Government of Odisha

Works Department

***

Office Memorandum

File No.07556900052014- 10747 /W, dated, 11. 9. 15

Sub: Analysis of Rates of PSC M-40 Grade in Girder & RCC M-40 Grade in Deck Slab of PSC Girder & RCC Slab of Schedule of Rates-2006 for 2014.

To facilitate uninterrupted construction of bridge work / fly over during continuous rain fall in Rainy season, it was felt necessary to adopt new item of Analysis of Rates of "PSC M-40 Grade in Girder & RCC M-40 Grade in Deck Slab / Cross girder/diaphragm of PSC Girder & RCC Deck Slab composite structure" in the Schedule of Rates-2006 for 2014. After careful consideration Government have been pleased to approve supporting Analysis of Rates of PSC M-40 Grade in Girder at Rs.22,682.93 / Cum & RCC M-40 Grade in Deck Slab at Rs.10,345.00 / Cum for Bridge Works item at Sl. No.14 to15 respectively placed in Chapter-XXII of Analysis of Rates- 2006 for 2014 and addendum to Chapter-XXII of Bridge Works as item at Sl. No.14 & 15 respectively.

1. The new Analysis of Rates of PSC M-40 Grade in Girder & RCC M-40 Grade in Deck Slab and Schedule of Rates-2006 for 2014 is effective from the date of issue of this Office Memorandum and it will be available in web-site of State Government.
2. To arrive at the rate for Analysis of Rates of "M-40 PSC Girder & RCC M-40 Grade in Deck Slab, the guidelines as laid down in Analysis of Rates- 2006 and supporting new Analysis of Rates for Bridge Works at item under Sl. No.14 to15 placed in Chapter-XXII of Analysis of Rates- 2006 will be followed.
3. This has been concurred in by the Finance Department vide their U.O.R. No.92-WF-I Dt.18.4.2015.

Encl: As above

11/9/15

EIC - cum- Secretary to Government

Memo No. 10748 /W, dated, 11. 9. 15

Copy with enclosure forwarded to P. S. to Hon'ble Chief Minister, Odisha for information and necessary action.

11/9/2015

FA - cum- Addl. Secretary to Government

Memo No. 10749 /W, dated, 11. 9. 15

Copy with enclosure forwarded to OSD to Chief Secretary, Odisha / P.S. to Development Commissioner-cum-Additional Chief Secretary, Odisha for information and necessary action.

11/9/2015

FA - cum- Addl. Secretary to Government

(P.T.O.)

Memo No. 10750 /W, dated, 11. 9. 15

Copy with enclosure forwarded to All Departments / Managing Director, OB & CC Ltd., Bhubaneswar / Managing Director, OCC Ltd., Bhubaneswar for information and necessary action.

11/9/2015
FA - cum- Addl. Secretary to Government

Memo No. 10751 /W, dated, 11. 9. 15

Copy with enclosure forwarded to EIC (Civil), Odisha / All Chief Engineers, Odisha / All Superintending Engineers / All Executive Engineers (under Works Department) for information and wide circulation among subordinate offices.

11/9/2015
FA - cum- Addl. Secretary to Government

Memo No. 10752 /W, dated, 11. 9.15

Copy with enclosure forwarded to the Accountant General (A&E), Odisha, Bhubaneswar / Accountant General, Odisha, Puri Branch, Puri for information and necessary action.

11/9/2015
FA - cum- Addl. Secretary to Government

Memo No. 10753 /W, dated, 11. 9. 15

Copy with enclosure forwarded to the Luminous Infoways Pvt. Ltd., N-6 / 373, Jaydev Vihar, Bhubaneswar email: support @ lipl.in for information and necessary action.

They are requested to display it in the web-site of State Government.

11/9/2015
FA - cum- Addl. Secretary to Government

Memo No. 10754 /W, dated, 11. 9. 15

Copy with enclosure forwarded to the Director, Printing, Stationary & Publication, Odisha, Cuttack for information and necessary action.

He is requested to publish this amendment in the next issue of Odisha Gazette.

11/9/2015
FA - cum- Addl. Secretary to Government

Memo No. 10755 /W, dated, 11. 9. 15

Copy with enclosure forwarded to A/C-I Section / A/C-II Section / Road Section / Plan Section / Building Section / Budget Section / N.Hs. Section / FC & AA Section / PPP Cell / EAP Cell, Works Department for information and necessary action.

11/9/2015
FA - cum- Addl. Secretary to Government

Addendum to Chapter XXIV of Bridge Work of Schedule of Rates-2006 for 2014 as Item-14 & 15.

PSC Girder M-40 & RCC M-40 in Deck Slab / Cross Girder/Diaphragm

(PSC Girder & RCC Deck Slab Composite Superstructure Span-30.630 Mtr c/c piers)

Sl. No.	Description	Unit	Rate
14-	P.S.C. M-40 Grade in girders including cost of all materials, labour charges for machineries, T&P, centering and shuttering, charges towards casting yard, casting bed, roads for lifting and launching of the girders including charges towards providing cranes, vehicle with trailer for lifting and to support the erection of girder for launching and placement at the required height and position including all chargers for arrangement for movement of cranes, trailers of required nos. and capacity complete but excluding cost and labour for M.S. reinforcement, H.T. steel, wire/ strand, sheathing, Bearing plate, Tube 'units', wedges etc. accessories, charges towards stressing and grouting, hire chargers of Jack and other equipment required for stressing and grouting. (Analysis is based on the (i) analysis for PSC M-40 grade concrete as per Data book P-483 and (ii) for other items such as centering, shuttering, charges, towards casting yard, casting bed, lifting and launching of girder by crane etc. as per actual practice followed for similar works).	1 Cum	Rate to be derived as per Analysis of Rate.
15-	RCC M-40 grade in Deck slab/Cross girder/ diaphragm including cost of all materials, labour, charges for machinery, T&P charges for suspended type staging/ centering and shuttering, supported on girders with M.S. bracket arrangement for cantilever portion including charges for all materials and labour for centering shuttering etc. complete. (Analysis is based on the (i) Analysis for RCC M-40 grade concrete as per Data book P-483 and (ii) for other items such as centering, shuttering charges etc. as per actual practice followed for similar works).	1 Cum	Rate to be derived as per Analysis of Rate.

Addendum to Chapter-XXII of Bridge Work of Schedule of Rate 2006 for 2014 as item 14 & 15
Analysis of rate for **M-40 in PSC Girder** and RCC-M-40 **in Deck Slab/Cross girder/diaphragm**

PSC Girder & RCC Deck Slab composite Superstructure (Span - 30.630Mtr c/c of piers)

Sl.	Description	UNIT	QNTY	RATE	AMOUNT	Remarks
14	**PSC Grade M-40 in Girder**					
	P.S.C. M-40 Grade in girders including cost of all materials, labour charges for machineries, T&P, centering and shuttering, charges towards casting yard, casting bed, roads for lifting and launching of the girders including charges towards providing cranes, vehicle with trailer for lifting and to support the erection of girder for launching and placement at the required height and position including all chargers for arrangement for movement of cranes,trailers of required nos. and capacity complete but excluding cost and labour for M.S. reinforcement, H.T. steel, wire/ strand, sheathing, Bearing plate, Tube 'units', wedges etc. accessories, charges towards stressing and grouting, hire chargres of Jack and other equipment required for stressing and grouting. ***(Analysis is based on the (i) analysis for PSC M-40 grade concrete as per Data book P-483 and (ii) for other items such as centering , shuttering, charges , towards casting yard,casting bed, lifting and launching of girder by crane etc. as per actual practice followed for similar works).***					
A)	**PSC Grade M-40 Concrete**					
	Unit =CUM					
	Taking Output=120CUM					
a)	**Material As per Data book page-483**					
	Cement	MT	51.6	6540	337464.00	
	Coarse Sand	Cum	54	55	2970.00	
	20 mm aggregate	Cum	64.8	1130	73224.00	
	10 mm aggregate	Cum	43.2	1150	49680.00	
	Admixture @ 0.4 % of Cement	Kg	206.4	100	20640.00	
b)	**Labour As per Data book page-483**					
	Mate	day	0.94	170	159.80	
	Mason	day	3.5	205	717.50	
	Mazdoor	day	20	150	3000.00	
c)	**Machinery As per Data book page-483**					
	Batching plant (assuming output 20 cum / hr)	hour	6	1200	7200.00	
	Generator 125 KVA	hour	6	905	5430.00	
	Loader	hour	6	520	3120.00	
	Transit Mixer (Capacity 4.0 cum)					
	Lead upto 1 Km	hour	15	600	9000.00	
	Lead beyond 1Km , L- 2+ p&m 0.5km=2.5km in Km	t. tm	300	5	1500.00	
	Concrete Pump	hour	6	165	990.00	

Sl	Description	UNIT	QNTY	RATE	AMOUNT	Remarks
	d) Overhead Charges @ 7.5% +7.5% Contractor profit on (a+b+c)= 15%				77264.30	
	e) Add Carriage (to be provided as per lead)					
	Cement	MT				
	Coarse Sand	Cum				
	20 mm aggregate	Cum				
	10 mm aggregate	Cum				
	f) Add Royalty (to be provided as per prevailing rate)					
	Coarse Sand	Cum				
	20 mm aggregate	Cum				
	10 mm aggregate	Cum				
					592359.60	
	Total cost per cum without Centering & Shuttering =592359.60/120 cum	**Cum**			**4936.33 (A)**	
	B) Add towards charges for centering & shuttering as per details in enclosed sheets (Annexure -I)					
	Cost per cum @ 6.691 Sqm /Cum @ Rs.529.04/sqm =Rs.3539.81	**Cum**			**3539.81 (B)**	
	C) Cost per Cum chargeble to PSC girder towards casting yard,casting bed , approach road, service road for movement of crane,vehicle with trailor etc. for lifting, shifting and launching of girders. as per details in enclosed sheets (Annexure-II) 3940.88+1604.11=5544.99	**Cum**			**5544.99 (C)**	
	D) Charges towards cranes, vehicle with trailers etc. for lifting of girders from casting yard, bed, shifting to site , launching/ elevating the same and placing in position with all care etc. complete . i.e transportation of Girder by HYD axle cranes vehicle with trailers of required nos and capacity for lifting and to support for erection of each Girder for placement at the elevated required height and position @ Rs.2750 per MT (Prevailing market rate including all charges i.e. charges of transportation of cranes,vehicle with trailers to site , charges to complete the work as above at site etc. complete)@ 2.50MT/Cum **@ 2750 x 2.50 =6875.00**	**Cum**			**6875.00 (D)**	
	E) Overhead Charges @ 7.5% +7.5% Contractor profit on (B+D)= 15% **(Over head charges on(C)has been already provided in the respective item rates)**				**1562.22 (E)**	
	Total = (A+B+C+D+E)				**22458.35**	
	Add cess 1 %				**224.58**	
	TOTAL **Rate per cum**				**22682.93**	

Analysis of rate for **M-40 in PSC Girder** and **RCC M-40 in Deck Slab/Cross girder/diaphragm**

PSC Girder & RCC Deck Slab composite Superstructure (Span - 30.630Mtr c/c of piers)

Sl No	Items of work	UNIT	QNTY	RATE	AMOUNT	Remarks
15	**RCC M-40 grade in Deck slab/Cross girder/ diaphragm including cost of all materials, labour, charges for machinery,T&P charges for suspended type staging/ centering and shuttering, supported on girders with M.S. bracket arrangement for cantilever portion including charges for all materials and labour for centering shuttering etc. complete.** ***(Analysis is based on the (i) Analysis for RCC M-40 grade concrete as per Data book P-483 and (ii) for other items such as centering, shuttering charges etc. as per actual practice followed for similar works)***					
A)	**R.C.C. Grade M-40 concrete**					
	Unit =CUM					
	Taking Output=120CUM					
a)	**Material As per Data book page-483**					
	Cement	MT	51.6	6540	337464.00	
	Coarse Sand	Cum	54	55	2970.00	
	20 mm aggregate	Cum	64.8	1130	73224.00	
	10 mm aggregate	Cum	43.2	1150	49680.00	
	Admixture @ 0.4 % of Cement	Kg	206.4	100	20640.00	
b)	**Labour As per Data book page-483**					
	Mate	day	0.94	170	159.80	
	Mason	day	3.5	205	717.50	
	Mazdoor	day	20	150	3000.00	
c)	**Machinery As per Data book page-483**					
	Batching plant (assuming output 20 cum / hr)	hour	6	1200	7200.00	
	Generator 100 KVA	hour	6	905	5430.00	
	Loader	hour	6	520	3120.00	
	Transit Mixer (Capacity 4.0 cum)					
	Lead upto 1 Km	hour	15	600	9000.00	
	Lead beyond 1Km , L- 2 in Km+0.5kmp&m	t. km	300	5	1500.00	
	Concrete Pump	hour	6	165	990.00	
d)	**Overhead Charges @ 7.5% +7.5% Contractor profit on (a+b+c)= 15%**				77264.30	
e)	**Add Carriage (to be provided as per lead)**					
	Cement	MT				
	Coarse Sand	Cum				
	20 mm aggregate	Cum				
	10 mm aggregate	Cum				
f)	**Add Royalty(to be provided as per prevaling rate)**					
	Coarse Sand	Cum				
	20 mm aggregate	Cum				
	10 mm aggregate	Cum				
					592359.60	
	Total per cum without Centering & Shuttering= 592359.60/120				**4936.33 (A)**	

Sl No	Items of work	UNIT	QNTY	RATE	AMOUNT	Remarks
B)	**Add towards charges for centering & shuttering as per details in enclosed sheets (Annexure - III)**					
	Cost per cum @ 3.90sqm/cum @ Rs.1021.72 =Rs.3984.71	sqm	3.900	1021.720	**3984.71 (B)**	
C)	**Cost per cum chargeble to Deck slab towards approach road used for movement of men , machinary, centering shuttering materials as per details in enclosed sheet (Annexure- II)**				**724.32 (C)**	
D)	**Overhead Charges @ 7.5% +7.5% Contractor profit on (B)= 15%** (over head charges on (C) has already been provided on the respective items of works)				**597.71 (D)**	
	Total (A+B+C+D)				**10243.06**	
	add cess 1%				**102.43**	
	Total **Rate per cum**				**10345.49**	

Annexure- I

PSC Girder & RCC Deck Slab composite Superstructure (Span - 30.630Mtr c/c of piers)

Detailed Analysis for *Centering and Shuttering of* ***PSC Girder (1 No)*** to be casted at casting yard.
Length of the Girder 29.160Mtr (For span of 30.630Mtr C/C)

Sl. No.	Description	Quantity required		Unit	Rate Rs.	Amount Rs. P	Remarks
1	**Centering & shuttering work for PSC girder at casting yard including cost of all materials , labour & T&P etc. complete**						
	Analysis for 1 nos of girder of 29.160M length						
	Shuttering area of each girder - 139.968 Sqmt						
	End Block shuttering - 2.94 Sqmt						
	Total area 142.914 sqm.						
a)	**Steel materials to be used**						
i)	*ISMC 100X50mm(bottom channel)*						
	2 x 29.16m = 58.32m						
	2 x 0.55m = 1.10m						
	Total = 59.42Mtr @ 9.20kg/m	546.664		kg			
ii)	*16mm dia Tie Rod tying bottom channel.*						
	1 x 31 x 0.75m = 46.50m @ 1.58 kg/m	36.735		kg			
iii)	*MS Steel shutter plate with MS plate and angle*						
	148.212sqm	7836.48		kg			
	Deduct Channel portion -						
	2 X 29.16 X 0.10 = 5.83						
	2 X 0.55 X 0.10 = 0.11						
	4 X 29.16 X 0.10 = 11.66						
	Total = 17.604						
	Net = 148.212-17.604= 130.608 @ 60.00 kg/sqm						
iv)	*ISMC 100 x 50 mm (middle & top channel)*						
	2 x 2x29.16m = 116.64m @ 9.20 kg/m	1073.09		kg			
v)	*16mm dia Tie Rod and rod supporting middle and top channel.*						
	Tie rod 2x31x0.45=27.9@1.58kg/mtr	44.082		kg			
	Support rod 2 x 31 x (1.6+1.4)m = 144m @ 1.58kg/m	239.88		kg			
vi)	*ISMC 100 x 50 mm on both side supporting turn buckle.*						
	2 x 29.16m=58.320Mtr @ 9.20kg/m	536.544		kg			
vii)	*MS Angle 50X50X6mm as longitudinal gauge provided at top.*						
	2 x 29.16=58.320Mtr @ 4.50kg/m	262.44		kg			

Sl. No.	Description	Quantity required		Unit	Rate Rs.	Amount Rs. P	Remarks
viii)	*50 x 6mm MS flat as cross gauge provided at top.*						
	30 x 0.9=27.00Mtr @ 2.40kg/m	64.80		kg			
	Total	10640.72		kg	62.00	659724.33	
ix)	*Cost of turn buckle .2x2x31*	124		Each	1500	186000	
x)	*cost of nuts , Bolts , washer 25 kg*	25		kg	62.00	1550.00	
	Total cost of steel material and other as above					847274.33	
	Considering 36 times use as per SR norms,charges for once use 847274.33/36					23535.40	
	Charges towards steel material cost for once use per sqm. 23535.40/148.212					**158.80**	**(a)**
b)	***Consumables***						
	Charged towards consumables etc for once use per sqm approx. Rs.3000.00 per girder . Charges per Sqm = 3000.00/148.212					**20.24**	**(b)**
c)	**Labour charges towards centering & shuttering including charges for conveying from stacks, cleaning,greasing etc.,erecting, laying,fixing in position removing and retunring to stackyard etc. complete but excluding cost of material,consumables.**	Sqm.	Prevailing market rate for similar works.			**350.00**	**(c)**
	Rate per 1 sqmt Total (a+b+c)	**Sqm.**				**529.04**	

Notes:

Centering and shuttering area of girder per cum — 6.691 Sqm

P.S.C. girder (Length 29.16mtr) for span of 30.60M C/C of piers.
Shuttering area of one girder = 142.914 Sqm
Concrete quantity of one girder = 21.359 cum
i.e. 6.691 Sqm/Cum

Shuttering Area

Bottom - 1 X 29.16 X 0.550	16.038
2 X 29.16 X 0.25	14.580
2 X 29.16 X 0.176	10.264
2 X 29.16 X 1.30	75.816
2 X 29.16 X 0.249	14.522
2 X 29.16 X 0.15	8.748
2 X .525 X 1.675	1.759
2 X (.525+.75)/2 X 0.755	0.963
2 X .75 X .15	0.225
	142.914 Sqm

Qty for each Girder

Web uniform(I Section area 0.69 Sqm)-1 X 29.16 X 0.69X1	20.1204
Web thickness - 2 X 0.89 X 0.25 X 1.715	0.763175
Straight - 2 X 0.75 X 0.125 X 1.715	0.3215625
End Diaphgram - 1/3 X 2 X 0.33 X 0.275 X 1	0.0605
Intermediate Diaphagram - 1/3 X3 X 0.34X 0.275 X1	0.0935
	21.359 Cum

Annexure-II

Analysis for **casting yard bed, approach road** for shifting and launching of girders
(for 45nos of girder of 29.16Mtr) each.

Sl. No	Itme of work	UNIT	QNTY	RATE	AMOUNT
	Data:				
	* Casting yard:- In this analysis casting yard , casting bed of 150mx40mtr size to accommodate 45nos of girder has been considered . If nos of girders are more then suitably modified sized casting yard, bed in one side or on either side of the river may be considered.				
	* Approach for launching:- Approach road for launching from one side or either side may be considered. In this analysis it has been considered that 45 nos of girders are to be launched from the casting yard, bed on one side of the river at a time one after another				
1	**Cost of casting yard and roads in casting yard.**				
a)	Casting yard				
i)	Earth work and levelling etc.				
	Casting yard 150m X 40m X 0 .30m	Cum	1800	125.14	225252.00
ii)	Providing 300mm Sand Filling Casting yard-150m X 40m X 0.300m	Cum	1800	77.29	139122.00
iii)	Providing P.C.C (1:3:6) - Casting yard -150m X 40m X 0.15m	Cum	900	3413.80	3072420.00
iv)	Providing plain cement concrete (1:2:4)				
	Casting Bed -Girder Bottom Pedestal - 0.525m X 29.16m X0.10m X 45 Nos.	Cum	68.89	4038.70	278226.04
b)	Road in casting yard.				
i)	Loosing and compacting the ground. Road -100X10 X 0.15	Cum	150	22.9	3435
ii)	Providing 150mm Sand Filling Road-100X10X0.150m	Cum	150	77.29	11593.5
iii)	Providing 250mm Moorum Sub Base Road -100X10X0.25m	Cum	250	231	57750
	Total cost of Casting yard , bed and road				**3787798.54**
	Cost per Cum chargeble to PSC girder towards casting yard , bed and road 3787798.54/(45x21.359)=3940.88				**3940.88**

Sl. No	Itme of work	UNIT	QNTY	RATE	AMOUNT
2	**Approach Road/Service road** of 500m to be constructed for **shifting /launching of girders** to worksite for movement of cranes,vehicle with trailor loaded with girder to different spans and also for movement of man / machinary / T & P for **concreting, centering, shuttering etc. items of Deck slabs** . (Considering the use of work 70% cost to be charged to PSC girder items & 30% cost to be charged to Deck slab items)				
i)	Earthwork in levelling approach road				
	1X (15+19)/2X 1.5 X 500m	Cum	12750	125.14	1595535
	(road of 15m to 25m top width is required for movement of 3 or 4nos of cranes with movement/ rotation of its components / trailer during launching				
ii)	Providing 300mm Sand Filling				
	Approach road - 500 X15X0.30m	Cum	2250	77.29	173902.5
iii)	Providing 250mm Moorum sub base - Approach road -500 X15X 0.25m	Cum	1875	231	433125
					2202562.50
	Considering the use of the road ,70% of the cost of the approach road is assumed be charged to PSC girder items, where as 30% cost is assumed to be charged to Deck slab items				
	Cost per cum chargeble to PSC girder per cum= 2202562.50x0.70/15x3x21.359=1604.11				**1604.11**
	Cost chargeble to Deck slab per cum= 2202562.50x0.30/15x60.817/cum (Deck Slab + Diaphgram Concrete Qty = 60.817 Cum)				**724.32**

Annexure-III

PSC Girder & RCC Deck Slab composite Superstructure (Span - 30.630Mtr c/c of piers)

Detailed Analysis for Centering and Shuttering of **RCC Deck Slab/Cross girder/Diaphragm** (Suspended type i.e. Centering & Shuttering supported on Girder and bracketes for Cantilever portion)

Sl. No.	Description	Quantity required	Unit	Rate Rs. P	Amount Rs. P	Remarks
1	**Centering & shutering work for R.C.C deck slab with suspended type staging,centering and shutering supported and girder,M.S brackets arrangement for cantilever ,prop etc. including cost of all aterials,labour,T&P etc. complete**					
a)	***Steel materials to be used.***					
	Deck Slab					
i)	*ISMC 150 x 75 mm(on bottom bulb to support pipes.)*					
	2 x 32 x 2.37m = 151.68m @ 16.40 kg/m	2487.552	kg			
ii)	*ISMB 150 x 80 mm(supported on pipes)*					
	2 x 3 x (4X6.85)m = 164.40m @ 14.90 kg/m (length from Cross Girder to Cross Girder= 6.85m)	2449.56	kg			
iii)	*MS Bracket using MS angle for Cantilever portion 65mmx65mmx6mm size*					
	2 x 32 x (1.5+1.2+1.0)m = 243.2m @ 5.80 kg/m	1410.56	kg			
iv)	*ISMB 100 x 75 mm(in cantilever portion supported on brackets)*					
	2 x 3 x 30.60m = 183.60m @ 11.50 kg/m	2111.40	kg			
v)	*16mm dia Tie Rod(as through bolt)*					
	2 x 2 x 32m x 0.45m = 57.60m @ 1.58 kg/m	91.08	kg			
	Total	8550.15	kg	62.00	530109.42	
vi)	*MS pipe 42.90mm dia up lift pipe (provided as vertical member)*					
	2 x 3 x 32 x 1.37m = 263.04m @ 3.820 kg/m	1004.813	kg			
vii)	*42.90mm MS pipe for Bracing uplift pipes (provided longitudinally)*					
	2 x 3 x (4 X 6.85)m = 164.4m @ 3.820 kg/m	628.008	kg			
viii)	*U head on vertical pipes.*					
	2 x 3 x 32nos = 192 Nos @ 5 kg/each	960.00	kg			
ix)	*MSGrill platform for erecting Superstructure Centering & shuttering.*					
	36.00 Nos @ 40 kg/each	1440.00	kg			
x)	*Clamp 2 x 3 x32 = 192.00Nos @ 1.50kg/each*	288.00	kg			P-9

Sl. No.	Description	Quantity required	Unit	Rate Rs. P	Amount Rs. P	Remarks
xi)	*cost of nuts , Bolts , washer 25 kg*	25	kg			
xii)	*0.895 Mtr portion of Slab beyond end cross girders on either side*					
	MS Pipe 2 X 2 X 3 X 1.55 = 18.6 Mtr + Bracing - 2.810 Mtr = 16.2 = Total 34.80 Mtr @ 3.82 kg/ Mtr	132.94	kg			
	ISMC 150 Channel - 2 X 8.1 Mtr = 16.2 Mtr @ 14.90 Kg/ Mtr	241.38	kg			
	Cross Girder / Diaphargm					
xiii)	*Shuttering area -* *2 X2 X 3 X 1.90 X 1.65 M= 37.62 Sqm* *bottom - 2 X 3 X 1.90 X 0.275 = 3.14 Sqm* *End Cross Girder* *2 X 2 X 2.12 X 1.65 = 13.99 Sqm* *2 X 2 X 2.12 X 0.275 = 2.33 Sqm* *Total = 57.08 Sqm* *Cost of Steel Shutter Plate = 57.08 Sqm @ 60.00 Kg per Sqm*	3424.8	kg			
	(ISMC 125 X 65)-2 X 2 X 5 X 1.25 = 25 Mtr @ 12.70 Kg/ Mtr	317.5	Kg			
	(ISMC 100 X 50) (vertical) - 2 X 4 X 5 X 1.70 Mtr = 68 Mtr @ 9.20 Kg/ Mtr	625.6				
	(ISMC 100 X 50) - 2 X10 X 0.7 Mtr = 14Mtr @ 9.20 Kg/ Mtr (Supporting bottom plate)	128.8	Kg			
	Total	9216.841	kg	62.00	571444.14	
	Total cost of steel materials and others as above				1101553.56	
	Considering 36 times use as per SR norms, charges for ones use=1083119.88/36				30598.71	**(a)**
b)	**Cost & carriage of laminated good quality ply** of 19 mm thick of 195.94 sqmt (taking apprx 10% wastage = 195.94*10.10= 215.53)	215.53	Sqm	1020.00	219840.60	
	Considering 10 times use of material rate as per SR norms for once use 219840.60/10				21984.06	**(b)**
c)	**Hire & Running charges** of Diesel welding set @ 2 hour per day for 4 days = 8 hour @ 81	8	hour	81.00	648.00	**(c)**
d)	**Cost of consumable** such as surface oil,putty,welding rod,sealing tap,theromocool etc.apprx. Rs.5000.00/ span				5000.00	**(d)**
	Total cost of steel materials & others as above				**58230.77**	
e)	**Cost per sqm=58230.77/253.02**				**230.14**	**(e) P-10**

Sl. No.	Description	Quantity required	Unit	Rate Rs. P	Amount Rs. P	Remarks
(f)	**Labour Charges for making ply shutter fitting to the panel including sealing the joints etc**					
	Per 1 Sqmt					
	For Manufacturing of wooden ply shutter plate(Data for 35.60 Sqmt)					
	Carpenter 2nd class 2 nos. for 7 days	14	Nos.	190.00	2660.00	
	Helper to Carpenter 2 nos. for 7 days	14	Nos.	170.00	2380.00	
					5040.00	
	Rate per sqm. 5040.00/35.60				**141.57**	(f)
(g)	**Labour charges for centering & shuttering works in deck slab with suspended type staging supported on girder with bracket arrangement for cantilever portion including conveying the materials from stacks , fitting and fixing in position , dismanteling & returning to site store , charges for making hanging arrangement / platform for the purpose etc. complete but excluding cost of centering / shuttering,consumable materials etc. .**	Sqm.	Prevailing market rate for same nature of works.		**650.00**	(g)
	For 1 sqmt	Sqm.				
	Total (e+ f +g) Rate per sqm			=	**1021.72**	
	Notes :-					
	Shuttering / Centering area					
	1 X 30.60 X 8.10 Mtr	=	247.86	Sqm		
	Side - 2 X 30.60 X 0.20 Mtr	=	12.24	Sqm		
	Both end - 2 X 8.10 X 0.36 Mtr	=	5.83	Sqm		
			265.93			
	Deduct Top Flang of Girder					
	3 X 28.78 X 0.75 Mtr	=	64.76	Sqm		
	Cross					
	2 X 5 X 1.90 X 0.275	=	5.20	Sqm		
			195.97	Sqm		
	Quantity of Concrete per Span = 50.494 Sqm					
	Rate Centering Shuttering area per Cum = 195.94 / 50.494=3.90 Sqm/ Cum					
	Cross Girder Area					
	2 X 2 X 3 X 1.90 X 1.65 Mtr	=	37.62	Sqm		
	Bottom - 2 X 3 X 1.90 X 0.275	=	3.14	Sqm		
	End Cross Girder					
	2 X 2 X 2.12 X 1.65	=	13.99	Sqm		
	2 X 2 X 2.12 X 0.275	=	2.33	Sqm		
			57.08	Sqm		P-11

Sl. No.	Description	Quantity required	Unit	Rate Rs. P	Amount Rs. P	Remarks
	Total shuttering area of deck slab+ cross girder=195.97+57.08=253.02 Sqm					
	Volume of Concrete in Cross Girder	=	10.323	Cum		

Note	If the concrete quantity and shuttering area of cross girders/diaphragm are considered along with deck slab,then the centering/shuttering area is found to be 4.16 sqm/cum. So on lesser side i.e 3.90 sqm/cum has been considered as the shuttering area of deck slab per cum)

High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications

Item Sl No	Sr No of Data Book	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
3	14.3		**(Analysis is bsed as per Data book P-490-491) considering 12 T13 standard system to be followed for Girders of 29.160m length in spans of 30.60 mtr /c/c**				
			Unit = 1 MT Data Book - 490 P-1800				
			Taking output = 0.288 MT				
			Details of cost for 12T13 strand 30.6 m long cable (weight = 0.288 MT)				
			a) Material				
			H.T. Strand @ 9.42 kg/m including 5 per cent for wastage and extra length for jacking(Provisional)	tonne	0.296	55000.000	16280.00
			Sheathing duct ID 66 mm along with 5 per cent extra length 30.6 x 1.05 = 32.13 m.	metre	32.13	114.450	3677.28
			Tube anchorage set complete with bearing plate, permanent wedges etc	each	2.00	3000.000	6000.00
			Cement for grouting including 3 per cent wastage @ 3.00 kg/m = 3 x 1.03 x 30.6 = 94.55 kg (say, = 95 kg)	tonne	0.095	6540.000	621.30
			Add 0.50 per cent cost of material for Spacers, Insulation tape and miscellaneous items			132.893	132.89
			b) Labour				
			i) For making and fixing cables, anchorages				
			Mate	day	0.16	170.00	27.20
			Blacksmith	day	1.00	190.00	190.00
			Mazdoor	day	3.00	150.00	450.00
			ii) For prestressing				
			Mate/Supervisor	day	0.05	170.00	8.50
			Prestressing operator / Fitter	day	0.25	190.00	47.50
			Mazdoor	day	1.00	150.00	150.00
			iii) For grouting				
			Mate/Supervisor	day	0.05	170.00	8.50
			Mason	day	0.25	190.00	47.50
			Mazdoor	day	1.00	150.00	150.00
			c) Machinery				
			Stressing jack with pump	hour	2.50	83.00	207.50
			Grouting pump with agitator	hour	1.00	65.00	65.00
			Generator 33 KVA.	hour	3.50	240.00	840.00
			(a+b+c)				2890.17

Item Sl No	Sr No of Data Book	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs
				d) Overhead charges @ 7.5% on (a+b+c)				216.74
				e) Contractor's profit @ 7.5% on (a+b+c+d)				216.74
				Cost for 0.288 = a+b+c+d+e				3323.65
				Rate per mt (a+b+c+d+e)/0.288				115411.97
				Add Labour cess 1%				1154.14
								116566.09
							say	***116566.10***

Note

Output Taken ***11656.61***

i) 12 Nos. Strand @ 0.785 Kg per Mtr = 9.42 Kg per Mtr for 30.6 Mtr = 0.288 kg

ii) Tube unit - 2 Nos. , Anchorages -12 X 2 = 24 Nos, Bearing Plate -2 Nos. Consists 1 set transportation and tax included.

Item Sl No	Sr No of Data	Ref. to MoRT H Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
			Loosening , leveling and compacting original ground supporting embankment to facilitate placement of First layer of embankment , scarified to adepth of 150 mm , mixed with water at OMC and then compacted by rolling so as to achieve minimum dry density				
			Unit = cum				
			Taking output = 600 cum				
			a) Labour				
			Mate	each	0.080	170.00	13.60
			Mulia unskilled	each	2.00	150.00	300.00
							313.60
			b) Machinary				
			Tractor with ripper attachemnt	hour	6.000	249.00	1494.00
			Vibratory road roller 8-10 ton capacity	hour	7.500	994.00	7455.00
			Water tanker 6 KL Capacity	hour	4.000	582.00	2328.00
			c) Material				11277.00
			Cost of water	KL	24.00	10.00	240.00
			d) Overhead charges @ 7.5% on (a+b+c)				887.30
			e) Contractor's profit @ 7.5% on (a+b+c+d)				887.30
			Cost for 600 cum = a+b+c+d+e				13605.19
			Rate per mt (a+b+c+d+e)/600				22.68
			Add Labour cess 1%				0.23
							22.90
						say	***22.90***
			Cement concrete (1:3:6) with 4 cm size hard granite metal per 1 cum				
			Unit = cum				
			a) Labour				
			Masson 2nd class	each	0.180	190.00	34.20
			Mulia unskilled	each	3.90	150.00	585.00
							619.20
			b) Material				
			crusher broken granite stone 4cm size	Cum	0.96	829.00	795.84
			Sand (Screened & washed)	Cum	0.48	55.00	26.40
			Cement	Qntl	2.29	654.00	1497.66
							2319.90
			c) Overhead charges @ 7.5% on (a+b)				220.43
			d) Contractor's profit @ 7.5% on (a+b)				220.43
			Cost for 1 cum = a+b+c+d				3379.97
			Add Labour cess 1%				33.80
							3413.76
						say	***3413.80***

Cement concrete (1:2:4) with 12mm size hard granite metal per 1 cum

Unit = cum

a) Labour				
Masson 2nd class	each	0.500	190.00	95.00
Mulia unskilled	each	1.40	150.00	210.00
				305.00
b) Material				
Crusher broken granite stone 12mm size	Cum	0.900	1150.00	1035.00
Sand (Screened & washed)	Cum	0.45	55.00	24.75
Cement	Qntl	3.23	654.00	2112.42
				3172.17
c) Overhead charges @ 7.5% on (a+b)				260.79
d) Contractor's profit @ 7.5% on (a+b)				260.79
Cost for 1 cum = a+b+c+d				3998.75
Add Labour cess 1%				39.99
				4038.73
			say	***4038.70***

Providing and filling manually with selected sand including all cost & carriage of materials etc. complete

Unit = cum

Taking output 100 cum

a) Labour				
Mulia unskilled	each	12.36	150.00	1854.00
				1854.00
b) Material				
Sand (Screened & washed)	Cum	100.00	48.00	4800.00
				4800.00
c) Overhead charges @ 7.5% on (a+b)				499.05
d) Contractor's profit @ 7.5% on (a+b)				499.05
Cost for 100 cum = a+b+c+d				7652.10
Add Labour cess 1%				76.52
				7728.62
			say	***7728.60***
For 1 cum				77.286
			Say	**77.29**

Providing & laying good quality of **moorum in sub-base** in layers not exceding 22.5 cm watering and compaction including hire and running charges of PRR etc. complete.

Unit = cum

Taking output 2.83 cum

a) Labour				
man mulia (1.5 - 0.5 =1 No)	each	1.00	150.00	150.00
woman mulia	each	1.50	150.00	225.00
hire and running charges of PRR (425 cum per day)	1 hr	0.053	339.00	17.97
				392.97
for 1 cum				**138.86**
b) Material				
Cost of moorum	Cum	1.20	50.00	60.00
				60.00
c) Overhead charges @ 7.5% on (a+b)				14.91
d) Contractor's profit @ 7.5% on (a+b)				14.91
Cost for 1 cum = a+b+c+d				228.69
Add Labour cess 1%				2.29
				230.97
			say	***231.00***

Earthwork in hard soil with initail lead & lift including rough dressing & breaking clods . Not exceeding 0.3 mtr in depth

Unit = cum

Taking output 100 cum

a) Labour				
man mulia	each	21.50	150.00	3225.00
woman mulia	each	21.50	150.00	3225.00
b) Overhead charges @ 7.5% on (a)				483.75
c) Contractor's profit @ 7.5% on (a)				483.75
Cost for 100 cum				7417.50
Add Labour cess 1%				74.18
				7491.68
			say	***7491.70***
1 cum				**74.92 (A)**

Compacting & watering upto OMC & rolling with PRR including hire and running charges

Unit = cum

Taking output 100 cum

hire and running charges of PRR (425 cum per day)	1 hr	1.88	339.00	637.32
cost of water with an avg lead 5 km (5 tips of water require for 390 cum earth)	cum	1.28	1380	1766.4
labour required for sprinkling water for 390 cum = 50 Nos.		12.8	150	1920
				4323.72 (a)
b) Overhead charges @ 7.5% on (a)				324.28
c) Contractor's profit @ 7.5% on (a)				324.28
Cost for 100 cum				4972.28
Add Labour cess 1%				49.72
				5022.00
For 1 Cum				50.22 **(B)**
			Total	**125.14** (A+B)

92
1785
23
112.5
150
150
SECTION A-A
MS CHANNEL 100X50