

The Report of Constructing of an Eco-aquarium facility on the Green Field Site.

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Abstract: Project of establishes an Eco-aquarium Park over the Greenfield Site is new in Hong Kong. And, that might be also new to other countries. The project itself is not like other erection of the superstructure we have faced before. We just only concern our building technology and manage groups of construction professional and complete the superstructure on time. Prior of the Eco-aquarium construction on the Greenfield site construction, we should concern and design of advance technology of aquarium plants. At the same time, the Greenfield site mostly contained high concentration of nitrogen within the rural area. Specific analysis should be undertaken on the aquarium plants, which are suit for built up on the Greenfield area. The other problems are how to design some kind of drainage system to decrease the nitrogen concentration within the soil to prevent its adverse affect the water quality the Eco-aquarium facilities.

However, there are benefits of founding an Eco-aquarium facility over the Greenfield area. Consequently, the project would lead to employment of constructing staff and other support staff during the construction. The constructing period of the Eco-aquarium facilities would be accomplish hopefully within three years period. We estimate the Park would have the income in return with millions of Hong Kong dollars when it is open to public. The Park would provide 3,000 staff vacancy during its operation.

Executive Summary

Eco-aquarium Park is a system of the aquarium facilities that can provide a favorable environment for the marine livings to live in. In the return, our citizen and tourist could enjoy a day trip with those marine lives. Hong Kong has only one similar park in Aberdeen, Hong Kong and no others in the recent years. This proposed

Eco-aquarium Park would locate at the Kowloon Shing very near to our late Kai Tak Airport.

The government would give the developer 250 hectares for the Eco-aquarium Park. After three years, in this rural land you will find a new complex building facilitate with sophisticate mainframe computer system automatically manage most of the aquarium facilities. There will be aquarists' office, shopping mall, small theatre, lounge and a conference room within this complex building. Where tourist can buy souvenir and hear brief introduction of the marine life before they go to the aquarium center. Beyond this, the park also have kids playing paradise, 2 food restaurant, 2 theatres, 1 high up sightseeing tower and a 80 hectares mechanical machine game center called '**Crazy World**'.

The project involved environmental, aquarium, diaphragm wall method and amusement difficulties that would leave for the forthcoming main contractor to find solutions. We suggest conducting management procurement method to handle the project.

Greenfield site and its potential pollution

Greenfield site (D. Gusset et al. 1993) traditionally interpret as rural or semi rural area which remain not to be use at the moment. In recent point of view, the Greenfield sites are located in remote area having a potential for another type development. There are also reports shows that there is a high retention of over 5,000 kg nitrogen per year (Sara Lloyd et al. 2004). This high retention with the rural lands is surely disturbing the ecosystem. Thus, it is a prior to find way in decreasing the nitrogen impact. Or, there would be no guaranteed on the future water quality of our aquarium facilities. Beyond the high concentration of Nitrogen, there are small amount of phosphorous inside.

Design of the Eco-aquarium Park

The Eco-aquarium Park consist of 250 hectares of land with a new complex building facilitate with sophisticate mainframe computer system automatically manage most of the aquarium facilities. There will be aquarists' office, shopping mall, small theatre, lounge and a conference room within this complex building. Tourist can buy souvenir and hear brief introduction of the marine life before they go to the aquarium center.

The basic aquarium basically in included plants, mainly as display tanks, water filtration facilities, and water supply system. Since, the park is far away from seaside.

There would be short supply of marine water. The water should be precisely assimilated by proportional chemical in order to recreate artificial marine water. So, the water supply system must use close system in an assurance there would be no other water come from outside. The other advantages they reduce the chance of disease spreading and any infiltration of Nitrogen surrounding area.

The 10 nos. display tanks would be designed in each volume each 1450 gallons built in circle structure enable viewers enjoys the sightseeing in all direction. The close circle water supply system needs to have effective biological filter system to maintain its water quality. The system is the bottom type sand base design filter within the tank. Ammonia would press into the tank, which enable the metabolic wastes change to some kind of nitrates.

The other main element is the high pressurize pump installation. The pump should be design up to a 100 gallons water circulation per hour.

Construction Technique to Accomplish the Project

Generally, engineer proposes the construction of drainage system to convey the nitrate water stream to the control area (Sara Lloyd et al. 2004). This can reduce the concentration of nitrogen within the Greenfield site. This project we recommend to use the Diaphragm Wall Method to establish the foundation of the Eco-aquarium Park. Since, the Diaphragm Wall its continuous connected rectangular column can effectively prevent nitrate water stream infiltrate into the structure. Thus, there would be no pollution to the aquarium water. On the other hand, there would be no support column at the basement of the park.

Beside the main tower and the aquarium exhibition corner, the project also bring in with kids playing paradise, 2 food restaurant, 2 theatres, 1 high up sightseeing tower and a 80 hectares mechanical machine game center called '**Crazy World**'.

The aquarium exhibition corner would be right beneath the main tower 30 feet under without any supporting column found. The whole superstructures in the Eco-aquarium Park would be built up in vantage 30's style, the most romantic dreaming age of 20 century.

Public and Private Project (PPP)

The idea of Aquarium developing project is from our developer. He envisages the development a specific recreation center in a suburban rural area beside the city center.

The Greenfield site with a lower capital could provide a large sufficient area could raise the facilities quality we built. Thus, there comes more enjoyable playing environment for the tourists. The government support this idea by provided us the rural land near to our late Kai Tak Airport.

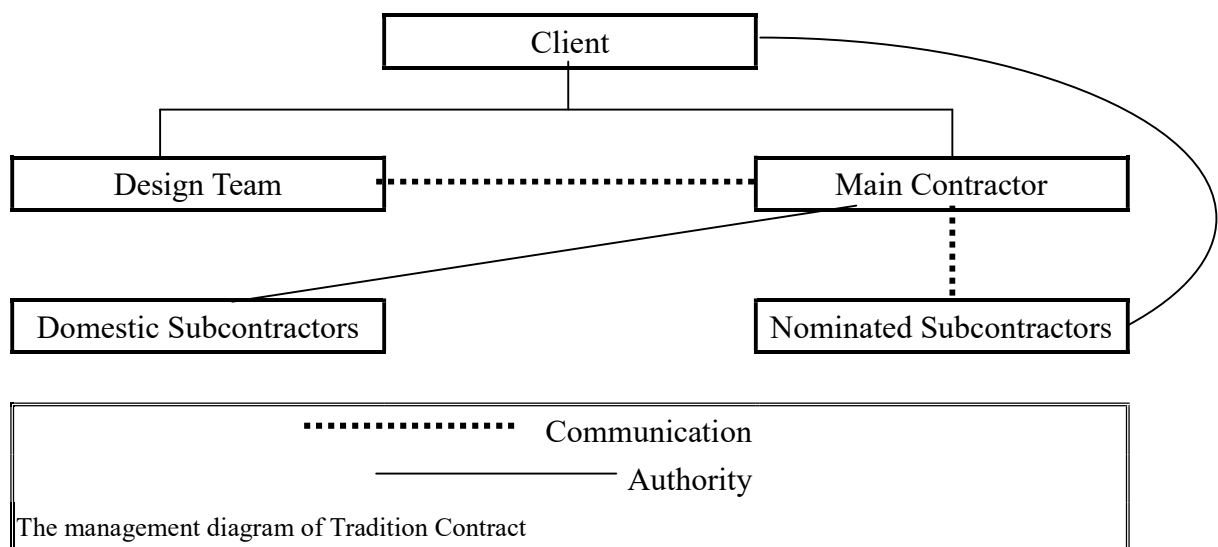
Optional Analysis

The client has basically have options to chose manage schema as follows: -

1. Tradition Contract Management
2. Design and Build Contract Management
3. Management Contract

Tradition Contract Management is the client employ a consultant for design and cost control. On the other hand, the main contractor is appointed to undergo the construction process. The one who take this option must familiar with the project he has to do. Since, the client should be experienced in how to organize and supervise the mentioned parties to develop the construction project in harmony.

The clients who are using these options are familiar with his financial commitment if the project design has been fully developed at the time of the tender. With reference to the design team is separated as an individual team, the architect has sufficient time and freedom to develop the design in an aesthetic manner. The cost can also be accurately estimated, planned and monitored by the design team. This enable the project to undergo the payment by quantity, which counted by construction items, accomplished. Thus, the appointed main contractor can fully concentrate on conducting the competitive tenders system to the subsystem.



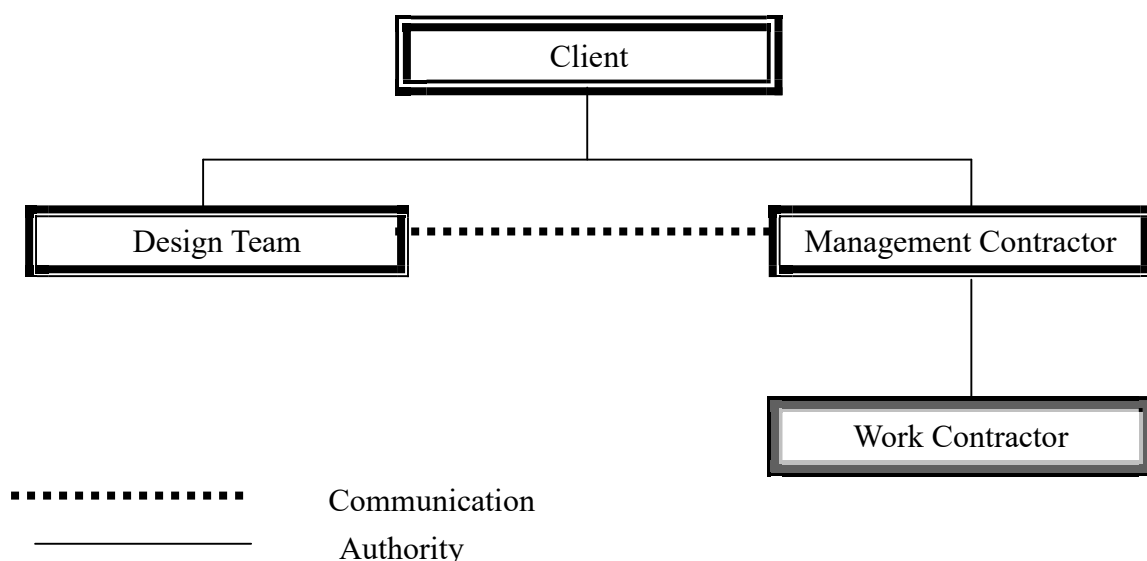
The Design and Build Contract Management means that there is a sole contractor responsible for design, construction, planning, organization and control of the project. This kind of management schema is more suitable for the client who is not familiar with handling construction project.

The design and build contract is having its larger extension than the traditional contract. The client knows his total financial commitment in the early construction stage. Since, the subcontractor usually uses his in hand materials and resources for the construction work. Due to the design team and construction team are within one contractor, they reduce the time of document submission. The client can easily see the construction sample easily. Thus, there is a faster construction progress.

However, the architect may have less time to develop the design leading to less aesthetic project in event. The specialist subcontract system is wholly under the control of the design and build subcontractor.

Management Contract schema means that the client would appoint a professional service system. The professional consultant team is to provide plan, program and co-ordinate in order to ensure the project can proceed smoothly.

The management contractor guarantees the client to deliver the project on time. So, the contractor would have tender for higher price for coverage of this risk. There would also a probability of arousing the conflict between the roles of project management and contract administrator.



The management diagram of the Management contract

Evaluation of the Procurement

The project is developing a complicated aquarium facility with other recreation support services over a Greenfield site. The construction difficulties we will face are as follows: -

1. Detail analysis and professional technique to the nitrogen load hazard of the Greenfield site.
2. Special technology to construct diaphragm wall foundation method.
3. Special knowledge of how to design and construct an aquarium facility of close water supply system for aquarium exhibition corner.
4. Specific experience in construction of the mechanical game-playing center.
5. The developer is not familiar with those fancy building stuff.

It seems to me that the Tradition Procurement would not appropriate because our developer is not familiar with this type of sophisticated construction. The future contractor has to due with the difficulties of environmental, aquarium, specific foundation method, amusement park design and construction. There would be not many contractors having the ability to due with these items during construction period.

So, Design and Build would not be another option.

The final option would be Management Contract Procurement for this project. An experienced contractor with good reputation would be chosen in this project. On the other hand, the design team should include more professionals on environmental, aquarium, and amusement park development as necessary. The authority of the design team should be erected in order to ensure the management contractor would follow their professional advise during the construction.

Generally, a management contractor is a specialist firm who can lead a group of specialist subcontractors to accomplish their tasks. This is what we want in this project. They could give practical comments to the client and design team during the early stage of the project.

However, we concern that the management contractor may not performance smoothly this time because they are only specialist in construction not in environmental or aquarium field. Since, the project is too complicated with many fields of advance knowledge. It may out of the reach of the contractor to finalize a desirable outcome.

So, we have to increase the authority and nos. of specialists for the design team. This is for the assurance of the management contractor better follow and communication with the design team.

Reference:

1. Guset D. and Posenthal P., 1993. What is a Greenfield site, Industrial Relations in Greenfield Sites? Centre for Economic Performance Discussion, Paper no.127, 2.
2. Lloyd S., Francey M. and Skinner L., Offset Scheme, Cost of Incorporating WSUD into Greenfield Site Development and Application of an Offset Trading Scheme, 795-796.