

COST AND RISK ANALYSIS AND ITS CONTROL OF FAST TRACK CONSTRUCTION TO SADHUGRAM IN KUMBHMELA 2015 AT NASHIK

S.B.Khatale¹, M.C.Aher²

¹PG Student, ² Professor, Department of Civil Engineering,
Ndmvps's k b t College of Engineering, Nashik, Maharashtra (India)

ABSTRACT

The name KumbhMela originates from Sanskrit in which Kumbh means a 'pitcher' and Mela means 'fair'. This event held at the bank of rivers; Ganga (Ganges) at Haridwar, confluence of river Ganges, river Yamuna and river Saraswati at Allahabad, river Godavari at Nashik and river Shipra at Ujjain. . This event is celebrated after every four years in one of this city in turned. Last KumbhMela was celebrated at Allahabad this time it's turn of Nashik to host this holy event in the year 2015. Today, fast tracking as a project delivery system has been widely implemented in several industries. Predictability of fast-track projects plays a significant role in their success. The predictability can be measured with regard to success in meeting the project's essential objectives (cost, time and quality). Fast tracking is the process of overlapping sequential activities or phases in parallel to compress the project schedule (PMI 2004). Fast tracking is a duration compression technique to shorten the project schedule usually to meet the target dates. The Cost estimation and its analysis give measures to control the cost in fast track construction of sadugram in kumbhmela 2015 at nashik. After detailed study and investigation as well as present construction status of Sadhugram in Kumbhmela fast track construction necessary to complete the work before kumbhmela. there are different phases of construction of sadhugram like plot hardening , WBM , Drainage etc. out of which WBM And plot hardening analysis is shown. Construction cost of plot hardening in kumbhmela by the conventional way of work is this Rs 1,09,50,064 and fast track costing is Rs 1,04,02,168. Construction cost of WBM road in kumbhmela by the conventional way of work is this Rs15402859.36 and fast track costing is Rs. 16464912.

Keywords: *Kumbhmela, fast-track, Construction management, Construction delays, costing, Statistical analysis.*

I. INTRODUCTION

Fast tracking is a duration compression technique to shorten the project schedule usually to meet the target dates. It generally takes place more quickly than normal. There is no boundary between a normal project and a fast track project and it is a difficult and often a stressful route to follow. Normally this will be done by overlapping or compressing some of the project phases. An effective and well known technique for earlier completion of construction projects is to overlap the project activities or phases that normally would be

performed in sequence. Fast track projects are those in which construction begins before all of the architect's drawings and specifications are complete. Also known as a Duration compression technique to shorten the project schedule usually to meet the target dates, phased construction, and the method is intended to save time by passing the traditional sequence of documentation, tendering and construction. Overlapping, also called fast-tracking technique of construction. Fast-tracking always involves risk that could lead to increased cost and some rework later.

A good rule of thumb is that sequential activities can sometimes be fast-tracked by up to 33%. In other words, if you're fast-tracking, you can start the second of two sequential activities when the first activity is 66% complete. There is risk involved. However, this seems to be a level of fast tracking risk that is normally acceptable. "Fast-tracking" is often the most effective way to shorten the duration of a project. Fast-track is a project by scheduling tasks that were originally scheduled to run one after the other to run instead at the same time.

A cost analysis (also called cost-benefit analysis, or CBA) is a detailed outline of the potential risks and gains of a projected venture. Many factors are involved, including some abstract considerations, making the creation of a CBA more of an art than a science, though a quantitative mindset is still a must-have. A CBA is useful for making many types of business and personal decisions, especially ones with a potential for profit (though this need not be the case). Although conducting a CBA can be a complex task, you do not need to be a business major to learn how to do so. Anyone who's willing to brainstorm, research, and analyze data can make a top-quality CBA.

Need of study

Due to fast track construction time required for construction minimizes but cost of construction increases to, but as if we are using fast tracking for very short span of period so to maximize the cost benefit ratio and improves the value for money by cost controlling.

Objectives

- To study the various fast track construction technique and its effects
- Cost estimation its analysis and give measures to control the cost in fast track construction to sadugram in kumbhmela 2015 at nashik
- Risk analysis and give measures to estimate the risk in fast track construction to sadugram in kumbhmela 2015 at Nashik.

Methodology

The methodology include literature study. Literature includes books, journal articles, conference proceedings, websites and reports for related work. The literature study is an iterative process that lasts during the entire study. Then costing of different items can be calculated by appropriate method. Method is selecting from the literature. Then comparison of the costing can be evaluated. Different risk can be studied according the site,nature and suggest appropriate measures to control it.

By comparing finanacial feasibility of fast track construction over the conventional method and also calculate risk associate with fast track construction and give measures to control it.

II. DATA COLLECTION

Optimum duration for Plot hardening

Table 2.1: No of Gangs and duration for Plot hardening

Sr. No.	Activity Name	160 Acers		163 Acers	
		Duration	No of Gangs	Duration	No of Gangs
1	Dressing and cleaning	9	2	11	4
2	Cutting down trees	3	2	5	2
3	Excavation for road way	6	2	17	2
4	Conveying material	11	4	21	4
5	Compaction	14	3	31	3
6	Shifting unwanted excess	11	3	14	4
7	Supply and spreading hard murum	44	10	8	18
8	Compacting sub base	35	10	21	5
9	Supply and spreading 12/10 mm	31	10	18	7
10	Providing 7 fixing indicator stone	7	4	4	3
11	Replantation	5	3	5	2

Optimum duration for WBM road

Table 2.2: No of Gangs and duration for WBM road

Sr. No	Activity Name	160 Acers		163 Acers	
		Duration	No of Gangs	Duration	No of Gangs
1	Excavation and conveying	7	10	7	10
2	Excavation for road side gutter	7	15	2	15
3	Laying CC pipes	47	13	37	13
4	Shifting excavated excess	15	20	14	20
4	Supplying and spreading hard murum	6	10	15	10
5	Compacting sub-base	10	15	6	15
6	Supplying and spreading 80mm	6	10	9	10
7	Compacting sub-base	7	10	6	10
8	Supplying and spreading 40mm	4	10	7	10
9	Supplying and spreading soft murum	2	10	4	10
10	Supplying and spreading hard murum	6	10	2	12
11	Compacting 40mm stone	3	10	5	10
12	Compacting soft hard	4	10	3	10
13	Supply and spreading 12/10 mm	3	3	3	3
14	Fixing informatory board	4	2	3	2

15	Fixing cautionary board	3	2	4	2
16	Fixing mandatory board	3	2	3	2
17	Fixing ecosolvent board	3	2	3	2
18	Fixing acrylic board	3	2	3	2

Optimum duration for Drainage line

Table 2.3: No of Gangs and duration for Drainage line

Sr. No.	Activity Name	160 Acers		163 Acers	
		Duration	No of Gangs	Duration	No of Gangs
1	Carrying out survey	8	5	10	5
2	Breaking existing asphalt	2	4	2	4
3	Breaking existing cement mortar	2	4	2	4
4	Dewatering the excavated trenches	3	8	5	8
5	Excavation for pipe trenches	2	10	2	10
6	Excavation for pipe trenches hard murum	3	8	4	8
7	Excavation for pipe trenches cement concrete	4	8	1	8
8	Excavation for pipe trenches hard murum	1	8	1	8
9	Excavation for pipe trenches MANJARA	1	8	1	8
10	Filling plinths and floors compaction	1	8	1	8
11	Laying CC M15 M20 RCC	4	8	2	8
12	Laying RCC pipes A) 200mm dia	24	23	13	23
	Laying RCC pipes b) 300mm dia	2	20	3	20
13	a) Constructing Sewer BB circular	31	10	16	10
	b) Constructing Sewer BB circular	31	10	16	10
	c) Constructing Sewer BB circular	1	10	1	10
	d) Constructing Sewer BB rectangular	1	10	1	10
	e) Constructing Sewer BB rectangular	1	10	1	10
14	a)Rebate manhole	16	10	1	10
	b) Additional manhole	9	10	5	10
	c) Rebate manhole	1	10	1	10
	d) Additional manhole	1	10	1	10
	e) Additional manhole	1	10	1	10
15	Rigid PVC pipe A) 200 mm dia	1	5	4	5
	Rigid PVC pipe B) 315 mm dia	1	5	2	5
16	Refilling trenches	5	8	4	8
17	Unwanted excess	5	8	4	8

Optimum duration for WC blocks

Table 2.4:No of Gangs and duration for WC blocks

Sr. No.	Activity Name	160 Acers		163 Acers	
		Duration	No of Gangs	Duration	No of Gangs
1	Excavation for foundation	1	2	1	2
2	Laying cement concrete	2	8	3	8
3	Fixing kerb stone	13	8	12	11
4	Filling in the plinths and compaction	1	8	2	8
5	Laying CC 50mm	66	15	57	23
6	Fixing 160mm UPVC pipe	10	14	11	14
7	BBM inspection chamber	38	10	17	15
8	Fixing UPVC pipe A) 15mm dia	5	14	7	14
	B) 20mm dia	1	8	1	8
	C) 25 mm dia	4	9	5	9
	d) 32mm dia	1	8	1	8
	e) 40mm dia	9	5	3	5
9	PVC cock	29	8	21	15
10	Ball valve A) 25mm dia	12	8	8	8
	b) 40 mm dia	7	8	5	8
11	Making ferrule connection	12	8	8	8
12	Fixing WC pan	38	15	17	23
13	Shifting unwanted excess	1	5	1	5
14	PCC	8	8	5	8

Optimum duration for Bathroom

Table 2.5:No of Gangs and duration for Bathroom

Sr. No.	Activity Name	160 Acers		163 Acers	
		Duration	No of Gangs	Duration	No of Gangs
1	Excavation for foundation	1	8	1	8
2	Laying CC	1	8	1	8
3	Fixing kerb stone	8	8	17	8
4	Filling the plinths and floor	2	8	3	8
5	Laying cc 50 mm thick	10	10	13	10
6	Fixing pvc long arm nanhi trap	12	10	8	10
7	Fixing 110 mm dia UPVC SWR	2	8	9	8
8	Fixing 110 mm dia UPVC	3	10	4	10

Sr. No.	Activity Name	160 Acers		163 Acers	
		Duration	No of Gangs	Duration	No of Gangs
9	Constructing BBM inspection chamber	38	10	25	10
10	Fixing UPVC plumbing pipe	10	10	1	10
	A) 15 mm dia				
	B) 20 mm dia	1	8	1	8
	C)25 mm dia	5	9	7	9
	D) 32 mm dia	1	8	1	8
	E) 40 mm dia	10	6	1	6
11	A) Fixing stop cock 25 mm dia	6	8	3	8
	A) Fixing stop cock 40 mm dia	6	8	3	8
12	Fixing Stop cock	4	8	3	8
13	Making ferrule connection	11	8	8	8
14	Removing rich mix concrete	1	8	5	11
15	Shifting excavated excess	1	5	1	5

Optimum duration for Stand post

Table 2.6:No of Gangs and duration for Stand post

Sr. No.	Activity Name	160 Acers		163 Acers	
		Duration	No of Gangs	Duration	No of Gangs
1	Excavation for foundation	1	8	1	11
2	Laying CC	1	8	1	11
3	Fixing kerb stone	16	8	8	11
4	Filling the plinths and floor	1	6	1	11
5	Laying cc 50 mm thick	12	8	39	15
6	Fixing pvc long arm nahani trap	46	10	20	15
7	Fixing 110 mm dia UPVC	28	10	20	13
8	UPVC pipe 15 mm Dia	3	10	4	4
9	UPVC pipe 15 mm Dia	14	10	9	9
10	Push cock	6	8	16	15
11	Ball valve	23	8	11	11
12	Removing rich mix concrete	1	8	1	11
13	Shifting excavated excess	1	6	1	8

Optimum duration for Provisional items

Table 2.7: No of Gangs and duration for Provisional items

Sr. No.	Activity Name	160 Acers		163 Acers	
		Duration	No of Gangs	Duration	No of Gangs
1	Providing brick masonry	2	6	2	6
2	BBM	12	8	12	8
3	Dismantling BM in lime	5	8	5	8
4	Internal plaster 12mm	1	6	1	6
5	External plaster	9	8	9	8
6	UCR	1	8	1	8
7	Dismantling UCR	1	8	1	8
8	Providing thick pointing	1	8	1	8
9	Laying CC	1	9	1	9
10	Laying CC	1	8	1	8
11	Casting RCC column	1	8	1	8
12	Casting RCC beam	1	8	1	8
13	Casting RCC slab	1	8	1	8
15	Removing lean or lime concrete	1	8	1	8
16	Removing rich mix concrete	1	8	1	8
17	Dismantling the RCC	1	8	1	8

III. DATA ANALYSIS

CONVENTIONAL CONSTRUCTION						
Sr No	ACTIVITY	DURATION	GANGS	RATE	HRS/DAY	COST
1	Dressing and cleaning	25	1	900	8	180000
2	Cutting down trees	10	1	1300	8	104000
3	Excavation for road way	58	1	3300	8	1531200
4	Conveying material	82	1	1300	8	852800
5	Compaction	93	1	1300	8	967200
6	Shifting unwanted excess	28	1	1300	8	291200
7	Supply and spreading hard murum	79	1	2900	8	1832800
8	Compacting sub base	156	1	1905	8	2377440
9	Supply and spreading 12/10 mm	108	1	2900	8	2505600
10	Providing 7 fixing indicator stone	27	1	954	8	206064
11	Replantation	8	1	1590	8	101760
	TOTAL COST					10950064

Fast Track Costing of plot hardening

Sr No	ACTIVITY	DURATION	GANG	RATE	HRS\DAY	COST
1	Dressing and cleaning	11	4	1300	8	457600
2	Cutting down trees	5	2	1300	8	104000
3	Excavation for road way	17	2	1300	8	353600
4	Conveying material	21	4	2000	8	1344000
5	Compaction	31	3	937	8	697128
6	Shifting unwanted excess	14	4	2000	8	896000
7	Supply and spreading hard murum	8	18	1905	8	2194560
8	Compacting sub base	21	5	2720	8	2284800
9	Supply and spreading 12/10 mm	8	7	1905	8	1920240
10	Providing 7 fixing indicator stone	4	3	1300	8	124800
11	Replantation	5	2	318	8	25440
TOTAL COST						10402168

COMPARISON OF COSTING OF WBM ROAD

Sr No	Fast track Duration	conventional Duration	conventional gangs	fast track gangs	hrs/day	Rate	Fast track costing	Conventional costing
1	7	80	1	1	8	1300	72800	832000
2	2	95	1	15	8	1300	312000	988000
3	37	220	1	13	8	1300	5002400	2288000
4	14	265	1	20	8	2000	4480000	4240000
5	15	156	1	10	8	1300	1560000	1622400
6	6	53.6	1	15	8	725	522000	310880
7	9	134.86	1	10	8	2000	1440000	2157760
8	6	53.6	1	10	8	725	348000	310880
9	7	67.22	1	10	8	2000	1120000	1075520
10	4	33.71	1	10	8	2000	640000	539360
11	2	18.9	1	12	8	725	139200	109620
12	5	53.6	1	10	8	725	290000	310880
13	3	31.77	1	10	8	2000	480000	508320
14	3	27.94	1	3	8	318	22896	71079.36
15	3	10	1	2	8	318	15264	25440
16	4	5	1	2	8	318	20352	12720
TOTAL COST							16464912	15402859.36

IV. CONCLUSION

After detailed study and investigation as well as present construction status of Sadhugram in Kumbhmela fast track construction necessary to complete the work before kumbhmela..Construction cost of plot hardening in kumbhmela by the conventional way of work is this Rs 1,09,50,064 and fast track costing is Rs 1,04,02,168.Construction cost of WBM road in kumbhmela by the conventional way of work is this Rs15402859.36 and fast track costing is Rs. 16464912.

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