Implementation of Value Engineering For Residential And Commercial Building

Er.Vivek Bansod¹, Prof. Milind M. Darade²

^{1, 2} Dept of Civil Engineering ²Assistant Professor,Dept of Civil Engineering ^{1, 2} D. Y. Patil School of Engineering & Technology, Lohegaon, Pune

Abstract- Infrastructure development in construction industry is a key driver in socio economic development of the country. As construction industry play a vital role in economic growth and development of the country. globally, the predicted growth in construction industry is 70% more by 2025 it is in need to have proper construction techniques which are value effective.Value engineering is a systematic application of recognized techniques which identify the functions of the product or service, establish the worth of those function and necessary function to meet the required performance at the lowest overall cost. Value engineering concentrates on the effectiveness through stating function, goals, need, required and desires. Value engineering concept was started by Mr. Lawrence D. Miles during 1940's. He worked for general electric company (GCE), USA. which faced scarcity of strategic material needed to produce their products during world war-II. Indian Value Engineering Society (INVEST) is a professional society established in October, 1977 and dedicated to the advancement of value engineering through education. INVEST is affiliated to the society of American value engineering(SAVE). Various cost reduction technique are as follows- "Thinner walls or single brick thick walls", "Load bearing brick work", "Brick on edge cavity wall", "Precast stone masonry blocks", "Modular brick masonry walls", "hollow clay blocks of shell type houses", "Sundried brick walls with waterproof treatment", "precast hyperbolic shell for roofing". All these techniques comes under "Value Engineering

Keywords- Value Technology, INVEST, SAVE capital project, scope creep, cost effectiveness

I. INTRODUCTION

1.1 General

Value engineering is a systematic application of recognized techniques which identify the functions of the product or service, establish the worth of those functions, and provide the necessary functions to meet the required performance at the lowest overall cost. Value engineering concentrates on the effectiveness through stating functions, goals, needs, requirements and desires. Value (V) = Function (F)/Cost (C)

Where, V is Value, F is sum of total function performance and C represents cost paid for it.

The relation of F and C shows that lower the cost for optimum function, better the value.

VALUE ENGINEERING: VE is the process of finding systems or methods of achieving the same programmatic goals using a different system that do not materially affect the desired outcome.

Some examples might be:

- Looking at the cost differences between steel and concrete structural systems.
- Using different mechanical equipment with similar characteristics.
- Reducing the lighting levels due to day-lighting; combining office functions into one space.
- Changing the building shape to improve the exterior wall to floor area ration.
- Reducing finish allowances.

Value engineering is typically able to reduce the cost of a project by 5% to 10% beyond which more aggressive methods must be used Alternatives are portions of the work that can be deferred until later in the project when more is known about how much of the project contingency bidding can be applied to the desired work. Alternatives are often items that may have another source of funds such as Deferred Maintenance monies, which might be done separately. They might also be areas of planned programmatic growth that will not be needed when the building is finished and can be "shelled" for a future project. Alternatives are best applied at later stages of design because history has shown that many alternatives at this stage cannot be afforded later in the project, thus they become de facto scope reductions. Scope Reductions are perhaps the most difficult aspect of any project because they are usually permanent reductions in quantity or quality of program space. Scope reductions at this point might include:

- Reducing the number or size of rooms
- Eliminating special features that would enhance a program
- Reducing the volume of space
- Eliminating special mechanical systems or features
- Reducing the site area impacts.

`There is often a tendency on projects to try to gain more scope within the budget. This is known as "scope creep" and so it is important to verify the design against the original program plan on which the budget was based. The first round of scope reductions tend to be areas where the design exceeds the original program plan before moving into other reduction areas. Ultimately, most projects are able to achieve a balanced budget. If that is not the case, additional funds might be diverted out of project contingency or it may be necessary to raise the total project budget through a program plan amendment. This requires documentation and submission back through the Approval Phase causing a delay of four to six months, thus it is important that project team work diligently to contain project costs. Anyone concerned with the cost of a construction project has heard of value engineering. Does the original vision of a palatial structure threaten to exceed the budget? The answer is often, "Let's value engineer that "Sometimes, value engineering looks like the solution to every budget problem, the magic wand that makes costs shrink and budgets balance. But what is it really? Is value engineering just a marketer's spin on cost cutting, a way to make settling for less palatable? If so, the term is being misused. As the federal government defines it, "Value engineering attempts to eliminate, without impairing essential functions or characteristics, anything that increases acquisition, operation or support costs" So reducing the size of a building by 10 percent or eliminating a media canter would cut costs - but it would not be value engineering.

II. LITERATURE REVIEW

Amit Sharma, R.M. BelokarValue Engineering is an organized/systematic approach directed at analysing the function of systems, equipment, facilities, services, and supplies for the purpose of achieving their essential functions at the lowest life-cycle cost consistent with required performance, reliability, quality, and safety[1]. Society of Japanese Value Engineering defines VE as: "A systematic approach to analysing functional requirements of products or services for the purposes of achieving the essential functions at the lowest total cost" In this paper we have discussed the concept of Value Engineering, its job plan and the effective implementation of it through a case study. Efforts have been put into the articulation of the paper to make it coherent which can be easily perceivable. A case study has been discussed in this paper involving a part used in the medical instruments. The material is chosen such that the cost is reduced without affecting the quality of the product. The best feasible solution from the available alternatives is chosen through the feasibility ranking table. Through the application of Value Engineering profits are maximized without hindering the reliability of the product. With the effective utilization of the technique the final outcomes comes out to be a successful showcase of value engineering.

K. Ilayaraja and MD. Zafar Construction industry is an index of growth of a nation. The real estate sector in India has assumed growing importance with the liberalization of the economy. Today, the construction industry is the second largest employing skilled and semiskilled labor after agriculture and plays an important role in nation's economy. Due to increase in business opportunity and migration of labor, the demand for commercial and housing spaces has also increased. According to the tenth five-year plan, the estimate of shortage in urban housing is accessed to be 8.89 million units. As of now, the housing and construction industry employs 30 million people and about 250 industries are associated with construction industry directly or indirectly. It includes hospitals, schools, townships, offices, houses and other buildings as well as urban infrastructure, highways, roads, ports, railways, airports, dams, power plants Value engineering is a methodology used to analyse the function of the goods and services and to obtain the required functions of the user at the lowest total cost without reducing the necessary quality of performance. Many a time, Value Engineering (VE)is confused with cost cutting exercises in construction industry. The essential difference between conventional cost cutting and VE is that it involves reducing the cost by improving the functionality through lesser consumption of energy in terms of manpower, materials and machines. In the initial stages VE was used by production engineers for reducing the cost of manufacture. However, it was found that the benefit of VE is much greater if multidisciplinary teams of engineers were involved which would also influence the design team that is normally the case in construction

Li Ning Value engineering, a subject about technology and economy dedicated to improve the function of product or system, and reduce the cost of product or system, therefore with the lowest life cycle cost to meet customers' requirements about function. The application of value engineering focuses on the design phase of the research of

IJSART - Volume 5 Issue 7 – JULY 2019

development of the product, which is an important characteristic of value engineering. Compared with other countries, there is certain disparity in both the theoretical research and practical application of value engineering in the construction industry in our country. Therefore we have to catch up. So using value engineering methods to control cost in the most productive phase of value engineering design phase bears great practical significance. At abroad, the construction industry is the main area applying value engineering. In China, apart from industry business, the construction industry is the most important area involving the application of value engineering.

JianyuZhaoImproving the effectiveness of production control has attracted the interest of researchers and lean construction practitioners over recent years, through techniques such as Last Planner System (LPS) and Locationbased Management System (LBMS). However, in these techniques, data collection and analysis still remain manual. Remotely locating workers on site has been suggested as a potential technology to collect crucial data required for production control. The purpose of this study is to test the applicability of a real-time tracking system for collecting data for production control in different types of construction projects. We applied Bluetooth Low Energy (BLE) technology in real-time tracking of workers in three case projects, including residential, office building, and plumbing renovation. We compared various tracking device placement strategies and analyzed the share of uninterrupted presence of workers in work locations based on the collected data

III. METHODOLOGY

1. CLC bricks

Use of CLC (Siporex) bricks, will increase the total cost of construction but, it decreases total dead load, as they are lighter in weight. At the time of earthquake, total load of the structure on the foundation, will be less thus, the intensity of earthquake would act to a lesser extent. Time required to construct any structure is less i.e., construction is easy & construction cost n labour cost also less.





Figure 3:Siporex brick

2. Cavity wall

We are using hollow CLC bricks for cavity wall. It will reducing the overall load of structure. It will be more beneficial because it gives better insulation resistance. Leakage can occur through the outer leaf through joints between bricks and mortar. It avoids moisture passing through the wall.

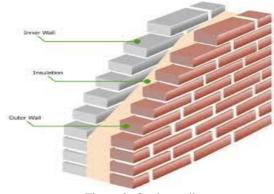


Figure 2: Cavity wall

3.800 x 800 granite

Granite is an igneous rock formed from volcanic activity. Granite tile remains a popular flooring choice because of its overall resiliency, strength, and number of unique colour options. Our premium surface granite tile selection offers over 50 colour patterns. We Are using 800X800mm granite For flooring of project, whether it is for residential or commercial use

4. Mivan Technology

Mivan is basically Aluminium formwork system. Mivan system was invention by Construction Company from Europe. In 1990, Mivan Company from Malaysia start manufacturing formwork, then after give name MIVAN. This technology is extensively used in Europe, Gulf country and Asia. Formwork is defined as the temporary structure whose

IJSART - Volume 5 Issue 7 – JULY 2019

purpose to support the building structure. The progress of the formwork equidistant with the progress of concrete construction through the 20th century. Modern technology must be required in this time because of increasing the population and land available for constructing houses in limitation. For mass housing project, it is essential to know the new technology for completion of project in fast rate, stand to good quality and able to withstand wear. Mivan technology is capable to constructing a huge no. of houses within short period. Mivan formwork is easily removed. All the activity can arrange in simple manner and get result more accurate, well regulate and high quality production at economically with less period

3.1 Problem Statement

Study Area 1 - Amar Landmark Site Details:

- Site name :Amar landmark
- Address: Near green park hotel pashan.
- Name of Builder: Amar Builder
- Name Contractor: SJ construction.
- Architecture: MOCO design
- Structural consultant: J+ W
- Total Area:2.8 acres
- Built-up Area:15570sq ft
- Type of building: Residential.



Study Area 2 - Devraai Residential Building Site Information

Name of the site: Devraai Phase-2 Location :Kiwale, Pune Site Area : 2125 m2

Page | 299

Built up Area : 3103.48 m2 Air-conditioned Area : 0 m2 Non Air-conditioned Area : 3103.48 m2 Typology : Residential apartments Energy consumption reduction : 84.5% reduction in energy consumption compared to

Energy Performance Index (EPI) : 15.5 kWh/m2/year

Renewable Energy : Rated capacity of solar PV installed on site – 3 kW

Solar hot water system met 96% of the conventional energy demand for hot water



IV. RESULT

4.1 DATA ANALYSIS OF CASE STUDY - 1

Sant hat *	A Cut Fig Copy - Faste + of Format Painter	seRa + 9 R = <mark>2</mark> + <u>A</u>		×** 098	Aark on Track lespect Links nactivate	 Manually Schedule 	Auto Schedule	inspect Nov	Node 1	Task Sa	itan mary M	letane (telocable	Inform		Notes Details Add to Timeline	Souli File	e
len	Cipboard	feet	6	Schedule			Te	ieks			Itsi	et .			Prop	etes	Editing	
	Task Name	Fied	Foed Cost	Tetal Cod	Sectine •	Vielana -	Intel .	Interior	Art New Co	dan -	2030 Exb. M	Qtr2,		Qr3,3		Q14,2020	2021 Qtr 1, 2021 L Jan Feb Mar	06-2, 25 far: 14
142		7100		71105000		2010		1105000	Para men ca		100 11	- 192					Labour 1 Labou	
14		1015		\$1,740.00		10.05		\$2,740.00								er 3,Steel(1 kg		
14	Vater Tank Val Shatter	e 2000	Promised	13,500.00	\$3,6100	20.05	71.00	1.6000					Car	painter	3 Carpain	nter 4, Carpain	nter 5, Carpainter	,Shut
148	Water Tank Wall Centing	1005	Protect	\$11,050.00	\$11,050.00	20.05	10.05	11,050.00					14	gregate	1 Brass)	Cement 1 ba	gl Labour 1, Labo	ar 2,La
14	Water Tank wall top slah shuttering	1005	Protect	\$1,360.00	11,351.00	0.05	11.00	1,5600					G	painter	1,Carpai	nter 2,Carpain	nter 3,Skuttering	1 Plat
150	Water Tank wall top slab reinforcement	\$0.0	Promod	\$1,390.00	\$ 1,390.00	\$0.00	100	1,390.00								er 3,Steel 1 k	-	
151	Cuting	teo	Posted	£11,000.00	₹ 11,05E.00	\$0.00	1100	* 11,050:00					1.1		e(1 Brass)	Cement[1 ba	ng],Labour 1,Labo	er 2,L
152		100		\$0.05	₹1.00	10.05							46	a a				
153		10.05			\$ 155,777.00			1,976,536.00					1					
163		10.05			₹ 114,458.00	\$0.05		0 8 216,456.00						1	+ 9/1			
16		£1.00			₹ 124,651.00	\$ 0.80		8 124,650.00						-р.				
112		£ 6.00			₹ 90,800.00	\$ 0.10		0 ₹ \$1,800.00										
17		1003		t 22,990.00		\$ 0.00		t 22,950.00									1, Mistri 2, Mistri	
175		1003		\$ 22,990.00		\$0.00		1 12,990.00									i 1,Mistri 2,Mistr	
175		1003		\$ 22,930.00		\$0.00		\$ 21,950.00									tri 1, Mistri 2, Nis	
173		1003			\$ 22,950.00	\$ 0.10		\$ 21,950.00							Cers	ent[1 bag],Mi	istri 1, Mistri 2, Mi	stri 3,1
175		C LO			11,717,531.00			1,006,866.00				-	-	-				
130	CPVC)				₹ 65,000.00	80.05		0 1 65,000.00										
181	Grannd Floor	£2.00	Posted	\$1,500.00	£7,500.00	10.00	t 1.00	0 81,500.00			Plumbs							
182	lst.Floar	t 0.03	Posted	\$1,500.00	£ 7,500.00	\$0.00	t 1.00	0 01,500.00					NC[1 WC					
183	Ind Floor	1003	Promited	\$1,500.00	£7,500.00	\$0.00	t 1.00	£1,500.00					umber W					
154	3rd Floor	1003	Promod	\$1,500.00	\$ 7,500.00	\$ 0.10	\$1.00	0 01,500.00					WC[1W					
185	4th Floor	1003	Prented	\$1,500.00	£ 7,500.00	20.00	1100	0 01,500.00			P				nber WC			
198	3th Floor	100	Presid	\$1,500.00	\$ 7,500.00	20.00	100	0 01,500.00				Plu				er WC(1 WC)		
187		1003	Promited	\$1,500.00	\$ 7,500.00	20.00	\$1.00	\$ 1,500.00					Plant	er(1 Ba	(meent)	Plureber WC	T WC	
122	7th Floor	1005	Presid	\$1,500.00	\$7,500,00	20.00	10.0	\$1,500.00		•			1 1	Plumbi	eril Bath	druk (moon	er WCI1 WCI	

CLC Brick Work takes less Cost but take more Duration

T Us		Resour	ce Sheet Z News	Outine 1	bles Grou	light (No Hig No Filt p by: (No Gic	e] •	imescele Venths	Zoom Entire Sel	Q cted	Tindire Details			Nev Window			Meores Y	
	Task Views	Resource Vi	ews		Data				Zoom		Sp.	R.Vev			Windew	3021	Maoss	
	Task Name 🔹	Fixed Cost +		Total Cost 🗸	Easeline +	Valance +	Actual *	Remainir •	Add New Column 🔹	2020 Feb III	Qtr 2, 2 tar Apr M		20 3, 202 Jul Au		Qtr 4, 2020 Oct. Nov. D	Qtr 1, 2		(† 2, 30 pr 11
6	Slab Casting	100	Promited	11,090.00	11,050.00	10.00	100	₹ 11,050.00		T		Aggre	igate[1	Brass),	Cement(1 ba	g] Labou	r 1, Labou	2,Lab
46	water task Vall Reinforment	1000	Prated	81,740.00	12,740.00	₹0.00	100	₹2,740.00				Fitter	1,Fitte	r 2,Fito	er 3,Steel 1	yl		
47	Water Tank Wall Shuttering	1003	Pranated	\$3,610.00	13,600.00	20.00	110	13,6100				Carpo	ainter 3	Carpai	nter 4, Carpa	inter 5,Ca	rpainter 1	Shutt
48	Water Tank Wall Casting	£6.00	Pratated	₹11,050.00	₹11,050.00	₹0.00	₹1.00	₹11,050.00				Aggr	egate[1	Brass	Cement(1 b	ag] Labor	ir 1,Labou	r 2, La
49	Water Tank wall top slab shuttering	1000	Printed	\$1,360.00	1,380.00	₹0.00	10.00	\$1,390.00				Carps	ainter 1	,Carpai	nter 2,Carpa	inter 3,5	uttering	Plat
50	Water Tank wall top slab seinforcement	100	Pranted	\$ 1,390.00	1,390.00	₹0.00	100	\$ 1,390,00							er 3,Steel(1			
51	Water Tank wall top slab Casting	1000		\$ 11,090.00		₹0.00		₹ 11,050.00						1 Brass	[Cement]1	sagi, Labo	ur 1,Labo	ar 2,1a
2	0.H.W complete	1000		20.00	1000	10.00	1100	1000				∲ 6/3						
53	BRICK WORK	(L)		1,866,900.00		E 1,366,900.00		7,506,500.00						-				
8	# PLASTER	(13)			₹216,450.00	60.0 S		₹216,450.00					•	8/24				
64) INTERNAL	100			0124,650.00	\$ 0.00		1114,650.00					h.					
74	# EXTERNAL	100			₹ 91,800.00	\$ 0.00		₹91,890.00										
75	East	1003			₹ 22,950-00	¥ 0.00		₹ 22,950.00							bag) Mistri			
76	West	£000		₹22,350.00		₹0.00		₹22,950.00					1 1		1 bag] Nistr			
π	Noth	1000			\$ 22,950.00	\$ 0.00		\$ 22,950.00							t[1 bag],Mis			
78	Secto	1000			\$ 22,990.00	10.00		₹ 22,950.00						Сете	nt(1 bag),N	istri 1,Nis	tri 2,Nist	(3,Mi
79	# PLUMBING & SANNITARY	E LOI			81,717,531.00			2,090,856.00										
80	 INTERNAL (CONCEALED CPVC) 	EEN			£ 65,000.00	60.0 S		₹ 65,000.00										
81	Ground Floor	£000		\$1,500.00	\$7,500.00	₹0.00		₹7,500.00		100 T	WC[1WC							
12	Ist Finer	1000		\$1,500.00	17,500.00	10.00	10.00				urber WC							
В	2nd Floor	1003		\$1,500.00	\$7,500.00	¥ 0.00	100				om), Plum		WC					
14	3rd Floor	£6.00			£1,500.00	₹0.00	\$1.00			i na	lumber W							
B	Ath Floor	\$000		\$1,500.00	\$7,500.00	₹0.00				Pk	mber[1 Ba							
86	3th Floor	1000		\$1,500.00	17,5000	₹ 0.00		₹7,500.00							WC[1 WC]			
87	6th Floor	1003	Pravated	\$7,500.00	115000	20.05	100	\$7,500.00			1.1	Plumberl	1 Bithr	poent P	urrber WC	1 WCI		

4'' (Conventional)Brick Work takes less Cost but take more Duration

In Above the MSP Scheduling we have use CLC Bricks to reduce time and cost of the project as compare to Conventional Brick Work

ł		, Gother)	ce Sheet + ZN Sent News + +	Outine Ta	bles Gou	light (No Hig No Fib p by: (No Gre	e] •	limescale: Months	Zoom Entire Sele	sks	PE Switch Windows* Arrange Al Move Hide* Macros
	Task Views	Resource Vi	BWS		Deta				Zeem	Split View	Window Macros
	TekNene 👻	Fired Cest +	Fixed Cost Accrual +	Total Cost +	Esseine +	Variance +	Actual 👻	Remainir •	Add New Column 👻	2020 Qtr 2, 2020 Feb Mar Apr May Jun	Qtr 3, 2020 Qtr 4, 2828 Qtr 1, 2021 Qtr 2, 20 1 Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr M
53	4 FLOORING	(L) 5	Prorated	1,985,864.00	₹ 69,461.00	E1,916,400.00	10.05	1,885,864.00			
54	 FLOORING AND SKERTING 	t 0.00 \$	Prorated	t 404,095.00	₹ 30,896.00	\$ 373,200.00	\$1.00	₹ 404,096.00			п
63	WINDOW MARBLE FRA	6103	Prorated	₹3,176.00	£3,1%.00	₹8.00	₹1.00	₹3,176.00			1
72	> TOILET FLOORING	10.00	Prorated	\$ 29,695.00	\$ 29,696.00	\$ 8.00	1005	\$19,696.00			
\$1	> TOILET DADO	01.05	Prorated	₹5,696.00	₹5,696.00	10.05	10.05	15,696.00		1	
90	4 PAINITING WORK	₹0.00	Prorated	₹150.00	₹ 250.00	₹8.00	100	₹250.00			-
51	INTERNAL PAINTING	10.05	Prorated	₹ 150.00	₹ 150,00	₹ 8.00	100	₹ 15L00			7
82	 EXTERNAL PAINTING 	£0.00	Prorated	₹100.00	\$ 300.00	¢ 0.00	\$1.00	\$ 100.00			
8	East side	£0.03	Promited	₹20.00	₹20.00	₹0.00	\$1.00	£21.00			Painting External(1 Sqft)
64	West side	10.00	Promited	\$ 30.00	\$ 20.00	\$ 0.00	\$0.00	t 20:00			Painting External[1 Sqft]
05	Ducts	10.05	Provated	\$ 30.00	₹ 20.00	\$0.05	1005	₹ 20.00			Painting External (1 Seft)
06	South side	£0.00	Promated	₹20.00	₹20.00	₹0.00	\$1.00	£21.00			Painting External[1 Sqft]
53	North side	10.00	Promited	\$ 20.00	\$ 20.00	\$0.00	2000	\$20.00			Painting External 1 Sqft
80	4 CARPENTRY WORK	10.05	Prorated	₹ 25,200.00	₹25,300.00	20.05	71.00	125,200.00			_
09	FIXING OF DOOR FRAMES	₹0.00	Prorated	₹25,200.00	12,200.00	60.05	\$1.00	£15,200.00			
119	FIXING OF DOOR PANELS AND DOOR A PANELS AND DOOR ACCESSORIES	CEESORIES	Prorated	£ 0.00	0.05	\$ 0.00	₹ 1.00	₹ 6.00			п
23	# LPVC WINDOWS	10.00	Prorated	\$ 13,500.00	\$13,500.00	\$ 8.00	110	\$13,500.00			1
80	Ground Floer	10.00	Provated	₹1,500.00	£1,500.00	20.00	20.05	1,500.00			Window(1 no)
31	1st Floer	£0.00	Provated	₹1,500.00	£1,500.00	₹0.00	1005	₹1,500,00			Window[1 no]
82	2nd Floor	₹0.00	Promited	\$1,500.00	\$1,500.00	\$0.00	1005	\$1,500.00			Window(1 no)
83	3rd Floor	10.00	Promited	₹1,500.00	₹1,500.00	20.05	2005	₹1,500.00			Window(1 no)
84	4th Floor	£0.03	Provated	₹1,500.00	₹1,500.00	₹0.00	1005	₹1,500.00			Window(1 no)
85	5th Floor	10.00	Provated	₹1,500.00	₹1,500.00	\$0.00	1005	₹1,500.00			Window(1 no)
35	6th Floor	10.00	Provated	\$ 1,500.00	\$1,500.00	20.05	20.05	1,500.00			Window(tino)//indows
	7th Floor	1003	Povstal	\$1,500.00	₹1,500,00	2005	110	₹1,500,00			Window [no] tings to activate Windows.

600 x 600 Flooring increase Cost and Duration too

t,	Peste + V Format Painter	2	<u>0</u> • <u>4</u> •	1 3 3 3 3		lark on Track Ispect Links activate	* 📌 Manually Schedule	Schedule	inspect Move	-	Tek Su			Deiverable ,	• Informatio	S Add to		Scroll R R	ear *
N	Clipboard	Ford	1 5		Schedule			Ta	nks			le	sert			Properties		Editing	
	Task Name			Fixed Cost Acoual +	Total Cost 🗸	Steine .	Valance +	Artial +	Remains .	Acid New	Column .	2020 Feb 1		2020 May kin	Qtr 3, 2020	Qtr4,1 Sec. 0.4		Qtr 1, 2021 Jan Feb Mar	Q12,2
238	 Parking Level & SubStation 		₹1.00	Proceed	£0.03	₹1.00	₹6J0							1					
239	Electrical Trench a Sobstation	nd	₹0.00	Prosted	¥0.00	₹0.00	₹0.00	₹1.00	0.05			-							
240	Electrical Equipment and Panel	sa	20.05	Prested	10.03	2000	1010	2000	20.00					1					
241	Installation of Ele work	nial	20.00	Prented	₹0.00	\$0.00	₹0.00	1000	0.05										
242	Testing & Comiss	ioning	\$100	Promited	£0.03	\$0.05	£010	₹1.00	0.05										
243	WATER PROOFING		₹1.00	Prorated	₹30,412.00	E 1,642,991.00	1,612,539,00)	₹1.00	E31,412.00			-		-					
253	# FLOORING		10.05	Prorated	1,905,864.00	₹ 68,464.00	1,836,400.00	1005	1,905,864.00			-							
254	> FLOOBING AND SAERIING		₹1.00	Procated	₹314,096.00	₹30,896.00	₹283,200.00	₹1.00	₹324,096.00						1				
263	> WINDOW MARSEN	FRA	£1.00	Provated	83,176,00	£3,176.00	₹600	₹1.0	\$3,15600						1				
272	> TOILET FLOORIN	Ģ	10.05	Prorated	₹29,696.00	£19,696.00	₹0.00	1005	13,696.00										
281	> TOILET DADO		₹1.00	Prorated	₹5,696.00	₹5,8%00	₹LU0	₹1.0	₹5,6%00			-			1				
290	# PAINITING WORK		₹1.00	Provated	£190.00	£29.00	₹600	₹1.0	E 150.00			-							
291) INTERNAL PAINTING		₹8.00	Proceed	₹150.00	₹ 150.00	₹ 6.00	₹1.00	\$ 150.00			-							
302	4 EXTERNAL PAINTING		₹1.00	Prorated	₹100.00	₹100.00	₹0.00	₹1.00	₹100.00										
303	East side		₹0.00	Pronted	₹20.00	₹20.00	£000	₹0.00	₹20.00						Paint	ing Externa	l(1 Sqft)		
304	West side		\$0.05	Printed	\$ 20.00	\$20.00	8000	20.00	\$ 20.00						Pain	ting Extern	al(1 Sqft)		
305	Ducts		₹0.00	Provided	₹20.00	₹20.00	₹000	10.05	t 20.00						Pai	nting Exter	nal 1 Sqf	1	
306	South side		₹0.00	Protect	₹20.00	₹20.00	₹0.00	100	£ 20.00						Pa	inting Exte	malij1 Sq	ft]	
307	North side		10.00	Printed	₹ 20.00	₹20.00	₹0.00	20.05	7 20.00						∎ P	ainting Ext	emal(1 S	(ft)	
308	4 CARPENTRY WOR	ĸ	₹1.00	Prorated	₹25,200.00	£15,200.00	₹6.00	₹1.0	£15,200.00			-							
309	> FILING OF DOI FRAMES	DR	₹1.00	Provaled	₹15,200.00	£15,200.00	₹6.00	₹1.00	₹ 15,200.00										
319	 FINING OF DOI PANELS AND D ACTESORIES 		₹ 8.00	Procated	80.05	£ 0.00	₹ 8.00	\$1.00	0.00 \$										
329	4 UPIC WINDOWS		71.00	Provated	₹13,500,00	211500.00	710	210	E13.50.00						Go to				IS.

800 x 800 Granite tile use Flooring takes more Cost but less Duration

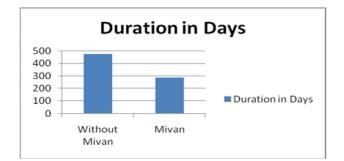
In Above the MSP Scheduling we have use Granite having Size 800 mm X 800 mm to reduce time of the project as compare to 2^{nd} Project we use tile having size 600 x 600 It reduce cost but it take more time As compare to 1^{st} project **4.2 DATA ANALYSIS OF CASE STUDY – 2**

FLE	IJ	SK RE	SOLIRCE	REPORT PROJECT VEW FORMAT			E		М	8	Sign in
	θ	Task Mode v	W95	TexhNeme	• Duration	• Stat				19 21 April9 28 April9 05 Ma T S W S T F M	
1			1	4 DEVRAL	(145 days)	Sat 30-03-19					
2	-		11	4 MOBELISATION	3 dans	Sat 39-03-19		a 02-04			
3			10	Mobilization of site	2 dens	Sat 30-05-19					
4			112	Mobilisation of Civil contractor	3 dass	Sat 30-08-19					
5			11	4 SUBSTRUCTURE	70 days	Wed (50419		-			
6			121	LARTHWORK	4 days	Wed 03-04-19					
7			122	EXCAVATION-Tower Asta) days	Man 08-04-19				B Labour 1 Labour 2	
8	J		123	PCC below foreines	6 ders	Tue 16-04-19			-	Labour 1 Labour 2 App	ecata (5 Brass
9		5	124	Centre line checking and approval from Arch.	3 days	Toe 13-04-19			- 1		
10		-	125	Footing Stuttering	4 days	Fit 28-44-19				Carpainter	Carpainter 2
11			126	Footing Reinforcement	3 ders	Sat 27-04-19				Fitter 1, Fitte	er 2, Fitter 3 Fi
12			123	Footing Casting	5 days	Wed 00-05-19					Labour 1,La
13			123	Plath column Stattering	6 days	Fi: 10-15-19					-
14			123	Planth Column Reinforcment	4 ders	Man 13-05-19					5
15		-	12.10	Plath column Casting	9 days	Fei (145-19					
16		-	12.11	Footing Excertation Filling	4 deys	Tue 18-05-19					
17		-	1212	Pinth Beam Shuttering	7 days	Sat 11-06-19					
18		-	12.13	Pinth bean Reinforcement	4 deys	Wed 05-06-19					
19		4	12.14	Plath Bean casting	4 days	Man 11-06-19					
21		-	1215	Hing	3 days	Fei 14-06-19					
21		4	12.16	Compaction	2 days	Toe 18-06-19					
22		4	1217	Plinth Level State Casting	3 days	Thu 20-06-19					
23		4	12.18	Rinh	0 deys	Sat 22-06-19					
24		4	13	4 SUPERSTRUCTURE	401.5 days?	Sat 12-06-19					
ä		4	131	+ RCC WORk	303.5 days	Sat 12-06-19					
ä		5	1311	# Ground floor	59.5 days	Sat 22-06-19					
27		5	13111	Ground Floor Column Reinforcement	13 days	Man 24-06-19					
28		4	13112	Ground Floor Column Stations	11 days	Sat 29-06-19					
29		5	13113	Ground floor Column Casting	14 days	Wed 05-07-19					
30		5	13114	Ground to 1st slab Staircase Shuttering	2 deys	Ed: 19-47-19					

IJSART - Volume 5 Issue 7 – JULY 2019

1 4 400 6.7.6.0.0 Filter (Filter 2 filter (Stater Stater S	E	D	9C 8	ESOURCE	REPORT PROJECT VIEW FORMAT				Signin #
Image: NST - NST - NST - Nation - Decision - Decision <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>									
Image 1 ADDRESSING Margo Margo <t< th=""><th></th><th>θ</th><th></th><th>· WBS ·</th><th>Tack Name</th><th>Dustion</th><th>* Sat</th><th></th><th></th></t<>		θ		· WBS ·	Tack Name	Dustion	* Sat		
1 4 Mathematical Constant 2 page Models Mathematical Constant 2 page Models Mathematical Constant 2 page Models Mathematical Constant Mathemat	1			1	4 DEVRAUMina	190 days	Sat 30-03-19		
4 9 1.1 Monitorial Generation 3.60 M.0.5.9 Tot 4 8 1.1 Monitorial Generation 1.60 M.0.5.9 Tot 7 9 1.1.1 CORRECTION M.60 M.0.5.9.1 M.0	2	-	-	11	4 MOBILISATION	3 days	Sat 30-03-19	Tue 0	a (2-04
Image Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res Name Res Name Res Name Res Name Res Image Res N	3			111	Mobilization of site	2 days	Sat 30-08-19	Mag (
0 m 121 # LEUT 9005 60 deg form Man 199 form 2 m 121 DECULUES Conv. form form Man 199 form 3 m 121 DECULUES Conv. form form Man 199 form 4 m DECULUES Conv. form form Form 199 <	4			112	Mobilization of Civil contractor	3 days	Sat 30-03-19	Tee II.	e
1 1 DECONSTRUMENT 7 mm Mon8A99	5		-	12	4 SUBSTRUCTURE	66 days	Man 08-84-19	Sat 1	1
1 1	6			121	4 EARTH WORK	66 days	Men 08-04-19	Sat 2	
9 P 1133 Combine designed approximate. At J Appr Trait SHB Trait 0 P 1131 From bin designed approximate. At J Appr Trait SHB Trait 0 P 1131 From bin designed approximate. At J Appr Trait SHB Trait 0 P 1213 From planters Appr Trait SHB Trait 0 P 1213 From planters Appr Trait SHB Trait 0 P 1213 From planters Appr Trait SHB Trait 0 P 1213 From flow the designed approximate Appr Trait SHB Trait 0 P 1213 From flow the designed approximate Appr Trait SHB	7		а,	1211	EXCAVATION - Tower Area	7 days	Mon 08-04-19	Nes	JCB, Labour 1, Labour 2
No. No. No. No. No. Construct Compation &	8	V		1212	PCC below footings	6 days	Tue 15-04-19	Men	Labour 1, Labour 2, Aggregate (5 Brass), Cement (50 bag), Sand (5 Brass)
0 m 131 Foregradmen Maps Markets Foregradmen 0 m 1213 Foregradmen Maps Markets Foregradmen	9		4	1213	Centre line checking and approval from Arch.	3 days	Tue 23-04-19	Thu 2	
U m 111 Freed Gamp Hops With State Home U m 111 Freed Gamp Hops With State Home	10		-	1214	Footing Shuttering	4 davis	Fn 26-84-19	Tue 3	Carpainter 1, Carpainter 2, Carpainter 3, Carpainter 4, Carpainter 5, Shutterin
0 m 111 Pertonansharang 6.00 Filled	11			1215			Sat 27-04-19	Tue 3	
No. No. <td>12</td> <td></td> <td></td> <td>1216</td> <td>Footing Casting</td> <td>S davs</td> <td>Wed 00-05-19</td> <td>The</td> <td>Labour 1 Labour 2 Labour 3 Labour 4 Labour 5 Labour 6 Apgregate[1 Br</td>	12			1216	Footing Casting	S davs	Wed 00-05-19	The	Labour 1 Labour 2 Labour 3 Labour 4 Labour 5 Labour 6 Apgregate[1 Br
0 me 113 Production (sign of \$400 First (sign of \$400 <	13			1217	Pinth column Statisting	6 days	Fri 10-05-19	Thu 1	Carpainter 1 Carpainter 2 Carpainter 3 Carpainter 4 Carpainter 5 Shutter
8 9 1118 Protectionmenting 4 grav 1 ab 25 / 3 / 1 ab 5 / 1 ab 0 9 1111 Protectionmenting 4 grav 1 ab 25 / 3 / 1 ab 1 ref 0 9 1111 Protectionmenting 4 grav 1 ab 25 / 3 / 1 ab 1 ref 0 9 1111 Protectionmenting 4 grav 1 ab 25 / 3 / 1 ab 1 ref 0 9 1111 Protectionmenting 4 grav 1 m 18-3 / m 1ab 1 ref 1 m 18-3 / m 1ab 1 ref 1 m 18-3 / m 1ab 1 m 1ab 1 m 18-3 / m 1ab 1 m 1ab	14			1213	Pirth Column Reinforcement	4 dava	Man 13-05-19	The 1	Fitter 1, Fitter 2, Fitter 3, Fitter 4, Fitter 5, Steel (1 kg)
0 m 1111 Produce framework Program Computer Comp	15			1219	Plinth column Casting	9 days	Fei 17-45-19	Men	Aggregate[1 Brass],Cement[1 bag],Labour 1,Labour 2,Labour 3,Labour
Image: Section 111 Production induction 4 days Fund 1484-1484-9 Fund Image: Section 111 Production mode 4 days Main 1884-9 Fund Fund 1484-1484-1484-1484-1484-1484-1484-1484	15		-	12110	Footing Excerction Filling	4 days	Tue 18-05-19	Fit 31	JCB, Labour 1, Labour 2, Labour 3
0 m 1111 Penilhen nettig 4 dps Man 18439 This 0 m 1113 Fills Fills <td>17</td> <td></td> <td></td> <td>12111</td> <td>Pinth Bean Stattering</td> <td>7 days</td> <td>Sat 01-06-19</td> <td>Sat DE</td> <td>Carpainter 1, Carpainter 2, Carpainter 3, Carpainter 4, Shuttering (1 Plate</td>	17			12111	Pinth Bean Stattering	7 days	Sat 01-06-19	Sat DE	Carpainter 1, Carpainter 2, Carpainter 3, Carpainter 4, Shuttering (1 Plate
0 m 1111 Figs 16m 1111 Fig 16m 1111 16m 16m <td>18</td> <td></td> <td></td> <td>12.1.12</td> <td>Pinth bean Reinforcennt</td> <td>4 days</td> <td>Wed (5-06-19</td> <td>Sat 15</td> <td>Fitter 1, Fitter 2, Fitter 3, Fitter 4, Fitter 5, Fitter 6, Steel [1 kg]</td>	18			12.1.12	Pinth bean Reinforcennt	4 days	Wed (5-06-19	Sat 15	Fitter 1, Fitter 2, Fitter 3, Fitter 4, Fitter 5, Fitter 6, Steel [1 kg]
2 mp 1115 Computer 2 type fm 18-30 % rd 2 mp 1118 France Holdstatung 3 type fm 18-30 % rd 3 mp 1118 France Holdstatung 3 type fm 18-30 % rd f Sprangel Hond (Concert Labor	19		η.	121.13	Pinth Bean casting	4 days	Mon 13-06-19	Thu 1	Aggregate[1 Brass],Cement[1 bag],Labour 1,Labour 2,Labour 3,Labo
III Pachlerikkong Jop Thursday Mark III Pachlerikkong Jop Thursday Jop Julian	20		-	121.14	Filing	3 days	Fri 14-06-19	Net	JCB
D mp 1117 Path 6 days 4st28-30 4st2 3 mp 1117 Path 7 days Markel-30 Markel 3 mp 1117 Path Markel-30 Markel Markel 3 mp 1111 Path Markel-30 Markel Markel-30 Markel-30 3 mp 1111 Path Markel-30 Markel-30 Markel-30 Markel-30 Markel-30 3 mp 11111 Path Markel-30	21		-	121.15	Compaction	1 days	Tue 13-06-19	Wed	Labour 1, Vibrator
3 mp 3.3 + MERESTRICTUE 37 fapr Man 146.0 Man 5 mp 1.31 + MEXTOR 10 fapr Man 146.0 Man 6 mp 1.31 + MEXTOR 10 fapr Man 146.0 Man 7 mp Max Max Max Max Max 8 mp Max Max Max Max Max 8 mp Max Max Max Max Max Max 9 mp Max Max Max Max Max Max 9 mp Max	22		5	12.1.16	Plinth Level Stab Casting	3 days	Thu 2046-19	Sat 22	Aggregate(1 Brass], Cement(1 bag), Labour 1, Labour 2, Labour 3, Labo
3 mp 13.1 + RCC NOR. 100 Mp Man 146.10 Tel. 3 mp 13.11 - Generative 30 Mp Man 146.10 Tel. Tel. 7 mp 13.11.1 - Generative 30 Mp Man 146.10 Tel. Tel. 7 mp 13.11.4 - Generative in ddd Starans Stanseng Apr. Man 146.90 Tel. - Generative in ddd Starans Stanseng Apr. Man 146.90 Tel. - Generative in ddd Starans Stanseng Apr. Man 146.90 Tel. - Generative in ddd Starans Stanseng Apr. Man 146.90 Tel. - Generative in Generative in ddd Starans Stanseng Apr. Man 246.90 Tel. - Generative in Generative in ddd Starans Stanseng Apr. Man 246.90 Tel. - Generative in Generative in ddd Starans Stanseng Apr. Man 246.90 Tel. - Generative in Generative in ddd Starans Stanseng Apr. Mark 366.90 Tel. - Generative in Ge	23		5	12117	Pinfs	0 days	Sat 22-06-19	Sat 22	22-66
3 mp 1311 - Consoling Mp Man 146.00 Fed.1 7 mp 1111 Consoling Statutes Apps Man 146.00 Fed.1 10 mp 11115 In the Sharming Apps Man 146.00 Fed.1 10 mp 11115 In the Sharming Apps Man 146.00 Fed.1 10 mp 11115 In the Sharming Sharming Apps Man 146.00 Fed.1 10 mp 11115 In the Sharming Sharming Apps Man 146.00 Fed.1 Fed.1 10 mp 11117 In the Sharming Apps Man 146.00 Man Fine 1-Sharming Corporations Corporatio	24			13	+ SUPERSTRUCTURE	117 days	Men 24-06-19	Mon (1
III Consults In data Namese Apr. Man. 148.39 That III IIII In this Namese Apr. Man. 148.39 That IIIIII In this Namese Apr. Man. 148.39 That Compate In this Namese Apr. Man. 148.39 That Compate In this Namese Apr.	25		-	131	4 ROC WORk	100 days	Man 24-86-19	The 1	† −−1
II wp 13115 Int Bab Tenning figs Man 148-59 Fr.33 wp, Compating	26		5	1311	4 Ground floor	33 days	Men 24-06-19	Wed 2	h .
3 mp 13115 Generation bands haven heldenement App Apr 356/3 Weit Filter (Filter & Should) hagi 20 mp 13117 Int Shide Shademenent 2 dep Apr 356/3 Mail Filter & Filte	27		5	13.1.1.4	Ground to 1st slab Staircase Shuttering	4 days	Mon 14-06-19	Thu 2	- Carpainter 1, Carpainter 2
30 m, 131137 Int Salo References I days Sar 26438 Man , Fitter 3. Fitter 4. Fitter 5. Fitter 6. Fitter 7. Steel(1 kg)	28		5	13.1.15	1st Slab Shuttening	5 days	Mon 14-06-19	Fit 28	+ Carpainter 3, Carpainter 4, Carpainter 5, Carpainter 7
	29		4	13.116	Groung to 1st slab Staircase Reinforcement	4 days	Sat 29-46-19	Wed	Fitter 1,Fitter 2,Steel(1 kg)
1 To 13118 Int State State Character Character Character Team (CALL) Web	30		5	13.117	1st Slab Reinfuscement	2 days	Sat 29-06-19	Net	+ Fitter 3, Fitter 4, Fitter 5, Fitter 6, Fitter 7, Steel [1 kg]
	31			13.1.18	1st Slab RCC Consultant Checking	2 davs	Tue (0-07-19	Wed	

DEVRAI	Duration in Days
Without Mivan	475
Mivan	290



From the above graph it conclude that required duration of the project without mivan technology is more than the mivan technology

LE	TASK RESOURCE REPORT R	RDIECT VIEW	FORMAT										Sign in
			Fixed						E		M		В
	Task Name		Cost Aconal 🗸	Tetal (ost 🔹	Ravine +	Variance +	Artial +	Remaini v	1 17 Mar 19 - 24 Mar 19 S T F M T				
1		0.05	Prorated	130321368.00									
1	4 MOBILISATION	₹0.0)	Prorated	Ť L O	Ť L O	₹L0	20.05	t L M				-	
	Mabilization of site	20.05	Prested	₹0.00	₹1.00	₹L0	20.05	£0.0					
	Mabilisation of Civil contractor	0.05	Pranted	₹L00	₹L0	₹L00	₹0.05	£0.00					
1	4 SUBSTRUCTURE	0.05	Prorated	₹ 221,491.00	£29,8400	-₹38,351.00	₹71,550,00	₹148,940.W		-		-	
1	EARTH WORK	₹0.00	Prorated	110	₹L0	110	₹0.00	0105					
1	EXCAVATION -Tower Area	₹6,200,00	Porated	₹27,900,00	₹23,800,00	₹4,00,00	₹ 13,950,00	₹13.950.00			JC	B Labour 1 Labo	ar 2
1	FCC belaw footings	0.05	Prorated	₹ 58,600,00	₹ 53,600,00	20.05	₹ 51,600,00	£0.05				Labour	Labour 2 As
-		20.05	Prorated	100		₹1.00		₹0.00					
1	Footing Stattening	20.03	Provated	26,001.00	19,000	-25,000.00	20.05	16,000.00					Carpaint
1	Footing Reinforcement	20.05	Provated	\$4,540.00	\$6,790.00	.42,250.00	20.05	1000				+	Fitter 1,F
1	Footing Casting	0.05	Provated	₹ 22,250.00	129,450.00	.27,00.00	20.05	₹ 22,250.00				1.00	*
1	Pinth column Shattering	10.05	Prorated	\$ 9,000.00	₹ 15,510.00	-24,300.00	20.05	89,000.00					
1	Pinfs Column Reinforcment	0.05	Prorated	26,040.00	29,040.00	-73,000.00	20.05	26,040.00					
1	Plinfs column Casting	t0.05	Prorated	₹21,350.00	₹ 28,000.00	-76,150.00	20.00	\$21,350.00					
1	Footing Eczystion Filling	0.05	Prorated	₹ 13,600.00	₹ 15,400.00	-71,000.00	20.05	₹13,600.00					
1	Pinth Bean Shattering	0.05	Provated	₹8,411.00	₹ 12,611,00	-74,00.00	20.05	11,400,00					
1	Pinth bean Reinforcennt	0.05	Provated	₹7,340.00	₹ 10,840.00	-73,600.00	10.05	87,340.00					
1	Pinth Bean casting	t0.05	Prorated	₹ 15,050.00	₹ 18,650.00	-₹3,600.00	₹0.05	₹15,050.00					
2	Hing	0.05	Prorated	₹7,500.00	₹7,500.00	₹1.00	20.05	\$7,500.00					
2	Compaction	0.05	Prorated	₹1,600.00	₹1,900.00	-₹ 300.00	₹0.00	₹1,600.00					
2	Plinth Level Slab Casting	0.05	Prorated	₹ 12,390.00	₹14,640.00	-82,250.00	₹0.00	₹12,990,00					
2	Pints	0.05	Prorated	₹0.00	₹1.00	₹1.00	20.05	₹0.00					
2	4 SUPERSTRUCTURE	60.05	Prorated	£1,972,828,00	E3,143,576.00	£220,751.00	₹0.00	1,972,828.00					
2	A RCC WORk	10.05	Prorated	₹ 796,971.00	E 1,090,820,00	1283,851.00	₹0.00	£7%(97LM					
2	4 Ground floer	t0.05	Prorated	₹ 121,890.00	₹170,530.00	-7,48,600.00	10.05	₹121,990.00					
2	Ground Floor Column Beinfarcment	0.05	Prorated	₹27,340.00	₹ 40,990.00	-₹13,650.00	t0.05	10,3400					
2	Shutteing	0.05	Porated		₹ 29,710.00			₹ 19,800,00					
2			Prorated		₹45,650.00			₹33,050.00					
- m) Ground to 1st slab Staircase Shuttening	0.03	Porated	₹ 1,211.00	₹1,880.00	2 600.00	₹0.03	8 (20030)					
< -01	S NEW TASIS : AUTO SCHEDULED	_	_		_	_		F	4		-	ខេត	_

	Task Name 🔹							Terraini +	19 17 1, 2019 17 M	2021 9 Huf 2, 2019 Huf 1, 2020 Huf 2, 2020 Huf 1, 2021 A M J J A S O N D J F M A M J J A S O N D J F M A
1	4 DEVR4I Miran	80.05	Prorated	₹40,565,231.00	t 4,445,668.00	38,119,563.00	₹ 77,905.83	2,487,305.17	1	
2	4 MOBLISATION	₹0.00	Prorated	0.05	₹0.00	₹0.00	₹1.00	₹L00	1	12-04
3	Mobilization of site	₹0.00	Printed	₹0.05	£000	₹0.00	₹0.00	£0.00	d	
4	Mabilisation of Civil contractor	\$0.00	Printed	₹0.00	£000	₹0.00	₹1,00	₹000	y.	
5	# SUBSTRUCTURE	80.05	Prorated	₹256,940.00	₹ 199,840.00	\$ 22,900.00	₹73,500.00	₹163,440.00		ř
6	# EARTH WORK	₹0.00	Prorated	₹ 236,940.00	10.05	1236,340,00	₹ T3,500.00	163,440.00		r=-1
7	EUCAVATION-Tower Area	₹6,200.00	Fronted	₹ 25,600.00	₹ 23,800.00	₹4,800.00	₹14,300.00	11,300.00		JCB, Labour 1, Labour 2
8	PCC below feetings	2 0.00	Prorated	₹ 59,200.00	\$ 58,600.00	2 600.00	\$ 59,200.00	2000		Labour 1,Labour 2,Aggregate(5 Brass),Cement(50 bag),Sand(5 Brass)
9	Centre line checking and approval from Arch.	₹0.00	Pronated	10.05	100	20.00	₹ 0.00	100		
10	Footing Stuttering	₹0.00	Protected	₹7,000.00	₹9,000,00	₹1,000.00	\$0.05	₹7,000.00		Carpainter 1, Carpainter 2, Carpainter 3, Carpainter 4, Carpainter 5, Shuttering
11	Footing Reinforcment	₹0.00	Provated	₹ 5,290.00	₹6,190.00	₹1,500.00	₹0.00	₹5,290.00		Fitter 1, Fitter 2, Fitter 3, Fitter 4, Fitter 5, Steel [1 kg]
12	Footing Casting	₹0.00	Prorated	₹ 24,650.00	₹ 29,450.00	\$4,800.00	₹0.00	₹34,650.00		Labour 1, Labour 2, Labour 3, Labour 4, Labour 5, Labour 6, Aggregate (1 Brass
13	Plath column Shuttering	₹0.00	Fronted	₹ 10,500.00	₹13,510.00	\$3,000.00	₹ 0.00	₹ 00,510.00		Carpainter 1, Carpainter 2, Carpainter 3, Carpainter 4, Carpainter 5, Shuttering
14	Plinth Column Reinforcment	₹0.00	Fronted	₹ 7,040.00	₹9,040.00	\$2,000.00	\$1.00	₹7,040.00		Fitter 1, Fitter 2, Fitter 3, Fitter 4, Fitter 5, Steel [1 kg]
15	Plath column Casting	₹0.00	Pronated	₹ 29,600.00	₹ 28,000.00	24,500.00	1005	₹ 23,600.00		Aggregate(1 Brass), Cement(1 bag), Labour 1, Labour 2, Labour 3, Labour 4,
16	Footing Encavation Filling	\$ 0.00	Fronted	₹ 14,200.00	₹ 15,400.00	\$ 1,200.00	\$ 0.00	14,200.00		JCB Labour 1, Labour 2, Labour 3
17	Plath Bean Shuttering	20.00	Fronted	\$ 9,800.00	12,610.00	\$ 1,800.00	1005	19,510.00		Carpainter 1, Carpainter 2, Carpainter 3, Carpainter 4, Shuttering[1 Plates]
13	Plath bean Reinforceant	\$ 0.00	Pronted	₹ 8,440.00	₹ 10,840.00	\$ 2,400.00	\$ 0.00	18,440.00		Fitter 1, Fitter 2, Fitter 3, Fitter 4, Fitter 5, Fitter 6, Steel [1 kg]
19	Plinth Beam casting	₹0.00	Prorated	₹ 16,250.00	₹ 18,650.00	\$2,400.00	\$ 0.00	\$ 16,250.00		Aggregate(1 Brass),Cement(1 bag),Labour 1,Labour 2,Labour 3,Labour
20	Filing	\$ 0.00	Prorated	₹ 7,500.00	\$7,500.00	\$0.05	1005	\$7,500.00		JCB
21	Conpaction	\$0.00	Pronted	₹ 1,700.00	1,900.00	-₹ 200.00	1005	\$1,700.00		Labour 1, Vibrator
22	Plinth Level Stab Casting	\$ 0.00	Prorated	₹ 13,140.00	₹14,640.00	\$1,500.00	\$1.00	₹13,140.00		Aggregate(1 Brass), Cement(1 bag), Labour 1, Labour 2, Labour 3, Labour
23	Pieth	20.00	Prorated	₹0.00	200	20.00	1005	2005		22.06
24	4 SUPERSTRUCTURE	₹0.00	Prorated	₹1,346,291,00	13,133,578,00	-8811,287.00	₹1.00	2,346,291.00		
3	4 RCC WORk	₹0.05	Prorated	₹ 322,790.00	£1,090,820.00	-2768,111.00	₹1.0I	₹322,710.00		1
25	4 Ground floor	\$0.00	Prorated	1.000083	\$170,530,00	-₹130,610.00	₹1.00	₹39,521.00		—
27	Ground to 1st slab Staircase Shuttering	₹0.00	Prorated	₹2,800.00	₹1,8000	₹ 990.00	₹ 0.00	₹2,000.00		- Carpainter 1, Carpainter 2
28	1st Slab Shuttening	₹0.00	Frorated	₹7,000.00	₹13,500.00	26,500.00	₹0.05	₹7,000.00		🙀 Carpainter 3, Carpainter 4, Carpainter 5, Carpainter 7
29	Groung to 1st slab Staircase Reinforcement	₹0.00	Pronted	₹ 2,840.00	₹1,840.00	₹1,000.00	\$1.00	₹2,840.00		- ⁷ Fitter 1, Fitter 2, Steel [1 kg]
30	Ist Slab Reinforcement	80.00	Prorated	₹3,540.00	₹ 11,290.00	\$ 1,750.00	\$ 0.00	\$3,540.00		₩ Fitter 3,Fitter 4,Fitter 5,Fitter 6,Fitter 7,Steel[1 kg]
31	1st Slab RCC Consultant	20.05	Prorated	20.00	2005	20.05	\$1.00	1005	Ŧ	1

DEVRAI	Cost Of Project
Without Mivan	30021368
Mivan	42565231

ISSN [ONLINE]: 2395-1052



V. CONCLUSION

- It was discussed that using value engineering methods by multidisciplinary team, value and economy are improved through study of alternative design concepts, material and construction methods without compromising functional requirement and quality.
- A second look at the design produced by architect and engineers gives the assurance that all reasonable alternatives have been explored. From study it is seen that different parameters of value engineering alternatives helps to find best solution.
- Thus, value engineering assures best value will be obtained over life cycle of the building or structure. Success of a project, deciding on where and how a project will be built, completion of the structure according to desired design and building quality, within determined time and cost limits, are all possible with good estimations and solution.
- Carrying out correct estimations is closely based on the knowledge level of the team. Value engineer assumes regulating and analyzing duties to increase the value of the project while preventing unnecessary costs.
- It is not possible to apply VE on each project a company produces. Much more successful value engineering studies can be carried out on complex and big projects which have high potential of restoring the investment.

REFERENCES

- [1] Amit Sharma, R.M. Belokar "Achieving Success through Value Engineering: A Case Study" Member, IAENG Proceedings of the World Congress on Engineering and Computer Science 2012 Vol II (http://www.iaeng.org/publication/WCECS2012/WCECS 2012_pp1330-1333.pdf)
- [2] K. Ilayaraja and MD. Zafar Eqyaaba "Value Engineering in Construction" Department of Civil Engineering, Bharath University, Chennai Indian Journal of Science and Technology, Vol 8 (file:///C:/Users/File/Downloads/87285-154763-2-PB.pdf)

- ISSN [ONLINE]: 2395-1052
- [3] Li Ning "Cost Control Application Research of Value Engineering in the Design Phase of Construction Project" Beijing Institute of Economic & Management, Beijing, China(file:///C:/Users/File/Downloads/25840807. pdf)
- [4] Sesmiwati , Wahyudi Putra Utama, FieldaRoza "A Critical Review of Value Engineering Development in Indonesian Construction Industry" ivil Engineering and Planning, University of Bung Hatta (https://www.researchgate.net/publication/317380991_A_ Critical_Review_of_Value_Engineering_Development_in _Indonesian_Construction_Industry)
- [5] Venugopal Sharma, rajesh Kumar "Analysis To Reduce Cost Through Value Engineering Of Furniture Product In Furniture Industry – A Case Study" Department of Mechanical Engineering, CSIT, Durg, Chhattisgarh, India (http://www.iraj.in/journal/journal_file/journal_pdf/2-416-151549323316-23.pdf.