a measure of influence of object on natural environment.

Besides the special value gets introduction of means of protection of the internal environment of premises from the investigated adverse influences. First, it is necessary to carry out the control of ecological cleanliness of building and finishing materials at all levels, down to the buildings handed over in operation. Second, it is necessary to carry out the control ecological estimation of building sites with the purpose of detection, for example, of educed natural gas

radon from soil and acceptance of duly protective measures. Studying of construction sites and their ecological estimation are necessary also for definition “aesthetic territory resource”, opportunities of formation of clean and beautiful space around of buildings.

The problem of materials is that in XXI century they should become accessible and non-polluting. At their application the power consumption, ecological compatibility and life cycle should be taken into account. Power consumption means power inputs on manufacture, transportation, stacking and operation of the material. Thus it is necessary to take into account renewable of this material and energy sources for its manufacture and to try to choose materials with the least power consumption. Ecological compatibility defines whether the material and its secretion are harmful for health or it demands sheeting whether the waste products of construction and operation of a material are harmful or how much ecological and economical technologies of recycling of a material and its waste products and also whether the material attributes to number of local. Life cycle is service life of a material, its maintainability and interchangeability, an opportunity of a reuse or harmless cheap recycling.

The principle of ecologically rational construction provides the all-round and highly effective control at all stages of life cycle of formed objects. Thus the control acts as in function of active maintenance of quality of construction (due to steady feedback and giving to the control of functions of regulation and management) and as in function of an objective estimation of ecological conditions in region of construction. From this point of view the complex control defines a necessary condition of maintenance of ecologically safe construction of industrial objects.

The important circumstance in development of ecologically rational norms of construction is the differential approach to an estimation of geological, geocriological, hydrological and other conditions of construction and from the point of view of the minimal loadings on natural landscapes and in sense of a choice of the most economic and at the same time reliable engineering decisions.

Planning ecologically effective control of construction represents extremely important engineering problem. The system of the ecological control at construction of objects includes the following:

1) ecological examination of the documentation:

a) Normative - technical;
b) Project-budget;
c) Technological.

2) ecological preparation and certification:

a) Workers and ITR of the construction organizations;
b) Construction and transport divisions;
c) Civilians.

3) the ecological control at stages of industrial and economic activities:

a) Engineering researches on lines and platforms;
b) Engineering and ecological preparation of lines and platforms;
c) Building, transport works and tests;
d) Economic and household activity;
e) Regenerative nature protection and compensatory actions.

ECOLOGICAL SAFETY OF PREMISES

Ecological safety of premises is the one of the most serious problems. Materials for premises should be the high quality, ecologically safe, modern design, durable and rather inexpensive. However many new construction materials are not safe for health of the human. For the last decade the construction materials have appeared much. The pressed plates on synthetic pitches, plastic, artificial carpet coverings... Even widely widespread linoleum, in opinion of doctors of hygienists, should have the big restrictions in use.

Since long time the person have aspired to create maximum comfortable, long-term and ergonomic buildings. Technologies of construction and used materials were constantly varied. Mud houses were replaced by graceful towers, the stone architecture came on change to wooden architecture, domes and arches have appeared, development of steel-rolling technologies has allowed to create the graceful flights organizing huge internal spaces of structures...

The premise for the person is an original ecological niche that he/she is inextricably related the most part of life. Creation of the favorable internal environment of premises is impossible without taking into account of complex of ecological factors of various character and direction, besides a microclimate including toxicological, vibrating, acoustic, electromagnetic, radiating influences and parameters of insolation.

In XXI century, beyond any reasonable doubt, on the foreground the ecological approach to construction of dwelling is put forward. The leading role here is allocated to architects. Their new ideas, receptions and ways of designing with application of non-polluting building and finishing materials and systems of energy supply will help to make an inhabitancy of the person more comfortable and ecologically safe.

The diversified technologies and materials, a wide palette of architectural styles are today at the order of builders. The customer and the contractor choose the most acceptable variant according to a special-purpose designation of construction.

Now the task of creation of ecologically high-grade premises is actual proceeding from requirements of modern specifications of construction with use of the most advanced and the best building materials (walling, roofing, finishing, etc.) that favorably influences on the level of premise comfort according to ecological and sanitary-hygienic norms; in result the level of comfort of newly constructed premises is improved that is achieved by improvement of a lay-out and use of modern materials and technologies.

It is still early to speak about construction or architectural ecology, as while there are no appropriate experts, there is no sufficient scientific reserve. Even the normative documents have recommendatory instead of guided character. However even now it is necessary to speak about emergency of a scientific substantiation and practical introduction of ecological decisions at designing, construction and operation of building objects. Global character of influence of industrialization and urbanization on biological efficiency of a planet has demanded not simple actions on conservation but scientific, theoretical comprehension of the reasons that have caused threat to the natural environment and scientifically proved recommendations for its protection and rational use of natural resources.

The structure with the healthy internal environment, not polluting environmental space, energy economical, providing connection of premises with a nature, aesthetically in harmony with elements of building is called ecological structure. In such building it is possible to expect, and it will not be a gross blunder, the reduction of disease of the population on 1 - 2 percents and on separate kinds of pathologies disease may decrease to 8 times; the economy of the fuel going on heating of a harmless building may be 10 - 30 percents and more. The range of the concepts included in given definition is very wide. The person in a building, on the one hand, certainly should be protected from harmful physical influences (radioactive inclusions, for example, got in

a building material) and on the other hand, the person should learn to concern carefully to everything that surrounds him/her. In Germany, for example, at a choice of terms of repair of old houses even the periods of duplication of the bats nesting on attics and under eaves of roofs are taken into account in order not to break their ability to live.

Earlier the buildings were projected and constructed in view of requirements that today can be named ecological. They were formulated by municipal (housing) hygiene, architectural, technical, building and other sciences and included the requirements to a site of building, to its accomplishment and gardening, to illumination and isolation of premises, sound protection, to a heat-shielding, to quality of air, etc. Aesthetic requirements also always formed the basis of designing of houses.

In the first half of XX century the leading program of architects was the so-called Athenian charter proclaimed by the International union of architects under initiative Mr. Le Korbusie in 40th years. It contained the appeals to maximal use of the sun, air, and greens in dwellings. In the second half of century when these principles, apparently, began to concede to the fashionable form creation nevertheless the idea of harmless architecture gets popularity. Then in the West the mass construction of low-rise buildings surrounded with gardens with application extremely non-polluting building (a tree, the clay, a natural stone) and finishing material, with the maximal heat-shielding, with use of energy of the sun and a wind, with systems of biological processing waste products, etc. began

However last decades the ecological conditions in buildings and around of them has so worsened that the exigency for revision of some requirements has appeared. Even today the tendency of approach of architectural creativity with ecological requirements is observed.

It is obvious that process of ecologization of buildings when designers and builders are guided first of all by the needs of a human body, will result in the decision of ancient and eternally new ecological-aesthetic tasks, for example, to formation of architecture of buildings harmonious with environmental space and a nature and even to occurrence of new fields of knowledge.

Achievement of power rationality of buildings is not only architectural but also the complex engineering task following from a global problem of economy of energy of not renewed resources and attraction renewed resources. The exigency of reduction of winter losses of heat for heating of buildings compels the introduction of the most severe norms of thermal protection of walls, coverings of buildings.

The given examples testify to the necessity of ecological monitoring of buildings. Meanwhile the certain development for realization of such monitoring are available: classification of the external environment from a condition “comfort” up to a condition “degradation”, classification of ecological factors by a degree of risk for health and life of human are known, there are the developments on maximum permissible levels and concentration of harmful influences in an inhabited environment according to climatic conditions of ability to live of the person in dwelling.

It is possible to consider the well-developed nomenclature of town-planning means of maintenance of ecology of environment. Features of a layout of ecologically high-grade premises, ecological requirements to building materials, to designs of houses and to their engineering equipment are known. It would be good to make as normative also other ecological qualities of premises.

Concepts “ecological premise” and “good, healthy, high-grade premise” are actually identical. It only confirms the thesis that good architecture is always ecologically verified architecture.

In modern premises the person is exposed to complex influence of the big group of chemical substances, biological agents and physical factors. Penetrating from street, toxic

substances collect in the premise sometimes exceeding maximum concentration limit. The saturation of the premise by the polymeric materials, smoking, use of means of struggle against insects supplements the air with harmful impurity. Bacteria and mycelial fungus finding the favorable environment in an apartment for duplication become aggressive. Due to more wide use of electrical household appliances and amplification of electrical supply of buildings the quantity of the areas with the increased electromagnetic field has increased. There are cases of hit of radioactive gas of radon in an apartment.

The most widespread source of air pollutions in premises is repair - building materials from which secretion of unhealthy substances among which the most widespread are phenol, formaldehyde, benzene, toluene, ethylbenzene, xylene, mercaptan comes in internal air of premises.

The special attention should be given to polymeric materials used in furnish of premises. In particular they are a source of receipt in air of the most harmful substances, they promote the electrization of surfaces, negatively influence on ion structure of air, worsen heat-shielding properties of some designs, adversely influence to the microclimate of premises. The unpleasant smell created by them causing a condition of discomfort, cardiovascular frustration, attacks of a bronchial asthma concerns to negative properties of polymeric materials.

For example, the various wallpapers with polymeric coverings (washed, water-resistant) do not pass the air and the moisture, the harmful substances come from there at heating of air which inhalation may have an effect on a state of health of children especially negatively. The used materials for furnish of floors on the basis of polyvinyl chloride (PVC) pitches, various kinds of linoleums secrete chlorine hydrogen, phthalate, chlorinated and no limiting hydrocarbons (PVC), styrene, carbon bisulfide, sulphurous anhydride and other harmful substances in air of a premise.

Some linoleum are capable to accumulate charges of a static electricity on the surface that negatively influences on condition of an organism, results in pulling a dust and fast pollution of a floor.

Consequence of contact to various polymeric materials is occurrence of an allergy. The most often reasons of allergic dermatitis and eczemas are phenol-formaldehyde, epoxide, polyester pitches.

The carpet coverings intended for a covering of floors of premises are dangerous to health of the person. The huge quantity of a dust collects in them. Sphere of carpet fibers promotes duplication of microorganisms. The increase of quantity of bacteria and mycelial fungus promotes decrease of immunity, occurrence of diseases of respiratory system and allergization. The essence invisible by an eye lives in a dust called synanthropic tich which secretions are the strongest allergen.

Carpets and the carpet strips made of synthetic fibers (acrylon, nylon, polyether, polyurethane, polyvinyl chloride) secrete in air the toxic substances among that formaldehyde, organic cyanides, and etc. oppressing immune system.

Means of dry cleaning of carpet coverings consist of strong substances. They promote good clearing of a dirty and reduce the microorganisms in a covering however they are unsafe for an organism of the person causing irritations of mucous membranes and allergic reactions.

Plastic walls, wood-fiber and particle pressed boards plates operate adversely on the internal environment of premises. Unfortunately they almost have completely superseded furniture from the wood. The hardboard is rather offensive also. Phenol or carbamino-melamine pitches constantly secreting the products of the disintegration serve as binding substance in this material.

One more danger proceeds from furnish " under olden time ", " under an oak ", " under a nut ". All of them exhale unpleasant evaporations. Such modern furniture may "soar" by years...

Even more serious threat to health is the soft armchairs and sofas. Recently foam rubber and foamed polyurethane stuffing have completely replaced the old materials like horsehair, a tow, and dry seaweed. At destruction of foam rubber stuffing the each gramme of it secrete 50 - 60 mg harmful substances. The older such furniture the more dangerously it and it's necessary to refuse it flatly after ten years of using it.

A) A mode of temperature and humidity of air

One of central aspects of maintenance of ecological comfort in premises is the requirement to cleanliness of air. So according to German scientists there are 230 cases of a lung cancer at small air exchange in dwelling (about 0,1 volumes of air at one hour) on 1 million inhabitants and there are only 30 cases at significant air exchange (about 0,8 volumes of air at one hour). It would seem the question is simple and it could be solved by aeration. But practically it is difficult to provide comfort.

The accepted systems of natural exhaust ventilation usually executed carelessly at mass construction work badly especially in houses that have more than 2 - 3 floors. They provide air exchange in the order 40 - 60 cubic meter at one hour in premise whereas according to norms it should give 140 - 160 cubic meter at one hour. In multi-store houses there are the additional features strongly preventing normal work of ventilation. The discomfort accrues in the distance of premises from the ground in such houses.

For high houses also it is characteristic the unstable temperature - humidity mode that is connected not only to a strong internal vertical air stream but also with the big influence of an external wind on high construction. The top part of a house some kind of "collects" the street noise from the great area. Doctors - hygienists mark the growth of diseases of aerogenic infections in multi-store buildings.

A number of lacks of multi-store houses basically can be eliminated by architectural – technical means however even after their elimination this type of a house cannot be referred to ecologically safe.

The other major parameter of quality of the air environment in a premise is the cubic capacity of air falling on 1 person. The researches of doctors - hygienists have shown that the former norm proved at the end of XIX century presently may be considered to hopelessly out-of-date and do not adequate to the modern representations about interaction of some chemical elements of air in a premise.

The change of a chemical compound of air and the contents of the raised concentration of gases in air adversely influence on people.

Requirements to aeration of premises in which now has appeared a lot of new chemical pollutants (used at furnish of furniture polymers, household chemistry) should be also raised. On the other hand it is necessary to take into account that the losses of heat are very great at aeration that compels to condense the bars of windows (usual pasting for winter) and it much more reduces air exchange.

Very frequently at creation and organization of the workplaces it is forgotten that for comfortable work conditions values of components of a microclimate of a premise are important: temperature of air, relative humidity, speed of movement of air, temperature of surfaces, radiating temperature. A human body as multifactor function perceives the microclimate all its components is in interrelation with each other. In the premise the appropriate sensations of the person are inherent in the certain combination of temperature, humidity, speed of movement of air: comfortable or not comfortable. So for example the warm air with low humidity (so frequently inherent in modern apartments and offices) operates as drying on mucous membranes of eyes, mouth, the top respiratory ways and may result in formation of cracks of mucous membranes and a bleeding of fine vessels. And on the contrary: long and often stay of people in conditions of the raised humidity burdens current of many diseases. Patients of hypertonic illness

and arteriosclerosis are especially sensitive to high humidity. At high humidity favorable conditions for growth of a mould, pathogenic bacteria in air are created.

Experience of many countries testifies to expediency of strict batching input air by the device of artificial ventilation with obligatory heat exchangers on an entrance of clean and on an exit of polluted air. It is possible only way to come nearer to desirable air exchange at economical power spending. Also it is necessary to take care of necessity of restoration of important for health ionozon structure of natural air.

Thus having mentioned only some aspects of a problem of creation of a harmless building of cleanliness of air in a premise it is possible to be convinced of necessity of the complex approach to a question. New techniques of the joint account of some factors that were earlier considered separately or were not considered at all are necessary. The quantity and character present in potential pollutants in the premise, the quality of external air, the volume of a premise in calculation on 1 person, the technical devices (ventilation and a design of windows, electric and heating devices etc.) enter into their number.

Problem of aeration of air of premises is widespread enough. In building plans natural ventilation for uninhabited buildings is frequently neglected. In such cases in all building, connected the uniform system of ventilation the air exchange breaks. In these houses it is possible to notice that air and the substances taking place in it collected from all building do not leave outside but circulate on all building. At that completely not useful air conditioning comes on change of natural ventilation.

Air in the premises with infringements of natural ventilation has the most unpredictable structure: the substances contained in polymeric materials, household chemistry, building designs, mycelial fungus, bacteria, consequences of persecution of insects and the rodents harmful to an impurity appearing in working process and at repair of premises, etc.

People spend a considerable part of the life in the premise therefore its sanitary condition is very important. The greatest value has quality of the internal environment of premises for health of children. This group of the population is especially subject to influence of adverse external factors.

Plants for clearing air: the fashion on cactuses at computers for neutralizing computer radiations is an error. In order the plants to neutralize electromagnetic radiation of devices it is necessary to put the computer in the bushes. Another thing the plants ionize air, which loses the own properties at contact with monitors or computer fans. The most useful and accessible plants are chlorophytums. Earlier they are liked to hold at schools. They absorb harmful chemical substances, kill bacteria and well humidify air. Also myrtle tree, box tree, mint, lavender, lemon well suppresses the growth of microorganisms. From fashionable plants the dracaena, dieffenbachia; ficuses absorb poisons in good way.

B) Radioactive (ionized) radiations

There are 3 kinds of radiations an alpha-, beta-, gamma - radiation. Gamma - radiation has the big energy and the penetrating ability and can very deeply delve into a human body. Harmful consequences of an irradiation come to three groups of diseases: oncological diseases of different organs, genetic damages at descendants, radiation sickness.

Ionize radiation as well as other permanent physical and chemical factors of an environment in the certain limits are necessary for normal ability to live. Such favorable influence on biota (all alive, including human) has small dozes ionize radiation peculiar to a natural radiating background to which for millions years of evolution life on our planet is adapted. It is known that influence of ionize radiation in very small dozes stimulates development and growth of plants.

It is important not only the general level of a doze but also localization of an irradiation. Technigenic radioactive nuclide may have special distribution in an organism and create a local irradiation in the fabric, which has been not adapted to it during evolution. So radioactive strontium getting in an organism even in a small quantity collects in bones and adversely influences a bone brain causing development of leucosis.

The radiating background in premises is composed from emitted by actually building materials (including secreted at disintegration radon included in their structure radioactive nuclide) and the radon filtering from bowels of the ground through the basement and a floor. Radioactive gas - radon rising on breaks of an earth's crust gets in cellars on ventilating mines and it moves on other floors through the staircases, water-drains, emptiness and cracks with streams of air. On an open place radon is dissolved of such low concentration that does not cause anxiety. However heavy radon collects inside the closed premises. Products of disintegration of the radon collecting in lungs and bringing to occurrence of a cancer (the received doze of an irradiation is more than from all other sources of the irradiation taken together) are most dangerous. Time past between the beginning of influence of radon and the beginning of disease may make some years. Consequences of an irradiation depend on size of the doze received by the person and individual distinctions of people.

Radon *Rn* is the product of radioactive disintegration of atoms of uranium, thorium and radium gets in an atmosphere from rocks. For the first time this element has been opened by English physicist Mr. E. Rezerford in the 1900 year which he has named its by emanation (derivative of a Latin word "outflow"). English physicist Mr. Dorn gave the name «radon» to gas in 1900 year. The word "radon" is a derivative from a word "radium". Radon is formed at radioactive disintegration from not only radium but also uranium *U*, thorium *Th*, actinium *Ac* and other radioactive elements. Therefore earlier radon was named thoron, actinon and niton.

Concentration *Rn* in an atmosphere depends on a condition of a magnetic field of the Earth. Its amplification causes repeated compression and expansion of rocks and as consequence secretion of *Rn* from their micro cracks (concentration *Rn* in pores of rocks in 10^6 times more than in an atmosphere). Radon is radioactive and consequently its radiation derivates aero ions in an atmosphere. Probably one of the chains connecting activity of the Sun and state of health of live essences looks so:

The sun - a magnetic field of the Earth – radon – aero ions - the person

Radioactive radiations may carry invisible health hazard of people. Also it is established that radon collects in a brain of the person that is adversely reflected in activity of an organism. Apparently the Sun influences on biosphere on different channels and one of them is radonic.

Radon in small concentration contains in all mineral waters. Some of them are named radonic.

In an organism the sexual and hematopoietic cells and also epithelium of thin gut cells are the most sensitive to radiation. Embryo tissue, young tissue and also organs during formation are very sensitive to action of ionize radiations.

Genital function of irradiated people is broken. Danger of oncological diseases of blood - leukemia is increased also. It is connected to defeat of the basic hematopoietic organ - a bone brain. The bone brain of children is the most radiosensitive organ. The change in work of a thyroid gland, hypophysis, and sexual glands concerns to the distant consequences of action of ionize radiation. English physicochemic Mr. Ramzai was lost from lung cancer caused by the radon action in 1916.

Effective way of struggle against radonic pollution is the improved isolation of the basements, normalization of a mode of air exchange in premises and application of building materials with allowable total specific activity of radioactive nuclide.

Relatively recently it was found out that walls of houses from breezeblocks and organic concrete are the sources of radiation. Radioactive gas radon secretes from radium and thorium contained in these materials (in microscopic amounts but obviously bringing harm). Walls of "clean" houses radiate up to 50 micro roentgens at one hour it is the level of a radioactivity considered allowable for health but the level of the walls from breezeblocks is greater.

Concrete plates contain such danger. They actively absorb moisture from air. And dryness of room air causes not only unpleasant sensations but also diseases of the top respiratory ways, fragility of hair, peeling the skin, irritating discharges of a static electricity. To solve this problem the dampeners of air, aquariums with fishes, vessels with the water established on batteries will help.

Regular airing of rooms essentially reduces the contents of radon in air. Dense wallpaper and good plaster limit the secretion of radon and flying organic polymers from walls. Washed wallpapers with a polymeric surface are ecologically harmful but reduce the nocuous secretion approximately ten times.

C) Electromagnetic radiations

The constant increase of intensity of technogenic radiations is marked in last 10 years. There are computers and other office equipment in premises. Power consumption and loading on the cables grow with each year. In this connection values of technogenic electromagnetic fields on workplaces are increased. At the same time various constructions (including concrete designs) detain the natural geomagnetic field of the ground beneficially affecting on health of the person. Thus there is an electromagnetic disharmony with a nature that may become the reason of various pathologies.

The household electrical devices including electro dampeners of air have also the minuses. Their surplus promotes occurrence so-called "elecrtosmog" in premise the excessive electromagnetic field negatively influencing health. For example the case is the known when the person going on a synthetic carpet in an environment of various electrical devices became the carrier of 20 thousand volt of a static voltage. It is necessary to keep in mind that electro smog is not only a headache, stress, an allergy, sleeplessness and cardiac arrhythmia but also accidents, even huge accidents (in Japan robots left from the control owing to "electromagnetic pollution of an environment" became the reason of destruction of people).

Adverse influence of electromagnetic fields is shown, first of all, in infringements nervous, immune and endocrine systems.

To exclude completely the influence of electromagnetic fields on a workplace is impossible however it is necessary to consider at increasing of values of an electromagnetic field above the certain level. An electromagnetic field unhealthy for person can be determined with the help of the usual monitor on the basis of an electron beam tube. " The monitor vibration effect" on the switched on monitor is marked at values ЭМП in 2-4 times exceeding norm.

Complaints to impossibility to work on the computer because of constant the monitor vibration are very often. The secret originator of this problem is the strong magnetic field influencing rejecting system of the monitor. Imagine how it influences on the human body! The cardiovascular system is more sensitive to this influence. Headaches, feeling of insuperable weariness are the consequence of influence of electromagnetic fields. So in a case of the monitor vibration the value of a low-frequency component of a magnetic field exceeds 0,5 mkTl and in some cases the values are marked in 6-7 mkTl on all area of office that has extremely fatally an effect on health of employees.

The raised electromagnetic background in premises is found basically in the following cases:

· unforeseen increase of loading at the electric cable of a building which are taking place near to workplaces; an electromagnetic field from electric wiring of buildings (an often problem, especially in old buildings because of unreasoned system of electro supply). Growth of power

consumption in the building brings to the increase of loading on the cables that in turn causes increase of an electromagnetic field;

· presence of the objects being sources EMF. Presence of electric mains next to premises, an arrangement of the process equipment in buildings, transformers, power cables.

· incorrectly organized workplace: a plenty of the switched on office engineering, randomly laying wires, not switched off unused devices;

Now the influence of electromagnetic fields on all systems of a human body is established. Their action on an organism is defined by intensity and duration of influence. The most sensitive to electromagnetic fields are the central nervous, cardiovascular, hormonal and reproductive systems. High enough correlation between development of tumors and influence of a magnetic field is marked. Also it is known that electromagnetic fields promote amplification of influence of the toxic substances contained in air.

People with diseases of the central nervous, hormonal, cardiovascular systems, with the weakened immunity, allergy should especially carefully observe the rules of electromagnetic safety and preserve themselves against influence of electromagnetic fields.

D) Noise, vibration

Noise is the same slow murderer as chemical poisoning. The first complaints to noise that have reached us can be found at Roman satirist Juvenal (60 – 127 years). He asserted that in capital " it was difficult to fall asleep: a scratch and the roar of transports in narrow streets, abuse of drivers prevented dream, irritated. The most part of patients - he wrote - dies in Rome from a sleeplessness ".

Modern noise discomfort causes unhealthy reactions in alive organisms. The sound of flying by jet plane for example depressively operates on the bee; it loses the ability to orient. The same noise kills the maggot of bees, breaks openly laying eggs of birds in a jack. Transport or industrial noise operates depressively on person - tires, irritates, blocks to concentrate. As soon as it ceases the person feels the simplification and rest.

The noise level in 20 - 30 decibels is practically harmless to the person. It is natural sound background without which human life is impossible. For " loud sounds " the allowable border is approximately 80 decibels. The sound in 130 decibels already causes painful sensation for the person and in I5O decibels it becomes intolerable for him. The sound in 180 decibels causes weariness of metal and at 190 - the rivets are pulled out from designs. Not without reason in Middle Ages there was an execution " under a bell ". Ring of bell slowly killed people.

Any noise of sufficient intensity and duration may result in decrease of acoustical sensitivity.

Irreversible changes happen gradually in an ear under influence of strong noise especially high frequency. At high levels of noise downturn of acoustical sensitivity comes even in 1-2 years of work, at average levels it is found out much later in 5-10 years.

Noise and vibration that influence, for example, on working people and present people in a zone of manufacturing of concrete variously. In many countries allowable norms of noise for residential and industrial zones as in daytime and at nighttime are legislatively established. Many measures of technical character on reduction of noise level and vibration are developed however most effectual measures is rather recent invention – self-packing concrete. It is developed in Japan with the purpose of substantial increase of quality, elimination of vibrating at stacking, increase of culture, safety and appeal of work of construction workers and decrease of harmful influence of process of concreting on an environment.

ECOLOGICAL CONSEQUENCES OF REPAIR - CIVIL WORK

The greatest ecological damage at construction is put to a nature by that for constructing object, a building site, the access roads the significant ground territories are allocated for constant and time using. Besides the area occupied actually by constructing object, in constant using the grounds for the device of communications, access roads, pipelines, electric transmission lines, communication lines, construction of auxiliary constructions (parking places, garages, warehouses, clearing constructions and so forth) are alienated. Quite often the future functioning object demands the development of a social infrastructure, i.e. construction of a time complex of housing and civil objects. Under this construction the agricultural, wood or hunting lands and even recreational zones are frequently alienated that the considerable damage is caused. Negative influence appears also on anthropogenesis objects, more all on buildings and constructions: stone and metal designs collapse, the paints fade and collapse, colored external protecting designs change the color, sculptures and ornaments of ancient monuments perish, roofs, farms of bridges are undermined by corrosion, expenses for clearing and coloring of facades and repair of buildings and constructions are increased.

Therefore construction demands the balanced and proved approach.

Till recently the primary goal of construction was creation of the artificial environment providing conditions of ability to live of the person. The environment was considered only from the point of view of necessity of protection against its negative influences on newly created artificial environment. Return process of influence of building activity of the person on natural environment and the artificial environment on natural to the full volume became a subject of consideration rather recently. Only separate aspects of this problem, in a measure of practical necessity, were studied and solved (for example, removal and recycling of dross, care of cleanliness of air in settlements...). Meanwhile construction is one of powerful anthropogenesis factors of influence on an environment. Anthropogenesis influence of construction is various on the character and occurs at all stages of building activity - beginning from extraction of building materials and finishing operation of ready objects.

The ecological damage being caused to an environment during construction is not limited by the air pollution, waters, soils, destruction of flora, fauna, etc. In some cases the growth of loadings on soil (static, dynamic, thermodynamic) results in the undesirable phenomena and processes – to the subsidence, landslips, water flooding, erosion that threatens stability of erected object and breaks the balance of geotechnical system.

It is necessary to note such feature of normative documents: all their nature protection requirements and conditions concern only actually constructing objects but in any way do not concern building sites.

Probably therefore there is a stereotype of representation about a building site as a chaotic heap of various building materials, details, the metal, the broken engineering, a dirty knee-deep behind the lop-sided fence and a dust flying in all sides and easy building dust. And certainly if to consider closely nature protection contents CniP “The territory selections for construction” it is possible to be convinced that all in it concerns the grounds alienated in constant using under newly constructing object.

However the situation created as a result of building activity – the air pollution by a dust of building materials and the exhausts of heavy transport, the territories of firm waste products, building dumps, sound pollution, reduction of quality of waters - create sharp discomfort to the population, render negative influence on health of people and harm to an environment.

In foreign practice the culture of construction manufacture and real measures on conservancy are strictly observed. The area under a building site in foreign practice is less in 2-3 times than it is accepted here that is achieved by a vertical lay-out of storing building materials and designs and even welfare projects (or, easier speaking, change houses). The building dust is not thrown out the window but lowered on the closed trenches in the bodies of lorries closed by a canvas.

Abroad there are the very rigid norms of land tenure, protection of cleanliness of air, soils and even roads; the very strict control of observance of these norms. Unfortunately we have the standard practice - unsatisfactory ecological maintenance of construction.

The conception “ecological maintenance of construction” (in a broad sense it includes all complex - building materials, designing, researches, construction industry) can be determined as the complex of rules, requirements and norms, actions and the works, special objects on maintenance of the maximal preservation of an environment and the minimal expenditure of natural resources at construction of buildings and constructions. It is necessary to add conditions on minimization of damage from processes of construction with its obligatory subsequent liquidation or indemnification.

At ecologization of construction it is necessary to take into account the norms of a payment for resources - the grounds, water, air, wood, etc. It is necessary to reconsider them. But it is difficult to hope for their efficiency if payments and penal sanctions are shown only to punishment of the organizations instead of the personal originators of damage.

The modern level of requirements to conservancy and the rational use of resources does not exclude the consideration separately questions of protection of air, water, soils, preservations of flora and fauna, the savings of resources (the grounds, waters, woods etc.) etc. Separate sections on these questions are necessary in all design documents (detailed design and technological designing).

They are necessary first of all for the purposes of the control of the parameters describing the condition of the natural environment and also for new tasks of eclogization of all construction complexes. Ecologization consists in ecological certification of constructing objects (estimate characteristics), the construction organizations, technologies of civil and erection works, building machines and mechanisms, transport for transportation

In the general balance of pollution of atmospheric air the share of motor transport carry more than 50 % of harmful emissions. For branches of construction this share is much higher – 80 - 85 %. Exhaust gases of engines of internal combustion are the mix containing more of 200 various substances which majority rank to harmful today. The basic substances – pollutant are the oxide carbon (IV class of danger), hydrocarbons (III class), oxide nitrogen (II class), carbonic gas, formaldehyde, soot, connections of lead, etc.

Intensive expansion of construction has predetermined necessity of creation of a new class of the special environmentally safe transport and building engineering adequate to high requirements of its ecological safety. Besides the organization of non-polluting motor transport services including system of actions for a rational choice of bases of construction is necessary; accommodation of the equipment in view of the maximal localization of sources of direct pollution; the remote control of concentration of pollution and an estimation of the general background; improvement of systems emergency alarming and blocking and also preventive maintenance of ecologically extreme situations; education of experts in the field of preservation of the environment.

The general principle of preservation of the environment at construction should become saturation by nature protection requirements, actions, works, and objects of each chapter of the project documentation instead of entering of these major questions into separate section right at the end of the project.

During construction - repair work an infringement occurs on sites, adjoining to zones of civil work. The broken grounds are considered the grounds lost the economic resources or being a source of negative influence on an environment in connection with infringements of a soil cover, a hydro-geological mode and formation of technogenic forms of a relief as a result of industrial activity of the human.

Sites are broken because of the device of time roadways, pollution of a soil - earth layer by the rests of building materials, household drains. There are a solution, reagents, scrap metal, floods of combustive-lubricating materials, etc. on sites.

The significant area of the broken territories is formed because of movement of engineering outside of roads. The width of “roadway” of time roads is being increased all time because they become almost impassable thus the strong degradation of soil - vegetative cover occurs. Local destructions of landscapes in result of technogenic infringements of a soil cover entail a number of negative consequences, for example, destruction of vegetation.

Driving of trenches locally changes the nutrition of moisture of a vegetative cover, brings to the ruin of sensitive to mechanical and other influences the vegetative cover.

Dangerous outflow of various polluting substances remains sometimes unnoticed for a long time and causes the great damage to all ecologically significant objects of the environment.

Quite often on lines of a drain of superficial waters conditions of technogenic irrigation (bogging, stagnant, etc.) are created.

The wood vegetation suffers from the result of an overload from economic activities of the person.

REQUIREMENTS TO THE CONSTRCUTION MATERIALS

The problem of materials is that in XXI century they should become accessible and non-polluting. At their application it should be taken into account power consumption, ecological compatibility and life cycle. Power consumption means energy cost on manufacture, transportation, stacking and operation of the material. Thus it is necessary to take into account renewable of this material and energy sources for its production and to try to choose materials with the least power consumption. Ecological compatibility defines whether the material and its secretion are harmful for health or it demands sheeting whether the waste products of construction and operation of a material are harmful or how much ecological and economical technologies of recycling of a material and its waste products and also whether the material attributes to number of local. Life cycle is service life of a material, its maintainability and interchangeability, an opportunity of a reuse or harmless cheap recycling.

Displacement of priorities for the benefit of harmless construction would allow to improve in many respects ecological safety and to remove even partly many harmful influences. The estimation of construction materials from the point of view of comfort and improvements of a microclimate should be done on the basis of sociological and sanitary-hygienic researches but not just through normative parameters of quality and pricing. Even if each of products and materials is characterized by allowable secretions of organically harmful substances - residual monomers, softeners, stabilizers, etc. - their total harm especially at long influence may be reflected on health of the person. The complex account of all factors is necessary and only on this basis updating of standards and specifications on building materials will be carried out.

The adverse economic situation in the country in 60-80-ies years has everywhere resulted in reduction of the area and a cubic capacity of premises against optimum, to almost full replacement of a building brick by the precast concrete. It, certainly, has had an effect on ecological safety of buildings, in particular, the seepage of external air has resulted to it denaturation on the ozone mode.

Separate groups of building materials differ essentially different harmful influence. For example, mineral materials as a rule influence only on temperature-humidity mode and a radiating background in dwelling.

The basic kinds of thermal insulators made by the industry are mineral wool hoard on synthetic binding and broaching mats. As binder phelolspirits basically are applied allocating during product operation phenol and formaldehyde and because of imperfection of the "know-how" they are applied in the raised amounts and the worse quality. Volumes of manufacture of non-polluting plates on bitumen and starch binding are rather insignificant.

Broaching mats on their thermal insulatoring properties do not concede to semi fixed plates and their application for warming of light designs of walls and coverings especially in low-store construction, allows to exclude the usage of phelolspirits that has positive effect for sanitary-hygienic conditions in premises and the heater shrinkage in designs. The main lacks of thermal insulatoring polyfoams made, in particular, in Russia are: combustibility and toxicity that essentially limits area of their application.

Recently in the countries of EU the opinion about cellular polystyrene as the ecologically harmful and fireproof material has changed. The cellular polystyrenes with the fire-retardant additive (lowering inflammability of the material) have the lowered combustibility (ability to self-attenuation after removal of the external source of fire) and may be applied in construction in a composition with other materials.

It is necessary to especially touch the question of manufacture and application of asbestos building materials (slates and a pipe). In the world practice it is authorized by the Convention of the International work organization № 162 dated June 4, 1986 "About labor safety at use of

asbestos". In seven countries - Finland, Denmark, Sweden, Germany, Netherlands, Austria and Italy - asbestos materials are forbidden in view of carcinogenicity of asbestos. Since January 1997 France has joined them also. Similar interdictions began to be entered by local authorities and in Russia (in particular, in Leningrad region).

Use of fibers - substitutes of asbestos was extended in foreign practice: vegetative (cellulose, jute, etc.), mineral (alkali-resistant fiber glasses, a basalt fiber, mineralized vegetative fiber, etc.) and synthetic (polyvinyl and polyacrylonitrile). Similar actions are conducted also in Russia.

As the roofing material the metal tiling is the most appropriate which combines small weight (4,5 kg on 1 sq. m), modern design, good anticorrosive properties and long service life. The metal tiling with a plastic covering does not demand the massive roof timber part; it is simple in installation and operation. The profiling sheets with a polymeric covering in the form of the tile have recommended themselves only from the positive side.

Consumption of paints on the basis of solvent is reduced all over the world with each year cause this kind of paints is least ‘friendly" in relation to the environment and to the person.

People are exposed to influence of organic solvents and other substances contained in them at use of glues, paints and varnishes. Some special glue contains such harmful substances as phenol, formaldehyde, chloride vinyl, and ethyl acetate; there are inorganic pigments, which represent salts of heavy metals in paints. Varnishes and paints contain the solvents and the substances affecting the nervous system and working narcotically - butyl acetate, vinyl chloride, acetone, xylene.

And still the returning to natural materials already was planned.

Speaking about harmless paint and varnish materials we shall consider more detailed the properties and features of application of natural paints on the basis of oils and wax.

In connection with growing interest to ecologically safe materials the approach to the paint and varnish materials conceptually has changed. For internal furnish the natural paints - the painting substances made on the basis of natural raw material more and more actively begin to be used. Today technologists are unanimous in opinion: the protective means (in particular means used for internal furnish of premises) should not limit the natural characteristics of wood. Material has to remain elastic, "to breathe" (the micro changes: the expansion and the compression occurring on a level of humidity of air) in order to influence favorably on the climate in a premise. The natural paints on the basis of oils and wax meet these requirements. They are named sometimes "biopaints" as the raw material for their preparation are used the vegetative pitches and oils, wax, natural dyes, materials of an animal origin and natural mineral substances.

They have the name "natural" or "ecologically safe" because the use of the synthetic materials, chlorinated hydrocarbons, heavy metals, softener, etc. is excluded at their manufacturing

The structure of any both synthetic and natural varnishes and paints contain three basic components: the pigments, binding substance (or film former) and solvent. Pigments represent a color powder, which sticks to the surface only due to binding substance. Solvent promotes the paints not to harden and easily lay down on the surface but upon termination of process of adhesion it evaporates.

Traditional paint and varnish materials contain as a rule the set of flying organic connections such as acetone, xylene, toluene, ethyl benzol, etc. which represent serious health

hazard. Through the lungs and skin they get in blood collecting in the person organism causing allergies and other illnesses. However even after the process of evaporation has been finished solvents do not cease to harm: firstly they become a part city smog and then rise above destroying an ozone cloud.

At opposition to these materials the biopaints are made on the basis of substances of a natural origin: vegetable oils (linen, sunflower, soya, thistle or sow-thistle and some others); waxes (carnauba, candelilla, bee, etc.), vegetative pitches and pigments. Citron oil (citron terpene), turpentine and rosin are used as solvents for natural paints. All these components pass ecological processing and are specified on packing with its full complement. One German firm, for example, uses for manufacture of the paints the oil from secondary squeezing of linen seeds grown in non-polluting areas under the constant control of experts - biologists. The first squeezing gives the high-quality vegetable oil used in food and the oil cake goes on forage to cattle.

The experiences carried out by German experts have denied the popular belief that quality of natural paints is lower than quality of synthetic. Perhaps their unique distinction in this sense is that natural paints dry longer. However in struggle for ecologic compatibility of the dwellings the time is not a pity...

Now especially for processing wooden and pith coverings the special kinds of paints on the natural basis are developed which deeply penetrate into a material leaving the pores open. The tree keeps the natural elasticity; due to open pores there is the circulation of the moisture that reduces probability of swelling or shrinkage. The wooden surface becomes steady to rubbing and gets good operational properties.

So special oil with firm wax, which gives water-and-dirt resistant properties to wooden surfaces, is developed. Their stability to influence of various liquids (fault, beer, coffee, tea, juices, milk etc.) is confirmed with tests and meets to industrial European standards.

Oil and wax in a new product are hashed by chemical, mechanical and physical ways, i. e. are connected in one molecular chain. The developed product has the big percent of the firm particles content: from 85 up to 99 % thus, whole substance, putted on wood, adhesions with it. Application of wax is caused by that if oil is put only on wood, it may penetrate too deeply in pores (depend on structure of wood), and in connection with wax depth of penetration makes about 0,2-0,3 mm.

***Oil impregnation and waxen mastics*.** Oil impregnations distinguish with a plenty of solvent (75 % of solvent and 25 % of oil), average on a degree of viscosity (45 % of natural oil and 55 % of solvent) and rich (90 % of natural oil and 10 % of solvent). Waxen mastics are subdivided on firm (paste-like) and liquid on the basis of solvents (turpentine) and on the basis of mastic without solvents. Now wax is made from synthetic paraffin and natural waxes of vegetative and animal origin with antiskid additives and additives of vegetable oils.

Oil impregnation and waxen mastics are used as alternative of varnish coverings that can be explained by the several reasons. First, in parquet and furniture manufacture various exotic breeds of wood recently are widely used. As is known, varnishes poorly are applied on the breeds having a plenty of natural oils in the structure. Even first coats frequently do not save the situation. Therefore much people have had to rediscover for themselves the forgotten technologies of drawing of paints on the basis of oil and wax.

The second reason: the new (or well forgotten old) tendency to preservation of a relief, structure at processing a parquet board. However the relief massive board demands the special furnish. To varnish such surface is impossible since updating of a varnish demands polishing that will result in disappearance of a relief. Therefore for the structured floor coverings only oil impregnation and waxen mastics are used as furnish.

At the end of 2002 in the number of the European cities the research on application of various building and facing materials at construction of buildings was carried out. The Institute "Fraunhofen Institut", the Technical Higher Educational Institution in Helsinki and the State scientific research institute of Finland has taken part in it. Doctor Mr. Karee Z.Samson from Canada has acted as the head of research.

The conducted researches have shown that wood gives the best microclimate in houses. Thus improvement of the microclimate is connected to hygroscopic properties of wood, i.e. its ability to absorb and give the moisture. These data are also confirmed by the international research, which has been carried out by "Improving Indoor Climate and Comfort with Wood Structures". As the result of it the conclusion was made that "wood surfaces inside premises considerably improve the microclimate in comparison with premises with internal furnish from steam proof materials".

With development of the chemical industry, as it is known, the "know-how" of building and finishing materials also improves. However in this case we face with the new problems frequently connected already with the ecological factors.

These problems may arise not only at construction of frame designs, where very frequently (for example, at furnish of an interior) the different sorts of glues, condensation, coverings, decorative plates, filling etc., containing various chemicals are applied.

In Europe the different sort of state and, including ecological, inspections, carries out the strict control of quality of the building material made by factories. However, at prohibition or restriction of application of any material or substance, the mass of new materials is born which harmful influences can be poorly studied.

Thus for health of the person, the house from massive wood is the best material. At construction of a house from wood, it is entirely almost possible to avoid application of materials with the contents of chemicals. In such house it is desirable to apply designs that do not demand at all to use the full steam proof isolation in the superficial structure, and ability of wood to absorb heat and pairs can be used for the reception of the healthy microclimate in any premises.

Ecological cost of the building is influenced essentially with used building materials. From the point of view of ecology, the most effective design is the design from massive wood. For example: the timbered wall with the thickness of 100 mm (sawing up, drying, chipping and other kinds of processing) demands not renewed energy - 144 MJ/m2.

For comparison:

The silicate brick demands energy	230 MJ/m2
Burnt clay brick	480 MJ/m2
Concrete	400-500 MJ/m2
Plaster plate thickness	85 MJ/m2
Timbered molded board thickness	27 MJ/m2

It is obvious that in the past the production of protection-decorative structures was based on application of extremely natural pitches of mineral, vegetative and animal origin. Ancient technologies have passed the check by time: until now the products from the wood covered with natural protective materials keep the properties.

So everyone has heart about well-known violins of the Italian masters. However not everyone knows that the studying of ancient violin varnishes has shown there the presence of rubbery substances giving the basis to assume, that such masters as Amity, Stradivarius, Gvarnery covered their violins with the euphorbia juice rather rich rubber for the best sounding.

Until recently as the best pitch - film former for furnish of stringed musical instruments played by plucking - guitars, violins etc. was considered sandarac - the vegetative pitch extracted from trees of family cypress. Up to the first quarter of the twentieth century, within two centuries, the one of the most widespread film formers for manufacturing of spirit varnishes and polishes was shellac - pitch of the biological origin. Shellac materials were applied for furnish of furniture and keyboard tools.

The antique furniture from oak, chestnut, ash-tree was frequently finished by waxen mastics that were used and as the independent integument material and as the first coats under spirit varnishes.

However at the present time the compositions, in which natural pitches serve as film formers, are used infrequently - basically in a life and at restoration works.

Stone materials

Stone materials are widely used in construction at the device of the bases, at the laying of plinths, columns, walls, furnaces, stone fences and sidewalks. Among stone materials are rubble stone, cobblestone, boulders, shell rock, gravel, and road metal and also sand.

Rubble stone

Among rubble stones are limestone and sandstone. By form kind the rubble can be flat, flag forms. Such rubble is named flag. Flag, without the cracks, extraneous inclusions and stratifications, is suitable for construction. Flag quality is defined by the impacts of a hammer. If the piece of stone issues the soniferous and pure sound it can be applied in construction.

Cobblestone, boulders

The cobblestone may be the various form and the sizes. It is used as usual filler of concrete solutions at the laying of the bases, and also may serve as the material for the laying of plinths of buildings, the bases of stone fences and fences, decorative furnish of stone and brick houses.

Shell rock

The shell rock is extracted in stone quarries where there was a sea many - many years ago, and it is, not that other, as fossils of the sea-bottom. At sawing up of the shell rock on plates and blocks the fossilized rests of shellfishes are visible in its structure, for what the stone has received such name. It is widely used in southern areas for the laying of houses, fences and also internal furnish of public buildings.

Gravel

Gravel is rather fine stone of the various forms. Fine gravel has the sizes 5-20, average - 20-40, large up to 80 mm. It is widely used in construction, especially for various fillings and pads.

Road metal

Road metal is received by crushing rocks. The best road metal is considered from firm rocks, for example, granite. It is widely used as filling of concrete in crucial designs.

Sand

Sand can be river, lake, mountain, ravine and sea kinds. Ravine and mountain sand frequently have clay impurity that demands for lines of works of its additional washing. The contents of impurity of all kinds should not exceed 5 % from volume.

Sand is more often applied as the filler at preparation of clay and cement mortals. Performance of crucial works needs the more fine and pure sand. For final finishing by the cement mortal and for the clay solution at the laying of furnaces, sand, as a rule, is sifted and the more fine sand is applied.

Sea sand frequently is with extraneous inclusions; it should be subjected careful washing for removal of salts that worsen the quality of cement and concrete solutions.

On size of the grain sand divides on fine, average and large.

Ceramic materials and products

Ceramic materials are the artificial received materials by roasting (unary or double) special mixes which basic component is clay. "Ceramos" - in ancient Greek language meant potter's clay and also products from burnt clay. In the deep antiquity utensils were received from clay by roasting, and later (about 5000 years ago) a brick, and then a tile, began to be produced.

The big solidity, the significant durability, the decorative effect of many kinds of ceramics, and also the prevalence of raw materials in a nature have caused the wide application of ceramic materials and products in construction. It is possible to be convinced of durability of ceramic materials on the example of the Moscow Kremlin which walls were combined almost 500 years ago.

Ceramic products can be conditionally divided on density into two basic groups: porous and dense.

Ceramic materials are widely used in construction at the device of sewer and drainage drains, flues, as fillers and painting and decorating.

Ceramic pipes. Ceramic pipes are made of ordinary clay with a strong, dense core, glassed from the internal or internal and external sides. The basic purpose of such ceramic pipes is the device of sewer drains.

The set of shaped details - clutch, tees, transitions from one diameter on another etc is issued to the pipes.

Besides for use in systems of the water drain, ceramic pipes are used as flues and chimneys. After installation and connection bricks or concrete faces the pipes.

Oven tiles. Oven tiles are the magnificent material for facing furnaces and fireplaces. Tiles are made of the mix of sand and fire-resistant white clay. After pressing and roasting on a face sheet of tiles glaze, which demands repeated roasting at high temperature, is put. The fused glaze forms the thin glassy frosted covering on the surface of the tile.

Haydite. Haydite is the easy porous material received at accelerated roasting fusible clays. On appearance haydite reminds gravel and represents spherical or slightly extended pebbles almost correct form. Their size changes from 3-5 up to 25-30 mm.

Due to the specially picked up mode of roasting, there are two processes almost simultaneously in raw material – clay swells up that gives the porosity of a material, and the external surface quickly get sweat that gives to the material high enough stability to external influences and creates almost tight environment.

Haydite is so light that does not sink in water. The basic scope of haydite is its usage as filler for the facilitated concrete and ferroconcrete designs, and also in manufacture of expanded-clay concrete blocks for technologies of the accelerated construction. It is stack as a bulk layer in

interfloor blockings and double floors of the ground floor for improvement of heat isolation of the premises.

Haydite has the mark that is the designation of weight of one cubic meter of this material in kilograms. Marks are made from 200 up to 800. Some technologies allowed achieving the reception of the super light marks - up to 150 kg in cubic meter.

Brick

Brick is a strong and durable material. There are a red brick on the basis of clay raw material and white - silicate. Service life of brick structures on the reliable bases practically is not limited. The red brick is the most ancient of artificial materials.

Red brick. The red brick is the result of roasting of the pressed clay briquettes. Extremely widely and for a long time it has been used in construction at the device of the bases, walls and partitions, the laying of furnaces, fences. Perhaps, it is the most universal material.

The well-burnt red brick gives the resonant and pure sound at impact. The over burnt brick has a black core or the melted off edges. Such brick is not suitable for wide application and fits only for the laying of the bases. The corpulent red brick of the classical size weighs from 3,5 up to 3,8 kg. Mark of the brick shows what pressure it maintains on compression. Marks are 76, 100, 125, 150, 200, 250 and 300. These figures show maintained pressure in kg / sm2. Weight of one cubic meter of a brick is about 1700 kg. There are 480 bricks in one cubic meter.

White brick. The white brick is made on a silicate basis, whence has received the name - "silicate". It is lighter and soft, less strong in comparison with red. It concedes to the red brick in universality of application - it is used only in the laying of walls and partitions, its application in the bases, socles, furnaces, fireplaces, pipes and other crucial designs is not supposed.

Decorative brick. The decorative brick is developed for performance of crucial works - the laying of external and internal walls with high requirements to the surface of the wall. This brick has strictly correct form and flat, lustrous surface of external walls. Use of such brick, which has received definitions "front", "obverse", allows to receive not only a magnificent laying of external walls but also to apply it inside premises without the subsequent furnish of walls. At use of the decorative brick for internal walls the special attention is given to the cutting of seams.

Forms and the sizes of a brick are: unary, one-and-a-half, double.

Concrete

Concrete may be several kinds: heavy, facilitated, easy, especially light, and cellular. The basic components are cement, water and sand. Cellular concrete is received by swelling up with the help of pore former of mixes astringent, siliceous filler and water with formation in process of curing of cellular structure with in regular distributed air pores on volume.

"Concrete" differ from each other on fillings and weight. And on properties which get during manufacture, on destination. Heavy concrete goes on the bases and vaults in monolithic housing construction, light and especially light is applied to internal walls, partitions. Application of concrete of this or that kind is precisely specified in building norms and rules. Designers use them when they expect loading for the building whatever it is - small or big, and solve design tasks. Builders need only precisely to follow the documentation. Meanwhile, in an industrial arsenal of firms and companies there is so-called foam concrete which is used in all elements and units of a house - from the base up to a roof.

Production from cellular concrete of autoclave solidification (gas concrete) is the inexpensive building material meeting the requirements of working standards on parameters of quality and ecological requirements of the contents of radioactive nuclides, for construction of houses and also for erection of internal walls, self-bearing external walls, partitions in multi-store buildings and constructions. Gas concrete is a unique heater of walls, roofs, and ceilings. It is easy and simple, fast and cheap to build from gas concrete.

Fine walls blocks from cellular concrete. They are applied to the laying of partitions inside residential buildings and household constructions with relative humidity of air no more than 75 %. Cellular concrete considerably surpasses traditional building materials by many own characteristics, it has the diffusion characteristics due to which constant humidity of air is supported in premises and consequently there will be never dump in houses, even an autumn. Cellular concrete does not burn down, reliably absorbs the sound.

Cellular concrete blocks for partitions of buildings. They are applied to the laying of partitions inside residential buildings and household constructions with relative humidity of air no more than 75 % in premises. They meet TU 21-00010257-380-92. Cellular concrete is the non-polluting material. It considerably surpasses the traditional building materials, has the diffusion characteristics due to which constant humidity of air is supported in premises.

Ecology and concrete: interrelation

The International federation of constructive concrete (FJB) has issued the three important documents: "Influence of concrete on ecology", "Ecological questions of manufacture of modular concrete" and "Recycling or reuse of concrete of offshore designs". The edition of similar bulletins once again testifies that concrete affects on person and the environment from the moment of its manufacturing, during operation of designs from it and even after the termination of terms of its operation.

Certainly, designs from concrete carry out, first of all, the protective role both for the person and for the environment. But also the environment frequently renders rather harmful influence on concrete and it is necessary to take the measure on its protection. What is the negative role of concrete in its mutual relation with the person and the nature?

Let’s begin with process of preparation of concrete. Here the person is exposed to influence of alkalis and chromates contained in cement. There is successfully enough struggle with this phenomenon, preventing contact of concrete and solution mixes with the skin of hands and eyes of the person at work.

Generally concrete designs, as a rule, are rather stable in time and do not render the harmful influence on an environment, including on potable water, during their operation. Moreover, such designs serve as protection against radiation and harmful chemical influences, carrying out the role so-called the immobilizer and the stabilizer. However in some cases concrete may be sources of pollution of environment at secretion from them some inorganic elements, including salts of heavy metals. Now there are already the test methods of concrete developed in the number of the countries for check of concrete on their ability of such secretion, and the recommendations for prevention or easing of such phenomenon in the same place are submitted.

In the city the person spends almost 90 % of time in premises, therefore the quality of indoor environment is the significant factor. Air change in modern rather heat-isolated premises has decreased from 1 till 0,3 cycle/hour only for last years. Concrete in residential buildings is the designs containing cement, large and fine filler, armature and additives. The most probable source of flying secretion may be the chemical additives contained approximately in 50 % of all concrete made in the world. However the known experimental data show that the role of concrete in total amount of flying substances contained in air of premises is small. The questions of radiating radiation of building materials, which are called "natural radiation", were considered.

Researches on studying of influence of ferroconcrete bordering designs on change of magnetic field in premises, that may have the effect on health of people, were carried out. The presence of steel armature and various metal pipelines in protecting designs does not reveal any (positive or negative) influences on person. However the growing quantity of the technogenic

waste products, used as fillers for concrete, demands constant studying from the point of view of their influence on person.

The experts engaged in ecological questions of manufacture of modular concrete "assert that the influence of technology of ferroconcrete and its application in construction more biopositive". Such concrete is made in the closed premises and this process is easily enough supervised. Completely naturally that modular concrete by virtue of its more high quality is more reliable and durable, more economic on the charge of materials and energy, may be used repeatedly during reconstruction of constructions, has more attractive appearance etc. The comparative tests, which have been carried out in Netherlands at erection of overlapping, have shown that on the charge of concrete, armature, energy and quantity of formed waste products modular plates are considerably more economical and consume less concrete on 40 % and less steel on 50 %.

Modular concrete, as well as at monolithic, has the number of lacks, among which, for example, the big body weight, the waste products formed at manufacturing of designs (about 100 kg in manufacture of 1 m3 production. However the industrially recycling of these waste products considerably is simplified. The data on heat power effect of concrete, which some experts name " the accumulator of energy ", are cited. The thermal capacity of it makes the value about 2400 kJ/m3 / ° K.

Now more than 30 gravitational petroleum and gas platforms from high-strength concrete in volume from 10 up to 250 m3 each are located in various regions of Northern Sea on the depths from 40 up to 300 m. According to the international agreement of the country – the owners of platforms have taken the obligation to remove them from the shelf after the ending of operation. Flooding in the sea, keeping the platforms entirely or in part in the sea is forbidden. In the bulletin "Recycling or the reuse of concrete of offshore designs" there are the recommendations for realization of such operation and recycling of the platform material as large filler according to European standard EN12620 "Fillers for concrete". These are the ecological aspects of concrete application.

Mixes

Appearance of ready mixes in the market of building materials is the big help both for private persons and for builder-professionals. In mixes all needed components in the necessary proportions are already incorporated and they are completely ready to application.

There are cement mixes and also mixes for ceramic tiles.

Astringent solutions

Solutions for connection of separate building elements - stones, blocks, bricks in single whole refer to as astringent. Solutions are clay, cement, limy, plaster and complex or mixed. The first are made on the basis of one astringent material and complex or mixed are made on the basis of two and more astringents.

The majority of solutions contains besides the astringent material also the filler, which add for the charge reduction of astringent, as much more expensive material, and for giving of the necessary properties to the solution. Their mixture occurs in the certain ratio which express in the numerically as follows: 1:1, 1:5 or 3:1:2,5.

It is necessary to remember that there is the astringent material always on the first place, after it, if it exists, there is the second astringent and the filler closes the proportion.

Cement mortals

Lump building air lime. Building, quick-slaking lime has the wide application for preparation of lime-sandy astringent, used for building material manufacture: brick silicate, products from cellular silicate concrete, for preparation of plaster solutions and concrete. It meets to GOST 9179 - 77.

The contents of active CaO+MgO: 3 sort - 70-79 %; the contents of active MgO - up to 2 %; time of clearing - up to 8 minutes.

Building shredded lime. High quality of lime is provided by the stable technology and qualitative initial raw material. Building lime is widely applied to preparation of the astringent materials used for manufacture of silicate brick, products from cellular and dense silicate concrete, for preparation plaster and layer solutions and concrete. GOST 9179 - 77.

Powder coloring is the non-polluting, without waste technology of reception of high-quality decorative and decorative - protective polymeric coverings. Last decade the especially fast penetration of technology of powder coloring occurs into the spheres of traditional ways of drawing of varnish coverings. Today in the world approximately 15 % of all products subject to coloring is painted with use of this technology and this number is increased.

The information on normative documents on building materials and products - see in the Appendix C.

INFLUENCE OF ECOLOGICALLY DANGEROUS FACTORS ON PEOPLE HEALTH

People, suffering an allergy, much more often address to the polyclinics. There are a lot of dangerous allergens in the premises: these are dust, spores of mycelial fungus and chemical substances, which finishing materials or household chemicals secrete very much. If in a premise electrical devices are illiterately allocated or there is a transformer or distributive dashboard on an external wall of the house, the serious problem becomes the high level of electromagnetic radiation. Due to it people start having the constant headaches, fast fatigue, reduced immunity.

There are more complaints from highly allergic individual in the summer, in the winter - from people sensitive to electromagnetic radiations. At the level of the raised winter fatigue electromagnetic radiations operate, obviously, most brightly. And officially authorized norms of limiting radiations are essentially underestimated in comparison with the same norms of the WHO - in Russia, for example, for premises the norm of electromagnetic radiation are comparable to radiation under high-voltage lines and to exceed them difficultly even in the big city.

Vinyl wallpapers, wall panels of doubtful origin and cheap laminated plastic - all this secretes the whole bouquet of substances, which in a complex may send person to hospital with an allergy or chemical poisoning.

In Europe and USA last years there were the sensational cases of infection of lehionellese using conditioners. The conditioned air is "dead". Any air, past through the mechanical filter, loses ionization and loses the useful physical properties. Experimental mice do not live long in such air. People get the raise of fatigue and immunity is reduced. Therefore it is better simply to air the premises. In cases when there is a need to condition, it is necessary to use ionizers of air in addition.

Wrong ventilation system of buildings is the one more problem. Some premises are badly aired and form a plenty of mycelial fungus. At typical schools there are problems with phenols because of cheap poor-quality building and finishing materials. In general phenol in some quantity secrete from any polymers. There are furniture and paints and linoleum. It is necessary to ask the hygienic certificate of safety of materials.

As the most widespread substances are phenol and formaldehyde, which source the furniture serves (wood-shaving plates, wood-fiber plates, plywood).

At the poisoning with phenol the following symptoms may appear: weakness, fatigue, hyperhidrosis, sialorrhea, irritability, excitability, dizziness, frustration of digestion (dyspepsia, infringements of secrete functions of stomach), changes in a liver, short wind, palpitation, tremor of hands, pain in epigastric areas, neurologic symptoms, infringements of vegetative nervous system. The poisoning occurs at its inhalation of fumes and particulate pollutant, formed at fume condensation, hit of substance in gastroenteric path and at absorption through skin. The chronic poisoning with phenol is shown in infringement of the central nervous system, and then in cardiovascular, at the further intoxication the activity of gastro enteric path is amazed, the vitamin exchange changes.

Formaldehyde is brought in the list of authentically cancerogenic substances, has chronic toxicity, negatively influences on hereditary genetic and chromosomal mutation, respiratory ways, eyes, integument, reproductive bodies.

Film materials for facing of wood chip plates (WCP) may contain allergens and irritating mucous membranes of substance.

Modern rooms are equipped in a plenty with furniture from WCP, in comparison with air volume in the room. Therefore the concentration of substances polluting air sometimes can be significant even from usual new furniture.

The opportunity of secretion in air of substances from furniture is defined mainly by manufacturing techniques of material (WCP, WVP etc.), presence of protection blanket on used materials. Intensity of secretion of flying substances depends also on temperature, humidity and frequency rate of air exchange.

Struggle against phenols: if excess of norms is small, problems are solved by means of regular airing and specially picked up indoor plants. If concentration of polluting substance is too high, the premise can be processed by the preparation that will swallow up this substance, and then to carry out the damp cleaning or to air. It is needed to have the air cleaner. It is selected individually: the ozonizer, somewhere - the dampener, somewhere - the ultra-violet lamp somewhere are more necessary.

The information on ecology of building and finishing materials for many builders is rather limited that in the result comes to the negative consequences at their wrong use. Examples of the similar approach are the set. The most frequently encountered examples from the series of mistakes are given below:

· Use the paint, intended only for external works by builders inside the premise, conducts to poisoning with harmful components of the paint.

· Presence in the premise the panels WCP without laminating covering conducts to poisoning with phenol (causes defeat of kidneys, liver, change of structure of blood).

· Asbestos cement and panels are used in the systems of forced ventilation (causes lungs cancer).

· Concrete on granite rubble frequently can be with superfluous radioactive radiation (causes oncological diseases).

· At erection of houses with use of a fixed timbering from cellular polystyrene blocks and at furnish inside by dry plaster or lining in premises the molecules of styrene get causes irritation of mucous membranes, eyes, headache, nausea, spasms). Accumulation of static electricity in premise also may worsen ecology of environment. It is necessary the absolute vapor sealing of premise walls, for example, by vinyl wallpapers. Also it is necessary the organization of compulsory system of ventilation.

· Pasting of walls of inhabited rooms by washed wallpapers or pressure sensitive adhesive, coloring them by oil paints interferes the normal ventilation of walls, worsens the comfort of premises.

· Use as vapor sealing asphalt paper, roofing felts, roofing material containing tar and bitumen, and separated from habitation by vapor permeability layer (dry plaster or lining) conducts to hit of molecules of phenol into the premises.

· Use of the tarred railway cross ties (entire phenol) at construction of buildings.

· Use of vinyl wallpapers, which "do not breathe", in the wooden house trimmed inside with dry plaster.

· Use of cellular polystyrene ceiling finishing panels results to the infringement of effective ventilation and occurrence of stagnant unventilation zones in premises.

· Wooden house is painted outside by waterproof oil paint.

· Use of poor-quality linoleum and pasting by vinyl wallpapers.

· It is necessary to wait certain time and do not work in the premise until the external film of finishing material will not dry up and smells will not disappear.

· Often the problem of premise ventilation is solved by simple opening of the window leaf. It is far from being the most effective variant from the point of view of energy saving and efficiency of premise ventilation, without speaking about short duration of airing procedure. The correct system of ventilation is necessary to organize.

Certainly, we are not talking that all modern building and finishing materials are harmful and they should not be used. It is only need to know, where and how they can be used and how correctly to organize system of ventilation. The complex approach to the decision of problems of construction, ventilation, energy saving and ecological safety will allow to solve these problems at the minimal expenses.

At air of any premise there are almost always the conditional - pathogenic bacteria and mycelial fungus. The probability of increase of their quantity in premises is connected to parameters of microclimate (air temperature, relative humidity, presence of constantly damp surfaces) and of the amount of people who are daily in the premise.

Microorganisms become especially dangerous to health at their big congestion in inhaled air or when protective properties of organism are reduced. The problem of microbiological pollution becomes more and more sharp.

Active duplication of microorganisms and mycelial fungus is marked in premises in the following cases:

· in the old buildings premises (at the common problem of biodamage of buildings, when mycelial fungus infect the walls, and there is their duplication even under new finishing materials);

· in premises where are a plenty of visitors and the bad system of ventilation. Each person brings from environment the spores of mycelial fungus and bacterium. At the bad airing and the raised humidity the bacterium receives the opportunity for distribution and duplication.

· in premises with the raised humidity of air (the attributes of biodamage of the building are found out - a plenty of mycelial fungus and conditional - pathogenic bacteria, inadmissible in air).

Such premises demand the serious antiseptic processing, which not always can remove the problem completely.

The industrial activity of mankind, the development of manufactures, the chemical pollution have resulted in sharp reduction of quantity of light ions in air, in particular negative ions. The great congestion of office equipment, monitors and computers at offices destroys the useful negative air ions in premises and generates nocuous positive ions. Natural air ions discharge in filters of conditioners and air turns out to be though also clean but "dead". Even chemically clean air, which has lost such physical properties as ionization, becomes less steady to adverse influences. It is marked that people, working for a long time in such premises, get sick more often. Air ions, penetrating into the lungs of person, charge blood, make cells and fabrics of organism more resistant that raises immunity.

Practically all marks of luminescent lamps contain mercury in the design. Therefore at infringement of integrity of these lamps, mercury gets into environment.

In easy cases the poisoning with mercury causes sleeplessness, fears, headache, depression and inadequate emotional reactions. The sharp poisoning causes destruction of lungs. The chronic poisoning with mercury becomes apparent in infringement of nervous and endocrine systems; the person constantly begins to feel weariness.

Influence of pollutants on health of the person

Agents or air pollutants	Possible influences on health of the person
Oxides of sulfur in the combination with other substances (smoke)	Aggravation of existing diseases of respiratory ways and danger of their occurrence; functional frustration of lungs activity, irritation of sense organs
The weighed particles in air	Aggravation of influence of gaseous pollutants,

	such as oxide sulfur; toxic influence depends on a chemical compound
Oxidizers, including ozone	Irritation of eyes, deterioration of condition of asthma patients; functional frustration of lungs activity at the persons, suffering the bronchitis
Oxide carbon	Entering into reaction with hemoglobin, deprives the fabric with oxygen; most sensitive are people, suffering intimate insufficiency and respiratory frustration; even mental deviations are possible at light concentration
Lead	Hit of lead in organism with food stuffs, water and air may have fatal consequences for person organism - to cause intoxications
Asbestos	As the others air pollutants asbestos may cause lung diseases and impregnation of pleura by lime - limed pleura

RECOMMENDATIONS FOR THE DAMAGE REDUCTION OF THE ENVIRONMENT AND HEALTH

Ecological security of the natural landscapes in region of construction in the essential level is reached due to improvement of quality and reliability of the constructing objects, effective technical, technological and organizational decisions and methods.

The special acuteness has got the problem of ecologically safe life-support of people both on the manufacture and in daily life.

Formation of non-polluting objects demands the serious study of the wide spectrum of the questions of the inhabitancy of people quality.

It is known that the wide complex of toxic chemical elements with emissions and drains of industrial and household structure goes intensively into the environment of practically any industrial settlement. Duly inventory of pollution sources allows to define not only the maximum permissible emissions but also to plan the effectual measures for their prevention.

It is established by researches that the three basic groups of pollution sources of the urbanized territories: emissions, drains, firm waste products differ on the absolute structure of chemical elements, on their relative intensity and the places of display of the influence. The duly appropriate ecological estimation based on the general methodical principles developed in hygiene of the environment, biogeochemistry, epidemiology and other related subjects will allow to develop and to use seriously the criteria of non-polluting designing and construction.

Recently the norms of maintenance of hygienic working conditions or person residing in the newly constructed housing buildings and complexes as a whole entered into the category of ecological requirements. The finishing technological operations of construction - an accomplishment of territory, export and recycling of the constructing waste products, the unused building materials - should be supervised at acceptance of object as crucially as tests and technical acceptance of all engineering networks.

From the ecological point of view the imperfection of today's construction norms is caused by that approaches and principles of strategy of ecological normalization have been

varied in time with the growth of danger of environmental contaminations and accordingly of ecological consciousness of people.

In 30th years of the last century the principle of “zero damage” and the restrictions adequate to it based on obligatory observance of norms of quality of the environment was operated and the restrictions for emissions of pollution in an environment were established. In many respects such approach has been kept till the present day although the emission in the environment of significant amounts of polluting substances in calculation on their natural blowing up by wind and water on the significant area and thus the observance of norms of maximum concentration limit are allowed.

Unorganized emissions of harmful substances, heat and radiations may be in the result of defectiveness of the designs (through defects, infringements of screens and isolators). For development of methods of localization and indemnification of harmful emissions and influences they are subdivided (conditionally) on material and power. Among the material emissions are dustiness of atmosphere, the weighed firm particles in water and soil, gaseous and liquid chemical compounds and elements. Among the power emissions or the influences are heat, noise, ultrasound, vibrations, light, electromagnetic fields, ionized radiations and radioactive waste products (they can be considered as material).

Methods of reduction of harmful emissions and influences are defined by environment of their distribution (an atmosphere, hydrosphere, lithosphere, biota), modular condition in the environment (gaseous, liquid, firm), toxicity and other properties. Technical and technological decisions on harmful emissions control and influences are dictated by their physical and chemical mass characteristics and also intensity.

Indus sewage (industrial sewage) and fecal drains from welfare objects are characterized by the number of parameters: quantity, physical and chemical properties from dissolved, the emulsified or the weighed substances, the degree of their toxicity, carcinogenicity, mutagenicity, alkalinity or acidity, organoleptic characteristics.

Industrial and household, firm waste products are distinguished on structure, degree of toxicity, radio-activity, carcinogenicity, chemical activity and so forth.

Industrial sewage is subdivided on conditionally pure (from cooling of the process equipment) and dirty (from other shops, sites, building sites, etc.). Conditionally pure drains are the subject of cooling in sediment bowls or cooling towers, the subject of clearing from suspensions and oils and then they are returned in manufacture with the limited additive of cold water (loss on evaporations). Such process is named the closed cycle of water consumption; from the point of view of conservancy it is the most harmless process. Dirty industrial sewage is allocated to the clearing constructions on sewer collectors, firm fractions are deleted from them, mineral oil is filtered, then sewage is disinfected and directed to devices of deep clearing or sediment bowls.

Power environmental contamination includes thermal emissions from the enterprises, buildings, heat-and-power engineering objects, communications and also all kinds of fields and radiation.

Among fields and radiation distinguish harmful (that harmful influence is established and investigated) and harmless for which facts of influence on persons and biota as a whole are not established.

Thermal pollution of all elements of the biosphere inherent to a greater or lesser extent to all kinds of activity proves at the greatest degree. In construction the industrial and construction material enterprises are remarkable for the greatest thermal pollution. Thermal pollution is shown as convectional or radiating heat exchange between the heated up installations, pipelines, process equipment or their emissions (in air), drains (in heat exchanger) and the environment that results in local rise in temperature of atmospheric air, water, soil or grounds.

The whole complex of nature protection actions is necessary for assistance of natural renewal of tree and bushes vegetation, for reduction of vulnerability of natural ecosystems, for land reclamation.

The soil - vegetative layer by itself is the stabilization factor, it “armors” in the certain degree the surface but the natural object being enough fragile in conditions of uncharacteristic for it of the geological mode easily collapses. Restoration of it is possible only at the discontinuance of the most active destroying processes first of all erosion.

Many researchers offer various methods of engineering land reclamation. One of them is the principle of complex anti-erosion actions i.e. the joint application of regulated steam of water from melted snow, rain waters, technical and biological reclamation. Upon the termination of works on engineering reclamation the stage of biological reclamation begins which purpose is the reduction or prevention of consequences of technogenic infringements, the prevention or the liquidation of development of cryogenic processes, the fastenings of grounds from wind and water erosion, the creation of the green landscapes necessary for life of people.

Biological reclamation is carried out by two ways: by activization of natural obliteration or special crop of long-term grasses. Activization of natural obliteration will be carried out in places where the soil layer and separate sites of a grassy cover are in part kept.

Preparatory and generally construction works are necessary to carry out together with the author's cryopedological control from the part of the design organizations, paying the special attention to safety of the natural environment around of building sites and also to the minimal sizes of infringements of superficial grounds on building sites.

Works on development of building sites are not recommended to be carried out without the project of a vertical lay-out and the organization of the works in details reflecting all features of engineering - cryopedological conditions of the platform and the order of its engineering preparation. The project of the organization of works should necessarily provide the exact terms and features of manufacture of works, and also measures on preservation of the environment and reclamation of unstable natural complexes.

Traditional methods of normalization of functional properties of separate building objects and complex as a whole do not take into account in the given measure the requirements of ecological safety of region. Imposing of ecological restrictions on the normative rules of construction may be realized within the framework of optimum designing of constructive potential of the construction complex and technological process of its formation. In the certain level the foreign experience may be used for the decision of this task.

At realization of construction - repair work it is necessary to conduct the complex of the actions promoting conservancy and rational nature management:

· use of technologies and building machines, mechanisms and transport that protect the environment to the maximum;

· to define the special places and the limiting sizes of the selected area for warehousing of waste products in the zone of influence;
· ways and conditions of storage of waste products of the civil work considering the ecological situation in territory of object;
· actions for recycling of waste products of civil work;
· actions for prevention or restriction of negative influence on the condition of natural environment and the condition of life of the population;
· actions for prevention of dump of polluting substances in superficial and underground water systems;
· actions for prevention of emissions of polluting harmful substances from stationary and mobile sources in an atmosphere;
· full recycling of firm waste products and the high degree of clearing of drains;
· realization of reclamation actions;
· creation of effectively working system of economic management of system of the conservancy, forcing to put the funds in the conservancy, to collect in the unconditional order the large sums for drawing of the ecological damage allowing economically stimulate the nature protection activity and careful performance of design decisions;
· ecological training and certification of the industrial personnel;
· realization of monitoring system for the realization of civil work and the condition of an environment.

THE CONCLUSION

Repair – construction works in school buildings should be carried out with observance of all rules providing preservation of the environment during the works and at the subsequent operation. Generally such works have rather limited scales and use the materials that are not bringing the significant pollution in the environment. Therefore their influence can be estimated as insignificant and local in time and space. These works are carried out inside of settlements and not accompanied by infringements in natural ecosystems.

Nevertheless taking into account the special importance of observance of ecological requirements for school buildings and the creation of favorable conditions of the environment for the children, and also the necessity of performance of sanitary-hygienic norms for settlements, it is needed to conduct the estimation of possible influence on the environment in each separate case of works and to take softening measures for restriction or neutralizations of negative consequences.

The submitted project reveals possible ecological risks and represents approaches to their estimation and reduction of negative consequences. They concern not only the direct realization of the repair - civil work, the used materials and the warehousing of waste products but also some aspects of the further operation of the building, the condition of the internal environment of premises.

Abundantly clearly that the plan of civil work should be considered together with the plan of nature protection actions and the plan of observance of sanitary-hygienic requirements. Only at such statement of the question the repair - civil work will answer to the modern standards.

Appendix A

SUMMARY OF SOME IMPORTANT LAWS ON PRESERVATION OF THE ENVIRONMENT

The law on water

This Law adjusts the use and protection of water, including water basins, channels and other artificial water objects. It also establishes measures for prevention of flooding and other dangerous influences. The law orders that water was used according to the appropriate license when the water object is allocated on the basis of concession or the lease agreement for the specified purposes. Potable water or municipal water supplies have the prime value. Water objects are protected against exhaustion, pollution or contamination through such mechanisms as standards, allowing documents for dump of sewage and creation of water-security zones.

The law on protection of environmental atmosphere

The Law, mainly, applies the historical tools to protection of an atmosphere and defines conditions and methods, which positions are specified in other acts (the maximal allowable concentration, the maximal allowable emissions, ecological estimation of influence, etc.), used to management of air.

The law on radioactive safety of the population

The Law puts the purpose to guarantee the public safety and protection of the environment against harmful influence of radiation. These guarantees include procedures on distribution of sanctions, measures of social safety, the right of persons to receive the information on influence of radiation and other measures.

The documents establishing the norms

The following establishing the norms documents (issued by the Ministry of Ecology and Extreme Situation) determine the rules on preservation of the environment:

- Rules about protection of atmospheric air (approved by the Minister on January 24, 2001, with the consent of the Ministry of Health and the Ministry of Internal Affairs of the KR, and registered by the Ministry of Justice of the KR);

- The Guidelines on performance of State control above standard sources of pollution of the atmospheric air, registered by the Ministry of Justice of the KR on December 28, 1999 № 114;

- The Guidelines about the order of the norm establishment of waste products recycling in the KR, approved by the Decision of the Ministry on preservation of the environment № 3 dated September 17, 1999, registered by the Ministry of Justice of the KR on October 1, 1999 № 73.

The appendix B

Influence, reasons, consequences and mitigation of influence of repair - civil work on the environment

For repair - civil work			
Possible influence	**Reasons**	**Consequences**	**Necessary mitigation**
Phase of repair - civil work:			
Pollution of ground	Pollution of the petroleum products and other chemicals. Inefficient sewage treatment during construction.	Loss of fertility of ground. Pollution of underground waters.	Comprehension of preservation of the environment; training for the manipulation and storage of the petroleum products and chemicals; maintenance of appropriate storage places of the building site.
Pollution of water	Pollution by the petroleum products and other chemicals.	Pollution of underground waters and superficial waters which conducts to pollution of potable water and, in a case with superficial waters, to infringement of water ecosystem	The same that mentioned above. Maintenance of transmission of contents of toilets into municipal clearing system.
Noise and dust	Machines and building engineering; dirty access roads	The factor of inconveniences for the next communities	Works only in working hours; water the access roads in dry period.
Firm waste products	Littering by the unused building materials and dust of workers.	The unattractive appearance and the rests of building materials break the norms of technical safety.	Effective cleaning of materials and dust in the specially allocated places.
Phase of operation:			
Waste products	Concrete, blocks, armature, brick, glass, slate will appear as the result of disassembly of the parts of walls and overlapping.	Threat of public safety. Waste products of resources.	Cleaning or secondary use or effective cleaning of littering and polluting materials; carrying out in specially allocated place and the place for dump of the waste products, harmless to the environment; and the burial place of pure and inactive materials.
The environment of premises	Harmful secretion from the building materials used in repair work.	Threat to health.	Use of materials, not secreting of harmful secretion during operation.

Residual influence at full softening measures: NONE
Risk: LOW

The appendix C

Normative documents on building materials and products

The name	Comments
60. Wall masonry materials	The general requirements to the brick and the wall stones from various materials. Specifications on concrete versions, types and marks. Acceptance procedures, monitoring and test methods.
61. Mineral astringent substances	The general requirements to cement and another astringents. Specifications on concrete versions, types and marks. Acceptance procedures, monitoring and test methods.
62. Concrete and solutions	The general requirements to concrete of various kinds, concrete mixes and building solutions. Specifications on concrete versions. Acceptance procedures, monitoring and test methods.
63. Fillers inorganic and organic for civil work	The general requirements to rubble, gravel, sand, artificial and natural porous fillers. Specifications on concrete versions. Acceptance procedures, monitoring and test methods.
64. Heat-isolation, sound-proof and sound-proof materials	The general requirements to mineral wool products, products from cellular concrete, plates on the basis of foam plasts and another heat-isolation materials. Specifications on concrete versions. Acceptance procedures, monitoring and test methods.
65. Roofing, waterproofing and sealing materials and products	The general requirements to rolled roofing materials, roofing mastics, isolation and sealing materials. Specifications on concrete versions. Acceptance procedures, monitoring and test methods.
66. Finishing and facing materials	Requirements to polymeric, ceramic, wood and other finishing and facing materials and products. Acceptance procedures, monitoring and test methods.
67. Asbestos concrete products	Requirements to asbestos concrete flat and wavy sheets, pipes and extrusion products. Acceptance procedures, monitoring and test methods.
68. Road materials	Requirements to bituminous concrete, bituminous concrete mixes and other road materials. Acceptance procedures, monitoring and test methods.
69. Other building materials	Requirements to sheet glass and products from glass for construction and other building materials. Acceptance procedures, monitoring and test methods

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Normative documents on wall masonry materials

Index	Number	The name
GOST	379-95	Brick and silicate stones. Specifications.
GOST	530-95	Brick and ceramic stones. Specifications
GOST	4001-84	Wall stones from rocks. Specifications
GOST	6133-84	Wall concrete stones. Specifications
GOST	7025-91	Ceramic and silicate brick and stones. Methods of definition of water absorption, density and the control of frost resistance
GOST	7484-78	Ceramic face brick. Specifications.
GOST	8426-75	Clay brick for chimneys.
GOST	8462-85	Wall materials. Methods of definition of strength at compression and bend
GOST	21520-89	Wall blocks from cellular fine concrete. Specifications.
GOST	24332-88	Silicate brick and stones. The ultrasonic method of definition of durability at compression
GOST	4.206-83	CPKP. Construction. Wall stone materials. Product indicators
GOST	6133-99	Wall concrete stones стеновые. Specifications

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Normative documents on mineral astringent substances

Index	Number	The name
GOST	125-79*	Astringent plaster. Specifications
GOST	310.1-76	Cements. Test methods. General provisions
GOST	310.2-76	Cements. Methods of definition of subtlety of grinding
GOST	310.3-76	Cements. Methods of definition of normal density, terms of grip and uniformity of volume change
GOST	310.4-81	Cements. Methods of definition of limit strength at a bend and compression
GOST	310.5-88	Cements. A method of definition heat generation
GOST	310.6-85	Cements. A method of definition of water-branch
GOST	965-89	White Portland cements. Specifications
GOST	969-91	Calcium aluminate and high-alumina cement. Specifications

GOST	1581-91	Backfill Portland cements. Specifications
GOST	3476-74	Domain and electrothermic phosphoric granular slag for manufacture of cements
GOST	4013-82	Plaster and gypsum anhydrite stone for manufacture of astringent materials. Specifications
GOST	5382-91	Cements and materials of cement manufacture. Methods of the chemical analysis
GOST	6139-91	Normal sand for test of cements. Specifications
GOST	9179-77*	Building lime. Specifications
GOST	10178-85	Portland cements and slag Portland cements. Specifications
GOST	11052-74	Extending gypsum-alumina cement.
GOST	15825-80	Color Portland cements. Specifications
GOST	22236-85	Cements. Acceptance procedures
GOST	22237-85	Cements. Packing, marks, transportation and storage
GOST	22266-94	Sulfate-resistant cement. Specifications
GOST	22688-77	Building lime. Test methods
GOST	23464-79*	Cements. Classification.
GOST	23789-79	Astringent plaster. Test methods..
GOST	24640-91	Additives for cements. Classification
GOST	25094-94	Additives active mineral for cements. Test methods
GOST	25328-82	Cement for building solutions. Specifications..
GOST	25818-91	Ashes - ablation of thermal power stations for concrete. Specifications
GOST	.26798.0-85	Backfill cements. Test methods. General provisions
GOST	26798.1-85	Backfill cements. Methods of definition of flow ability, density, water-branches, thickening time and grip terms
GOST	26798.2-85	Backfill cements. Methods of definition of strength at the bend and compression
GOST	26871-86	Astringent plaster materials. Acceptance procedures. Packing, marks, transportation and storage
GOST	4.204-79	CPKP. Construction. Astringent materials: lime, plaster and astringent substances on their basis. Product indicators
GOST	4.214-80	СПКП. Construction. Cements. Product indicators
GOST	30515-97	Cements. The general specifications.

GOST	1581-96	Backfill Portland cements. Specifications
GOST	26798.1-96	Backfill cements. Test methods
GOST	26798.2-96	Backfill cements of types I-G and I-H. Test methods
GOST	30744-2001	Cements. Test methods with use of polyfractional sand
CT CEV	3477-81	Cements. Selection and preparation of tests.
CT CEV	4772-84	Cements. Terms and definitions
GOST P	51795-2001	Cements. Methods of definition of the contents of mineral additives

Normative documents on asbestos products

Index	Number	The name
GOST	8747-88	Sheet asbestos products. Test methods
GOST	18124-95	Asbestos flat sheets. Specifications
GOST	30301-95	Asbestos products. Acceptance procedures
GOST	30340-95	Wavy asbestos sheets. Specifications
GOST	4.202-79*	CPKP. Construction. Asbestos products. Product indicators.
CT CEV	4926-84	Asbestos products. Terms and definitions
CT CEV	4927-84	Asbestos products. Classification

Normative documents on heat-isolation and soundproof materials

Index	Number	Name
GOST	16297-80	Soundproof materials. Test methods
GOST	16381-77*	Building heat-isolation materials and products. Classification and the general technical requirements
GOST	17177-94	Building heat-isolation materials and products. Test methods
GOST	18866-93	Road metal from domain slag for manufacture of mineral cotton wool. Specifications
GOST	20916-87	Heat-isolation plates from polyfoam on the basis of resol phenol-formaldehyde pitches. Specifications
GOST	21880-	Heat-isolation sewing mat from mineral cotton wool. Specifications

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GOST	22950-95	The raised rigidity mineral wool plates on synthetic binding. Specifications
GOST	23208-83	Heat-isolation cylinders and semi cylinders from mineral cotton wool on synthetic binding. Specifications
GOST	23250-78	Building materials. A method of definition of a specific thermal capacity.
GOST	23307-78*	Vertical - layered heat-isolation mat from mineral cotton wool. Specifications
GOST	23422-87	Building materials A neutron method of measurement of humidity
GOST	23499-79	Building soundproof materials and products. Classification and the general technical requirements.
GOST	24748-81	Heat-isolation lime-siliceous products. Specifications
GOST	24816-81	Building materials. Methods of definition сорбционной humidity
GOST	25226-82	Perlite raw material for manufacture of circulite. Specifications
GOST	25880-83	Building heat-isolation materials and products. Packing, marks, transportation and storage
GOST	26281-84	Building heat-isolation materials and products. Acceptance procedures
GOST	26417-85	Building soundproof materials. A test method in small reverberation chamber
GOST	30256-94	Building materials and products. A method of definition of heat conductivity a cylindrical probe.
GOST	30290-94	Building materials and products. A method of definition of heat conductivity the superficial converter
GOST	4.201-79	CPKP. Construction. Heat-isolation materials and products. Product indicators
GOST	4.209-79	CPKP. Construction. Soundproof materials and products. Product indicators
GOST	9573-96	Plates from mineral cotton wool on synthetic heat-isolation. Specifications
GOST	25226-96	Road metal and perlite sand for manufacture circulite. Specifications
GOST	7076-99	Building materials and products. A method of definition of heat conductivity and thermal resistance at a stationary thermal mode
CT CEV	5063-85	Building heat-isolation materials and products. Terms and definitions

Normative documents on roofing, waterproofing and

sealing materials and products

Index	Number	Name
GOST	2551-75	Rolled roofing and waterproofing materials. Packing, marks, storage and

		transportation
GOST	2678-94	Rolled roofing and waterproofing materials. Test methods.
GOST	2697-83	Roofing asphalt paper. Specifications
GOST	2889-80	Bitumen roofing hot mastic. Specifications
GOST	7415-86	Hydro-isolation. Specifications
GOST	10296-79	Isolation. Specifications
GOST	10923-93	Roofing material. Specifications
GOST	14791-79	Not hardening building sealing mastic. Specifications
GOST	15836-79	Rubber isolation mastic. Specifications
GOST	15879-70	Glass ruberoid. Specifications.
GOST	18956-73	Rolled roofing materials. Test methods on ageing under influence of artificial climatic factors
GOST	19177-81	Condensing rubber porous linings. Specifications
GOST	20429-84	Foilisol. Specifications
GOST	23835-79	Rolled roofing and waterproofing materials. Classification and the general technical requirements
GOST	25591-83	Roofing and waterproofing mastics. Classification and the general technical requirements
GOST	25621-83	Condensing polymeric building sealing materials and products. Classification and the general technical requirements
GOST	25945-87	Not hardening polymeric building sealing materials and products. Test methods
GOST	26589-94	Roofing and waterproofing mastics. Test methods.
GOST	26627-85	Rolled roofing and waterproofing materials. Acceptance procedures
GOST	4.203-79	CPKP. Construction. Rolled roofing and waterproofing materials. Product indicators
GOST	4.222-83	CPKP. Construction. Roofing and waterproofing mastics. Product indicators
GOST	4.224-83	CPKP. Construction. Condensing and sealing polymeric building materials and products. Product indicators
GOST	4.251-79	CPKP. Construction. A roof. Product indicators
GOST	30547-97	Rolled roofing and hydro-isolation materials.
GOST	30693-2000	Roofing and waterproofing mastics. The general specifications
GOST	25945-98	Not hardening polymeric building sealing materials and products. Test methods
GOST	30740-2000	Sealing materials for seams of airfield coverings. The general specifications

Normative documents on finishing and facing materials

Index	Number	Name

GOST	24064-80	Gluing rubber mastics. Specifications
GOST	30307-95	Latex building polymeric gluing mastics. Specifications.
GOST	862.1-85	Parquet products. The parquet piece. Specifications
GOST	862.2-85	Parquet products. The parquet mosaic. Specifications
GOST	862.3-86	Parquet products. Boards parquet. Specifications
GOST	862.4-87	Parquet products. Boards parquet. Specifications
GOST	4598-86*	Wood-fiber plates. Specifications
GOST	6266-97	Gypsum pasteboard sheets. Specifications
GOST	6666-81	Stones onboard from rocks. Specifications
GOST	6787-90	Ceramic tiles for floors. Specification
GOST	6927-74	Front concrete plates. Technical requirements
GOST	7251-77	Polyvinyl chloride linoleum on fiber and a no woven sub base. Specifications
GOST	8904-81*	Firm wood-fiber plates with the paint and varnish covering. Specifications
GOST	9479-84	Blocks from a natural stone for manufacture of facing products. Specifications
GOST	9480-89	Facing sawn plates from natural stone. Specifications
GOST	9590-76*	Decorative paper lamellar plastic. Specifications
GOST	11529-86	Polyvinyl chloride materials for floors. A quality monitoring
GOST	11583-74	Polymeric building finishing materials. Methods of definition of color stability under influence of light, uniformity of coloring and radiant
GOST	13996-93	Front ceramic tiles and carpets from them. Specifications
GOST	17057-89	Facing ceramic glass mosaic tiles and carpets from them. Specifications.
GOST	17241-71	Polymeric materials and products for a covering of floors. Classification
GOST	18108-80	Polyvinyl chloride linoleum on heat-sound-isolation sub base. Specifications
. GOST	18 958-73	Silicate paints
GOST	19111-77	Profile polyvinyl chloride molded strip products. Specifications
GOST	19279-73	Polymer concrete paints.
GOST	19592-80	Wood-fiber plates. Test methods

GOST	22856-89	Decorative road metal and sand from a natural stone. Specifications
GOST	23342-91	Architectural - building products from a natural stone. Specifications
GOST	24099-80	Decorative plates on the basis of a natural stone. Specifications
GOST	24210-80	Polymeric rolled and tile materials for floors. Methods of definition of soundproofing properties.
GOST	24944-81	Polyvinyl chloride decorative finishing film. Specifications.
GOST	25609-83	Polymeric rolled and tile materials for floors. A method of definition of a parameter of heat- adoption
GOST	26149-84	Rolled covering for floors on the basis of chemical fibers. Specifications
GOST	26150-84	Building polymeric finishing materials and products on polyvinyl chloride base. A method of a sanitary - chemical estimation.
GOST	26603-85	Antiseptically no woven cloths from fibers of all kinds for heat-soundproofing linoleum. A method of definition of biostability
GOST	26604-85	Antiseptically no woven cloths from fibers of all kinds for heat-soundproofing linoleum. Specifications
GOST	26988-86	Wood-fiber plates. A method of definition of strength at a stretching it is perpendicular to plates.
GOST	27019-86	Polymeric rolled materials for floors. The accelerated method of definition of sound-proof properties
GOST	27023-86	Carpets welded from polyvinyl chloride linoleum on heat-soundproofing sub base. Specifications
GOST	27180-86	Ceramic tiles. Test methods
GOST	4.207-79	CPKP. Construction. Wood-fiber plates. Product indicators
GOST	4.210-79	CPKP. Construction. Finishing and facing materials. Product indicators
GOST	4.219-81	CPKP. Construction. Facing materials from a natural stone and blocks for their manufacturing
GOST	4.223-83	CPKP. Construction. Parquet products. Product indicators
GOST	4.229-83	CPKP. Construction. Decorative plastics. Product indicators
GOST	4.230-83	СПКП. Construction. Facing polymeric finishing materials and products. Product indicators
GOST	30548-97	No woven cloths for linoleum. Test methods
GOST	4.228-83	CPKP. Construction. Gluing polymeric materials. Product indicators
GOST	6141-91	Ceramic glass tiles for internal facing walls. Specifications
GOST	9479-98	Blocks from rocks for manufacture of facing, architectural - building, memorial and other products. Specifications
GOST	30629-99	Facing materials and products from rocks. Test methods
GOST	6787-2001	Ceramic tiles for floors. Specifications
GOST	27180-2001	Ceramic tiles. Test methods
CT CEV	3979-83	Ceramic tiles. Terms and definitions
GOST P	51829-	Gypsum fiber sheets. Specifications

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Normative documents on asbestos concrete products

Index	Number	Name
GOST	8747-88	Asbestos concrete sheet products. Test methods
GOST	18124-95	Flat asbestos concrete sheets. Specifications
GOST	30301-95	Asbestos concrete products. Acceptance procedures
GOST	30340-95	Wavy asbestos concrete sheets. Specifications
GOST	4.202-79*	CPKP. Construction. Asbestos concrete products. Product indicators
CT CEV	4926-84	Asbestos concrete products. Terms and definitions
CT CEV	4927-84	Asbestos concrete products. Classification.