Construction Process in Vietnam

Reflection of ICM 2000

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Introduction

Aim of the paper

The course of International Construction Management 2000 is held by the Swedish International Development Co-operation Agency in order to provide effective and efficient development assistance for developing world. It considered many factors involved in design, planning, production, management and property management of the project, and give the participants a chance to share their experience from around the world.

Coming from a developing country –Vietnam, I found very much interesting to attend the course because of its programme have concentrated on managing of Construction work form beginning stage to last stage.

Compared to my own knowledge, the course brings many effective attitudes of management, which could be useful for my own job and the construction industry in my country. Based on what we have done before and what I obtained from this course, I would like to write this paper to make a good picture for one project in Vietnam, and on the other side try to describe some features from Construction Process in Vietnam.

Facts about author and the project

I am working in Hanoi University of Civil Engineering in falcuty of Civil and Industrial Engineering. Founded 1966, Hanoi University of Civil Engineering has grown into the largest university in Vietnam, which offers education and training in the major areas of Civil Engineering

Working in position of a Lecturer in Civil and Industrial Engineering falcuty, in charge of Construction Technology and Management subject, I spent almost the time to study and work in the subject, and my lectures have much concern to Methods of Construction and Construction Management. That is the reason why I need to get familiar with site construction work and have some experience in construction production in almost 10 years. I have spent some part-time working in a Construction company, which could provide me a lot of realistic knowledge's, and the sites of this company become a good place, where my students can polish the skills they have learned before heading off into the work world. I have worked in many project including Hotels, office building, Factories etc., in charge of tendering process, assisting the contractor with construction methods, planning and preparation of claim.

The project I have brought to work in this course is a construction building with 45 apartments and service area, sport activities and entertainment centre, parking area. The building has location at 1057 XoViet nghe Tinh Str.- Binh Thanh District – Ho Chi Minh City – Vietnam. The building is constructed in a land of 2500m2 with gross area of 1800m2, 12 storeys.

The Owner of Project is Joint Venture Thanh Da Riviera, which was set up between Gia Dinh Tourist Company (Vietnamese party) and Vietnam Trend Property Investment Co. Inc. (foreign party), which is a combination between Swiss Investors and French Investors.

Vietnam Conditions

Vietnam occupies the land that makes up the southeast region of Asia with tropical climate of two seasons: dry and wet. That is a very important point could be considered in the planning of the Engineers, specially when he prepare time schedule for underground work.

In history of the country, there was very long period in nineteenth century the French invaded Vietnam. It created a social reason of the strong influence of French style in many way of life, especially in architect design.

In technical training, Vietnam has produced high number of skilled workers, especially in the North central region, but not in the South region. The difference originned from 30 years invaded by American of the South with the tendency to commercial business more than technical business. In the same time, the North concentrated in technical business more than trading.

The renovation policy, which began in 1986, has produced significant economic result. The economy is beginning to process feature typical of other high performing East-Asian economies. Output, employment, exports and imports have all been growing strongly especially since 1990, while inflation has fallen to manageable levels.

Construction Industry in Vietnam has developed very much in 25 years recently. In the beginning of 1970's the projects have much effect from Russia style in design and also in technology of construction. There are more prefabricated projects available in parallel with traditional brick built projects

In the last 1970's and the early 1980's, the view gradually change from prefabricated building into in-situ casting concrete building. It caused by all inconvenience, which discovered during the 10 year using this kind of house and the needs of developing technology in Construction Industry.

In 1987, the Government issued the Law on Foreign Investment, opening the door to a rapid influx of foreign capital. Between 1990 and 1995 Foreign capital registered in Vietnam annually grew from around 600 million \$US to 3 billion \$US. This implies cumulative registered investment capital grew almost ten-fold 800million \$US to 8billion \$US. This policy creates the exploration of construction projects in many kind of business such as hotels, office buildings, industrial factories etc.

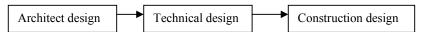
Design Stage

Designing Process in Vietnam

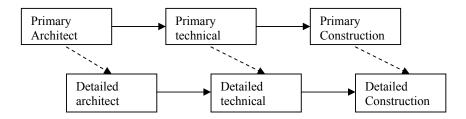
Rapid economic development, industrialisation and changing social economy structure in Vietnam has necessitated large scale building activity, thereby imposing great responsibility on Architects and designers to provide functional building with liveable environment within the economic constraint of the country. The architectural design activity embrace a wide field of interest and calls for the attention of many professionals. With a view to achieve an efficient design development with respect to location, design and erection of buildings, it is necessary to consider various parameters so that the design solutions respond to changes in technology and design as well as changing social aspirations and requirement.

The designing process in Vietnam involves detailed consideration of function of the building, knowledge about the community, the people, the social structure, living habit, work methods, like, dislike and preference. Depend on the volume of project, designing process can be in one step or two steps:

One step designing usually apply for small volume project, in that case the designers will make all Architect drawings, Technical drawings, Budget plan and Time schedule in the one time with all consideration to fulfil whole documentation for tendering process as well as production process. The designer plans to submit to the Client all necessary documentation, in which they can get approval for next step of design during the period of their work. This process performed in the following schedule:



Two steps designing usually apply for bigger volume project, one or many designer can execute this process, and the whole designing work will be carried out in two steps. In first step the designers issue only primary design in which the ideal of project volume and budget can be specified. In second step, designers have to develop the primary design, which was approved in first step, into detailed design for project and it performed in the following schedule:



The most important point of the Saigon Domaine project is all the Architect Design have been in charge by one French Architect, which named CDS Cheser Pte. Ltd. In Vietnam, this is the common way of almost foreign invested projects to have Architect designed abroad. This attitude has some weak point and strong point

The weak points of abroad architect design

- The cost of design will be expensive because of all abroad expense and in combination with Vietnamese condition.
- The Designer has not much knowledge's concern to actually condition in Vietnam.
- The relation between Architect and Structural Designers can not develop in good way: very little discussion, some trouble in communication.
- Can not catch 100% regulation in Vietnam, so it has to repair and change after.

The strong point of abroad architect design

- Good quality
- More confident to the Owner
- The Owner can control the work easier in beginning steps.
- The Owner and designer have the same view and taste for the project.

Coming up form the designing stage in the course, which brings the good aspects of combination between Designing stage and Production stage, and the way to integrate in earlier stage all necessary information as well as training, I found it is very important in supporting Project Manager to Control the Project, and effective to avoid any extra cost in later stage.

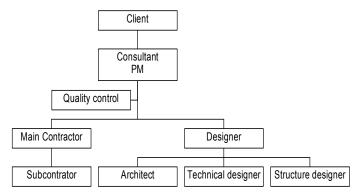
Swedish training programme have arranged in matching each stage of construction process. That is one good way to fulfil the knowledge's for engineers and managers, that must be considered in the training programme in Vietnam.

Another point that could be a significant factor to be success is reability. It should be entered as one major part from beginning of training programme.

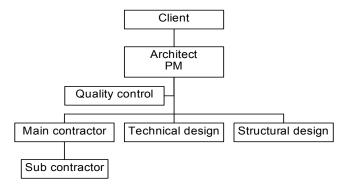
Project Organisation

In Vietnam, the most common forms of organisation used in project is the linestaff, but each client have their own way to arrange the system. There are two major performance of organisation for construction project are applying nowadays:

The client employs a consultant, who can appoint the designer including architect, structural designer, and technical designer. The consultant will be in charge to combine all designers and to arrange all necessary authority permission and procurement procedure. See the chart:



The client appoints architect, who will be Project Manager and the architect can choose their sub-designer such as structural designer and Technical designer and also perform the role of PM.



The employment of consultants is increasingly on a wide range of work in Vietnam recently, especially for government investment project; it may be a private group or state company. However, no matter who they are, they must be capable to provide knowledge, skills, expertise, ideal and experience.

On the other side, the foreign investment project seems to tend to employ the Architect with the role of Project Manager.

Saigon Domaine project have organised in the second term, but the Architect in role of Project Manager caused a little different in the organisation chart:

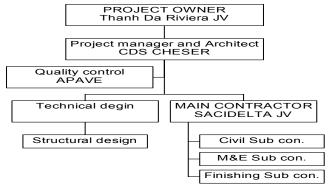


Figure 1: Organisation Chart of Saigon Domaine Project

Though the organisation system in this project has approved by planning specialists, it seems the system doesn't work well in term of combination. That is the reason why in detailed design stage has some trouble between designers, causing by lack of communication. There was considerable amount of architectural drawings, that must be changed and re-drawed, hence The Project Manger have to set up one team of designers on site in order to recover the actual situation, this team develops all necessary detailed drawings of each field such as architect, structure, M&E. The team working under control of Project Manager with weekly design meeting and their own planning which is illustrated as follow:

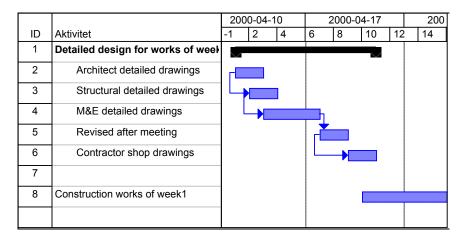


Figure 2: Planning schedule of design team on site of Saigon Domaine project (Excerpted for one week)

The philosophy is that the start date of each activity is associated with the link drawings, hence the architect has to make the allowance for detailed architectural design. These allowance should be in place the schedule and indicate the date on which a designer start to prepare a drawing and date which it should be complete. This system will automatically produce following report for any design meeting:

Drawing which should be started during next week

Drawing which should be at present under preparation

Drawings that should be complete.

The schedule allow the contractor's co-ordinator to chase information before it is due, and therefore anticipate problems, rather than that the present system of only discovering a problem with a drawing when it is not produced on schedule.

There should be a transparent procedure for penalising designer who fails to produce drawing on time.

This system requires a lot of designer on site to follow and carried out all requirement of design meeting, but it is realistic solution to recovery the lack control of designing stage.

The actual situation of designing inVietnam now is still in very embarrass way and not effective, it creates a lot of extra cost for Production period because of its loose way of combination.

The background of ICM has opened very clear Organisation System, which had been used in Vietnam but not in proper way, also the attitude of the clients are different to choose the Method of Organisation for their project. However, the organisation with the Architect on site was found effective way to release the problems on site, and recover any lack of communication as well as the ordinary arguments, which are the same happen in Sweden.

Procurement – Contracting

The popular form of Construction Contract are using in Vietnam with the main articles as following:

General provisions

Owner's right and requirement

Contractor's obligation

Administration of Contract

Subcontractors

Construction by Owner or by separate contractor

Changes in the Work

Time of work

Payment and completion

Protection of person and property

Insurance and bond

Uncovering and correction work

Miscellaneous provision

Applicable Law and arbitration

Actually Saigon Domaine project have signed in special form of contract, which was prepared by French Architect. Basically, the condition of Contract cover all common risk of both client and contractor, but the way to arrange Contractual files makes more complicated for administration of the site because of large amount of documentation and special condition with the attachment. The file consist of six books:

Particular Administrative Clause Book

General Specification Book of Private Building Work Market

Particular Clause Book of Private Building Work Market

Special Regulation Book of Private Building Work Market

General Plan of Work Safety and Health Co-ordination

Special Plan for Safety and Health Protection

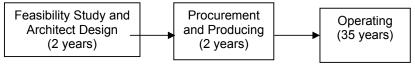
Main Contractor – SACIDELTA has signed contract with Thanh Da Riviera Joint Venture, and after that he signed subcontracts with all other subcontractors in the same conditions and Specification. Because of large set of contractual documentation, all subcontractors were required to sign in the original set of six books of Main Contract File.

This is a complicated way of contracting, but detailed enough to avoid any kind of risk in the future.

Project Planning

Saigon Domaine project has planned to commence its feasibility study since 1996, and during period of two years 1997 and 1998, the Economic crisis in Asia creates some difficulties and hesitations for the investors, but in the same time the Architect design is still in slowly progress.

The final decision was made in early of 1999 and it open for the commencement of tendering process, and signing Contract in July 1999. The Construction process started in September 1999 and planed to complete in February 2001.



Project Financing

There are a lot of projects in Vietnam, that have government supports for financing, most of them are government project, and they are built following the government policy to develop social requirements and public facilities.

The foreign invested project normally support by both parties, who are member of the Joint Venture, following the rate of contribution in Joint Venture.

Saigon Domaine project is owned by Thanh Da Riviera Joint Venture. The Company has structure of contribution as follow:

Foreign Party contributed 65% in the term of monetary from their capital and shareholders

Vietnamese Party contributed 35% in the term of land using

In the Construction period, Vietnamese party is in charge of all necessary authority permission to hand over the land to the Joint venture, and foreign party is in charge of calling capital from their partners.

Budget and Budget Control

In Vietnam normally there are two kind of budget necessary to prepare during the designing stage:

Initial budget is a guess by engineers when project is first developed. This figure can be done in the primary design

Project budget is a more accurated guess based on more detailed information once project is fully specified. This is usually the sum established in a client organisation as the budget, and will be done in the period of detailed design.

In Saigon Domaine Project Budget was made in three steps as shown below:

Period of Design	Initial budget (\$ US)	Project budget (\$ US)
Primary design	7,800,000	
First revised design		7,300,000
Specific design		7,500,000

It illustrates that Economic Control in this stage only considered to the total investment cost. Annual cost estimating or life cycle costing is very seldom used in this stage.

Compared to the method of bring the total budget in the conceptual designing stage in Sweden, it could be good if the designers are expertised and reability to fulfil a proper design, which doesn't allow any changes later. It also depends on the clients or his consultant to make the stability decision.

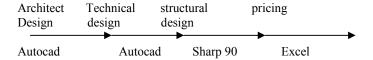
In Sweden, you can lock the budget at the briefing stage. But it is hard to do the same way in Vietnam

Information Technology

Information Technique is very important means for Architect and other designers, and it has good development in Vietnam for all designers, especially Architect and technical designers. All drawings can be done with the supports of AUTO-CAD programme; structural calculations are supported by SHARP 90 programme.

But the quantity surveyors or estimators can only take some part from architect drawing, they have to make quantity-takeoff by traditional intuitive methods and after can use EXCEL programme only for mathematics estimating.

Saigon Domaine project has full set of Architect design and Technical service design, which were done in France, all drawings and necessary report have been sent to a engineering office in Vietnam in order to continue the structural design and pricing. Information technology using can be shown as follow:



The Information Technology now become varies popular tools in all around the world. But the differences are the way to apply and utility effect in the countries.

There is a very good lesson in using Information Technology together with leadership in Sweden

Production Stage

Tendering and Contract

Tendering process in Vietnam

The business of contracting is the planned utilisation of resources, engineering skills, labour, materials, time and money in such a way that both parties to the contract receive the maximum benefit from the resources expended. So the participants involved in contracting project have to try as much as possible to limit indirect cost, and all the procedures will be charged to the shoulder of Project Consultant or Architect- Project Manager.

The common form in Vietnam is tendering. Almost project must get into tendering procedures, but the government regulation have made the exceptional case for the Foreign Invested Project, which have the rate of contribution as follows:

Foreign Party contributes 71% of capital or more Vietnamese party contributes 29% of capital or less

In that case, the party, who has bigger contribution, will hold priority to appoint the contractor and designer that they trust. And despite of selection without any competition, the contractor must be passed all technical interview and negotiation with the client.

When the client finds a reasonable Project Cost, which was specified by designer, he organises a tender procedure. All relevant tenderers are called in the same condition of tender documentation, time of submission and the list of working items, which is prepared by Architect. They obliged to make quantity-takeoff and fulfil bill of quantity with their own price.

The tenderer must try all his bests, his knowledge, experience and capacity to offer a Right price for the project

In normal case the candidates could be initially selected before tendering based on their technical and commercial background, which are considered to be suitable to undertake the work:

Legal status Financial situation Well-known experience System of Technology

That initial selection will help to reduce a large number of all construction company, who desire to attend all available tendering process with the hope of wining only 1% to 2% no matter how big the work of consultant or architect, who organised the tender is.

Saigon Domaine project has issued invitation letter for tendering with basic conditions, which are required by the client to all participants:

The participant must be a Joint Venture company or International Contractors. Legal capital of the participant must not be less than 3.0 Million \$US. Proof of experience in similar project.

The result of that reflects good effect of only five companies attended this tender.

Methods of procurement popular used in Vietnam are standard approach and divided approach. Turnkey projects are not common used because of the lack of trust from client to the contractor, especially when clients are foreigner. But in some case when the contractor is involved in the project as a partial investor, they might have turnkey contract with their own investment. On the other hand, the design is not clear enough to allow turnkey form of Procurement.

All the Contractors in Vietnam prepared their tender with the concentration on the major points:

Total price with consideration of provision sums covering preliminaries for the project. The most important part of the contract is Specification, which is needed to pay more attention in order to definite how much the work cost. A team of engineers will work in very tightly corporation to make prices for each items of work. In case The Architect issues list of working items, Contractors' works are limited only in making quantity-takeoff for the items and pricing, but if The Architect doesn't issue List of working items, the contractors must also specify all kind of works, which should be necessary in process. Depends on their experience, each contractor can provide different form of pricing, it could be more detailed with clear explanation how the work would be done, or very simple items list with lump sum price

The second major point in tender file is Time Schedule and Method Statement. There is another team of engineers working in corporation with pricing team in term of timing and how to do. Based on the Specification, they should make specified technical method and the combination of plants and labours that the contractor intends to incorporate into the works. These methods must be sure to the client that the agreed cost is realistic and appropriate for the work. Vietnamese contractors prepared good method statement, but during the construction progress they have not much respectation on their methods. The reason of that only can understand is the needs of limitation the expense as much as possible, which are in their mind not necessary. But it caused a lot of problem in site conditions and relations.

Negotiating price

Normally, in the commercial environment, the use of competitive tendering process may not be sufficient in making the best purchasing arrangement, and there is a need to use negotiating techniques in order to obtain the best price. The method usually is oral discussion face to face. Beside the formal document that must be fulfil in the tender, all tenderers have the right to make alternative proposal, which should cover in detail how suitable and profitable the alternative proposal works in the project. This is one good point to be awarded and the contractor may have a chance to make more detail explanation for their technical and commercial proposal in negotiating periods.

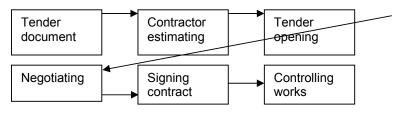
In Saigon Domaine project the Contractor- SACIDELTA have made a good proposal in reducing cost and taking consideration in technical items based on their own experience, which are illustrated in table 1-1. This proposal leads the contractor-SACIDELTA into a very good view of the client and became one of the points for them to be awarded:

Table 1-1: Cost reduction of alternative proposal in Saigon Domaine project

Alternative Proposal	Origin price	Alternative price
Cancel the insulation Amaflex 25mm in Cold water supply	8662 \$US	none
Change The bored pile under Swimming pool into precast concrete pile	45600 \$US	11350 \$US
Change system of anti-termite under ground slab	20000 \$US	8000 \$US
	74262 \$US	19350 \$US
Total reduction achieved		54912 \$US

In doing negotiating techniques, the client can obtain the tender figure, which after negotiation becomes the agreed contract sum and called The Contract Cost. In an ideal world this is less than the budget.

The procurement contracting in Vietnam can be showed in the chart:



Production Planning

A project can be described as something with a beginning, a middle and an end or as a one time unique endeavour by people doing something that has not been done this way before.

Based on clearly defined objectives, the time planning has been prepared during the tendering process. If there is no limit of the time, the tenderers must propose a time schedule, which is reasonable and with consideration of all risk of weather or any obstacles may occur. But if there is a limitation of the time, the tenderer must consider the method of work in the way of achieving the appointed time

Bar chart and Critical Path methods are often used in Vietnam as mainly means of time control and later is background for financial schedule. But the programme has not been used in full efficient, it only works in term of timing control, Vietnamese Engineers don't go far into cost and resources matter analyse.

Site manager works with engineers of all subcontractors to consider time planning every week in order to catch the General Planning, and Microsoft Project programme is useful to help them follow the progress of work.

The normal production time for a civil building of several storeys approximately is 2 years. In principle, the foundation works were built in dry season to avoid any obstacles caused by raining. Saigon Domaine has General Time Schedule of 17 months with the commencement at September 1999, it was the beginning of dry season, and the works of piling and foundation have no obstacles.

In term of method of planning, the course provides the introducement of Micro Planner-Xpert programme for project planing with some more professional function of resources controlling. But it is not available to apply, and also to study more. Anyway, what we learned is the way to develop technology in order to support civil engineers on project planning.

Economic Control

Likely costs have to be considered at all stages of the work. It is the Project Manager's job to ensure that sufficient funds are available for the assignment, thereafter-monitored costs commitments against approved budgets, avoiding any over budget expenditure and penalties.

The managers must have an accurate method of estimating the costs that have been committed each month, especially when using subcontractors, these estimated of committed cost of each month are more difficult.

Financial control on construction work is the expenditure of money, as planned and to budget. The accountant controls two types of finance: capital and current expenditure. In both cases managers have the following responsibilities:

Expend money as planned.

Not to exceed the budget

Identify and report any expected difference from the planned rate of expenditure

Identify and report any difference from agreed budget.

Saigon Domaine project has also its own Financial Schedule, based on which the monthly expenditures can be review and control by accountant and Project Manager. But the term of cost control only limited in payment progress; cost of purchasing will be control through subcontractors, whose have their contract signed in lump sum.

There will be always problems of the contractor's claim included variation work and material delivered on site in a sum of more than actual quantity, and Project Manager must be very careful to adjust this figure. In that case, the contract have included in the Bill of Quantity a provision of contingency can be good to avoid contractor's claim for any variation. Actually, in Vietnam, it is very difficult to set up a figure for contingency because of unperfectly design and estimating during tendering stage. Hence, this is the work of Project Manager to adjust every monthly claim.

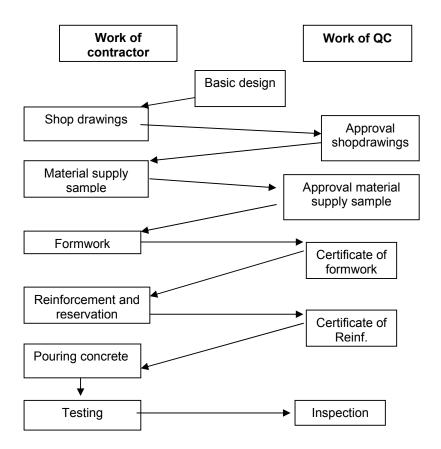
Quality Control

This subject is still very young and in beginning step in Vietnam, anyway it now gradually becomes popular in use, but there were many aspects of Quality Control depend on the clients and investors come from where, they may prefer to apply British Standard system or Vietnamese standard system or ISO 9000. Basically, these series are similar, but it can makes more complicated for Project Manager because of different way of calculation or measurement Saigon Domaine project is one of special case of applying French Standard. On the other side, government project seems tend to the Vietnamese Standard.

The level of Quality Control only on site control based on Specification and Insurance.

In some foreign invested project, there is a engineering office, which was appointed to be Quality Controller, their duties are following the production process to control quality of all the works in respected with Specification of project. On the other side, government projects are control by Vietnamese Standards, and will be surveyed in the period of commissioning.

One example of Quality Control on site for Reinforced Concrete wall:



Property Management

The subject brings very strong impression to all of participants of the course. We became aware that the subject could be in critical time to apply to our country, specially the feedback to designing stage, because property Management in Vietnam has not yet in good cooperation with designing stage as well as production process. It seems to be in another field of business and Municipal Housing Company operates in the different way with Production Process. While almost construction companies are in private system of management, The Municipal Housing company is still owned by government, and it does not consider too much for economy problems, because system of housing management always being supported by State.

The lack of combination to previous stage therefore creates a lot of problems in operating and maintenance planning, and also the plan of reconstruction. Normally

the reconstruction maturity stayed in a level of approximately 15 to 20 year, and it limited in a very simple work such as repaint, roof repairing. The renders will repair all internal damage.

On the other hand, the regulation of using houses does not strict enough to restraint people from their wants to rehabilitate their own internal environment. Municipal Architect takes care only for external size of the building such as the height, the property line etc. But not much care for the facade and the external details of the building.

The picture below showed houses in a main street of capital Hanoi, where the most strictly rules were applied to clean the façade of the buildings:



Figure 3: The facades of building in the Central Capital- Hanoi

In almost ordinary housing area, residents have extended the balconies and all things that they found necessary for their house, without caring for the face of the City

Anyway, municipality has done a lot of affords to improve the situation of housing, but it seems people are very stubborn in term of lands and houses.

If the Property Management system can be well organised with all very clear policies concerning market, finance and feedback to previous stage, housing problems will be solved and it would be a firsts step of developing living condition in Vietnam.

On the other hand, The housing business seems not being easy to apply in Vietnam because of the users have a big different between incomes. The poors, who lived on government subsidies, can not request too much from municipal housing company. And the Richs, who lived on their own income don't want to go to municipal houses, they preferred to by land and built their own house, in that way they only pay for the right of using land, but not for the house.

Because of poor knowledge in this field, I could not make any more details of property management system in Vietnam, but what coming up from the course stays in very strong impression of being applied and useful in future of Vietnamese housing policy. The best will be the system of organisation and finance.

In my personal point of view, the Property Management is very interesting subject, that would be a tools for economy system of housing business. The way of organisation to operate, maintain, and reconstruct can be effective to feedback the previous stage like designing and production. But it should base on the proper Housing finance policies, which can provide more convenient to develop. I think this new subject necessary to be insert into construction industry in Vietnam. It should be more and more Vietnamese Engineers need to be trained in this subject.

Conclusion

The Construction Process in Vietnam has many aspects to develop during 1990's and still in the middle way of being fulfil. Reflecting from the background of this course, I found a lot of advantages, which could very useful in comparison to our Vietnamese way of Construction. The main reasons of existing weak points in Construction Industry in Vietnam are:

Policy and regulations are not very clear in principle to control the whole process special to foreign invested projects. It caused the loosed controlling in every stage, eventhought sometime it goes in right way.

Engineers and even some specialists are not well trained in term of Construction Management, or if any, it is very short time to obtain enough knowledge. In term of training, The University of Civil Engineering still very slow to update the new programme in replacing for the old one. Basically some technical programme have been used since long time ago, especially Construction Management. That caused the lack of knowledge of engineers and lead to the complicated system on the work.

That means the most improtant thing for us now is proper training programme in Construction Management.

I have much hoping to bring all update knowledge's from this course first to my University, mostly for my department of Construction Management in order to improve the training programme, which I thought will be very important now. This must be the first step necessary to equip all new-graduated engineers from beginning step of their job.

Though time of course is very limited for what I wish to know, but the most basic I achieved is not only science knowledge we should learn, but also how to apply and organise them in proper way.