

Saimaa University of Applied Sciences
Technology, Lappeenranta
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Renovation surveys practice in St. Petersburg

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ABSTRACT

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Renovation surveys practice in St. Petersburg, 26 pages, 2 appendices

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The main scope of this research was to investigate the possibility of application of the survey services provided by Vahanen in St. Petersburg. The correspondence of the facilities and the needs of the market state was discussed. The study was commissioned by the representative of Vahanen Group.

This study was carried out at the inspection objects of Vahanen at Espoo at the summer of the 2014. In addition the visit of the laboratories of the main office of the company was provided in order deepen the information about the testing methods and techniques. Lifeline of the renovation project and its stages were briefly examined.

Based on the obtained information it was possible to make a conclusion that the Finnish and Russian ways of providing the surveys and the renovation services have lots of similarities. Each investigated method has the detailed description and applicability field on the market of St. Petersburg. The recommendations and the opinion about such services can be used for the estimation of the benefits of the presence on the Russian market.

Keywords: renovation, survey, market, Vahanen, tender

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1 INTRODUCTION

1.1 Field of research

This thesis aims at defining the possibility of development to St. Petersburg market of surveys for Vahanen Group. It was ordered by the International Service department of Vahanen and the mentor is Juha Soilu, who deals with international development in several countries: Russia, Estonia, Romania, India and Arabian Peninsula. There Vahanen provides services for planning and carrying out building projects both in major urban areas and in interesting growth areas. So the first purpose for writing this thesis was in discovering and explanation of the renovation market of St. Petersburg. Also it is interesting to understand how the renovation project proceeds in St. Petersburg. The second purpose was in comparison services, which Vahanen can provide and the need in such services in St. Petersburg. This thesis is covering the current situation of the market and describes the process of a renovation project. It is important to understand the renovation culture of St. Petersburg and the general principles and stages of renovation project in Russia for successful development of Vahanen. During the thesis writing, the inspection objects in Finland where visited and the renovation services which Vahanen is able to provide were discovered. Afterwards the renovation market of St. Petersburg's was investigated with the purpose of applicability in providing these services in Russia. Finally, the summarizing of the gained information and definition the opportunities of development for Vahanen on the Russian market was done.

1.2 Historical background

St. Petersburg was founded more than 300 years ago by Peter the 1st and nowadays it is a big cosmopolitan city with a rich history. Thousands of old and historically essential buildings and monuments are waiting for renovation and monitoring. Furthermore the area of St. Petersburg is divided into zones and it should be mentioned that there is a zone with special conditions of usage which includes territories of historically protected buildings. Some of them are in good condition in comparison with the others, but some need to be renovated immediately. For that reason these buildings are protected by the government or

special organizations like UNESCO [1] and municipality appropriate funds for their renovation or conservation. Due to that the Russian government organize tenders for these works (Chapter 2.2).

2 RESEARCH DATA AND ANALYSIS

2.1 Statistical data of existing buildings in St. Petersburg

The most recent statistical research of the existing building at St. Petersburg was developed by the government organization Rosstat in 2012. Mainly the research field was concentrated on the residential buildings and living conditions of the inhabitants. The following and summarized data in Table 1 was obtained from the official web-site <http://www.gks.ru/> and it is a free source of information.

Table 1. Statistical data for existing buildings at St. Petersburg

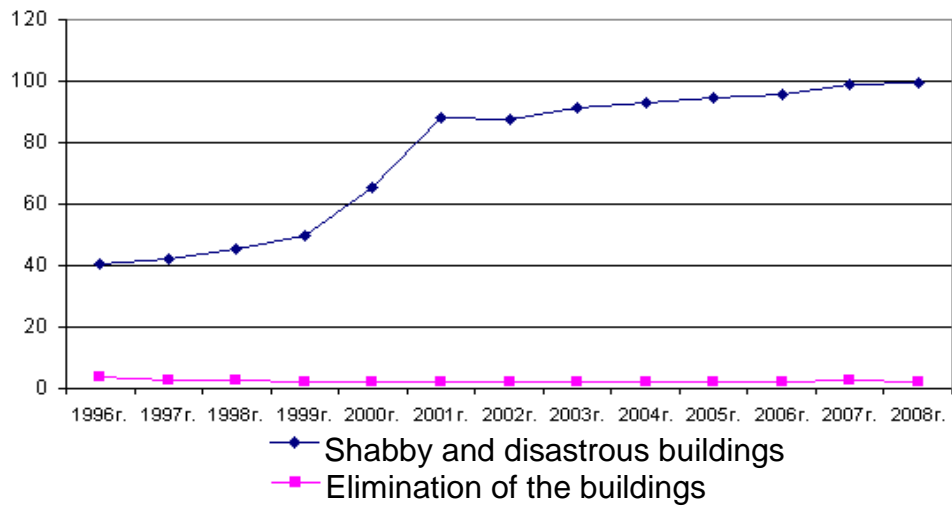
Number of buildings	51463		
Number of apartments, (thousands)	2025		
Area, (thousands m ²)	119675		
Renovated apartments, (thousands m ²)	125,9		
Damaged buildings, (thousands m ²)	Total	Shabby	Disastrous
	472	172,8	229,2

In the glossary of Government Resolution [3], the shabby building means the one, which has deterioration rate of the structures higher than 70%, compared with the initial one. The disastrous condition of building is assumed to be, when the bearing and envelope structures have reached the deformations incompatible with the normal functionality of the building.

By means of the above mentioned document, the Russian government confines the definition of the structures which are the subject of the end of their life cycle.

Figure 1 describes the dynamics of the buildings, which have reached their limit state by exact year.

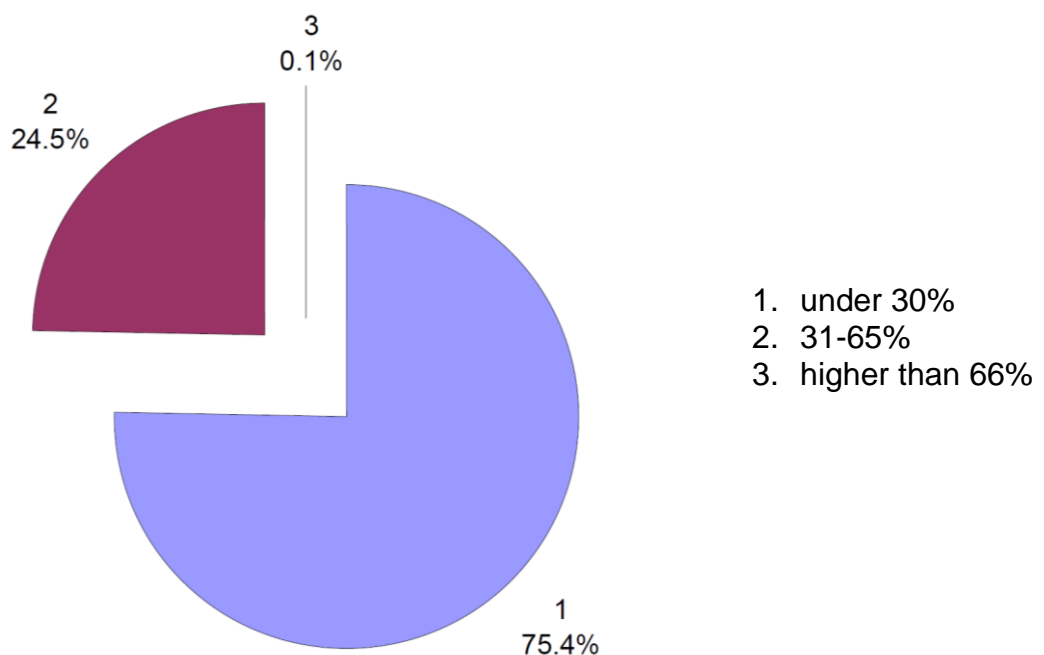
Figure 1. Dynamics of deterioration of buildings in time (millions m²)



It is clearly seen that the dynamics of the past described years do not undergo the high increase in the values. So it may mean that the renovation market of St. Petersburg is in good condition and has shown a good performance.

The future field of development of the renovation opportunities is described by the pie-chart in Figure 2. Among the total amount of the buildings, 24,6% should be subject of renovation or demolition, and the rest of 75,4% could need the renovation soon. It means that the renovation field of St. Petersburg has lots of facilities in the surveys and refurbishing.

Figure 2. Distribution of buildings by the deterioration rate



In order to discover the problem deeper, it is required to understand the possible clients. Mainly the existing structures are composed from stones or bricks and their content on the total number of structures is almost 50%. Consequently, the vast majority of the works is associated with the buildings of XVIII and XIX centuries. The second part of the market is devoted to the modern structures, which are made of concrete and more detailed information is summarized in Table 2, specifying the erection rates in the past.

Table 2. Distribution of the building by erection year and materials

	Thousands of m ²	Percentage
Total	119675	100
By type of material of structures		
Stones/bricks	55132	46,1
Panel	47411	39,5
Blocks	3800	3,2
Monolith	9283	7,8
Mixed	1605	1,3
Timber	411	0,3
By the erection year		
Before 1920	15316	12,8
1921-1945	2149	1,8
1946-1970	30050	25,1
1971-1995	41329	34,5
After 1995	30831	25,8

2.2 Tenders

It is a competitive form of selection of offers of goods, services or works, organized by the government, according to the conditions which are declared in documentation. In the stipulated terms the tender is based on the principles of competitiveness, justice and efficiency. The contract would be signed with the

winner of the tender — the participant who has submitted the proposal, which conforms the documentation requirements and the best conditions were offered. The term tender used in the daily speech, is the analogue of the Russian competition or auction, or other competitive procedures. For example it can be a request of quotations or a request for proposals.

Figure 3. Tender activity in Russian Federation

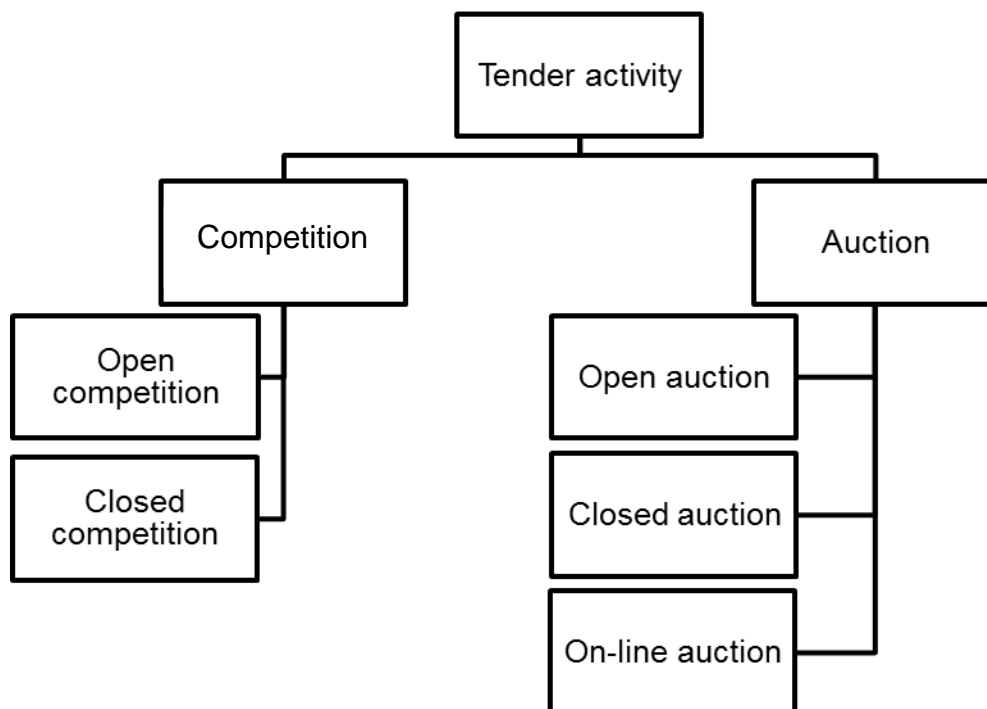


Figure 3 shows the organization of tender activity in St. Petersburg, as well they are applied to the whole country. Competition is subdivided by open and closed, it can be carried out to one or two stages. The auction is carried out for the state/government needs at all of the levels, within the state order and it is held only in one stage. According to the Federal Law [2], there exist other ways of purchases which are not the auction — it is a request of price quotations. They can be applied at the small volumes of purchases (less than 500 000 roubles), and also purchases for the unique source in cases which are especially stipulated by the Russian legislation.

2.2.1 Open competition

The most widely spread way of competitive purchases is the open competition in which the part can be taken by any supplier. The notification of open competition can be published in specialized editions, on a web-site of the customer or in mass-media. The procedure of open competition lasts not less than a month and demands big resources (preparation of competitive documentation, an assessment of demands etc.).

Competition is held by the customer (city, state or another public institution) or his representative. All requirements to a subject of purchase and suppliers, and also criteria of a choice of the winner and procedure of competition are stated in the competitive documentation. Participants of competition submit the applications issued according to the requirements. If only one application was submitted for the competition, it is cancelled. The public procedure includes opening of the offers of participants and their offered prices. The contest committee estimates all demands and defines the winner, it is the participant who has submitted the most advantageous proposal. After that negotiations are organized for signing the contract. If negotiations cannot demand both the organizer and the supplier, the organizer of competition carries out to the supplier who has made the following on advantages proposal.

2.2.2 Closed competition

The rules of the closed competition are the same as in open competition. The difference consists of a choice of participants. Any competent supplier can take part in open competition, but the invitation to participation in the closed competition is not published. Only those suppliers who were invited to the closed competition can participate in it. Information about the results of the closed competition is not published either.

The closed competition is held in the following cases:

- limited number of suppliers who have that kind of production or the limited number of suppliers has the qualification for arranging it for the customer

- production is bought for needs of safety/defence or purchase has confidential character
- time and expenses which are required for consideration and an assessment of a large number of competitive demands, are incommensurable to the cost of the bought production

2.2.3 Open auction

Open auction allows to publish the state order in the Internet. The state contract on providing goods, works or services, is called as a 'lot'. The main criteria of definition of the winner of any auction is the price. Therefore the winner of auction is the company who has offered the lowest price for the state or municipal contract.

The notification on carrying out the open auction should be published in the official publication and on the official website not less than in twenty days before the expiration date of submission of applications for participation in auction. The notification on carrying out open auction can be reduced to seven working days to an expiration date in the cases defined by the law.

Rates can be discrete (with a certain step) and continuous. Auction can consist of several rounds, on each the participant has an opportunity to do a new rate. If at the end of the round the new rates are not staked in that case the auction ends. The irretrievable monetary contribution, pledge or other providing demands is undertaken for confirmation of intentions of participants of the auction.

2.2.4 Closed auction

The difference of the closed auctions is only that the auctioneers do not know the demands of other participants because they apply in the sealed envelopes whereas in open auctions each demand becomes known to all participants.

The notification on carrying out the closed auction, documentation of the auction, the changes made to it, and also documentation explanations about auction are not subject to publication in mass media and to placement on the Internet. The customer sends written invitations to the closed auction to companies not later than in twenty days before the termination of applications for participa-

tion in auction. The participants usually have access to the data which is the state secret, and are capable to carry out deliveries of goods, performance of work, rendering the services which are a subject of auction.

Closed auctions most often are used for decreasing risks of the customer. First of all, risks are connected with possible arrangement of participants. However, the decrease in efficiency is a payment for it.

2.2.5 On-line auction

On-line auction is an open auction in an electronic form placed on a web-site of electronic trading platforms which were accredited by the Ministry of Economic Development of the Russian Federation.

The auction is regulated by chapter 3.1. of Federal Law No. 94-FZ and government resolutions. The notification about the auction and the results of auction should be placed directly on electronic platforms. State and municipal customers are obliged to carry out open auctions in an electronic form. In such conditions the participants of the auction are not known before end of auction. That provides the competition and reduces the possibility of corruption. The information about three types of tenders is summarised in Table 3.

Table 3. Difference of On-line auction from other types of tenders

Characteristics	On-line auction	Request of quotations	Open competition
Submission of application	Multiple (electronic form)	Once (paper form)	Once (paper form)
Liabilities of customer and winner	Set by laws (electronic signature)	-	Set by laws
Relative volume of documents	Minimal (sent once)	Small	Huge (sent separately for every competition)

2.2.6 Request of quotations

The request of quotations is a way of placement of orders when the information about requirements for goods, works, services for the state or municipal needs is reported to an unlimited circle of people by placement of the notification on the official web-site.

The procedure of carrying out the request of quotations is regulated by chapter 4 of the Federal Law No. 94-FZ of July 21, 2005. This way is usually used when the question is about batch or standard production, for example, about computers, a stationery, fuel or operating supply materials, some types of construction works, rent of rooms etc. The winner is the participant who has offered the lowest price of the contract admits. The maximum price of the contract should not exceed 500 000 roubles.

The way of request of quotations is the simplest and fastest from other competitive procedures, and this can be seen in Table 4. In this case it is not necessary to develop competitive documentation and criteria of an assessment of demands. As the batch production is most often bought an assessment of quoted demands occurs approximately in 1-7 days.

Table 4. Comparison of Request of quotations and Open auction

Characteristics	Request of quotations	Open auction
Place of publication of order	On-line publication on the official web-site	Printed publication + On-line publication on the official web-site
Price of the contract	500 000 maximum	-
Additional conditions	The results of auction were refused and the price is less than 500 000	Goods, works and services are compared by price only
Restrictions	Customer can't place the same order more than once in one quarter	List of goods, works and services is set by municipality

3 PROCESS OF THE RENOVATION PROJECT

3.1 Life line of the project

Russian and Finnish ways of organization of the project flow have lots in common. Otherwise the Russian flow is not so strict.

Every Russian project starts from the preparation of the investigation [4]. At that stage it is necessary to find out as much information about the object as it is possible. The renovation company studies building plans, structural and architectural drawings, which were prepared at the time when the object was built. Also it is very important to know the previous geology of the building site.

It is known that in St. Petersburg lots of buildings were erected on muddy soils, so the level of the ground water earlier and now can be different, that is why it is quite important to check the calculations of the basement and foundation according to the current situation.

Some renovation projects are done for the buildings which weren't used for several decades. In that case it can be problematic to define the author of the building and year of construction. Mostly this information is very useful and helps to specify constructional characteristics which were used at the certain historical period of civil production in St. Petersburg.

The idea of the author in the year of construction is possible to be different with the actual condition of the existing building. For example, structural scheme, geometry of building and its structures, strength of materials (steel, concrete, stone, timber), loads and forces, applied at the project stage have to be compared with the current state.

At that phase the main goals of investigation should be defined. A List of works, which would be provided through the renovation project, has to be accomplished. Furthermore, the renovation company can specify the methodology of the surveys e.g., tools, materials and equipment, places of surveys and taking samples, checking calculations. In addition, the company should remember to

get all necessary permissions for the access to the structures and prepare a schedule.

The second phase of investigation concerns the object. That means that preliminary (visual) investigation takes place. The main issue is to define preliminary the condition of the building, so-called weak points and places of structures. For that kind of observation binoculars, tape rules and other types of equipment for photo fixation can be used.

As the result, plans of buildings with applied weak points and defects would be made (e.g. defect areas, width of cracks, depth of corrosion), also the geometry of the building and exact sizes of each construction are determined. Mostly the definition of the damage degree of the building is enough to set the qualification of the technical condition of the building (5.1.13 GOST 31937-2011)

The third stage is the detailed (instrumental) investigation. Plenty of tools can be used in this stage of investigation. According to the previous stages the strength and condition of structures and materials can be defined. Also during the survey samples of constructions and soil should be taken. After the work on site an engineer has to make calculations in order to define the capacity of structures, as far as making tests at the laboratory.

The works should be performed according the normative document SP 13-102-2003 'The rules of investigation of the bearing structures', which is required to be taken into account during the surveys. Based on the experience of the presence of Vahanen on the markets of St. Petersburg and Moscow in 2015 the clients use as the reference this document, the example of the letter from the customers to Vahanen can be found in Appendix 2.

The detailed description of the main steps of the investigation are collected in Table 5. In the following chapter the stages which are common to the project would be discussed in terms of the general aspects.

Table 5. Renovation project life line

Stage number	Stage description
1	Site investigations <ul style="list-style-type: none">○ Façade○ Balconies○ Windows○ Roof structure
2	Project planning <ul style="list-style-type: none">○ Decision of the structures and materials which are going to be renovated/renewed○ Quality and quantity of the renovation○ The methods of renovation
3	Designing <ul style="list-style-type: none">○ Architectural○ Structural
4	Tendering phase <ul style="list-style-type: none">○ Safety documents○ General terms of contract
5	Supervising <ul style="list-style-type: none">○ Quality and quantity management○ Financial○ Safety

3.2 Stages of project

In general the subsequent steps are usually performed for the important structures and objects of the cultural heritage. For the preservation of the condition of the historical buildings and the significant architectural masterpieces the investigation is deep and detailed. Nevertheless, it is vital to outline the stages which are most common for the reconstruction, but can vary from project to project.

(1) Predesign inspection

Accumulation and compilation of data about the location of a building and about the building itself should be done at the stage (1). In addition, the historical and cultural value of the monument and necessity of renovation due to city-planning, social and economic, health, hygienic and ecological factors should be defined [5]. Estimation of profit and benefits of development of the building and/or area and calculation of income is executed.

(2) Conceptual design

Intermediate stage of making the project is (2), which does not need to be agreed by municipalities. At this stage the project's properties can be studied in details before final decisions and compiling final project.

(3) Project

The main part of renovation project, which should be agreed with the municipalities is (3). The project has to be elaborated according to laws, acts and standards and signed by the head engineer, architect or project manager. (3) consists of explanatory note, a layout draw and infrastructure, an architectural part, technology of renovation, technical equipment, pipelines and networks, ecology and environment, energy efficiency, civil defence and emergency solutions, access for persons with reduced mobility, architectural lightning, building site management and cost estimations.

(4) Project-design

The interior and exterior of the object should be developed at (4), according to the functional purpose and architectural style.

(5) Detailed documentation

This part includes detailed information, which is needed for building processes on site and installation works. (5) consists of detailed drawings, specifications of machinery, equipment and materials and calculations of cost.

4 APPLICABILITY OF SURVEYS PROVIDED BY VAHANEN

In the same convention as it was mentioned before the foreign companies have several restrictions on their business and working procedures in Russia. Mainly the inconvenience is connected to the licences and permits which should be obtained in order to perform the surveys. Vahanen overcomes those problems by the use of affiliated company FiCoTe and furthermore the Russian specialists take part in the projects.

In order to perform the survey services on the bearing structures in Russia the international company should obtain the following documents according to the SP 13-102-2003:

- the permission to access the bearing structures on the reconstruction object
- certified tools and equipment
- the licence for the personnel which states that they have the certain level of qualification

As the example it is possible to mention the letter to Vahanen from the customer (Appendix 2) which states that those documents are mandatory to obtain and apply each time whenever the survey is executed.

4.1 Visual inspection (on site)

The previous old drawings are used to compare the current condition of the building with the initial one.

This survey should be made to find out places of defects of structures and compose the defect map, as for instance the façade at Picture 1, Appendix 1. Defects mean different cracks, holes, water spills and other damages which prevent the normal functionality of the building [6]. These defects can be detected on different parts of the building. That is why not only facades, but also bearing, partition walls and balconies are subjected to the visual inspection [9].

4.1.1 Tools and equipment

For the visual observation of the building the experienced professional is needed, who is able to detect and place defects on the plans of the building or on the elevations. In such a case, when more than 30% of façade is defected, normally a decision is made to repair the entire façade.

4.1.2 Methodology (main steps)

In order to execute this kind of survey, the following steps are required:

1. Observation and detection of the damages
2. Taking photos of defects
3. Depiction of the detected defects on the drawings
4. Report composition

4.1.3 Applicability of the method in St. Petersburg

Exactly the same procedure is always implemented in Russia, with the only difference that sometimes there is an absence of the old drawings. Almost always the new or previous owners of the real estate have erected or demolished partition walls without needed calculations and adjustments, which is obviously illegal even in Russia. Due to this fact the surveying team almost always is trying to make the new drawings of the current position of bearing and partition walls. This stage must be the most important part of the survey and should be done precisely. This makes it available to find out the places, where more detailed survey is needed. And moreover it allows the company to estimate the approximate costs and the amount of works which should be provided in order to return the initial or increase the performance of the building. During the report composition it is recommended to use the book "Inspection of technical condition of constructions and structures".

4.2 Taking samples (on site)

After the visual inspection the company makes the decision to investigate the condition of the structures which are subjected of the interest. For this reason concrete samples are bored out from the part of the building, wall, slab or other

surface [7]. The main scope is to take part of the material to make different tests with it.

4.2.1 Tools and equipment

The following equipment is required in order to execute this kind of test:

1. Drill, which is used to put the anchor for fixing the diamond driller
2. Diamond drill

4.2.2 Methodology (main steps)

In order to execute this kind of survey, the following steps are required:

1. Drilling a hole
2. Putting screw anchor inside
3. Fixing diamond drill (Appendix 1. Picture 2)
4. Taking off the sample (Appendix 1. Picture 3)
5. Measurement of thickness of materials
6. Checking the moisture in the insulation material
7. Pouring the hole back with an epoxide glue

4.2.3 Persons

The specific people are requested for this test procedure:

- One with licence
- One who is learning (obtaining the licence)

4.2.4 Applicability of this method in St. Petersburg

This must be the most universal procedure of taking the samples for the further testing without huge damage to the structures. So it can also be applied to the most part of the buildings in St Petersburg, except those which are under protection under the laws of the historical heritage. In such cases the surveying firms are obliged to perform various types of non-destructive tests.

4.3 Tension test (on site)

A concrete slab is bored or cut according to the shape of the plate, which should be glued to the surface. Then the tension capacity is defined by the pulling machine.

4.3.1 Tools and equipment

The following equipment is required in order to execute this kind of test:

1. Drill, which is used to put the anchor for fixing the diamond driller
2. Diamond drill or saw
3. Epoxide glue
4. Steel plate
5. Pulling machine

4.3.2 Methodology (main steps)

In order to execute this kind of survey, the following steps are required:

1. Drill a hole
2. Put screw anchor inside
3. Fix diamond drill or saw (according to the shape of plate)
4. Glue the surface of concrete and steel plate together
5. Install the pulling machine
6. Measure the tension capacity (stress)
7. Pour the hole back
8. Write down the result in the report

4.3.3 Applicability of this method in St. Petersburg

On-site tension tests are quite always performed in St Petersburg, but as it was mentioned before, there exist some restrictions on the kinds of buildings where they are allowed [8].

4.4 Definition of position of reinforcement (on site)

Ferro scanning of the concrete is used for definition of the place and diameter of reinforcement rods. This information can be used for definition of the percent of steel in carbonized layer and also for calculations.

4.4.1 Tools and equipment

Only the ferro scanner (Appendix 1. Picture 4) is required for the execution of this works.

4.4.2 Methodology (main steps)

Surface of concrete is scanned by a ferro scanner to define the place of reinforcement.

4.4.3 Applicability of this method in St. Petersburg

The method is widely used also in St. Petersburg mainly in the cases when the invasion is prohibited or unfavorable due to some reasons. This non-destructive technique allows to define the position of the reinforcement, but the main limitation is connected to the information characteristics of the reinforcement which should be known or predicted [10]. These properties cannot always be easily determined, and the quality of the survey depends on the experience of the tester.

4.5 Carbonization test (laboratory)

Concrete samples are sprayed with phenolphthalein and the absence of pigmentation indicates the carbonized level.

4.5.1 Tools and equipment

The following equipment is required in order to execute this kind of test:

1. Spray with phenolphthalein
2. Enough ventilation and protection to avoid contact with the chemicals
3. Ruler

4.5.2 Methodology (main steps)

In order to execute this kind of survey, the following steps are required:

1. Clearing the concrete surface
2. Spraying phenolphthalein on the concrete (Appendix 1. Picture 5)
3. Outline the pigmented part (Appendix 1. Picture 6)
4. Measurement the layer of carbonization in different places and define whether the steel reinforcement is carbonized layer
5. Calculation of the average distance
6. Report

4.5.3 Applicability of this method in St. Petersburg

The estimation of carbonized level is widely used during surveying process in St. Petersburg. Normally it is used to detect the corrosion of the reinforcement and estimate the level of aggression of the environment [11].

4.6 Tension test (laboratory)

Definition of the tension capacity by stretching the concrete cylinder sample in pulling machine is defined.

4.6.1 Tools and equipment

The following equipment is required in order to execute this kind of test:

1. Epoxide glue
2. Steel plates
3. Pulling machine

4.6.2 Methodology (main steps)

In order to execute this kind of survey, the following steps are required:

1. Clear and plain surfaces of cylindrical concrete sample
2. Glue these surfaces with steel plates
3. Expand the sample in pulling machine
4. Measure the pressure which is needed to destruct the sample (N/mm²)

4.6.3 Applicability of this method in St. Petersburg

In general, the tests of the concrete to the tensile stresses are rarely used in Russia. Quite often the samples are subjected to compression, and procedures are distinguished into the cubic and cylinder strength. Later on the desired parameters can be defined according to [7].

4.7 Microscope observation (laboratory)

The special preparation is needed to perform this kind of an analysis. Slices of concrete 15 micron thick should be covered by fluoric epoxy. Using UV and normal light they are analysed in order to detect defects. The position, number of cracks and air voids are estimated. The main scope is the definition of the life cycle of a structure and the need in renovation. Furthermore, if the presence of asbestos is detected in the concrete mixture, according to the Finnish laws the special procedures should be provided.

4.7.1 Tools and equipment

The following equipment is required in order to execute this kind of test:

1. Microscope
2. Camera for taking images

4.7.2 Methodology (main steps)

In order to execute this kind of survey, the following steps are required:

1. Put thin slice of concrete into the microscope
2. Register quality and quantity of defects
3. Make a decision about renovation and life cycle of structure
4. Report writing

4.7.3 Applicability of this method in St. Petersburg

The microscopic structure of the concrete is rarely investigated during the surveys in Russia. Probably this methodology is very perspective in St. Petersburg, especially due to the fact that the climatic conditions are practically the same,

however Russian building companies do not pay enough attention to the air contamination in concrete.

5 CONCLUSIONS

Having a high rate of deteriorated buildings in the region of St. Petersburg, the renovation market has wide variety of the profitable perspectives. For the renovation companies, such as Vahanen, the possibilities of the expansion to St. Petersburg have been discussed. The methodologies of the surveys can be applied for St. Petersburg, as well as for the whole country.

In the research, the facilities of the renovation market of St. Petersburg have been investigated. The organization of obtaining the order, from the point of view of the company has been described. Several survey methods and their applicability in Russia have been discussed in this thesis.

The given discussion of the techniques has a wide field of applicability on the market. The provided work is useful for Vahanen, as well as for the reader to have an overview of the renovation surveys practice in St. Petersburg.

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6 APPENDIX 1

Picture 1. Example of defect map



Picture 2. Procedure of taking the sample



Picture 3. The result of drilling.



Picture 4. Ferro Scanner Hilti



Picture 5. Spraying with phenolphthalein



Picture 6. Estimation of the carbonized level



7 APPENDIX 2

Letter to Vahanen from client about the executed surveys:

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ
"ТСК-Менеджмент"

143441, Московская область, Красногорский район, д. Путилково, 71 км МКАД, строение 15
ИНН 7708539667; КПП 502401001; р/с 40702810200000006711 в ОАО Банк ЗЕНИТ
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E-mail: info@tsk-mng.ru т. +7(495) 280-04-56

Исх. № 55 -С
от «2» апреля 2015г.

По трещинам в ж/б стеновых панелях.
Объект: ЖК «САМПО»

Руководителю проекта
ООО «Лемминкяйнен Строй»
Древнову В.К.

Уважаемый Виктор Константинович!

Рассмотрев представленный отчет компании «VAHANEN» по трещинам в ж/б стеновых панелях сообщаю следующее:

Отчет не может быть принят по причинам:

1. Не представлено свидетельство о допуске к работам по обследованию несущих конструкций зданий и сооружений в соответствии с СП 13-102-2003
2. Не представлены перечень и сертификаты на приборы и инструменты используемых при обследовании в соответствии с СП 13-102-2003 раздел 4.
3. Не представлены документы подтверждающие квалификацию специалистов проводивших обследование в соответствии с СП 13-102-2003 раздел 4.
4. Не представлен отчет по обследованию наружных стеновых панелей CPR, CPS, а так же цокольных панелей SPR.
5. Оформление «Вывода и рекомендаций по устранению трещин» не отвечает требованиям СП 13-102-2003 раздел 11 «Оформление результатов обследования»

Предлагаю в согласованные сроки устранить указанные замечания в соответствии с СП 13-102-2003, ГОСТ 31937-2001 и направить отчет на повторное рассмотрение.

Инженер технического надзора
ООО «ТСК-менеджмент»



Кудакаев Р.Р.