

8 Construction Methods and Programme

8.1 Construction Methods

The construction methods to be adopted would be similar to those outlined in the original Scheme Assessment Report – Main Crossing (Bridge) prepared for the multi-modal bridge configuration.

8.2 Construction Programme

Preliminary construction programmes have been developed based on the following assumptions:

- 5 ½ day working week
- Single shift working
- 12.5% loss of productivity due to weather (assumed)

The programmes are included in Appendix E. The total construction duration from site mobilisation to completion of finishes are shown below and compared with the duration for the Multi-Modal Base Case of 66 months (orthotropic deck).

Cable Stayed Bridge Variant		Total Duration	Variance from Multi-Modal Base Case
1	Mono Tower Single Box Deck Orthotropic	61 months	- 5 months
2	Mono Tower Single Box Deck Composite	62 months	- 4 months
3	Mono Tower Twin Box Deck Orthotropic	61 months	- 5 months
4	Mono Tower Ladder Deck Box Beams	61 months	- 5 months
5	Mono Tower Ladder Deck Plate Girders	61 months	- 5 months
6	H- Shape Tower Single Box Deck Orthotropic	60 months	- 6 months
7	H-Shape Tower Single Box Deck Composite	61 months	- 5 months
8	Diamond Tower Ladder Deck Box Beams	68 months	+ 2 months
9	Diamond Tower Ladder Deck Plate Girders	68 months	+ 2 months
10	A-Frame Tower Ladder Deck Plate Girders	61 months	-5 months

The approach viaduct construction is not on the critical path.

The primary drivers that differentiate the options are:

(a) Erection Cycle and Unit Length

The orthotropic deck options have been based upon 25 m unit lengths and an 11-day cycle for a single box and 12-day cycle for a twin box. The extra day recognises the additional time involved in fairing up the more flexible twin box section. The composite options are all based upon 18 m unit lengths and an 8-day cycle. There is little differential between the D2M options resulting from this, but there is benefit in comparison with the shorter units proposed for the heavier multi-modal deck options.

(b) Tower Complexity

The mono-tower is the simplest tower form and jump forming can be undertaken unhindered by merging of tower legs, angular changes in the legs or the introduction of tie beams at deck or tower head level. The Diamond Tower is particularly complex.

(c) Heavy Lift of Tower Deck Units

The larger the unit that can be erected at the tower by strand jacks or floating crane, the faster the start of main span deck erection. The H-Shape Tower would allow a strand jack lift of a complete tower deck unit including erection gantries. The Mono-Tower requires a longitudinal splice in the deck to allow erection around the tower. The Diamond Tower deck needs to be built around the tower tie members and hence would have to be erected in relatively smaller pieces.

At the next stage of design more detailed programmes will be developed. The assumed loss of productivity due to weather will require a quantitative assessment based on wind and weather records for the site.