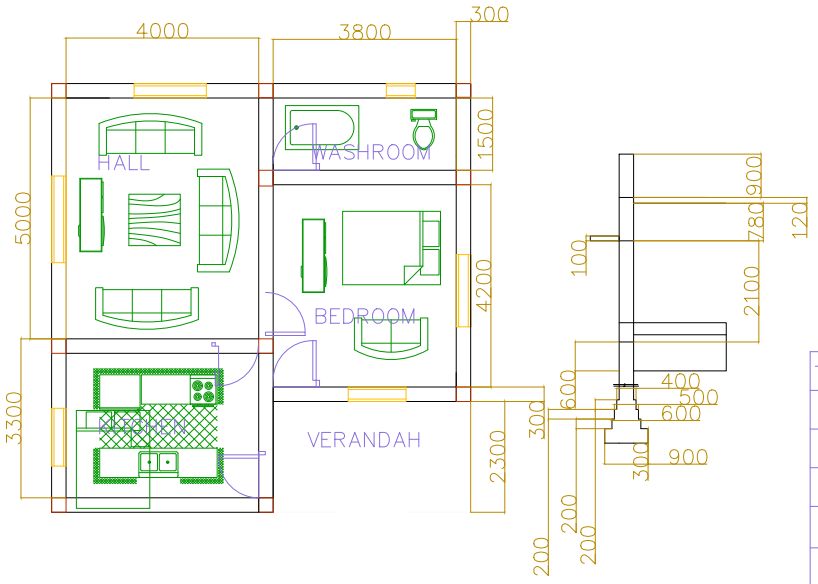
Construction Management Assignment
Cost Estimation & Scheduling of 1BHK Building

Semester VI
B. Tech
Civil Engineering

IIT Guwahati

Submitted by-

Name:
Astha Gupta & Suhani Kalra
Roll Number:
210104025 & 210104108
Submission Date: 1 April 2024



TYPE	NOS.	DIM.
D1	5	0.9*2
W1	3	1.5*1.2
W2	2	1.2*1.2
W3	1	1.8*1.2
V	1	0.8*0.45

Introduction

The plan delineates the construction of a modern and practical 1BHK dwelling, occupying a space of 8.7 meters by 8.9 meters. Crafted with precision using AutoCAD, it prioritizes strength & space efficiency to offer a cozy living atmosphere. Emphasizing functionality and economical use of resources, the design aims to create a home that balances practicality with aesthetic appeal.

Objective of the Project

- To Estimate the quantities for each Work by Long wall & Short wall method using our above plan measurement of 1 BHK building.
- Unit Rate Analysis of Each Activity using IS 7272 Part I -1974 & CPWD Schedule of Rates (2023 edition)
- Estimation of time & Labour Required for each activity
- Total cost estimation of above 1 BHK residential building
- Preparing the schedule and Resourse Allocation using Project 13

Specifications

1. In above plan, dimensions are as follows
   Hall (4m x 5m) ; Kitchen (4m x 3m) ; Bedroom (3.8 x 4.2m) ; Washroom (3.8m x 1.5m) ; Verandah(3.8m x 2.3m)
2. Plinth Level = 0.6 m
3. Parapet Wall Width & Height = 0.3 & 0.9 m
4. Thickness of Roof Slab = 0.12m
5. Damp proof course = 2.5 cm thickness of bitumen & polythene Sheet
6. Door Dimensions = 0.9m x 2m
7. Window dimensions = 1.2m x 1.2m ; 1.5m x 1.2m ; 1.8 m x 1.2m

https://drive.google.com/drive/folders/1EVuXFvqEwXDJ1YR5ATGARvDa3Za-rskr?usp=drive_link

Quantities Estimation of plan (8.7x 8.9) using long wall & short wall

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
1	**Excavation in foundation**							
	Long wall (vertical)	3	9.5	0.9	1.5	38.48	cum	L= 5+3+0.3+2*0.15+2*0.45 = 9.5
	Short wall(1)	3	3.4	0.9	1.5	13.77	cum	L=4+2*0.15-2*0.45 = 3.4
	short wall(2)	4	3.2	0.9	1.5	17.28	cum	L = 3.8+2*0.15-2*0.45 = 3.2
	sum of Q					69.53	cum	

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
2	**PCC in foundation**							
	Long wall (vertical)	3	9.5	0.9	0.3	7.7	cum	L= 5+3+0.3+2*0.15+2*0.45 = 9.5
	Short wall(1)	3	3.4	0.9	0.3	2.75	cum	L=4+2*0.15-2*0.45 = 3.4
	short wall(2)	4	3.2	0.9	0.3	3.45	cum	L=3.8+2*0.15-2*0.45 = 3.2
	sum of Q					13.9		

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
3	**Rcc for foundation including plinth beam**							
	Footing upto plinth Beam + plinth Beam							
	Rectangular portion of footing	10	0.9	0.9	0.3	2.43	cum	Total column = 10, foundation 0.9x0.9
	Footing upto plinth Beam	10	0.3	0.3	0.6	0.54	cum	
	Plitnth Beam under column	10	0.3	0.3	0.3	0.27	cum	
	Plinth beam under walls					0	cum	
	Long wall (vertical)	3	9.5	0.3	0.3	2.565	cum	
	Short wall(1)	3	3.4	0.3	0.3	0.918	cum	
	short wall(2)	4	3.2	0.3	0.3	1.152	cum	
	sum of Q					7.875	cum	

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
4	**Brickwork in foundation upto plinth level**							
	Long wall - 1	3	9.2	0.6	0.2	3.31	cum	9.5-2*0.15 = 9.2
	Long wall - 2	3	9.1	0.5	0.2	2.73	cum	9.2-2*0.05 = 9.1
	Long wall - 3	3	9	0.4	0.2	2.16	cum	9.1-2*0.05 = 9.0
	Long wall - 4	3	8.9	0.3	1.2	9.61	cum	L= 9-2*0.05 = 8.9 ; H = 1.5- 2*0.2 - 2*0.3 + 0.6 = 1.2
	Short wall 1-(1)	3	3.7	0.6	0.2	1.33	cum	L= 3.4 + 2*0.15 = 3.7
	short wall1-(2)	3	3.8	0.5	0.2	1.14	cum	L= 3.7 + 2*0.05 = 3.8
	short wall1-(3)	3	3.9	0.4	0.2	0.936	cum	L= 3.8 + 2*0.05 = 3.9
	short wall1-(4)	3	4	0.3	1.2	4.32	cum	L= 3.9 + 2*0.05 = 4
	Short wall 2-(1)	4	3.5	0.6	0.2	1.68	cum	L= 3.2 + 2*0.15 = 3.5
	Short wall 2-(2)	4	3.6	0.5	0.2	1.44	cum	L= 3.5 + 2*0.05 = 3.6
	Short wall 2-(3)	4	3.7	0.4	0.2	1.184	cum	L= 3.6 + 2*0.05 = 3.7
	Short wall 2-(4)	4	3.8	0.3	1.2	5.472	cum	L= 3.7 + 2*0.05 = 3.8
	sum of Q					35.312	cum	
I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
5	**DPC at plinth Level**	1						
	Long wall (vertical)	3	8.6	0.3	_	7.74	sqm	L= 5+3+0.3+2*0.15 = 8.6
	Short wall(1)	3	4.3	0.3	_	3.87	sqm	L=4+2*0.15 = 4.3
	short wall(2)	4	4.1	0.3	_	4.8	sqm	L = 3.8+2*0.15 = 4.1
	sum of Q					16.41	sqm	

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
6	**rcc for column upto roof level**							
	column above plinth Beam	10	0.3	0.3	3	2.7	cum	

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
7 - i	**Brickwork in Superstructure**							
	Long wall - 1	2	8.9	0.3	3	16.02	cum	L= 5+3+ 2*0.3 = 8.9
	Long wall - 2	1	6.6	0.3	3	5.94	cum	L = 4.2 + 1.5 + 3*0.3
	Short wall(1)	3	4	0.3	3	10.8	cum	
	short wall(2)	3	3.8	0.3	3	10.26	cum	
	sum of Q					43.02	cum	
ii	Brickwork in parapet wall							
	Long wall	2	8.9	0.3	0.9	4.81	cum	L= 5+3+ 2*0.3 = 8.9
	Short wall	2	8.1	0.3	0.9	4.37	cum	L= 4+ 3.8 +0.3

	sum of Q					9.18	cum	
	sum of brickwork in superstructure Q					52.2	cum	
iii	Deduction for door and windows							
	D1 = 0.9x2	5	0.9	0.3	2	2.7	cum	
	W1 = 1.5X1.2	3	1.5	0.3	1.2	1.62	cum	
	W2 = 1.2X1.2	2	1.2	0.3	1.2	0.864	cum	
	W3 = 1.8X1.2	1	1.8	0.3	1.2	0.648	cum	
	V= 0.6X0.45	1	0.6	0.3	0.45	0.081	cum	
	sum of Q					5.913	cum	
iv	Deduction for LINTEL Beam							
	D1 = 0.9x2	5	0.9	0.3	0.1	0.135	cum	
	W1 = 1.5X1.2	3	1.5	0.3	0.1	0.135	cum	
	W2 = 1.2X1.2	2	1.2	0.3	0.1	0.072	cum	
	W3 = 1.8X1.2	1	1.8	0.3	0.1	0.054	cum	
	V= 0.6X0.45	1	0.6	0.3	0.1	0.018	cum	
	sum of Q					0.414	cum	
v	Deduction for columns	10	0.3	0.3	3	2.7	cum	
	Total brickwork = 52.2- 5.913 - 0.414- 2.7 = 43.13						cum	

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
8	**Earth filling**							
	Hall	1	4	5	0.48	9.6	cum	H= 0.6 - 0.075 - 0.025- 0.02 = 0.48
	Room	1	3.8	4.2	0.48	7.6608	cum	"
	Kitchen	1	4	3	0.48	5.76	cum	"
	Verandah	1	3.8	2.3	0.48	4.1952	cum	"
	Toilet	1	3.8	1.5	0.48	2.736	cum	"
	sum of Q					29.952	cum	"

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
9	**RCC chajja**							
	W1 = 1.5X1.2	3	1.8	0.3	0.1	0.162	cum	L= 1.5 + 0.15 + 0.15 = 1.8
	W2 = 1.2X1.2	1	1.5	0.3	0.1	0.045	cum	L= 1.2 + 0.15 + 0.15 = 1.5
	W3 = 1.8X1.2	1	2.3	0.3	0.1	0.069	cum	L= 1.8 + 0.15 + 0.15 = 2.1
	sum of Q					0.276	cum	

10	**RCC slab**							
	total area	1	8.9	8.7	0.12	9.29	cum	L= 5+3+3*0.3 = 8.9 ; B= 4+ 3.8 +3*0.3= 8.7
	Shuttering Quantity in rcc work = 8.9x8.7 + 2x(8.9+8.7)x0.12 = 81.64 sqm							

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
11	**Plastering Quantity**							
	Hall							
	Horizontal wall	2	4	_	3	24	sqm	
	vertical wall	2	5	_	3	30	sqm	
	Room							
	Horizontal wall	2	3.8	_	3	22.8	sqm	
	vertical wall	2	4.2	_	3	25.2	sqm	
	Kitchen							
	Horizontal wall	2	4	_	3	24	sqm	
	vertical wall	2	3	_	3	18	sqm	
	Verandah							
	Horizontal wall	1	3.8	_	3	11.4	sqm	
	vertical wall	1	2.3	_	3	6.9	sqm	
	Toilet							
	Horizontal wall	2	2	_	3	12	sqm	
	vertical wall	2	1.5	_	3	9	sqm	
	Washroom							
	Horizontal wall	2	1.8	_	3	10.8	sqm	
	vertical wall	2	1.5	_	3	9	sqm	
	Deduction for door and windows							
	D1 = 0.9x2	(10/2)	0.9	_	2	9	sqm	
	W1 = 1.5X1.2	(1/2)	1.5	_	1.2	0.9	sqm	
	W2 = 1.2X1.2	(1/2)	1.2	_	1.2	0.72	sqm	
	W3 = 1.8X1.2	(1/2)	1.8	_	1.2	1.08	sqm	
	V= 0.6X0.45	(2/2)	0.6	_	0.45	0.27	sqm	
	Total plaster work					191.13	sqm	

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
12	**Flooring**							
	Hall	1	5	4	_	20	sqm	
	Room	1	4.2	3.8	_	15.96	sqm	
	Kitchen	1	3	4	_	12	sqm	
	Washroom	1	1.5	3.8	_	5.7	sqm	
	Verandah	1	2.3	3.8	_	8.74	sqm	
						62.4	sqm	

I.No.	Description of Item	no.	Length	Bredth	Height	Quantity	unit	Remark
13	**Wood Volume Requirement**							
	D1 = 0.9x2	5	0.9	0.07	2	0.63	cum	
	W1 = 1.5X1.2	3	1.5	0.07	1.2	0.378	cum	
	W2 = 1.2X1.2	2	1.2	0.07	1.2	0.2016	cum	
	W3 = 1.8X1.2	1	1.8	0.07	1.2	0.1512	cum	
						1.3608		

Unit Rate Estimation of Quantity calculated

Rate Analysis of Excavation work

1. Work specification : Excavation in foundation + Site Clearance

❑ Labor required for 1 m3 of Excavation work in foundation

Labor	Recommended constant in days (IS 7272 Part I -1974)	Labour rate in Rs. per day (CPWD Schedule of Rates 23)
Mate	0.06	816.00
Mazdoor	0.62	645

Unit Rate Estimation of Excavation work in foundation

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	Labour				
1.1	mate	cum	0.06	816	48.96
1.2	Mazdoor	cum	0.62	645	399.9
2	Sundries				8.97
3	TOTAL				457.83
4	Add 1% water charges				4.57
5	GST(18%)				83.23
6	contractor's profit and overhead(15%)				81.84
7	Add cess @1%				6.27
8	Total cost per unit				633.74

No of Labour for excavation activity = 45(including site clearance) ; no of mate = 5 , total labour = 50
Our estimated quantity of Excavation work in foundation = 69.53 cum
Hence total cost will be = 44064 rupees

2. Work specification: Providing and laying in position plain cement concrete in foundation with mix proportion 1:3:6 (1 portland cement(opc -43 grade) : 3 coarse sand of zone III: 6 stone aggregate 20mm nominal size) – work up to plinth level

Wet volume of PCC = 1 m3
Dry volume of PCC = 1.52 m3
Weight of cement = 0.1x 1.52 = 0.152 m3 = 0.152x1440 kg = 0.218 tonnes
Volume of coarse sand = 0.3x1.52 = 0.45 m3
Volume of Aggregate (20mm size) = 0.684 m3
Volume of Aggregate (10mm size) = 0.228 m3

Unit Rate Estimation of PCC work in foundation

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Cement	tonne	0.218	5156	1124
1.2	Coarse sand of zone III	cum	0.45	1450	652.5

1.3	Aggregate (20mm size)	cum	0.684	1425	974.7
1.4	Aggregate (10mm size)	cum	0.228	1400	319.2
1.5	Carriage of cement	tonne	0.218	174.81	38.1
1.6	Carriage of coarse sand of zone III	cum	0.45	196.66	88.5
1.7	Carriage of Aggregate (20mm and 10mm sizes)	cum	0.684	196.66	134.5
2	Labour	cum			
2.1	Mason	cum	0.17	857	145.7
2.2	Mazdoor	cum	1.83	645	1180
2.3	Bhisti	cum	0.80	816	652.8
3	PLANT AND EQUIPMENT				
3.1	Mixer Operator	cum	0.07	900	63
3.2	Mixer Vibrator	cum	0.07	350	24.5
4	Sundries				107.95
5	TOTAL				5505.5
6	Add 1% water charges				56.13
7	GST(18%)				1001
8	contractor's profit and overhead(15%)				984
9	Add cess @1%				75.5
10	Total cost per unit				7622.13

No of Mazdoor for PCC activity = 25 ; no of Bhisti = 11 ; mason = 3 ; Total Labour = 34
Our estimated quantity for PCC Work = 13.9 cum
Hence total cost will be = 105945 rupees

3. Work specification: Brickwork in superstructure and foundation with cement mortar 1:4 (1 cement: 4 coarse sand) ; nominal size of brick with the mortar = 200 x 100 x 100

Wet volume of mortar = 1 m3
Dry volume of mortar = 1.33 m3
Weight of cement = 0.2x1.33x1440 = 0.38 m3
Volume of sand = 0.8x1.33= 1.064 m3
No of brick in 1 m3 = 1/(0.2x0.1x0.1) = 500 bricks
Hence in 1m3 of brickwork , mortar volume = [1- 500x (0.19x0.09x0.09)]x1.1 = 0.25m3

Rate Analysis of Mortar

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Cement	tonne	0.38	5156	1959.28
1.2	Coarse sand of zone III	cum	1.064	1450	1542.8
1.3	Carriage of cement	tonne	0.38	174.81	66.42

1.4	Carriage of coarse sand of zone III	cum	1.064	196.66	209.24
2	Labour	cum			
2.1	Mazdoor	cum	0.75	645	483.75
2.2	Bhisti	cum	0.07	816	57.12
3	Sundries				86.37
4	TOTAL				4404.98

Rate Analysis of Bricks

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Bricks	No.	1000	5450	2725
1.2	Mortar	cum	0.25	4404.98	1101.24
1.3	Carriage of Bricks	No.	1000	464.11	232
2	Labour				
2.1	Mason	cum	0.94	857	805.5
2.2	Mazdoor	cum	1.8	645	1161
2.3	Bhisti	cum	0.2	816	163
2.4	Extra labour	cum	1.13	645	728.85
3	Sundries				138.33
4	TOTAL				7054.92
5	Add 1% water charges				70.54
6	GST(18%)				1282.58
7	contractor's profit and overhead(15%)				1513.44
8	Add cess @1%				99.21
9	Total cost per unit				10020.7

No of Mazdoor for Brickwork activity = 230 ; no of Bhisti = 16 ; mason = 73 , Total Labour = 399
Our estimated quantity of Brickwork in foundation + superstructure = 78.442 cum
Hence total cost will be = 786043 rupees

4. Work specification: Providing and laying in position reinforced cement concrete in foundation with mix proportion 1:2:4 (1 cement: 2 coarse sand of zone III: 4 stone aggregate 20mm nominal size), excluding the cost of shuttering and reinforcement– work up to plinth level

Wet volume of RCC = 1 m3
Dry volume of RCC = 1.54 m3
Weight of cement = 1/7x 1.54 = 0.22 m3 = 0.22x1440 kg = 0.318 tonnes
Volume of coarse sand = 2/7x1.54 = 0.44 m3
Volume of Aggregate (20mm size) = 0.66m3
Volume of Aggregate (10mm size) = 0.22 m3

Rate Analysis of RCC in foundation

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Cement	tonne	0.318	5156	1639.6
1.2	Coarse sand of zone III	cum	0.44	1450	638

1.3	Aggregate (20mm size)	cum	0.66	1425	940.5
1.4	Aggregate (10mm size)	cum	0.22	1400	313.5
1.5	Carriage of cement	tonne	0.318	174.81	55.58
1.6	Carriage of coarse sand of zone III	cum	0.44	196.66	86.53
1.7	Carriage of Aggregate (20mm and 10mm sizes)	cum	0.66	196.66	129.79
2	Labour	cum			
2.1	Mason	cum	0.17	857	145.7
2.2	Mazdoor	cum	2	645	1290
2.3	Bhisti	cum	0.9	816	734.4
3	PLANT AND EQUIPMENT				
3.1	Mixer Operator	cum	0.07	900	63
3.2	Mixer Vibrator	cum	0.07	350	24.5
4	Sundries				121.22
5	TOTAL				6182.32
6	Add 1% water charges				61.82
7	GST(18%)				1124
8	contractor's profit and overhead(15%)				1105.22
9	Add cess @1%				84.73
10	Total cost per unit				8558

No of Mazdoor for Brickwork activity = 16 ; no of Bhisti = 7 ; mason = ; Total Labour = 23
Our estimated quantity of Rcc for foundation including plinth beam = 7.875 cum
Hence total cost will be = 67395 rupees

5. Work specification: Earth filling work in floor

Unit Rate Estimation of Earth filling work in floor

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	Labour				
1.1	mate	cum	0.02	816	16.32
1.2	Mazdoor	cum	0.25	645	161.25
1.3	Bhisti	cum	0.02	857	17.14
2	Sundries				3.89
3	TOTAL				198.60
4	Add 1% water charges				1.98
5	GST(18%)				36.1
6	contractor's profit and overhead(15%)				35.50
7	Add cess @1%				2.72
8	Total cost per unit				274.91

No of Mazdoor for Earth filling activity = 8 ; no of Bhisti = 1 ; mate = 1 Total Labour = 10
Our estimated quantity of Earth filling work in floor = 29.952 cum
Hence total cost will be = 8234 rupees

6. Work specification : rcc for column upto roof level + RCC work in chajjas

(Providing and laying in position reinforced cement concrete for column with mix proportion 1:2:4 (1 cement: 2 coarse sand of zone III: 4 stone aggregate 20mm nominal size), excluding the cost of shuttering– work up to roof level + RCC work in chajjas)

Wet volume of RCC = 1 m3
Dry volume of RCC = 1.54 m3
Weight of cement = 1/7x 1.54 = 0.22 m3 = 0.22x1440 kg = 0.318 tonnes
Volume of coarse sand = 2/7x1.54 = 0.44 m3
Volume of Aggregate (20mm size) = 0.66m3
Volume of Aggregate (10mm size) = 0.22 m3
Considering volume of steel = 2.5 % of 1m3 = 0.025 x 7850 = 196.25 kg = 1.96 quintal

Rate Analysis of rcc for column

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Cement	tonne	0.318	5156	1639.6
1.2	Coarse sand of zone III	cum	0.44	1450	638
1.3	Aggregate (20mm size)	cum	0.66	1425	940.5
1.4	Aggregate (10mm size)	cum	0.22	1400	313.5
1.5	Steel	quintal	1.96	5965	11691.4
1.6	Carriage of cement	tonne	0.318	174.81	55.58
1.7	Carriage of coarse sand of zone III	cum	0.44	196.66	86.53
1.8	Carriage of Aggregate (20mm and 10mm sizes)	cum	0.66	196.66	129.79
1.9	Carriage of steel r/f	quintal	1.96	174.81	342.62
2	Labour	cum			
2.1	Mason	cum	0.23	857	145.7
2.2	Mazdoor	cum	3.50	645	1290
2.3	Bhisti	cum	0.9	816	734.4
3	PLANT AND EQUIPMENT				
3.1	Mixer Operator	cum	0.10	900	63
3.2	Mixer Vibrator	cum	0.10	350	24.5
4	Sundries				361.9
5	TOTAL				18457
6	Add 1% water charges				184.57
7	GST(18%)				3355.48
8	contractor's profit and overhead(15%)				3299.55
9	Add cess @1%				252.96
10	Total cost per unit				25549.5

Unit Rate Estimation of Formwork in column

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	Labour	cum			
1.1	Carpenter	cum	0.25	857	214.25
1.2	Mazdoor	cum	0.20	645	79.98

2	Sundries				5.88
3	TOTAL				300.1
4	Add 1% water charges				30
5	GST(18%)				59.41
6	contractor's profit and overhead(15%)				58.42
7	Add cess @1%				4.47
8	Total cost per unit				452.4

No of Mazdoor for activity = 11 ; no of Bhisti = 3 ; mason = 1; no of carpenter = 1 Total Labour = 15
Our estimated quantity of Rcc for column + chajjas = 2.7 + 0.276 = 2.976 cum
Hence total cost will be = 77382 rupees

7. Work specification: Providing and laying in position reinforced cement concrete for slab with mix proportion 1:2:4 (1 cement: 2 coarse sand of zone III: 4 stone aggregate 20mm nominal size), including the reinforcement– work up to roof level (rcc for slab)

Wet volume of RCC = 1 m3
Dry volume of RCC = 1.54 m3
Weight of cement = 1/7x 1.54 = 0.22 m3 = 0.22x1440 kg = 0.316 tonnes
Volume of coarse sand = 2/7x1.54 = 0.44 m3
Volume of Aggregate (20mm size) = 0.66m3
Volume of Aggregate (10mm size) = 0.22 m3
Considering volume of steel = 2 % of 1m3 = 0.02 x 7850 = 157 kg = 1.57 Quintal
Binding Wire = 1% of 1.57(steel) = 0.0157

Rate Analysis of rcc for slab

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Cement	tonne	0.316	5156	1639.6
1.2	Coarse sand of zone III	cum	0.44	1450	638
1.3	Aggregate (20mm size)	cum	0.66	1425	940.5
1.4	Aggregate (10mm size)	cum	0.22	1400	313.5
	Steel	quintal	1.57	5965	9365
	Binding wire	quintal	0.0157	50	0.78
1.5	Carriage of cement	tonne	0.318	174.81	55.58
1.6	Carriage of coarse sand of zone III	cum	0.44	196.66	86.53
1.7	Carriage of Aggregate (20mm and 10mm sizes)	cum	0.66	196.66	129.79
1.8	Carriage of steel r/f	quintal	1.96	174.81	342.62
2	Labour	cum			
2.1	Mason	cum	0.24	857	205.68
2.2	Mazdoor	cum	2.50	645	1612.5
2.3	Bhisti	cum	0.9	816	734.4
3	PLANT AND EQUIPMENT				
3.1	Mixer Operator	cum	0.07	900	63
3.2	Mixer Vibrator	cum	0.07	350	24.5

4	Sundries				323
5	TOTAL				16474
6	Add 1% water charges				164.74
7	GST(18%)				2994.97
8	contractor's profit and overhead(15%)				2945.05
9	Add cess @1%				225.78
10	Total cost per unit				22804.56

No of Mazdoor for activity = 23 ; no of Bhisti = 9 ; mason = 3 ; Total Labour = 35
Our estimated quantity of Rcc for slab = 9.29 cum
Hence total cost will be = 211854 rupees

8. Work specification : plasterwork for upto roof level

Area of plastering = 191.13 sqm
Cement Plaster - 1:6 (1 cement: 6 coarse sand)
Thickness of plaster = 12mm
Volume = 191.13 x 0.012 = 2.29 m3
Dry Volume = 2.29 x 1.33 = 3.05 m3
Weight of cement = 0.43x1440 = 6.27 tonne
Volume of sand = 0.85 x 3.05 = 2.61 m3

Rate Analysis of Plasterwork

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Cement	tonne	6.27	5156	32328
1.2	Coarse sand of zone III	cum	2.61	1450	3785
1.3	Carriage of cement	tonne	6.27	174.81	1096
1.4	Carriage of coarse sand of zone III	cum	2.61	196.66	514
2	Labour				
2.1	Mason	sqm	0.08 x 191.13	857	13104
2.2	Mazdoor	sqm	0.10 x 191.13	645	12328
2.3	Bhisti	sqm	0.10 x 191.13	816	15610
3	Sundries				1575
4	TOTAL				80340
5	Add 1% water charges				804
6	GST(18%)				14606
7	contractor's profit and overhead(15%)				14363
8	Add cess @1%				110
9	Total Cost				110223

Hence total cost will be = 110223 rupees
No of Mazdoor for activity = 20 ; no of Bhisti = 20 ; mason = 16 ; Total Labour = 56

9. Work specification : Floorwork for upto 2.5 cm thick cement finishing at top with 1:2:4 ratio of cement concrete (Flooring)

Area of Floor = 62.4 sqm
Cement concrete - 1:2:4
Thickness of plaster = 25mm
Volume = 62.4 x 0.025 = 1.56 m3 + 10% extra for unevenness = 1.716 m3
Dry Volume = 1.716 x 1.5 = 2.574 m3
Weight of cement = 0.37 x1440 = 0.53 tonne
Volume of coarse sand = 2/7 x 2.574 = 0.735 m3
Volume of Aggregate = 1.47 m3
Volume of Aggregate (20mm size) = 1.1 m3
Volume of Aggregate (10mm size) = 0.37 m3

Rate Analysis of Floorwork

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Cement	tonne	0.53	5156	2732
1.2	Coarse sand of zone III	cum	0.735	1450	1065
1.3	Carriage of cement	tonne	0.53	174.81	93
1.4	Carriage of coarse sand of zone III	cum	0.735	196.66	145
1.5	Aggregate (20mm size)	cum	1.1	1425	1567
1.6	Aggregate (20mm size)	cum	0.37	1400	518
1.7	Carriage of Aggregate	cum	1.47	196.66	289
2	Labour				
2.1	Mason	sqm	0.07 x 62.4	857	3743
2.2	Mazdoor	sqm	0.10 x 62.4	645	4024
2.3	Bhisti	sqm	0.10 x 62.4	816	5092
3	Sundries				385
4	TOTAL				19653
5	Add 1% water charges				196.53
6	GST(18%)				3573
7	contractor’s profit and overhead(15%)				3513
8	Add cess @1%				270
9	Total Cost				27205

Hence total cost will be = 27205 rupees
No of Mazdoor for activity = 7 ; no of Bhisti = 7 ; mason = 5 ; Total Labour = 19

10. Work specification : Woodwork

Wood Volume Requirement = 0.63 m3

Rate Analysis of Woodwork

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Kailwood (1^{st})	cudm	1360	30	40800
2	Labour				
2.2	Mazdoor	cum	2 x 0.63	645	813

2.3	Carpenter	cum	20 x 0.63	857	10799
3	Sundries				1048
4	TOTAL				53460
5	Add 1% water charges				5347
6	GST(18%)				9719
7	contractor's profit and overhead(15%)				9557
8	Add cess @1%				732
9	Total Cost				74003

Hence total cost will be = 74003 rupees
No of Carpenter for activity = 13 ; no of Mazdoor = 2 ; Total Labour = 15

11. Work specification : White washing with lime coats on new surface (painting work)

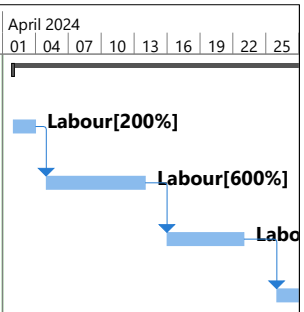
Rate Analysis of White wash for 10 sqm

Item No.	Item Description	Unit	Quantity	Rate	Amount(in rupees)
1	MATERIAL				
1.1	Dehradun White lime	quintal	0.02	650	13
1.4	Carriage of lime	quintal	0.52	2.57	1.18
2	Labour				
2.2	Mazdoor	sqm	0.1	645	60.45
2.3	Washer	sqm	0.3	816	253.5
3	Sundries				6.7
4	TOTAL				335
5	Add 1% water charges				3.35
6	GST(18%)				61
7	contractor's profit and overhead(15%)				60
8	Add cess @1%				4.59
9	Total Cost				463.4

Total area of white washing = plastering area = 191.13 sqm
Hence total cost will be = 8858 rupees
No of white washer for activity = 6 ; no of Mazdoor = 2 ; Total Labour = 8

Total cost of building Project (civil work) = Excavation work in foundation + PCC work in foundation + Earth filling work in floor + Brickwork in (foundation + superstructure) + RCC in foundation + RCC for column + RCC in slab + RCC in chajjas + plasterwork + Floorwork + Woodwork = 44064 + 105945 + 8234 + 786043 + 67395 + 44382 + 211854 + 110223 + 27205 + 74003 + 8858 = **Rupees 1488206**

ID	Task Name	Task Mode	Duration	Start	Finish	Predecessors	Resource Names
1	**Estimate Project**		**122 days**	**Tue 02-04-24**	**Thu 22-08-24**		
2	Site Clearance Wor		2 days	Tue 02-04-24	Wed 03-04-2		Labour[200%]
3	Excavation for foundation		8 days	Fri 05-04-24	Sat 13-04-24	2	Labour[600%]
4	PCC for foundation		6 days	Tue 16-04-24	Mon 22-04-2	3FS+1 day	Labour[600%]
5	Rcc for foundation including Plinth		5 days	Fri 26-04-24	Wed 01-05-24	4FS+3 days	Labour[500%]
6	Brickwork in foundation upto plinth level		9 days	Wed 08-05-24	Fri 17-05-24	5FS+5 days	Labour[1,000%]
7	RCC for beam & colmmn upto roof		5 days	Thu 30-05-24	Tue 04-06-24	6FS+10 days	Labour[300%]
8	Earth Filling		3 days	Sat 15-06-24	Tue 18-06-24	7FS+8 days	Labour[300%]
9	floorwork		6 days	Tue 25-06-24	Mon 01-07-2	8FS+5 days	Labour[300%]
10	Brickwork in Superstructure upto roof level		18 days	Wed 19-06-24	Tue 09-07-24	7FS+12 days	Labour[1,000%]
11	RCC for slab and chajjas (roof		6 days	Wed 24-07-24	Tue 30-07-24	10FS+12 days	Labour[600%]
12	Woodwork		4 days	Fri 12-07-24	Tue 16-07-24	10FF+6 days	Labour[400%]



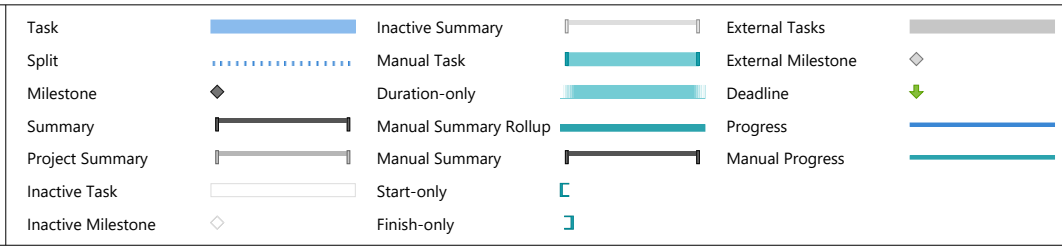
Project: Project3
Date: Mon 01-04-24

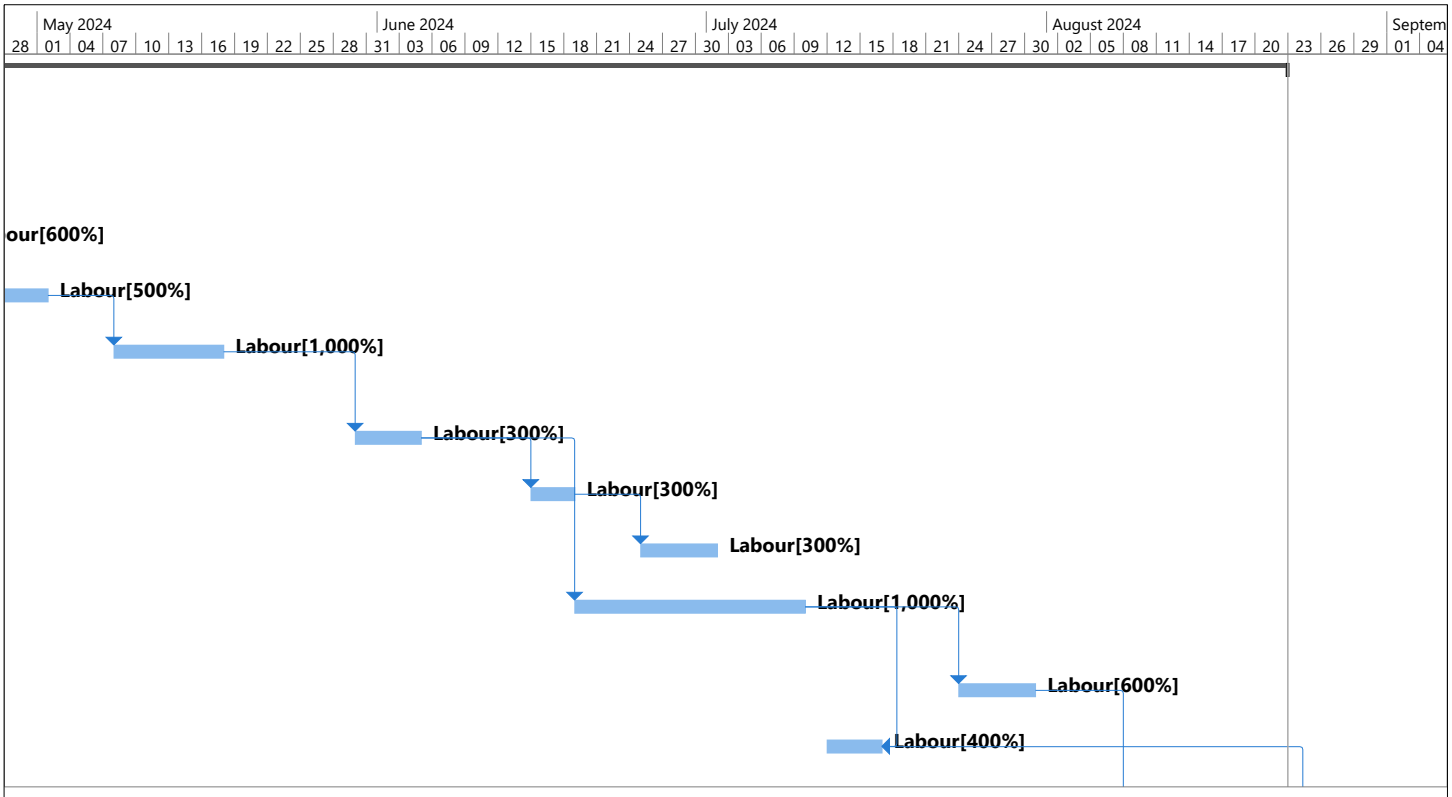
Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

ID	Task Name	Task Mode	Duration	Start	Finish	Predecessors	Resource Names
13	Plastering		8 days	Thu 08-08-24	Sat 17-08-24	11FS+7 days	
14	Painting(white wa:		4 days	Mon 19-08-2	Thu 22-08-24	13SS+8 days,12FF	Labour[200%]

April 2024
26 | 29 | 01 | 04 | 07 | 10 | 13 | 16 | 19 | 22 | 25

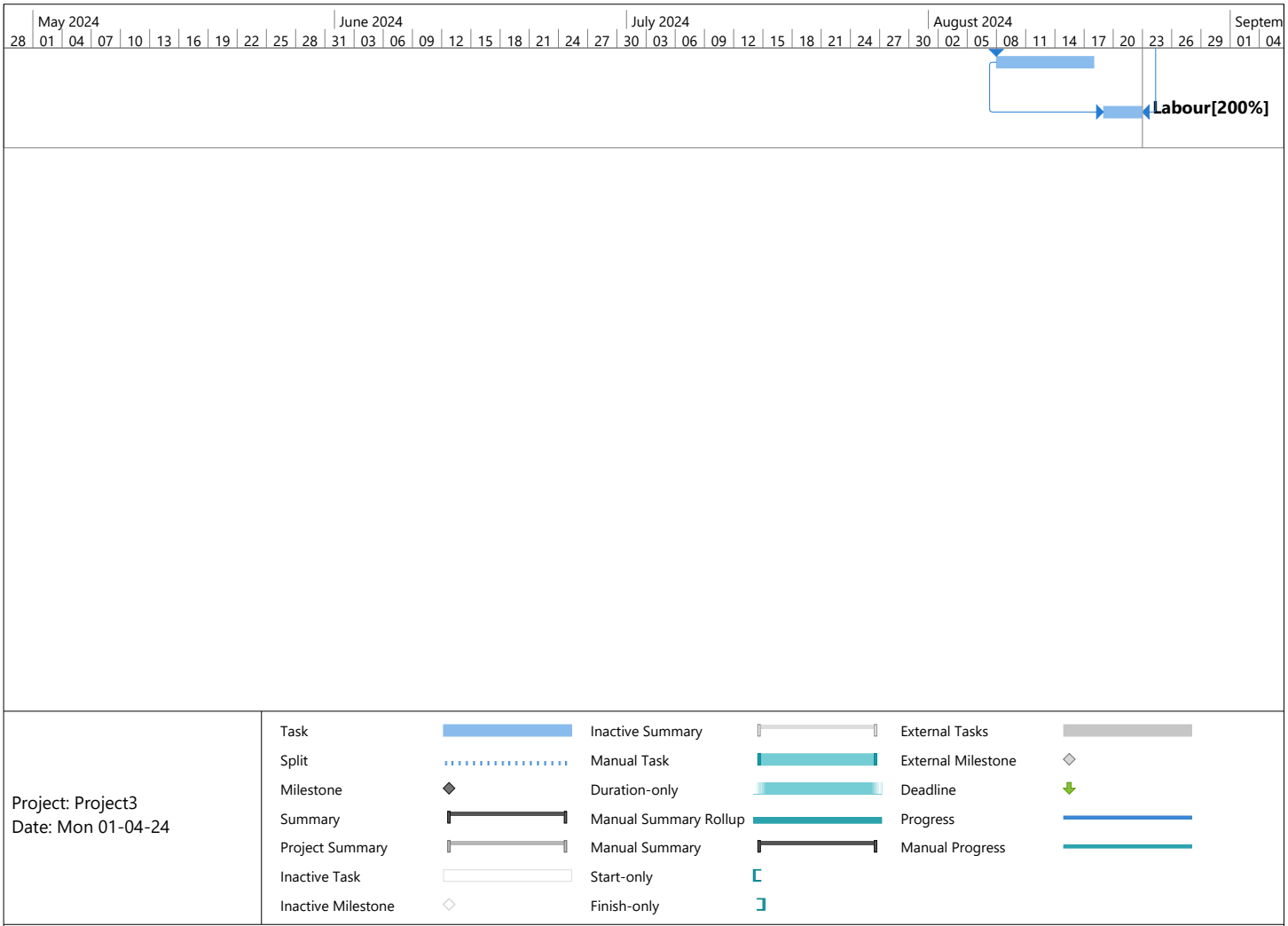
Project: Project3
Date: Mon 01-04-24





Project: Project3
Date: Mon 01-04-24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

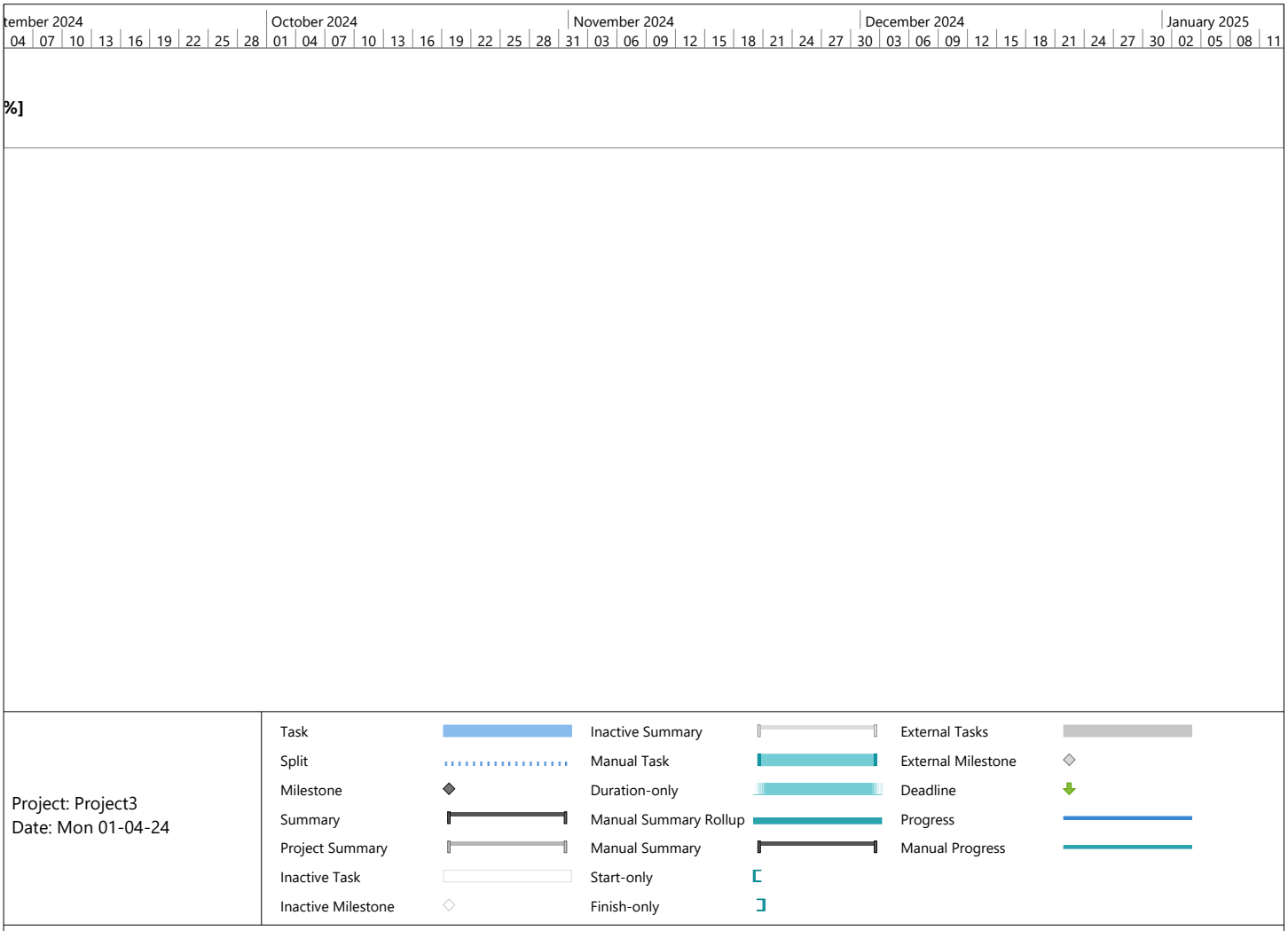


Project: Project3
Date: Mon 01-04-24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

Project: Project3
Date: Mon 01-04-24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	



Project: Project3
Date: Mon 01-04-24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	