

INTRODUCTION OF PROJECT: CONSTRUCTION OF NEW THAKETA BRIDGE IN MYANMAR

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1. BACKGROUND

Yangon city area surrounded by Yangon River, Bago River and Pazundaung creek, has a characteristic of urban transportation network which connects between the city center and its surrounding area by numerous number of river bridges. Existing Thaketa Bridge on Yamonnar Road, which cross over Pazundaung creek and connect Yangon city center and Thaketa district area by two-lane road, is one of most important bridge in Yangon.

According to traffic count survey in 2013, total traffic volume passing over existing Thaketa Bridge was estimated about 29,000 PCU / day, which exceeds the traffic capacity for two-lane road. Furthermore, existing Thaketa Bridge was constructed 47 years ago so that deterioration has being processed. As a result, the weight of vehicle passing on the bridge are restricted to 10 ton in long time. In order to solve the problem without disturbing traffic at the area, a construction of new bridge was aspired.

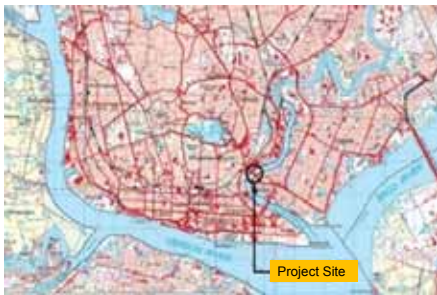


Fig.1 Location of the Project



Fig.2 Existing Thaketa Bridge



Fig.3 Bird's Eye View of the Bridge

2. PLANNING

In 2013, "The Preparatory Survey on The Project for Construction of New Thaketa Bridge" was carried out in accordance with the request of Japanese Grant Aid from Myanmar government. In the study, following polity were taken account.

- In order to eliminate the bottleneck of current traffic at existing Thaketa bridge and its surroundings, the replacement of the old bridge and its approach road with expansion of road width will be implemented.
- The project scope range of approach road improvement expanding the road width to dual two-lane will be determined by taking account of the appropriate scale as a Grand Aid project.
- Optimal bridge type will be selected by bridge planning which is appropriate for Grand Aid project by Japan.

By the preparatory study, appropriateness and effectiveness of the project was confirmed. Therefore, implementation of the project was determined.

3. DESIGN

(i) Requirement

The center span of the new bridge shall be provided wide enough for necessary navigation clearance of ships sailings which is currently operated with using three spans of existing Thaketa Bridge. Hence, the length of center span was arranged as 100 m by taking account of the clearance and some rooms. For the height clearance, same height as the existing Thaketa Bridge shall be required at least under the bridge girder. In addition, application of advanced design / construction technologies developed in Japan was expected in aspect of technical development achievement in Myanmar.

(ii) Selection of Bridge Type

In order to enable to pass the required height clearance at center span and connecting approach road to existing road level with acceptable vertical gradient, bridge girder depth at span center is to be minimized as 1.8m. Hence, bridge type was selected from applicable one for 100 m span and its girder depth. By comparison study with candidate types, PC extradosed bridge was selected in terms of economical aspect, construction and maintenance workability, aesthetic appearance, etc.

(iii) Selection of Foundation Type

Foundation P1,P2 are located at deeper point of the Pazundaung Creek, for which river depth, the range of tide, the speed of tide, and secure navigability of sailing vessels shall be taken account for the design.

Table.1 Outline of Project Facilities

Category	Item	Type / Length
Bridge	Bridge Length	253m (220m+33m)
	Effective Width	20.5m (2m+0.5m+2x3.5m+1.5m +2x3.5m +0.5m+2m)
	Superstructure Type	3-span continuous PC Extradosed Bridge (L=220m) PC BOX girder bridge (L=33m)
	Foundation Type	In river: Steel Pipe Sheet Pile Foundation (Pile diameter: φ1200mm) On land: Cast-in-place RC pile (Pile diameter: φ1000mm)
Road	Road Length	Approach road and ramp total L=508m

Keyword: New Thaketa Bridge, PC Extradosed bridge, Steel Pipe Sheet Pile, Japanese Grant Aid, Myanmar

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Steel pipe sheet pile foundation (SPSP) was selected in terms of economical aspect, construction workability, etc. SPSP is the advanced technology from Japan that connects steel pipe piles by joint pipes and worked as a cofferdam during construction.

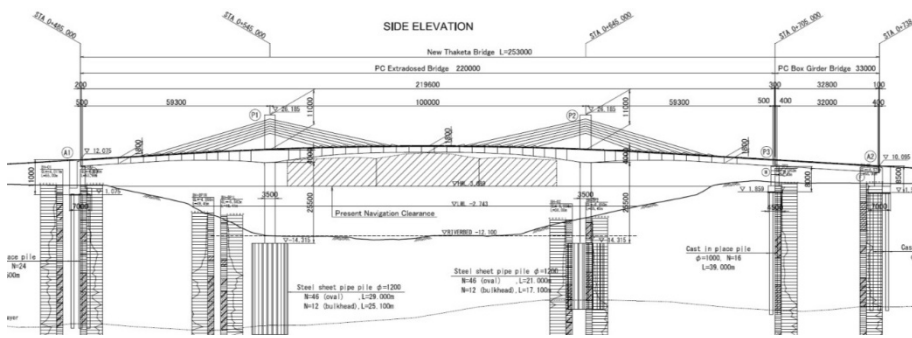


Fig.4 Profile of New Thaketa Bridge

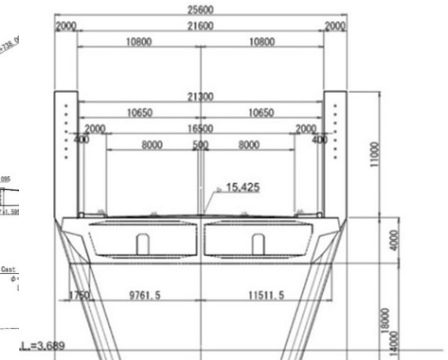


Fig.5 Cross-section at Pier Position

4. CONSTRUCTION

In April of 2015, the construction of New Thaketa Bridge was commenced at site.

(i) In First year, preparation works, construction of temporary bridge, soil treatment for soft ground, construction of cast-in-place RC pile and driving of SPSP piles were conducted.

(ii) In Second year, remaining works of SPSP construction, structure works for pier of P1 P2 P3 pier and A1 A2 abutment, embankment and MSE wall works were conducted. As shown in Fig.7, Inside of SPSP well was excavated with mutual work of dewatering and installation of temporary supports. After completion of temporary supports installation till 7 stories and excavation till the bottom, top slab and column of the pier were constructed, respectively.

(iii) For last year, pier head and pylon of P1, P2, Extradosed girders for center span P1-P2 and side span A1-P1, P2-P3, road pavement and road facility works were conducted.

As shown in Fig.8, girder of extradosed bridge are constructed by cantilever erection method with using form traveler. It is the repeating work for arranging formworks, re-bar and PC, casting a segment of main girder, tensioning PC cable and launch the form traveler forward.

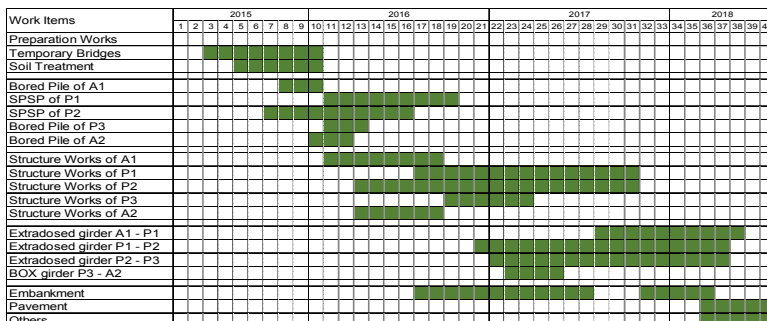


Fig.6 Bar Chart of the Construction Works



Fig.8 Construction of PC Extradosed Bridge

5. TECHNICAL TRANSFER PROGRAM

In parallel with construction, technical transfer program was implemented as a soft component portion of Japanese Grant Aid. Through the program, MOC engineers were expected to obtain followings;

- To understand major issues, consideration and technical solutions for Survey/ Planning/ Design related to the project.
- To understand comprehensive process related to project implementation and construction management / To understand comprehensive work procedure, construction methodologies and technical points of the works.

First part of the program was conducted by style of lecture in classroom subjected to each of Geotechnical Survey, Hydrological Survey, Bridge Planning, Foundation Design, Substructure Design and Superstructure Design.

Second part was conducted by site OJT style at construction site of New Thaketa Bridge with the corporation of the Contractor.

6. CONCLUSION

Since traffic volume increased more and more by recent development of Thilawa District, the importance of New Taketa Bridge has being enhanced in these days.

As a member in charge of the project, we surely desire a profound effect of the project for both aspect of improvement of traffic condition at the Yangon city area and technical development of MOC engineers.

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