Assignment

A bridge – necessiated by increasing traffic at an industrial center – is to be constructed. The structure of the bridge is of post-tensioned reinforced concrete box structure on monolithic piers, constructed in way of "Incremental Launching" method.

Your job is to elaborate estimates for accomplishment (schedule, bill of quantities, cost estimate) and to describe your ideas in a written form detailed as listed below:

- Bill of quantities, Bill of works (See: technical specifications)
- Periodic layout of site
- (foundation works, erecting piers, pre-casting and launching, finishes)
- Master schedules of performance (PERT + Bar chart) indicating tasks of great importance
- Detailed schedule of constructing blocks of bridge
- (one-week period of pre-casting a block)
- Technical Report
- Traffic management suggested during construction if considerable

For to elaborate Detailed- and Master schedules you may accept traditional principles of building structures of this kind (See: Phases of construction).

Documents to be elaborated	Responsible	Assessed
Bill of quantities, bill of works		
Site layout		
Master schedule		
Detailed schedules		
Technical Report		
Introduction / Performance		

Phases of construction :

Pre-Casting Plant is located on one or both of the abutments constructed in advance. It consists of a monolithic reinforced concrete slab (workbench), outer formwork sidings (can be tilted up and down), inner formwork (can be pulled in and out) and rear shuttering. (See drawings attached)

The bridge is constructed in more segments (blocks) each of them pre-cast in weekly periods. New-cast block is attached to the last finished one. They are pressed to each other by post-tensioning bars. At the end of a casting period (one week), all blocks constructed (that is the segment of the bridge completed) are launched (pushed through) over the piers. Size of blocks are chosen some 10 to 40 m, so the span of arches must be some integer times (2-3x) the length of them. If an arch has a span longer than 3 blocks, auxiliary temporary supports are needed for construction.

When constructing the bridge, segments completed approach the piers like a cantilever. For to decrease moments at supports they apply temporary structures, such as Temporary Supports and Steel Nose (See drawings attached). For launching they apply two pieces of synchronized hidraulic presses of pushing power of 170 tons each. For to decrease friction during launching they use special-coated temporary bearings manipulated from light scaffolds suspended from the piers.

Post-tensioning is performed in two phases. At first, blocks are pressed to each other by straight tensioning bars and wires during the "Incremental Launching" period, while in the second phase post-tensioning means pressing the whole structure together using high-capacity tensioning cables. In some cases, when double-box bridges are to be constructed, both of the parallel bridges are cast on the same casting plant, after each other. That case first-made bridge must be shunted a-cross onto piers of the "parallel" bridge using temporary structures ("cross-beams") and power-hoists, while second-made bridge can be constructed after that, in the same (previous) track.

When tensioned lifting the whole structure temporary bearings are changed to permanent ones. Finishing works can be performed after that as usual.

Budapest	
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Supervisor



											W	idt	h [m]							
				12.16							20.53										
					Span (L) [m]								
			24		30			36		24		30		36							
					n																
				4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6
	Soil-Mec		В																		
le		er	A																		
Ρi	nki	Ρi	В																		
	Fra		Α																		

Conditions declared by the Client

- No piers in river-bed allowed (but temporary support if needed).
- Traffic considered necessiates 2 x 2 tracks of roadway.
- The earliest handover of at least 2 x 1 tracks has great significance.
- Construction-traffic through near-by bridge is not allowed.
- Traffic of thoroughfares to be crossed can hardly be limited.
- Limited disturbance of near-by traffic has great importance.



Cross-Section, **Twin-Bridge**





		QUANTI	FIES PER I	PIER					
m	A	¥7. 4	Width 20.52 m						
ID	D Activity			12.1	l6 m Pi	20.53 m			
				Α	В	A	В		
1	Piling		pcs	3 A 1000	Franki (8m)	6 A 800 F	Franki (8m)		
			2	2 A 1200 So	il-Mec (14m)	4 A 800 Soi	1-Mec (14m)		
2	Excavation, Ditch, Rough		m ³	79,5	96,8	105,8	111,9		
3	Excavation, Ditch, Refinery		m ²	16,8	21,8	28,0 30,2			
4	Opening pilehead (Demolishing loose upper	sections)	m	Frank	di: 3.7	Franki: 3.9 Soil Mee: 2.6			
5	Blinding (10 cm)		m ³	1 7	2 2	2.8	3.0		
6	Formwork Foundation		m ²	20.4	25.8	2,8	29.8		
7	Reinforcement, Foundation		Ton	1,6	2,2	2,1	2,3		
8	Concreting, Foundation		m ³	13,5	18,4	17,3	19,0		
9	Refill, Ditch, Including Compaction, Tempor	ary	m ³	30,0	36,8	35,2	37,3		
		24 m span		30,7	36,2	48,0	48,3		
10	Formwork, Pier	30 m span	m ²	38,4	45,2	60,0	60,3		
		36 m span		46,1	54,3	72,0	72,4		
11		24 m span	G ³	170,8	177,5	227,8	252,4		
11	Scaffolding, Heavy, Pier & Head Beam	30 m span	Gross m	206,1	214,1	260,8	304,6		
		24 m span		1,7	1,7	2,3	1,6		
12	Reinforcement, Pier	30 m span	Ton	2,1	2,2	2,9	1,9		
		36 m span		2,5	2,6	3,5	2,3		
		24 m span	3	10,6	10,9	14,4	9,7		
13	Concreting, Pier	30 m span	m	13,2	13,6	18,0	12,4		
14		36 m span	2	15,8	16,3	21,6	14,5		
14	Formwork, Head Beam		m Ton	23,8	16,4	22,8	1.2		
15	Concreting Head Beam		m ³	9.3	5.6	8.1	7.2		
17	Bearing's Bed		DCS	2.0	2.0	4.0	4.0		
18	Refill, Ditch, Including Compaction, Final		m ³	36.0	41.6	53.3	55.6		
19	Scaffolding, Light, Suspended		Man-Hour	24,0	24,0	24,0	24,0		
20	Temporary Structures, Shunting (a-cross), Me	ounting & Dismounting	Man-Hour			100,0	100,0		
21	Bearings, Final		Man-Hour	44,0	44,0	33,0	33,0		
22	Scatfolding, Light, Demolish	WORKS	Man-Hour	24,0	24,0	24,0	24,0		
		Carpenter	PEK DKIL	9GE	0	6	0		
23	Preparing Pre-Casting Plant	Black Smith	Man-Hour / m	4	,0 ,0	3,0			
		Steel Fitter		4	,0	3,0			
		Building Labourer	Mars Harry (21	,0	9	,0		
24				1	6	2,4			
24	Townson Sunnort Mounted On Test Biles	Carpenter Steal Fitter	Man Hour / m	1	,0	2	2		
	Temporary Support, Mounted On Test Piles	Carpenter Steel Fitter Building Labourer	Man-Hour / m	2	,0 ,2 4	3	,3 1		
25	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting	Carpenter Steel Fitter Building Labourer Black Smith	Man-Hour / m	2 5 1	,2 , <u>4</u> ,4	3	,3 ,1 ,1		
25	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer	Man-Hour / m	2 5 1 0	,2 ,4 ,4 ,6	3 8 1 0	,3 ,1 ,1 ,5		
25 26	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith	Man-Hour / m Man-Hour / m	1 2 5 1 0 1	,2 ,4 ,4 ,6 ,4	3 8 1 0 1	,3 ,1 ,1 ,5 ,0		
25 26	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer	Man-Hour / m Man-Hour / m	2 5 1 0 1 0	,2 ,4 ,4 ,6 ,6 ,6 ,6 ,6 ,6	3 8 1 0 1 0	,3 ,1 ,1 ,5 ,0 ,4		
25 26 27 28	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer	Man-Hour / m Man-Hour / m Man-Hour / m	1 2 5 1 0 1 1 0 0	2 2 4 4 6 6 6 5 5 cheduled 6	3 8 1 0 1 1 0 Individually 0	,3 ,1 ,1 ,5 ,0 ,4		
25 26 27 28	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting	Carpenter Steel Fitter Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer	Man-Hour / m Man-Hour / m Man-Hour / m	1 2 5 1 0 1 0 0 0 0 0	2 4 4 6 5 6 6 8	3 8 1 0 1 1 0 1 1 0 0 1 1 0 1	,3 ,1 ,1 ,5 ,0 ,4 ,4 ,9 ,2		
25 26 27 28 29	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter	Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m	1 2 5 1 0 1 0 0 0 0 0 0 3	2 4 4 6 5 6 5 6 8 6 6 6 6 6 6	3 8 1 0 1 1 0 1 1 0 0 1 5	,3 ,1 ,1 ,5 ,5 ,0 ,4 ,4 ,2 ,4		
25 26 27 28 29	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning	Carpenter Steel Fitter Black Smith Black Smith Black Smith Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer	Man-Hour / m Man-Hour / m Man-Hour / m	1 2 5 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 4 6 5 6 8 6 8 6 2	3 8 1 0 1 1 0 1 1 0 1 1 5 7 7 7	,3 ,1 ,1 ,5 ,5 ,0 ,4 ,4 ,9 ,2 ,4 ,4 ,8 ,8		
25 26 27 28 29 30	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Building Labourer	Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m	1 2 5 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 4 6 6 8 6 8 6 2 2	3 8 1 0 1 1 0 0 1 0 0 1 1 5 7 7 5 5 6	,3 ,1 ,1 ,5 ,5 ,0 ,4 ,4 ,9 ,2 ,4 ,4 ,8 ,8 ,4 ,0		
25 26 27 28 29 30 31	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Building Labourer Building Labourer	Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m	1 2 5 1 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 6 5 5 5 5 5 6 6 2 7 7	3 8 1 0 0 1 0 0 0 0 1 1 5 7 7 5 6 0 0	,3 ,1 ,1 ,5 ,0 ,4 ,4 ,9 ,2 ,4 ,4 ,4 ,0 ,5		
25 26 27 28 29 30 31	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting	Carpenter Steel Fitter Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Building Labourer Black Smith Black Smith	Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m	2 5 1 0 0 1 1 0 0 0 0 0 0 3 3 5 5 5 0 0 0 0 0 0	2 2 4 4 6 5 5 5 5 6 6 2 7 3 3	3 8 1 0 1 0 10 10 10 10 10 10 11 5 7 7 5 6 6 0 0 0 0 0 0	3 ,1 ,1 ,5 ,0 ,4 ,9 ,2 ,4 ,4 ,9 ,2 ,4 ,4 ,4 ,6 ,5 ,5 ,0 ,4 ,4 ,4 ,4 ,4 ,4 ,4 ,4 ,5 ,5 ,5 ,6 ,6 ,6 ,7 ,7 ,7 ,7 ,7 ,7 ,7 ,7 ,7 ,7		
25 26 27 28 29 30 31	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting	Carpenter Steel Fitter Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer	Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m S PER BLO	2 5 5 1 0 0 0 0 0 0 3 5 5 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 6 6 8 6 6 8 6 2 2 7 3	3 8 1 0 1 0 0 10 1 1 5 7 7 5 6 6 0 0 0 0	3 ,1 ,1 ,5 ,0 ,4 ,4 ,9 ,2 ,4 ,4 ,8 ,8 ,4 ,0 ,5 ,2 ,2 ,2 ,2 ,2 ,2 ,2 ,2 ,2 ,2		
25 26 27 28 29 30 31 31	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer Black Smith	Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m S PER BLO Man-Hour / m	2 5 1 0 0 0 0 0 0 0 3 3 5 5 0 0 0 0 0 0 0 0 0	2 2 4 4 6 5 5 5 5 6 6 2 2 7 3 8 8	3 8 1 0 0 0 0 0 0 0 1 1 5 7 7 5 6 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	,3 ,1 ,1 ,5 ,5 ,0 ,4 ,4 ,4 ,9 ,2 ,4 ,4 ,8 ,8 ,8 ,4 ,0 ,5 ,5 ,2 ,2 ,8		
25 26 27 28 29 30 31 31 32 33	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer	Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m Man-Hour / m S PER BLO Man-Hour / m	2 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.2 .4 .6 .6 .6 .6 .6 .6 .6 .6 .6 .2 .6 .2 .3 .8 .8 .8 .8 .8 .8	3 8 1 0 0 1 0 0 1 1 5 7 7 5 6 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	,3 ,1 ,1 ,5 ,5 ,0 ,4 ,4 ,4 ,9 ,2 ,4 ,4 ,8 ,8 ,8 ,4 ,0 ,5 ,5 ,2 ,2 ,2 ,4 ,4 ,4 ,5 ,5 ,6 ,6 ,7 ,6 ,7 ,7 ,7 ,7 ,7 ,7 ,7 ,7 ,7 ,7 ,7 ,7 ,7		
25 26 27 28 29 30 31 31 32 33 34 35	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabrican Concenting, Rear Slab	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer	Man-Hour / m Man-Hour / m	2 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.3. .4 .6 .6 .6 .6 .6 .6 .6 .7 .3 .8 .8 .8 .6 .2 .6 .2 .6 .2 .6 .2 .6 .3	3 3 8 1 0 1 0 1 0 1 1 5 7 7 5 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 3 1 1 5 5 0 4 9 2 4 4 9 2 4 4 8 4 0 5 5 2 8 4 4 6 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5		
25 26 27 28 29 30 31 <u>32</u> 33 34 35 36	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabrican Conduits, Rear Slab Concreting, Rear Slab Formwork, Inner. Pull-In	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Black Smith Building Labourer WORKS	Man-Hour / m Man-Hour / m	2 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.3. .4 .6 .6 .6 .6 .6 .6 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .7 .3 .8 .8 .8 .8 .8 .8 .4	3 3 8 1 0 1 0 1 1 0 1 1 5 7 7 5 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .1 .5 .0 .4 .9 .2 .4 .8 .4 .0 .5 .2 .4 .6 .4		
25 26 27 28 29 30 31 31 32 33 34 35 36 37	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Rear Slab Formwork, Inner, Pull-In Reinforcement, Upper Slab & Sidewalls (40	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer WORKS tion) % pre-fabr.)	Man-Hour / m Man-Hour / m	2 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .4 .6 .6 .6 .6 .6 .6 .6 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .7 .3 .8 .8 .8 .4 .0	3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .1 .5 .0 .4 .9 .2 .4 .8 .4 .0 .5 .2 .8 .4 .6 .4 .4 .5 .2		
25 26 27 28 29 30 31 31 32 33 34 35 36 37 38	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Rear Slab Formwork, Inner, Pull-In Reinforcement, Upper Slab & Sidewalls (40 Conduits, Upper Slab	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer WORKS tion)	Man-Hour / m Man-Hour / m	CK 1 2 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	.2 .4 .6 .6 .6 .6 .6 .6 .6 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .7 .3 .8 .8 .8 .8 .4 .0 .6	3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0	3 3 1 1 5 5 0 4 9 2 2 4 4 8 8 4 0 5 2 8 8 4 6 6 4 4 5 7		
25 26 27 28 30 31 31 32 33 34 35 36 37 38 39 9	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Rear Slab (40 % pre-fabricat Conduits, Rear Slab Formwork, Inner, Pull-In Reinforcement, Upper Slab & Sidewalls (40 Conduits, Upper Slab	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer WORKS tion)	Man-Hour / m Man-Hour / m	CK 1 2 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0	.2 .4 .6 .6 .6 .6 .6 .6 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .6 .2 .7 .3 .8 .8 .8 .8 .4 .0 .6 .6 .6 .6	3 8 8 1 0 1 0 1 0 1 5 7 7 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 3 1 1 5 5 0 4 9 2 2 4 4 8 4 4 6 6 4 4 5 5 2 2 5 5 5 5 5 5 5 6 7 7 7 2 5 5 5 5 5 5 5 5 5 5 5 5 5		
25 26 27 28 30 31 31 32 33 34 35 36 37 38 39 40	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Rear Slab (40 % pre-fabricat Conduits, Rear Slab Formwork, Inner, Pull-In Reinforcement, Upper Slab & Sidewalls (40 Conduits, Upper Slab Conduits, Temporary Fixing Formwork, Front, Mounting	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer WORKS tion)	Man-Hour / m Man-Hour / m	CK 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	.2 .4 .6 .6 .6 .6 .6 .6 .6 .8 .8 .8 .8 .8 .4 .0 .6 .6 .6 .7 .3	3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .1 .5 .0 .4 .9 .2 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .6 .4 .5 .6 .7 .2 .6 .7 .2 .6 .1		
25 26 27 28 30 31 31 33 33 34 35 36 37 38 39 40 41 47	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Rear Slab (40 % pre-fabricat Conduits, Rear Slab Formwork, Inner, Pull-In Reinforcement, Upper Slab & Sidewalls (40 Conduits, Temporary Fixing Formwork, Front, Mounting Concreting, Upper Slab & Sidewalls	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer WORKS tion)	Man-Hour / m Man-Hour / m	CK 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	.2 .4 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .3 .8 .8 .8 .8 .4 .0 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .4 .4	3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .1 .5 .0 .4 .9 .2 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .7 .2 .6 .1 .3		
25 26 27 28 30 31 31 33 33 34 35 36 37 38 39 40 41 41 42 43	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Rear Slab (40 % pre-fabricat Conduits, Rear Slab Formwork, Inner, Pull-In Reinforcement, Upper Slab & Sidewalls (40 Conduits, Upper Slab Conduits, Temporary Fixing Formwork, Front, Mounting Concreting, Upper Slab & Sidewalls Temporary Fixings, Pull-out Curing	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer WORKS tion)	Man-Hour / m Man-Hour / m	CK 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	.2 .4 .6 Scheduled .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .3 .8 .8 .8 .8 .8 .4 .0 .6 .6 .6 .4 .4 .2	3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .1 .5 .0 .4 .9 .2 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .6 .4 .5 .7 .2 .6 .1 .3 .9		
25 26 27 28 30 31 31 32 33 34 35 36 37 38 39 40 41 41 44	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Rear Slab (40 % pre-fabricat Conduits, Rear Slab Formwork, Inner, Pull-In Reinforcement, Upper Slab & Sidewalls (40 Conduits, Upper Slab Conduits, Temporary Fixing Formwork, Front, Mounting Concreting, Upper Slab & Sidewalls Temporary Fixings, Pull-out Curing Formwork, Front, Dismounting	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer WORKS tion)	Man-Hour / m Man-Hour / m	CK 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	.2 .4 .6 Scheduled .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .3 .8 .8 .8 .8 .8 .8 .4 .0 .6 .6 .6 .4 .2 .8 .8 .8 .4 .2 .8 .8 .4 .2 .8 .2 .3 .3 .4 .2 .3 .3 .3 .3 .3 .4 .2	3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .1 .5 .0 .4 .9 .2 .4 .6 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .6 .4 .5 .6 .1 .3 .9 .6		
25 26 27 28 30 31 31 32 33 34 35 36 37 38 39 40 41 41 44 43	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Rear Slab Concreting, Rear Slab Formwork, Inner, Pull-In Reinforcement, Upper Slab & Sidewalls (40 Conduits, Temporary Fixing Formwork, Front, Mounting Concreting, Upper Slab & Sidewalls Temporary Fixings, Pull-out Curing Formwork, Front, Dismounting Post-Tensioning Wires, Pull-In	Carpenter Steel Fitter Building Labourer Black Smith Building Labourer Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer WORKS tion)	Man-Hour / m Man-Hour / m	CK 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	.2 .4 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .3 .8 .8 .8 .8 .8 .8 .8 .6 .6 .6 .6 .4 .2 .8 .8 .8 .8 .8 .8 .4 .2 .8 .6 .6 .6	3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .1 .5 .0 .4 .9 .2 .4 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .6 .4 .5 .6 .1 .3 .9 .6 .7 .7 .7 .7 .7 .7 .3 .9 .6 .7 .7 .7		
25 26 27 28 30 31 31 33 33 34 35 36 37 38 39 40 41 42 43 44 44 5 5	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Upper Slab & Sidewalls (40 Conduits, Upper Slab & Sidewalls (40 Conduits, Temporary Fixing Formwork, Front, Mounting Concreting, Upper Slab & Sidewalls Temporary Fixings, Pull-out Curing Formwork, Front, Dismounting Post-Tensioning Wires, Pull-In Tensioning	Carpenter Steel Fitter Black Smith Black Smith Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Black Smith Building Labourer WORKS tion) % pre-fabr.)	Man-Hour / m Man-Hour / m	CK 1 2 5 1 0 0 0 0 0 0 0 0 0	.2 .4 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .3 .8 .8 .8 .8 .8 .8 .8 .8 .6 .7 .7 .7 .7 .7 .7 .7 .7 .7	3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .1 .5 .0 .4 .9 .2 .4 .5 .2 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .6 .4 .5 .6 .1 .3 .9 .6 .7 <tr td=""> <tr td=""></tr></tr>		
25 26 27 28 30 31 31 32 33 34 35 36 37 38 39 40 41 42 43 44 44 45 46 47 47 48	Temporary Support, Mounted On Test Piles Adjustable Formwork, Mounting Steel Nose, Truss, Mounting Pre-Casting + Launching (a-long) Temporary Support, Dismounting Post-Tensioning Injection, Conduits Steel Nose, Dismounting Steel Nose, Dismounting Formwork, Side, Tilt-Up Reinforcement, Rear Slab (40 % pre-fabricat Conduits, Rear Slab (40 % pre-fabricat Conduits, Rear Slab (40 % pre-fabricat Conduits, Rear Slab Formwork, Inner, Pull-In Reinforcement, Upper Slab & Sidewalls (40 Conduits, Temporary Fixing Formwork, Front, Mounting Concreting, Upper Slab & Sidewalls Temporary Fixings, Pull-out Curing Formwork, Front, Dismounting Post-Tensioning Wires, Pull-In Tensioning Formwork, Inner & Side, Pull-Out & Tilt-Do Launching (a-long)	Carpenter Steel Fitter Black Smith Black Smith Black Smith Building Labourer Carpenter Building Labourer Steel Fitter Building Labourer Steel Fitter Building Labourer Black Smith Building Labourer WORKS tion) % pre-fabr.)	Man-Hour / m Man-Hour / m	1 2 5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 1 1 1 1 1 1 1 1 1 1 0 1 <td< td=""><td>.2 .4 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .3 .8 .8 .8 .8 .8 .8 .8 .8 .6 .6 .6 .6 .6 .6 .6 .6 .6 .8 .4 .2 .8 .6 .6 .8 .4 .6 .8 .4 .4 .6 .6 .8 .4 .6 .8 .4 .4 .6 .6</td><td>3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>.3 .1 .5 .0 .4 .9 .2 .4 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .6 .4 .5 .7 .6 .7 .6 .7 .6 .7 .6 .7 .0 .4 .1 .3 .9 .6 .7 .0 .4 .1 .1 .3 .0 .4 .2 .3 .3 </td></td<>	.2 .4 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .3 .8 .8 .8 .8 .8 .8 .8 .8 .6 .6 .6 .6 .6 .6 .6 .6 .6 .8 .4 .2 .8 .6 .6 .8 .4 .6 .8 .4 .4 .6 .6 .8 .4 .6 .8 .4 .4 .6 .6	3 8 1 0 1 0 1 0 1 0 1 5 7 5 6 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	.3 .1 .5 .0 .4 .9 .2 .4 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .8 .4 .5 .2 .6 .4 .5 .7 .6 .7 .6 .7 .6 .7 .6 .7 .0 .4 .1 .3 .9 .6 .7 .0 .4 .1 .1 .3 .0 .4 .2 .3 .3		