



FAKULTAS TEKNIK UNIVERSITAS TARUMANAGARA

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SURAT TUGAS

NOMOR: 1438-DK/FT-Untar/VI/2014

1.	Jenis penugasan	Urusan akademik
2.	Pejabat berwenang pemberi tugas	Dekan Fakultas Teknik
3.	Nama yang ditugaskan	1. Andi Surya Kurnia, S.T., M.Ars. 2. Olga Nauli Komala, S.T., M.Ars. <i>L</i>
4.	Posisi (kapasitas) sebagai	Dosen
5.	Jabatan Struktural/JJA	AA
6.	Kegiatan yang dihadiri	International Conference on Empathic Architecture (ICEA) 2014
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8.	Tempat Berangkat & Kegiatan a. Tempat berangkat b. Tempat kegiatan (lokasi tujuan)	-Rumah -Universitas Kristen Petra, Surabaya
9.	a. Tanggal berangkat b. Tanggal kembali bekerja	10-11 September 2014 (Rabu-Kamis)
10.	Posisi subyek dalam kegiatan	Pemakalah
11.	Alat transportasi yang digunakan	Pesawat
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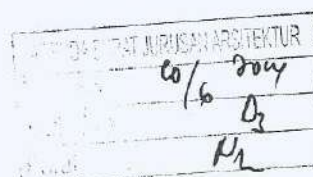
Dekan



Prof. Dr. Agustinus Purna Irawan, S.T., M.T. *dr*

Tembusan :

1. Pudek II
 2. Ketua Jurusan Arsitektur
 3. Kasubag. Keuangan/ Personalia
- /es





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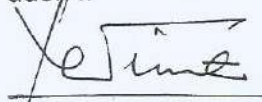
1. Andi Surya Kurnia, S.T., M.Ars. (AA)		
1. Uang Saku 2 x Rp. 250.000,-	Rp. 500.000,-	
PPh 5 %	Rp. 25.000,-	
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2. Transpor Rumah – Bandara (PP)		Rp. 250.000,-
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4. Penginapan (1 malam) 1 x Rp. 300.000,-		Rp. 300.000,- *)
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Jumlah		Rp. 2.175.000,-
2. Olga Nauli Komala, S.T., M.Ars. (AA)		
1. Uang Saku 2 x Rp. 250.000,-	Rp. 500.000,-	
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5. Transpor Jakarta – Surabaya (PP)		Rp. 1.000.000,- *)

Jumlah		Rp. 2.175.000,-

*) Dipertanggung Jawabkan

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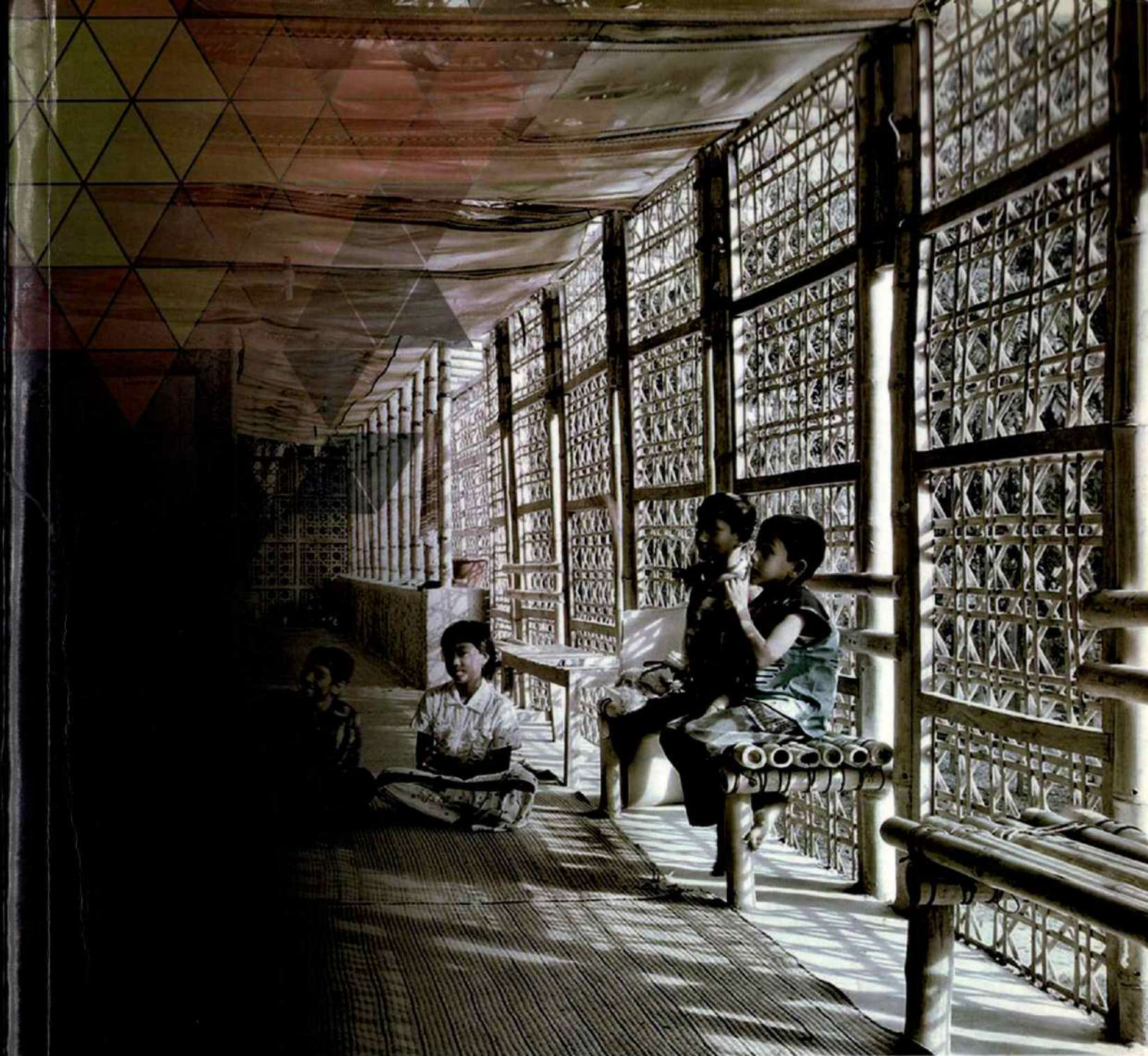

Ir. Tony Winata, M.Sc.

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PROCEEDING

INTERNATIONAL CONFERENCE ON EMPATHIC ARCHITECTURE (ICEA) 2014

Surabaya, 11th - 12th September 2014

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2014





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ARCHITECTURE 2014**

ICEA 2014

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Welcome to Indonesia!

Welcome to Surabaya and to Petra Christian University!

I warmly welcome all participants, especially those who firstly come to Indonesia and Surabaya. Please accept my sincere thankful for your participation in this international event.

This international conference is held as one of the agenda in celebrating the 47th Anniversary of Architecture Department of Petra Christian University.

Along with this delightful commemoration, I believe that this conference could light up intense interactions, inspirations and discussions among all participants that lead into some research collaborations. Further, the cooperation may not only sharpen the expertise but also create beneficial applications for community service. Thus, I do hope that all participants enjoy a fruitful academic atmosphere during the conference as well as a convenient stay in Surabaya and Indonesia.

Last but not the least, I thank you for all committee who have put their best effort in preparing and conducting this international event.

Sincerely yours,

Rolly Intan
Rector
Petra Christian University, Surabaya



Salam sejahtera bagi kita semua

Tidak hentinya ucapan rasa syukur pada Tuhan karena sampai detik ini kita masih diberi kelonggaran waktu untuk hidup dan berinteraksi sesama, saling bertukar pikiran, berbagi ilmu pengetahuan dan saling menjunjung tinggi keberagaman berpikir

Suatu lompatan cemerlang bagi pengagas International Conference of Emphatic Architecture (ICEA) yakni program studi Arsitektur Universitas Kristen Petra Surabaya, yang melihat bahwa berpikir arsitektur sudah tidak lagi hanya terbatas pada sisi Estetika saja namun lebih kepada per- MAKNA-an RASA dari Arsitek dan karya arsitektur yang ditimbulkannya

Dalam falsafah Jawa '*oyo rumongso iso ananging iso-o rumongso* (jangan merasa bisa tetapi berusaha bisa merasa / perasaan pihak lain) yang diperuntukkan kepada manusia, namun dengan empati falsafah Jawa ini sudah diarahkan pada karya arsitektur sebagai benda mati yang dipandang hidup

Demikian semoga konferensi ini bisa berjalan dengan baik, lancar dan memberi manfaat bagi dunia per-arsitektur-an maupun Arsiteknya.

Selamat berkonferensi

Hari Sunarko IAI

Ketua

Ikatan Arsitek Indonesia Daerah Jawa Timur



Distinguished Guests, Ladies and Gentlemen:

I want to take a moment to extend a very warm welcome to everyone to the Second International Conference of Emphatic Architecture (ICEA) 2014, that held by the Department of Architecture at Petra Christian University from September 11th to 12th, 2014. As you know, we had the first conference in 2012, and it is a pleasure to have all of you as a part of the conference this year.

Ladies and Gentlemen, the theme of the conference is 'Emphatic Architecture', and I am very pleased to be able to welcome all the speakers: Prof. George Kunihiro, FAIA from Kokushikan University, Japan, Assoc. Prof. Dr. Johannes Widodo from National University of Singapore, Prof. Dr. Ir. Soeprapto, M.Sc., from the Research Institute for Human Settlement, Bandung (Pusat Penelitian dan Pengembangan Permukiman), and Mr. Ng Seksan, a Landscape Architect from Malaysia.

We are very fortunate indeed in having their presence here to talk with us about this important subject. Hence, prepare yourself to be challenged, excited and inspired. For the ten best papers of ICEA 2014 will have an opportunity to be published in a special issue of Journal Architecture and Urbanism, 2015 edition.

I would like to extend my gratitude and thanks to the organizing committee of the conference that have made it possible, this ICEA 2014 event.

At last, I would like to say once more on behalf of the Faculty of Civil Engineering and Planning, welcome. It's a pleasure to see so many of you here.

Enjoy the rest of your time with us, and God bless you!

Best regards,

Timoticin Kwanda, Ph.D

Dean

Faculty of Civil Engineering and Planning

Petra Christian University, Surabaya



Distinguished participants and speakers,

It gives me a great pleasure to welcome all of you to the International Conference on Empathic Architecture (ICEA) 2014, held on September 11th to 12th. Thank you all for coming, welcome to Surabaya and to Petra Christian University, we are honoured to have all of you here.

My warm welcome and gratitude especially goes to our keynote and invited speakers; Prof. George Kunihiro, FAIA from Kokushikan University, Japan, Assoc. Prof. Dr. Johannes Widodo from National University of Singapore, Mr. Ng Sek San from Seksan Design, Malaysia, and Prof. Dr. Ir. Soeprapto, M.Sc. from the Research Institute for Human Settlement, Bandung.

This is the 2nd conference we held with the topic of Empathic Architecture. The first one is a national conference with the title "Towards Empathic Architecture", that we held on May 2012. Our department's mission is to educate students to be architecture graduates with integrity, able to develop built environment creatively, sensitive and empathic towards human needs, with environmental insight and a spirit of lifelong learning. Thus, at that time, in line with this mission, we have started the discussion regarding empathic architecture.

This year, celebrating the 47th anniversary of our department, a series of events to promote empathic architecture has been held from March to September 2014; Architecture Festival, Architecture Week, Petra Gathering, Architectural Scrapbooking Competition and this international conference as the peak and the closing of the celebration. We intend to host the ICEA regularly, to elevate the discussion about empathic architecture at international level. In ICEA 2014, three sub topics will be discussed; technology, culture, and architecture education, to explore the applications of empathic architecture in these areas. Ten best papers will have an opportunity to be published in special issue of Journal Architecture and Urbanism 2015 edition (indexed by Scopus), while others will be reviewed to be published in Dimensi, Journal of Architecture and Built Environment.

I would like to take this opportunity to express my sincere appreciation to the conference organisers, the 47th anniversary committees, and also to the sponsors of the event. Without all of them, I think this conference and all other events won't be possible.

Finally, I really hope that this conference will be beneficial to all of us. I wish all of you a fruitful day of conference and an excited field trip.

Soli deo Gloria! For the Glory of God alone.

Eunike Kristi Julistiono, S.T., M.Des.Sc.
Head
Department of Architecture
Petra Christian University, Surabaya



KEYNOTE SPEAKER



MEANING OF COMMUNITY DESIGN A PERSONAL EXPERIENCE THROUGH ARCHITECTURE

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ABSTRACT

Through personal experience, the author relates the role of community design and architecture practice. The element of empathic architecture is explored in the two case studies of community design.

INTRODUCTION

In the practice of architecture, architects must cover wide range of issues. It can be global in scale and magnitude, like the environmental issues, human settlement challenges or cultural understanding when working away from one's home ground. On the other end of the scale, architect designs spaces for the clients, creates details for buildings and guarantees the society that buildings will be built with efficiency and safety.

All through the process, architect is guided by a design concept, which he had brought onto the project, generated by the context in which the project is being executed.

The Charter of the UIA (International Union of Architects), it states the following:

2.1 Standard: "Architects shall respect and help conserve the systems of values and the natural and cultural heritage of the community in which they are creating architecture. They shall strive to improve the environment and the quality of the life and habitat within it in a sustainable manner, being fully mindful of the effect of their work on the widest interests of all those who may reasonably be expected to use or enjoy the product of their work."

Educational institutions teaching architecture are all aware that students must be trained to become competent in their professional training as well as become aware of their professional ethics.

Today, I would like to relate my personal experience as a student and a young architect being trained in the profession and how the early career had shaped my view of the practice of architecture. I will illustrate the case in point with two cases in my career: first as a student, and the second, with the most recent project.

THE ASIAN NEIGHBORHOOD DESIGN

I have been in practice of architecture for almost forty years. I began my education in the United

States in 1970 at the height of student protest of the Vietnam War. Being a minority in the U.S. as an Asian American, I grew up being conscious of a variety of cultures, religions and nationalities. America was a melting pot of global culture, race and religion.

Graduating from high school during the student movement, my initiation into the university life was with a national student strike protesting the Cambodian bombing by the U.S. Air Force.

As the student movement subsided, architecture students went back to their studio to learning about the creative process of architectural design. Personally, the extracurricular activity with the Asian architecture student association took me out to local Asian communities. During my senior year, a group of our Asian student group founded a non-profit entity called Asian Neighborhood Design.

Goal of AND was to provide services to the Asian communities in the area of architecture and community design. Projects like assisting the local entrepreneur prepare storefront design presentations for their relocation, renovation of shops apartment units to be proposed to the local authority, presenting alternative community planning ideas to the redevelopment agency and an act of architectural activism to try to prevent demolition of buildings which housed elderly living in the community.

My involvement in AND was short, about one and a half years, before graduating and heading east to Boston to study design at the graduate level.

Since the seed was planted 40 years ago, AND has gone through an impressive evolution. Although I have not been involved in the organization during the process of the incredible growth, I would like to briefly illustrate their achievement as a case study for "Empathic Architecture".

AND is a volunteer community design center assisting minority communities with their professional skills to provide services, both to the individuals and organizations otherwise not able to afford services of architectural professionals. They will also take on architecture and planning services, which they see as for public needs.

**HISTORY OF AND**

Since its establishment in 1973, more than forty years ago, AND has evolved from a student volunteer group to a "nationally recognized public architecture service agency providing design and planning services to the community." Although AND began as an organization serving mainly Asian communities in San Francisco Bay Area, it now provides services to minority communities in the region.

In the 1970's AND assisted in planning and construction of the San Francisco Chinatown and Japantown, two of the major Asian communities in the city. One project of focus was the proposal for the alternative development for the low-income residential building, the International Hotel, which housed many of the long-time residents of Chinatown. Since most of the Chinese speaking residents of the community lacked knowledge in the real estate transaction, AND published a bilingual handbook for the homebuyers in Chinese and English. Playing the advocacy role to assist in the residents' discussion with the San Francisco Redevelopment Agency, AND became known for its role as an activist agency for human settlement.

In the initial stage of the organization's development, the AND chose to actively represent the community's interest to the authority by assisting the residents and leading the effort to protect the rights of the citizens of San Francisco's Asian communities.

By 1980's AND was fully established as a public agency in the San Francisco Bay Area communities. With additional financial resources, AND completed a Design Demonstration Project in the Chinatown and published a report within the community. The project aimed to inspire local residents about the possibility of residential improvement with proper design process. 1980's was a period of expansion for AND.

To expand its influence in community design, AND formed "AND Enterprise", first community-oriented "not-for-profit" economic development venture, which evolved into "for-profit" venture in the following phase. Furthermore, AND founded the second economic venture, "Specialty Mill Products", a custom furniture business which trained and employed local residents and sold its goods beyond the San Francisco communities.

As a public architecture service agency, AND involved itself in the health and safety of the community. AND organized a Public Safety Workshop after a devastating San Francisco Earthquake of 1989 and conducted a thorough

seismic inspection of the low-income housing stock of the Chinatown.

It was in the 1980's and the 90's that the AND began to be recognized nationally for its many achievements. The United States Housing and Urban Development honored the achievements of the AND. President Bill Clinton, then in office, sought the input of the AND training business model. In the architectural profession also began recognizing the empathic nature of the AND's operation. The California Council of the American Institute of Architects gave the organization honor as well as the Architecture Record Magazine.

In the 2000's, having firmly established itself in the San Francisco's Asian communities, AND began to reach out to serve other minority communities in the San Francisco Bay Area. AND operates the "Employee Training Program (ETP)" which train trainees in the variety of construction-related skills. The program is funded by the California State Employees Training Funds. The ETP has trained over 2,500 graduates of the program over the course of its history.

COMMUNITY DESIGN

With all the programs AND operates from urban development to the employee training program, the main service it provides to the community is the architectural service. The architects of AND has designed their own development projects, assisted in renovation, street façade design, commercial space improvement of a number of clients in the minority community of San Francisco. AND architect pursue quality design, but the expression of the design as object is not their primary objective. It is the well being of the residents, safety and comfort of the community, and the success of the community-based business ventures.

PRESENT

During my forty years of practice, I have accumulated a list of built projects. However, the number is not high. I attribute this to several factors. First, my involvement in the community design and activism re-directed my sense of determination to become a heroic architect as many of the young aspiring architectural students and interns aspired to become. There is an internal struggle of whether to express one's emotions and beliefs using architecture as medium. On one end, I am willing to create a piece of architectural work which transcends practical reality, to propose an alternative spatial and sculptural solutions headed for public recognition and enjoyment of its delight. On the other hand, I recognize people and their



many individual beliefs and backgrounds. I can envision the general public not understanding or relate to the built work of architecture, if not sympathetic to my philosophy. The challenge is to incorporate the strength of architectural expression and empathic attitude towards people, environment and natural world.

INTERNATIONAL BAMBOO ARCHITECTURE BIENNALE

I have focused on the architectural practice in Asia region since my return to Japan. I have been involved in the modern heritage revitalization, rural community development and sustainable landscape architecture projects, along with mainstream architectural design commissions.

In the summer of 2012, I was invited by a group of architects and artists to visit a third tier county level city in the Zhejiang Province. Longquan, a population of 275,000, is situated in southern part of the province. It is under the jurisdiction of city of Lishui. Longquan is well known for its celadon ceramic industry, dating back to 4th Century A.D., and the traditional sword manufacturing popular among the martial art players.

In Zhejiang Province, bamboo industry is also a major industry. Longquan has a vast area of bamboo forest and factories for bamboo construction materials are in place producing various building materials used for construction and for furniture industry.

Our team was commissioned by Longquan People's Government to organize an event, which promote bamboo industry. Our proposal featured international exhibition of bamboo architecture aimed to introduce local industry to the world. These bamboo buildings will be designed by an international group of architects, and to be constructed as permanent working buildings in a village setting. Local authority designated the village of Baodi, with the population of 7,000, situated about 50 kilometers west of Longquan City Center, as the site of the bamboo architecture event. The event was named the "Longquan International Bamboo Architecture Biennale" to be held bi-annually. Initial plan proposed was to construct ten bamboo structures of various functions, ranging from museum, hotel and hostel, research facility, welcome center, local ceramic factory, artist's studio and mushroom cultivation shed.

Mayor of Longquan assigned me to the office of Commissioner of the Biennale and the architect for the ceramic factory.

Concept of the project is to create an environment in the village center of Baodi, which will become a

commercial/tourist facility generating income to the local community, both during and after the exhibition event. The village authority will plan a number of touristic programs such as agri-tourism, cultural workshops and museum experiences, or just a restful resort environment. There will also be a bamboo research/experimental facility to develop knowledge and resources for the local bamboo industry. In the future, there can be more of such facilities for other local industries. The goal of such plan is to establish the vocational training program, education and employment opportunities in the local areas to encourage youth to remain in villages and in the local area, instead of migrating to larger coastal cities. Sustainability of the rural community is a critical issue, which this project attempts to address.

THE ARCHITECTS

Main responsibility of the Commissioner is to select the candidates, retain their services for the ten buildings, and to coordinate communication between the architects and the project site.

To make the event globally significant, and to feature bamboo as the building material, we compiled a list of internationally active architects most of whom are experts in bamboo. Upon presentation of our recommendation, Longquan government approved the list in the fall of 2012.

From China, Li Xiaodong, professor of architecture at Tsinghua University and the 2012 Aga Khan Award recipient, Yang Xu, a philosophical architect from Shanghai, from Japan, Kengo Kuma, professor at the University of Tokyo and an internationally renowned architect and Keisuke Maeda, a young ARCASIA Award winning architect were selected. From European Union, another Aga Khan Award recipient, Ann Heringer from Germany who built a school building using bamboo and rammed earth structure, and Mauricio Cardenas Laverde, a Colombian-born architect from Italy who is working to legalize bamboo as a structural building material in the European Union were invited to participate. Simon Velez, also a Colombian architect and internationally respected architect of bamboo architecture, agreed to join our team of architects in Longquan. While Velez is an established master of bamboo architecture, a young Vietnamese architect, Vo Trong Nghia, whose meteoric rise in the international architectural scene, with a series of dramatic bamboo structures, will bring an added excitement to the mastery of bamboo structure. We have also extended an invitation to Madhura Primatilleke, a popular Sri Lankan architect whose sensitive architecture had won many awards including the ARCASIA Award. From South Korea, we



have invited a husband and wife team of Wise Architecture, Young-chul Jang and Suk-hee Chun of Wise Architecture, a young partnership educated in the U.S. As a member of the architect team, I have been given a task of renovating or replacing an existing ceramic factory owned by a local municipality. Twelve architects, all are well known in their country or already an established international architect from various backgrounds, will create an environment with a series of permanent and functioning bamboo buildings, which will be unique to any place around the world. The structures will be more than objects; they will serve the community in many levels. It will generate income to the local community, become a training ground to youth in the villages, produce jobs for the citizens of Longquan and put the municipality of Longquan on the global map as the place to visit during the Longquan International Bamboo Architecture Biennale.

THE CHALLENGE

With a definite goal of creating a community-oriented facility, which can also become a quality works of contemporary architecture, the architects produced innovative and unique designs, which have delighted the local community. Excitement was in the air. Construction commenced in the spring of 2013. Soon the project has gone into a financial difficulty. The discrepancy between the design intricacy and the constraints of local construction process had put the cost of the project beyond the original budget. Several meetings and presentations were made to the local authority to seek their understanding of the importance of maintaining the original intention of the architectural designs. After many hours of meetings, the Mayor of Longquan had approved a revised project budget. The project has become a community design project. It is in a slow process but is going forward in a right direction. A year of delay has not caused any drainage in the community spirit. Longquan International Bamboo Architecture Biennale will open in the spring of 2015, three years from the inception.

CONCLUSION

Empathic architecture respects and addresses the needs of the users beyond being a physical object of expression. Architectural students are taught this important characteristic of our profession. However, during the course of their career, the righteous objective of "doing more than what is asked" is often overshadowed by the profitability of the practice and the requirement to satisfy the client's needs.

ACKNOWLEDGMENT

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COLOR IN ARCHITECTURE WHICH FRIENDLY FOR CHILDREN WITH AUTISM

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ABSTRACT

Autism Spectrum Disorders (ASD) is a disorder of the human nervous system which results in difficulty in communicating and expressing feelings or desire to interfere with the social relations. They often can't accept the built environment that designed with comfort considerations for normal people. Specific space for autism's convenience should be considered by architect. Finding the acceptable colors for children with autism, as one of the elements of their space, is the aim of this research. The characteristics of colors and how children with autism react to color are used as the basic theories of this research. Collaboration with psychology field is required to know the characteristics of children with autism besides doing some observations to children with autism and interviews to teachers and parents of them. Furthermore, some prior experiments are explored to know how specific character of children with autism react differently to certain colors. It can be concluded that specific characteristics of children with autism and their specific activities require specific colors charts, so that we can not apply same colors standard for all children with autism. Further experiments are needed to know precisely specific colors charts for specific characters and activities of children with autism.

INTRODUCTION

In our daily life today, we can meet our friends or relatives were categorized as having a disorder. One of the abnormalities that indicate increasing number of persons are children with autism, with the character of children like behave and act different with other normal children. Becoming more parties who empathize with the condition of children with autism, include the architect whose capacity as a space designer for them.

This paper seeks to explore various issues related to autism children and the existence of the physical aspects of the built environment affects them. Due to the physical aspect has a wide scope, this paper seeks to limit the discussion only about one architectural element that is the color. Other architectural elements can also be expected to further review through further research, after this color research done.

Color in architecture not only as part of the aesthetic elements in the architecture, but the colors are also a means of communication between humans and the environment, and affect the interactions that occur within it (Meerwein, Rodeck and Mahnke, 2007: 3). The process of "seeing color" is a sensory experience that is dependent on the presence of light, the eye's ability to remember and convey color stimuli, as well as the ability to receive and process color stimuli received as a sensation received by the visual senses. The existence of color is considered to have influence for children with autism, so the study in this paper seeks to explore the relationship between the color and children with autism.

RESEARCH METHOD

Research begins with a study of various related literature about children with autism. Literature study includes an understanding of the existence of a child with autism and an understanding of color as one of the elements forming the space, which will be one factor considered for architects. The literature study results are summarized to clarify the relationship of children with autism and color elements, wherein the initial hypothesis of the research is the existence of a dominant color that has a positive effect for children with autism. Results of literature study followed up by an interview to the party that had already enough capability to handle a child with autism, such as a child psychologist, tutor children with autism in one children educational institution with special needs, parents of children with autism. In this research method scenario also features interviews with directly trial to children with autism using a few color props in order to get the correlation between color and response of children with autism. Encountered obstacles to run this scenario, because it is based on interviews suggested that children with autism are not tested by persons who are not known in advance. In addition, children with autism tend not to have stability in give responses, so feared that directly trials will not get optimal results. Thus the research methods that seek correlations through trials replaced with observations on the work of children with autism who often use color as a medium of creativity. Researchers sought to keep doing directly trials to children with autism to strengthen observations regarding the color but the



implementation of this method should be in a long term and need a lot of help from people close to the child with autism, as a further step of this research.

LITERATURE REVIEWS

AUTISM

The term autism was introduced by Dr. Eugen Bleuler in 1911, but much earlier, in 1724, has recorded a case that became known as autism, that is, when a boy, Peter Wild, running without clothes. Peter never learned to speak, and not sensitive to smells. It took almost 200 years to give a name to the condition of developmental disorders in children, even today there are still many differences of interpretation and definition of autism, both about the causes, symptoms, and characteristics.

Autism is "one of a spectrum of five related neurological and development disorders called Pervasive Developmental Disorders, PDD, or Autism Spectrum Disorders, ASD" which consists of autism, Pervasive Development Disorders – Not Otherwise Specified (PDD-NOS), Asperger's Syndrome, Rett Syndrome and Childhood Disintegrative Disorder CDD" (Quinn, 2006). American Psychological Association (APA) has identified that the condition of autism can be identified within the first three years of life. Hence, knowing the condition early will help the children do the therapies which are suitable for their specific condition, so that the destructive things can be reduced.

The prevalent cases of ASD have significantly increased, from 1: 5000 in 1987, to 1: 500 in 1997, and become 1: 150 in 2000 (<http://www.artforautism.or.id/>, accessed on October 16th, 2013). The numbers have continuously increased from 1: 100 in 2008 to 1: 88 in 2012 (<http://health.detik.com/read/2012/04/02/100034/1882522/763/jumlah-anak-autisme-di-2012-makin-banyak>, accessed on October 16th, 2013) and then become 1:50 in 2013 (National Geographic Indonesia, 2013). Autistic cases have occurred everywhere to every ethnic groups, religion, social and economic backgrounds.

THE CHARACTERISTICS OF CHILDREN WITH AUTISM

Although there are some different conditions of autism, American Psychiatric Association identifies that there are three general patterns which characterize autism, such as: impairment in social interaction, impairment in communication skill and the presence of restricted, repetitive and stereotyped patterns of behaviors, interests and activities.

Table 1. The General Characteristic Patterns of People with Autism

Source: American Psychiatric Association in Hollander and Anagnostou, 2007

QUALITATIVE IMPAIRMENT IN SOCIAL INTERACTION	
"marked impairment in the use of multiple non verbal behaviors such as eye – to – eye gaze, facial expression, body postures and gestures to regulate social interaction; failure to develop peer relationship appropriate to development level: a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (for example: by a lack showing, bringing or pointing out objects of interests; lack of social or emotional reciprocity)"	
QUALITATIVE IMPAIRMENT IN COMMUNICATION SKILL	
"delay in or total lack of the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime); marked impairment in the ability to initiate or sustain a conversation with others (in individual with adequate speech); stereotyped and repetitive use of language or idiosyncratic language; lack of varied, spontaneous make – believe play or social imitative play appropriate to developmental level"	
RESTRICTED REPETITIVE AND STEREOTYPED PATTERNS OF BEHAVIOR, INTERESTS, AND ACTIVITIES	
"encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus; apparently inflexible adherence to specific, non functional routines or rituals; stereotyped and repetitive motor mannerism (such as hand or finger flapping or twisting, or complex whole body movements); persistent preoccupation with parts of objects"	

Although the level of impairments of each person may be different, the patterns of these impairments are usually found in children with autism. Hence, the elements of their space must avoid the destructive things that can be occurred because of these impairments.

Sensory Problems of Children with Autism

Generally, children with autism have problems with their senses which involve auditory problems, visual problems, tactile sensory problems, vestibular systemic problems, and proprioceptive systemic problems (Reza Mohammadi, 2011). Children with autism have different respond to other stimuli. Therefore, we cannot predict what they perceive and feel about the stimuli. They "experience fluctuations in their sensory processing", so that the "different sensory perceptions can cause pain, distress, anxiety, fear or confusion" (The Autism and Practice Group, 2007).

There are some issues related to sensory issues of autistic people, as shown in Table 2.

Table 2. Sensory Issues of Children with Autism
Source : The Autism and Practice Group (Learning Disability Services), 2007

SENSORY ISSUES OF AUTISTIC CHILDREN	
Sensory Sensitivities	Sensory sensitivities can be hypersensitivity and hyposensitive. Hypersensitive means the channel is too open and too much information gets in for their brain to handle. Hyposensitivity means the channel is not open enough and not enough information gets in.
Sensory Overload	Sensory overload happens when there is too much information coming in at once and this is overwhelming
Gestalt Perception	Gestalt perception is the inability to filter foreground and background information, so that everything is perceived as a "whole" rather than a combination of different items"
Fragmented Perception	Fragmented perception is the inability to break down the whole picture into meaningful units
Delayed Processing	Delayed processing happens when autistic children take a long time to process information that is coming in. Sensory overload can cause delayed processing.
Distorted Perception	Distorted perception is a condition when the senses of autistic children get distorted. It means the senses may change or misrepresent what they see, hear, touch or smell. This condition can become worse when the received information is overload
Sensory Shutdowns	Sensory shutdowns happen when autistic children cannot deal with all the information coming in, so that they shut down one or more their sensory systems to block out the stimuli.
Compensation	Compensation is a condition when autistic children use reliable senses to build a better understanding of their environment. For example, they will use their touch if their senses of hearing and vision were disturbed.

Because of the broad range of autistic children's sensory problems, the focus of this paper is visual problems, in relation to colors as one of the elements which form their space. In this case, colors for children with autism may relate to some sensory issues, such as sensory sensitivities, sensory overload, delayed processing and sensory shutdowns. Bogdashina in Simmons explores some visual sensory symptoms in people with autism, which can be hypersensitive and hyposensitive (Simmons, R.et.al., 2009). Children can be either hypersensitive or hyposensitive, but some children are a combination of both (Exkorn, 2005).

According to Exkorn, hypersensitive children are "overly sensitive to stimuli" so that they may "engage in stimming because they want to reduce their current level of stimulation, whether they perceive their environments as too loud, bright or

crowded" (Exkorn, 2005). In hyposensitive cases, Exkorn describes that "children do not seem to be disturbed by an overload of environmental stimuli and seem to seek out additional stimulation" or "under responsive to stimuli" (Exkorn, 2005). If children cannot cope with the hypersensitive or hyposensitive over the stimuli, the destructive behaviors may occur.

DISCUSSION AND RESULT ANALYSIS

CHILDREN WITH AUTISM & COLORS

Children with autism may have different reactions to colors, either hypersensitive or hyposensitive. Their visual sensory problems make their color perceptions different from other typical children. Hypersensitive reactions of visual sensory symptoms in relation to color stimuli may consists of dislike of the dark and bright lights and covering/closing eyes at bright lights (Simmons, R.et.al., 2009). Children with autism may also severe hyposensitive reaction by fascinating with reflections and/or brightly colored objects (Simmons, R.et.al., 2009). Therefore the usual concept of colors cannot be generally applied to their space.

The Basic Theory of Colors

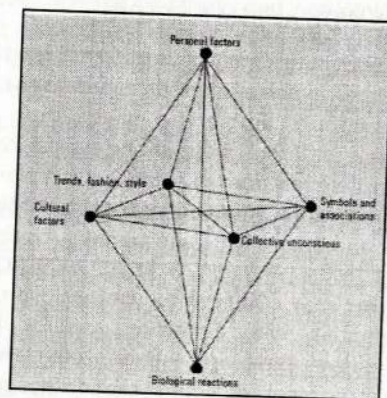
According to Meerwein, Rodeck and Mahnkee, color is "a specific visual sensation produced by visible radiation or color stimulus" which manifestations are created when electromagnetic radiation at wavelengths in the visible spectrum, interact with physical matters". Perception of color relates to the senses of human sight and becomes "an important medium of visual communication in the human environment" which serves as "information, communication and design material" and much more than an aesthetic element" (Meerwein, Rodeck and Mahnkee, 2007). They explore six interdependent factors that effect our color experience, such as biological reactions to color stimulus; the collective unconscious; conscious symbolism and association; cultural influence and mannerism; trend, fashion, style; personal factors (which consists of basic personal disposition, personality structure and temperament; physical and psychological constitution; age and gender; sensitivity to color), which called as spatial color experience scheme as shown in Diagram 1 (Meerwein, Rodeck and Mahnkee, 2007).

Furthermore, Meerwein, Rodeck and Mahnkee explore some factors that influence human reaction to color space, such as hue and nuance; amount and location of the color in space; paint color and spatial function; and the effect of color over time in the space. They also describe some aspects of interior



architectural colour designs, which relates to some interrelated aspects of key importance, such as: relationship of people to colour (physiological requirements, psychological requirements); relationship of colour to building and spatial function; relationship of colour to space and its elements; orientation; environmentally friendly materials and paints, and aesthetic qualities (Meerwein, Rodeck and Mahnke, 2007).

Diagram 1. Spatial Color Experience Scheme
Source: Meerwein, Rodeck and Mahnke, 2007



Children with Autism & the Space in Architecture

Designing space for children with autism should have different approaches, because they have different characters from other typical children. In this case, their perception of space is distorted because of their sensory problems. Besides knowing the sensory problems, architect has to know behavioral patterns of children with autism, so that their environment can fit with their characteristics and reduce their destructive behavior.

Space for children with autism is specific, so that designing a public space for them with specific needs cannot use the usual methods and standard. According to Mostafa, designing a public environment for children, such as a school, whose problems are specific for each person is impossible, except by grouping the students with similar needs (Mostafa, 2007). Mostafa also emphasizes that autistic behavior can be influenced by altering the sensory environment, stimulatory input, resulting from the physical architectural surroundings (such as color, texture, ventilation, sense of closure, orientation, acoustics), before the sensory malfunction occurs. Because of the specific sensory needs, he suggests the identification of architectural environment for children with autism should be based on the sensory zoning rather than conventional and functional zoning, then the problems of distraction and diversion can be reduced (Mostafa, 2007). He suggests the spatial

groupings which is based on sensory zoning, so that the space can be grouped as high – stimulus area (such as space for music, art, crafts, and psychomotor therapy), sensory transition zone and low – stimulus functions area (Mostafa, 2007).

Children with Autism & the Color as Element of Architecture

Color vision of autistic children is related to visual processing issues, besides optometric issues, spatial vision, depth perception and stereopsis, motion perception, optic flow, biological motion, animacy, and visuomotor control (Simmons, R, et.al., 2009). Children with autistic disorder have different reaction to colors because their "rods and cones (components of the eye) have changed due to a chemical imbalance or neural deficiencies". Hence what colors they actually see are different from what they perceive. About "85% of them saw colors with greater intensity than neurotypical children, 5% saw muted colors and 10% saw the color as neurotypical children do" (Parron – Wildes, 2005).

Based on spatial color experience scheme by Meerwein, Rodeck and Mahnke, the interdependent factors of biological reactions to color stimulus and personal factors of children with autism, which can affect their color experiences, cannot be generalized like other typical children. Furthermore, the relationship of people to colour (physiological requirements, psychological requirements) becomes an important point in choosing interior architectural color designs for children with autism.

Autism children have shown strong affinities to or aversions from particular colors (Simmons, R, et.al, 2009). Simplifying the environment for autistic children can be done by using "less stimulating colors to minimize distractions" and by "limiting the use of primary colors to toys or products that can be removed from the space" (Parron-Wildes, 2005).

Mostafa makes a sensory design matrix and suggests same design guidelines for children with autism. In his sensory design matrix, he analyzes each architectural attributes (such as proportion, scale, symmetry, color, lighting and texture) in relation to the capacity of children with autism to respond the various autistic sensory needs (Mostafa, 2007). In relation to colors, he suggests to use bright colors, neutral colors and warm colors. The types of color are determined by how each person with children with autism react to color stimuli. According to Mostafa, using bright colors can create visual stimulation for the hypo-visual people. Then, using neutral colors may create serenity for the hyper-visual one and using warm colors tends to create

psychological warmth for the hypo-tactile person (Mostafa, 2007).

Hence, the right colors for children with autism may not be the same, based on the hypersensitive and hyposensitive conditions. Choosing the right colors for them is also determined by the pattern of activities and the given stimuli in their space.

CHILDREN WITH AUTISM & COLOR RESEARSCHEs

There are several obstacles in the study of children with autism, among these we as researchers can not directly interaction with them because of the special characters that tend to reject new stranger they met. Therefore it needs quite a long time if we want to interact directly with children with autism, but we can obtain information from parents or mentors that always be with them while on therapy center. In this study we could get 3 parents who are willing to share information and one of the treatment centers are willing to share mentor's experiences and where we can visit their treatment's place as part of our observation.

Research conducted through interviews with parent whose children with autism and therapy's caregivers of children with autism, also with observation of the works produced by children with autism. To maintain the privacy of children with autism and their families then we can not mention specific names in this study, but we can still deliver the work of related topics we studied.

Information obtained from three parents whose children with autism, all of them expressed their love to bright colors, such as red and bright blue. Similarly, information obtained from a caregiver of childcare institution for disabled children (variety of disabilities, including autism as many as 6 people), the preferred colors are bright colors. This is evident from the choice of color crayons when children with autism coloring their task paper as therapy's program.

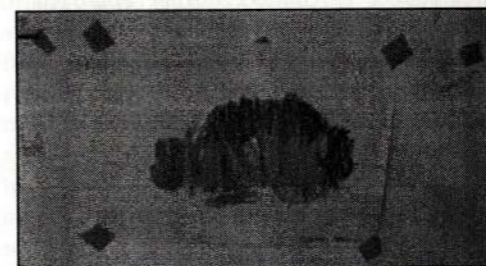


Figure 1. One of children with autism's coloring work



Figure 2. Another children with autism's coloring work

Source: Researcher's Documentation, 2013

Based on interviews and observations to one of the treatment centers involving children with autism (Special Need Therapy Services) acquired a few things for researchers note. Figures 1 and 2 show the results obtained from children with autism when given the task of coloring. Figure 1 is the result of one of the children with autism around the age of 7 years, while Figure 2 is produced by children with autism around the age of 9 years. Though the delay in the recognition and understanding of color, but children with autism may show interest in certain colors through the work they produce. Both images shows the interest of children with autism to use bright colors of many colors provided by the mentor.



Figure 3. A child with autism using colorful yarn in knitting skills

Figure 3 explain that children with autism also have skills that are not inferior to normal children, such as knitting skills that require fairly high accuracy. Based on the information submitted by the parents of the autistic child, the child initially uses colorful yarn when knitting in accordance with the wishes which may be different from the perception of most other normal child. But with the passage of time, the skills of children with autism can be quickly developed and perception of color gradually lead to the



perception of color in general, such as when he saw the color of the original object.

Several studies linking children with autism's ability to respond the color, as inferred by Coulter (Optometry and Vision Development, 2009: 168), revealed the presence of:

1. Differences in memory of color
2. Differences in the ability to distinguish colors
3. Differences in the ability to detect the color of the background that colored achromatic
4. Refusal to play with a toy that has a specific color
5. Simply eating foods that white enameled

Children with autism also had a different response to the color of light given to him. Of the few studies that concluded by Coulter, revealed that 50% of children with autism's experience severe sensitivity to fluorescent light. In such lighting conditions, children with autism will exhibit repetitive behaviors (Optometry and Vision Development, 2009: 168).

Although indirectly, there are few descriptions in the literature that describe accidentally color preferred by people with autism, such as the following excerpt from Hagland (2009). In this excerpt also looks innocent autistic nature, are less able to capture the "innuendo" in a sentence that was brought to them. Hagland tells this quote in the book that discusses autistic adult, of course remains to be seen whether children with autism also like the same colors.

Mary enjoyed going bowling but was not very skilled. Her odd behaviour and *colourful* clothes made her stand out at the bowling alley. Some of the regulars would shout 'Here comes the champion!' when she arrived at the bowling lane. Mary thought they were praising her skill and was pleased to have made some new friends (Hagland, 2009)

Hagland also tells although it has a strong tendency people with autism like the same color, it is still possible to offer other colors that are similar. For example, if they like the black color, maybe they would accept a dark blue color similar to black. Thus, it is still possible to "change" the tendency of this rigid so that they can also accept other colors. This may be necessary given the man-made environment that is dominated by normal, they would find a variety of colors.

That needs further investigation whether the children with autism has an interest in the same color, or different, and can not be generalized. If so, then it can not be determined a uniform color for all children with autism.

CONCLUSION

In essence we all know that the aesthetic value have a positive impact for staff, patients and their families, but there is no research that supports that particular color or pattern has a direct positive influence. The right combination of patterns, colors, lighting, textures, and positive distraction, can improve the experience of meaning. Aesthetic aspect is very subjective. The choice of colors and patterns are influenced by a very biased basis of cultural background, geography, gender, age, and educational differences. There is no universal aesthetic value. Everyone has a choice and individual taste (McCullough, 20).

This is reinforced by the research that we are doing, is associated with the excavation of the effect of color for children with autism. By learning about color theory and an understanding of the existence of children with autism as well as equipped with observation and interview results, we can conclude that the influence of color for children with autism can not be generalized.

However, based on the existing sample we summarize the existence of similar interest for children with autism to bright colors. This is most likely due to the perception of bright colors are perceived by children with autism through the senses of sight and transmitted to the brain through the nervous system as a whole which is quite convenient for them.

Autistic children's perception about color can also change over time, there is a tendency similar colors or matching colors can also be accepted by them comfortably. In fact it is possible that the color perception of children with autism will be same with the color perception for normal children, because the ability to perceive performed by autistic children repeatedly.

With the interim results of this study, it is important for an architect to conduct further approach to children with autism in an effort to realize a space that is comfortable for them. For example in terms of determining the color for room they usually occupy, because the effects and consequences that occur are personal. We feel the need for more research conducted to supplement the findings of this study, so that empathy for children with autism can be more widely and give a deeper meaning for autistic children themselves as well as for the overall relationship in this life.

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Figure 4. Mr. Franky and Mrs. Denrich when making observations in SNETS, 2013

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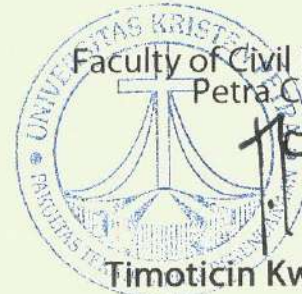
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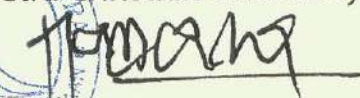
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