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VOLUME II

URBAN STUDIES, PLANNING
& DEVELOPMENT
ARCHITECTURE AND DESIGN



**4th INTERNATIONAL MULTIDISCIPLINARY
SCIENTIFIC CONFERENCE ON SOCIAL SCIENCES AND ARTS**

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**URBAN STUDIES, PLANNING AND DEVELOPMENT,
ARCHITECTURE AND DESIGN**

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CONFERENCE PROCEEDINGS CONTENTS

SECTION URBAN STUDIES

1. **A METHODOLOGICAL APPROACH TO DEVELOP A TYPOLOGY OF CONTEMPORARY URBANIZATION PROCESSES FOR NATURAL RESOURCE REGIONS OF SIBERIA**, Irina P. Vorontsova, Lyudmila K. Vitkovskaya Ivan A. Drobyshev, Aleksandr N. Pozdeev., Siberian Federal University, Russia3
2. **AN APPROACH TO SUSTAINABLE DEVELOPMENT WITHIN THE HRADEC KRÁLOVÉ -PARDUBICE BIOCENTRIC AGGLOMERATION**, Ing. Lucie Teslikova Hurdalkova, Ing. arch. Dagmar Kuta, VSB - Technical University of Ostrava, Czech Republic11
3. **HOUSEHOLD MOBILITY IN LATVIA: CURRENT SITUATION AND PROSPECTS FOR THE PROMOTION OF SUSTAINABLE MOBILITY**, MSc Env. Zanda Krukle, MSc Pol Kristine Gaugere, University of Latvia, Latvia.....19
4. **THE ANALYSIS OF THE DOMESTIC AND FOREIGN PRACTICE OF THE DEVELOPMENT OF CREATIVE INDUSTRIES AND SPACES IN THE CONDITIONS OF A MODERN TOWN**, Prof. Larisa Ermakova, PhD Daria Sukhovskaya, Pyatigorsk State Linguistic University, Russia31
5. **ASPECT OF ENVIRONMENTAL PROTECTION IN THE SHAPING OF SUSTAINABLE RESIDENTIAL DEVELOPMENTS ACCORDING TO THEIR USERS. POLAND, THE NETHERLANDS**, Magdalena Jagiello-Kowalczyk, Cracow University of Technology, Poland.....39
6. **ASPECTS REGARDING THE ROMANIAN BLACK SEA COAST HISTORICAL HERITAGE AND ITS IMPORTANCE IN THE GENERAL MARITIME PLANNING**, Emanuel Plopeanu, Ovidius University of Constanta, Romania.....49
7. **ASSESSMENT OF ENVIRONMENTAL SITUATION AND WILLINGNESS OF URBAN POPULATION TO PARTICIPATE IN SOLVING ENVIRONMENTAL PROBLEMS**, Zotov V.V., Yushin V.V., Prelikova E.A., Kursk Academy of State and Municipal Service, Russia.....57
8. **BUILT ENVIRONMENT AND CONCEPTS OF TIME AND PERMANENCE**, Aleksandar Kosina, Faculty of Technical Sciences, University of Novi Sad, Serbia65
9. **BUYING MOTIVES OF GREEN CUSTOMER IN AUTOMOTIVE INDUSTRY**, Jan Pekarek, Dr. David Schuller, Brno University of Technology Faculty of Business and Management, Czech Republic.....73

10. CHARGING SUPPLY MEASUREMENT: THE CASE OF CZECH REPUBLIC, Jan Pekarek, Dr. David Schuller, Brno University of Technology Faculty of Business and Management, Czech Republic.....	81
11. COMMERCIAL SUBURBANIZATION IN NITRA CITY, Mgr. Milan Midler, Doc. RNDr. Alena Dubcova, CSc., Constantine The Philosopher University in Nitra, Slovakia	89
12. CURRENT POLICY AND SUPPORT IN THE ADVERTISING INDUSTRY IN THE ZILINA REGION, Miriam Garbarova, Petra Holla Bachanova, Lukas Vartiak, University of Zilina, Slovakia.....	97
13. ENVIRONMENTAL IMPACT OF TRANSPORTATION INFRASTRUCTURE IN PROJECT ASSESSMENT, Petr Varbuchta, Hana Kovarova, doc. Vit Hromadka Ph.D., Eva Vitkova Ph.D., Brno University of Technology Faculty of Civil Engineering, Czech Republic.....	105
14. ENVIRONMENTAL PROBLEMS OF GLOBAL CITIES IN CHINA: THEORY AND PRACTICE, Assist. Prof. Ksenia Gennadiievna Muratshina, Bachelor Student Anastasiya Sergeevna Nefedova, Ural Federal University, Russia.....	111
15. EVALUATION OF THE INFLUENCE OF THE DIFFERENT POSSESSIVE MODELS OF THE WATER INFRASTRUCTURE ON THE PRICE OF WATER IN THE CZECH REPUBLIC, Lukas Labudek, M.Sc., Veronika Roudna, M.Sc. et M.Sc., Jiri Nowak, B.Sc., Assoc. Prof. Alena Ticha, M.Sc., Ph.D., Brno University of Technology Faculty of Civil Engineering, Czech Republic.....	117
16. FORMATION OF THE HUMAN CAPITAL OF CITIES WITHIN THE FRAMEWORK OF SUSTAINABLE DEVELOPMENT, Assoc. Prof. Svetlana B. Globa, Assistant professor Victoria V. Berezovaya, Assoc. Prof. Irina S. Bagdasaryan, Dr. Elena N. Sochneva, Siberian Federal University, Russia.....	125
17. INCREASING THE COMPETITIVENESS OF THE CITY BY ELIMINATING THE ASYMMETRY OF SPATIAL DEVELOPMENT, Assoc. Prof. Svetlana B. Globa, Prof. Angelika Mettke, Assistant professor Victoria V. Berezovaya, Assoc. Prof. Nina M. Butakova, Victoria Arnold, Siberian Federal University, Russia.....	135
18. INFLUENCE OF ANTISOCIAL ACTIVITIES ON SECURITY AND QUALITY OF LIFE, Ing. Jozef Kubas, MUDr. Ing. PhD. Zuzana Stofkova, University of Zilina Faculty of Security Engineering, Slovakia	143
19. INFORMATION AND COMMUNICATION TECHNOLOGY DEVELOPMENT AND NETWORKED READINESS IN THE CONTEXT OF "SMART" CITIES, Candidate of Science, Associate Professor Kazantseva N K, Assistant Professor Tkachuk G A, Master Student Ryabina V V, Ural Federal University named after the first President of Russia B. N. Yeltsin, Russia	151

20. LOCAL CENTERS FOR THE LOCAL COMMUNITY , Krasheninnikov A.V., Kartashova K.K., Lazareva M.V., Moscow Architectural Institute - Urban Planning and Design, Russia	159
21. LOCATION OF PUBLIC CUBATURE CAR PARKS IN LARGE POLISH CITIES-CURRENT STATE AND DEVELOPMENT PERSPECTIVES , Agnieszka Szumilas, Robert Masztalski, Wroclaw University of Science and Technology, Poland	167
22. LONG-TERM DEVELOPMENT OF ELECTRIC POWER INDUSTRY USING SMART GRIDS , Andrey Berezin, Konstantin Gomonov, Vladimir Matyushok, Bruno Sergi, RUDN University, Russia	173
23. OBJECTS OF EXCLUSION: A KIND OF POPULAR DESIGN AS PREDICATE OF SURVIVAL , Marcus Dohmann, Federal University of Rio de Janeiro - Fine Arts School, Brazil	179
24. PLANNING SUSTAINABLE MANAGEMENT OF URBAN MUNICIPAL WASTE IN RUSSIA , Assist. Prof. Tatyana G. Krupnova, PhD ,Student Egor V. Artyukov, Assist. Prof. Viktor V. Trofimenko, PhD, South Ural State University, Russia	187
25. PREDICTING HOUSE PRICES USING BOTH GEOGRAPHICALLY WEIGHTED REGRESSION AND KRIGING METHODS , Anastasiia Yu. Timofeeva, Vladimir S. Timofeev, Novosibirsk State Technical University, Russia	195
26. PROTECTION, PROMOTION AND USE OF CULTURAL HERITAGE THROUGH THE ORGANIZATION OF EXPO 2022 AS A CHANCE TO SAVE THE POST-INDUSTRIAL CITY , Aneta Tylman, Monika Cysek-Pawlak, University of Lodz, Poland	203
27. RAILWAY STATION IN A SMALL TOWN - A PLACE OF INTEGRATION FOR LOCAL COMMUNITIES - EXAMPLES OF ADAPTATION IN THE POMERANIAN REGION , Magdalena Podwojewska, Gdansk University of Technology Architecture Faculty, Poland	211
28. RESEARCH OF SPATIAL DISTRIBUTION OF SOCIAL & BUSINESS ACTIVITIES IN A LARGE CITY USING GEOINFORMATION TECHNOLOGIES , Alexander Gushchin, Sergey Sanok, Yana Tatarnikova, Ural State University of Architecture and Arts, Russia	219
29. RESTRUCTURING OF SOCIAL SPHERE AS A STRATEGIC GUIDELINE FOR SUSTAINABLE DEVELOPMENT OF URBAN ENVIRONMENT , Rezer T.M., Ural Federal University named after the first President of Russia B. N. Yeltsin, Russia	227

- 30. SECURITY IN LOCAL GOVERNMENT OF THE SLOVAK REPUBLIC**, Ing. Jozef Kubas, Ing. Viktor Soltes, University of Zilina Faculty of Security Engineering, Slovakia.....235
- 31. SHAPING THE FUNCTIONAL AND SPATIAL STRUCTURE OF SELECTED FRAGMENTS OF KRAKOW**, Tomasz Bajwoluk PhD in Arch, Cracow University of Technology, Poland.....243
- 32. SMART CITY GROWTH: EXPERIENCE AND OPPORTUNITIES IN THE NORTH AND THE ARCTIC**, Assoc. Prof. Svetlana B. Globa, Prof. Sergey I. Mutovin, Assistant professor Victoria V. Berezovaya, Dr. Nina M. Butakova, Siberian Federal University, Russia.....251
- 33. SUSTAINABLE MANAGEMENT OF URBAN WASTEWATER IN THE RUSSIAN CITY**, Assist. Prof. PhD Tatyana G. Krupnova, Student Evgeniy D. Scalev, Assist. Prof. Viktor V. Trofimenko, PhD, South Ural State University, Russia259
- 34. THE LEGAL NATURE OF CONTROL REPORT DRAWN UP BY THE CONTROL STRUCTURES OF ROMANIAN COURT OF ACCOUNTS AS RESULT OF FINANCIAL AUDIT**, Ph.Dr. Eugenia Iovanas, University Aurel Vlaicu, Faculty of Humaniste Science-Public Administration, Aurel Vlaicu University of Arad, Romania267
- 35. THE LOCATION STUDY OF WROCLAW P&R FACILITIES BY THE USE OF FUZZY INFERENCE MODEL**, Anna Lower, Michal Lower, Agnieszka Szumilas, Wroclaw University of Science and Technology, Poland275
- 36. THE NEW PRINCIPLES OF DEVELOPMENT CONTROL IN RESIDENTIAL AREAS: THE CASE STUDY OF BAKU-CITY**, Assoc. prof. Shahla Gahramanova, Prof. Shekhali Babayev, Azerbaijan University of Architecture and Construction, Azerbaijan283
- 37. THE ROLE OF MUNICIPAL HOUSING STOCK MANAGEMENT IN SOCIAL COHESION IN POLAND**, Andrzej Muczynski, Anna Banaszek, University of Warmia and Mazury in Olsztyn, Poland293
- 38. THE VULNERABILITY OF INSOLATED COMMUNITIES AND BUILDINGS REARDING OF THE UTILITTIES ACCESS**, Adriana Tokar, Diana Foris, Arina Negoitescu, Tiberiu Foris, Transilvania University of Brasov, Romania301
- 39. UNEMPLOYMENT AND ITS SPECIFICS IN SLOVAKIA**, Tomas Habanik, University of Ss. Cyril and Methodius in Trnava, Slovakia.....309
- 40. URBANIZED TERRITORIES OF THE KRASNOYARSK KRAI**, Assoc. Prof. Anna Semenova, Assoc. Prof. Irina Popelnitskaia, Prof. Eugenia Bukharova, Siberian Federal University, Russia.....317

SECTION PLANNING AND DEVELOPMENT

- 41. DESIGN AND MANAGEMENT OF CONSTRUCTION PROJECTS**, Ing. Zdenka Fridrichova, Czech Technology Platform, Czech Republic327
- 42. ECONOMIC IMPACTS OF RAILWAY INFRASTRUCTURE PROJECTS AND THEIR EVALUATION**, Tomas Funk, MSc., Assoc. Prof. Vit Hromadka, MSc., Ph.D., Brno University of Technology Faculty of Civil Engineering, Czech Republic335
- 43. ELEMENTS OF PRECISION FARMING IN FORAGE PRODUCTION USING GEOINFORMATION TECHNOLOGIES**, Prof. Dr. Faik Safiollin, Assoc. Prof. Dr. Marsel Hismatullin, Assoc. Prof. Dr. Svetlana Sochneva, Assoc. Prof. Dr. Elena Pudovik, Kazan State Agrarian University, Russia343
- 44. EVALUATION AND COMPARISON OF INNOVATION POTENTIAL OF REGIONS IN CENTRAL EUROPE**, Petr Hlavacek, Jan Evangelista Purkyne University, Czech Republic349
- 45. IMPROVING RESILIENCE OF THE LOCAL PEOPLE BY FLOOD RISK MANAGEMENT (THE CASE STUDY OF VARNA CITY, BULGARIA)**, Assoc. Prof. Dr. Daniela Zlatunova, Sofia University St Kliment Ohridski - Faculty of Geology and Geography - Department Regional Development, Bulgaria355
- 46. LAND USE CHANGES AND LANDSCAPE STABILITY: A CASE STUDY OF RADISA CATCHMENT (WESTERN SLOVAKIA)**, Dr. Matej Vojtek, Dr. Jana Vojtekova, Andrea Angelovicova, Constantine The Philosopher University in Nitra, Slovakia363
- 47. LAND-USE CHANGES OF THE SLOVAK CULTURAL LANDSCAPE OVER THE PAST 250 YEARS (ON EXAMPLE LANDSCAPE TYPES)**, Martin Boltiziar, Branislav Olah, Igor Gallay, Constantine The Philosopher University in Nitra, Slovakia371
- 48. SEED MANAGEMENT AND FORECASTING YAROW RAZE YIELD EXPERIENCE BASED ON GIS AND SPACE TECHNOLOGIES**, Prof. Dr. Faik Safiollin, Assoc. Prof. Dr. Rustam Nizamov, Assoc. Prof. Dr. Marsel Hismatullin, Assoc. Prof. Dr. Irina Malganova, Kazan State Agrarian University, Russia383
- 49. SLOPE PROTECTION IN URBAN GREEN AREAS: EXAMPLE OF WARSAW SLOPE IN “NA KSIĄŻĘCEM” PARK IN WARSAW, POLAND**, Andrzej Długonski, Cardinal Stefan Wyszyński University in Warsaw, Poland391
- 50. STRATEGIC PLANNING IN MUNICIPAL HOUSING MANAGEMENT IN POLAND**, Andrzej Muczynski, University of Warmia and Mazury, Poland399

51. THE IMPACT OF URBAN POLICY ON THE DEVELOPMENT OF THE HRADEC KRÁLOVÉ - PARDUBICE AGGLOMERATION , Ing. Lucie Teslikova Hurdalkova, Ing. arch. Dagmar Kuta, VSB - Technical University of Ostrava, Czech Republic.....	407
52. TOWARDS THE HETEROGENEITY OR HOMOGENEITY OF MINING LANDSCAPE? A CASE STUDY FROM SLOVAKIA , Dr. Jana Vojtekova, Dr. Matej Vojtek, Prof. Martin Boltiziar, Constantine The Philosopher University in Nitra, Slovakia	417
SECTION ARCHITECTURE AND DESIGN	
53. A BIM-GIS VALUATION MODEL OF URBAN GREEN INFRASTRUCTURE PROJECT , Poletti Angela, Di Iorio Maria Anna, Rovelli Chiara, Politecnico di Milano, Italy	429
54. A METHODOLOGICAL APPROACH TO DESIGN AN INCLUSIVE INTERIOR CHILDREN'S PLAY SPACE: FROM OBSERVATION TO INTERVIEW , Amaral Ines, Guedes Graca, University of Minho, Portugal.....	441
55. ABOUT EMPATHY AND DWELLING , Negrisanu Daniela, Blidariu Cristian, Politehnica University of Timisoara, Romania	451
56. ALEXANDER NEVSKY CATHEDRAL (1839-1864) OF THE CITY OF VYATKA: RECONSTRUCTION OF EXTERIOR AND INTERIOR ELEMENTS , Prof. Dr. Natalia Krivosheina, Postgraduates Elena Elpasheva, Danil Pogodin, Darina Cherezova, Vyatka State University, Russia.....	459
57. ANALYSIS OF HOUSING TYPOLOGY , Ing. arch. Dagmar Kuta, Ing. Jan Ceselsky, Ph.D., doc. Ing. Maria Zubkova, Ph.D., VSB - Technical University of Ostrava, Czech Republic	467
58. FATIGUE FAILURE OF STEEL SPACE TRUSS SYSTEMS FROM SNOW LOADS , Hande Gokdemir Mizam Dogan, Eskisehir Osmangazi University, Turkey.....	475
59. ARCHITECTURAL ACOUSTICS AS FORMING FACTOR IN SACRAL SPACE , Elzbieta Trocka-Leszczynska, Romuald Tarczewski, Joanna Jablonska, Wroclaw University of Technology, Poland	483
60. ARCHITECTURAL METAPHOR , Petrovici Liliana-Mihaela, Technical University Gh. Asachi Iasi, Romania	491
61. ARCHITECTURAL SPACE DENSITY ANALYSIS (ASDA): EXPLORATION OF SPACE AND SPACE FORMS EFFECT ON PEOPLE: FROM ENCLOSURE THROUGH REFUGE TO SPACE QUALITY , Pal Csanady, Artifex Kiado, Hungary.....	499

62. INTEGRATION OF ARCHITECTURE INTO NATURE: PRINCIPLES AND METHODS, Victor Logvinov, The Union of Architects of Russia, Russia	507
63. ATMOSPHERE IS THE NEW "ENVIRONMENT". THE COMPLEXITY OF THE "BIG EVENT" OF ARCHITECTURE, Prof. Belen Butragueno, Prof. Javier Francisco Raposo, Prof. Mariasun Salgado, Technical University of Madrid - UPM, Spain	515
64. BETWEEN BRATISLAVA AND ESZTERGOM – THE FEIGLERS AND ARCHITECTURE OF THE LONG CENTURY, Prof. Ing. arch. Jana Pohanícová, PhD., Slovak University of Technology Bratislava, Slovakia	527
65. SET-BACK IRREGULARITY IN EXISTING STRUCTURES, Hande Gokdemir Mizam Dogan, Eskisehir Osmangazi University, Turkey	533
66. CHANGES OF ARCHITECTURAL EXTERIOR OF MILITARY HOSPITALS IN RUSSIA, Fedorova Mariia Sergeevna, Dr., Professor, Head of the Chair, Ludmila P. Holodova, Ural Federal University named after the first President of Russia B.N.Yeltsin, Russia	541
67. DESIGN OF ASSOCIATIONAL CULTURAL LANDSCAPES USING COGNITIVE TECHNOLOGIES, Assoc. Prof. Dr. Alexander Gushchin, Prof. Dr. Marina Divakova, Ural State University of Architecture and Arts, Russia	547
68. ECONOMIC EVALUATION OF TRADITIONAL SOURCES USED FOR HEATING OF ADMINISTRATIVE BUILDINGS IN THE CONDITIONS OF THE CZECH REPUBLIC, Lukas Labudek, M.Sc., Michal Prak, M.Sc., Veronika Roudna, M.Sc. et M.Sc., Assoc. Prof. Alena Ticha, M.Sc., Ph.D, Brno University of technology, Faculty of Civil Engineering, Czech Republic	557
69. EFFORT EVALUATION OF BIM PROCESS FOR EXISTING BUILDINGS, Dr. Matteo Del Giudice, Ph. D. Assist. Prof. Dr. Fabio Manzone, Ph. D. Assist. Prof. Dr. Manuela Rebaudengo, Ph. D. Dr. Andrea Barbero, Politecnico di Torino, Italy ...	565
70. EVOLUTION OF DESIGN AND MORPHOGENIC PECULIARITIES OF KITCHEN FURNITURE IN THE XX-XXI CENTURY, Prof. Dr. Natalia Krivosheina, Assoc. Prof. Maxim Naumov, Postgraduate Julia Naumova, Vyatka State University, Russia	573
71. EXPANSION OF THE BUILDING CONCEPT «PASSIVE HOUSE» DUE TO THE APPLICATION OF ENERGY-EFFICIENT TECHNOLOGY OF NATURAL LIGHT DELIVERY TO THE PREMISES ON THE EXAMPLE OF THE SOCIAL PROJECT «THE HOUSE FOR PENSIONERS», S Pleshkov, M Ananin, Yu Vedischeva, Ural Federal University named after the first President of Russia B. N. Yeltsin, Russia	581

- 72. FAULTY WORKMANSHIP AFFECTING THE AESTHETICS OF BUILDINGS CONSTRUCTED IN MONOLITHIC FAIR-FACED CONCRETE TECHNOLOGIES – DIAGNOSIS AND PREVENTION**, Przemyslaw Bigaj, Cracow University of Technology, Poland591
- 73. FROM PROFANATION TO CONVERSION**, Prof. D.Sc. Ph.D. Eng. Arch. Jerzy Uscinowicz, Bialystok University of Technology, Poland599
- 74. FROM THEORETICIANS VIEWS ON THE SUBJECT OF MONUMENTALITY AND VISIONARY PROJECTS TO ARCHITECTURE OF THE SPECTACLE**, Dr. Jacek Kotz, Wroclaw University of Science and Technology, Faculty of Architecture, Poland.....611
- 75. GREEN DESIGN IN CHILDREN DEVELOPMENT**, Mohora Irina, Povian Cristina-Maria, Politehnica University of Timisoara, Romania.....619
- 76. ICONIC ARCHITECTURAL FORM FOR THE ICONIC SOCIETY**, Boguslaw Podhalanski, Politechnika Krakowska, Poland627
- 77. EVERYTHING SHOULD BE BEAUTIFUL IN ARCHITECTURE**, Tomasz Kozlowski, Politechnika Krakowska, Poland.....637
- 78. INDUSTRIAL DESIGNERS MAPPING THE CITY: THE CONSTRUCTION OF AN INFOGRAPHIC MAP OF LOCAL ARTISANS IN THE CITY AS A PEDAGOGICAL TOOL**, Dr. Juan Carlos Briede-Westermeyer, Dr. Isabel Leal-Figueroa, Cristhian Pérez-Villalobos, Jorge Cartes-Sanhueza, Universidad del Bio-Bio, Chile645
- 79. LANDSCAPE OF GOLF COURSES IN WROCLAW METROPOLITAN ZONE**, Maciej Stojak, Wroclaw University of Science and Technology, Poland653
- 80. LANDSCAPE ORGANIZATION OF THE ASTANA CENTRAL PARK SELECTED ISSUES**, Sabina Kuc, Olga Semeyuk, Cracow University of Technology, Poland.....661
- 81. OLD WORKERS ESTATES - THE ELEMENT OF THE UPPER SILESIAN CULTURAL LANDSCAPE IN DANGER**, Anna Sulimowska, Silesian University of Technology, Poland.....669
- 82. OPTIMIZATION OF DESIGN OF PUBLIC PASSENGER TRANSPORT STOPS RESPECTING CHARACTERISTICS OF USERS AS WELL AS ENVIRONMENTAL PARAMETERS**, Ing. Dana Rubinova, Ph.D., Brno University of Technology Faculty of Mechanical Engineering Institute of Machine and Industrial Design Department of Industrial Design, Czech Republic.....677

- 83. PROBLEM ASPECTS OF CREATION OF ECOLOGICAL PARK AROUND THE SMALL LAKE CITY (AN EXAMPLE OF LAKE CHARA, KAZAN, RUSSIA)**, Prof. Dr. Mingazova N., Ass. Malygina M, Kazan (Volga Region) Federal University, Russia.....685
- 84. REM AT BOTH SIDES OF THE MIRROR**, Prof. Belen Butragueno, Technical University of Madrid - UPM, Spain693
- 85. SCIENTIFIC 3D-RECONSTRUCTION OF CLASSICAL MONUMENTS AND THE CONTEMPORARY NEOCLASSICAL ARCHITECTURE: THE POSSIBILITY OF INTERACTION**, Dmitry Karelin, Dmitry Shvidkovsky, Moscow Institute of Architecture - Public building department, Russia701
- 86. THE ISSUES OF PARTICIPATION IN DIDACTICS OF DESIGN. CASE STUDIES**, Prof. Robert Idem, Assist. Prof. Anna Gorka, Assist. Prof. Dorota Wojtowicz-Jankowska, Gdansk University of Technology Architecture Faculty, Poland717
- 87. STUDY OF GLASS POURING PROCESS THROUGH A MOULD AND ITS INFLUENCE ON A SURFACE PATTERN OF A FINISHED GLASS SAMPLE**, Assistant Professor Vera Sadakova, Students Natalya Gryazeva, Anastasia Sitnikova, Vyatka State University, Russia727
- 88. SUSTAINABLE REFURBISHMENT OF A HOUSING UNIT AT DEBELA GORA, APUSENI MOUNTAINS IN ROMANIA**, Tamasan Maria, Ionescu Claudiu, Catana Laurentiu, Mihuta Madalin, Muntean Flavia, Ursu Adrian, Aurel Vlaicu University of Arad, Romania735
- 89. TESTING PARTICIPATORY ARCHITECTURE METHOD: REFURBISHMENT AND CONSTRUCTION OF PRIMARY SCHOOLS**, Tomas Bek, CTU in Prague, Czech Republic743
- 90. THE CHURCH INTERIORS MADE BY EXILED PAINTERS IN VYATKA: FINDINGS AND DISCOVERIES 2016**, Prof. Dr. Natalia Krivosheina, Assistant Professor Vera Sadakova, Vyatka State University, Russia.....751
- 91. THE CONSTRUCTION SECTOR CRISIS IN ITALY: ANY STRATEGY FOR SMALL AND MEDIUM-SIZED BUILDERS?**, Piantanida Paolo, Rebaudengo Manuela, Politecnico di Torino, Italy759
- 92. THE CONTEMPORARY ASPECTS OF REVITALIZATION OF THE BUILDINGS AND THE PORT AREAS**, Tomasz Szymanski, Gdansk University of Technology Architecture Faculty, Poland767
- 93. THE EXISTENCE OF DIFFERENT STAGES IN THE DESIGNING PROCESS OF AN INCLUSIVE INDOOR CHILDRENS PLAY SPACE**, Amaral Ines, Guedes Graca, University of Minho, Portugal.....775

94. THE MOTIF OF NARRATION IN THE CONTEMPORARY RIVERSCAPES: MEANDERS OF TIME ALONG SLEZA RIVER IN WROCLAW, POLAND, Alina Drapella-Hermansdorfer, Wrocław University of Science and Technology, Poland.....783

95. THE PUNTA OF GUARDIA LIGHTHOUSE ON THE PONZA ISLAND: PROJECT FOR RESTORATION, Gianluigi De Martino, Cristiana Bartolomei, Chiara Fronta, university of Bologna, Italy.....791

96. THE ROLE OF ARCHITECTURE IN RECONCILING THE INTERESTS OF PEOPLE AND WILDLIFE IN CITIES. Justyna Kleszcz, University of Zielona Gora - Faculty of Civil Engineering Architecture and Environmental Engineering, Poland.....799

97. THE ROLE OF URBAN AGRICULTURE IN SHAPING HEALTHY WORKING ENVIRONMENT OF CONTEMPORARY URBAN MAN – THE INTRODUCTION., Justyna Kleszcz, University of Zielona Gora - Faculty of Civil Engineering Architecture and Environmental Engineering, Poland807

98. THE SUSTENABILITY OF TRADITION - A VERNACULAR MODEL OF ARCHITECTURAL DESIGN, Associate professor Mihai Corneliu Driscu, Gheorghe Asachi Technical University of Iasi, Romania.....815

99. THE TYPOLOGY OF FAÇADES MADE OF PRECAST CONCRETE ELEMENTS ON THE BASIS OF THE APPLIED RHYTHM TYPE, Pawel Mika, Cracow University of Technology, Poland823

100. TOWARDS AN ARCHITECTURE OF EMOTIONS: THE EXAMPLE OF SESC|POMPEIA BY LINA BO BARDI., Assoc. Prof. Dr. Ana Luísa Rodrigues, University of Minho, Portugal.....831

101. TRENDS TOWARDS EXAGGERATION AS A FORM OF THE ZIPF'S LAW VIOLATION IN CONTEMPORARY PUBLIC BUILDINGS DESIGN, Elzbieta Trocka-Leszczynska, Romuald Tarczewski, Joanna Jablonska, Wrocław University of Technology, Poland.....837

102. USING CONTROLLABLE RANDOMNESS AND ATOMIC DESIGN APPROACH TO DESIGN POSTERS WITH TYPOGRAPHIC MEANS, Pavel Pisklavkov, South Ural State University, Russia845

103. VALUE CHAIN SCHEME: CREATION OF VALUE ADDED IN ARCHITECTURE, Emilia Madudova, Juraj Fabus, Zilinska univerzita v Ziline, Slovakia.....853

104. WHY SHOULD WE ADOPT NON-USED ATTICS OF MONUMENTAL SACRAL CATHOLIC CHURCHES FOR SECULAR PURPOSES?, Ksenia Piatkowska, Gdansk University of Technology Architecture Faculty, Poland.....861

THE PUNTA OF GUARDIA LIGHTHOUSE ON THE PONZA ISLAND: PROJECT FOR RESTORATION

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ABSTRACT

The lighthouse, an architecture landmark of the coasts around the world has been the subject of study, especially it focused on the drafting the restoration project of the Punta of Guardia lighthouse on the Ponza island, Italy. Ponza is an island which gives its name to the archipelago of the Pontine islands, located off the Lazio coast. The lighthouse in question is one of the most important signaling systems of medium-high Tyrrhenian, built on a sea stack 112 meters above sea level, at the end of 1800. As almost the totality of these structures, the lighthouse has been abandoned by the date of its automation, for about forty years. The study was accompanied by an historical research of the building, the execution metric and photographic surveys, the materials and construction techniques and as a result of analysis of the degradation and restoration work. All these operations were the prelude for the preparation of a project on the conservation of surfaces and the renovation of the structure, addressing mainly due to humidity problems in all its forms. Then, the restoration has had a conservative order and structure protection in order to strengthen its maritime signaling connotation. Everything preparatory to a reconversion of the touristic intended use, the island's main vocation and to which the building is more likely for its geographical position of extraordinary charm, in full compliance with the soul of the lighthouse, a place that offers an open and flexible tourism type, a lighthouse accommodation, the strength of European tourism of recent years. The project is based on three key point: environment, culture and sustainability.

Keywords: Punta of Guardia lighthouse, restoration, environment, sustainability, lighthouse accommodation.

INTRODUCTION

Italy is rich in architectural works of great value, however, there are structures that are not considered as they should, but they have a great potential. Lighthouses characterize the coasts of the peninsula. Sites in fascinating places, these maritime signaling, in the course of their history, have been treated exclusively in their technical aspect, especially as it regards the lamps, bright center of the night signaling. In the seventies many lighthouses were automated, cause technological progress, in damage of lighthouse keeper which take care of these structures not only regard the maintenance aspect. In fact, in the last forty years, in the lighthouses not manned, you find a steady deterioration of architectural works, on the contrary of the technical aspects [1].

CASE STUDY

Restoration of the lighthouses is deeply felt topic throughout Europe by now and it has become one of the strengths of tourism in many Nations. Italy is trying keep up, thanks to an initiative of the Marina Militare and Demanio, management holders of these, in the establishment of the project "Valore Paese Fari" pointing just to the recovery of these structures. Last call for bids issued in October 2016, in the list of lighthouses to be given in concession, there is also the Punta of Guardia Lighthouse on the Ponza Island [2], and on this specific subject is developing our research of the restoration project. The object of study is in the situation just described. As previously mentioned, the lighthouse is located to Ponza, an island in the middle-high Tyrrhenian sea, known since Roman times, it represented a strategic point of the geography of the country, role that also holds today thanks to the attendance of an important maritime signaling. One of these is the Punta of Guardia Lighthouse, located at the southern end of the island, on the sea stack at 112 meters above sea level. (Fig.1, Fig.2, Fig.3)

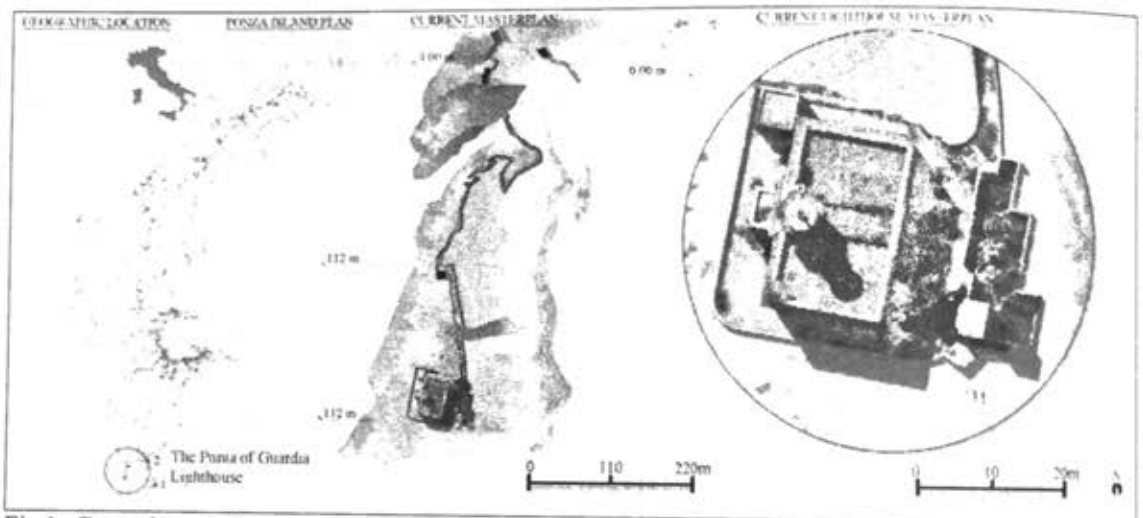


Fig.1 General overview_ geographic location, Ponza island plan, current masterplan and current lighthouse masterplan



Fig.2 View 1_ Punta of Guardia Lighthouse.

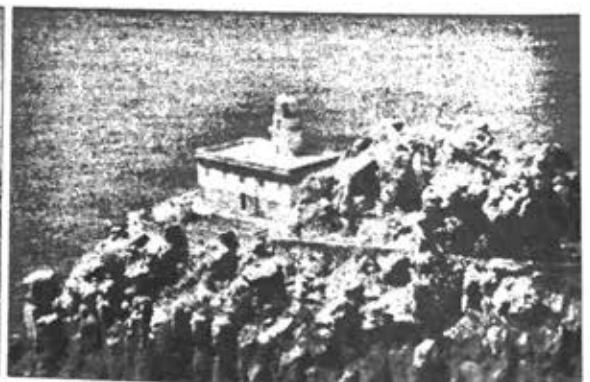


Fig.3 View 2_ Punta of Guardia Lighthouse.

Historical studies tells us that it was not an easy choice to erect the signaling where we know it, at a first time they want to built it on Monte Guardia, the highest point of the island, where there was and still endures today, but in ruins condition, Bourbon's watchtower, and later used as Semaforo, name by which it is known also today. In the end, the story finishes with the construction of the lighthouse in the current place, most likely because most overlooking the sea and for the presence of a dangerous shoal a few

nautical miles from the island's shores. The building, made of masonry with blocks of yellow tuff [3], basalt and volcanic rock, installed with a wall structure at irregular courses, tied with lime mortar, over time has not changed considerably, the only change that can report is relating to the staining patterns of the tenement faces, confirmed by archive material provided by Marina Militare, these patterns are very important because they represent another aspect of the signaling in the diurnal hours. These experiments of variations, it is assumed they have been adopted to make more visible lighthouse, nowadays the scheme it has settled to a configuration in horizontal bands with an alternating coloring, red and white, this means that the construction is distinguished from the surrounding environment, since in nature there is a perfectly horizontal geometry, that is the first purpose of diurnal signaling (Fig.4). Over the years, next to the main structure and along the way leading to the tops of the sea stuck, they have been built some construction according to the need for the lighthouse keepers. The 1975 is a very important date in the history of the lighthouse, as previously mentioned, it was the year when many of them were automated, that also happened to Punta of Guardia lighthouse, and this is the moment in which begins the abandonment state prevailing currently.

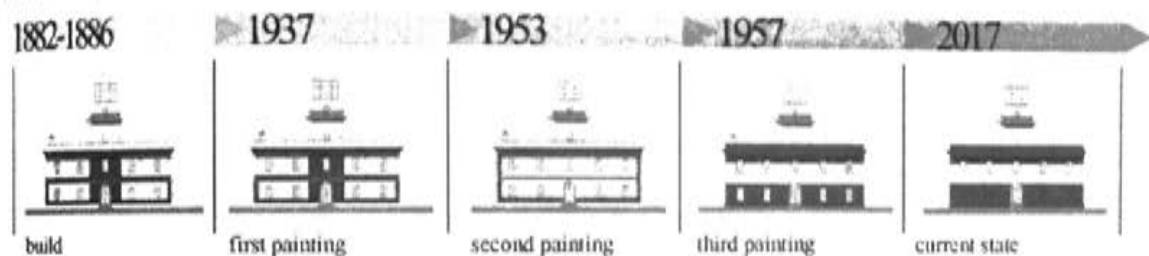


Fig.4 Changing patterns for the diurnal signaling.

Conditions in which the lighthouse keepers had no more reason to be present on the site led to greater attention about the technical machinery and to the damage of the architectural structure, because uninhabited and without any daily care. Precisely because of his state of abandonment it was not easy to reach the site, in fact it was possible only after obtaining the authorization for the execution of activities by the Marina Militare Italiana- Mari Fari. After making the historical investigations, it was possible to proceed to the next step, the direct knowledge of the site. The latter can only be reached by sea, in fact, on a small boat, with a point of departure from the Ponza harbor, it has come to the pier at the beginning of the way towards the lighthouse. Few minutes by boat that divide the lighthouse from the town, on this occasion we were able to verify the archive maps, one of the ground floor of the building plan with adjoining areas of relevance, which are around all the route, first floor plan, elevation east-south-east and a cross section, all drawn to scale 1:100 updated to 1965. It was found that the plans certify the correctness of the survey made by direct method (Fig.5), otherwise, for the elaborate on the main elevation e-s-e was different, already at an initial comparison between tenement and design, this is a model, it is hypothesized used in the representation of this type of lighthouse at the late nineteenth century, so there is no correspondence with reality. The lighthouse survey involved the use of both major instrumentation isolated, through an external polygonal base and a check of the interior of the building and adjacent, through direct survey actions, both digital photogrammetry to single frame and subsequently they were united in forming the configurations of present facades. A fundamental part of this type of operations were the photographic reliefs, fundamental to prepare the initial investigations for the identification of the

types of construction with which the building was erected and the study on the state of materials conservation.

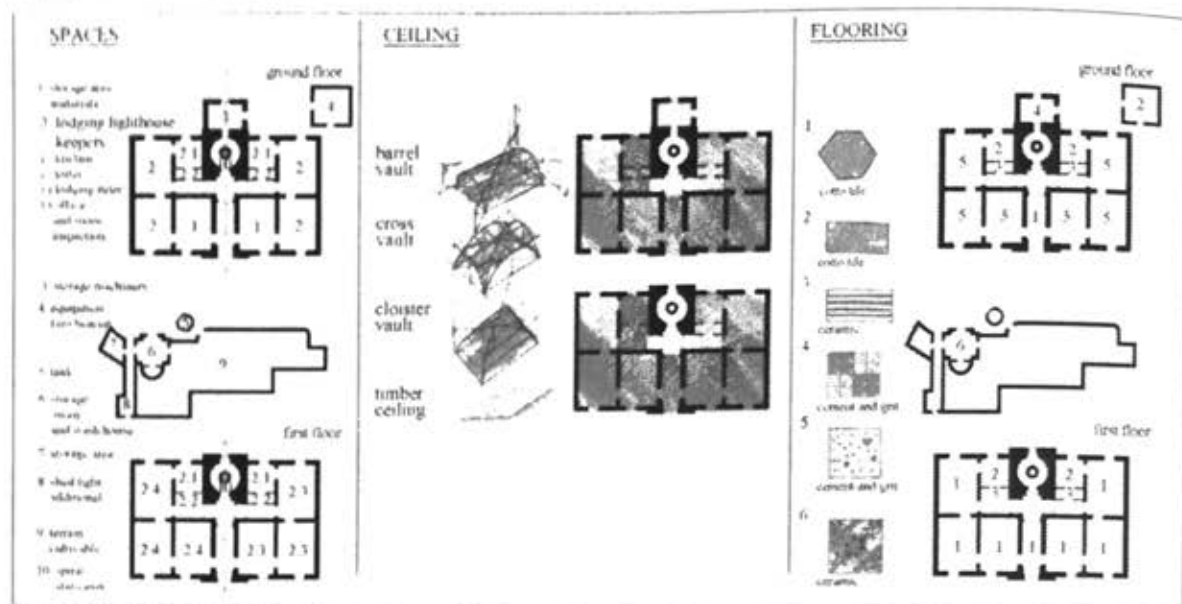


Fig.5 Analysis of lighthouse's spaces and elements

The analyze leads us to define the building as an object constructed in exactly the purpose for which it was made, a functional role. Lighthouses over time became perfect machines able to withstand the most varied actions: meteoric, wind erosion and marine aerosols. They still have an architectural value and the specific composition rules, in fact there is also a nomenclature on construction types. In our case we have a block type of lighthouse, the tower is built in the lantern services block whose plant is generally symmetrical, as in our case. Punta of Guardia lighthouse, it is located into an extreme area, that is very common thing for this type of buildings, it is exposed to all the actions listed above, which constitute a very aggressive environment for all the metallic structures and the surfaces made from plaster, realized by aerial mortar applied to the wall satin, recognizable by due to shrinkage cracks and covered with a dyed lime, white and red, recognizable by the typical transparency[4]. The state of conservation of the latter, currently it is just enough, but if you refer to the fact that the lighthouse does not receive maintenance from about forty years, we can conclude that not only the structure fulfills in order to counter the many actions to which it is subjected, but also the preparation of the finish results to be made in a workmanlike. These considerations arise from the assumption that the building place in that context for so many years, unattended, could the present day in much worse conditions. Therefore, cognitive survey carried, lead to the causes of the problems we mentioned, the loss of the maintenance and continuous exposure to the weathering result in detachment of the plaster, discoloration of pigmentations, failure to control the waters, weeds presence, anthropic actions, contrasted with traditional procedures: cleaning, protection and where necessary consolidation [5]. Another problem plaguing the lighthouse is that humidity in different type: meteoric, of condensation and capillary rise damp. In this case, we want to reverse these problems through remediation work, such as the implementation of different solutions for each humidity type, shown below[6]:

- **METEORIC HUMIDITY:** include the new drainpipes and a roof garden, to have more control over the flow of water and supervision of the internal temperatures

of the building, so as to mitigate, view of the southern exposure of the lighthouse.

- **CONDENSATION HUMIDITY:** reintegration of windows fixtures, now completely deteriorated, with new high-energy performance and with the same aesthetic characteristics corresponding to the current ones in the types and colors, to have a good internal ventilation.
- **CAPILLARY RISING DAMP:** the insertion of a floor on the ground, absent, as evidenced by archival drawings, through the positioning of formworks.

These solutions they want to return the comfort inside the building [7]. The aim of the restoration is to return the building aesthetic role through confirming its function, by the renovation of pigmentations to give greater resonance to the structure, but leaving visible the traces of the flow of time and of historical stratifications (Fig.6 e Fig.7).

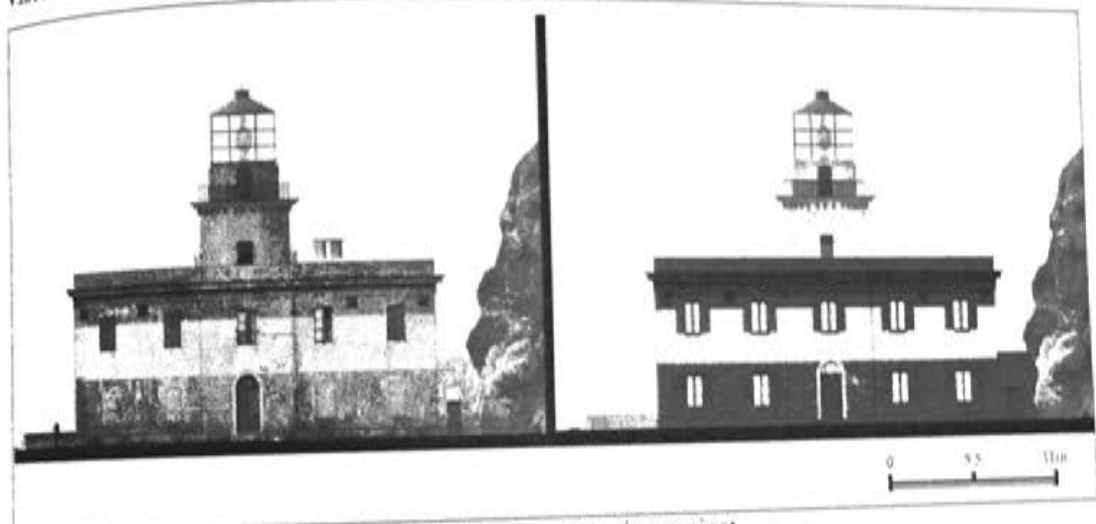


Fig.6 Elevation east-south-east before and after the restoration project.

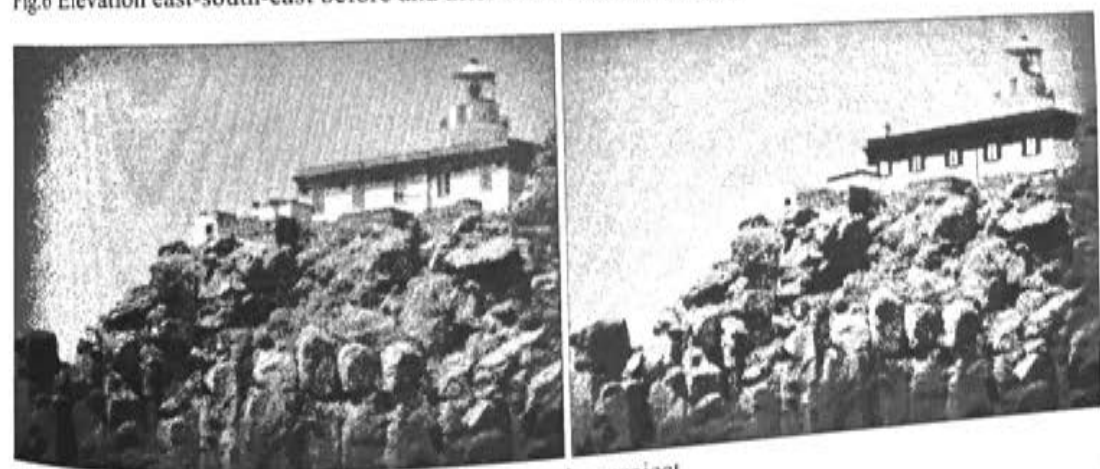


Fig.7 View from the sea before and after the restoration project.

Aim of the work was to preserve and protect the architectural object in an integral manner, and is a derived choice not only by the desire to protect the lighthouse as a building, which as already argued, that it is able to resist in autonomy, proof is the absence of kinematic mechanisms that may compromise the static nature, after 130 years. There are chains, it is assumed as pre-consolidation during the construction works to give a greater resistance to the masonry box than horizontal forces, it considered that

the lighthouse spaces are all made of barrel vault, cloister vault and cross vault made of yellow tuff at regular blocks and mortar. In summary, after the historical investigation, knowledge of places by developing new planimetric and elevation surveys, the researches of building types, analysis of degradation and the resolution of related problems, it understands that study up to this point has been targeted to the arrangement of the building in order to prepare it for new use, without which the restoration project would have no reason to be [8]. First of all, the issue has led to reflections not just on a building conversion, but of all the associated parts, especially in reference to the environment in which it is located and based on this would be made the most of its potential [9]. The Ponza island is a place that lives intensely the summer, so it started from a new concept of tourism, the lighthouse accommodation, now developed in all European countries in recent years and which it has proved to be a receptive high demand [10]. The environment, culture and sustainability are the key points which is based the design, developed aspects right from the accommodation building and which are crucial in new activities of the lighthouse. The one offering the lighthouse in its new functions is an experiential tourism, in addition to being intimately relaxing, it was also meant to be used as a guesthouse by scholars that can found large areas of research, for example: botany, marine biology, birds migrating; or place for sports, the island is a regular destination for those who practice trekking, snorkeling, fishing, excursion. So, the project was developed in these terms, on arrival, pier, ancient times was called sbarcatoio, it has been extended through the insertion of a removable pier, this was thought to facilitate access to a greater number of mooring boats. Overlooking to the sbarcatoio there is the sentry box which was previously intended for the storage of boat, recovered as a storage point for sports equipment. Continuing along the narrow road, on which it has been arranged a cleaning from weeds, it reaches the shed which was used for fuels, recovered as a point dedicated to services. Once in the outer area of the building, the flooring was released by vegetation and cleaned, eliminating the boundary wall of the garden, of no valuable interest, it brings more spatiality to this area. Where before there was the garden, used by lighthouse keepers for cultivation, they were obtained grassy areas with broom plants, typical island, and a vegetable garden for growing herbs and spaces for staying. The perimeter wall overlooking the sea was internally painted with white lime glaze, that it was decided to recover, for the impact on the landscape and for wind protection, we know that the area is as beautiful as so impervious, therefore, its closure is due to the visitor protection. They were also placed, in order to create shading areas, recycled wood diaphragm, so as to filter the light. Instead, to create a more sheltered from sunlight space, it was decided to install the boat sails, precisely the SPECTRA®, product of Allied-Signal Corporation, extremely flexible and malleable, with a high resistance to abrasion and UV rays, white color, perfectly suitable for the purpose. For visitors who do not wish to make use of the lighthouse, the hut that was used as a furnace, it was recovered as a kiosk, compatible with the use of the outdoor area. Inside of the building it has changed the cotto tiles paving, dating back to a previous restoration, with a cement and grit, as that already present but lighter in color than the original pavement, in such a way as to make them different. On the ground floor, for the solar study and the existing configuration, you have identified new features. It joined the relaxation area and the dining room, through the demolition of the wall between the rooms, replaced by a laminated wood beam, to make the most convivial space and relevant to the purpose. Adjacent is the kitchen with a dressing room and services. Symmetrically we find a study area, a utility room and a

bedroom with bathroom. Upstairs there are the bedrooms: two doubles and four triples. You can access to the terrace, but prior authorization, because to get it transits from the room where the technical equipment is placed. To make viable the garden roof is placed on the perimeter of a parapet made of self-cleaning glass. It is thought to also install, in a strategic point of the roof garden, four of micro-wind station, that give the building energy livelihood for emergency. The area is very windswept and an alternative energy. (Fig.8).

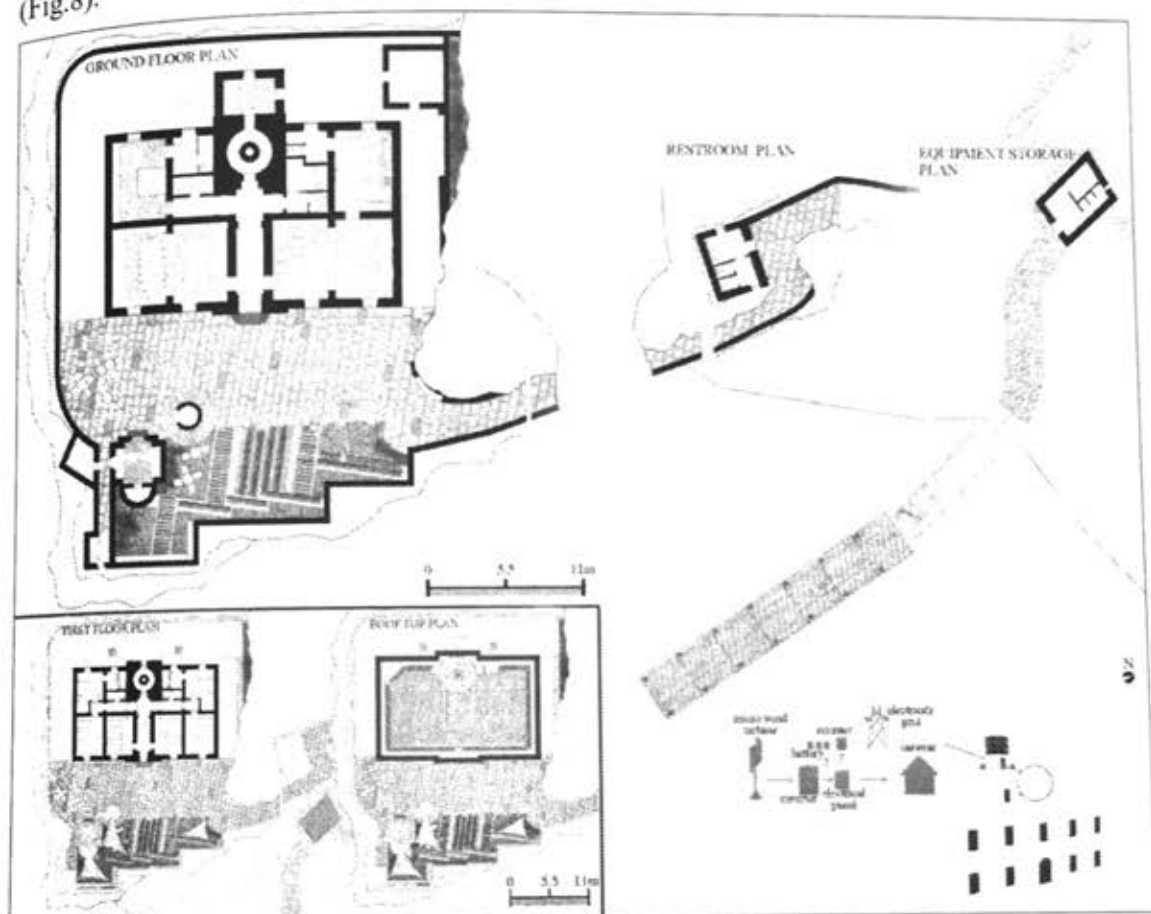


Fig.8 Restoration project_ new use as lighthouse accommodation

Conclusion: The topic detected to be very exciting in its many aspects of cognitive survey and for the potentiality expressed from the beginning [11]. All choices made in research, born marked by a sobriety that returns the feelings of a life lived in a lighthouse, reinforcing its identity as a maritime signaling taking care of the restoration pigmentation and studying an intended use capable of restoring the right intent a portion of land that was now left to itself [12]. In the project the material attached as that removed was minimal, the only purpose of putting in place the security and make it comfortable for the stay and the passage of the users, in full compliance with existing, history, but especially, the inhabitants of the Ponza island, for which the Punta of Guardia lighthouse has become a symbol.

REFERENCES

- [1] E. Di Persano, G.B. Magnaghi, Vedute e descrizioni dei Fari e semafori sulle coste d'Italia, Magnamare Edizioni, Ristampa anastatica a cura di C. Bartolomei, 1877.
- [2] Giovanni Maria De Rossi, Ponza Palmarola Zannone, Giulio Guidotti editore, 1993.
- [3] A. Giuffrè, Letture sulla meccanica delle murature storiche, Edizioni Kappa, Roma, 1999.
- [4] Cesare Brandi, Teoria del restauro, Piccola Biblioteca Einaudi, Torino, 2000.
- [5] A. Defez, Il consolidamento degli edifici: nuova edizione a cura di Luciano Maria Monaco, Liguori editore, 2002.
- [6] Giovanni Carbonara (a cura di), Atlante del restauro architettonico, UTET Torino, 2004.
- [7] Norma Italiana, Beni culturali Materiali lapidei naturali e artificiali Descrizione della forma di alterazione – Termini e definizioni, UNI11182 del 1988 aggiornato 2006.
- [8] Stefano F. Musso, Recupero e restauro degli edifici storici: Guida pratica al rilievo e alla diagnostica, EPC Libri, 2006.
- [9] Donatella Fiorani, Restauro e tecnologie in architettura, Carocci Editore, 2009.
- [10] Vincenzo Bonifacio, Pontio L'isola di Pilato Dal mito alla realtà, VianelloLibri, 2010.
- [11] Cristiana Bartolomei, Innovazione nel patrimonio dei fari italiani. Un progetto di conservazione e uso sostenibile per la "luce" sarda di Capo Spartivento, Ricerche e progetti per il territorio, la città e l'architettura – DAPT Dipartimento di architettura e pianificazione territoriale, N.3, 2011.
- [12] Alfonso Ippolito, Cristiana Bartolomei, La gestione del dato di rilievo attraverso software open source: il sistema delle porte bolognesi, 36° convegno internazionale dei docenti della rappresentazione, Parma, Gangemi Editore, 2014.