

Annual Report

Department of
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Tokyo Metropolitan University

2017

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OVERVIEW OF RESEARCH ACTIVITIES

Architectural Planning / City Planning

Kenji TAKEMIYA

(1) Study on the architectural planning of early childhood educational facilities

Kenji TAKEMIYA

1) We examined the secular change of facility use based on the actual situation survey of S kindergarten, which is characterized by architecture and gardens, for 3 years.

2) We conducted a detailed surveys on actual usage throughout the year at the certified centers for early childhood education and care 'O', practicing multiage learning, and organized the findings on the actual situation of using the center.

3) We conducted data collection survey on the operation and planning of nursery school facilities in the three central wards of Tokyo, and visit surveys of four facilities characteristic of the facility plan.

(2) Research on improvement of nursing care and recuperation environment for the elderly

Kenji TAKEMIYA

We gathered the knowledge concerning the care and space utilization of terminal and bereavement care in the elderly nursing home care facilities and the various care homes away from home.

(3) Research on Healthcare Environment and Supporting Environment for Disabled Children

Kenji TAKEMIYA

1) We carried out a visit survey to the facility practicing the treatment of super-severe children with high medical dependence and support for their families in Finland.

2) We conducted a survey on facility usage related to facility management and planning of after school day service in Tokyo.

(4) Study on Facility Planning of Medical Facilities

Kenji TAKEMIYA

We grasp the nationwide improvement situation of community comprehensive care wards, precipitated the major facility types based on the operation form, conducted a visit survey of the pioneering regional inclusive care ward and organized the use characteristics of the ward.

(5) Research on Utilization of Facilities after the Olympic and Paralympic Games

Kenji TAKEMIYA

We conducted field survey on the current situation of utilization of the 2000 Sydney Olympic and Paralympic Games facilities.

These studies are to be published in Summaries of Technical Papers of Annual Meeting, AIJ.

Tohru YOSHIKAWA

Theoretical Study on Compactness of Cities

Tohru YOSHIKAWA

In Japan, urban policies for compact cities are being conducted considering the decrease in population, the lower birth rates, the aging society and the serious global environmental issues. Considering this situation, the study explored what is the compactness of cities. During this year, the optimal urban form of a three dimensional city with hierarchical bases structure assuming the existence of multiple floors minimizing the average travel time to the center was analyzed.

Development of the evaluation method for the existing building stock on the basis of location

Tohru YOSHIKAWA

It is the problem important to our country, which is leaving for the low birthrate and aging society, to utilize a large quantity of buildings accumulated after the war as effective social property. To this end, methods easy to use for evaluating the existing building stock easily would be effective. Therefore, this study aimed at the development of the method to evaluate existing stock buildings based on the location. In this year, the characteristics of consumer surplus and numbers of visitors as evaluation indexes of social benefit for facilities with distance decay of utilization ratio were analyzed based on a model city.

Motoki TORIUMI

Masumi MATSUMOTO

Studies on Sustainable Living of Elderly People in their Local Communities

Masumi MATSUMOTO

This series of studies aims to research on the living environment of elderly people who continue to live in the same community, and to research and develop supporting systems for such people.

- 1) Research using sensors to monitor elderly people's behaviors in their homes.
- 2) Research on community salons and support for senior citizen.
- 3) Research on various community activities for elderly people and their relationship with the professionals working in community comprehensive care centers.

Studies on Regeneration and Revitalization of New Towns

Masumi MATSUMOTO

Tama New Town is the largest new town developed over 40 years ago in Japan. This series of studies aims to research and develop the methods for regeneration and revitalization of living environment of new towns, mainly exemplified by Tama New Town.

- 1) Research on housing conditions and lifestyles in Nagaike District of Tama New Town.
- 2) Research on neighboring commercial areas of Tama New Town.
- 3) Studies on governing body of an old condominium apartment.
- 4) Studies on community activities initiated by women residing in Tama New Town.

Studies on the Positioning of Interior Design in Housing Design Processes

Masumi MATSUMOTO

Conducted hearings to architects on the design making processes relating to housing designs.

Ryo SANUKI

I am conducting urban planning and urban analysis research using city space analysis method and GIS. In addition to that field, I also applied applied research in different fields such as residential problems, urban disaster prevention, public facilities / infrastructure measures, and the revival of the area between Nakayama. Specifically, the following are included: (1) location planning from the viewpoint of the consolidation agreement formation process of the multiple dwelling houses, the location plan viewed from the relationship with the surrounding area facilities, (2) revitalization of the area in the Hachioji Zhongshan area, (3) construction of the current status and evaluation method on public facilities and infrastructure, Development of buildings in Asian countries, (5) development of techniques for improving natural disaster resilience in suburban cities, etc.

Architectural Design and History

Masao KOIZUMI

- (1) Research on Accessibility of Urban and Architectural Space

Masao KOIZUMI

The First Stage of the Research is to analyze the Relationship between Housing and the City. This Research will be generalized into an Analysis of Relation between Architecture and Urban City.

These Researches will cover Areas such as; Type of Connection and Distance between Housing and the City, an Arrangement of Territories, Strength of the Boundary between Different Territories, etc. These Basic analyses will be developed into Research and Practice of a Design Method concerning Accessibility in an Urban Scale.

- (2) Research on Housing Transformation Reflecting the Change of Family

Masao KOIZUMI

Today a Family Style has transformed because of an Increase of Divorce and the rapid Progress of the Aging Society. But still most of the Houses are planned for so called “Nuclear Family”.

The Goal of this Research is to develop a Planning Method for Housings and propose a new Typology, through the Analysis of Contemporary Japanese Family and their Life Style. Collective Housing will be a main Target for this Theme.

(3) Research on revitalization of residential suburb

Masao KOIZUMI

Research on lifestyle for next generation in Yokohama area under the keyword such as energy and environment, health and wellness, community.

Katsuhiko KOBAYASHI and Akira KINOSHITA

Analyses on Composition of Modern and Contemporary Architecture

Katsuhiko KOBAYASHI, Akira KINOSHITA

One of the main purposes of architectural design research is to clarify morphological principles that give birth to architectural beauty. For this purpose, it is important and effective to abstract compositional principles and compositional methods from existing architectural works and to examine the design principles. In the academic year of 2017, designs of recent high-rise buildings, works of Bauhaus movement, buildings with piloti were analyzed.

Development of Architectural Design Method

Katsuhiko KOBAYASHI, Akira KINOSHITA

In architectural design research, it is also important to apply design principles and compositional methods abstracted by analyses to actual architectural design works. Thereby theory and practice, in other words, basic research and high-level application would be synthesized. In the academic year of 2017, relations between theory and design practice were pursued through two design works of our master program students.

Research on Design of Architectural Conversion

Katsuhiko KOBAYASHI, Akira KINOSHITA

It is becoming one of the crucial social subjects in the architectural field of Japan to find out various methods to revitalize the existing building stocks. Among these methods, architectural conversion is very useful and important. For more than 10 years, we have made research survey on architectural conversion abroad. In the academic year of 2017, we published research results of the previous year in Summaries of Technical Papers of Annual Meeting, A.I.J. and made investigations on converted buildings in Baltic States (Tallinn, Tartu, Riga, Vilnius, Klaipeda), Berlin and Helsinki in Sept. We also went to north-eastern cities of China (Harbin, Changchun, Shenyang, Dalian) for ten days, in August as a part of research project “Architectural Conversion in Asian Cities” granted by Advanced Research under the Asian Human Resources Fund Program.

Study on Landscape Architecture and City in Early Modern Period

Akira KINOSHITA

In recent years I have been investigating the historical origin of the idea of “Landscape” in architecture, by analyzing works of English architects from the end of 17th century to the beginning of 18th century. The research done this year have focused on some written works by Sir John Vanbrugh which have drawn little academic attentions. By analyzing the written work by Vanbrugh, such as “The Country House”, a farce, it was possible to trace the inclination of growing bourgeoisie of the era towards the history and countryside which are essential to the genesis of landscape architecture. Through an involvement to a landscape conservation activity in suburbia city of Tokyo, some practical aspects of those studies were examined.

Yukimasa YAMADA

Studies on the Architectural History of Catholic Churches in the Northern Vietnam

Yukimasa YAMADA

Christianity in Vietnam, since its introduction early in the sixteenth century, has been evolving and expanding to an indigenous culture among the society, convention and thoughts different from European countries. We are focusing attention on three Catholic dioceses that have been played most important rolls in the history and culture of Christianity in the Northern Vietnam, Bui-Chu diocese, Thai-Binh diocese and Phat-Diem diocese. Collaborating with the liaison section of each diocese, we attempt to conduct surveys and analysis of existing historical churches, supported by JSPS KAKENHI Grand-in-Aid for Scientific Research (A). In this fiscal year, based upon the ex-ante adjustment in June, we organized Workshop on our database systems and Final Presentation on our field surveys so far in the northern Vietnam, collaborating with the Department of Architecture of Hue Science University and the Department of Japanese Culture of Hue University of Foreign Studies, in September, Hue city, Vietnam.

Studies on Conservation and Utilization of Historical Buildings in Japan

Yukimasa YAMADA

The trends in conservation and utilization of historical buildings under the law for the protection of cultural properties are changing recently with establishing the registration system for cultural properties in 1996 and the landscape law in 2004. In this fiscal year, based upon the results of our recent studies, we held a lecture meeting for the public in Okaya city, Nagano, on the conservation and activation of domestic but not familiar cultural properties.

Studies on Historic Architecture and Urbanism in the Islamic World

Yukimasa YAMADA

Although numbers of the historic architecture in the Islamic world have their own peculiar features in the architectural techniques and designs, their nature has not yet been understood adequately in Japan, nor has their urbanism as their

agglomeration. In this fiscal year, based upon the surveys so far and literature reference, we held a lecture meeting for the public on the cultural heritage, such as Islamic architecture, in the Arab Middle East region.

Jun INOKUMA

Construction Management and Building Materials

Yoshinori KITSUTAKA

Pull-out Behavior of Mechanical Anchor Bolts
Yoshinori KITSUTAKA and Yoichiro Kunieda

Demand for mechanical anchor bolts has been increasing for seismic retrofitting of existing concrete structures and installation of equipment, as they allow precise positioning and are easy to secure. Concrete structures are affected by earthquakes during their service life. The joints of mechanical anchor bolts are subjected to cyclic loading under an earthquake, which leads to drop accidents of ceiling members and equipment. To ensure the seismic safety of a structure, it is crucial to grasp the behavior of its joints with anchor bolts during an earthquake. This study reports on pull-out tests by monotonic and cyclic loading conducted on five types of mechanical anchor bolts to clear the fracture properties and pull-out resistance of joints between concrete and anchor bolts.

A Study on the Evaluation of External Wall Degradation Using an UAV
Yoshinori KITSUTAKA

Instead of the “scrap and build” principle, extending the service lives of buildings to utilize them for a long time has been attracting attention in the construction industry in recent years. Degradation including discoloration and staining of the external walls of buildings, which begins from the moment of completion, is particularly undesirable from the aspect of the life extension of buildings, as it adversely affects their rating in most cases. This study was conducted with the aim of establishing a new method of measuring the degree of degradation of the external walls of a building in a short time without scaffolding. This is based on digitalization and analysis of color information obtained by filming the entire wall surface using an unmanned aerial vehicle (UAV), which has recently been applied to architectural and civil engineering surveying, while verifying the results in comparison with conventional image analysis. A thresholding technique, which is based on lightness distribution by image analysis equipment and the threshold discrimination method, enabled measurement of various physical quantities related to the judgment of degradation. The technique of photographing degraded areas using a normal camera, which is employed by conventional studies, was compared with the technique using an UAV for filming, and the degradation measurement from the air was validated.

A Study on the Evaluation of damage resistance of gymnasium flooring caused by wheelchair sports

Yoshinori KITSUTAKA and Yoichiro Kunieda

These days, many athletes of wheel chair sports have an experience with being refused to use by gymnasium due to the floor damage caused by wheel chairs. Accordingly, this research aimed i) to quantify the floor damages caused by wheel chair sports and ii) to suggest the optimal floor system based on several damage resistance tests. A scratch resistance test and static and dynamic load tests evaluated the resistance property for each floor material (e.g. surface physical property and load-displacement relation). As a result, the optimal combination of floor and protective material preventing the obvious damage could be suggested. The possibility of damage prevention should be suggested and tested as further researches such as the surface colors of floors or the structure modification of wheelchairs.

Yoichiro KUNIEDA

A real machine verification of demolition simulation

Yoichiro Kunieda and Yoshinori KITSUTAKA

As IoT technologies has advanced, many IoT approaches can be seen in the construction field to resolve the shortage of human resources or the assurance of the onsite safety. Even in the demolition field, the IoT technology has been increasingly adopted such as the auto-pilot vehicles which removed demolition wastes from Fukushima power plants. In this research, the demolition simulation model has been developed to encourage recycling of waste generation, and the availability of result application to the actual demolition machines has been validated through the real machine test. The GPS recorders were set to each machine element and the demolition targets. By comparing the tracking result and the visual data, the reproducibility of simulation could be analyzed.

Risk estimation of external wall deterioration with 3D-CAD

Yoichiro Kunieda and Yoshinori KITSUTAKA

Instead of the “scrap and build” principle, extending the service lives of buildings to utilize them for a long time has been attracting attention in the construction industry in recent years. New or existing buildings, the estimation of building degradation become more and more important in terms of the building management. This study intent to develop the deterioration risk estimation model for the external walls. With 3D-CAD and the conventional data, the risk could be estimated and visualized in 3D based on the scale properties of own and surrounding elements. A case study varied the model ability to automatically evaluate the deterioration risk from the physical data for each element.

Makoto TSUNODA

Studies on Activation Technique of Public Building Stock

Makoto TSUNODA

In Japan, demolition and new construction based on declining in the durability and increased availability of buildings continues to be practiced. This practice is unfavorable from the viewpoint of utilization of the existing building stock. Activation technique is necessary for leading preservation and improvement of the public property.

In this year, we paid its attention to business contents and implementation process in the renovation of the existing public building by civic cooperation, the characteristics of the project involving private enterprises were clarified. In addition, measures for handling practical issues were presented from both architectural and organizational points.

Research on the method of renovating detached houses to improve comprehensive performance

Makoto TSUNODA

Housing renovation technology plays an effective role in improving various performances required by residents. However, there are many restrictive refurbishment actions that only improve unit performance, not leading to an increase in the value of existing homes. In order to build used residential market, it is necessary to develop comprehensive renovation technology that can cope with improvement of required performance of various living conditions. This research aims to construct a comprehensive renovation system to support residents from the elucidation of the mutual relationship between the technologies of used housing renovation process.

In this year, focusing on refurbishment aimed at improving earthquake resistance, we revealed a methodology to comprehensively improve other performance such as heat insulation, energy saving property, barrier free property, etc. in addition to seismic rehabilitation. We also explored the possibility of comprehensive renovation commensurate with the refurbishment needs by extracting problems in the operation of the construction method.

Research on How to Configure the Renovation Construction Methods Corresponding to the Building Stock

Makoto TSUNODA

Although we were supported by using the formulas of the various construction system for performance was required in new construction, there is a completely different conditions in terms of new construction and renovation that are present in a pre-existing condition. And that the work of the components to the contents of the construction methods in new construction is not seen to reflect. Therefore, there is some relationship between the role of members in the construction methods and improved performance as a result of each repair. In the renovation, it is considered that the contents of the construction system are particularly reflected in the constituent members to direct.

In this year, we made the platform which contributed to development of new construction methods of renovation and explanation of the repair principle.

Studies on methodology of the building improvement to be compatible with value of

property and utility.

Makoto TSUNODA

It is not unusual for an available building to be removed for some reason. As a removal reason, completion original performance cannot maintain and use of building changes. There are various things in reproduction technique to resolve these situations. So far to improve the property values when we extend the life of an existing building, maintenance and improvement of various performances and addition of the new performance that does not hold it are required. Similarly, to improve the utility value, physical changes of the building it and the function changes such as the usage of building are required. These two value improvement does not become independent each, and renovation program of the building should be drafted after having considered the trade-off of both. Various renovation techniques are seen in today, but the technique that included plural value improvement to advance building renovation of building are the urgent need.

The result of this year is as follows.

In the house renovation of RC condominium complex houses, we grasped the current situation of the contents of the residents themselves and the contents of technical support by the contractor. In addition, we presented the contents of support by related contractors and how to utilize them in order to respond to the needs of the residents.

Structural Engineering

Kazuhiro KITAYAMA

1. Earthquake Resistant Performance for Precast Prestressed Concrete Exterior Beam-Column Unit Frame Assembled by Post-Tensioning Unbonded Tendons

KITAYAMA Kazuhiro

The beam-column joint hinging failure, which is a new failure mechanism proposed by Dr. Shiohara, has been broadly known for reinforced concrete (R/C) moment-resisting frames when an ultimate flexural capacity of a column section is close to that of a beam section in a R/C frame at the center of a beam-column joint. Consideration to the joint hinging failure was introduced in Standard for Lateral Load-carrying Capacity Calculation of R/C Structures (Draft) published by Architectural Institute of Japan in 2016. In contrast, for moment-resisting frames which consist of precast concrete beams and columns connected by post-tensioning unbonded tendons (called as unbonded PCaPC frames), the joint hinging failure is little verified through laboratory tests.

Suzuki, Song, Jin and Kitayama (2015 and 2016) conducted loading tests to unbonded PCaPC cruciform beam-column subassemblages, and indicated the following; although a column-to-beam ultimate flexural capacity ratio was 1.2 for a cruciform subassemblage specimen with slabs alone, the specimen did not fail in joint hinging but beam flexure due to concrete crushing at beam ends. Meanwhile, a joint panel rotation increased after peak lateral capacity and symptoms of the joint hinging failure were observed. Damage to a beam-column joint in a 3D subassemblage specimen with

transverse beams and slabs was, however, mitigated due to transverse beams and slabs covering a joint panel surface, showing beam flexural failure in spite of a column-to-beam ultimate flexural capacity ratio of 1.2.

Therefore, in order to study on the joint hinging failure in unbonded PCaPC frames, two exterior beam-column subassemblage specimens were tested under cyclic load reversals in 2017. Specimens were designed to form the joint hinging mechanism on the basis of a simplified calculation proposed by Dr. Shiohara in 2014, which can predict the joint hinging ultimate capacity of an R/C beam-column joint. One plane specimen and one specimen with slabs alone had a column-to-beam ultimate flexural capacity ratio of 1.16 and 1.07 under top tension for a T-shaped beam, respectively. Column axial load of 450 kN (axial stress ratio of 0.05) was common. A joint shear capacity margin was 1.81 for the plane specimen and 1.63 under top tension for the specimen with slabs. Findings drawn from the tests are indicated as follows.

- (1) Both spalled-off and crushing of concrete in a beam-column joint occurred severely, and column longitudinal bars buckled in a joint panel under cyclic loading at a story drift angle of 4 % for both specimens. Beam-column joints did not fail in shear.
- (2) Peak lateral load-carrying capacity in the test exceeded the beam ultimate flexural capacity obtained by a section analysis for the plane exterior beam-column subassemblage. Deformation component due to a beam-column joint deformation, however, shared 36 % of a total story drift of the subassemblage just before a peak capacity was attained. Column longitudinal bars in a joint and joint lateral hoops yielded. Therefore, it was judged that beam flexural failure and joint hinging failure occurred simultaneously.
- (3) Peak lateral load-carrying capacity in the test did not reach the ultimate flexural capacity of a beam obtained by a section analysis for the exterior beam-column subassemblage with slabs alone. Since the contribution of a beam-column joint deformation to a story drift was largest, and column longitudinal bars and joint lateral hoops yielded, the joint with slabs failed in a joint hinging mechanism.
- (4) It was confirmed by the tests that a beam-column joint in unbonded PCaPC frames also fails in a joint hinging mechanism as same as that in R/C frames.
- (5) Peak lateral load-carrying capacity at joint hinging failure for the exterior joint with slabs alone was almost same as that without slabs. This indicates that a mere slab without transverse beams does not contribute to enhancement of a joint hinging capacity.

2. Analytical Study on Joint Hinging Mechanism for Precast Prestressed Concrete Beam-Column Frame Assembled by Post-Tensioning Unbonded Tendons

KITAYAMA Kazuhiro

Beam-column joints in reinforced concrete (R/C) frames frequently fail in a joint hinging mechanism under earthquake excitations. Meanwhile, joint hinging failure for beam-column joints in unbonded PCaPC frames is little investigated in both experimental and analytical study fields. Recent experimental studies conducted at Kitayama Laboratory in TMU showed a possibility of joint hinging failure for interior beam-column joints and the occurrence of that for exterior joints in unbonded PCaPC frames.

Then, analytical study on a joint hinging mechanism in unbonded PCaPC frames was started in this academic year. The theory on a joint hinging mechanism for R/C structures developed by Prof. Shiohara at the University of Tokyo was extended to a joint in unbonded PCaPC frames. Based on this theory extension, a theoretical equation to take an ultimate joint hinging capacity was introduced for interior beam-column joints in unbonded PCaPC frames. Adequacy of the theoretical equation will be verified by comparing with test results in the near future.

3. Serviceable Limit State for Beams in Precast Prestressed Concrete Frame Assembled by Post-Tensioning Unbonded Tendons

KITAYAMA Kazuhiro

Provisions for ensuring the serviceability, restorability and safety against earthquake excitations for prestressed concrete buildings were proposed by the Architectural Institute of Japan in 2015. Precast prestressed concrete frames assembled by post-tensioning unbonded tendons (called unbonded PCaPC frames) behave somewhat differently from usual reinforced concrete frames subjected to horizontal loads because strain distribution along the post-tensioning tendon is uniform due to no bond along it, and it is hard for the tendon to yield.

The serviceable limit for beams in unbonded PCaPC frames was determined for many specimens in recent studies by reaching a stress of 0.9 times the concrete compressive strength at an extreme compression fiber of the beam section. In many cases in the literature, beam deflections at the serviceable limit state were less than those corresponding to the onset of a stiffness reduction in a force – deflection relationship. Therefore, in order to investigate a cause of such a difference, the serviceable limit state for beams in unbonded PCaPC frames was studied again through re-examining test results conducted by Kitayama Laboratory at TMU. A beam deflection and bending moment at the serviceable limit were, moreover, calculated by using a macro-model proposed by Song et al. in 2016, which can reproduce the flexural behavior of beams in a cruciform unbonded PCaPC subassemblage, and such a calculated value was compared with a test result.

Six cruciform unbonded PCaPC subassemblage specimens forming a beam yielding mechanism were used in the study. To know a stress at an extreme compression fiber of a beam section, an average strain within a length of 50 mm in a beam hinge region was estimated from interpolation of deformations measured by two transducers mounted near an extreme compression fiber. Strains measured by strain gauges with a gauge length of 10 mm were moreover used, which were attached on the top and bottom surface of a beam, located at 60 mm away from the beam critical section. A beam deflection and bending moment when reaching the concrete compressive strength at an extreme compression fiber of a beam section were also researched for comparison.

Beam deflections when reaching a stress of 0.9 or 1 times the concrete compressive strength at an extreme compression fiber, which were estimated by using two transducers, were very smaller, i.e., one-third to half, than those which were estimated by strain gauges. Beam deflection angles at a stress of 0.9 times the concrete compressive strength, estimated by transducers, ranged from 0.11 % to 0.37 %.

Targets of transducers placed at a beam hinge region were mounted on a column surface. Then, compressive deformations measured by these transducers included somewhat a component due to a column deflection. This resulted in overestimation of an extreme compression fiber strain. In contrast, strain gauges always underestimated a compressive strain at a beam critical section because those gauges were located at 60 mm apart from the beam critical section in tests. Therefore, true values of a beam deflection and bending moment, when reaching a stress of 0.9 or 1 times the concrete compressive strength at an extreme compression fiber, are between two values estimated by using transducers or strain gauges.

Points consisting of a beam deflection and bending moment on respective envelope curves for a beam force – deflection relationship, when reaching a stress of 0.9 times the concrete compressive strength at an extreme compression fiber, remained between an elastic range and stiffness-severely-dropping range. In contrast, those points when reaching the concrete compressive strength at an extreme compression fiber were located on the stiffness-severely-dropping range, keeping a capacity almost constant. This indicates that concrete damage condition that a stress at an extreme compression fiber of a beam section reaches 0.9 times the concrete compressive strength was regarded as adequate as one of factors which define the serviceable limit state for unbonded PCaPC beams.

Beam deflections predicted by a macro-model, when reaching a stress of 0.9 times the concrete compressive strength at an extreme compression fiber, were relatively larger than test results obtained by two manners above-mentioned, which did not coincide with the onset of stiffness degradation. One of reasons causing this discrepancy is attributed to the assumption of elasticity for the concrete constitutive law under compression, which differs from actual behavior of concrete with cracks and minor damage.

4. Seismic Performance Evaluation for Reinforced Concrete Frame using Partially High-Strengthened Steel Bars

KITAYAMA Kazuhiro and KISHIDA Shinji (Shibaura Institute of Technology)

Partially high-strengthened steel bars (called PHS bars) are made by heat treatment to its limited length. The potential plastic hinge in beams of a reinforced concrete (R/C) frame can be relocated from the column face to an inner region of the beam span by using PHS bars as beam longitudinal reinforcement which passes through a beam-column joint. Prof. Kisida and Dr. Murata showed in 2015 that this new construction method was able to mitigate damage to a beam-column joint and prevent it from failing in joint hinging.

In the study, this new construction method is applied to precast fabrication consisting of R/C beams and columns. It is necessary for this purpose to splice longitudinal bars. If splice joints for PHS bars are placed at the end of beams or columns, sufficient performance of these joints is needed so that a high axial stress equivalent to Steel Grade 685 can develop there. Then, cyclic reversed loading tests were carried out for R/C beam-column subassemblages using PHS bars to investigate an influence of splice joints embedded in beams or columns on seismic performance of the subassemblage under earthquake excitations. For cast-in-place frames using PHS bars,

moreover, an effect of slabs on development of the beam hinge relocation and an influence of varying axial load in a column on whole behavior of the subassemblage were also studied by the tests.

Seven plane beam-column subassemblage specimens were tested. Among them, three specimens were a precast type (two : interior joint, and one : exterior joint), and four specimens were a cast-in-place type (two : interior joint, and two : exterior joint). PHS bars were arranged for beam and column longitudinal reinforcement. The relocation of potential plastic hinge in beams was designed to be at 400 mm, which was equal to a beam depth, away from the column face. Column axial load varying from 0 to a compressive axial ratio of 0.15 was applied to one exterior beam-column subassemblage specimen made of cast-in-place concrete. A mere slab without transverse beams was provided to one interior beam-column subassemblage specimen made of cast-in-place concrete.

Two construction methods for the precast structure were proposed in the study. For one method, an upper column and lower column are connected to a beam, where column longitudinal bars of the upper column pass through a beam-column joint, and are spliced mechanically at a top of the lower column. For another method, right and left beams and an upper column are connected to a lower column with a beam-column joint region, where there are splice joints at both a bottom of the upper column and one beam end. A column-to-beam ultimate capacity ratio was approximately 1.5 for interior specimens, and 1.4 for exterior specimens respectively. This value ranged from 0.7 to 2.3 for the exterior specimen with varying column axial load. Concrete compressive strength was 35 MPa to 38 MPa.

Seismic performance in the tests for precast beam-column subassemblages was almost equal to that for subassemblages made of cast-in-place concrete. The relocation of a potential plastic hinge in beams was not well formed for almost all specimens, and heavy damage concentrated on a beam-column joint. The hinge relocation in a beam was designed to be a longer way from the column face comparing with previous test specimens conducted by Kisida et al. This caused an increase in a PHS beam bar strain at the column face although it remained elastic, attributed to enhancement of a joint input shear force and progress of lateral expansion of a beam-column joint.

For the exterior specimen with varying column axial load, when lateral load was applied to the direction toward an axial load of 0, a column-to-beam ultimate capacity ratio became small. Then, a beam-column joint failed in joint hinging. On the contrary, when lateral load was applied to the direction toward an increasing compressive axial load, a column-to-beam ultimate capacity ratio became large, and joint hinging failure was prevented, forming well the hinge relocation in the beam.

5. Earthquake Resistant Performance of Reinforced Concrete Building Damaged by the 2011 East Japan Earthquake under Retrofit Construction

KITAYAMA Kazuhiro

A reinforced concrete (R/C) three-story school building located in Nasu town in Tochigi prefecture, which was under construction for seismic rehabilitation using steel-braced frames, suffered moderate damage under the 2011 East Japan Earthquake. A plan of the building is 108 meter long for the longitudinal direction, and the first term

construction for seismic retrofit was completed but the second term construction was not conducted yet when the 2011 Earthquake attacked the building. Damage during the earthquake concentrated on a non-retrofitted area of the building; three R/C columns failed in shear and severe shear cracks classified as Grade 3 were observed for four columns.

Residual seismic capacity after the earthquake was estimated to be 0.77 times the original seismic capacity before the earthquake for the first story in the longitudinal direction. Thus the damage of the building was classified into the moderate level. In contrast, residual seismic capacity limited to a non-retrofitted area of the building was re-estimated to be 0.59 times the original seismic capacity, judging to be the heavy damage level.

Static push-over analyses and earthquake response analyses were carried out for spatial moment-resisting frames of the school building in the longitudinal direction to investigate the reason why damages concentrated on a non-retrofitted area of the building. A horizontal earthquake motion with a peak acceleration of 475 gal, obtained at a Nasu City hall adjacent to the school, was input to the building for the east-west direction.

A Maximum story angle of 0.19 % for the third story obtained by the earthquake response analysis was the smallest compared with that of 0.27 % for the first story and 0.33 % for the second story, corresponding to actual slight damages for the third story. A maximum deformation angle within a clear height for short columns in a B frame, which suffered severe damage by shear, reached approximately 1 %. Damage condition for columns in a non-retrofitted area, about half a part of the building, obtained by the analysis, was almost similar to the actual damage. Shear failure of a column in a retrofitted area, however, occurred in the analysis, which was different from actual minor damage.

6. Method for Preservation and Renovation for Reinforced Concrete Buildings Focusing on Toyoda Hall and Art-Plaza

KITAYAMA Kazuhiro, YAMADA Yukimasa, TSUNODA Makoto, MATSUMOTO Masumi and INOKUMA Jun

For two existent reinforced concrete (R/C) buildings which were renovated by the same architect respectively as the one who designed the building originally, i.e., Toyoda Hall designed by Maki Fumihiko and Art-Plaza designed by Isozaki Arata, particular methodology for preservation and renovation was researched. Renovation for Art-Plaza was described herein.

Art-Plaza was not only altered in the use from a library to an art gallery, but also retrofitted seismically to enhance earthquake resistant performance. The seismic capacity index I_s for the east-west direction of the building was 1.32, quite large because of four shear walls with a maximum thickness of 400 mm which can sufficiently resist horizontal load induced by earthquakes. In contrast, the I_s value for the north-south direction in the second story was 0.35 since there were rooms suspended from box-shaped girders at the third level floor, resulting in the necessity of seismic retrofit.

Then, R/C shear walls with a 400mm-thickness at the first story were installed just

below the suspended rooms at the second story, and additional concrete with a thickness of 400 mm was cast at the surface of existent R/C walls with a thickness of 100 mm in the suspended rooms. This was intended to carry smoothly both a lateral-induced force and an axial load to the foundation. Mat slabs and foundation beams under the ground were newly placed to prevent an uplift rotation of two-story shear walls created by the retrofit. Shear walls with opening and steel-braced frames were installed for the east-west direction at both ends of a central core area. Six box-shaped girders in the north-south direction had the risk of falling down from supporting points during earthquake excitations because those girders were roller-supported on an orthogonal box-shaped girder at the north end of the building. Therefore, these six girders were supported by placing flat R/C columns with a width of 400 mm to prevent those from falling down. Soil improvement was conducted under force-carrying elements newly installed for retrofit.

A floating image of the building was derived from pilotis below the suspended rooms at the second story. The image, however, disappeared due to installing shear walls for retrofit into the pilotis space. A setback of the installed walls was done 4 meter away from an end of the second floor in order to reserve a little the floating image. A facade along the north side of the building had originally large horizontal opening for picture windows. But, the facade was changed by six flat R/C columns added over two stories to support the longitudinal girders.

Thus, the original architectural design by Isozaki Arata was considerably changed by seismic retrofit. The reason why the architect, i.e., Isozaki Arata, allowed such change of the original design seems to be based on deep trust in a structural engineer for both the original and seismic retrofit design, i.e., Dr. Murakami Masaya, Professor emeritus of Chiba University. Mr. Ohta Tsutomu, a president of Horie Institute of Architectural Engineering, said that Isozaki hardly made an objection to decisions taken by both Dr. Murakami and Mr. Yamamoto Yasuhiko, a co-architect with Isozaki.

7. Relationship among Seismic Retrofit, Preservation and Renovation for Reinforced Concrete Modern Architecture in Japan

KITAYAMA Kazuhiro

A first reinforced concrete (R/C) building in Japan was built in 1911 designed by Endo Oto. From this, approximately one century has passed. Then, numerous R/C old buildings which seem to be worth being preserved as cultural assets choose the way continuing to be in service. At the time, R/C old buildings which do not satisfy the present building law of Japan should be upgraded in seismic performance by retrofit. Methods for the harmonious combinations among seismic retrofit, architectural design and serviceability without injuring a cultural value of the building, therefore, were researched through surveying actual renovated R/C buildings.

Forty-one buildings made by reinforced concrete (R/C) or R/C with steel plates (called SRC in Japan) built before 1943 were selected, which were renovated to be preserved as cultural assets and enhance its seismic performance by retrofit. Buildings retrofitted by the base isolation system or the vibration control system were omitted in the study. For a method of seismic retrofit, installation of R/C shear walls was adopted for 27 buildings, whose number was larger than that for other retrofit methods.

Additional concrete casting to thicken a thickness of the existent shear wall was adopted for 20 buildings, and installation of steel-braced frames for 14 buildings. Note that a method for seismic retrofit is altered with objects for preservation such as a facade, usage, and materials of the building.

Jiro TAKAGI

Toshikazu KABEYASAWA

An experimental study on the damming effect caused by the waterborne debris
The hydrodynamic test has been conducted in last year and it examines the increment of the wave load due to the damming caused by the waterborne debris. We propose the method of evaluating the damming wave load based on the test results and pointed out the wave force burden ratio on the front and back of the specimen does not change depending on the Froude number in the test.

An experimental study on the Impact loading caused by the waterborne debris
The hydrodynamic test has been conducted in last year and it examines the dynamic response of the reinforced concrete structures under impact loading force caused by the waterborne debris. We can estimate the momentum after collision by assuming inelastic collision and point out that we can judge the collapse risk of the building by examining the allowable capacity of impulse.

A study on the relaxation length of slab reinforcement in the static loading test on the sub assemblage reinforced concrete frames
We conducted a static cyclic loading test of a three - dimensional reinforced concrete sub assemblage specimen with a floor slab. It is clarified that the effective width of slab attached to the girder does not turn to be full-length until the large drift level when the torsional deformation of orthogonal girder is prominent at the end of the frame

Post-earthquake damage observation after 2016 Kumamoto Earthquake
A large-scale earthquake recorded the maximum seismic intensity 7 on April 2016 occurred in Kumamoto. The earthquake response analysis of the reinforced concrete corridor frame of the elementally school was carried out, and it evaluates the maximum drift and damage level of the structure. It also pointed out that the maximum story drift is reduced if the structure is consistent of columns with wing walls and beams with hanging walls with the equivalent horizontal cross section.

Noriko TAKIYAMA

Restoring Force Estimation of Fitting-Type Joint of Japanese Traditional Wooden

Structure

Noriko TAKIYAMA

According to regional characteristics and cultural differences, there are various specifications in SASHIGAMOI joint in Japan. In the limit strength calculation which is one of calculation methods used in the seismic performance evaluation of traditional wooden residents, the shear forces of all earthquake resistant elements are simply added and the restoring force is given for each seismic element without considering the different detail of SASHIGAMOI joint. In this study, to figure out the fracture mode and the restoring force characteristic, we performed cyclic loading test on 4 specimens with same external dimension method but different joint shape. Then, we quantify the dispersion of restoring force characteristic between each specimen. Moreover, based on the evaluation formula of the past, we also aimed to construct the evaluation formula to estimate the restoring force and compare with results of experiment.

Verification Experiment on Reinforcement Method by Aramid Fiber Sheet for Column Base of Existing Wooden House

Noriko TAKIYAMA

High-performance aramid fiber sheets are a new class of composite materials made up of weaved polyamide fibers. In this study, the seismic performance and failure behavior of timber column-ground sill joints reinforced with aramid fiber sheets were investigated. In a past study, we conducted many bending tests under cyclic loading for three column-ground sill specimens. After reinforcing the specimens with aramid fiber sheets, the joint strength improved but was dependent on the method of attaching the sheet. It was found that the compression zone of the aramid fiber-reinforced plastic layer broke at the joint boundary, and the seismic property is unstable because of many failure mode. So, we proposed an improvement in the method of attaching the fiber sheet to the joint. On the compression zone at the boundary of the joint, resin was not pasted onto the aramid fiber, the fiber was not cured, and the plastic layer was not formed. And we use vertical splitting sheet, to stabilize the failure mode and to improve deformation performance. Therefore, we could solve some problems and control the failure of column-ground sill joints.

Analytical Consideration on Seismic Behavior of Early Showa Period Billboard Architecture Based on Factual Investigation at Chuo-3, Ota City

Noriko TAKIYAMA, Ryo SANUKI, Masumi MATSUMOTO, Shigeru AOKI and Tomoyuki GONDO (The University of Tokyo)

This research reports the results of our research on seismic behavior of the billboard architectures in Chuo-3, Ota City with Densely Built-up Wooden House Areas. First, we conducted an exhaustive survey of 809 buildings and roads, and microtremor measurements on the ground in the area. Next, measuring the dimensions of the billboard architecture, standard analysis models were constructed. Furthermore, we conducted seismic response analysis to evaluate response characteristics and eigenvalue analysis to evaluate their respective vibrational properties, such as the natural frequency and vibrational mode. Lastly, sensitivity analyses were conducted on the floor rigidity or materials of the walls.

Field Survey of Traditional Townscape and Wooden Houses in Kamiange District, Kamionkata, Hachioji

Noriko TAKIYAMA, Nobuyuki SUNAGA, Katsuhiro KOBAYASHI, Yukimasa YAMADA and Ryo SANUKI

There are some traditional wooden houses in Kamiange district, Kamionkata, Hachioji. This district used to prosper in the sericulture and forestry, has impressive townscape with many stone walls and board fences. We investigate about the feature of townscape and nature of whole this district, design, structural and environmental property of wooden houses, to preserve cultural value of traditional townscape and wooden houses of this district. And residential environment were simulated. Moreover, compared with success examples of preservation on other district, we tried to find the applicable method for this district.

Seismic Property of Traditional Wooden House in IPDGHB, Fukushima

Noriko TAKIYAMA

The Ouchi-Juku and Maesawa district of the inland Fukushima prefecture, which was registered as an IPDGHB (Important Preservation District for Groups of Historic Buildings), contains many traditional thatched houses. A low-five-intensity earthquake on the Japanese seven-stage seismic scale was recorded near these preservation district; nevertheless, none of the thatched houses suffered any damage. Hence, it is very important to understand their construction and structural characteristics. The purpose of this study was to analyze the structural and vibration characteristics of a thatched house in Ouchi-Juku and Maesawa district.

Material Test of Brick Wall of Cultural Heritage Buildings in Bagan Archaeological Zone, Myanmar

Noriko TAKIYAMA, Mitsuhiro MIYAMOTO (Kagawa University) and Mikio KOSHIHARA (The University of Tokyo)

The 2016 Myanmar Earthquake hit Chauk in the central Myanmar. In Bagan archaeological zone, there are more than 3,000 monuments, and more than 300 monuments suffer from severe damage from this earthquake. In this research, we conducted some material tests on brick units from many monuments and some brick prism specimens to understand traditional material characteristics. Firstly, we conduct compressive tests of many brick units from some monuments to understand the difference in material properties. Next, we conduct the compressive test of mortar cylinders and cubes to understand the property of the joint mortar. Finally, we conduct the compressive test, the diagonal compressive test, and the bending test of brick prism specimens.

Kazushige YAMAMURA

Environmental Engineering

Nobuyuki SUNAGA

Research on Comfortable Bioclimatic Architecture

For the benefit of preserving global environment, the effective use of energy consumed in architecture and the utilization of natural energy are indispensable factors for architectural design. Furthermore to popularize Zero Energy Building and Bioclimatic Architecture (BA) which is designed by considering energy conservation, natural energy utilization and comfortable environment, it is necessary to clarify the actual performance of BA and to establish evaluation methods which are simple and widely acceptable for the public. We have been engaged in the research of these themes, and, in recent years, we concentrate on building stock improvement and residents' energy-saving awareness and behavior.

In this academic year (2017/04 – 2018/03), we mainly carried out following studies and activities.

1. Long-life, Environmental Friendly House by Tokyo Metropolitan Government [Collaboration with Assistant Professor Eiko Kumakura and Research Fellow Hiroko Onodera]

At the request of Tokyo Metropolitan Government, we have studied about the performance of 16 detached houses which have high thermal performance, a solar floor heating and hot water system and HEMS from 2013.

Last academic year we integrated the results of this research to a report. This academic year we summarized it into a pamphlet, in order to popularize the high-performance house and energy-saving awareness and action. This pamphlet was released at the homepage of Tokyo Metropolitan Government. Also the results of this research was introduced in general housing journals, and the results of further study using the data of the high-performance houses was published in the journal of Architectural Institute of Japan.

2. Relationship between Thermal Insulation Performance and Life Quality [Collaboration with Research Fellow Hiroko Onodera]

When the thermal insulation performance of residence leaps to the highest level, it is considered the comfortableness of residents is improved and the residents' behavior and awareness will be changed. This research examines the effect of high level thermal insulation by actual measurement, questionnaire survey and Web survey, collaborating with Asahi Kasei Construction Materials Corporation. In last academic year, we revealed that the kind of window, which normal residents can answer in questionnaire survey, is able to be used as the index of thermal insulation performance of residence, and in this academic year we supported it by statistical analysis using the data of previous studies. From the measurement and CFD analysis about the experimental house, it is clarified the comfortability and energy saving performance of this house and the whole house air-conditioning system using small size air-conditioner, small duct fan and ceiling fan.

3. Refinement of residential building on the theme of environmental performance improvement

We have been studying about Insulated Door at Inside of Window (IDiW), a Japanese wooden house refine project 2011, the actual condition of housing retrofit and the state measures for energy-saving. In this academic year we participate in a research project by a housing provider, and study the partial thermal insulation improvement of wooden detached house. Also we made a questionnaire for the residents' awareness for detached house improvement.

4. Improvement of Thermal Performance of Apartment House in Asia [Collaboration with Research Fellow Hiroko Onodera]

We carried out the literature survey about the thermal performance of apartment house and clarified that there are small number of study about it, especially in summer, in Japan and China. So we started the indoor climate measurement and the questionnaire survey for apartment house in Asia from 2014. In this academic year we are subsidized by Housing Research Foundation JUSOKEN, and we surveyed at Okinawa prefecture and Kochi prefecture in Japan, which climate is hot and humid in summer (Japanese climate zone XIII and VII). On the other hand, the study results of the difference of effect by several energy-saving methods in 5 climate zones in China was published in AIJ transactions, and also a paper titled "Effect of Air Conditioning Operation Patterns on Indoor Thermal Environment and Energy Consumption of Multi-Residential Buildings in Hot and Humid Region" was adopted at international conference PLEA2017.

5. Improvement of Air-conditioning System of Art Museum's Repository

In this research we are examining the detailed distribution of thermal environment in the repository of K museum for the improvement of air-conditioning system, in cooperation with MAYEKAWA Associates, Architects & Engineers. It is required to keep constant temperature and humidity in the repository of museum, but it is difficult because there are many storage furniture and boxes of fine art which disturb the air movement by air-conditioner. In this year we carried out detailed CFD analysis and examine the effect of improvement of air-conditioning system. On the other hand, we carried out the winter measurement in the condition of after improvement and no items in the collection of the Museum.

6. Improvement of Thermal Environment at the Outside Space of Architecture and Urban Quarter [Collaboration with Assistant Professor Eiko Kumakura]

In this academic year, we studied about the thermal environment of Marathon course area at the 2020 Tokyo Olympics, the trends in awareness of an urban thermal environment based on "hot" and "cool" tweets attached location information, and the greening system by the administration. We presented the results of these studies at several conferences.

7. Other outcome, social contribution and award

1) N. Sunaga is played as the vice-president of Japan Solar Energy Society and as a member of committee in AIJ and so on.

2) N. Sunaga is played as a member of committees of Tokyo Metropolitan Government, Mizuho town in Tokyo and Environmentally Symbiotic Housing Promotion Council.

3) Mr. Shimon Okazaki was given a commendation of graduation thesis by the Dept. of Architecture and Building Engineering, TMU.

4) Mr. Reo Watanabe received Student Encouragement Prize 2016 of Japan Solar Energy Society in May, 2017 and it is decided Mr. Ryo Meshino will receive the same prize of 2017 (in May, 2018).

5) The paper of a master course student, Mr. Koujiro Takeda, was selected for the Kanto Branch Selected Transaction of Architectural Institute of Japan 2017.

Akihiro NAGATA

A Study on the Performance of Shut-Off of Heat and Air Flow of Air Curtain
Akihiro NAGATA

A Study on the Evaluation Method of Thermal Performance for Combination of Glazing and Shading Devices
Akihiro NAGATA

Masayuki ICHINOSE

Environmental Engineering

(1) Development and verification of radiative cooling and heating system assisted by a slight air flow

(2) BIM utilization for MEP design

(3) Zero Energy House design and build competition project

(4) Color temperature control LED lighting system

(5) Water body effect on the urban canopy thermal environment

(6) Actual situation of IEQ and EUI at the super high-rise office building in the tropics Asia

Eiko KUMAKURA

「Trends in awareness of an urban thermal environment during summer based on tweets and photos」

Eiko Kumakura and Nobuyuki Sunaga

This research topic is the analysis of thermal sensation-related tweets in Tokyo during two summer periods. The "hot" tweet ratio had a high correlation and exponential

relationship with the average and maximum outdoor air temperature. However, the ratio of “hot” tweets decreased from the beginning of summer to the end of summer, even though the temperature did not decrease. This suggests that people in the urban area adjusted to the temperatures. Additionally, the areas with a high density of "hot" tweets were divided into seven land use types. This set of information could help to identify the locations and time range in which countermeasure of thermal environment considering people's awareness is necessary.

「Investigation on the Incentive Programs for Green Roofs and Walls in Special Wards of Tokyo」

Eiko Kumakura and Nobuyuki Sunaga

Attractive buildings with green roofs and walls in urban areas are currently expected to increase in number worldwide. Although many wards in Tokyo participate in an incentive program to propagate green roofs and walls, information regarding subsidized greenery buildings, including greenery areas, types, and money spent on each building, remain unclear in many wards. In response, we conducted a questionnaire survey in each ward on the achievements and publicity activities of the incentive program in the special wards of Tokyo. The results were as follows: 1) The number of subsidized greenery buildings have declined over the past 5 years in the 17 wards, with decrease in the budget amount in 10 of those wards. 2) A comparison among the incentive programs of the city center, the sub-center, and other areas revealed that the program of the city center has promoted huge areas of greenery. 3) The ratio of budget execution of wards that have more detail condition setting for the budget amount, such as building types and soil thickness, were higher than that of the other wards. Therefore, we propose an improvement in the incentive programs in terms of increasing applications and expanding greenery areas within each ward.

「Thermal environment of the Tokyo 2020 Olympics marathon course」

Based on actual measurements of the thermal environment on the marathon course in 2014 and 2015, 13 districts were selected to simulate the impact of cooling material, weather conditions and starting time. The results were as follows: 1) MRT of homeward is around 50 degrees Celsius. 2) Improving methods of the thermal environment for runners are, in descending order, hastening the starting time, ensuring it is cloudy, and using water retentive pavement. 3) The MRT for runners were decreased maximum 2.6, average 0.4 degrees Celsius by choosing the area in shadows. 4) The devices for cooling differ depending on district features for spectators in the pedestrian area.

LIST OF RESEARCH ACTIVITIES

Architectural Planning / City Planning

Kenji TAKEMIYA

1. Proceedings of Oral Presentations

SHIBUYA Akari, TAKEMIYA Kenji

Study on the facility planning for staffs in hospitals

Summaries of technical papers of annual meeting E-1, AIJ, pp.49-50, 2017 (in Japanese)

Reina WATANABE, Kenji TAKEMIYA, Shigeki NAKAYAMA

Examination of Case study and Departmental Arrangement Guideline in the Advanced Perinatal Center

-Study on the Architectural Plan for Provision of Safety & High Quality Maternity Medical Treatment Part 4-

Summaries of technical papers of annual meeting E-1, AIJ, pp.53-54, 2017 (in Japanese)

KAMITOMO Yuki, TAKEMIYA Kenji

Study on the Planning Method used against the Growth and Change of Hospital Architecture

Summaries of technical papers of annual meeting E-1, AIJ, pp.57-58, 2017 (in Japanese)

TSUSHIMA Takahumi, TAKEMIYA Kenji

Roots and facility management of dementia cafe in the 23 wards of Tokyo

Summaries of technical papers of annual meeting E-1, AIJ, pp.203-204, 2017 (in Japanese)

SUGINO Yuna, TAKEMIYA Kenji

Analysis of space utilization for terminal and bereavement care: Case study in medical and welfare facilities and home for the elderly

Summaries of technical papers of annual meeting E-1, AIJ, pp.225-226, 2017 (in Japanese)

IRIE Kanako, TAKEMIYA Kenji

On the spatial composition and the status of its utilization at the nursery schools or the certified Centers for Early Childhood Education and Care practicing multi-age groupings

Summaries of technical papers of annual meeting E-1, AIJ, pp.431-432, 2017 (in Japanese)

NAGATA Eri, TAKEMIYA Kenji

A Study on the change of the space utilization from admission to graduation from

kindergarten -Case study of the Sh kindergarten which has a characteristic kindergarten building and yard-

Summaries of technical papers of annual meeting E-1, AIJ, pp.437-438, 2017 (in Japanese)

KAMIOKA Yuki, TAKEMIYA Kenji

Study on facility planning of the day care center for children and youth with severe disabilities

Summaries of technical papers of annual meeting E-1, AIJ, pp.459-460, 2017 (in Japanese)

KAWATA Yuki, TAKEMIYA Kenji

Study on the facility planning of small unit-care facilities from facility design and usage conditions : Case study of urban areas in the metropolitan area

Summaries of technical papers of annual meeting E-1, AIJ, pp.477-478, 2017 (in Japanese)

Tohru YOSHIKAWA

1. Refereed Articles

Takehiro Kondo and Tohru Yoshikawa, Urban Form that Minimizes the Total Travel Cost Assuming Multiple Floors in a Three-Dimensional City with Two-Stage Hierarchical Bases, *Urban and Regional Planning Review*, Vol. 5, pp. 1-24, 2018.

TUSHIMA Ginga, YOSHIKAWA Tohru and SANUKI Ryo, Development and Application of a Method to Analyze the Prosperity at the Centers of Local Cities From, The Viewpoint of Their Distances from the Stations, *AIJ journal of technology and design*, Vol.23, No.54, pp.667-670, (in Japanese), 2017.

BAN Nobuhisa, YOSHIKAWA Tohru, Comparison of External Effects among Special Area in Urban Renewal and Other Town Planning Systems in the Four Wards in the Hearts of Tokyo, *Journal of Architecture and Planning (Transactions of AIJ)*, Vol.82, No.735, pp.1211-1219, (in Japanese), 2017.

KOJO Takuro, YOSHIKAWA Tohru, Analysis of Distribution of Retail Stores Using the Location Potential by Population Distribution and by Major Roads, *Journal of Architecture and Planning (Transactions of AIJ)*, Vol.82, No.742, pp.3181-3191, (in Japanese), 2017.

2. Proceedings of Oral Presentations

Takeru YASUIKE, Tohru YOSHIKAWA and Ryo SANUKI, Multi-temporal analysis of the factors of pedestrian amount in a central district in a local city in view of prosperity and decline of facilities, *Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan*, F-1, pp.1041-1042, (in Japanese), 2017.

Ichirouta YOSHIOKA, Tohru YOSHIKAWA and Ryo SANUKI, An analysis on the characteristics of visual space in shrine areas at central Tokyo focusing on directionality of voids, *Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan*, F-1, pp.1017-1018, (in Japanese), 2017.

YOSHIKAWA Tohru, Comparison of the average visiting probability and the consumer surplus of regional public facilities with distance decay of the utilization ratio in virtual twin cities, Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, F-1, pp1029-1030, (in Japanese), 2017.

Seiya CHIKAKI, Tohru YOSHIKAWA and Ryo SANUKI, A new optimal placement model on actions expressed as items - Considering transition and congeniality of actions in diary life -, Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, F-1, pp1031-1032, (in Japanese), 2017.

LE PHONG NGUYEN, Tohru YOSHIKAWA, A study on the influence of pedestrians' moving resistance on accessibility in the city, Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, F-1, pp.1043-1044, (in Japanese), 2017.

ASAKUMA Akira, YOSHIKAWA Tohru and SANUKI Ryo, The effect given by the daily rhythm in the spatiotemporal structure of the railway network in a megalopolis, Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, F-1, pp.1049-1050, (in Japanese), 2017.

Takayuki ISOBE and Tohru YOSHIKAWA, Comprehensive evaluation of optimal placements of AEDs in large-scale high-rise urban facilities using three types of survival curves - Basic study on urban facilities for security and relief in cities, part 6 -, Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, F-1, pp.933-934, (in Japanese), 2017.

Le Phong Nguyen and Yoshikawa Tohru, A research on the influence of resistance for pedestrians to using public transport on urban accessibility, 15th International Conference on Computers in Urban Planning and Urban Management, Conference Posters, 03. ID: 35530, 2017.

3. Others

3-2 Research Reports

TUSHIMA Ginga, YOSHIKAWA Tohru and SANUKI Ryo, Analysis of Spatial Factors of Parking Lot Location in Centers of Local Cities by Multinomial Logistic Regression Analysis: Focusing on Division and Hollowing Out of Commercial Area, Reports of the City Planning Institute of Japan, No.16, pp.324-329, 2018.

Haruno IRIE and Tohru YOSHIKAWA, Evaluation of space configuration of shopping centers from the viewpoint of rambling behavior for search by visitors, Reports of the City Planning Institute of Japan, No.16, pp.151-157, (in Japanese), 2017.

Ryo MACHINAGA and Tohru YOSHIKAWA, Appropriate location of NIMBY facilities requiring the balance between separation and use distances: A case study on smoking areas, Reports of the City Planning Institute of Japan, No.16, pp.61-67, (in Japanese), 2017.

3-3 Manuals / Reviews

Tohru YOSHIKAWA, Tama New Town and the Mediterranean Sea, Studies on Tama New Town, No.19, pp.111-116, (in Japanese), 2017.

Tohru YOSHIKAWA, Temporary versus Permanent Buildings, Studies on Tama New Town, No.19, pp.119-120, (in Japanese), 2017.

Motoki TORIUMI

Masumi MATSUMOTO

1. Refereed Papers

N.Takiyama, K.Hara, R.Sanuki, M.Matsumoto, T.Gondo and S.Aoki, Vibrational Properties of Early Showa Period Billboard Architecture for Renovating Densely Built-up Wooden House Areas, Proceeding of The Ninth ISEC, 2017.7

M.NIHEI, Y.TAMASHIMA, T. YOSHIDA, M.MATSUMOTO, M.KAMATA, A study on evaluations of living spaces by caregivers for elderly people, AAATE, 2017.9

Ryo SANUKI

1. Refereed Papers

1) Ryo SANUKI, Hong-Wei HSIAO, Shih-Hung YANG, Ping-Chuan HSEIH : Study on Location of Resettlement Housing in Taipei City, 2017 International Conference on Architecture Engineering and Environmental Design, , 2017年5月

2) Hong-Wei HSIAO, Ryo SANUKI, Shih-Hung YANG, Ping-Chuan HSEIH : Study on the Present Condition of Community Governance of Resettlement Housing in Taipei city , 2017 International Conference on Architecture Engineering and Environmental Design, , 2017年5月

3) Ginga Tsushima, Tohru Yoshikawa, Ryo Sanuki: DEVELOPMENT AND APPLICATION OF A METHOD TO ANALYZE THE PROSPERITY AT THE CENTERS OF LOCAL CITIES FROM THE VIEWPOINT OF THEIR DISTANCES FROM THE STATIONS, Japan Architectural Institute Technical Report, Vol.23, No.54, pp.667-670, 2017.6

4) Ryo SANUKI, Hong-Wei HSIAO, Shih-Hung YANG, Ping-Chuan HSEIH : Study on Adaptation of the Neighborhood Theory for Resettlement Housing in Taipei City Focusing on their Location and Accessibility, 2017年第十一屆物業管理研究成果發表會論文集, , 2017.6

5) Hong-Wei HSIAO, Ryo SANUKI, Shih-Hung YANG, Ping-Chuan HSEIH : Study on the Urban renewal in Resettlement housing in Taipei city: focus on case studies, 2017年第十一屆物業管理研究成果發表會論文集, , 2017.6

6) Noriko Takiyama, Kohei Hara, Ryo Sanuki, Masumi Matsumoto, Tomoyuki Gondo and Shigeru Aoki : Vibrational Properties of Early Showa Period Billboard Architecture for Renovating Densely Built-up Wooden House Areas, Proceeding of The Ninth International Structural Engineering and Construction Conference, , 2017.6

7) Ryuzo Ikezawa, Hiroki Tsutsumi, Ryo Sanuki: Effect of broadening of administrative unions etc. from the perspective of public facility management, Proceedings of the Symposium on Building Production, pp.59-62, 2017.7

8) Xueqi Cui, Makoto Tsunoda, Hongwei Hsiao, Sangjun Yi, Ryo Sanuki: STUDY ON RESIDENT PARTICIPATION IN REPAIR WORK FOR COMMON PART OF

CONDOMINIUM, Proceedings of the Architectural Institute of Japan, Vol.82, No.739, pp.2197-2206, 2017.9

2. Proceedings of Oral Presentations

- 1) Hong-Wei HSIAO, Ryo SANUKI : Present condition and issue of resettlement housing in Taipei city:
- 2) Focus on the management organization and repairment situation, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8
- 3) Yuzuru NAGAI, Hiroki TSUTSUMI, Ryo SANUKI, Koya IKAI : Current status of the vacancy rate in Maebashi City, as seen from the survey Relationship with aging rate, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8
- 4) Ryo SANUKI, Hong-Wei HSIAO, Sangjun YI : Study on the Revitalization of Historical Building in Taipei City: Focusing on the Case of URS and Old House Project, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8
- 5) Fumiya Yamakoshi, Hiroki Tsutsumi, Yuki Mizuide, Ryo Sanuki : Study on evaluation method of civil infrastructure using public facility evaluation index - Inference of water supply arrangement using population and GIS data of road, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8
- 6) Xinyan CHEN, Ryo SANUKI, Masumi MATSUMOTO, Noriko TAKIYAMA, Tomoyuki GONDO, Shigeru AOKI : Seismic Performance Evaluation of Houses for Development of Regional Base in Chuo-3chome, Ota City, Tokyo Part II: Survey of Billboard Architecture and Development of Analysis Models, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8
- 7) Naoto IDATE, Ryo SANUKI, Masumi MATSUMOTO, Tomoyuki GONDO, Noriko TAKIYAMA, Shigeru AOKI : Seismic Performance Evaluation of Houses for Development of Regional Base in Chuo-3chome, Ota City, Tokyo Part III: Eigenvalue Analysis and Seismic Response Analysis of Billboard Architecture, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8
- 8) Ichirouta YOSHIOKA, Tohru YOSHIKAWA, Ryo SANUKI : An analysis on the characteristics of visual space in shrine areas at central Tokyo focusing on directionality of voids, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8
- 9) Seiya CHIKAKI, Tohru YOSHIKAWA, Ryo SANUKI : A new optimal placement model on actions expressed as items - Considering transtion and congeniality of actions in diary life, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8
- 10) Takeru YASUIKE, Tohru YOSHIKAWA, Ryo SANUKI : Multi-temporal analysis of the factors of pedestrian amount in a central district in a local city in view of prosperity and decline of facilities, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8
- 11) Akira ASAKUMA, Tohru YOSHIKAWA, Ryo SANUKI : The effect given by the

daily rhythm in the spatiotemporal structure of the railway network in a megalopolis, Summaries of technical papers of Annual Meeting, Architectural Institute of Japan, pp.41-42, 2017.8

12) Shota Tanno, Kazuma Kojima, Naoto Idate, Ryo Sanuki, Katsuhiko Kobayashi, Noriko Takiyama : A survey study on the upper district of Kamikata-cho on Hachioji City - Part 1 Outline of the traditional village and the streets -, Japanese Architectural Institute Kanto Branch Report Report, pp.259-262, 2018.3

3. Others

1) Chie Nozawa, Shin Aiba, Masahiko Nakanishi, Ryo Sanuki: How should we evaluate municipal location optimization plans: a dilemma on assessment after establishment of location optimization plan, Urban Planning, pp.78-81, 2017.7

2) Ryo Sanuki: Importance of Cooperation between Public Facilities Restructuring and Urban Planning Administration, “Re” , pp.84-87, 2017.10

Architectural Design and History

Masao KOIZUMI

2. Proceedings of Oral Presentations

Masao KOIZUMI and others, Symposium 「feature, advantage, issue of Japanese energy and climate condition」 , Gifu academy of forest science and culture, 2017.11

(in Japanese)

Masao KOIZUMI and others, Symposium ULI Japan Fall Conference 2017 「Japanese real estate for next 20years from architect’ s point of view」 , ULI Japan, 2017.11 (in Japanese)

3. Others

3-2. Research Reports

Masao KOIZUMI and others, Symposium 「future image of housing and lifestyle in shrinking society」 , with gas club, 2017.6

Masao KOIZUMI, Lecture, future housing labo. 2017 「Future housing under transformation of lifestyle for the next generation」 , Tokyo GAS, 2017.9

Masao KOIZUMI, Lecture, 「Housing Planning and Environmental Design」 , Shizuoka housing promotion council, 2017.10

3-3. Manuals/Reviews

Masao KOIZUMI and others, judge and review 「the 5th Daito Trust Construction Rented Accommodation competition」 , Shin kenchiku, APR, 2017.4

Masao KOIZUMI and others, integration of housing design and environmental,

environmental design for housing, 2018.3

3–4. Works/Products, etc.

Masao KOIZUMI, 「Kotobuki labor welfare center building project」, Nikkan Kensetsu Kogyo Shinbun, 2017.4

Masao KOIZUMI, Focus Kenchiku 「Konan Word synthesis Government building」, Nikkei Architecture, Nikkei Business Publications, 2017.4

Masao KOIZUMI, Focus Kenchiku 「Konan Word synthesis Government building」, Shin kenchiku, Shin kenchiku-sya, 2017.4

Masao KOIZUMI, Techno Scope 「segmental design to reduce the pressure to the surrounding area」, Nikkei Business, Nikkei Business Publications, 2017.6

Masao KOIZUMI and others, focus on the future of technique 「LCCM house」, Ecosin Web, Ministry of the environment, 2017.8

Masao KOIZUMI and others, Open Ended House; the house designed by terms of edge, 2017.9

Masao KOIZUMI and others, Odawara City hall, architectural design proposal: second prize, 2017.12

Masao KOIZUMI and others, 「Enemane House 2017-ZEH Village Challenge of Tokyo Metropolitan University, ashin-suteki ongakkan, You TV, 2018.1

Katsuhiko KOBAYASHI

2. Proceedings of Oral Presentations

KOBAYASHI Katsuhiko, Akira KINOSHITA et al., Studies on Design of Recent Skyscrapers, Part 21, -Tendencies and Major Works in Australia -, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 531-532, Sept. 2017 (in Japanese)

KOBAYASHI Katsuhiko, “Research and Field Survey of the Architectural Conversion in Asian Cities”, Final Conference for the Research Project, The Technology of Urban Architecture Rooted in Regional Asian Climates, at TMU International Center, Feb. 2018

SHEN Qing, Katsuhiko KOBAYASHI, Akira KINOSHITA et al., Studies on the Architectural Conversion in Australia, Part 1, -Design Methods seen in Converted Examples in Sydney-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 519-520, Sept. 2017 (in Japanese)

MUNAKATA Koji, Katsuhiko KOBAYASHI, Akira KINOSHITA et al., Studies on the Architectural Conversion in Australia, Part 2, -Design Methods seen in Converted

Examples in Melbourne-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 521-522, Sept. 2017 (in Japanese)

TACHIBANA Fuko, Katsuhiko KOBAYASHI, Akira KINOSHITA et al., Studies on the Architectural Conversion in Australia, Part 3 , - Design Methods seen in Converted Examples in Brisbane -, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 523-524, Sept. 2017 (in Japanese)

KINOSHITA Akira, Katsuhiko KOBAYASHI et al., Studies on Architectural Conversion in New Zealand, Part 1, -Design Methods seen in Converted Examples in Wellington-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 525-526, Sept. 2017 (in Japanese)

MURAI Riku, Katsuhiko KOBAYASHI, Akira KINOSHITA et al., Studies on Architectural Conversion in New Zealand, Part 2, -Design Methods seen in Converted Examples in Auckland-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 527-528, Sept. 2017 (in Japanese)

TOKUDA Shota, Katsuhiko KOBAYASHI, Akira KINOSHITA et al., Studies on Architectural Conversion in Russia, -Design Methods seen in Converted Examples in Moscow-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 529-530, Sept. 2017 (in Japanese)

3. Others

3-2 Research Reports

KOBAYASHI Katsuhiko, KINOSHITA Akira, et al., Report of Survey on Architectural Conversion in Baltic States, Berlin, Helsinki, 300 pages, March 2018

3-3 Manuals / Reviews

KOBAYASHI Katsuhiko, Pilgrimage to Architectural Conversion of the World, Part 6 Taipei, Tainan, Kaohsiung, Core Tokyo, May 2017, pp.6-10

KOBAYASHI Katsuhiko, Pilgrimage to Architectural Conversion of the World, Part 7, Singapore and Hongkong, Diverse Aspects of Conversion Architecture in Merchant Cities of Former British Commonwealth, Core Tokyo, August 2017, pp.9-13

KOBAYASHI Katsuhiko, Pilgrimage to Architectural Conversion of the World, Part 8, Seoul, Successive Resurrection of Architectural Stocks in Recent Years, Core Tokyo, August 2017, pp.10-13

KOBAYASHI Katsuhiko, Pilgrimage to Architectural Conversion of the World, Part 9, Venice, Architectural Conversion Matured inside the Perpetual Aquapolis, Core Tokyo, December 2017, pp.7-11

3-4 Open University Lecture

Katsuhiro KOBAYASHI, An Introduction to Appreciating Architecture II -Understanding the Modern and Contemporary Architecture-, held 4 times in Minamiosawa Campus, 10, 17, 18 Nov., 1, Dec.

3-5. Awards

Katsuhiro KOBAYASHI et al., 2017 Good Design Award, Environmentally friendly housing project [Mina Garden Tokaichiba], Oct. 2017

Yukimasa YAMADA

1. Refereed Papers

Qi NIU, Yukimasa YAMADA

Analysis of Modern Kitchen Desings in Harbin,

Low Temperature Architecture Technology, ISSN1001-6864/CN23-1170/TU, January 2018

2. Proceedings of Oral Presentations

Yukimasa YAMADA 2017,

Preliminary Findings from the Survey 2016 of Churches in the BuiChu Diocese (1) –Studies on Historical Catholic Churches in the Northern Vietnam (11)–

Architectural Institute of Japan Hokuriku Branch research report, vol.60, pp.615-618 (in Japanese).

Yukimasa YAMADA 2017,

Preliminary Findings from the Survey 2016 of Churches in the BuiChu Diocese (2) –Studies on Historical Catholic Churches in the Northern Vietnam (12)–

Summaries of Technical Papers of Annual Meeting, A.I.J., pp. 859-860 (in Japanese).

Jun INOKUMA

Akira KINOSHITA

2. Proceedings of Oral Presentations

SHEN Qing, Katsuhiro KOBAYASHI, Akira KINOSHITA et al., Studies on the Architectural Conversion in Australia, Part 1, -Design Methods seen in Converted Examples in Sydney-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 519-520, Sept. 2017 (in Japanese)

MUNAKATA Koji, Katsuhiro KOBAYASHI, Akira KINOSHITA et al., Studies on the Architectural Conversion in Australia, Part 2, -Design Methods seen in Converted Examples in Melbourne-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 521-522, Sept. 2017 (in Japanese)

TACHIBANA Fuko, Katsuhiko KOBAYASHI, Akira KINOSHITA et al., Studies on the Architectural Conversion in Australia, Part 3 , - Design Methods seen in Converted Examples in Brisbane -, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 523-524, Sept. 2017 (in Japanese)

KINOSHITA Akira, Katsuhiko KOBAYASHI et al., Studies on Architectural Conversion in New Zealand, Part 1, -Design Methods seen in Converted Examples in Wellington-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 525-526, Sept. 2017 (in Japanese)

MURAI Riku, Katsuhiko KOBAYASHI, Akira KINOSHITA et al., Studies on Architectural Conversion in New Zealand, Part 2, -Design Methods seen in Converted Examples in Auckland-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 527-528, Sept. 2017 (in Japanese)

TOKUDA Shota, Katsuhiko KOBAYASHI, Akira KINOSHITA et al., Studies on Architectural Conversion in Russia, -Design Methods seen in Converted Examples in Moscow-, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 529-530, Sept. 2017 (in Japanese)

KOBAYASHI Katsuhiko, Akira KINOSHITA et al., Studies on Design of Recent Skyscrapers, Part 21, - Tendencies and Major Works in Australia -, Summaries of Technical Papers of Annual Meeting, A.I.J., pp., 531-532, Sept. 2017 (in Japanese)

3-2 Research Reports

KOBAYASHI Katsuhiko, KINOSHITA Akira, et al., Report of Survey on Architectural Conversion in Baltic Cities, Berlin, Helsinki, 300 pages, March 2018

3-3 Manuals / Reviews

KINOSHITA Akira, Reassessing Public Space from The Conservation of Trees -Distress and Chance for Change of Suburbia City, Chofu-, Kenchiku Journal, p.15, Jan. 2018

Construction Management and Building Materials

Yoshinori KITSUTAKA

1. Refereed Papers

1) Hiroshi YAMAUCHI, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Koichi MATSUZAWA: Study on crack resistant properties of concrete subjected to heating, Proceedings of the Japan Concrete Institute, Vol. 39, No.1, pp.283-288, 2017.7 (in Japanese)

2) Yoichiro KUNIEDA, Eri TAKAGI, Yoshinori KITSUTAKA: Studies of the mechanical characteristics of Accelerated Carbonation ALC (Autoclaved Lightweight

aerated Concrete) under a high temperature condition, Proceedings of the Japan Concrete Institute, Vol. 39, No.1, pp.1105-1110, 2017.7 (in Japanese)

3) Hideki IGAWA, Takashi YOKOMURO, Yoshinori KITSUTAKA, Hideo EGUCHI: Self-healing Performance of Fiber Varied Types and Compositions Reinforced High Density Concrete, Proceedings of the Japan Concrete Institute, Vol. 39, No.1, pp.1441-1446, 2017.7 (in Japanese)

4) Yoshinori Kitsutaka and Fumiya Ikedo : Mechanical Model of Gypsum Board Anchors Subjected Cyclic Shear Loading, ICGCME 2017, 19th Int. Conf. on Geotechnique, Construction Materials and Environment, 2017, 19(6)Part III

5) Yoshinori Kitsutaka, Shingo Kusumi, Koichi Matsuzawa and Yoichiro Kunieda : Pull-out Behavior of Mechanical Anchor Bolts by Cyclic Loading, ICRCDC 2017, 19th International Conference on Reinforced Concrete Design and Construction, 2017, 19 (8) Part XVI

2. Proceedings of Oral Presentations

1) Hideyo EGUCHI, Takashi YOKOMURO, Yoshinori KITSUTAKA and Hideki IGAWA: Self-healing performance of fiber varied types and compositions reinforced heavy weight concrete, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.175-176, 2017.8 (in Japanese)

2) Hiroshi YAMAUCHI, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Koichi MATSUZAWA: Study on crack resistant properties of concrete subjected to heating, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.211-212, 2017.8 (in Japanese)

3) Sumie SUZUKI, Shinichi KOIZUMI, Yoshinori MASUDA, Yoshinori KITSUTAKA, Tadatsugu KAGE and Koji TERANISHI: Experimental study on evaluation for workability of high fluidity concrete by J-Ring Test Part.1 Agenda and experimental plan, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.327-328, 2017.8 (in Japanese)

4) Tadatsugu KAGE, Shinichi KOIZUMI, Yoshinori MASUDA, Yoshinori KITSUTAKA, Sumie SUZUKI and Koji TERANISHI: Experimental study on evaluation for workability of high fluidity concrete by J-Ring Test Part.5 Method of test for J-Ring flow of concrete and evaluation criteria for workability, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.335-336, 2017.8 (in Japanese)

5) Yoichiro KUNIEDA, Yoshinori KITSUTAKA, Yu BABA and Masahiro YOSHIOKA: An attempt to reduce color differences of external tiles by optimized tile selection, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.707-708, 2017.8 (in Japanese)

6) Shingo KUSUMI, Yoshinori KITSUTAKA, Koichi MATSUZAWA, Yoichiro KUNIEDA and Yasue YAGISAWA: An attempt to reduce color differences of external tiles by optimized tile selection, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.757-758, 2017.8 (in Japanese)

7) Erina NAKAZATO, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Natsumi ONO: Static Vertical Test with Partial Specimen of Steel Ceilings : Part 1, Test method, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.913-914, 2017.8 (in Japanese)

- 8) Natsumi ONO, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Erina NAKAZATO: Static Vertical Test with Partial Specimen of Steel Ceilings : Part 2 Monotonic and repeated load test with composite specimen, AIJ, Construction Materials, pp.915-916, 2017.8 (in Japanese)
- 9) Yu BABA, Yoshinori KITSUTAKA, Masahiro YOSHIOKA and Yoichiro KUNIEDA: The effects of color differences produced by external tile repair on human impression, AIJ, Construction Materials, pp.1117-1118, 2017.8 (in Japanese)
- 10) Kyosuke TANIAI, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Ryo ENOMOTO: Quantitative evaluation of refurbished architecture facades by focusing on fusion of old and new finishing -Part1, Psychological analysis by using impression evaluation and the typology-, AIJ, Construction Materials, pp.1171-1172, 2017.8 (in Japanese)
- 11) Ryo ENOMOTO, Yoshinori KITSUTAKA, Kyosuke TANIAI and Yoichiro KUNIEDA: Quantitative evaluation of refurbished architecture facades by focusing on fusion of old and new finishing Part2, Physical evaluation and typology analysis-, AIJ, Construction Materials, pp.1173-1174, 2017.8 (in Japanese)
- 12) Bungo KODAMA, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Hiroyuki MIYAUCHI: Study on soiling evaluation of building external walls by using UAV, AIJ, Construction Materials, pp.1181-1182, 2017.8 (in Japanese)
- 13) Izumi HARA, Yoshinori KITSUTAKA, Nami Shida and Yoichiro KUNIEDA: Study on damage of gymnasium flooring caused by wheelchair sports. Part 1, Suggestion of measuring methods, AIJ, Construction Materials, pp.1223-1224, 2017.8 (in Japanese)
- 14) Kotomi HIGASHI, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Izumi HARA: Study on damage of gymnasium flooring caused by wheelchair sports. Part 2, Impression evaluation, AIJ, Construction Materials, pp.1225-1226, 2017.8 (in Japanese)
- 15) Yoichiro KUNIEDA, Yoshinori KITSUTAKA, Yu BABA and Masahiro YOSHIOKA: Optimization of external wall tile allocation to reduce color differences, Summaries of Technical Papers of Annual Meeting Japan Society for Finishings Technology, pp.217-220, 2017.10 (in Japanese)
- 16) Izumi HARA, Yoshinori KITSUTAKA, Nami Shida and Yoichiro KUNIEDA: Study on damage resistance of gymnasium flooring caused by wheelchair sports, AIJ, Construction Materials, pp.1223-1224, 2017.8 (in Japanese)

3. Others

3-1. Review

- 1) Yoshinori KITSUTAKA: New value created in harmony of building material by reform, Monthly Reform, v34(7), p.117, 2017.7 (in Japanese)
- 2) Yoshinori KITSUTAKA: High-strength concrete and maintenance -repair of high-rise apartment-, Monthly Reform, v34(8), pp.11-24, 2017.8 (in Japanese)
- 3) Yoshinori KITSUTAKA: Possibility of AI application to the field of building finishing, Japan Society for Finishings Technology, FINEX, p.3., 2018.1/2 (in Japanese)
- 4) Yoichiro KUNIEDA, Yoshinori KITSUTAKA, Yu BABA and Masahiro YOSHIOKA: Optimization of external wall tile allocation to reduce color differences, Monthly Reform, v35(1), pp.120-124, 2018.1 (in Japanese)

5) Yoshinori KITSUTAKA (Chair) et al.: Report of building deterioration in Taiwan, Japan Society for Finishings Technology, 2018.3 (in Japanese)

3-2. Specific Project Research

Grant-in-Aid for Scientific Research of Ministry of education, Yoshinori KITSUTAKA, Grant-in-Aid for Scientific Research (C), Study on the safety of building finishing joints with concrete bed

Makoto TSUNODA

1. Refereed Papers

Study on Resident Participation in Repair Work for Common Part Condominium, Focus on the Legal Structure and Repair Cases of Condominium Operated by Different Agent in Dalian City China, Xueqi CUI, Makoto Tsunoda, Hongwei HSIAO, Sanjun YI and Ryo Sanuki, Journal of Architecture and Planning, AIJ, Vol.82, NO.739, 2197-2205, Sep., 2017 (in Japanese)

2. Proceedings of Oral Presentations

Toshiki CHO, Makoto TSUNODA, A Study on the Actual Condition of Renewal Method and it's Selection Process of Government Office Buildings., Summaries of Technical Papers of Annual Meeting, AIJ, F, pp.251-252, Sep. 2017 (in Japanese)

Eriko OHTSUKA, Makoto TSUNODA, A Study on Decision Making Process of Design Contents for Renovation Works in Exclusively-owned Areas, Summaries of , Technical Papers of Annual Meeting, AIJ, E-1, pp.847-848, Sep. 2017 (in Japanese)

Makoto TSUNODA, Yukiko ARIGA, A study on systematization of construction process management in renovation works at wooden detached house -Actual condition of renovation works affecting construction progress-, Summaries of Technical Papers of Annual Meeting, AIJ, E-1, pp.843-844, Sep. 2017 (in Japanese)

Yukiko ARIGA, Makoto Tsunoda, A study on systematization of construction process management in renovation works at wooden detached house -Measures of construction process management for improvement of efficiency-, Summaries of Technical Papers of Annual Meeting, AIJ, E-1, pp.845-846, Sep. 2017 (in Japanese)

3. Others

3-1 Technical books

Kouichi SATO, Makoto TSUNODA, Yoshiro MORITA, Hideaki SUMIKURA, Kanako SUZUKI, A Guide to the Industry of Architecture, SHOUKOKUSYA, Nov.2017 (in Japanese)

Yoichiro KUNIEDA

1. Refereed Papers

1) Hiroshi YAMAUCHI, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Koichi MATSUZAWA: Study on crack resistant properties of concrete subjected to heating,

Proceedings of the Japan Concrete Institute, Vol. 39, No.1, pp.283-288, 2017.7 (in Japanese)

2) Yoichiro KUNIEDA, Eri TAKAGI, Yoshinori KITSUTAKA: Studies of the mechanical characteristics of Accelerated Carbonation ALC (Autoclaved Lightweight aerated Concrete) under a high temperature condition, Proceedings of the Japan Concrete Institute, Vol. 39, No.1, pp.1105-1110, 2017.7 (in Japanese)

3) Yoshinori Kitsutaka, Shingo Kusumi, Koichi Matsuzawa and Yoichiro Kunieda : Pull-out Behavior of Mechanical Anchor Bolts by Cyclic Loading, ICRCDC 2017, 19th International Conference on Reinforced Concrete Design and Construction, 2017, 19 (8) Part XVI

4) Yoichiro KUNIEDA, Ricardo CODINHOTO: BASIC STUDY OF 4D-CAD APPLICATION TO DEMOLITION IMPACT ESTIMATION, J. Struct. Constr. Eng., AIJ, No.748, 2018.6 (accepted) (in Japanese)

2. Proceedings of Oral Presentations

1) Hiroshi YAMAUCHI, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Koichi MATSUZAWA: Study on crack resistant properties of concrete subjected to heating, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.211-212, 2017.8 (in Japanese)

2) Yoichiro KUNIEDA, Yoshinori KITSUTAKA, Yu BABA and Masahiro YOSHIOKA: An attempt to reduce color differences of external tiles by optimized tile selection, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.707-708, 2017.8 (in Japanese)

3) Shingo KUSUMI, Yoshinori KITSUTAKA, Koichi MATSUZAWA, Yoichiro KUNIEDA and Yasue YAGISAWA: An attempt to reduce color differences of external tiles by optimized tile selection, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.757-758, 2017.8 (in Japanese)

4) Erina NAKAZATO, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Natsumi ONO: Static Vertical Test with Partial Specimen of Steel Ceilings : Part 1, Test method, Summaries of Technical Papers of Annual Meeting, AIJ, Construction Materials, pp.913-914, 2017.8 (in Japanese)

5) Natsumi ONO, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Erina NAKAZATO: Static Vertical Test with Partial Specimen of Steel Ceilings : Part 2 Monotonic and repeated load test with composite specimen, AIJ, Construction Materials, pp.915-916, 2017.8 (in Japanese)

6) Yu BABA, Yoshinori KITSUTAKA, Masahiro YOSHIOKA and Yoichiro KUNIEDA: The effects of color differences produced by external tile repair on human impression, AIJ, Construction Materials, pp.1117-1118, 2017.8 (in Japanese)

7) Kyosuke TANIAI, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Ryo ENOMOTO: Quantitative evaluation of refurbished architecture facades by focusing on fusion of old and new finishing -Part1, Psychological analysis by using impression evaluation and the typology-, AIJ, Construction Materials, pp.1171-1172, 2017.8 (in Japanese)

8) Ryo ENOMOTO, Yoshinori KITSUTAKA, Kyosuke TANIAI and Yoichiro KUNIEDA: Quantitative evaluation of refurbished architecture facades by focusing on

fusion of old and new finishing Part2, Physical evaluation and typology analysis-, AIJ, Construction Materials, pp.1173-1174, 2017.8 (in Japanese)

9) Bungo KODAMA, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Hiroyuki MIYAUCHI: Study on soiling evaluation of building external walls by using UAV, AIJ, Construction Materials, pp.1181-1182, 2017.8 (in Japanese)

10) Izumi HARA, Yoshinori KITSUTAKA, Nami Shida and Yoichiro KUNIEDA: Study on damage of gymnasium flooring caused by wheelchair sports. Part 1, Suggestion of measuring methods, AIJ, Construction Materials, pp.1223-1224, 2017.8 (in Japanese)

11) Kotomi HIGASHI, Yoshinori KITSUTAKA, Yoichiro KUNIEDA and Izumi HARA: Study on damage of gymnasium flooring caused by wheelchair sports. Part 2, Impression evaluation, AIJ, Construction Materials, pp.1225-1226, 2017.8 (in Japanese)

12) Yoichiro KUNIEDA, Yoshinori KITSUTAKA, Yu BABA and Masahiro YOSHIOKA: Optimization of external wall tile allocation to reduce color differences, Summaries of Technical Papers of Annual Meeting Japan Society for Finishings Technology, pp.217-220, 2017.10 (in Japanese)

13) Izumi HARA, Yoshinori KITSUTAKA, Nami Shida and Yoichiro KUNIEDA: Study on damage of gymnasium flooring caused by wheelchair sports, AIJ, Construction Materials, pp.1223-1224, 2017.8 (in Japanese)

3. Others

3-1. Review

1) Yoichiro KUNIEDA, Yoshinori KITSUTAKA, Yu BABA and Masahiro YOSHIOKA: Optimization of external wall tile allocation to reduce color differences, Monthly Reform, v35(1), pp.120-124, 2018.1 (in Japanese)

3-2. Specific Project Research

None

Structural Engineering

Kazuhiro KITAYAMA

1. Refereed papers

(1) Miao Si-Yu, Kitayama Kazuhiro and Jin Kiwoong : Seismic Performance and different limit states of beam in Precast Prestressed Concrete Beam-Column Joint Assembled by Unbonded Tendon, Proceedings of the Japan Concrete Institute, Vol.39, No.2, July 2017, pp. 361-366 (in Japanese).

(2) Kazuhiro KITAYAMA and Hiromu KATAE : Earthquake Resistance of Reinforced Concrete Corner Beam-Column Joints with Different Column Axial Loads under Bi-directional Lateral Loading, Bulletin of the New Zealand Society for Earthquake Engineering, Vol. 50, No. 4, December 2017, pp.527-536.

2. Proceedings for Oral Presentation

(1) KITAYAMA Kazuhiro, MIAO Siyu and JIN Kiwoong : Seismic Performance Estimation of Unbonded Precast Prestressed Concrete Frame Focusing on Different Steel Indices (Part 3 : Concrete Strain of Beam), Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, Structures IV, August 2017, pp. 745-746 (in Japanese).

(2) MIAO Siyu, KITAYAMA Kazuhiro and JIN Kiwoong : Seismic Performance Estimation of Unbonded Precast Prestressed Concrete Frame Focusing on Different Steel Indices (Part 4 : Estimation of Different Limit States), Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, Structures IV, August 2017, pp. 747-748 (in Japanese).

(3) TOMATSURI Hiroyuki, OKUBO Takahiro, SAKASHITA Masanobu, FUKUYAMA Hiroshi, IZUMI Nobuyuki, TESHIGAWARA Masaomi and KITAYAMA Kazuhiro : Study on Scale Effects of Flexural Type RC-Beams with High Shear Strength Stress Part 1. Outline of Tests and Results, Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, Structures IV, August 2017, pp. 41-42 (in Japanese).

(4) Kenta OHNISHI, Naoaki FUJITA, Hitoshi KIMURA, Ryo WATANABE, Yuki IDOSAKO, Masanori TANI, Satoshi MASHIMO, Minehiro NISHIYAMA, Tomohisa MUKAI, Haruhiko SUWADA, Kazuhiro KITAYAMA and Yuji ISHIKAWA : Cyclic Loading Tests on Full-scale and Half-scale Heavily Confined Reinforced Concrete Columns (Part2:Experimental results of specimens subjected to varying axial load($\eta_{max}=0.67$)), Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, Structures IV, August 2017, pp. 113-114 (in Japanese).

(5) Hitoshi KIMURA, Kenta OHNISHI, Naoaki FUJITA, Ryo WATANABE, Yuki IDOSAKO, Masanori TANI, Satoshi MASHIMO, Minehiro NISHIYAMA, Tomohisa MUKAI, Hiroshi FUKUYAMA, Masaomi TESHIGAWARA and Kazuhiro KITAYAMA : Cyclic Loading Tests on Full-scale and Half-scale Heavily Confined Reinforced Concrete Columns (Part4:Deformation behavior and strain of hoop), Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, Structures IV, August 2017, pp. 117-118 (in Japanese).

(6) ZOU Shan-Shan and KITAYAMA Kazuhiro : Exterior Beam-Column Joint Hinging Failure in Precast Prestressed Concrete Frame Assembled by Post-tensioning Unbonded Tendon, Proceedings of the 13th Annual Meeting of Japan Association for Earthquake Engineering, November 2017, No.P1-24, CD-Rom, pp.1-8.

3. Others

3-1. Technical books

(1) Japan Building Disaster Prevention Association, Standards and Commentary for Seismic Capacity Evaluation to Existent Reinforced Concrete Buildings (Revised Version in 2017), correction to Chapter 5, description of Appendix 1, etc., July 2017 (in Japanese).

(2) Japan Building Disaster Prevention Association, Application Hand-book to Standards for Seismic Capacity Evaluation and Guideline for Seismic Rehabilitation to Existent Reinforced Concrete Buildings (Revised Version in 2017), description of Appendix II-2 “Earthquake Damage to R/C Retrofitted Buildings”, July 2017, pp.210-218 (in Japanese).

3-3. Manuals / Reviews

(1) Kazuhiro KITAYAMA, Tension-Shift in Reinforced Concrete Beam and Column, The Kenchiku Gijutsu, No.815, December 2017, pp.184-185(in Japanese).

Jiro TAKAGI

Toshikazu KABEYASAWA

1. Refereed Papers

1) Toshikazu kabeyasawa, Toshimi Kabeyasawa, Taro Arikawa, A Study on the Dynamic Response of the Reinforced Concrete Structure under Impulsive Wave Load , Proceedings of JCI Annual Conference, JCI, 2017.7 (in Japanese)

2) T. Kabeyasawa, T. Kabeyasawa, H. Fukuyama, Effects of Floor Slabs on the Flexural Strength of Beams in Reinforced Concrete buildings, Bulletin of the New Zealand Society for Earthquake Engineering, Vol.50 No.4, NZSEE, reviewed, ISSN 1174-9857, pp.482-493

3) T. Mulai, T. Kabeyasawa, M. Tani, H. Suwada and H. Fukuyama, Residual Seismic Capacity of Ductile RC Frame with Wing Walls based on Full Scale Loading Test, Bulletin of the New Zealand Society for Earthquake Engineering, Vol.50 No.4, NZSEE, reviewed, ISSN 1174-9857, pp.565-573

4) T. Kabeyasawa, T. Mulai, T. Fukuyama, H. Suwada and H.Kato, Full-Scale Testing of Reinforced Concrete Frame Buildings with attached walls considering Damage Control Design, Bulletin of the New Zealand Society for Earthquake Engineering, Vol.50 No.4, NZSEE, reviewed, ISSN 1174-9857, pp.586-594

5) Toshikazu Kabeyasawa, Toshimi Kabeyasawa, Taro Arikawa, PERFORMANCE OF SOFT FIRST STORY BUILNINGS UNDER EARTHQUAKE MOTIONS AND TSUNAMI LOADINGS, Journal of Structural Engineering Vol.63B, AIJ, 2018.3 (in Japanese)

2. Proceedings of Oral Presentations

1) Toshikazu Kabeyasawa, A development of performance indication system of buildings to achieve the sustainable use just after Upcoming Tokyo Metropolitan Earthquake, 9th Tokyo Metropolitan University presentation proposal for the political projects, 2018.7

2) Toshimi Kabeyasawa, Toshikazu Kabeyasawa, Li Yutong, Masafumi Matsushima, Naoto Kihara, Tsunami collapse tests on reinforced concrete frame buildings by continuous wave and floating wreckage Part 1 Outline of test, Proceedings of Annual

AIJ Conference, AIJ, 2017.8 (in Japanese)

3) Seitaro Tajiri, Toshimi Kabeyasawa, Toshikazu Kabeyasawa, Estimated Damage Rate of Reinforced Concrete School Building Caused by 2016 Kumamoto Earthquake, Proceedings of Annual AIJ Conference, AIJ, 2017.8 (in Japanese)

4) Toshikazu Kabeyasawa, Toshimi Kabeyasawa, A Study on Effective Width of Slab on Reinforced Concrete Beam in Assembled Frame Specimens (Part7) A study on a compatibility condition of displacement in transverse beam, Proceedings of Annual AIJ Conference, AIJ, 2017.8 (in Japanese)

5) Toshikazu Kabeyasawa, Toshimi Kabeyasawa, Taro Arikawa, An analytical study on the Dynamic Response of the Reinforced Concrete Structure under Impulsive Wave Load, Proceedings of 13th annual conference, JAEE, 2017.11 (in Japanese)

6) Toshimi Kabeyasawa, Toshikazu Kabeyasawa, Li Yutong, Masashi Matsuyama, Naoto Kihara, Tsunami Collapse Tests on Reinforced Concrete Buildings by Continuous Wave and Floating Wreckage, Proceedings of 13th annual conference, JAEE, 2017.11 (in Japanese)

7) T. Kabeyasawa and T. Kabeyasawa, Tsunami Collapse Tests on Soft 1st Story RC Building After Damaged by Dynamic Loading, RSNZ-JSPS Workshop, 2017.11

8) T. Kabeyasawa and T. Kabeyasawa, Tsunami Collapse Tests on Reinforced Concrete Frame Buildings under Continuous Wave with Floating Wreckage, RSNZ-JSPS Workshop, 2017.11

9) Toshikazu Kabeyasawa, Disaster Survey Report on 2017 Central Mexico Earthquake, AIJ, 2018.2

3. Others

3-2. Research Reports

1) National institute for Land and Infrastructure Management, Design Guideline for Buildings at Disaster Bases(Draft), Project Research Report of NILIM (Joint Work) Vol.1004, 2018.1

Noriko TAKIYAMA

1. Refereed papers

1) Noriko Takiyama, Kohei Hara, Ryo Sanuki, Masumi Matsumoto, Tomoyuki Gondo and Shigeru Aoki: Vibrational Properties of Early Showa Period Billboard Architecture for Renovating Densely Built-up Wooden House Areas, Proceeding of The Ninth International Structural Engineering and Construction Conference, Valencia, Spain, July. 2017.

2) Noriko Takiyama, Ryohei Tamaki, Xinyan Chen, Akari Yamaguchi and Mitsuhiro Miyamoto: Structural Characteristics of Traditional Thatched House in Old Post Towns, Proceeding of The Ninth International Structural Engineering and Construction Conference, Valencia, Spain, July. 2017.

3) Akari Yamaguchi, Xinyan Chen and Noriko Takiyama: Analysis of Timber Column-Ground Sill Joints Reinforced with Improved Aramid Fiber Sheets, Proceeding of The Ninth International Structural Engineering and Construction Conference, Valencia, Spain, July. 2017.

2. Proceedings for Oral Presentation

- 1) Xinyan Chen, Ryo Sanuki, Masumi Matsumoto, Noriko Takiyama, Tomoyuki Gondo and Shigeru Aoki: Seismic Performance Evaluation of Houses for Development of Regional Base in Chuo-3chome, Ota City, Tokyo, Part II Survey of billboard architecture and Development of analysis models. Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, pp.807-808, 2017.8. (in Japanese)
- 2) Naoto Idate, Ryo Sanuki, Masumi Matsumoto, Tomoyuki Gondo, Noriko Takiyama and Shigeru Aoki: Seismic Performance Evaluation of Houses for Development of Regional Base in Chuo-3chome, Ota City, Tokyo, Part III Eigenvalue Analysis and Seismic Response Analysis of Billboard Architecture. Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, pp.809-810, 2017.8. (in Japanese)
- 3) Mitsuhiro Miyamoto, Noriko Takiyama, Mikio Koshihara and Hiromi Sato: Study on Seismic Damages and Structural Performance of Pagodas in Nepal (Part 1: Outline of Seismic Damages), Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, pp.905-906, 2017.8. (in Japanese)
- 4) Haruka Okuhiro, Mitsuhiro Miyamoto, Noriko Takiyama and Mikio Koshihara: Study on Seismic Damages and Structural Performance of Pagodas in Nepal (Part 2: Results of Micro-Tremor Measurement), Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, pp.907-908, 2017.8. (in Japanese)
- 5) Akari Yamaguchi, Kshitij C. Shrestha, Mitsuhiro Miyamoto, Noriko Takiyama and Mikio Koshihara: Study on Seismic Damages and Structural Performance of Pagodas in Nepal (Part 3: Material Strength Test of Traditional Brick Wall), Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, pp.909-910, 2017.8. (in Japanese)
- 6) Noriko Takiyama and Xinyan Chen: Bending Strength of Shear Keyed Joint with Horizontal Cotter of Traditional Wooden Structure, Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, pp.517-518, 2017.8. (in Japanese)
- 7) Ayaka Hirose, Ryohei Tamaki, Xinyan Chen, Kosei Kawashima and Noriko Takiyama: Fukushima-Ken Ouchi-Juku niokeru Kouzoutyousa nimotozuku Dentoutekikayabukijuutaku no Shindouseijou no Haaku (Vibration Characteristics of Traditional Thatched House Based on Structural Investigation in Old Post Towns Ouchi-Juku, Fukushima). Architectural Institute of Japan Kanto Chapter Research Meeting, 88(I), pp.353-356, 2018.3. (in Japanese)
- 8) Kosei Kawashima, Ayaka Hirose, Xinyan Chen and Noriko Takiyama: Fukushima-Ken Maesawa-Syuraku niokeru Dentouteki Tyumonzukuri Minka no Kouzoutyousa to Taishinseiyouka (Structural Investigation and Seismic Estimation of Traditional Thatched L-Shaped House in Old Post Towns Maesawa, Fukushima). Architectural Institute of Japan Kanto Chapter Research Meeting, 88(I), pp.357-360, 2018.3. (in Japanese)
- 9) Xinyan Chen and Noriko Takiyama: Dentou Mokuzou Jutaku niokeru Siyou no Kotonaru Sashigamoi Setsugoubu no Rikigakutokusei no Hikaku to Fukugenryoku no Suitei (Comparison of Seismic Characteristics and Estimation of Restoring Force of

Sashigamoi Joint in Japanese Traditional Wooden Structure). Architectural Institute of Japan Kanto Chapter Research Meeting, 88(I), pp.361-364, 2018.3. (in Japanese)

10) Akari Yamaguchi, Syo Koike, Xinyan Chen and Noriko Takiyama: Kison-Mokuzou-Tatemono no Tyukyaku-Hokyo niokeru Aramidoseni-Shito Haritukekeishiki no Taikeiteki-Kensyujikken (Systematic Verification Experiment on Reinforcement Method by Aramid Fiber Sheet for Column Base of Existing Wooden House). Architectural Institute of Japan Kanto Chapter Research Meeting, 88(I), pp.365-368, 2018.3. (in Japanese)

11) Syota Tanno, Kazuma Kojima, Naoto Idate, Ryo Sanuki, Katsuhiko Kobayashi and Noriko Takiyama: Hachioji-shi Kamionkata-cho Kamiange-chiku nikansuru Tyousa Kenkyu –Part 1: Dentouteki Syuraku no Gaiyou to Machinami (Study on Kamiange district in Kamionkata, Hachioji, Part 1: Outline and Townscape of Traditional District). Architectural Institute of Japan Kanto Chapter Research Meeting, 88(II), pp.259-262, 2018.3. (in Japanese)

12) Sunao Matsuda, Chenman Cai, Nobuyuki Sunaga and Noriko Takiyama: Hachioji-shi Kamionkata-cho Kamiange-chiku nikansuru Tyousa Kenkyu –Part 2: Dentouteki Minka no Kenchikuteki Tokucho oyobi Kouzou, Zairyou Tokusei nitsuite (Study on Kamiange district in Kamionkata, Hachioji, Part 2: Construction Form, Design, Structural and Environmental Characteristics of Traditional Houses). Architectural Institute of Japan Kanto Chapter Research Meeting, 88(II), pp.263-266, 2018.3. (in Japanese)

3. Others

3-2. Research reports

1) Tokyo National Research Institute for Cultural Properties: 2016 Networking Core Centers for International Cooperation in the Conservation of Cultural Heritage Project, Technical Assistance for the Protection of Damaged Cultural Heritage in Nepal, May. 2017. (co-authored)

Kazushige YAMAMURA

Environmental Engineering

Nobuyuki SUNAGA

1. Refereed Papers

Meinan WANG and Nobuyuki SUNAGA, The Effects of Building Performance and Air-conditioning Setting Temperature on Energy Consumption and Thermal Comfort in Multi-residential Buildings in China, Journal of Environmental Engineering (Transactions of AIJ), Vol.82, No.734, pp.347-356, Apr., 2017

Nobuyuki Sunaga, Hiroko Onodera, Eiko Kumakura, Ikuya Nakano and Hyunwoo Roh, Solar Town Fuchu - Plan and Performance -, Elsevier / Procedia Engineering, International High-Performance Built Environment Conference – A Sustainable Built Environment Conference 2016 Series (SBE16), iHBE 2016, Volume 180, Pages 1433-1442, May, 2017

Ryo Meshino and Nobuyuki Sunaga, Influence of thermal insulation performance of housing on lifestyle of residents - Focusing on window performance -, Proceedings of PLEA 2017 Conference, "DESIGN TO THRIVE", Vol.1, pp.1252-1259, Jul., 2017

Meinan Wang, Nobuyuki Sunaga, Jinghui Ma and Meiling Zhang, Effect of Air Conditioning Operation Patterns on Indoor Thermal Environment and Energy Consumption of Multi-Residential Buildings in Hot and Humid Region, Proceedings of PLEA 2017 Conference, "DESIGN TO THRIVE", Vol.2, pp.726-732, Jul., 2017

Kojiro Takeda, Eiko Kumakura and Nobuyuki Sunaga, Awareness trends of urban thermal environment during summer based on tweets and photos, Proceedings of PLEA 2017 Conference, "DESIGN TO THRIVE", Oral short presentation (Lack of paper in proceedings), Jul., 2017

Hiroko ONODERA, Nobuyuki SUNAGA, Eiko KUMAKURA, Ikuya NAKANO and Hyunwoo ROH, Energy Consumption of Houses Utilizing Natural Energy and the Issues Involved in Realising ZEH, Journal of Environmental Engineering (Transactions of AIJ), Vol.82, No.742, pp.1035-1042, Dec., 2017 (in Japanese)

2. Proceedings of Oral Presentations (all in Japanese)

Kojiro TAKEDA, Eiko Kumakura and Nobuyuki SUNAGA, ANALYSIS OF THERMAL SENSITIVE TWEETS IN DENSELY POSTED AREA IN SUMMER OF TOKYO, The 12th National Conference of Heat Island Institute International, pp.50-51, Jul., 2017

Shimon OKAZAKI, Eiko KUMAKURA, Nobuyuki SUNAGA and Kazuaki NAKAOHKUBO, THERMAL ENVIRONMENT OF PEDESTRIAN AREAS ALONG THE MARATHON COURSE OF TOKYO 2020 OLYMPICS Part3 Numerical analysis on the effects of thermal environmental interventions for athletes and spectators, The 12th National Conference of Heat Island Institute International, pp.64-65, Jul., 2017

Ryosuke IWANAGA, Eiko Kumakura and Nobuyuki SUNAGA, COMPARISON OF THE ACHIEVEMENT AND THE PUBLICITY ACTIVITY OF THE GREENING SUBSIDY IN THE SPECIAL WARD OF TOKYO, The 12th National Conference of Heat Island Institute International, pp.110-111, Jul., 2017

Ryosuke IWANAGA, Eiko Kumakura and Nobuyuki SUNAGA, Investigation on the Greening Subsidy in Special Ward of Tokyo, Summaries of Technical Papers of Annual Meeting, A.I.J., D-1, pp.703-704, Aug., 2017

Reo WATANABE and Nobuyuki SUNAGA, Study on Air Flow Pattern and Air Flow Rate of Single-Side Opening Room with Lengthwise Alternate-Open Casement Window, Summaries of Technical Papers of Annual Meeting, A.I.J., D-2, pp.139-140, Aug., 2017

Koji HAMA, Katsumi SHINOZUKA and Nobuyuki SUNAGA, Actual measurement and analysis in repository-1 of Kumamoto Prefectural Museum of Art Part 1. Analysis of internal temperature, humidity and air flow characteristics behavior by actual measurements, Summaries of Technical Papers of Annual Meeting, A.I.J., D-2, pp.535-534, Aug., 2017

Katsumi SHINOZUKA, Nobuyuki SUNAGA and Koji HAMA, Actual measurement and CFD analysis in repository-1 of Kumamoto Prefectural Museum of Art Part 2. Analysis of the internal environment of repository by CFD analysis, Summaries of Technical Papers of Annual Meeting, A.I.J., D-2, pp.536-537, Aug., 2017

Yoshitaka ISHIZUKA, Nobuyuki SUNAGA Hiroki OTSUKA and Ryuichi KURAHASHI, Study on air-conditioning and ventilation system of high-insulated house located in mild climate area Part1. Outline of system and Thermal Environment and energy consumption in winter season, Summaries of Technical Papers of Annual Meeting, A.I.J., D-2, pp.1117-1118, Aug., 2017

Keisuke CHIBA and Nobuyuki SUNAGA, Study on the Actual Condition of Environmental Load Reduction Technique for Green Government Building in Japan, Summaries of Technical Papers of Annual Meeting, A.I.J., D-2, pp.1509-1510, Aug., 2017

Ryo MESHINO, Nobuyuki SUNAGA, Hiroko ONODERA, Shinji SHIRAIISHI, Hiroki OOTSUKA and Kaori Hamada, Research on the Effect and Influence of the Thermal Insulation Performance of Housing on Residents -Consideration by winter survey for detached houses-, Proceedings of JSES/JWEA Joint Conference, pp.91-94, Oct., 2017

Yoshitaka ISHIZUKA, Nobuyuki SUNAGA, Hiroko ONODERA and Hiroki OTSUKA, Study on air-conditioning and ventilation system of highly heat-insulating housing located in mild climate area - Air flow characteristics at heating and cooling by air-conditioners installed under the floor and in attic space -, Proceedings of JSES/JWEA Joint Conference, pp.311-314, Oct., 2017

Akihiro NAGATA

1. Refereed Papers

1) Kyu Watanabe and Akihiro Nagata, The Effects of Pressure Difference on the Performance of Shut-off of Heat and Air Flow of Blowing Down Type Air Curtain Located on the Head of Aperture, J. Environ. ENg. AIJ, vol.83, No.743, pp.29-37, 2018 (in Japanese)

2. Proceedings of Oral Presentations

1) Akihiro Nagata: Simplified Modeling of Internal Long-Wave Radiation Exchange Part 2: Validation of the Proposed Approximation and Internal Heat Balance, Summaries of Technical Papers of Annual Meeting, AIJ, D-2, pp.583-584, 2017 (in Japanese)

2) Shun Katsumata, Hikaru Kamiyama, Isamu Gomi, Sachiko Nishikawa, Akihiro Nagata, Eiji Sakuma and Taito Kinoshita: A Study on the Evaluation Method of Thermal Performance for Combination of Glazing and Shading Devices : Part 7: Visualization and Analysis of Airflow under Winter Conditions, Summaries of Technical Papers of Annual Meeting, AIJ, D-2, pp.425-426, 2017 (in Japanese)

3) Isamu Gomi, Hikaru Kamiyama, Shun Katsumata, Sachiko Nishikawa, Akihiro Nagata, Taito Kinoshita and Eiji Sakuma: A Study on the Evaluation Method of Thermal Performance for Combination of Glazing and Shading Devices : Part 8: Case Studies using CFD Analysis, Summaries of Technical Papers of Annual Meeting, AIJ, D-2, pp.427-428, 2017 (in Japanese)

4) Sachiko Nishikawa, Shun Katsumata, Isamu Gomi, Hikaru Kamiyama, Akihiro Nagata, Taito Kinoshita and Eiji Sakuma: A Study on the Evaluation Method of Thermal Performance for Combination of Glazing and Shading Devices : Part 9: Comparison of Air Flow and Heat Transfer between CFD and ISO 15099, Summaries of Technical Papers of Annual Meeting, AIJ, D-2, pp.429-430, 2017 (in Japanese)

5) Akihiro Nagata: Current Status and Issues of Thermal Performance Evaluation of Windows ~ With a Central Focus on Thermal and Airflow Properties around Glazing and Shading Devices ~, Environmental Engineering Research, No.329, Kinki Chapter of SHASEJ, pp.11-20, 2017 (in Japanese)

3. Others

3-3. Manuals / Reviews

1) Akihiro Nagata: ISO 52017-1 Calculation of Sensible and Latent Heat Loads and Internal Temperatures, Journal of JABMEE, vol. 49, No.5, p.30, 2017-05 (in Japanese)

2) Akihiro Nagata, Human Factors and Building Services, Kenchikusetubi to Haikankoji, vol.55, No.10, pp.6-10, 2017-08. (in Japanese)

3) Akihiro Nagata, Recent Trends of Thermal Environment Simulation, Journal of SHASE, vol.92, No.1, pp.59-63, 2018-01. (in Japanese)

Masayuki ICHINOSE

1. Refereed Articles

1) Sutida Sattayakorn, Masayuki Ichinose, Rumiko Sasaki (2017). Clarifying thermal

comfort of healthcare occupants in tropical region: A case of indoor environment in Thai hospitals. *Energy & Buildings*, Elsevier, Vol. 149, pp. 45-57.

2) 池上宗樹, 一ノ瀬雅之, 長谷川順也「デジタル建築設計資料集成設備編の提案 - BIM を用いた建築設備設計ガイド - 」, “A PROPOSAL OF DIGITAL HAND BOOK FOR ARCHITECTURAL DESIGN; MECHANICAL ENGINEERING - Guide book for mechanical design by BIM-” ,日本建築学会技術報告集、日本建築学会、2018年10月以降掲載決定

3) Nedyomukti Imam Syafii, Masayuki Ichinose, Eiko Kumakura, Steve Kardinal Jusuf, Kohei Chigusa and Nyuk Hien Wong. (2017). Thermal Environment Assessment Around Bodies of Water in Urban Canyons: a Scale Model study. *Sustainable Cities and Society* 34, pp. 79 – 89

4) Nedyomukti Imam Syafii, Masayuki Ichinose, Eiko Kumakura, Steve Kardinal Jusuf, Kohei Chigusa and Nyuk Hien Wong. (2017). Enhancing the Potential Cooling Benefits of Urban Water Bodies. *Nakhara: Journal of Environmental Design and Planning* 14, pp. 29 – 40

2. Proceedings of Oral Presentations

1) S Sattayakorn, M Ichinose, et al., Comfort in Patient Room of Healthcare Facilities in Tropical Region: A different requirement between patient and their companion, *PLEA*, Vol.I, pp.1273-1280, 2017.7

2) N Imam Syafii, M Ichinose, et al., Urban Water Pond Cooling Effect and Related Microclimate Parameter: a Scale Model Study, *PLEA*, vol.II, pp. 1920 – 1926, 2017.7

3) R Sasaki, M Ichinose, et al., Decision making factors of façade glass material selection in Tropical region, focusing on architectural designer, *PLEA*, pp.1588-1595, 2017.7

4) Y Fukawa, M Ichinose, et al., Field Investigation on Unacceptable Sensation of Thermal Environment in Taiwan Office, *PLEA*, pp.1076-1083, 2017.7

5) Y Fukawa, M Ichinose et al., Observational Study on Thermal Comfort Criteria for Air-conditioned Office Space in the Tropics Asia, *Healthy Buildings 2017 Asia*, 2017.9

6) M Ichinose, M Kinoshita, et al., Slight Airflow Combined Radiant Cooling System for Enhancing Comfort and Energy Conservation, *Healthy Buildings 2017 Asia*, 2017.9

3. Others

3-1. Monographs / Technical books

3-2. Research Reports

1) Masayuki Ichinose: Technology for sustainable urban architecture rooted in regional Asian climate and culture, Jogjakarta, Singapore Institute of Technology, Jul. 2017 (Invited lecture)

2) Masayuki Ichinose, Green Buildings Contribution to Energy Efficiency and Sustainable Development – Experience of Japan, Vietnam Green Building Week, Sep. 2017 (Invited lecture)

3-4. Works/Products, etc.

1) Zero Energy House design and build competition, Ene-Mane House 2017

Eiko KUMAKURA

1. Refereed Papers

Eiko Kumakura, Ryousuke Iwanaga and Nobuyuki Sunaga, Investigation on the Incentive Programs for Green Roofs and Walls in Special Wards of Tokyo, *Journal of The Japanese Institute of Landscape Architecture*, Vol.81(5)

Hiroko Onodera, Nobuyuki Sunaga, Eiko Kumakura, Ikuya Nakano and Roh Hyunwoo, Energy consumption of houses utilizing natural energy and the issues involved in realizing ZEH, *Journal of Environmental Engineering (Transactions of AIJ)*, 82(742), pp.1035-1042, 2017.12

Nedyomukti Imam Syafii, Masayuki Ichinose, Eiko Kumakura, Steve Kardinal Jusuf, Kohei Chigusa and Nyuk Hien Wong, Enhancing the Potential Cooling Benefits of Urban Water Bodies. *Nakhara: Journal of Environmental Design and Planning* 13, pp.29-40, 2017.12

Imam Syafii, N., Ichinose, M., Kumakura, E, Jusuf, S.K., Chigusa, K., Wong, N.H., Thermal environment assessment around bodies of water in urban canyons: A scale model study, *Sustainable Cities and Society*, Volume 34, October 2017, pp.79-89

2. Proceedings of Oral Presentations

(International peer review conference)

Koujirou Takeda, Eiko Kumakura and Nobuyuki Sunaga, Awareness trends of urban thermal environment during summer based on tweets and photos, *The 33th International Conference on Passive and Low Energy Architecture*, proceedings USB, Edinburgh Scotland, 2017.7

Imam Syafii, N., Ichinose, M., Kumakura, E, Jusuf, S.K., Chigusa, K., Wong, N.H., Urban Water Pond Cooling Effect and Related Microclimate Parameter: a Scale Model Study, *The 33th International Conference on Passive and Low Energy Architecture*, proceedings USB, Edinburgh Scotland, 2017.7

(oral presentation)

Ryousuke Iwanaga, Eiko Kumakura, and Nobuyuki Sunaga, Comparison of the achievement and the publicity activity of the gardening subsidy in the special ward of Tokyo, *The 12th National Conference of Heat Island Institute International*, Tokyo, p110-111, 2017.8

Shimon Okazaki, Eiko Kumakura, Nobuyuki Sunaga and Kazuaki Nakanohkubo, 2Thermal Environment of pedestrian areas along the marathon course of Tokyo 2020 Olympics Part3 Numerical analysis on the effects of thermal environmental interventions for athletes and spectators, *The 12th National Conference of Heat Island Institute International*, Tokyo, p64-65, 2017.8

Koujirou Takeda, Eiko Kumakura and Nobuyuki Sunaga, Analysis of thermal sensitive tweets in densely posted area in summer of Tokyo, *The 12th National Conference of Heat Island Institute International*, Tokyo, p50-51, 2017.8

Ryousuke Iwanaga, Eiko Kumakura, and Nobuyuki Sunaga, Investigation on the Greening Subsidy in Special Ward of Tokyo, *Summaries of Technical Papers of Annual*

Meeting, A.I.J., D-2, pp.703-704, 2017.7

Miho Shirai, Eiko Kumakura and Masayuki Ichinose, Visual confort evaluations of amenity water facilities in urban areas by using VR, Summaries of Technical Papers of Annual Meeting, A.I.J., D-2, pp.709-710, 2017.7

Ineko Tanaka, Noriko Kodaka, Minako Murakami, Eiko Kumakura and Etsuko Mochizuki, Development of built environment leaning program for SUGINAMI Eco-school. Part 11, Comfortable thermal and luminous environment in a classroom for junior highschool students, Summaries of Technical Papers of Annual Meeting, A.I.J., D-2, pp.1169-1170, 2017.7

3. Others

Grant-in-Aid for Young Scientists (B), 2015.04.01–2018.03.31, Principal Investigator

Grant-in-Aid for Challenging Exploratory Research, 2016.4.1-2019.3.31, Co-Investigator