



Government of West Bengal
Irrigation & Waterways Department
Jalasampad Bhavan, 1st Floor, Western Block
Bidhannagar, Salt Lake City, Kolkata 700 091

No. 350(9) [SIW]

Dated, 19th January, 2018

From: Shri G.K Chattopadhyay,
Secretary to the Government of West Bengal
& Chairman, Departmental Unified Schedule of Rates Revision Committee
Irrigation & Waterways Department

- To: 1. Chief Engineer (South)
Irrigation & Waterways Directorate
2. Chief Engineer (West)
Irrigation & Waterways Directorate
3. Chief Engineer (South West)
Irrigation & Waterways Directorate
4. Chief Engineer (North)
Irrigation & Waterways Directorate
5. Chief Engineer (Design & Research)
Irrigation & Waterways Directorate
6. Chief Engineer
Teesta Barrage Project
Irrigation & Waterways Directorate
7. Director of Personnel & Ex-officio Chief Engineer
Irrigation & Waterways Directorate
8. Chief Engineer (North East)
Irrigation & Waterways Directorate
9. Project Director & Ex-officio Chief Engineer
West Bengal Major Irrigation and Flood Management Project (WBMIFMP)
Irrigation & Waterways Directorate

Sub: Publication of the 'Unified Schedule of Rates' (USoR) of Irrigation & Waterways Department.

A 'Departmental Unified Schedule of Rates Revision Committee' was constituted vide Irrigation & Waterways Department Order No. 19-(W)/2017-18 dated 20.11.2017 and communicated through Memo No. 453-IB on even date. The committee headed by the undersigned has prepared a 'Departmental Unified Schedule of Rates' and had recently submitted the same to the Department.

The Government in the Irrigation & Waterways Department has accepted the recommendations of the 'Unified Schedule of Rates Revision Committee' vide Memo No. 544-IB dated 10.1.2018. In addition,

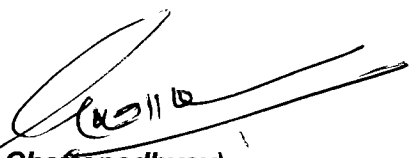
the general guidelines for adopting of Departmental Unified Schedule of Rates, the applicability of the 'Combined Schedule of Rates' of Public Works Department is also defined in the preamble of the Departmental Unified Schedule of Rates.

This Unified Schedule of Rates is brought into effect from 19.01.2018 (19th January 2018) for all works under the Irrigation & Waterways Department, in supersession to all existing "Schedule of Rates" of various Circle offices being used at present.

The Executive Engineer, DVC Study Cell is requested to upload the Departmental Unified Schedule of Rates of Irrigation & Waterways Department in a separately designated link in the Departmental website today itself. Booklet with soft copies in Compact Discs of the Unified Schedule of Rates of Irrigation & Waterways Department is being enclosed for your information and forwarding to all the Superintending Engineers.

All concerned are being informed.

Encl: Hard copy in Booklet form and Soft Copy of USoR


(G.K. Chattopadhyay)
Secretary & Chairman, Departmental Unified
Schedule of Rates Revision Committee
Irrigation & Waterways Department


No. 350 (9) / 1 (3) / SIW

Dated, 19th January, 2018

Copy forwarded for information to:

1. P.S to Hon'ble Minister-in-Charge
Irrigation & Waterways Department
2. The Additional Chief Secretary
Irrigation & Waterways Department
3. The Financial Advisor
Irrigation & Waterways Department

Encl: Hard copy in Booklet form and Soft Copy of USoR


(G.K. Chattopadhyay)
Secretary & Chairman, Departmental Unified
Schedule of Rates Revision Committee
Irrigation & Waterways Department

No. 350(9)/2(41)/SIW

Dated, 19th January, 2018

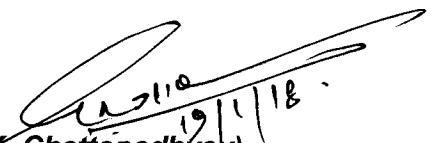
Copy annexing USoR in Compact Disc forwarded for information and necessary action to:

1-40. Superintending Engineer.....
Irrigation & Waterways Directorate

✓ 41. Sri R.K Sharma
Executive Engineer
DVC Study Cell & e-Governance Cell
Irrigation & Waterways Directorate

He is requested to upload this order in the Departmental website www.wbiwd.gov.in

Encl: Soft Copy of USoR


(G.K. Chattopadhyay)
Secretary & Chairman, Departmental Unified
Schedule of Rates Revision Committee
Irrigation & Waterways Department



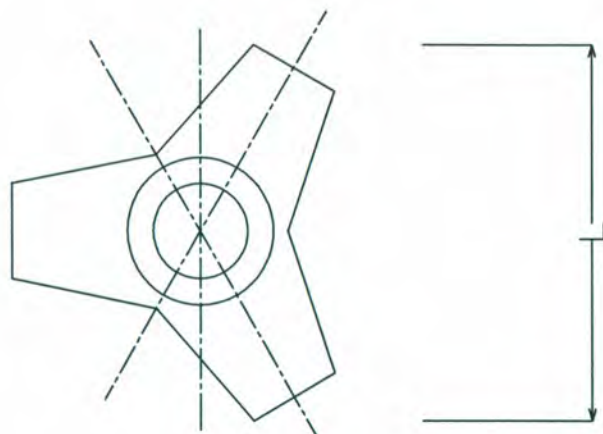
GOVERNMENT OF WEST BENGAL
IRRIGATION & WATERWAYS DEPARTMENT



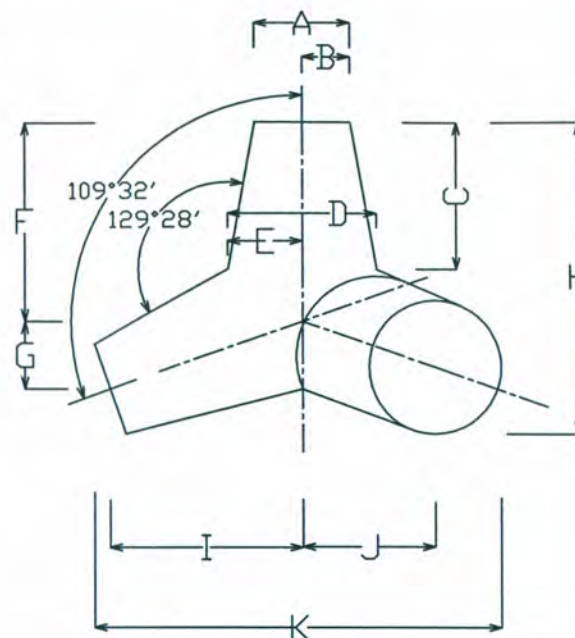
UNIFIED SCHEDULE OF RATES



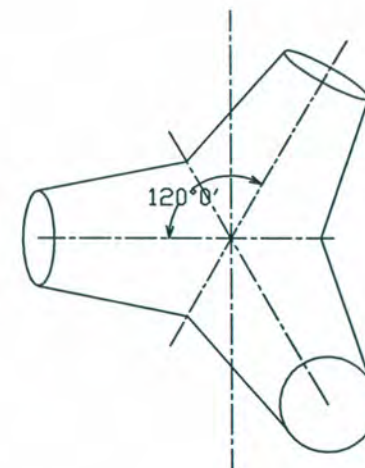
(WITH EFFECT FROM 19.01.2018)



PLAN AT TOP



ELEVATION

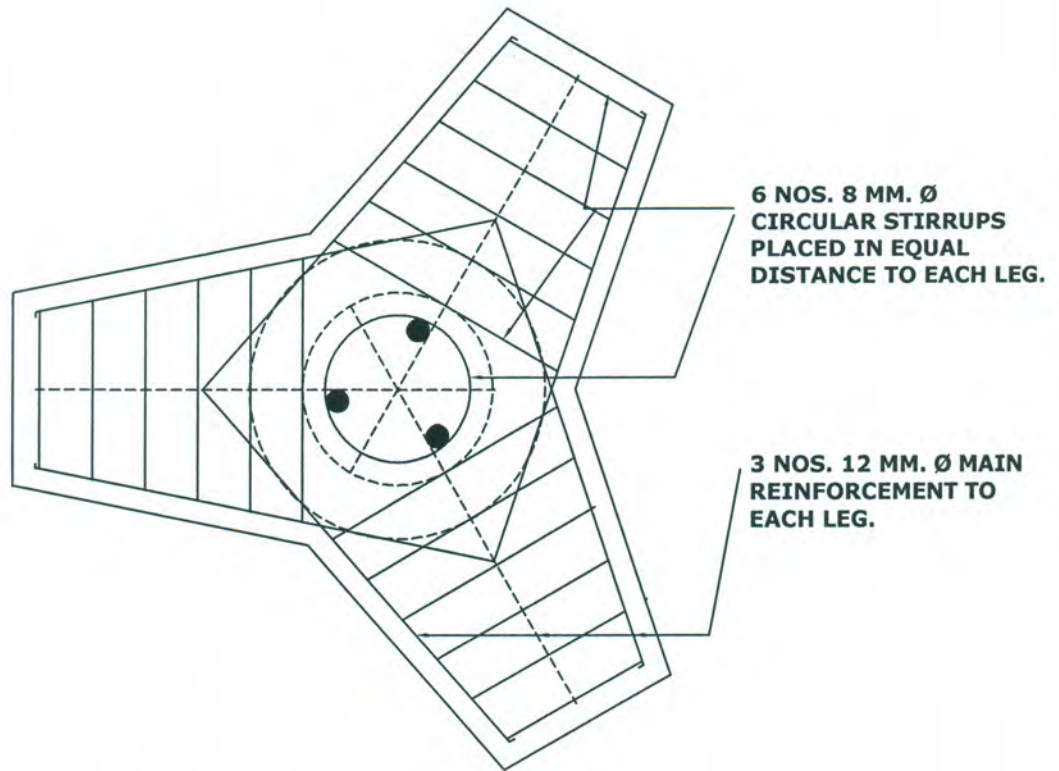


PLAN AT BOTTOM

SYMBOL	A	B	C	D	E	F	G	H	I	J	K	L
DIMENSIONS IN MM.	362	181	572	564	282	773	258	1200	727	364	1310	1441

DETAILS OF R. C. C. TETRAPOD

[REF. - USoR, ITEM NO. 2.91 AND CHAPTER - 2.8 FOR SPECIFICATION]
(NOT TO SCALE)

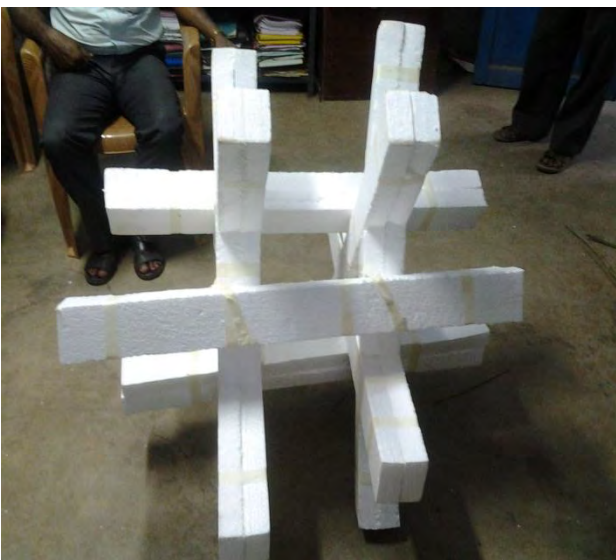


PLAN AT TOP

CLEAR COVER TO REINFORCEMENT IS 70 MM.

REINFORCEMENT DETAILS OF R. C. C. TETRAPOD

**[REF. - USoR, ITEM NO. 2.91 AND CHAPTER - 2.8 FOR SPECIFICATION]
(NOT TO SCALE)**



MODEL PICTURE OF PROPOSED R. C. C. PORCUPINE



MODEL PICTURE OF PROPOSED R. C. C. PORCUPINE

CHAPTER 1
EARTHWORK FOR RIVERS, CHANNELS, CANALS, EMBANKMENTS ETC.

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
			Dist.: Jalpaiguri, Coochbehar, Alipurduar, Plains of Siliguri Sub-Division	Dist.: Murshidabad, Malda, Dakshin Dinajpur, Uttar Dinajpur, Nadia	Dist.: Purba Burdwan, Paschim Burdwan, Birbhum, Bankura, Purulia	Dist.: N 24 Parganas, S 24 Parganas, Kolkata, Hooghly, Howrah, Jhargram, Purba & Paschim Medinipur
1.01	Earthwork from borrow pits over existing embankment or for repairs to embankment, closing breaches etc. within an initial lead of 30 metre and lift of 1.50 metre including breaking clods and depositing the same in layers not exceeding 25 cm. and rough dressing etc. complete as per profile.	Cum	81.00	74.00	81.00	81.00
1.02	Earthwork in excavation in the canals / drainage channels / borrow pits / River bed / slope of bank as noted below as per designed section & throwing the spoils in layers of 25 cm. for making banks as per profile or to deposit the same in any other place within an initial lead of 30 metre and initial lift of 1.5 metre including breaking clods, rough dressing etc. complete as per direction of the Engineer-in-charge.					
	(a) Ordinary soil / local soil / soil mixed with moorum or kankar / silt, dry or moist / slushy silt / sticky soil.	Cum	109.00	99.00	109.00	109.00
	(b) Gravel / moorum / kankar / compact moorum / very much weather rock / sticky soil mixed with moorum / soil mixed with Shingles.	Cum	124.00	113.00	124.00	124.00
	(c) Soft weathered rock / soft laterite.	Cum	225.00	204.00	225.00	225.00
	(d) Hard rock / conglomerated rock / hard weathered rock / hard laterite where blasting is prohibited.	Cum	503.00	493.00	503.00	503.00
1.03	Earthwork in making new embankment / ring bundh/ retired embankment by excavation of earth from borrow pits in all kinds of soil including making berms and depositing the same in layers not exceeding 25 cm. as per profile within an initial lead of 30 metre and lift of 1.5 metre including cost of nicking outlines, dug-belling, putting profiles, cutting and removing thick and thorny jungles, uprooting trees and stumps of all sizes upto 30 cm., girth from the site alignment as per direction of the Engineer-in-Charge including dewatering, removal of weeds, carcasses, organic matter etc., if any, breaking clods, rough dressing, watering, ramming, compacting etc. complete. (Work to be executed on section measurement by pre-work & post-work level section) A. Where land for earth owned/arranged by the Department.	Cum	118.00	106.00	118.00	118.00
1.04	Extra rate over Item Nos.1.01, 1.02 & 1.03 for all kinds of soil for every additional lead of 30 metres or part thereof beyond the initial lead of 30 metres.	Cum	12.00	11.00	12.00	12.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
1.05	Extra rate over Item Nos.1.01, 1.02 & 1.03 for all kinds of soil for every additional lift of 1.50 metre or part thereof beyond the initial lift of 1.50 metre.	Cum	12.00	11.00	12.00	12.00
1.06	Earthwork supplied by boat within a lead of 8.0 KM & all lifts for making embankments or for repairs to embankments, closing breaches or for any other purposes including loading, transporting, unloading and spreading in layers of 25 cms as per profile, all lifts bothways and head load including breaking clods, rough dressing ramming etc. complete as per direction of Engineer-in-charge.(measurement will be made on the basis of pre-work & post-work section / stack measurement with due allowance of shrinkage). No extra payment will be made for stacking.	Cum	288.00	270.00	288.00	288.00
1.07	Earthwork supplied by boat within a lead of 8 KM including loading, unloading and stacking at site complete as per direction of the Engineer-in-charge.(measurement will be made on the basis of stack measurement with due allowance for shrinkage).	Cum	148.00	144.00	148.00	148.00
1.08	Extra rate over Item No. 1.06 & 1.07 for carriage of each Km. or part thereof beyond the initial lead of 8.0 Km.	Cum	11.00	11.00	11.00	11.00
1.09	Disposal / carriage of excavated earth / materials outside Government land by truck or by any other conveyance over kancha / pucca road including making access for plying the truck or any other conveyance beyond 300 m from the excavated point including cost of stacking, loading, unloading, transporting, arrangement of land, if required by agency, spreading and levelling as necessary etc. complete. Measurement : By stacks at loading point after deducting voids as per rule. (This item can only be used after obtaining permission from the concerned Superintending Engineer).	Cum	117.00	114.00	117.00	117.00
1.10	Earthwork in closing ghoges in embankments including cutting, filling, puddling with water and ramming including all leads and lifts, if necessary.	Cum	108.00	98.00	108.00	108.00
1.11	Earthwork in re-excavation / silt clearance of drainage channels in all kinds of soil including sludge and slush but excluding slush mixed with industrial wastes, sewage, municipal garbage, carcasses, etc and depositing the same as per profile in proper place as directed by the Engineer-in-charge without causing hindrance to traffic and posing health hazard and making arrangement to maintain the site in workable condition including removal of polypacks, brickbats, stone ballasts & boulders, remnants of bullah & bamboo pins and all kinds of water hyacinth, solid / semi solid compact mass formed due to water hyacinth and burning them to ashes or removing outside Govt land where necessary and removal of thick & thorny jungles upto 30 cm girth including shoring and shuttering, if required, and including initial removal of sludge and slush etc by pan or bucket if required, and making arrangement for bailing out of any seepage water and removal of sand or soil blown from underneath, all complete. (Measurement : Pre-work and Post-work level section. Pre-work section to be taken after removal of water hyacinth and all other floating materials etc.)					

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	(a) By manual means within an initial lead of 30 M and an initial lift of 1.50 M	Cum	130.00	118.00	130.00	130.00
	(b) By mechanical means using hydraulic excavators within an initial lead of 30 M and an initial lift of 3.0 M	Cum	121.00	121.00	121.00	121.00
1.12	Earthwork in re-excavation / silt clearance in drainage channel in all kinds of soil including sludge, slush mixed with all sorts of industrial wastes and municipal garbages, polypacks, carcasses, small khatal effluents, night soil etc. by mathor labour as may be necessary and depositing the same in places as directed by the Engineer-in-charge , in such a manner, without causing much hindrance to traffic and posing health hazard and making arrangement to maintain the site in workable condition and rough dressing when dry including making arrangement of bailing out of any seepage water and removal of sand or soil blown from underneath, removal of khatal, temporary latrines, clearing and removing all kinds of semi compact masses formed by water hyacinth, jungles up to 30 cm girth, and burning them to ashes or removing outside Government land in conformity with the Municipal rules, including shoring shuttering as required, nicking out lines etc. (Measurement : Pre-work and Post-work level section. Pre- work section to be taken after removal of water hyacinth and all other floating materials etc.)					
	(a) By manual means within an initial lead of 30 M and an initial lift of 1.50 M	Cum	146.00	132.00	146.00	146.00
	(b) By mechanical means using hydraulic excavators within an initial lead of 30 M and an initial lift of 3.0 M	Cum	124.00	124.00	124.00	124.00
1.13	Extra rate for additional lead of earthwork in item Nos. 1.11 & 1.12 above.					
	(a) Each additional lead of 15 M or part thereof beyond 30 M up to 90 M	Cum	11.00	10.00	11.00	11.00
	(b) Each additional lead of 15 M or part thereof beyond 90 M up to 210 M	Cum	3.00	4.00	3.00	3.00
	(c) Each additional lead of 15 M or part thereof beyond 210 M up to 510 M	Cum	3.00	3.00	3.00	3.00
1.14	Extra rate for earthwork in Item Nos.1.11 and 1.12 above for each additional lift or part thereof beyond the initial lift. (a) by manual means beyond initial lift of 1.5 metre (b) by mechanical means using hydraulic excavators beyond initial lift of 3.0 metre.	Cum	9.00	8.00	9.00	9.00
1.14 A	Earthwork in excavation in all kinds of soil for making embankments, repairs to the embankment, closing breaches etc. as per profile including supply and transporting the earth by truck or tractor or any other mechanical means on land , including loading, transporting, unloading and stacking with all lifts bothways and head load where necessary and depositing the same on embankments, clannels, filling depressions in requisite profile, levelling as per direction of the Engineer-in-charge within a lead of					

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	NB :- Measurement to be taken on the basis of stack measurement / pre-post work section measurement after deduction of void as per norms. No extra payment will be made for stacking.					
	A) Beyond 500 metre and upto 1.00 km	Cum	218.00	204.00	218.00	218.00
	B) Beyond 1.00 km and upto 2.00 km	Cum	227.00	212.00	227.00	227.00
	C) Beyond 2.00 km and upto 3.00 km	Cum	235.00	220.00	235.00	235.00
	D) Beyond 3.00 km and upto 4.00 km	Cum	244.00	229.00	244.00	244.00
	E) Beyond 4.00 km and upto 5.00 km	Cum	252.00	238.00	252.00	252.00
1.15	<p>Earthwork in excavation or re-excavation of drainage channels / rivers in all kinds of soil including silt, sand, slush etc. mixed with all sorts of Industrial wastes, sewages, municipal garbage, carcasses, tannery effluents, jungles, bushes, semi-solid / solid compact mass, water hyacinth, cowdung deposits, decomposed vegetations, polythenes, brick bats, gravels, stone ballast, crates, remnant of bullah and bamboo pins etc. by means of suitable excavator mounted on pontoon (min. depth of water 0.75 metre) specially made to suit the site condition in tidal or non-tidal channel / river and carrying of the excavated materials to suitable locations of the channel / river bank from the point of excavation by diesel machine operated boats or similar arrangements in a manner suited for the purpose and placing the excavated materials from the boat etc. on the top of the bank in case of disposal at suitable places arranged by the agency at his own cost, on the bank at available locations having distances from the point of re- excavation as shown below, by means of excavators or any other machines or manually as may be required, including all lifts.</p> <p>Measurement : By Pre-work and Post- work level sections. Pre-work level for the existing bed of the channel / river is to be taken by displacing water hyacinth and all other floating materials including compact masses, carcasses etc. and for which no extra payment will be made. Post-work level section will be taken only when a stretch of at least 300 metre is completed and the said post-work will be taken within 7 days after completion of excavation in that reach.</p> <p>(a) For distance 0 to 50 metre from the point of re-excavation to the placing point on the bank.</p> <p>(b) For distance beyond 50 metre but within 100 metre from the point of re- excavation to the placing point on the bank.</p> <p>(c) For distance beyond 100 metre but within 200 metre from the point of re- excavation to the placing point on the bank.</p> <p>(d) For distance beyond 200 metre but within 300 metre from the point of re- excavation to the placing point on the bank.</p> <p>(e) For distance beyond 300 metre but within 400 metre from the point of re- excavation to the placing point on the bank.</p> <p>(f) For distance beyond 400 metre but within 500 metre from the point of re- excavation to the placing point on the bank.</p>					
		Cum	170.00	170.00	170.00	170.00
		Cum	174.00	174.00	174.00	174.00
		Cum	178.00	177.00	178.00	178.00
		Cum	181.00	181.00	181.00	181.00
		Cum	185.00	185.00	185.00	185.00
		Cum	189.00	188.00	189.00	189.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	Note: The cost for the above work includes the cost of hire charges of excavator including all accessories, excavators, diesel machine operated boats, pontoons etc. and including the cost for mobilisation, demobilisation, maintenance, cost of fuel and lubricants, wages of operators and labours and all other incidental charges as may be necessary for the above work and the rate also includes the charges of dismantling and re-erection of machine excavator, pontoon etc., if necessary, in the interest of work or for passing of the machines etc. below the bridges.					
1.16	Excavation of materials from river bed / stoney soil as noted below as per designed section and throwing the spoils for making banks as profile or to deposit the same in any other place as directed by the Engineer-in-charge for making embankment within a lead of 50 metre and lift upto 4 metre. including dressing etc. complete. (Work is to be done with mechanical devices) (a) Loose boulder mixed with shingles or sand having boulder of size above 20 cm. upto 30 cm. more than 20% upto 30% by volume including removing roots & stumps of trees, cost of profiling channel crossing etc. complete. (b) Boulder, shingles, sand debries, having size above 20 cm. upto 40 cm. more than 30% and upto 40% by volume (as per visual estimation) including removing roots and stumps of trees and minings, cost of profiling, channel crossing etc. complete.	Cum	123.00	123.00	123.00	123.00
		Cum	153.00	153.00	153.00	153.00
1.17	(a) Extra rate over Item No 1.16 for a lead of 50m or part thereof beyond initial lead.	Cum	14.00	12.00	14.00	14.00
	(b) Extra rate over Item No 1.16 for a lift of 4m or part thereof beyond initial lift.	Cum	9.00	8.00	9.00	9.00
1.18	Dressing and chilchalling flanks or slope of embankment including filling with earth or cutting upto 150 mm. average thickness and ramming properly after sprinkling water.	Sqm	10.00	9.00	10.00	10.00
1.19	Construction of embankment by earth moving machinery with approved materials already deposited at site available from river bed cutting and excavation from drain and foundation of other structures as per given profile for formation of bank and as per directon of the Engineer-in-charge. (Payment will be made on the basis of Pre-work & Post-work level after necessary void deduction)	Cum	39.00	39.00	39.00	39.00
1.20	Compacting earthwork in embankment in layers of 25 cm. by power roller or by any other mechanical means, like tractor driven sheep foot roller/ vibrating plate compactor earth rammer etc., (not at OMC) including necessary watering, labour charges, hire charges of all materials, tools & plants etc. and including cost and supply of all materials complete as per direction of the Engineer-in-charge. (Payment will be made on the basis of Pre-work & Post-work level)	Cum	23.00	21.00	23.00	23.00
1.21	Extra rate for puddling earth in layer of 15 cm. including watering and ramming, if necessary, all complete as per the direction of the Engineer-in-charge.	Cum	10.00	9.00	10.00	10.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
1.22	Cutting, uprooting of roots & stumps of trees of different girth upto 1 meter depth below ground level or bed level & filling the rootholes by soil and removal of branches, roots & stumps etc. including carriage and stacking as per instruction of the Engineer-in-charge (Measurement of girth at breast height of 90 cm)					
	(a) Bamboo cluster (each cluster to be measured seperately) / Tea bushes.	Sqm	90.00	82.00	90.00	90.00
	(b) Banana cluster/ Pineapple	Sqm	73.00	66.00	73.00	73.00
1.23	Cutting uprooting and clearing jungles including shrubs, water weeds, bushes, trees, plants, upto 30 cm. girth including removing as directed by Engineer-in-charge.	Sqm	5.00	5.00	5.00	5.00
1.24	Cutting and clearing jungles including shrubs, water weeds, bushes, trees, plants, upto 30 cm. girth including removing as directed by Engineer-in-charge.	Sqm	2.00	2.00	2.00	2.00
1.25	Clearing and removal of water hyacinth including weeds, thick and thorny floating jungles and burning them to ashes when dry or removing them outside Government land including all leads and lifts to stack in a nearby available space complete.	Sqm	7.00	7.00	7.00	7.00
1.26	Clearing and removal of debris (including floating debris) including sludge & slush mixed with all sorts of industrial waste, solid/semi-solid compact mass formed due to water hyacinth in combination with industrial wastes, carcasses, municipal garbage sludge, polypacks, thick and thorny jungles and long grass etc. and depositing, spreading the same on the canal bank and later burnt to ashes when dry including all leads and lifts complete.	Sqm	30.00	27.00	30.00	30.00
1.27	Clearing and removing solid / semisolid compact mass formed due to water hyacinth in combination with industrial waste, carcasses, municipal garbage, sludge, thick and thorny jungles and long grass etc. and disposal of lifted water hyacinth / semi-solid compact mass by truck or by any other conveyance over kuncha / pucca road including making access for plying the truck or any other conveyance beyond 240 m from the lifting point including cost of loading , unloading , transporting, arrangement of land, if required by the agency all complete including all leads and lifts. (This item can only be used after obtaining permission from the Superintending Engineer) Mode of measurement : Payment will be made on the basis on the stack measurement after deducting voids @ 40 %.	Cum	100.00	99.00	100.00	100.00
1.28	Turfing with chorkata or durba grass sods 5 cm. to 8 cm. thick in slope, crest berm etc. of embankments, canals and drainage channels etc. within a lead of 150 metre and all lifts including fine dressing, watering, ramming, guarding etc. complete. (sods will have to be arranged by the contractor at his own cost. Payment to be made on the grown grass only).	Sqm	28.00	26.00	28.00	28.00
1.29	Extra rate over Item No 1.28 (a) For each additional lead of 75 metre or part thereof beyond the initial lead of 150 metre upto 750 metre.	Sqm	5.00	5.00	5.00	5.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	(b) For each additional lead of 250 metre or part thereof beyond 750 metre.	Sqm	7.00	6.00	7.00	7.00
	Note :Add extra rate towards compensation for earth for land owned / arranged by the contractor over rate of earthwork for land owned / arranged by the Department and for royalty charges on earth as per latest rate as mentioned in PWD Schedule. The royalty will be paid to the agency on production of necessary documents in support of payment made toward the royalty. During initial payment of bill a deduction as per considered rate may be made.					

NOTE:

- ❶ The above rates are exclusive of G.S.T and Labour Welfare Cess.
- ❷ Construction Wing should add G.S.T., as applicable, as per Goods and Service Tax Act, 2017 to derive the cost.
- ❸ Construction Wing should add Labour Welfare Cess (in terms of Clause 3 of Construction Labour Welfare Cess Rules, 1998) @ 1% to derive the final cost.

CHAPTER 2
PROTECTIVE AND LINING WORKS IN CANALS & CHANNELS AND OTHER FLOOD PROTECTIVE MEASURES

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
			Dist.: Jalpaiguri, Coochbehar, Alipurduar, Plains of Siliguri Sub-Division	Dist.: Murshidabad, Malda, Dakshin Dinajpur, Uttar Dinajpur, Nadia	Dist.: Purba & Paschim Burdwan, Birbhum, Bankura, Purulia	Dist.: N 24 Parganas, S 24 Parganas, Kolkata, Hooghly, Howrah, Jhargram, Purba & Paschim Medinipur
2.01	Supplying Jhaw / Eucalyptus bullah piles at work site, including dressing and making one end pointed.					
	(i) 10 cm av. diameter	Metre	96.00	96.00	96.00	96.00
	(ii) 12.5 cm av. diameter	Metre	145.00	145.00	145.00	145.00
	(iii) 15 cm av. diameter	Metre	217.00	217.00	217.00	217.00
	(iv) 17.5 cm av. diameter	Metre	267.00	267.00	267.00	267.00
	(v) 20 cm av. diameter	Metre	305.00	305.00	305.00	305.00
	(vi) 22.5 cm av. diameter	Metre	460.00	460.00	460.00	460.00
	Note: Diameter of pile to be measured at a distance of 1.5m from the thicker end.					
2.02	Labour for driving Jhaw / Eucalyptus bullah piles by monkey in all sorts of soil including hoisting and placing piles in position, protecting the pile head with iron ring and cutting and shaping heads before and after driving and including hire and labour for necessary driving appliances and all tackles.					
	(i) 10 cm av. diameter	Metre	83.00	83.00	83.00	83.00
	(ii) 12.5 cm av. diameter	Metre	92.00	92.00	92.00	92.00
	(iii) 15 cm av. diameter	Metre	105.00	105.00	105.00	105.00
	(iv) 17.5 cm av. diameter	Metre	112.00	112.00	112.00	112.00
	(v) 20 cm av. diameter	Metre	119.00	119.00	119.00	119.00
	(vi) 22.5 cm av. diameter	Metre	126.00	126.00	126.00	126.00
	Note: 1) Payment to be made on the length driven into the ground. Diameter to be measured at 1.5m. from the thicker end. 2) For string staging under specific instruction of Engineer-in-charge or for driving from pontoon or boats, the rate will be enhanced by ₹ 4.00 per meter. 3) For driving done by pile engine set (without staging) under specific instruction of Engineer-in-charge, the rates will be enhanced by ₹ 4.00 per meter.					

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	4) For driving done by pile engine set (with heavy staging or from specially made pontoon) under specific instruction of Engineer-in-charge, the rates will be enhanced by ₹ 7.00 per metre.					
2.03	Taking out Jhaw / Eucalyptus piles from river bed or from elsewhere including carrying, stacking materials in the nearest stack yard.					
	(a) Up to 17.5 cm. diameter	Metre	11.80	11.80	11.80	11.80
	(b) Above 17.5 cm. and up to 25 cm. diameter	Metre	14.10	14.10	14.10	14.10
2.04	Supplying, fitting and fixing M.S iron shoe to Jhaw / Eucalyptus bullah piles including necessary cleats, nails etc. complete.					
	a) For bullahs above 10 cm & up to 20 cm av. Diameter	Each.	180.00	180.00	180.00	180.00
	b) For bullahs above 20 cm & upto 25 cm av. Diameter	Each.	224.00	223.00	224.00	224.00
2.05	Supplying, fitting and fixing with iron nails half split bullah wailing pieces and cross pieces etc. complete with cost of all materials and carriage to site.					
	(a) Width of thinner end above 10 cm. and less than 15 cm. (i) Jhaw / Eucalyptus.	Metre.	104.00	104.00	104.00	104.00
	(b) Width of thinner end above 15 cm. (i) Jhaw / Eucalyptus.	Metre.	192.00	191.00	192.00	192.00
2.06	Labour for fitting, fixing with iron nails half split bullah wailing pieces and cross pieces etc. complete including cost of nails only complete as per direction of the Engineer-In-charge. Jhaw / Eucalyptus					
	a) Width of thinner end above 10 cm. and less than 15 cm.	Metre	16.00	16.00	16.00	16.00
	b) Width of thinner end above 15 cm.	Metre	16.00	16.00	16.00	16.00
2.07	Taking out bullah wailing pieces after removing nuts, bolts and iron nails and stacking the same within 150 metre from the site of work including sorting out and stacking serviceable materials.	Metre.	9.00	8.00	9.00	9.00
2.08	Cutting bullah by saw at level desired by the Engineer-in-Charge and marking the same by paint and stacking the same upto 60 metre lead and all lifts complete.					
	(a) Bullah of dia upto 15 cm.	Each	13.00	11.00	13.00	13.00
	(b) Bullah of dia above 15 cm.	Each	15.00	14.00	15.00	15.00
2.09	Supplying, dressing and stacking at site bamboo pins above 5 cm. diameter and upto 7.5 cm. diameter. (Dia. to be measured at mid length).	Metre.	29.00	29.00	29.00	29.00
2.10	Driving bamboo pins in standing or flowing water including scaffolding and driving appliances.					
	(a) Where boats are not necessary.	Metre	11.00	10.00	11.00	11.00
	(b) Where boats are necessary.	Metre	13.00	12.00	13.00	13.00
2.11	Supplying, fitting and fixing with iron nails half split bamboo wailing pieces (av. dia. of bamboo not less than 5.0 cm.)	Metre	22.00	22.00	22.00	22.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.12	Taking out old bamboo pins from piling and stacking the same within 150 metre from the site of work. (a) Where boats are not necessary. (b) Where boats are necessary.	 Metre Metre	 8.00 9.00	 7.00 9.00	 8.00 9.00	 8.00 9.00
2.13	Taking out bamboo wailing pieces after removing iron nails and stacking the same within 150 metre from the site of work. (a) Where boats are not necessary. (b) Where boats are necessary.	 Metre Metre	 2.00 4.00	 2.00 3.00	 2.00 4.00	 2.00 4.00
2.14	Constructing and placing of Dip trees in river bank, slope and bed as per direction of the Engineer-in-charge including constructing cement concrete jhama blocks (30 cm. x 30 cm. x 30 cm. with mix. 1:3:6) with necessary shuttering, curing and tying complete and including supply of bamboo of 5 cm. dia & above with branches and fixing extra branches by nails, wires and making fixing arrangements including supply of labours, materials, all equipments, boats etc. with all leads & lifts. (a) With bamboo upto 4 metre length. (b) With bamboo above 4 metre & upto 6 metre length. (c) With bamboo above 6 metre & upto 8 metre length.	 Each Each Each	 413.00 496.00 616.00	 403.00 486.00 602.00	 413.00 496.00 616.00	 413.00 496.00 616.00
2.15	Construction of Dip trees made of single full size bamboo (min. length 7.50 metre and avg. dia 7.50 cm.) with all its branches including tying with circular sausage filled with boulder (Panchami /Pakur/Laterite/North Bengal variety) including hire charges of boat and placing the same in position, tying with 1.00 metre long bamboo post driven over berm by 10 SWG GI wire including cost of dip trees and other materials but excluding the cost of boulder sausage works.	Each	457.00	446.00	457.00	457.00
2.16	Construction of Dip trees made of 2(two) Nos. full size bamboo (minimum length 7.50 metre and avg. dia 7.5 cm) with all its branches including tying with circular sausage filled with boulder (Panchami /Pakur/Laterite/North Bengal variety) including hire charges of boat and placing the same in position, tying with 1.00 metre long bamboo post driven over berm by 8 SWG GI wire including cost of dip trees and other materials but excluding the cost of boulder sausage works.	Each	840.00	823.00	840.00	840.00
2.17	Making and placing dip trees of single bamboo with branches (Minimum 8m. in each length and 7.50 cm. average diameter) tied by 10 SWG G I wire at 3 different locations of the bamboo with 3 nos empty cement polythene bags filled with single boulder weighing 25kg to 35 kg in each bag and submerging the dip trees under water, tying the same at the bank on 1.5 m. long pegged bamboo pin (2/3rd. driven) with 10 SWG GI wire as per direction of the Engineer-in-charge including cost of all materials, hire charges of boat, labour charges, carriage of all materials etc. complete but excluding the cost of boulders and its carriage upto site.	Each.	356.00	354.00	356.00	356.00
2.18	Supplying and tying in bundles with 12 SWG galvanized iron wire filling in specified areas in bundles and providing ties with half split bamboos fitted, fixed including lead upto 2 km and all lifts, laying and placing complete as per direction of the Engineer - in - charge.(measurement to be made on volume of each bundle)					

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	a) With bundles of brush wood	Cum	82.00	77.00	82.00	82.00
	b) With Bhabni Bundles	Cum	72.00	-	-	-
2.19	Constructing and laying in position sausage brush wood mattress of 0.3 metre to 0.9 metre thickness in flowing water & tying with 8 SWG GI wire to anchoring post as per direction including supply and carriage of brush wood, 8 SWG wire and anchoring post but excluding the cost of wire-netting.	Cum	267.00	247.00	267.00	267.00
2.20	Quarrying, Carrying, & Supplying stone Boulders / Shingles etc. at quarry site selected by the Engineer-in-charge. (The rate is excluding Royalty and other statutory charges, as applicable) North Bengal Variety. a) Boulder above 40 kg. each. b) Boulder above 30 kg. each. c) Boulder above 20 kg. each. d) Boulder above 10 kg. each. e) Shingles. f) Bed materials / Coarse sand. N.B.The construction wing is to add royalty and other related fees at the presently prescribed rates for forest and non-forest area as stated below to arrive at the total rate at quarry site till such rates are modified by the Forest Department and Department of Industry, Commerce & Enterprises, Government of West Bengal. (a) For Forest area Royalty including entry fee and TP fee : Rs. 91.25 per Cum (b) For Non-Forest area Royalty : Rs. 53.00 per Cum Royalty(including other charges wherever applicable) certificates in original from competent authority are to be submitted along with the bill, otherwise amount due towards Royalty(including other charges wherever applicable, but excluding GST) will be deducted from the bills of works .	Cum Cum Cum Cum Cum Cum	154.00 137.00 86.00 68.00 188.00 68.00	140.00 124.00 78.00 62.00 171.00 62.00	- - - - - -	- - - - - -
2.21	Repairing of GI wire mesh by sewing with 10 SWG G.I. wire including supplying & fixing 10 SWG G.I. tying wires at 0.6 metre apart. Including the cost of wire but excluding the cost of GI wire netting.	Sqm	24.00	22.00	24.00	24.00
2.22	Labour charges for loading in Truck at loading point & unloading at destination and carrying by head – load upto a distance of 50 metre each way . a) Boulder	Cum	132.00	120.00	132.00	132.00
2.23	Extra rate over item no 2.22 for carrying boulder by head load for each additional lead of 50 meter or part thereof beyond initial distance of 50 meter, upto a distance of 200 metre.	Cum	28.00	25.00	28.00	28.00
2.24	Supplying to site empty cement polythene bags (capacity 50kg) in good condition including stacking, incidental charges etc. all complete (capacity 50 kg).	Each	6.00	6.00	6.00	6.00
2.25	Supplying Nylon cage netting 1 metre x 1 metre x 1 metre size with knot having mesh size 17.5 cm x 17.5 cm constructed with nylon thread (210 x 24) having tensile strength not less than 250 Kg. / sq. cm. including carriage, delivery and stacking at site inclusive of all taxes complete.	Each	117.00	117.00	117.00	117.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.26	Labour charges for dumping and placing in position properly filled in Nylon crates with filled in gunny / poly cement bags (minimum 25 nos. having capacity 50 kg) with local earth or sand, sewing and tying the crate with nylon wire within a lead of 150 m. and all lifts in river slope or bed by cutting trenches upto 50 cms depth, if necessary, or by boat including cost of hire charges of boat, boatmen and other necessary equipments and also including cost of bags, carriage and charge of filling bags with earth / sand but excluding cost of nylon crate as per direction of the Engineer – in – Charge. NB:- Volume of each earth/ sand filled bags should not be less than 0.028 m ³ . Size of Nylon crate is 1metre X 1metre X 1metre.					
	(a) Where boats are not necessary.	Each	418.00	386.00	418.00	418.00
	(b) Where boats are necessary.	Each	430.00	397.00	430.00	430.00
2.27	Labour charges for filling empty cement gunny bag / polythene bag (capacity 50 kg) with all kinds of earth (wet or dry), sand or aggregates(stone / brick) and sewing as done in case of cement bags ,(tying with a knot after filling will not be accepted) , and stacking within a lead of 30 metre as per direction of Engr-in-charge (cost is excluding the cost of any types of filling materials). NB:- Volume of earth/ sand filled bags should not be less than 0.028 cum/ bag	Each bag	7.00	6.00	7.00	7.00
2.28	Extra rate for item no above for each additional lead of 60 metre or part thereof beyond the initial lead of 30 metre.	Each bag	3.00	3.00	3.00	3.00
2.29	Dumping in position earth / sand filled gunny / poly bags (capacity 50 kg) within a lead of 30 metre inclusive of all lifts.	Each bag	3.00	3.00	3.00	3.00
2.30	Extra rate over item no. 2.29 for dumping by boat in flowing / stagnant water including cost of hire charges of boat , boatman, crew etc and including loading into boat all complete as per direction of the Engr-in-charge	Each bag	2.00	2.00	2.00	2.00
2.31	Placing / laying, stone / brick aggregates filled gunny / poly bags on the slope of the bank of the river / sea or the slope of the embankment or in the river bed with all leads etc. complete.	Each bag	4.00	4.00	4.00	4.00
2.32	Removing earth/sand filled poly bags/gunny bags from the channel bed/slope and initially depositing the same near channel bank at a place as directed by the Engineer-in Charge for measurement of Bag. & then disposing off the same at a distance not less than 150 metre from the channel site.	Each bag	6.00	5.00	6.00	6.00
2.33	Making sausages Square or Rectangular in section (any length) made with 1st class kiln burnt / 1st class picked jhama full bricks rolled inside with 10 S.W.G. galvanised square pattern (internal dimension of mesh will be 100 m.m. x 100 m.m. square) galvanised wirenet caging with proper lapping of minimum 150 m.m, and sewing with 12 S.W.G. galvanised wire including cost of all materials, carriage upto site, placing and laying the same in position, after preparing the bed to proper slope etc. complete as per direction of the Engineer-in-charge. (cost is excluding the cost of end pieces.)					
	a) 1 .20 metre x 1 .20 metre nominal section	Metre	5668.00	5638.00	5668.00	6131.00
	b) 0.90 metre x 0.90 metre nominal section	Metre	3316.00	3298.00	3316.00	3576.00
	c) 0.60 metre x 0.60 metre nominal section	Metre	1589.00	1581.00	1589.00	1704.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	d) 3.00 metre x 1.20 metre nominal section	Metre	13695.00	13618.00	13695.00	14851.00
	e) 1.00 metre x 0.60 metre nominal section	Metre	2531.00	2518.00	2531.00	2724.00
	f) 1.35 metre x 0.75 metre nominal section	Metre	4107.00	4085.00	4107.00	4433.00
	g) 1.35 metre x 0.60 metre nominal section	Metre	3359.00	3341.00	3359.00	3619.00
	h) 1.05 metre x 0.60 metre nominal section	Metre	2646.00	2632.00	2646.00	2848.00
	i) 0.75 metre x 0.45 metre nominal section	Metre	1515.00	1507.00	1515.00	1623.00
	j) 1.00 metre x 1.00 metre nominal section	Metre	4027.00	4005.00	4027.00	4348.00
	k) 0.90 metre x 0.60 metre nominal section	Metre	2294.00	2282.00	2294.00	2467.00
2.34	Making rectangular sausage cage with 10 SWG galvanized iron wire of 125mm. x 125mm. mesh wire netting with proper lapping of minimum 150 mm. including sewing the joints with 12 SWG G I wire and supply of all materials and equipments including placing the sausage cage in position, filling the same with boulder or lump aggregates complete as per direction of the Engineer-in-charge but excluding the cost of boulder / lump aggregates and its carriage upto site.(Cost is excluding the cost of end pieces)					
	a) 1.20 metre x 1.80 metre nominal section	Metre	1124.00	1078.00	1124.00	1124.00
	b) 1.20 metre x 0.90 metre nominal section	Metre	696.00	673.00	696.00	696.00
	c) 1.20 metre x 0.60 metre nominal section	Metre	557.00	541.00	557.00	557.00
	d) 0.90 metre x 0.60 metre nominal section	Metre	452.00	440.00	452.00	452.00
	e) 1.35 metre x 0.75 metre nominal section	Metre	684.00	661.00	684.00	684.00
	f) 1.35 metre x 0.60 metre nominal section	Metre	609.00	591.00	609.00	609.00
	g) 1.05 metre x 0.60 metre nominal section	Metre	504.00	490.00	504.00	504.00
	h) 0.75 metre x 0.45 metre nominal section	Metre	345.00	337.00	345.00	345.00
2.35	Making sausages circular in section (any length) made with 1st class kiln burnt / 1st class picked jhama full bricks rolled inside wire net caging made of 10 S.W.G. galvanised iron wire square pattern (internal dimension of mesh will be 100 mm. x 100 mm. square) galvanised wirenet caging with proper lapping of minimum 150 mm and sewing with 12 SWG. galvanised iron wire including cost of all materials, carriage up to site, placing and laying the same after preparing the bed/trench to proper slope etc. complete as per direction of the Engineer-in-charge. (cost is excluding the cost of end pieces .)					
	a) 0.60 metre diameter.	Metre	1254.00	1247.00	1254.00	1345.00
	b) 0.75 metre diameter.	Metre	1873.00	1863.00	1873.00	2015.00
	c) 0.90 metre diameter.	Metre	2611.00	2597.00	2611.00	2815.00
	d) 1.00 metre diameter.	Metre	3175.00	3158.00	3175.00	3428.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.36	Making sausage cage circular in section with 10 SWG galvanized iron wire of 125mm. x 125mm. mesh wire netting with proper lapping of minimum 150 mm. including tying and sewing the joints with 12 SWG G I wire and supply of all materials and equipments including placing the sausage cage in position, filling the same with boulder or lump aggregates complete as per direction of the Engineer-in-charge but excluding the cost of boulder / lump aggregates and its carriage upto site.(Cost is excluding the cost of end pieces)					
	a) 0.60 metre diameter.	Metre	279.00	272.00	279.00	279.00
	b) 0.75 metre diameter.	Metre	364.00	354.00	364.00	364.00
	c) 0.90 metre diameter.	Metre	456.00	442.00	456.00	456.00
	d) 1.00 metre diameter.	Metre	522.00	505.00	522.00	522.00
2.37	Making sausage cage with 10 SWG galvanized iron wire of 125 mm. x 125 mm. mesh wire netting with proper lapping of minimum 150 mm. including sewing the joints with 10 SWG G I wire and supply of all materials and equipments including placing the sausage cage in position, filling the same with boulder or lump aggregates complete as per direction of the Engineer-in-charge but excluding the cost of boulder / lump aggregates and its carriage upto site.					
	a) Size :- 1.00 m x 1.00 m x 1.00 m	Each	877.00	855.00	877.00	877.00
	b) Size :- 1.00 m x 1.00 m x 0.60 m	Each	631.00	618.00	631.00	631.00
2.38	Making sausage cubical or any shape made with 10 SWG galvanized iron wire of 100 mm. x 100 mm. mesh wire netting with proper lapping of minimum 150 mm. including sewing the joints with 10 SWG G I wire and filling the same with 1st class kiln burnt / 1st class picked jhama full bricks including supply of all materials and equipments at site and including placing the sausage in position, complete as per direction of the Engineer-in-charge .					
	a) Size :- 1.00 m x 1.00 m x 1.00 m	Each	4303.00	4281.00	4303.00	4624.00
	b) Size :- 1.00 m x 1.00 m x 0.60 m	Each	2712.00	2698.00	2712.00	2904.00
2.39	Supplying, fitting, fixing end pieces for rectangular / square / circular sausages at the ends, with 10 SWG / 8 SWG G I wire net of different mesh sizes tying & sewing the same maintaining a lap length of 150 mm all around with 12 SWG G I wire complete, including the cost of supply of wire netting,fitting etc, complete as per direction of the Engineer - in - charge.					
	a) Mesh size 100 mm x 100 mm with 10 SWG wire	Sqm	131.00	130.00	131.00	131.00
	b) Mesh size 125 mm x 125 mm with 10 SWG wire	Sqm	108.00	107.00	108.00	108.00
	c) Mesh size 125 mm x 125 mm with 8 SWG wire	Sqm	141.00	140.00	141.00	141.00
	d) Mesh size 150 mm x 150 mm with 8 SWG wire	Sqm	120.00	119.00	120.00	120.00
	e) Mesh size 150 mm x 150 mm with 10 SWG wire	Sqm	93.00	92.00	93.00	93.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.40	Making rectangular / circular sausage cage with 8 SWG galvanized iron wire of 125 mm. x 125 mm. mesh wire netting with proper lapping of minimum 150 mm including sewing the joints with 10 SWG G I wire and supply of all materials and equipments including placing the sausage cage in position, filling the same with boulder or lump aggregates complete as per direction of the Engineer-in-charge but excluding the cost of boulder / lump aggregates and its carriage upto site.(Cost is excluding the cost of end pieces)					
	a) 1.80 metre x 0.60 metre nominal section	Metre	943.00	918.00	943.00	943.00
	a) 1.50 metre x 0.60 metre nominal section	Metre	817.00	797.00	817.00	817.00
	c) 1.20 Metre x 0.60 metre nominal section	Metre	681.00	665.00	681.00	681.00
	d) 1.80 metre x 0.45 metre nominal section	Metre	842.00	824.00	842.00	842.00
	e) 1.50 metre x 0.45 metre nominal section	Metre	726.00	711.00	726.00	726.00
	f) 1.20 metre x 0.45 metre nominal section	Metre	610.00	598.00	610.00	610.00
	g) 1.80 metre diameter.	Metre	1381.00	1327.00	1381.00	1381.00
	h) 1.50 metre diameter.	Metre	1077.00	1040.00	1077.00	1077.00
	i) 1.20 metre diameter.	Metre	805.00	780.00	805.00	805.00
	j) 0.90 metre diameter.	Metre	555.00	541.00	555.00	555.00
2.41	Making rectangular / circular sausage cage with 8 SWG galvanized iron wire of 150 mm. x 150 mm. mesh wire netting with proper lapping of minimum 150 mm including sewing the joints with 10 SWG G I wire and supply of all materials and equipments including placing the sausage cage in position, filling the same with boulder or lump aggregates complete as per direction of the Engineer-in-charge but excluding the cost of boulder / lump aggregates and its carriage upto site.(Cost is excluding the cost of end pieces)					
	a) 1.80 metre x 0.60 metre nominal section	Metre	837.00	812.00	837.00	837.00
	a) 1.50 metre x 0.60 metre nominal section	Metre	724.00	704.00	724.00	724.00
	c) 1.20 Metre x 0.60 metre nominal section	Metre	601.00	585.00	601.00	601.00
	d) 1.80 metre x 0.45 metre nominal section	Metre	743.00	724.00	743.00	743.00
	e) 1.50 metre x 0.45 metre nominal section	Metre	640.00	624.00	640.00	640.00
	f) 1.20 metre x 0.45 metre nominal section	Metre	537.00	524.00	537.00	537.00
	g) 1.80 metre diameter.	Metre	1257.00	1203.00	1257.00	1257.00
	h) 1.50 metre diameter.	Metre	973.00	935.00	973.00	973.00
	i) 1.20 metre diameter.	Metre	721.00	696.00	721.00	721.00
	j) 0.90 metre diameter.	Metre	491.00	477.00	491.00	491.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.42	Making rectangular / circular sausage cage with 10 SWG galvanized iron wire of 150 mm. x 150 mm. mesh wire netting with proper lapping of minimum 150 mm including sewing the joints with 12 SWG G I wire and supply of all materials and equipments including placing the sausage cage in position, filling the same with boulder or lump aggregates complete as per direction of the Engineer-in-charge but excluding the cost of boulder / lump aggregates and its carriage upto site.(Cost is excluding the cost of end pieces)					
	a) 1.80 metre x 0.60 metre nominal section	Metre	703.00	679.00	703.00	703.00
	b) 1.50 metre x 0.60 metre nominal section	Metre	606.00	586.00	606.00	606.00
	c) 1.20 Metre x 0.60 metre nominal section	Metre	500.00	484.00	500.00	500.00
	d) 1.80 metre x 0.45 metre nominal section	Metre	617.00	598.00	617.00	617.00
	e) 1.50 metre x 0.45 metre nominal section	Metre	530.00	515.00	530.00	530.00
	f) 1.20 metre x 0.45 metre nominal section	Metre	443.00	431.00	443.00	443.00
	g) 1.80 metre diameter.	Metre	1100.00	1046.00	1100.00	1100.00
	h) 1.50 metre diameter.	Metre	842.00	804.00	842.00	842.00
	i) 1.20 metre diameter.	Metre	615.00	590.00	615.00	615.00
	j) 0.90 metre diameter.	Metre	411.00	397.00	411.00	411.00
2.43	Supply of G.I wire netting of different mesh and made with different SWG G I wire at site as per direction of the Engineer-in-charge.					
	a) Mesh size 100 mm x 100 mm with 10SWG wire	Sqm	119.00	119.00	119.00	119.00
	b) Mesh size 125 mm x 125 mm with 10SWG wire	Sqm	95.00	95.00	95.00	95.00
	c) Mesh size 125 mm x 125 mm with 8 SWG wire	Sqm	129.00	129.00	129.00	129.00
	d) Mesh size 150 mm x 150 mm with 8 SWG wire	Sqm	107.00	107.00	107.00	107.00
	e) Mesh size 150 mm x 150 mm with 10 SWG wire	Sqm	80.00	80.00	80.00	80.00
2.44	Labour charges for launching sausage length upto 2.00 metre/ dumping crates from boats in proper position including hire charges of boat, boatman etc complete as per direction of the Engineer-in-charge					
	a) Sausage of 0.60 metre diameter.	Metre	35.00	34.00	35.00	35.00
	b) Sausage of 0.75 metre diameter.	Metre	55.00	53.00	55.00	55.00
	c) Sausage of 0.90 metre diameter.	Metre	79.00	77.00	79.00	79.00
	d) Sausage of 1.00 metre diameter.	Metre	98.00	95.00	98.00	98.00
	e) Sausage crate of Size :- 1.00 m x 1.00 m x 1.00 m	Each	125.00	121.00	125.00	125.00
	f) Sausage crate of size :- 1.00 m x 1.00 m x 0.60 m	Each	76.00	73.00	76.00	76.00
2.45	Labour charges for launching sausage length above 2.00 metre from boats in proper position and where use of multiple boat is necessary, including hire charges of boat, boatman etc complete as per direction of the Engineer-in-charge					
	a) Sausage of 0.60 metre diameter.	Metre	100.00	97.00	100.00	100.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	b) Sausage of 0.75 metre diameter.	Metre	156.00	152.00	156.00	156.00
	c) Sausage of 0.90 metre diameter.	Metre	224.00	218.00	224.00	224.00
	d) Sausage of 1.00 metre diameter.	Metre	277.00	270.00	277.00	277.00
2.46	Labour charges for launching sausage length upto 2.00 metre/ dumping crates from bank or slope and placing in position including supply of all equipments complete as per direction of the Engineer-in-charge					
	a) Sausage of 0.60 metre diameter.	Metre	15.00	14.00	15.00	15.00
	b) Sausage of 0.75 metre diameter.	Metre	23.00	22.00	23.00	23.00
	c) Sausage of 0.90 metre diameter.	Metre	34.00	31.00	34.00	34.00
	d) Sausage of 1.00 metre diameter.	Metre	42.00	38.00	42.00	42.00
	e) Sausage crate of Size :- 1.00 m x 1.00 m x 1.00 m	Each	53.00	49.00	53.00	53.00
	f) Sausage crate of size :- 1.00 m x 1.00 m x 0.60 m	Each	32.00	29.00	32.00	32.00
2.47	Labour charges for launching sausage of length above 2.00 metre from bank or slope and placing in position including supply of all equipments complete as per direction of the Engineer-in-charge					
	a) Sausage of 0.60 metre diameter.	Metre	32.00	30.00	32.00	32.00
	b) Sausage of 0.75 metre diameter.	Metre	50.00	46.00	50.00	50.00
	c) Sausage of 0.90 metre diameter.	Metre	73.00	67.00	73.00	73.00
	d) Sausage of 1.00 metre diameter.	Metre	90.00	82.00	90.00	90.00
2.48	Labour charges for laying boulder/ shingles in apron or within wire netting of sausage for slope pitching including carriage upto 30 metre and all lifts & dressing the exposed faces etc. complete as per direction of the Engineer-in-charge.					
	I) Boulder	Cum	235.00	213.00	235.00	235.00
	II) Shingles	Cum	134.00	122.00	134.00	134.00
2.49	Supplying to site and pitching with 1st class kiln burnt or picked Jhama bricks including dressing, ramming and preparing bed to proper slope complete with necessary earth work not exceeding 300 m.m. in depth and filling gaps with powdered earth or local sand etc. complete (The rate is including cost of sand).					
	i) With 1st class kiln burnt brick					
	a) 7.50 cm thick	Sqm	3115.00	3106.00	3092.00	3459.00
	b) 12.50 cm thick	Sqm	5017.00	5008.00	4983.00	5571.00
	c) 20.00 cm thick	Sqm	7617.00	7638.00	7562.00	8499.00
	d) 25.00 cm thick	Sqm	9531.00	9556.00	9463.00	10634.00
	e) 32.50 cm thick	Sqm	12519.00	12537.00	12434.00	13943.00
	ii) With picked jhama brick No.1.					
	a) 7.50 cm thick	Sqm	3084.00	3075.00	3062.00	3428.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.50	Providing and laying pre-cast brick block pitching of required size (53 Cm. x 53 Cm. x 25 Cm. or as directed by the Engineer-in-charge) with 1st class kiln burnt bricks in cement mortar including flush pointing on all faces except exposed face which to be plastered with 19 m.m. thick cement plaster , curing, dressing, ramming & preparing subgrade in slopes & bed complete with necessary earth work not exceeding 300 mm in depth with all leads & lifts including cost of all materials/ blocks up to site by all means of transport. The gap between adjacent blocks will not be more than 10 m.m. (Sand, cement mortar mix for making blocks, pointing & plastering is 1:4)	Cum	5394.00	5293.00	5313.00	5806.00
2.51	Cast in situ Brick block pitching of required size with 1st class kiln burnt / picked jhama bricks in cement mortar including flush pointing on all faces except exposed face which will be plastered with 19 m.m. thick cement plaster & curing, dressing, ramming & preparing subgrade in slopes & bed with all leads & lifts including cost of all materials. The gap between adjacent blocks will not be more than 10 m.m. (Mortar mix for making blocks, pointing & plastering-1:4)	Cum	5140.00	5062.00	5059.00	5552.00
2.52	Providing and laying cast in situ cement concrete blocks of any size at site with well graded Coarse aggregate, including dressing, ramming and preparing bed to proper slope with necessary earth work not exceeding 300 mm in depth including necessary shuttering, curing complete and finishing exposed surface of cement blocks with 1 :3 cement and sand mortar with all leads and lifts including supply and carriage of all materials complete. With Jhama Khoa a) Nominal Mix. 1:4:8 with 37.5 mm down coarse aggregate b) Nominal Mix. 1:3:6 with 37.5 mm down coarse aggregate	Cum Cum	4278.00 4652.00	4217.00 4578.00	4143.00 4509.00	4657.00 5012.00
2.53	"Cast-in-situ cement concrete blocks or lining units as per designed size and specification, with well graded stone metal aggregate, laid in position by casting in alternative panels or otherwise to keep a gap of 12mm between the adjacent units, over a layer of polythene sheet of thickness not less than 100 μm to act as a separator between the bottom surface of the block and the filter material laid below the blocks, including dressing, ramming, shuttering, finishing the exposed surface with 1:3 cement and sand mortar, curing and filling the gaps between the adjacent units by 5.6mm down coarse aggregate to be compacted properly, with all leads and lifts including supply and carriage of all materials, complete, without the cost of filter. (The rate is exclusive of the cost of stone aggregate and its carriage upto site. Construction wing has to add the cost of same from the SoR of PW (Roads) to derive the consolidated rate. Consumption chart of the USoR may be used for assessing the quantity of coarse aggregates per cum of concrete). With Stone aggregates! (Pakur, North Bengal or Rajmahal varieties) a) Nominal Mix. 1:3:6 with 37.5 mm down coarse aggregate b) Nominal Mix. 1:2:4 with 20 mm down coarse aggregate	Cum Cum	3379.00 3985.00	3305.00 3890.00	3286.00 3877.00	3574.00 4153.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	c) Nominal Mix. 1:1.5:3 with 20 mm down coarse aggregate	Cum	4753.00	4634.00	4627.00	4892.00
2.54	<p>Precast cement concrete blocks or lining units as per designed size and specification, with well graded stone metal aggregate, including dressing, ramming, shuttering, finishing the top surface with 1:3 cement and sand mortar, curing, transporting and laying the blocks or lining units at worksite in position, over filter, layer, keeping a gap of 6mm between the adjacent units, by use of removable plyboards or non removable thermocol boards, with all leads and lifts, including supply and carriage of all materials complete.</p> <p>(The rate is exclusive of the cost of stone aggregate and its carriage upto site. Construction wing has to add the cost of same from the SoR of PW (Roads) to derive the consolidated rate. Consumption chart of the USoR may be used for assessing the quantity of coarse aggregates per cum of concrete).</p> <p>With Stone Aggregate (Pakur, North Bengal or Rajmahal varieties)</p>					
	a) Nominal Mix. 1:2:4 with 20 mm down coarse aggregate	Cum	4073.00	3970.00	3966.00	4242.00
	b) Nominal Mix. 1:1.5:3 with 20 mm down coarse aggregate	Cum	4819.00	4692.00	4693.00	4957.00
2.55	<p>Labour charge for dumping / laying of Laterite / Stone Boulders 25 kg & above / Shingles / Brick Bats, from stack of worksite with all leads and lifts in water or spreading the same on the slope of the bank of River/Sea or the slope of the embankment or in the River/ Sea bed to an uniform thickness as per direction of the Engineer-in-charge including cost of all accessories and other incidental charges.</p>					
	(a) Boulder 25kg & above where boats are not necessary.	Cum	203.00	184.00	203.00	203.00
	(b) Boulder 25kg & above where boats are necessary.	Cum	247.00	228.00	247.00	247.00
	(c) Shingles	Cum	130.00	118.00	130.00	130.00
	(d) Brick Bats	Cum	114.00	103.00	114.00	114.00
2.56	<p>Labour charges for stacking unloaded boulder / shingles to make them convenient for measurement as per direction of the Engineer-in-charge.</p>					
	a) Boulder of size above 30 kg	Cum	71.00	64.00	71.00	71.00
	b) Boulder of size upto 30 kg	Cum	56.00	51.00	56.00	56.00
	c) Shingles	Cum	29.00	26.00	29.00	29.00
2.56 A	<p>Extra rate for stacking unloaded boulder on private land (where Govt. land is not available) to make them convenient for measurement as per direction of the Engineer-in-charge (land to be arranged by the contractor at his own cost. Note :- This item is payable only when the Engineer-in-charge in his discretion is satisfied about the necessity.</p>	Cum	8.00	8.00	8.00	8.00
2.57	<p>Labour charges for boulder pitching on top and slope by placing required boulders (each weighing 25 Kg. and above within lead of 100 metres and all lifts) including filling the interstices with fragments as required, preparing sub-grade by cutting or filling the earth on slope upto 7.5 cm. depth, watering and ramming where necessary complete as per direction of the Engineer-in-charge.</p>					
	a) Over Jhama Khoa / metal filter/ Geo-textile filter.	Cum	501.00	455.00	501.00	501.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.58	Making filter with well graded 40 mm down ballasts and laying uniformly behind weep holes, below pitching on bed, side slopes including supply and carriage of all materials to site including preparing bed with earthwork up to 30 cm depth, where necessary and compacting with wooden mallet after laying to achieve designed section as per direction of the Engineer- in - Charge (measurements will be on finished work / in stack after deducting necessary void.)					
	(a) Jhama ballast	Cum	1915.00	1959.00	1625.00	2174.00
	(b) 1st class brick ballast	Cum	1692.00	1659.00	1640.00	1868.00
2.59	Labour charges for providing filter with well graded 40 m.m. down stone metal / shingles and laying uniformly below pitching on bed, side slopes including preparing bed with earthwork up to 30 cm depth, where necessary and compacting as per direction of the Engineer- in - Charge and including all leads and lifts complete but excluding the cost of supply and carriage of stone metals up to site.	Cum	360.00	327.00	360.00	360.00
2.60	Labour charges for relaying and replacing the displaced dry brick pitching by old bricks including dressing and preparing bed with necessary earth work upto 30 cm depth complete including filling gaps with powdered earth or local sand, including collection of bricks within a lead of 50 metre and finishing the same as per direction of the Engineer - in - Charge.					
	a) 7.50 cm thick	Sqm	69.00	66.00	66.00	76.00
	b) 12.50 cm thick	Sqm	91.00	86.00	87.00	101.00
	c) 20.00 cm thick	Sqm	109.00	105.00	102.00	125.00
	d) 25.00 cm thick	Sqm	130.00	126.00	123.00	151.00
	e) 32.50 cm thick	Sqm	159.00	154.00	149.00	184.00
2.61	Labour charges for collecting scattered bricks from slope, bed or apron and stacking the same above ground within a lead of 100 metre and all lifts as per direction of the Engineer - in - Charge.	1000 Nos	684.00	620.00	684.00	684.00
2.62	Labour charges for collecting or taking out displaced cement concrete or brick blocks of all sizes from slope, bed or apron and relaying the same in canal bed or slopes including clearing, dressing, ramming and preparing bed with necessary earthwork complete within a lead of 200 metre and all lifts complete.	Cum	308.00	280.00	308.00	308.00
2.63	Labour charges for collecting loose scattered laterite and stone boulders from slope, bed or apron and stacking the same above ground level within a lead of 100 metre and all lifts as per direction of the Engineer - in-charge.	Cum	205.00	186.00	205.00	205.00
2.64	Relaying displaced stone or laterite boulder pitching including dressing, preparing bed with necessary earthwork upto 30 cm depth complete with cost of collection of boulder within a lead of 30 metre.	Cum	199.00	180.00	199.00	199.00
2.65	Caulking joints of laterite / stone boulder or Brick pitching with cement mortar 1:4 and flush pointing as per direction of the Engineer-in-charge.					
	(a) Stone / laterite boulder pitching	Sqm	126.00	118.00	124.00	125.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	(b) Brick pitching.	Sqm	77.00	71.00	76.00	78.00
2.66	Brick mattressing 75 mm. thick (one layer of brick) with 1st class or picked jhama bricks encased in 12 SWG. square pattern (internal dimension of mesh will be 100 mm. x 100 mm square) galvanised iron wire netting including cutting, straightening, stiching the wire netting and tying vertically with 12 SWG. GI wire not more than 30 cm. apart from centre to centre including fine dressing earth surface and cost of all materials and carriage complete as per direction of the Engineer-in-charge.					
	i) With 1st class picked Jhama Brick	Sqm	550.00	544.00	550.00	574.00
	ii) With 1st class kiln burnt Brick	Sqm	553.00	547.00	553.00	577.00
2.67	Brick mattressing 15 cm. thick (two layers) with 1st class or picked jhama bricks encased in 12 SWG square pattern (internal dimension of mesh will be 100 mm. x 100 mm. square) galvanised iron wire netting including cutting, straightening, stiching the wire netting and tying vertically with 12 SWG GI. wire not more than 30 cm. apart from centre to centre including fine dressing earth surface and cost of all materials and carriage complete as per direction of the Engineer-in-charge..					
	i) With 1st class picked Jhama Brick	Sqm	890.00	884.00	890.00	938.00
	ii) With 1st class kiln burnt Brick	Sqm	896.00	890.00	896.00	944.00
2.68	Making cubical bamboo porcupine cages with bamboo of 60 mm to 75mm dia. having length of 2 metre each for all horizontal and vertical struts and 2.8 metre length for diagonal struts, 3 nos horizontal and 3 nos vertical struts should be placed equi-distant from each face to make the square cage of outer dimension 75 cm x 75 cm and projecting each strut by 60 cm on all directions. Two nos diagonals or cross bamboo posts should be placed on each face having their centre tied with the centre of cage properly including fitting, fixing corners, vertical, horizontal and diagonal struts with iron nails not less than 20 cm long and tying corners with 16 SWG galvanized iron wire, filling in the cages with boulders / lump aggregates. Cages built with 10 SWG hexagonal or square pattern 10 cm mesh, with proper lapping, tying and sewing with 10 SWG GI wire including cost of all materials, carriage to site and laying the same in the bed or slope of the river, filling the same with the filler materials complete as per direction of the Engineer - in - Charge but excluding the cost & carriage of boulder / lump aggregate up to site. (N.B:::- If G I wirenetting is not considered then Rs. 348.00 per cage may be deducted from the following costs, towards cost of wire netting including OH and conctarcor's profits.)					
	For cages of size 75cm x 75cm x 75cm with boulder					
	(a) Single cage.	Each cage	3010.00	2983.00	3010.00	3010.00
	(b) Double cage.	Each cage	5906.00	5851.00	5906.00	5906.00
	(c) Triple cage	Each cage	8750.00	8672.00	8750.00	8750.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.69	<p>Making cubical bamboo porcupine cages with bamboo of 60 mm to 75mm dia. having length of 2 metre each for all horizontal and vertical struts and 2.8 metre length for diagonal struts, 3 nos horizontal and 3 nos vertical struts should be placed equi-distant from each face to make the square cage of outer dimension 75 cm x 75 cm and projecting each strut by 60 cm on all directions. Two nos diagonals or cross bamboo posts should be placed on each face having their centre tied with the centre of cage properly including fitting, fixing corners, vertical, horizontal and diagonal struts with iron nails not less than 20 cm long and tying corners with 16 SWG galvanized iron wire, filling the cages with 1st class kiln burn Brick @ 80 nos bricks per cage. Cages built with 10 SWG hexagonal or square pattern 10 cm mesh, with proper lapping, tying and sewing with 10 SWG GI wire including cost of all materials, carriage to site and laying the same in the bed or slope of the river complete as per direction of the Engineer - in - Charge .</p> <p>(N.B:- If G I wirenetting is not considered then Rs. 348.00 per cage may be deducted from the following costs, towards cost of wire netting including OH and contractor's profit .)</p> <p>For cages of size 75cm x 75cm x 75cm with 1st class kiln burn Bricks</p> <p>(a) Single cage.</p> <p>(b) Double cage.</p> <p>(c) Triple cage</p>	<p>Each cage</p> <p>Each cage</p> <p>Each cage</p>	<p>3652.00</p> <p>7191.00</p> <p>13426.00</p>	<p>3625.00</p> <p>7136.00</p> <p>13345.00</p>	<p>3652.00</p> <p>7191.00</p> <p>13426.00</p>	<p>3714.00</p> <p>7315.00</p> <p>13613.00</p>
2.70	<p>Making cubical bamboo porcupine cages with bamboo of 60 mm to 75mm dia. having length of 1.8 metre each for all horizontal and vertical struts and 2.5 metre length for diagonal struts, horizontal 3 nos and 3 nos vertical struts should be placed equi-distant from each face to make the square cage of outer dimension 60 cm x 60 cm and projecting each strut by 60 cm on all directions. Two nos diagonals or cross bamboo posts should be placed on each face having their centre tied with the centre of cage proper including fitting, fixing corners, vertical, horizontal and diagonal struts with iron nails not less than 20 cm long and tying corners with 16 SWG galvanized iron wire, filling the cages with boulders / lump aggregates. Cages built with 10 SWG hexagonal or square pattern 10 cm mesh, with proper lapping, tying and sewing with 10 SWG GI wire including cost of all materials, carriage to site and laying the same in the bed or slope of the river, filling the same with the filler materials complete as per direction of the Engineer - in - Charge but excluding the cost & carriage of boulder / lump aggregate up to site.</p> <p>(N.B:- If G I wirenetting is not considered then Rs. 215.00 per cage may be deducted from the following costs, towards cost of wire netting including OH and contractor's profit .)</p> <p>For cages of size 60cm X 60cm X 60cm with boulders.</p> <p>(a) Single cage.</p> <p>(b) Double cage.</p>	<p>Each cage</p> <p>Each cage</p>	<p>2627.00</p> <p>5117.00</p>	<p>2602.00</p> <p>5067.00</p>	<p>2627.00</p> <p>5117.00</p>	<p>2627.00</p> <p>5117.00</p>

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	(c) Triple cage	Each cage	7732.00	7658.00	7732.00	7732.00
2.71	<p>Making cubical bamboo porcupine cages with bamboo of 60 mm to 75mm dia. having length of 1.8 metre each for all horizontal and vertical struts and 2.5 metre length for diagonal struts, 3nos horizontal and 3 nos vertical struts should be placed equi-distant from each face to make the square cage of outer dimension 60 cm x 60 cm and projecting each strut by 60 cm on all directions. Two nos diagonal or cross bamboo posts should be placed on each face having their centre tied with the centre of cage properly including fitting, fixing corners, vertical, horizontal and diagonal struts with iron nails not less than 20 cm long and tying corners with 16 SWG galvanized iron wires, filling the cages with 1st class kiln burn Brick @ 40 nos bricks per cage. Cages built with 10 SWG hexagonal or square pattern 10 cm mesh, with proper lapping, tying and sewing with 10 SWG GI wire including cost of all materials, carriage to site and laying the same in the bed or slope of the river etc. complete as per direction of the Engineer - in - Charge (N.B:- If G I wirenetting is not considered then Rs. 215.00 per cage may be deducted from the following costs, towards cost of wire netting including OH and contractor's profit .)</p> <p>For cages of size 60cm x 60cm x 60cm with 1st class kiln burn Bricks</p> <p>(a) Single cage.</p> <p>(b) Double cage.</p> <p>(c) Triple cage</p>	<p>Each cage</p> <p>Each cage</p> <p>Each cage</p>	<p>2948.00</p> <p>5759.00</p> <p>10334.00</p>	<p>2923.00</p> <p>5710.00</p> <p>10260.00</p>	<p>2948.00</p> <p>5759.00</p> <p>10334.00</p>	<p>2979.00</p> <p>5821.00</p> <p>10427.00</p>
2.72	<p>Making R. C. C. (1:1.5:3) porcupine with nine members having length of 1.5 metre each for all horizontal and vertical struts, out of which 3 nos. such member casted monolithically to form an equilateral triangle of inner dimension 60 cm and rest part projected and such 2 members are fitted and fixed with 3 nos horizontal struts, placed equi-distant from each face with 6 nos nuts & bolts not less than 25 cm long to make the hollow triangular shaped cage of dimension 60 cm x 60 cm and projecting each strut by 30 cm on all directions. Each member is reinforced with four nos. 6mm dia. HYSD bar with 6mm dia. HYSD stirrups @ 200 mm c/c including fitting with necessary wire for each members and dumping / placing including shuttering, curing complete as per direction of the Engineer - in - charge.</p> <p>(i) For R.C.C. porcupine having each member size 150 cm X 10 cm X 10 cm .</p> <p>(The cost is excluding the cost of stone chips and its carriage upto site. Construction wing has to add the cost of 0.1109 cum of stone chips at site to derive consolidated rate).</p>	Each	2207.00	2208.00	2150.00	2196.00
2.73	Extra rate for items above for dumping by boat in flowing water including cost of hiring of boat, boatman, loading into boat and dumping in specified location including all other equipments etc. complete as per direction of the Engineer-in-charge.	Each cage	82.00	77.00	82.00	82.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.74	Fitting, fixing bitumen drum sheet to bullah piling and wailing pieces including cutting straightening drum sheet fixing with country nails @ 20cm c/c at top & bottom and bolts& nuts at top & bottom at every joint of drum sheet with a laping of 15 cm, including supply of drum sheet, fixture all complete as per direction of the Engineer - in - charge.	Sqm	437.00	433.00	437.00	437.00
2.75	Darma mat stiffened with split bamboo wailing pieces in both direction @ 50 cm c/c, placed, fitted and fixed with frame work or behind piling works and tied with 22 SWG, GI wire as per direction including cost, carriage and supplying all materials to site complete.					
	A) Where boats are not necessary	Sqm	277.00	270.00	277.00	277.00
	B) Where boats are necessary	Sqm	282.00	275.00	282.00	282.00
2.76	Supplying fitting, fixing Darma mat in flowing or stagnant water or in dry areas with 16 SWG GI wire as per direction of the Engineer-in-charge.					
	A) Where boats are not necessary	Sqm	171.00	170.00	171.00	171.00
	B) Where boats are necessary	Sqm	176.00	174.00	176.00	176.00
2.77	Splicing (as per drawing and direction of the Engineer-in-charge) in position 150 mm. to 250 mm. dia. of individual bullah with 2 Nos. 1250 mm. x 75 mm. x 10 mm. M.S. flat and 4 Nos. half rings made of (700 x 75 x 6) mm. M.S. flat fitted and fixed with 4 Nos. 12 mm. dia. bolts with nuts and washers. Flat bars are to be fitted and fixed with 3 Nos. 20 mm. dia. through bolts with nuts and washers including cost of supply and carriage of all materials, making necessary scaffolding, staging etc. drilling holes complete (splicing is to be done on position after the bottom bullah is driven as per necessity). Length of lap of bullah should be provided as five times the diameter of bullah or 90 cm. whichever is greater.	Each	2736.00	2705.00	2736.00	2736.00
2.78	Coal tarring with 5% pitch including cost of material and labour complete as per direction of the Engineer-in-charge					
	a) One Coat	Sqm	29.00	27.00	29.00	29.00
	b) Two Coat	Sqm	55.00	51.00	55.00	55.00
2.79	Painting on steel or other metal surface with any approved bituminous anticorrosive paint after preparing the surface including removing paints, cleaning, smoothening etc. including scaffolding where necessary including cost of all materials complete.					
	a) One Coat	Sqm	36.00	33.00	36.00	36.00
	b) Two Coat	Sqm	57.00	54.00	57.00	57.00
2.80	Applying two coats of anti corrosive EPOXY paint (black) of approved make and brand to sluice gates only after preparing the surface by rough sand blasting. (to be considered after prior permission of the Engineer-in-charge.)	Sqm	222.00	218.00	222.00	222.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.81	Supplying, testing and installation of open Weave Jute Geo-textile (JGT) having overall weight of 500 gm/sq. m, thickness 6 mm, width 1220 mm, Tensile strength 10 KN/m (Warp direction) × 7.50 KN/m (weft direction) on slopes of embankments dressed and cut to a gradient as per design and drawing for control of surface soil erosion on proposed bank slope of embankment including the cost of preparation of sub-grade and excavating the trenches of 500 mm deep and spade-width wide where necessary, and filling the trenches with earth duly secured to sub-grade by U shape MS staples (11 gauges) or wooden or plastic pegs at an interval of 450 mm, providing side lapping of 100 mm and horizontal lapping of 300 mm as per direction complete. The rate is inclusive of all incidental charges, transportation by all means to the work site, all leads and lifts complete. (Payment will made on the basis of finished surface area of the slope).	Sqm	58.00	56.00	58.00	58.00
2.82	Supplying at site and laying in position UV stabilized polypropylene woven geotextile of 430 gsm as filter, as per specification, including cost of preparing the bed, placing the geotextile as per profile with at least 15cm lapping, wherever required and anchorage at top, sewing / welding the overlapped portion, storage and transportation by all means, complete as per direction of the Engineer-in-charge. Note: 1. Payment to be made on measurement of finished surface without lapping, but including anchoring length at top. 2. Payment will be made subject to the result of 3rd Party Testing, to be done by the Engineer-in-charge departmentally. Paragraphs 2.7.7, 2.7.9 and 2.7.10 under the Chapter of "Specification for Works" in the USoR shall be reproduced and included in the tender document as "Specification & Special Terms & Conditions for Geotextile" in case of use of this item in the estimate. 3. This particular item is to be used in special cases, either in continuation of previous usage or after offering adequate justification from techno-economical angles.	Sqm	242.00	235.00	242.00	242.00
2.83	Supplying at site and laying in position UV stabilized needle punched, stapled fibre / continuous filament polypropylene non-woven geotextile of 300 gsm as filter, as per specification, including cost of preparing the bed, placing the geotextile as per profile with at least 15cm lapping, wherever required and anchorage at top, sewing / welding the overlapped portion, storage and transportation by all means, complete as per direction of the Engineer-in-charge. Note: 1. Payment to be made on measurement of finished surface without lapping, but including anchoring length at top. 2. Payment will be made subject to the result of 3rd Party Testing, to be done by the Engineer-in-charge departmentally. Paragraphs 2.7.7, 2.7.9 and 2.7.10 under the Chapter of "Specification for Works" in the USoR shall be reproduced and included in the tender document as "Specification and Special Terms & Conditions for Geotextile" in case of use of this item in the estimate.	Sqm	195.00	188.00	195.00	195.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.84	Supplying at site 9mm polypropylene (PP) rope gabion (4-strand and mesh size 75mm x 75mm) as per specification, laying along sea/riverside toe of embankment, closing and locking the gabions, inter locking the adjoining gabions, after placement of full bricks inside, including cost of all materials (excluding bricks), labours, transportation to site by all means, all leads and lifts complete as per direction of the Engineer-in-charge.. Gabion of size 2m (L) x 1m (W) x 1m (H), with intermediate partition at every metre width. Note: Paragraph 2.9 under the Chapter of "Specification for Works" in the USoR shall be reproduced and included in the tender document as "Specification and Special Terms & Conditions for Polypropylene (PP) Rope Gabion", in case of use of this item in the estimate."	Each	4168.00	4165.00	4168.00	4168.00
2.85	Supplying and laying 1st class brick inside Polypropylene (PP) rope gabions in layers on slope of embankment or at toe of embankment with all lifts & leads including cost of labour, cost of materials at site all complete as per direction of the Engineer -in- charge.	Cum	3282.00	3260.00	3282.00	3577.00
2.86	Supplying at site geotextile bags of size 1.00 m x 0.70 m using UV stabilized needle punched polypropylene non-woven geotextile of 300 gsm as per specification, double stitched at two ends with polypropylene or equivalent yarn including cost of transportation by all means and other incidental charges complete. Note: Payment will be made subject to the result of 3rd Party Testing, to be done by the Engineer-in-charge departmentally. Paragraphs 2.7.5, 2.7.7, 2.7.8, 2.7.9 and 2.7.10 under the Chapter of "Specification for Works" in the USoR shall be reproduced and included in the tender document as "Specification and Special Terms & Conditions for Geotextile Bags" in case of use of this item in the estimate.	Each	134.00	134.00	134.00	134.00
2.87	Supplying at site composite geotextile bags of size 1.00 m x 0.70 m comprising UV stabilized needle punched 200 gsm polypropylene non-woven geotextile as inner liner and 300 gsm UV stabilized woven polypropylene geotextile as outer liner as per specification, double stitched at two ends with polypropylene or equivalent yarn including cost of transportation by all means and other incidental charges complete. Note: Payment will be made subject to the result of 3rd Party Testing, to be done by the Engineer-in-charge departmentally. Paragraphs 2.7.5, 2.7.6, 2.7.7, 2.7.8, 2.7.9 and 2.7.10 under the Chapter of "Specification for Works" in the USoR shall be reproduced and included in the tender document as "Specification and Special Terms & Conditions for Composite Geotextile Bags" in case of use of this item in the estimate.	Each	199.00	199.00	199.00	199.00
2.88	Labour charges for filling Geo-textile bags with filler materials (earth/sand), machine stitching the open end of the bag with thread as per design and placing the same on slope or dumping from bank within initial lead of 150m and all lifts including carriage and hire charges of all materials and equipments but excluding the cost of filler materials as directed by the Engineer-in-Charge i) Bag size 1.00m x 0.70m of capacity 0.1325 cum/bag	Each	57.00	52.00	57.00	57.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	i) Bag size 1.50m x 1.00m of capacity 0.406 cum/bag	Each	162.00	147.00	162.00	162.00
2.89	Extra rate for item no. 2.88 , for dumping by boat in flowing water including cost of hiring of boat, boatman, loading into boat and dumping in specified location including all other equipments etc complete as per direction of the Engineer-in-charge.					
	i) Bag size 1.00m x 0.70m with capacity 0.1325 cum/bag	Each	56.00	53.00	56.00	56.00
	i) Bag size 1.50m x 1.00m with capacity 0.406 cum/bag	Each	78.00	74.00	78.00	78.00
2.90	Supplying at site High Density Polyethylene (HDPE) bag of size 0.84 m x 0.38 m conforming to BIS : 14252 : 2015 for bank protective works including all cost of cost of transportation on road by all means,including other incidental charges complete. Note: Payment will be made subject to the result of 3rd Party Testing, to be done by the Engineer-in-charge departmentally. Paragraphs 2.8 including the sub-paragraphs, i.e. 2.8.1 and 2.8.2 under the Chapter of "Specification for Works" in the USoR shall be reproduced and included in the tender document as "Specification and Special Terms & Conditions for High Density Polyethylene (HDPE) Bags" in case of use of this item in the estimate."	Each	23.00	23.00	23.00	22.00
2.91	Labour charges for filling HDPE bags with filler materials (earth/sand), machine stitching the open end of the bag with thread as per design and placing the same on slope or dumping from bank within initial lead of 30m and all lifts including carriage and hire charges of all materials and equipments but excluding the cost of filler materials as directed by Engineer-in-Charge (Volume of earth/sand filled bag should not be less than 0.0328 cum).	Each	12.00	11.00	12.00	12.00
2.92	Extra rate for item no above for each additional lead of 60 metre or part thereof over the initial lead of 30 metre.	Each	5.00	5.00	5.00	5.00
2.93	Extra rate for item above for dumping by boat in flowing/stagnant water including cost of hiring of boat, boatman, including loading into boat and dumping in specified location including all other equipments etc complete as per direction of Engr-in-charge.	Each	6.00	6.00	6.00	6.00
2.94	Cost of stone / laterite boulder at quarry site including Royalty (Royalty certificate in original from competent authority are to be submitted along with the bill, otherwise amount due towards Royalty of stone/laterite boulder will be deducted from the bills of works) . a) Panchami source (Each weighing 25 kg & above) b) Pakur source (Each weighing 25 kg & above) c) Laterite Boulder (Each weighing 20 kg & upto 40 kg) Following rates of royalty are to be considered till further modification of prevailing rates by the Department of I dustry, Commerce & Enterprises, Govt. of West Bengal for Pachamil sourced stone boulder and laterite boulderand by the Department of Mines & Geology,Government of Jharkhand for stone boulder of Pakur variety a) Panchami source : Rs. 53 per Cum b) Pakur source : Rs.105 per Cum c) laterite boulder : Rs. 36 per Cum	Cum Cum Cum	602.00 659.00 424.00	602.00 659.00 424.00	602.00 659.00 424.00	602.00 659.00 424.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
2.95	Supplying Heavy Black stone boulder to site including Royalty and cost of loading, carriage up to site, unloading and stacking as per direction of the Engineer-in-charge.					
	(a) Each weighing 30 kg to 100 kg.	Cum				1540.00
	(b) Each weighing above 100 kg	Cum				3479.00
	Note :- This rate is only for coastal protection work in Digha-Shankarpur Jalda area under Contai Irrigation Division.					
2.96	Casting of Tetrapod weighing 1.20 MT (approximately) as per drawing with M35 grade of controlled cement concrete mix with well graded stone chips (20 mm nominal size) using concrete mixer, necessary shuttering, reinforcement and cost of quality control, sampling, testing of concrete cubes, vibrating, curing etc. complete as per technical specification, conforming to IS 456 and relevant special publications, submission of job mix formula after preliminary mix design and testing of concrete cubes as per direction of Engineer-In-Charge complete. Note: 1. Consumption of cement will not be less than 340 kg per cubic meter of controlled concrete but actual consumption will be determined on the basis of preliminary test and job mix formula. Note: 2. Construction wing has to add cost and carriage (including loading and unloading) of 0.436 m3 coarse aggregate only to arrive at consolidated rate. Plasticiser may be added to maintain the workability of the concrete.	Each	-----	-----	-----	5088.00
2.97	Handling, transporting and placing the newly casted 1.2 MT (approximately) Tetrapods in layers at seaside slope as per direction of the Engineer-In-charge including cost of handling operations, labour, materials, tackles, cranes, plants & equipments etc. complete within a lead of 100 metre and all lifts.. Note: 1. The contractor shall engage cranes of suitable capacity and boom length for easy handling and placing at the specified location. 2. The contractor shall engage skilled workmen suitable for the work.	Each	-----	-----	-----	437.00
2.98	Testing of Geo-textile materials including UV Test from well equipped laboratories like Jadavpur University, BITRA, CIPET etc.) (This item is applicable only for third party testing conducted by the Engineer-in-charge to assure the quality of the Geo-textile material)	1 Unit	63000.00	63000.00	63000.00	63000.00

NOTE:

- ❶ The above rates are exclusive of G.S.T and Labour Welfare Cess.
- ❷ Construction Wing should add G.S.T., as applicable, as per Goods and Service Tax Act, 2017 to derive the cost.
- ❸ Construction Wing should add Labour Welfare Cess (in terms of Clause 3 of Construction Labour Welfare Cess Rules, 1998) @ 1% to derive the final cost.

CHAPTER 3

SPECIAL ITEMS FOR SLUICE STRUCTURES

[illegible]

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	(c) Above 7 sqm.					
	(i) Taking out and refitting the same.	Sqm	430.00	410.00	430.00	430.00
	(ii) Taking out only.	Sqm	182.00	171.00	182.00	182.00
	(iii) Only Lowering	Sqm	311.00	295.00	311.00	311.00
3.03	Taking out & refitting the Jack & Gear including supply of new nuts & bolts, cleaning & greasing, if necessary and as directed by the Engineer - in -charge.					
	(a) Taking out and refitting the same.	Each	270.00	250.00	270.00	270.00
	(b) Taking out only.	Each	131.00	119.00	131.00	131.00
3.04	Taking out Pedestal and refitting the same with new nuts & bolts as necessary (nuts & bolts to be supplied by the contractor at his own cost)					
	(a) Taking out and refitting the same.	Each	403.00	376.00	403.00	403.00
	(b) Taking out only.	Each	161.00	146.00	161.00	161.00
	(c) Only refitting	Each	285.00	269.00	285.00	285.00
3.05	Taking out screw gearing by cutting nuts and bolts from draw shutter & refitting with new nuts & bolts to be supplied by the contractor without any extra payment.					
	(a) Taking out and refitting the same.	Each	262.00	240.00	262.00	262.00
	(b) Taking out only.	Each	175.00	159.00	175.00	175.00
	(c) Only refitting	Each	186.00	172.00	186.00	186.00
3.06	Lifting draw shutters for feeding or drainage operation, as per direction of the Engineer-in-charge.	Each	34.00	31.00	34.00	34.00
3.07	Lowering draw shutters after feeding or drainage operation, as per direction of the Engineer-in-charge.	Each	34.00	31.00	34.00	34.00
3.08	Lifting flap shutter on channel for feeding including tying with suitable galvanized wire to iron bracket to guard against falling down, as per direction of the Engineer-in-charge.	Each	185.00	171.00	185.00	185.00
3.09	Lowering flap shutter from channel after feeding operation, as per direction of the Engineer-in-charge.	Each	109.00	99.00	109.00	109.00
3.10	Supplying, fitting and fixing of Mild Steel Guide Channel with necessary Mild Steel lugs of required length and size by making hole into wall and fixing with necessary masonry work with maintaining proper line and level as directed by the Engineer-in-charge. This item includes two coats of anti-corrosive bituminous paint over two coats of red lead primer. Payment will be made on actual length of Guide Channel.	Kg	78.00	77.00	77.00	77.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
3.11	Supplying, fitting, fixing Mild Steel draw shutter with Mild Steel plate of thickness as specified by the Engineer-in-charge and other necessary Mild Steel sections for sluice including fabricating the same (as per drawing and instruction given by the Engineer-in-charge) excluding cost of Mild Steel guide channel, sill beam, gearing arrangement etc. but including painting with two coats of anticorrosive bituminous paint of approved make & brand over two coat of red lead primer and with necessary masonry work with all materials supply etc. complete at site.	Kg	85.00	85.00	84.00	84.00
3.12	Supplying only at site Mild Steel draw shutter with Mild Steel plate of thickness as specified by the Engineer-in-charge and other necessary Mild Steel sections for any sluice including cutting, drilling, forging and welding of the Mild steel and fabricating the same (as per drawing and direction of the Engineer-in-charge), painting with two coats of anticorrosive bituminous paint of approved make & brand over a coat of red lead primer etc. complete.	Kg	76.00	76.00	75.00	75.00
3.13	Supplying, fitting, fixing Mild Steel flap shutter with Mild Steel plate of thickness as specified by the Engineer-in-charge and other necessary Mild Steel sections for sluice including fabricating the same (as per drawing and instruction given by the Engineer-in-charge) including painting with two coats of anticorrosive bituminous paint of approved make & brand over two coat of red lead primer and with necessary masonry work with all materials supply etc. complete at site.	Kg	86.00	85.00	84.00	84.00
3.14	Supplying only at site Mild Steel flap shutter with Mild Steel plate of thickness as specified by the Engineer-in-Charge and other necessary Mild Steel sections for any sluice including cutting, drilling, forging and welding of the Mild Steel and fabricating the same (as per drawing and direction of the Engineer-in-charge), painting with two coats of anticorrosive bituminous paint of approved make & brand over two coat of red lead primer etc. complete.	Kg	77.00	77.00	76.00	76.00
3.15	Supplying / Replacing Gun Metal Bush for screw gearing arrangement required for hanging arrangement of draw shutter and fitting & fixing with the screw gearing arrangement for operating the draw shutter by taking out the old screw gearing arrangement and Gun Metal bush etc. complete as per direction of the Engineer-in-charge. (The old materials to be returned to Departmental Godown.)					
	(a) 50 mm. dia	Each	7103.00	6736.00	6619.00	6377.00
	(b) 65 mm. dia.	Each	7431.00	7052.00	6919.00	6663.00
	(c) 75 mm. dia.	Each	7774.00	7380.00	7233.00	6962.00
	(d) 80 mm. dia.	Each	7939.00	7538.00	7384.00	7107.00
	(e) 100 mm. dia.	Each	9413.00	8951.00	8736.00	8397.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
3.16	Supplying / Replacing at site alloy steel bush for gearing arrangement of Mild Steel regulator shutter including fitting & fixing the same in Cast Iron wheel with bearing and necessary lubricant including cutting internal thread in the bush as necessary including cost of all materials, tools, labours and carriage to site complete of specified diameter as per direction of the Engineer - in - charge.					
	(a) 50 mm. dia	Each	1070.00	990.00	1034.00	1016.00
	(b) 65 mm. dia	Each	1141.00	1059.00	1099.00	1079.00
	(c) 75 mm. dia	Each	1284.00	1195.00	1230.00	1203.00
	(d) 80 mm. dia	Each	1355.00	1263.00	1296.00	1266.00
	(e) 100 mm. dia	Each	1711.00	1605.00	1622.00	1578.00
3.17	Supplying, fitting & fixing Cast Iron wheel (after taking out existing one if necessary), rim made of 28 mm. to 36 mm. dia to fit any size of gear rod including carriage to site, painting with two coats of bituminous paint over two coats of red lead primer etc. complete as per direction of the Engineer-in-charge.					
	(a) 45 cm dia. Cast Iron wheel.	Per Set	2378.00	2267.00	2199.00	2110.00
	(b) 60 cm. dia. Cast Iron wheel	Per Set	3105.00	2965.00	2867.00	2749.00
3.18	Supplying, fitting and fixing top runner fabricated by ISMB / ISMC of required size, 2 nos. for each gate of required length and fitting, fixing with required nos. of anchors / lugs by Mild Steel flat bar of required size bifurcated at one end and welded with the other end with top runner and providing with required drilled holes of required dia. for base plate and all other components as required including carriage of all materials to site complete including painting with two coats of anticorrosive bituminous paint of approved make and brand over two coats of red lead primer etc. all complete as per direction of the Engineer-in-charge.	Kg	70.00	69.00	68.00	69.00
3.19	Taking out runner of any section including cutting bolts and nuts, dismantling existing concrete or brick work where necessary.	Metre	44.00	40.00	44.00	44.00
3.20	Replacing skin plate, channels, angles etc. only of draw/ flap shutter including cutting the old skin plate, channels, angles etc. as necessary in required shape and replacing the old one by new plate, channels, angles etc. including run welding and tag welding where necessary including removing rust from existing frame by chipping, emery clothing the surface and painting with two coats of red lead primer as per direction of the Engineer-in-charge complete.	Kg	88.00	88.00	87.00	87.00
3.21	Supplying / Replacing including fitting & fixing at site new Cast Iron guide channel true to the line & level for draw shutters of sluices as per drawing & direction of the Engineer-in-charge with Cast Iron hold fast not more than 1 Metre apart including two coats of anti-corrosive bituminous paint of approved make and brand over two coats of red lead primer. (Rate is inclusive of taking out of old guide channels, if required)	Kg	81.00	78.00	76.00	73.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
3.22	Supplying, fitting and fixing at site Cast Iron flap shutter for hume pipe sluice with Cast Iron collar and other fittings etc. complete (as per drawing & direction of Engineer-in-charge) including casting the same, necessary drilling & painting with two coats of anticorrosive bituminous paint of approved make and brand over two coats of red lead primer with carriage to site complete. (This Rate is inclusive of taking out of old ones)	Kg	98.00	94.00	93.00	90.00
3.23	Supplying, fitting & fixing of Cast Iron collar with links and necessary Mild Steel bolts for H.P. sluice of dia. between 90 cm. & 120 cm. as per drawing and direction of the Engineer-in-charge including carriage to site complete. (This rate is inclusive of taking out of old ones)	Kg	94.00	89.00	88.00	86.00
3.24	Supplying / Replacing Gear rod by a new Mild Steel Gear rod, threaded length as required and fitting, fixing in position with screw gearing arrangement for operating the draw shutter including taking out old gear rod by cutting bolts etc. complete as per direction of the Engineer-in-charge. (The old materials to be returned to Departmental Godown.)					
	(a) 50 mm. dia.	Metre	1537.00	1516.00	1517.00	1517.00
	(b) 65 mm. dia.	Metre	2318.00	2290.00	2285.00	2285.00
	(c) 75 mm. dia.	Metre	2995.00	2960.00	2951.00	2951.00
	(d) 80 mm. dia.	Metre	3261.00	3226.00	3212.00	3212.00
	(e) 100 mm. dia.	Metre	4882.00	4832.00	4804.00	4804.00
3.25	Sand blasting to Mild Steel surface with coarse sand followed by immediate application of two coats of Zinc Rich Epoxy Primer of approved make and brand and subsequent painting two coats with Coal Tar Epoxy of approved make and brand including cost of materials, labours, machinery, fuel and power including carriage of the steel materials at site complete. [Brand of primer and paint shall be approved by the Engineer-in-charge.] Note : This item is to be used for shutter of drainage sluices directly in contact with tidal saline water or industrial and toxic effluents.	Sqm	1056.00	1042.00	1047.00	1099.00
3.26	Supplying, fitting & fixing in position rubber seal arrangements with musical note harmonic 'J' type for making water tight in both up and down stream of draw shutter as well as flap shutter including guide paths, additional M. S. flats, bolts and nuts for fixing the rubber seal in position including fabrication cost and carriage of all materials to site and complete as per direction of the Engineer-in-charge.					
	(a) Flat Type Rubber Seal					
	(i) 59 mm x 6 mm	Metre	598.00	582.00	595.00	595.00
	(ii) 127 mm x 6 mm	Metre	742.00	726.00	736.00	736.00
	(iii) 150 mm x 12 mm	Metre	792.00	776.00	786.00	786.00
	(iv) 90 mm x 20 mm	Metre	792.00	776.00	786.00	786.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
	(b) Musical Note, Harmonic Type					
	(i) 59 mm x 6 mm	Metre	816.00	800.00	813.00	813.00
	(ii) 127 mm x 6 mm	Metre	1166.00	1150.00	1160.00	1160.00
	(iii) 70 mm x 12 mm	Metre	985.00	969.00	981.00	981.00
3.27	Oiling, cleaning & greasing the regulator gate & gate parts including guide channel, top runner, pedestal block, gear rods, wheel, fish plate etc. with sufficient lubricant as and when necessary as directed by the Engineer-in-charge including cost of all materials to site complete.	Each Set	359.00	351.00	359.00	359.00
3.28	Supplying / Replacing at site new pedestal or other similar items for sluices made with Mild Steel plates, angles, channels, holding down nuts & bolts etc. including fitting, fixing in position in concrete or masonry complete as per direction of the Engineer - in -charge.	Kg	79.00	79.00	78.00	78.00
3.29	Supplying fitting & fixing Cast Iron base plate of required size with necessary drilled holes of required dia. and number for fixing with the top runner and one number hole at the center of required dia. for screw rod duly threaded with necessary grooving for easy roller grip arrangement by 13 mm dia. high carbon steel balls in both Gun Metal or other bushes & base plate etc & providing with required bolts and nuts (Mild Steel) 16 mm dia & 100 mm long and one suitable screw as key, complete including painting with two coats of red lead primer.	Kg	96.00	93.00	91.00	88.00
3.30	Supplying fitting & fixing Mild Steel base plate of required size with necessary drilled holes of required dia. and number for fixing with the top runner and one number hole at the center of required dia. for screw rod duly threaded with necessary grooving for easy roller grip arrangement by 13 mm dia. high carbon steel balls in both Gun Metal or other bushes & base plate etc & providing with required bolts and nuts (Mild Steel) 16 mm dia & 100 mm long and one suitable screw as key, complete including painting with two coat of red lead Primer.	Kg	93.00	93.00	92.00	92.00
3.31	Supplying, fitting & fixing in position rubber seal arrangement for making water tight including M. S. flats, bolts and nuts and making holes in the shutter leaf for fixing the rubber seal in position including fabrication cost and carriage of all materials to site and complete as per direction of the Engineer-in-charge.					
	(i) Double bulb rubber seal (Bottom seal) 150 mm X 44 mm	Metre	3099.00	3083.00	3096.00	3096.00
	(ii) "L" type 88mmX14mm type -II vertical side seal	Metre	1502.00	1486.00	1499.00	1499.00
	(iii) Rubber pad 90 mmX40mm	Metre	1502.00	1486.00	1499.00	1499.00
	(iv) "L" type rubber seal 135mmX100X 30mm/20mm top seal	Metre	3099.00	3083.00	3096.00	3096.00

NOTE:

- ❶ The above rates are exclusive of G.S.T and Labour Welfare Cess.
- ❷ Construction Wing should add G.S.T., as applicable, as per Goods and Service Tax Act, 2017 to derive the cost.
- ❸ Construction Wing should add Labour Welfare Cess (in terms of Clause 3 of Construction Labour Welfare Cess Rules, 1998) @ 1% to derive the final cost.

CHAPTER 4
MISCELLANEOUS ITEMS

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
			Dist.: Jalpaiguri, Coochbehar, Alipurduar, Plains of Siliguri Sub-Division	Dist.: Murshidabad, Malda, Dakshin Dinajpur, Uttar Dinajpur, Nadia	Dist.: Purba Burdwan, Paschim Burdwan Birbhum, Bankura, Purulia	Dist.: N 24 Parganas, S 24 Parganas, Kolkata, Hooghly, Howrah, Jhargram, Purba & Paschim Medinipur
4.01	Bailing out water by pump including all leads and lifts and including making all arrangements for disposal, where continuous flow or seepage of water is encountered and rating of pumps and hours of operation is specifically ascertained as per direction of the Engineer-in-charge.	HP-Hr	23.00	23.00	23.00	23.00
4.02	Supply at site including handling, stacking etc. of steel wire rope 16 mm dia. & 6/36 construction fibre main core conforming to IS : 2266/2002.	Metre	288.00	286.00	286.00	286.00
4.03	Providing Stone Column in position of required diameter up to desired depth below ground level / existing bed level in all kinds of soil (excluding rock) by making bore holes by Direct Mud Circulation (DMC) Method and filling the holes up to required depth with stone materials and coarse sand of required proportion in layers of 500 mm compacted by 1.5 MT rammer falling from height of 1.5 metre with at least 20 blows or as per drawing and direction of the Engineer-in-Charge including cost of mobilization and demobilization of necessary equipments, disposal of excess excavated materials / slurry beyond 300 metre from the edge of foundation trench or as directed, hire charges of all machineries and accessories, labourers, cost and carriage of all materials etc. complete.					
	(a) 400 mm Diameter	Metre	480.00	470.00	480.00	480.00
	(b) 500 mm Diameter	Metre	595.00	584.00	595.00	595.00
	(c) 600 mm Diameter	Metre	719.00	705.00	719.00	719.00
	Note : Construction wing has to add cost of sand and cost & carriage of Stone Materials as required to arrive at the complete rate.					
4.04	Application of layer of 1.5mm thick bitumen (VG-10) @ 5 kgs / 10 sqm. Hot bitumen applied including costs of materials, carriage etc. all complete.	Sqm	7.00	6.00	7.00	7.00
	Note : Construction wing has to add cost & carriage of 5 kgs VG-10 Bitumen to arrive at the complete rate.					

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
4.05	Filling of joints in concrete lining blocks, expansion joints of structure etc. with bituminous compound (VG 10 @ 0.693 MT / Cum) and sand in proportion 75:25 for filling the joints properly as per instruction of the Engineer-in-charge with hot sand and bituminous compound including cost of supply and carriage of all materials to site as per direction of the Engineer-in-charge. Note : Construction wing has to add cost & carriage of 0.693 MT VG-10 Bitumen and cost of 0.250 Cum Coarse Sand to arrive at the complete rate.	Cum	2882.00	2609.00	2882.00	2882.00
4.06	Best Seasoned wood work in shutters, posts, plates, rafters, battens, trusses, beams, purlins, bargas, wheel-guards, running boards, frames etc. including supplying at site, handling, hoisting, fitting & fixing in position excluding the cost of bolt and nuts only but including the cost of nails and screws with cost and carriage of all materials complete as per the direction of the Engineer-in-charge. (The quantum should be corrected upto 3 decimels) (a) Sal wood (b) Hard Wood (Mahua / Arjun / Tentul etc or similar quality hard wood as approved by the Engineer-in-charge)	Cum Cum	93148.00 49099.00	92782.00 48733.00	93148.00 49099.00	93148.00 49099.00
4.07	Labour charges for old or new wood work including hoisting, fitting & fixing including supplying new nails and screws wherever necessary etc. complete as per the direction of the Engineer-in-charge. (The quantum should be corrected upto 3 decimels)	Cum	6426.00	5815.00	6426.00	6426.00
4.08	Labour charges for taking out old wood work including cutting bolts and nuts and stacking within a lead of 100 metre etc. complete as per the direction of the Engineer-in-charge. (The quantum should be corrected upto 3 decimels)	Cum	2725.00	2467.00	2725.00	2725.00
4.09	Supplying at site and fitting & fixing Mild Steel long nuts & bolts etc. complete as per the direction of the Engineer-in-charge.	Kg	76.00	75.00	76.00	76.00
4.10	Supply and carriage to site and fixing in position of copper strip 16 S.W.G. 375 mm to 400 mm wide in construction and expansion joints with 10 mm dia anchor brass bars, 600 mm long hooked at one end and brazed with copper strip at the other end, at 400 mm interval on both sides of the strips as per drawing and specification including welding or brazing, bending to required shape connection to other structural members, including labour charges etc. complete as per direction of the Engineer-in-charge.	Metre	10373.00	10363.00	10373.00	10373.00
4.11	Supplying and laying inverted filter in canal bed, canal slope, weep holes, block pitching etc. as per drawing including preparation of Sub-grade etc. complete as per direction of the Engineer-in-charge. Note: Construction wing has to add cost and carriage of all materials, required as per drawing, to site following latest PWD Schedule of Rates to arrive at the complete rate.	Cum	180.00	163.00	180.00	180.00

Sl. No.	Description of Item	Unit	Rate (₹)			
			Zone I	Zone II	Zone III	Zone IV
4.12	Driving M S sheet piles of any kind of approved type and size conforming to I.S. code in all kinds of soil/ soil mixed with gravel, shingle & pebbles, by vibro-sinker including handling, cutting to requisite size, drilling holes, hoisting in position, welding, fabrication of sets of taper piles, corner piles etc. with clutch bars as may be required including staging, scaffolding and hire charges of driving machinery and equipments, scraping and cleaning piles, painting the surface with one coat of surface primer of approved make and brand and two coats of ready mixed oil bound paint (except red lead and black japan) etc. including all cost of labours, supply and carriage of equipments to site (by any mean) as per drawing and direction of the Engineer-in-charge but excluding the cost of sheet piles. NB:- Measurement of area underground to be taken i.e. straight length of pile multiplied by driven length).	Sqm	1379.00	1357.00	1379.00	1458.00
4.13	Driving M.S. sheet piles of any kind of approved type and size conforming to IS code in all kinds of soil/ soil mixed with gravel, shingle & pebbles, by monkey hammer including handling, cutting to requisite size, drilling holes, hoisting in position, welding, fabrication of sets of taper piles, corner piles etc. with clutch bars as may be required including staging, scaffolding and hire charges of driving machinery and equipments, scraping and cleaning piles, painting the surface with one coat of surface primer of approved make and brand and two coats of ready mixed oil bound paint (except red lead and black japan) etc. including all cost of labours, supply and carriage of equipments to site (by any mean) as per drawing and direction of EIC but excluding the cost of sheet piles. N.B. Measurement of area underground to be taken i.e. straight length of pile multiplied by driven length.	Sqm	1333.00	1250.00	1333.00	1333.00
4.14	Extraction of driven sheet piles carefully by chain pulley block and rope drum or equivalent arrangement, stacking at site at a suitable location within a lead of 100 metre from the site of work as per direction of the Engineer-in-charge.	Sqm	883.00	815.00	883.00	883.00

NOTE:

- ❶ The above rates are exclusive of G.S.T and Labour Welfare Cess.
- ❷ Construction Wing should add G.S.T., as applicable, as per Goods and Service Tax Act, 2017 to derive the cost.
- ❸ Construction Wing should add Labour Welfare Cess (in terms of Clause 3 of Construction Labour Welfare Cess Rules, 1998) @ 1% to derive the final cost.

MODES OF MEASUREMENTS

a) Supply and/or Carriage of Stone or laterite boulder 50Kg. and above size	:	1/6 th (one sixth)	To be deducted as voids from gross measurement of stack	
b) Supply and/or Carriage of stone or Laterite boulder below 50Kg. size.	:	1/7 th (one seventh)	Do	Do
c) Supply and/or carriage of shingles & Brick or Jhama ballast, stone ballast & chips.	:	1/13 th (one thirteenth)	Do	Do
d) Supply and/or Carriage of earth, Rubbish, Cinder, lime, surki, Moorum.	:	1/10 th (one tenth)	Do	Do
e) Supply and/or Carriage of Jhama bats or. brick bats	:	1/7 th (one seventh)	Do	Do
f) Sand (after necessary deduction of Bulking), steam coal or slacked coal.	:	1/18 th (one eighteenth)	Do	Do

The specifications for all other items and supply of materials shall comply to printed specification of I. & W. D. and any materials not covered there shall comply with that of P.W.D. and the Indian Standard specification and any work not covered there shall be carried out as per best practice adopted in this country according to the direction and satisfaction of the Engineer-in charge.

CHART FOR CONSUMPTION OF MATERIALS

Consumption of different materials of construction in the corresponding contract items of work shall be computed on the basis of the quantities shown in this table subject to a variation of plus/minus 5% (five percent). Where, however, the circumstances of work so required, the Engineer-in-Charge shall be competent to allow (for recorded reasons) for greater variation.

This will apply not to items as per BIS specification (or its equivalent) but also to those as per IRC specification. In case of any variation, requirement as per BIS or IRC specification is to be followed with due approval of the Engineer-in-Charge.

N.B. : This Table is based on the following consideration :

- i) The dry sand with necessary allowance for bulking is used.
- ii) The size of bricks used is (250 mm × 125mm × 75mm)
- iii) Modular Bricks (190 mm × 90 mm × 90 mm) = 50000 Nos. per 100 Cum. & 4951 Nos. per 100 Sq.m.
- iv) Weight of 1 Cum. of cement = 1.44 M. Ton.

Consumption of materials		
No of bricks within a square or rectangular sausage per metre of size		
a) 1 .20 Metre x 1 .20 Metre nominal section	595	Nos
b) 0.90 Metre x 0.90 Metre nominal section	335	Nos
c) 0.60 Metre x 0.60 Metre nominal section	149	Nos
d) 3.00 Metre x 1 .20 Metre nominal section	1488	Nos
e) 1.00 Metre x 0.60 Metre nominal section	248	Nos
f) 1.35 Metre x 0.75 metre nominal section	419	Nos
g) 1.35 Metre x 0.60 metre nominal section	335	Nos
h) 1.05 Metre x 0.60 metre nominal section	260	Nos
i) 0.75 Metre x 0.45 metre nominal section	140	Nos
j) 1.00 Metre x 1.00 metre nominal section	413	Nos
k) 0.90 Metre x 0.60 metre nominal section	223	Nos
No of bricks within a cylindrical sausage per metre of size		
a) 0.60 Metre diameter.	117	Nos
b) 0.75 Metre diameter.	183	Nos
c) 0.90 Metre diameter.	263	Nos
d) 1.00 Metre diameter.	325	Nos
G I Crate		
a) Size :- 1.00 M x 1.00 M x 1.00 M	413	Nos
b) Size :- 1.00 M x 1.00 M x 0.60 M	248	Nos

Consumption of coarse aggregate, fine aggregate and cement for cement concrete pitching work (1cum cement = 1440 kg)

CC Pitching (1:4:8) with Jhama Khoa including 1:3 sand cement plaster	Jhama Khoa	0.98 cum
	Sand	0.5037 cum
	Cement	0.12657 cum
CC Pitching (1:3:6) with Jhama Khoa including 1:3 sand cement plaster	Jhama Khoa	0.96 cum
	Sand	0.4937 cum
	Cement	0.16457 cum
CC Pitching (1:4:8) with Stone Metal including 1:3 sand cement plaster	Stone Metal	0.96 cum
	Sand	0.4937 cum
	Cement	0.12457 cum
CC Pitching (1:3:6) with Stone Metal including 1:3 sand cement plaster	Stone Metal	0.94 cum
	Sand	0.4837 cum
	Cement	0.16057 cum
CC Pitching (1:2:4) with Stone chips including 1:3 sand cement plaster	Stone Chips	0.90 cum
	Sand	0.4637 cum
	Cement	0.21957 cum

CC Pitching (1:1.5:3) with Stone chips including 1:3 sand cement plaster	Stone Chips	0.86 cum
	Sand	0.4437 cum
	Cement	0.029057 cum

Consumption of coarse sand and cement for caulking joints of		
a) Stone Boulder pitching	Cement	0.00546 cum
	sand	0.023 cum
b) Brick pitching	Cement	0.000918 cum
	sand	0.00363 cum

For 1 no R C C Porcupines		
Cement Concrete (1:1.5:3) = 0.129 cum	Stone Chips	0.11094 cum
	Sand	0.05723 cum
	Cement	0.038 cum
Reinforcement		20.00 kg
Nut, Bolts & Washers		3.036 Kg

1. Other consideration: May be considered during preparation of estimate.

1) Gunny/Poly bags (50Kg cement capacity size)

a) One bag filled up with:

i) Local earth (volume) = 0.028 cum = 0.988 cft.

2) Close bamboo piling:

a) No. of pins required per metre of piling work for pin diameter-

i) Above 5.00 cm dia. upto 7.50 cm dia. – 9 Nos.

3) Close bullah piling:

a) No. of pins per metre for pin diameter

- i) 10 cm.6 Nos.
- ii) 12.5 cm.5 Nos.
- iii) 15 cm.4 Nos.
- iv) 17.5 cm.3 Nos.
- v) 20 cm.2 $\frac{1}{2}$ Nos.
- vi) 22.5 cm.2 Nos.
- vii) 25.0 cm.2 Nos.

TOP & ROUND STEEL BARS

Areas & Weights

Dia		Tor / Round bar		
		Weight per Metre Length	Cross Sectional Area	Circumference
mm.	inch.	(in kg.)	(in Cm ²)	(in Cm.)
10	0.39	0.620	0.785	3.14
12	0.47	0.888	1.131	3.77

14	0.55	1.208	1.539	4.40
16	0.63	1.578	2.010	5.03
18	0.71	2.000	2.545	5.65
20	0.79	2.465	3.142	6.28
22	0.87	2.983	3.801	6.91
25	0.98	3.852	4.909	7.85
28	1.10	4.832	6.158	8.80
32	1.26	6.311	8.042	10.05

Weight of S.W.G GI Wire –

8 S.W.G (4.064 mm) = 10.66 Metre/Kg.
10 S.W.G (3.251 mm) = 15.00 Metre/Kg.
12 S.W.G (2.642 mm) = 21.00 Metre/Kg.
16 S.W.G (1.626 mm) = 68.00 Metre/Kg.

Capacity of H.P. pump
(Diesel Driven) = 1100 Lit./min. with 6.00 m Head.

WEIGHTS & STANDARD SIZES OF STEEL PLATES

Thickness in m	5	6	8	10	12	14	16	18
Weight in Kg/Sq.m.	39.25	47.10	62.80	78.50	94.20	109.90	125.60	141.30

20	22	25	28	32	36	40
157.00	172.70	196.25	219.80	251.20	282.60	314.00

Approximate Weight of Standard Bolts and Nuts in Kg. (Subject to variation as per B.I.S. Code)

Length excluding head in millimeter	Diameter of bolt in mm.						
	6 mm.	10 mm.	12 mm.	16 mm.	19 mm.	22 mm.	24 mm.
25 mm.	0.019	0.048	0.100	0.169	0.275	...	...
32 mm.	0.020	0.052	0.106	0.179	0.444	0.425	...
38 mm.	0.022	0.055	0.113	0.189	0.463	0.444	0.627
45 mm.	0.024	0.059	0.119	0.198	0.318	0.463	0.654
50 mm.	0.025	0.062	0.125	0.208	0.332	0.482	0.677
64 mm.	0.029	0.069	0.137	0.228	0.360	0.521	0.727
76 mm.	0.031	0.076	0.150	0.247	0.388	0.559	0.777
89 mm.	0.034	0.083	0.162	0.267	0.416	0.597	0.827
102 mm.	0.037	0.090	0.175	0.287	0.445	0.635	0.878
114 mm.	0.040	0.097	0.188	0.306	0.473	0.674	0.927
127 mm.	0.044	0.104	0.200	0.326	0.501	0.712	0.977
140 mm.	0.047	0.111	0.212	0.345	0.529	0.750	1.027
152 mm.	0.050	0.118	0.225	0.365	0.557	0.789	1.077
178 mm.	0.056	0.132	0.250	0.404	0.613	0.865	1.178
203 mm.	0.063	0.147	0.275	0.443	0.700	0.942	1.278
229 mm.	...	0.161	0.300	0.465	0.783	1.019	1.378
254 mm.	...	...	0.325	0.521	0.825	1.095	1.478

279 mm.	...	...	...	0.550	0.838	1.172	1.578
305 mm.	...	...	...	...	0.895	1.249	1.678
Nut	0.006	0.016	0.034	0.063	0.097	0.144	0.207
25mm of Shank	0.006	0.014	0.025	0.039	0.056	0.077	0.100
Washers (10 nos)	...	...	1.125	1.800	2.475	3.375	6.300

CONVERSION TABLE

A) Linear Measurment

- 1) 1 Inch = 25.40 milimetres
- 2) 1 milimetre = 0.03937 x Inches
- 3) 1 metre = 3.281 ft. = 1.094 yard
= 39.3701 Inches
- 4) 1 Km = 0.621 mile = 1093.61 yard
- 5) 1 Centimetre = 0.3937 Inch
- 6) 1 Inch = 25.40 milimetres
= 2.54 centimetres
- 7) 1 foot = 0.3048 metre = 30.48 cm
- 8) 1 yard = 0.9144 metre
- 9) 1 Mile = 0.8690 N Mile = 1.61 K M
= 1760 yds = 5280 ft
- 10) 1 N Mile = 1.1508 Mile = 6080 ft

B) Square Measure

- 1) 1 Sq inch = 6.451 Sq. cm
- 2) 1 Sq ft = 0.0929 Sq. metre
- 3) 1 Sq yard = 0.8361 Sq. metre
- 4) 1 Acre = 40.47 Are = 4840 Sq yds
- 5) 1 Sq mile = 2.590 Sq Kilometre
- 6) 1 Sq cm = 0.155 Sq inch
- 7) 1 Sq metre = 10.764 Sq ft
= 1.196 Sq yard
- 8) 1 Sq Kilometre = 0.3861 Sq mile
- 9) 1 Hectare = 2.471 acres = 10000 Sq. m
- 10) 1 Are = 0.02471 acre = 100 Sq m
- 11) 100 Ha = 1 Sq Km
- 12) 1 Acre = 0.40 Hectare = 43560 Sq ft

C) Density

- 1) 1 lb/ft³ = 16.019 Kg/m³
- 2) 1 kg/m³ = 0.0624 lb/ft³
- 3) 1 lb/in³ = 27.680 gm/cm³
- 4) 1 gm/cm³ = 0.0361 lb/in³

D) Temperature

(E) Volumetric Measure

- 1) 1 cubic inch = 16.3871 cu cm
- 2) 1 cubic ft = 0.0283 cubic metre
- 3) 1 cubic yard = 0.7646 cubic metre
- 4) 1 Acre ft = 1233.48 cubic metre
- 5) 1 cu cm = 0.061 Cubic inch
- 6) 1 cubic metre = 1.308 cubic yard
= 35.315 cubic ft
= 0.00081 acre ft
- 7) 1 Imp Gallon = 4.546 litre
= 10 lbs of water = 0.1604 cft
- 8) 1 Litre = 0.22 Gallon

F) Weights Measures

- 1) 1 Ton = 1.016 Tonne = 1016 Kg
= 10.16 quintal = 2240 lbs
- 2) 1 cwt = 50.8 Kg = 0.508 quintal
- 3) 1 lb = 0.454 Kg = 16 oz = 7000 grains
- 4) 1 Maun = 37 Kg = 0.37 quintal
- 5) 1 Tonne = 0.984 Ton = 2204.622 lbs
= 1000 Kg
- 6) 1 quintal = 1.968 cwt = 2.679 maun =
100 Kg
- 7) 1 Kg = 2.204 lbs = 1.072 seer

G) Fuel Consumption

- 1) Mile/Gallon = 0.354 Km/Litre
- 2) Km/Litre = 2.825 Mile/Gallon

H) Miscellaneous

- 1 lb/ft = 1.488 Kg/m
- 1 Kg/m = 0.672 lb/ft
- 1 lb/sq in = 0.0703 Kg/sq cm
- 1 lb/sft = 4.88 Kg/sq metre
- 1 lb/cft = 16.0185 Kg/cum
- 1 cum of steel = 7850 Kg.
- 1 cum of Iron = 7708 Kg.
- 1 H P = 33,000 ft lbs/min

1) $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$

2) $^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$

$= 746 \text{ watts}$

1 Bag cement = 50 kg.

$= 0.03475 \text{ cum}$

1 cum Water = 1000 kg

1 cum of Brick = 1600 kg

1 cum of Timber = 650 kg. to 720 kg.

SPECIFICATION FOR WORKS

1.0 EARTH WORK:-

Earth unless otherwise mentioned specifically, means all kinds of soil, sand, slush, silt dry or wet and hard or soft rock.

The rate of excavation of earth in all items will include the cost of nicking out lines, putting profiles, cutting and removing of thick and thorny jungles, roots of trees and stumps of all sizes, trees upto 0.3 metre girth, from the site of work as directed by the Engineer-in-Charge. Site of work will include both the site of excavation and the site for depositing the earth and throwing/laying of the spoils. During the excavation, the natural drainage of the area shall be maintained. The rate in all relevant items will also include dewatering and making arrangement for disposal of bailed water. Clearance of silt and slush by using bucket or pan if necessary, removal of water hyacinth and burning them to ashes and weeds, carcasses, organic matter etc.

1.1 The earthwork shall be classified under the following categories and measured separately for each category:

(A) All kind of soils:

Generally any strata, such as sand, gravel, loam, clay, mud, black cotton, moorum, shingle, river or nallah bed boulders, siding of roads, paths etc. and hard core, macadam surface of any description (water bound, grouted tarmac etc.), lime concrete, mud concrete and their mixtures which for excavation yields to application of picks, shovels, jumper, sacrifiers, ripper and other manual digging implements.

(B) Local soil or sand mixed with shingles:-

This item will include soils having shingles upto 10 cm size more than 10 % as constituents but will not contain more than 5 % of boulder of size above 10 cm (by eye estimation). This may be excavated by spades.

(C) Local soil or sand mixed with shingles and boulders:-

This item will include soils having boulders of size above 10 cm upto 20 cm by more than 5 % upto 20 % (by eye estimation). This cannot be excavated by spades only, pick axes have to be used.

(D) Ordinary rock:-

Generally any rock which can be excavated by splitting with crow bars or picks and does not require blasting, wedging or similar means for excavation such as lime stone, sand stone, hard laterite, hard conglomerate and un-reinforced cement concrete below ground level. If required light blasting may be resorted to for loosening the materials but this will not in any way entitle the material to be classified as 'Hard rock'.

(E) Soft weathered rock/soft laterite:-

In case of soft weathered rock / soft laterite, it can be excavated by pick axes and come out in small pieces, undisturbed 8 cm cube of such rock cannot be broken by hand pressure but will disintegrate into small particles by hitting with 1 kg hammer.

(F) Hard rock:-

In case of hard weathered rock/hard laterite, it will consist of hard boulder above 80 Kg or strata of hard rock which may require blasting for removal. It has to be broken into pieces of size below 50 Kg for which no extra payment will be made. The boulders of size between 30 Kg to 50 Kg will have to be stacked separately for which separate payment for stacking will be made with deduction of void. For blasting, the contractor must possess a license for using and storing of gelatin or gun powder. A properly trained & licensed fireman shall be engaged for handling of explosives & blasting. Special care is to be taken for blasting near homesteads. In this connection, instruction of the Chief Mining

Engineer is to be followed regarding blasting operation. Generally any rock or boulder for the excavation of which blasting is required such as quartzite, granite, basalt, reinforced cement concrete (reinforcement to be cut through but not separated from concrete) below ground level and the like.

(G) Hard rock (blasting prohibited):-

Hard rock requiring blasting as described under (F) but where the blasting is prohibited for any reason and excavation has to be carried out by chiseling, wedging, use of rock hammers and cutters or any other agreed method.

1.2 Excavation from borrowpits:-

This item is intended for making embankment, repairing or strengthening old embankments, putting and removing long bundhs, partition bundhs and cross bundhs, filling poly or gunny bags etc. The earth has to be taken from borrowpits either from the river/channel side subject to tidal inundation during the working period or from the countryside. The sides and location of borrowpits are to be selected strictly as per instruction given by the Engineer-in-charge and in all types of borrowpits excavations, keeping of proper witness is mandatory on the part of the contractors. The earth has to be deposited in layers not exceeding 25 cm in the profile in proper slope at required levels.

The clods will have to be broken and the top, side slopes will have to be roughly dressed to the designed profile. The witnesses of borrowpits will have to be removed by the contractor at his own cost and laid in the profile of the embankment after the check measurement, failing which, the contractor will be liable for accepting deduction of 10% in the measurement. The contractor has to fill up the borrowpits if excavated in homestead, road and other undesirable areas, at his own cost.

1.3 Excavation in new drainage channel or re-excavation/widening of existing drainage channel above ruling water level or re-sectioning of channels in excess of the design section

This item would be provided for excavation in drainage channels and widening above water level where no cross bundh need to be constructed. During re-excavation of drainage channel involving re-sectioning, where cross bundhs, long bundhs, partition bundhs need to be erected, the extent of earthwork beyond design section (a trapezoid consisting of base width as the designed bed width and divergent sides are designed side slope) will also be classified in this item and the remaining earthwork within the design section will be classified as silt. The excavation has to be made in proper slope and at required levels and spoils are to be deposited so as to make marginal embankment in proper place as directed by the Engineer-in-charge on both banks including rough dressing.

1.4 Silt Clearance of drainage channels including sludge and slush but excluding slush mixed with industrial wastes, municipal garbage, carcasses, khatal effluents etc.

This item is intended for drainage channels mainly in rural areas as well as in the border line of semi-urban areas i.e. beyond the periphery of Corporation/municipal or industrial areas, where not much quantity of municipal garbage and industrial wastes and other contamination are normally encountered. However, in case of any confusion/dispute regarding selection of zone of applicability, the decision of the Superintending Engineer will be final and binding. Normally major portion of the silt may be excavated by shovel, however the item also includes initial silt clearance work by pan or bucket, if necessary. The item also includes cost of removal of water hyacinth, thick and thorny jungles upto 30 cm girth, compact mass formed due to formation of water hyacinth etc. The measurement will be taken on the basis of pre and post level sections unless mentioned otherwise. Deposit of excavated material will be generally as per 1.3 above. If sufficient Government land is not available on channel bank, the extra quantity of excavated material after making the marginal embankment on both banks may be disposed off subject to instruction of the Engineer-in-charge for which separate payment will be made,

however, till such time, the excavated material shall be stored and stacked properly, so that it does not fall back in the channel, nor it shall create hindrance to traffic movement on channel bank, fall in the private land on countryside of embankment and thereby damage crop or private properties. The rate includes cost of putting and removing intermediate cross bundhs but excludes the cost of putting and removing long bundhs, end cross bundhs and partition bundhs for sealing inlets etc. However, Engineer-in-charge reserves the right to deduct a maximum of 20%, as a penal measure, from the total amount of the respective items of silt clearance for unsatisfactory removal of cross bundhs, long bundhs, partition bundhs, sealing inlets etc.

The item has been further classified in three categories in regard to modalities for bailing out of water.

- 1.4.1** For channels containing practically no upland dry weather flow as normally encountered in many drainage channels in rural area.
- 1.4.2** For drainage channels containing some dry weather flow but where suitable arrangement of diversion can be made through adjoining existing drainage channels, low lying drainage pockets by merely constructing cross bundhs/partition bundhs at the selective location and/or excavating short length diversion channel.
- 1.4.3** For drainage channels containing dry weather flow but diversion through other channels or in drainage pockets are not feasible and the running water cannot be bailed out in the adjoining land and has to be managed either by pumping in alternate segmented pockets formed within the drainage channels to suit segmental silt clearance or through longitudinal gutter drains/channels formed within the channel.

While the earthwork and ancillary works required for forming the suitable arrangement of diversion (excluding the intermediate cross bundhs formed across the channel) will be paid extra, the rate of earthwork in silt clearance includes, in all cases, cost of arrangement for bailing out of stagnant water, water deposited for subsequent rainfall, running water, seepage water coming from soil underneath etc.

1.5 Silt Clearance of drainage channels including sludge and slush mixed with all sorts of industrial waste, municipal garbage, carcasses, dead bodies, polypacks, small khatal effluents etc.

This item is intended for drainage channels in thickly populated semi-urban areas, market areas and in fully urban areas such as within and contiguous to the periphery of corporation / municipal / industrial areas. As already stated in 1.4 above, the decision of the Superintending Engineer will be final and binding regarding zone of applicability. The rate includes engagement of mather labours, silt clearance work by pan or bucket etc. The item also includes cost of removal of water hyacinth, polypacks, jungles, compact or semi-compact mass formed due to water hyacinth, removal of khatal, latrines, carcasses, night soil, small to medium khatal effluents, industrial effluents etc. Measurement will be taken on the basis of pre and post level section unless specifically mentioned otherwise. Deposit of excavated materials will have to be made on bank top, countryside of embankment or as directed by the Engineer-in-charge. Extra material may be disposed otherwise, as instructed by the Engineer-In-charge, it shall be ensured that the slushy material, either during temporary or permanent storing within Government land or during disposal, shall be barricaded properly so as not to cause any hindrance to traffic flow or damage to public properties or pose any health hazard. The rate includes the cost of putting and removing intermediate cross bundhs, but excludes the cost of putting and removing long bundhs, end cross bundhs, partition bundhs, sealing inlets etc. However, the Engineer-in-charge reserves the right to deduct a maximum of 20%, as a penal measure, from the total amount of the respective items of silt clearance for unsatisfactory removal of cross bundhs, long bundhs, partition bundhs, sealing inlets etc.

The item has further been classified in two categories in regard to modalities for bailing out water. Since drainage channels in urban areas always contain dry weather flow, category

1.4.2 and 1.4.3 as enumerated in the foregoing para of 1.4 will be applicable. As already mentioned, the cost of arrangement for bailing out of all sorts of water including stagnant water, rainfall deposit, sub-soil seepage, running water etc., are included in this item.

1.5.1 Closing Ghoges:-

The earth has to be relaid by puddling with water and ramming in layer not exceeding 25 cm. Only one measurement (that of cutting) will be paid for. The opening and closing shall be done as per time schedule directed by the Engineer-in-charge.

1.6 Breach Closing:-

The work is to be done in submerged areas of a tidal river. The closure work shall have to be maintained and guarded with all materials and labours round the clock by the contractor at his own cost along with arrangements for sufficient lights at night etc. till the work is handed over to the Department.

The earth has to be taken from borrow pits subject to tidal inundation during the working period. The size and location of borrow pits are to be strictly followed as per the instruction given by the Engineer-in-charge and in all cases, keeping up of a central witness is mandatory on the part of the contractor. The earth has to be deposited in layers not exceeding 25 cm in the profile and in proper slope and duly puddled. The clods have to be broken and the top, side slopes have to be roughly dressed to designed profiles.

The measurement for earthwork for the breach closing work will be taken by pit measurement or section measurement as the case may be and as per direction of the Engineer-in-charge, whose decision is final.

On completion of breach closing, 10 per cent voids will be deducted from gross measurement, if measurement is done by section measurement of banks.

The payment of earthwork will be made after handing over of finished section to the Department. No payment will be made for guarding any part of work before handing over of the whole closure. Additional expenditure, if any, to be incurred due to the delay in completion, will be recovered from the contractor. The contractor shall not be entitled to claim any compensation for loss of labour and materials for the closure work prior to handing over to the department.

1.7 General Note on Measurement of Earthwork:-

Borrowpits for making, repairing and strengthening embankments and breach closing, putting and removal of cross bundhs will generally be measured by pit measurements unless otherwise stated. Measurement will be taken by pre and post work section in silt clearance, excavation or re-excavation of drainage channels etc. unless specifically mentioned. No deduction of voids will be made in silt clearance and excavation or re-excavation of drainage channel, but 10 per cent void will be deducted from gross section in case of finished banking works (if sectional measurement is adopted), stacks of earth etc. A deduction of 10 per cent will also be made until witnesses in borrowpits are removed. A maximum amount of 20 per cent measurement will be deducted from respective item of silt clearance for non-removal of cross bundhs, long bundhs, sealing of inlets etc. in drainage channel. Prework section will be taken before the commencement of work and post work section will be taken after the work is completed prior to handing over to the Department unless otherwise mentioned specifically. The profile has to be provided at every 30 metre approximately unless mentioned otherwise, however bed width and bed level may be checked at random. The contractor shall arrange for peg, bamboo, coir string

and labours during measurement process.

1.8 For Making new embankment (Ring bundh/Retired embankment etc.):

Work is to be executed on the basis of pre work & post work level sections. Deductions for voids in section measurements will be made as follows: Pre-work sections shall invariably be taken before the commencement of carted/carried earth work. Necessary deduction will be made from pit measurement if there is wastage of excavated materials.

No deduction for voids in section measurements would be made, when the measurements are done after 2nd monsoon. Profile is to be fixed with proper shrinkage allowance.

The laying of excavated earth shall be done in layers not exceeding 25 cm. and the clods will have to be broken. Foreign materials such as roots & branches of trees, drift, timbers, bushy jungles, grasses etc. mixed with excavated earth from borrow pits shall not be laid in the bank. The base of embankment shall be ploughed before laying first layer. The rate of excavation includes all these operation. The excavation of canal, canal banks, flood embankment etc. will have to be made as per profile which will have to be provided by the Contractor at his own cost at every 30 metre approximately. Necessary dug belling showing the lines of embankment or spoil bank & edge of cutting canal or borrow area will have to be done by the Contractor which has been included in the rates of excavation.

Nature of Carriage	Period of Measurement	Percentage of Voids be deducted from gross measurement	Remarks
By head load	Upto 31 July.	10	Within 1st year's first half monsoon.
-Do-	Between 1 August and 15th October	5	Within first year's second half monsoon.
-Do-	Between 16th October and next year's 15th Oct.	3	After first year's full monsoon,
-Do-	After 16th October of next year.	Nil	After two year's full monsoon.
By truck or tractor or cart.	Upto 31st July	4	Within first year's first half monsoon
-Do-	Between 1st August and 15th Oct.	3	Within first year's Second monsoon.
-Do-	Between 16th October and next year's 15th Oct.	2	After first year's full monsoon,
-Do-	After 16th October of next year.	Nil	After two year's full monsoon.

1.9 Lead & Lift Measurement:-

The measurement of lead and lift will be generally horizontal and vertical distance respectively between centers of gravity of the excavated zone and of the spoil bank/embankment.

1.9.1 Lift Measurement:-

The lift may be calculated based on the under mentioned consideration to avoid rigorous calculation of centers of gravity.

1.9.2 In case of new work:-

The vertical distance of 0.375 times the height of spoil bank from the ground level plus 0.40 times the depth of canal excavated (0.5 times the depth in case of borrow pits) from the same ground level.

1.9.3 In case of old work:-

Total lift shall be taken as difference in height between level of cutting edge of slope on or near bank top and existing average prework level of the channel bounded between cutting edges of slope plus 0.4 times average depth of excavation (obtained by deducting average prework level from designed bed level of the channel) plus difference in height between existing highest bank level (average of highest value of left and right bank if earth is deposited on both banks) and cutting edge of slope, plus 0.375 times the height of newly formed spoil bank, if any, (height of spoil bank being measured from existing highest bank level as mentioned).

1.10 Lead Measurement:-

The lead (head lead generally upto 300 metre) will be taken as the horizontal distance as crow flies between the centre of excavated zone (irrespective of depth of cutting) and the centre of spoil bank. All distances shall be measured over the shortest practical route and not necessarily the route actually taken. Route other than shortest practical route may be considered in cases of unavoidable circumstances and approved by the Engineer-in-charge along with reasons in writing.

The distance between the centre of the excavated zone and of the centre of spoil bank in carted earth (generally beyond 500 metre) and the boated earth shall be measured on the basis of shortest practicable route as decided by the Engineer-in-charge.

1.11 No payment will be made for earthwork done from any area not identified by the Engineer-in-charge. Foreign materials such as roots and branches of trees, bushy jungles, water hyacinth etc. mixed with excavated earth from borrow pits shall not be laid in the bank. The profile has to be provided at every 30 metre approximately, at contractor's cost including supply of peg, bamboo, coir sting and labour. Necessary dug-belling showing the lines of embankment or spoil bank and edge of cutting along the canal or the borrow areas will have to be done by the contractor, the cost of which is included in the rates of excavation and no extra payment shall be claimed.

1.12 No additional expenditure incurred due to the delay in completion of the work in silt clearance, re-excavation of channel or breach closing shall be claimed by the contractor. The contractor shall not be entitled to any compensation for loss of labour or materials due to breach of cross bundhs or closure of work.

1.13 No extra payment will be made to the contractor for payment of Royalty or Cess in purchasing earth, because such considerations have already been made in appropriate items.

1.14 Excavation of Foundation and Filling up Trenches:-

Foundation, when excavated to the level shown in the drawing, will be shown to the Engineer-in-charge and if on account of some reason, he decides to go deeper, the contractor

shall excavate further as per requirement. Base width of the trench, shall not, generally be more than the width of the bottom most part of the structure, adequate side slopes, depending on soil encountered, may be provided to ensure stability of the slope. No claim regarding excavation in excess of base width of structures for providing working space, shall be entertained. The foundation trench has to be kept dry by providing suitable arrangement of bailing out of all sorts of water, cost of which is included in the item. However, if soil investigation report indicates that in case of very permeable sub-soil like silt or sand, substantial sub-soil seepage and sand blowing would occur and well point dewatering or similar method for lowering the ground water table is required to be taken up, the same shall be paid extra. Analysis of rate for such item may be done and got approved by the Superintending Engineer. The rate includes clearance of silt and slush by using pan and bucket if necessary, removal of water hyacinth, jungles up to 30 cm girth, organic matter, municipal garbage etc, unless otherwise stated specifically. In no case, shall the foundation concrete or soling be laid prior to receiving order to that effect from the Engineer-in-charge or his authorized representative.

Excavation shall include throwing the excavated earth atleast 1.50 m or half the depth of excavation, whichever is more, clear of the edge, if not otherwise instructed by the Engineer-in-charge.

The excavated areas around the foundation of structures are to be filled up properly to the required levels with earth obtained from excavation or other materials as directed, well rammed with water and consolidated in layers of required thickness. The quantity for this item will be measured on the basis of quantity of excavation paid, less the volume occupied by the structure in foundation.

Note:

In case, due to paucity of space or other reasons, straight excavation is required to be carried out and shoring might be required for loose earth/sandy or silt soil or deep excavation is required in clayey soil, the rate and specification of such work may be taken from the Schedule of rates of P.W.D.

1.15 Removal of Water Hyacinth:-

The item includes removal of water hyacinth, weeds, floating garbage etc. in rural and urban areas. The rate also includes cost of burning the water hyacinth on channel bank, when dry or removing outside Government land, either in the countryside of the embankment or in vacant land / dumping grounds in conformity with municipal rules, so that the materials either during temporary or permanent storing / deposition or during disposal shall not cause any hindrance to traffic or pose any health hazard. In no circumstances, the water hyacinth shall be allowed to push beyond working zone in the downstream reach. Payment will be made on the basis of stack measurement after deducting voids @40%. No payment shall be made for water hyacinth deposited on the water side slope of the channel. In urban municipal areas, sometimes it is found that for some length in the upstream of the bridges (wooden, bamboo or multi span concrete bridges) and in front of the pump houses or near market places or in areas where khatal effluents are directly disposed in channels, semi compact masses are formed due to deep rooted water hyacinth along with municipal garbage, polypacks, khatal effluents, long grasses etc. Rate of removal of such type of semi compact mass is not included in the instant item and may suitably be analyzed and got approved by the Superintending Engineer.

1.16 ANTIQUITIES AND USEFUL MATERIALS:-

- 1.16.1** Any finds of archaeological interest such as relics of antiquity, coins, fossils or other Articles of value shall be delivered to the Engineer-in-charge and shall be the property of the Government.
- 1.16.2** Any material obtained from the excavation which in the opinion of the Engineer-in-charge is Useful shall be stacked separately in regular stacks as directed by the Engineer-in-charge and shall be the property of the Government.

1.17 PROTECTIONS:

- 1.17.1** Excavation where directed by the Engineer-in-charge shall be securely barricaded and provided With proper caution signs, conspicuously displayed during the day and properly illuminated with red lights and/or written caution messages using fluorescent reflective paint as directed by Engineer in charge during the night to avoid accident.
- 1.17.2** The Contractor shall take adequate protective measures to see that the excavation operations do not damage the adjoining structures or dislocate the services. Water supply pipes, sluice valve chambers, sewerage pipes, manholes, drainage pipes and chambers, communication cables, power supply cables etc. met within the course of excavation shall be properly supported and adequately protected, so that these services remain functional. However, if any service is damaged during excavation shall be restored in reasonable time.
- 1.17.3** Excavation shall not be carried out below the foundation level of the adjacent buildings until underpinning; shoring etc. is done as per the direction of the Engineer-in-charge for which payment shall be made separately.
- 1.17.4** Any damages done by the contractor to any existing work shall be made good by him at his own cost. Existing drains pipes, culverts, over head wires, water supply lines and similar services encountered during the course of execution shall be protected against damage by the contractor. The contractor shall not store material or otherwise occupy any part of the site in manner likely to hinder the operations of such services.

2.0 PROTECTIVE WORKS :-

2.1 Bullah Piling Work:

Bullah piles shall be strong, straight and free from knots, holes and cracks. No joints in bullah piling is admissible except written permission from the Engineer-in-charge. Extra length required for lapping and cost of supplying of nuts, bolts and rings will not be paid for. The diameter of piles will be measured at a distance of 1.50metrefrom the thicker end. The driving of bullah piles will be done either in the river / channel bank or in the bed of the river / channel under tidal condition and stagnant or flowing condition of river etc. in all kinds of soil. The rate of supply is inclusive of sharpening the thinner end of the bullah and length shall be measured after sharpening shaping, and numbering. The piles will have to be driven vertically true to plumb along the alignment and upto required depth. The top of piles will have to be maintained more or less in the same level or as directed. The rate of driving is inclusive of hire charges of hoisting and driving arrangement, staging, scaffolding, floating arrangement like boats etc. Driven length shall be measured by deducting the exposed length from the supply length. The rate is inclusive of shaping of toe, protection of head and hire charges of necessary driving appliances and tools, boat or pontoon and scaffolding. No payment will be made for exposed portion of bullah. No pile shoe will be used if the driving is possible upto the required depth without the shoe and the decision of the Engineer-in-Charge shall be final in this respect.

During taking out bullah piling, payment shall be made over previously considered driven length only. The rate of taking out includes hire charges of scaffolding, chain pulley block, rope drum, floating arrangement and all other accessories.

2.2 Bamboo Piling Work:-

The bamboos shall be of thick & almost solid variety, fully matured and as straight as possible. The diameter shall not be less than 5 cm. The diameter will be measured at half length of each pin or bamboo as the case may be.

Driving shall be done reasonably true to plumb to the required depth by hammer, mallet or monkey as necessary under stagnant or flowing stream. All bamboos split up or damaged

during driving shall be removed & replaced at contractor's own cost.

The runners, ties or struts shall be fixed by 16 SWG G.I. wire at every joint and nailed at every 2 metre.

2.3 Pitching Works:-

Before the pitching work is undertaken, the river bank shall be cut and dressed to proper slope. Pitching shall not be laid on made up earth except where unavoidable. In such cases, the earth shall be watered well, rammed and consolidated before hand.

2.3.1 Various types of flexible pitching and primary guidelines on applicability of these.

2.3.1.1 Empty cement polythene bags:

Empty second hand cement polythene bags (capacity 50 kg) filled up with locally available sand / silt / loamy soil and sewing after filling may be used as a purely temporary measure, on riverside side slopes of newly constructed embankment, particularly when such slopes are built up by filling of earth and such palliative pitching works are scheduled to be replaced by suitable rigid or flexible pitching of permanent nature, e.g. brick block, dry brick, cement concrete, boulder, geobags, etc., immediately after passing of one monsoon season.

2.3.1.2 High-density Polyethylene (HDPE) bags:

High-density Polyethylene (HDPE) bags conforming to IS: 14252:2015, filled up with sand / silt / loamy soil and machine stitched after filling may be used for pitching as a semi-permanent measure, on riverside side slopes of river / channel bank or embankment, above LWL in the following cases:

(i) Scour hole below LWL has been filled up by dumping nylon crated bags or other suitable materials, and the resultant composite mass used for filling would be required to be kept after observation for at least more than a year, before stabilization. Upon stabilization of the underwater mass, such HDPE bag pitching, if found disintegrated on a large scale after 4 to 5 years due to UV radiation or other reasons, may be replaced by other suitable rigid / flexible pitching of more durable nature. In case of minor disintegration of individual bags, these may be suitably replaced by new HDPE bags.

(ii) The pitching work is generally subjected to low / moderate flow velocity as per standard calculation, not exceeding 2.5 meters, and/or access condition at worksite may not be conducive for deployment of heavy machinery and equipment, and/or the demographic and socio-economic conditions prevailing in the area to be protected otherwise justify use of the HDPE bags, instead of adopting cost prohibitive rigid protective measures of more durable nature.

2.3.1.3 Geobags:

Geobags / composite geobags manufactured using UV stabilized woven / combination of woven and non-woven geotextile films may be used when:

(i) Flow velocity is relatively high, in excess of 2.5 meters as generally found in many rivers of North Bengal thereby requiring heavier mass of individual units, which could easily be achieved by filling up geobags with sand / silt / loamy soil obtained from riverbed or river berm lands.

(ii) Underwater scouring has fully been stopped and the combined mass below LWL used for filling up scour holes has been stabilized.

(iii) Prevailing wave action calls for heavier mass of individual units of pitching and deployment of required machinery at site, like crane can be made easily.

(iv) Cost competitiveness of geobags including cost of supply, filling and laying in position, compared to the corresponding cost of conventional rigid pitching materials, has been established.

2.3.1.4 Applicability of different types of flexible protection under different site conditions stated in Para 2.3.1.1 to 2.3.1.3 above are purely suggestive and may be used only as a primary guidance, as these items are relatively new and do not have much past reference of uses. The

Engineer-in-charge is to carefully consider all the relevant aspects, including design, construction, maintenance, durability and economics as per codal provisions or sound engineering practices, before making the final selection of the particular type of flexible pitching. Assistance of the Design Wing may be solicited, if required."

2.3.2 Rigid Pitching:-

2.3.2.1 Brick Pitching:-

Brick pitching shall be made with 1st class kiln burnt/ picked jhama bricks as per direction of the Engineer-in-Charge. This shall be laid to the specified thickness and in proper bond. No extra half bricks or brick bats shall be used than are necessary to complete the bond. Each course of bricks, shall be laid such that the top surfaces is perfectly leveled and in smooth gradient. All longitudinal joints shall be horizontal and perfectly in straight line.

2.3.2.2 Brick Block Pitching:-

Brick block shall be made of first class kiln burnt brick work in cement mortar to the required size and thoroughly cured as per direction of Engineer-in-charge. The laying shall be done in the manner as for brick pitching. Finishing the top surface with cement sand mortar in specified proportion will be followed by curing and subsequent leveling. While finishing this top surface, care shall be taken to see that the gaps in between blocks are not filled up by mortar.

2.3.2.3 Cement concrete block pitching:-

Cement concrete blocks for (a) protection to the bank slope of irrigation canal / drainage channel to minimize seepage loss, ensure stability of slope and improve conveyance capacity, and (b) protection to the riverside slope of embankment to ensure stability and to prevent scouring or damage against wave action or high flow velocity, shall be designed as per codal provision and/or sound engineering practices, keeping in view the objective of end use and durability. Such block / lining should always be placed over a properly designed conventional or geotextile filters, to avoid possibility of failure against pore water pressure.

2.3.3.1 Precast cement concrete blocks, made in casting yards with finished top surface with cement sand mortar, followed by curing are to be laid in position over the filter bed, and levelled, with a nominal gap of 6mm between the adjacent units. Such gaps may be created by removable plyboard shuttering or unremovable thermocol boards. There is no need of filling up the gaps.

2.3.3.2 Cast-in-situ cement concrete blocks / linings shall be laid, by casting in alternative panels, or otherwise, with shuttering on four sides and with a layer of thick polythene sheet at bottom (of thickness 100 μ m), to prevent clogging of filter due to intrusion of cement slurry, during casting. Side shuttering may be removed within 3 to 5 hours after casting. Gap between the adjacent blocks should be at least 12mm, to be kept preferably using removable side shutterings or thermocol boards. In case removable shutterings are used, the gaps are to be filled up and compacted by 5.6mm down coarse aggregate. Finishing the top surface with cement sand mortar, will be followed by curing. While finishing the top surface, care is to be taken to ensure that the gaps in between blocks are not filled up by mortar. In case of plan dimension of individual units of block / lining exceeding 1 sqm, or in case of excessive seepage observed particularly at the lower portion of the slope, causing sloughing or scouring of soil materials, 50mm dia PVC pipes, with 300mm embedment into the virgin ground and top flush with the finished surface of the block / lining may be inserted at the centre of each block / lining and the pipes may be filled up and packed by 20mm down well graded coarse aggregates, to create additional pore water pressure dissipating device, in addition to the gaps lying along four sides of such units. Rate of supply, fitting and fixing of such PVC pipes may be analyzed by the

construction wing, using PWD (Sanitary & Plumbing) and PW (Roads) SoR.”

2.3.2.4 Boulder Pitching:-

This shall be done with Pakur, Panchami & North Bengal variety of stone boulders to cover the area to be pitched with boulders of size not less than 0.015 cum approximately and weighing about 25kg and above. The boulders shall be arranged in layers and packed close together to the required specified thickness and made up to the proper slope. Smaller broken stones are to be used in filling the space between the bigger ones. Each working Division shall use the stone boulders from the nearest available quarry site.

2.4 Stacking and dumping of boulders pertaining to Anti Erosion Works:-

Attempt shall be made to stack the boulders at a safe zone as close to the worksite as possible keeping in view the extent of erosion and likely submersion of the stockyard by flood spill. In case the boulders are required to be stacked beyond the initial distance from the anchor point of the spur for want of space, prior written permission from the Engineer-in-charge is to be obtained by the agency to that effect.

While stacking, boulders are to be packed keeping void as minimum as possible, only 1/7th of gross volume is deducted as void and net volume is arrived at. The stacking shall be done layer by layer without any vertical gap in between two consecutive layers. All stacks as soon as measured shall be numbered serially with location in reference to permanent objects.

During taking measurement of stacked boulder by responsible officer, the measured stacks shall serially be numbered with oil paint and be marked with spreading liquid lime by the concerned agency for which no extra payment will be made. The serial number of stacks shall also be maintained in the measurement book also for the facility of the check measurement.

While checking measurement of stacks of boulders by officers other than those who recorded initial measurement some percentage of the stacks chosen at random shall be restacked in presence of the officers checking the measurement so as to verify whether the stacks have been made in proper manner or not. This percentage shall normally be not less than 2% in case of S.D.O.'s and 1% in case of Executive Engineer's checking. No extra payment for such restacking will be admissible.

The alignment of the spur shall be properly marked over the entire length of the spur by bamboo or sal bullah piles for which separate payments will be admissible as per provision of item in the schedule of work.

The measurement of stacks of boulders shall be verified with those recorded in measurement book before dumping is started. After the close of each day's work the balance portion of the broken stacks, if any, shall be measured and approximate quantity recorded by the supervising staff before leaving the site. At the time of resuming the work next day, previous day's measurements for the said stacks shall be verified before allowing dumping.

Dumping by boat shall be done for constructing the portion of the bar which will be under water. For constructing the anchored portion as well as the portion above the water level of the river, provision of boats will not be necessary and this shall be done by dumping boulders by head load only.

Dumping of boulders shall always be made in presence of a responsible officer not below the rank of Junior Engineer. The quantity dumped day to day shall be separately recorded by supervising staff with reference to serial number of stacks in addition to recording in measurement book by the junior Engineer concerned.

Boulders shall be simultaneously dumped over the entire length of the bar below water so that the bar is raised vertically at a uniform rate. Requisite number of boats shall be mobilized at each site and the loaded boats shall be aligned properly along the side of the spurs before each dumping. After the placement of all the boats have been made and duly checked, the dumping shall be simultaneously commenced. The cycle shall be repeated for each trip of the boat.

For each boat load, challans shall be prepared in triplicate; one shall be retained by the supervising staff at the loading site, the second copy shall be handed over to the agent of the

contractor and the third copy to the boatman to be again collected back by the supervising staff at the dumping site as soon as the unloading is completed. The agency at the time of submitting the bill, shall enclose the second copy of challan. Each challan shall indicate the approximate quantity of boulders carried by the boat.

For easy identification the boats shall be prominently numbered by the contractor at his own cost for which he shall have no extra claim to the department on this account.

2.5 Sausages Works:-

Sausage works may be of different shapes like rectangular, square or circular type of various sizes depending on the site condition. The fill materials inside the sausage crate may be either by picked jhama /1st class kiln burnt bricks or with stone boulders. For launching sausages from bank, rate is inclusive of making ramps and supply of all equipments including carriage within a lead of 60 metre and all lifts complete.

2.5.1 Sausage cage made with Picked Jhama /1st class kiln burnt bricks:

Full bricks 1st class kiln burnt or picked jhama (413 nos per cubic metre volume of sausage) are rolled inside the sausage cage made with 10 SWG G.I. wire of internal dimension of square mesh 100 mm × 100 mm, with a minimum lapping of 150 mm wire net as per direction of the Engineer – in –charge. The top & bottom face of the sausage shall be tied by double ply 12 SWG G.I. wire at an interval of 0.60 m longitudinally & laterally. The ends of sausage shall be properly closed with end pieces by sewing with 12 SWG G.I. wire including inter twisting the free ends of the wire at the junction as per direction. The cost is inclusive of all materials, carriage upto site, labours for making, filling sausage cage & preparation of bed in standing or flowing water upto 0.30 metre depth complete. The cost of end pieces of wire netting will be paid extra as separate item.

2.5.2 Sausage cage made with boulders or lump aggregates etc.:

The boulders shall be filled inside the sausage in well packed & perfectly dressed condition. Sausage shall be made with 8 SWG /10 SWG G.I. wire of square mesh size 125 mm × 125 mm wire netting or square mesh size 150mm x150mm wire netting as per requirements with a minimum lapping of 150 mm as directed by the Engineer –in-charge. The ends of the sausage shall be properly closed with end pieces sewing with 10 SWG/12 SWG G.I. wire as per direction including inter twisting the free ends, tying the face of the sausage by double ply wire at an interval of 0.60 metre longitudinally and laterally. The sub-grade shall be prepared before laying the sausage and the laying shall be done in stagnant or flowing water upto 0.30 metre depth. The wire netting shall be held straight before placing the boulders. The rate is inclusive the cost of required wire netting, binding wires etc. carriage upto site and all the labour charges required for making, sewing etc. the sausage cage including filling with boulders or lump aggregates in the same as per direction of Engineer-in -charge. The lump aggregates constitute any type of solid aggregates like singles, sprawls, cobbles, brick bats, brick ballasts, stone metal, sand etc. filled in bags suitably placed inside the sausage crates as per direction of the Engineer-in-charge. The cost of boulders or lump aggregates including it's carriage upto site will be paid separately. The cost of end pieces of wire netting will also be paid extra as separate item.

2.6 Driving Mild Steel Sheet Piles:-

The driving of M.S. sheet piles will be done in the river bank or in the bed of river even in tidal condition or on the ground or in trenches in all kinds of soil, sand, soil mixed with gravel, shingles and pebbles etc.

Clutches of sheet piles shall be cleaned and examined for metal wire edge lugs (scales) and deflections that interfere with driving of sheet pile. Besides, the above clutches shall be examined for rectilinearity and safety. Clutches shall be checked by pulling templates through it. The template is piece of steel pile of the corresponding section, more than 5.50metre of specified length. Clutch longitudinal deflection (along) the line of pile shall not be more than 1mm per liner metre of sheet pile. All defects of sheet piles is to be eliminated before driving. If in the same sheet piles there are such defects which cannot be eliminated those sheet piles shall be rejected/removed from site.

During driving of sheet piles, it is necessary to carry out strictly in accordance with designs and specifications. Areas where sheet piles are to be driven shall be prepared as per general directions of the Engineer-in-charge. Piles shall be driven properly interlocked and piles which go out of clutch shall not be permitted. Sheet piles may be required to be driven in trenches back filled with local sand if cobbles or similar layers do not permit to drive the piles below. Sheet piles shall be painted with one coat of approved Tar primer or equivalent and two coats of anticorrosive ready mixed oil bound paint. To keep verticality of sheet piles as well as the designed alignment of sheet piles and required contours, special guides shall be provided during pile line and on the plane perpendicular to it. The position of every sheet pile in plan shall be checked with reference to the guides and vertically along sheet pileline by plumb.

After plumb checking, measurements when driving next sheet pile shall be taken in every 6 sheet piles. Sheet piles getting out of plumb in plan shall not exceed 150mm at pile top level and 100mm at ground level.

Taper piles or junction piles as required shall be manufactured. Where the inclination of the pile in the direction of driving exceeds permissible limits, it shall be set right by the contractor for which no extra payment shall be made. The special and tapered sheet pile shall be manufactured with rivets and laps. If it is permitted to manufacture the above sheet piles welded, perfect quality of welding and safety of welding shall be ensured during driving.

While driving sheet piles with vibrosinker, it is necessary to follow directions given in the operational instructions of vibrosinker. Fastening of vibrosinker to sheet pile shall be rigid. During driving, the bolt connection shall be periodically checked and bolts tightened. Axis of vibro-sinker shall coincide with sheet pile axis. Tolerances in sheet pile opening meant for jaw wedge of vibro-sinker shall not exceed 2 mm for distance between pile end and upper wedge of opening and 4 mm for other dimensions. Alternatively, pneumatically operated jaw grips can be used.

If during driving, piles deviate from vertical position, it shall be lifted up, corrected and then driven again. If it is found that clutch or weld seam has been broken or some other breakage has occurred affecting the work of sheet pile line, that sheet pile shall be extracted immediately and replaced by a good one at contractor's cost.

For smooth lifting and lowering of sheet piles, the machine used for work shall be equipped with corresponding crane equipment and attachments. Velocity of lifting crane hook when extracting sheet pile with vibration shall not be more than 3 metre/minute for sandy soil any 1 metre/minute in case of clayey soil.

When keeping and handling sheet pile, safety measures shall be observed to prevent it from damage i.e. overstrain of materials, clutch damage etc. All deviations from technical specifications which may take place in the process of carrying out of sheet pile driving work, as new points not dealt with in the technical specifications shall be done as per instruction of the Engineer-in-charge.

In the process of driving sheet piles, register shall be kept in which every driven pile shall be recorded with its length, time and driving, equipment used. All conditions of driving shall also be recorded and maintained.

Payment to the agency for driving sheet piles shall be made at the unit price per square metre of sheet piles actually driven including the cost of all handling, cleaning, painting, driving, cutting and riveting/welding where required fabricating taper piles and making holes in the piles where required, fabricating corner and special junction piles, replacing defect piling etc. in accordance with the provision made in the foregoing paragraphs complete.

No concreting of the toe wall trench covering the projected length of the top of the sheet

pile shall be allowed until the same are checked by the competent Engineer and his approval for commencement of concreting is received.

2.7 Installing geo textiles:

2.7.1 Site Preparation:-

Clear and grade the installation area. Before installation of the geotextile, the site must be cleared of large and sharp stones, tree stumps or any other objects that could damage the geotextile. Cut trees and shrubs flush with the sub grade. Removal of topsoil and vegetation mat is not necessary, but is recommended where practical. Excessively soft spots or voids may be unsuitable for geotextile installation. Fill these areas with select material and compact prior to geotextile installation. The problem area may be enhanced by using a geotextile at bottom of the excavation prior to backfilling. If heavy construction equipment is used, driving on the geotextile must be avoided.

2.7.2 Deployment of the Geotextile:-

Unroll the geotextile on the prepared sub grade in the direction of construction traffic. Hold the geotextile in place with pins, staples, fill material or rocks. Adjacent rolls shall overlap in the direction of the construction. Depending on the strength of the sub grade, the overlaps may have to be sewn.

2.7.3 Placement of the Aggregate:-

Place the aggregate over firm subgrades by back dumping aggregate onto the geotextile and then spreading it with a grader. For weaker subgrades, dump onto previously placed aggregate and then spread the aggregate onto the geotextile. On weaker subgrades, a sufficient layer of aggregate must be maintained beneath all equipment while dumping and spreading to minimize the potential of localized subgrade failure. Avoid traffic directly on the geotextile. When using construction equipment on the aggregate, try to avoid any sudden stops, starts or sharp turns. Maintain a minimum lift thickness of 15 cm except in cases of low volume roads. Compact the aggregate to the specified density using a drum roller. Fill any ruts with additional aggregate and compact as specified.

In addition to the application and function to be covered by the geotextile, it is important to consider the following:

Before installation, check if the packing foil is complete. If not, check the geotextile roll for damage due to UV radiation or mechanical impacts.

Before installation of the geotextile, the site must be cleared of large and sharp stones, tree stumps or any other objects that could damage the geotextile.

Secure the geotextile from wind forces, for example by placing small bags with sand on the fabric to hold it in place.

If heavy construction equipment is used, driving on the geotextile must be avoided. If several rolls of geotextile are used for the installation, joint overlaps shall be made correctly either by sewing or by using adequate overlaps, depending on the application and soil conditions.

Prior to covering, the geotextiles must be inspected to ensure that the geotextile has not been damaged during installation.

2.7.4 Joints and overlaps:-

In installations where more than one roll of geotextile is used, the joint overlaps shall be made either by sewing or by using adequate overlaps.

The requirements to the joints depend on the application and soil conditions in question.

The larger the deformations which can be expected, the greater the requirements for the overlap. The table given below can be used as a guideline. The requirements are specified for typical road applications. For larger hydraulic structures, the minimum overlap shall never be below 500 mm and is often required to be minimum 1 metre.

Overlap requirements/ASSHTO M288

Soil CBR	Minimum overlap
Greater than 3	300 - 450 mm
1 - 3	0.6 - 1 m
0.5 - 1	1 m or sewn
Less than 0.5	Sewn

Sewing is a good alternative to overlapping, especially when the required overlaps are quite large, for example close to and above 1 m. Sewing can be carried out using different types of threads and seams. It is therefore important that the quality of the seam. This is typically done by testing the seam according to EN ISO 10321 "Geosynthetics - Tensile test for joints/seams by wide-width strip method".

2.7.5 Geo Bags:-

The geo-textile bags of different size will be manufactured using the Polypropylene UV stabilized needle punched non woven Geo-textile having requisite properties. The two long end will be double chain stitched with polypropylene or equivalent yarn. The material will be supplied at site as desired by the Engineer-in charge with the required test report as asked by the Engineer-in-charge.

2.7.6 Composite Geo Bags:-

The composite geo-textile bags of different size will be manufactured from Polypropylene UV Stabilized Woven Geo-synthetic material and Polypropylene UV stabilized needle punched P P non woven Geo-textile material having requisite properties. The woven geo-textile will be used as outer layer and the non-woven geo-textile will be used as inner liner. Initially the two types of sheet of required dimension has been laid one above another and stitched together. Then this composite material will form a bag by stitching the two long end by double chain stitch with polypropylene or equivalent yarn. The material will be supplied at site or as desired by the Engineer-in-charge with the required test report as asked by the Engineer-in-charge.

"2.7.7 – Specification of woven geotextile as filter materials and to be used in Geobags"

Sl No.	Property	Unit	Test Method	Desired Value
1	Weight	Gsm	ASTM D 5261	430
2	Tensile Strength Warp/Weft	KN/M	IS : 1969	70/70
3	Elongation at specified Tensile Strength. Warp/Weft	%	IS : 1969	27/25

4	Trapezoidal Tearing Strength Warp/Weft	N	ASTM D 4533	1500/1500
5	Puncture Strength	N	ASTM D 4833	1200
6	Water Flow	Lit/m2/Sec	ASTM D 4491	25
7	AOS	mm	ASTM D 4751	0.425
8	U.V. Resistance after 500 hrs	% strength retained	ASTM D 4355	>= 80

“2.7.8 – Specification of non-woven geotextile as filter material and to be used in Geobags”

Sl No.	Property	Unit	Test Method	Desired Value
1	Weight	Gsm	ASTM D 5261	300
2	Tensile Strength	KN/m	ASTM D 4595	17
3	Elongation	%	ASTM D 4595	> 60
4	Grab Tensile Strength	N	ASTM D 4632	1050
5	Grab Tensile Elongation	%	ASTM D 4632	> 60
6	Trapezoidal Tearing Strength	N	ASTM D 4533	425
7	CBR Puncture Strength	N	ASTM D 6241	3100
8	Thickness	mm	ASTM D 5199	2.0
9	Flow water rate - 5 cm head	Lit/m2/Sec	ASTM D 4491	55
10	AOS	mm	ASTM D 4751	0.015
11	U.V. Resistance after 150 hrs	% strength retained	ASTM D 4355	>= 75

2.7.9 Sampling and Testing

2.7.9.1 Geotextiles must be tested by the Client / Engineer-in-charge at accredited or well equipped laboratories (e.g.

BITRA, CIPET, Jadavpur University, etc.) having all testing facilities prescribed above. Cost of such testing, deemed to be 3rd Party Testing would have to be borne by the Engineer-in-charge and the responsibility of taking samples, and sending to laboratories shall entirely be vested on him, for which necessary provision for cost shall be made in the estimate, but may not be included in the BoQ of contract. This apart, the contractor also shall furnish Manufacturer’s Test Certificates (MTC) from either own laboratory or from accredited laboratories stated above. No payment shall be released without MTC and full payment shall not be released until results of 3rd Party Testing are made available. In case of non compliance of the results of 3rd Party Testing with the specified parameters, the Engineer-in-charge shall make payment at reduced rate on pro-rata basis as stated below.

Criteria	Reduced rate of payment
Sl.1 to Sl.7	@ 10% (for each criterion)
Sl.8	@ 50%

2.7.9.2 The sampling and testing frequency must be in accordance with the following:

Batch or order size (sqm) defined as the lot size	No. of samples representing the lot
Initial 10,000 sqm or part thereof (Plan area of each geobag may be taken as 0.7 sqm)	1
Each subsequent 10,000 sqm or part thereof	1

2.7.10 Identification and Storage

- 2.7.10.1 The geotextile rolls / geobags must be clearly labeled showing, manufacturer, month and year of manufacture, batch identification mark and any other information as required by the law in force.
- 2.7.10.2 Geotextiles must be stored under protective cover or wrapped with a waterproof, opaque UV protective sheeting to avoid any UV damage prior to installation.
- 2.7.10.3 Geotextiles must not be stored directly on the ground or in any manner in which they may be affected by heat. The method of storage must be in accordance with the recommendations set by the manufacturer."

2.8 Specification of High Density Polyethylene (HDPE) Woven Bags

Sl No.	Property	Unit	Test Method	Expected value
1	Length	cm	IS 14252	84 + 2
2	Width	cm	IS 14252	38 - 1
3	Ends per dm and Picks per dm		IS 14252	40±1
4	Mass of sack (without tying cord)	gm	IS 1964	55±2
5	Average Breaking Strength of fabric, Min (Ravelled strip method, 325mm x 70mm), Warpway / Weftway	N(kgf)	IS 1969	750(76)±6
6	Average breaking strength of bottom seam, Min (Ravelled Strip method)	N(kgf)	IS 9030	314(32)
7	Elongation at break of fabric (Ravelled Strip method), bothways	%	IS 1969	20
8	Average breaking strength at break of UV stabilized HDPE fabric after been exposed to UV radiation and weathering (after 192 hours), Min	%	IS 14252	50
19	Ash content, Max	%	IS 14252	2.20
Note :- The mass of the sack is based on fabrics weighing 75 gsm; 1N=0.102kgf (approx.) Width after raveling = 50 mm, Gauge length = 200 mm.				

2.8.1 Sampling and Testing

- 2.8.1.1 Sampling and testing of the HDPE woven bags shall be in accordance with relevant provision of IS: 14252:2015 or other Codes mentioned in that Code. Procedures described for making payment in relation to sampling and testing shall be similar to the provisions of Para 3.7.9.1 stated hereinbefore.

2.8.2 Printing Packaging and Marking

- 2.8.2.1 Printing, packaging and marking shall be in accordance with the provision of Clause 5 of IS: 14252:2015. Each bag shall carry the following:
- (a) Manufacturer's name and logo
 - (b) BIS Standard Mark
 - (c) Manufacturer's BIS License Number
 - (d) Month of manufacture."

No bag shall be accepted without the above information

2.9 Properties of the material of the Polypropylene Rope Gabion

	Properties	Limits
1	Weights	40 gm/ metre or more
2	Tensile strength	a) 9mm dia rope, Breaking strength >= 1560 Kg b) Punching shear:- 6000 Kg to be tested as per IS: 7071

3	Construction of Net	Interlaced at the intersection of ropes
4	Abrasion Resistance	Residual breaking strength of at least 85% of the stipulated rope strength at the end of 1000 cycles, when tested as per IS: 7071
5	Thermal Stability	The rope tested as per IS: 7071 shall have a residual strength of 90%
6	U V Resistance	More than 80% strength retention after 500 hours of outdoor weathering as per ASTM D 4355

- 2.9.1 Testing and compliance procedures, conforming to relevant IS / ASTM Code, with the frequency of sample as may be agreed upon between the Engineer-in-charge and the Contractor or as may be prescribed in the relevant codal provision. Linkage between 3rd party testing and payment, in a manner similar to the provision of Para 2.7.9.1, may be established, before invitation of tender."

2.10 Specification of Tetrapod:-

2.10.1 Casting of Tetrapod:-

Tetrapod units shall be measured in numbers for casting and rates shall cover all cost that are necessary for casting, curing to complete all items according to specification and will be paid under respective items of Unified Rates of schedule and SoR of PWD.

Grade of concrete of Tetrapod is M35 cement concrete.

The concrete shall be designed to the design mix as relevant IS Codes.

Data for preliminary Mix Design for M35 (Tetrapod concrete)

- Characteristic compressive strength of concrete at 28 days is 35 N/mm²
- Degree for workability – As per relevant I.S. code
- Maximum free water cement ratio- 0.45
- Minimum cement content – 440 Kgs for M35
- Type of exposure- Severe
- Maximum nominal size of aggregate 20 mm
- Standard deviation of compressive strength of concrete – 5 N/ mm²

Notwithstanding the foregoing, the standard deviation shall be determined from the test results as soon as 30 samples are tested. Mix design shall be performed for severe exposure condition.

2.10.2 Proportions of Materials:-

Concrete mixes shall be proportioned to give workable, dense concrete, which can be thoroughly compacted within the shuttering. The mix proportions for fine and coarse aggregate shall be complied with the requirements for designed concrete mixes according to IS: 456 for concrete.

The proportions of cement, fine and coarse aggregates and water proposed by the contractor for use in the works for grade of concrete shall be subject to approval by the Engineer-In-charge and results from the preliminary tests from trial mixes, shall be satisfactory to the Engineer-In-charge as outlined in the relevant IS Codes. (Trial Mixes and Preliminary Tests)

The contractor shall arrange to carry out necessary calculations, all the tests for determining the grade of concrete at his own cost and the approval of Engineer-In-charge is mandatory. The proportioned weight of coarse aggregate and fine aggregate to produce the concrete of required strengths.

- The proportion of cement, aggregate (Fine and coarse) and water to be determined.
- The sieve analysis of aggregates which they proposed to use in the works.
- Full details of preliminary tests on concrete and
- All the calculations relevant to the design of grade of concrete mix.

2.10.3 Armour Layer (Tetrapod):-

Armour layers shall be placed to the levels as directed by the Engineer-in-charge, based upon the levels and the thickness shown in the drawing. The Tetrapod in the armour layers shall be placed individually in two or more layers such a manner as to ensure close interlocking of Tetrapod and reduce the voids in the armour layers as far as possible.

2.10.4 Casting of Tetrapods (Armour Layer):-

The contractor shall make his own arrangements for making form work, moulds etc. for casting Tetrapod. The Casting yard shall be provided near the site by the Engineer-In-charge and the contractor shall lift the tetrapod after casting, curing and stack them in the stacking yard. Any damage to tetrapod for any reason, the cost of the same will be recovered from the contractor's running bill, which may become due to the contractor.

The contractor shall submit drawings and substantiate their proposals, showing details of the shuttering he intends to use for the approval of the Nodal officer. Shuttering shall be made from steel plates and shall be of suitable design and substantiate construction to carry the loads due to the wet concrete and any incidental loads without inadmissible bulging, distortion or deflection.

Any changes or modifications to the shuttering required by the Engineer-In-charge shall not entitle the contractor to any extra payment. Shuttering shall be sufficiently tight to prevent loss of water or mortar from the concrete. Special attention shall be paid to shuttering where pokers or shutter vibrators are to be used. All shuttering shall be accurately aligned and have close fitting joints. The outside of steel shuttering must be painted in light color to reduce temperature gain due to solar radiation. All shuttering surfaces in contact with concrete shall be treated with an approved composition before usage to prevent adhesion of the concrete. The use of diesel, mineral or engine oil will adhere to or discolors the concrete, shall not be used.

All tetrapod shall be on horizontal and rigid beds. Each tetrapod shall be cast in one continuous operation and no construction joints in the concrete will be permitted. If the contractor shall, for any reason whatever, only partially complete the casting of any tetrapod, such unfinished Tetrapod shall be rejected at contractor's cost and risk.

All concrete surfaces shall be smooth, any fins occurring at formwork joints shall be removed and honey comb filled with mortar after getting approval from the Engineer-In-charge for doing so.

All concrete is to be protected during hardening from the direct rays of the sun and drying winds. A record of dates of concreting the tetrapods shall be kept by the contractor and the dates and numbers shall be prominently displayed on the tetrapods.

2.10.5 Transporting and Placing of Tetrapod:

Tetrapod units shall be measured in numbers for transporting and Placing in position. The rates for transporting and placing Tetrapod shall cover all costs that are necessary for lifting, transportation, placing and fixing in position to complete all items according to specification and will be paid under respective items of Unified Rates of Schedule.

The contractor shall engage cranes of suitable capacity and boom length for easy handling and placing at the required reach. The contractor shall engage skilled labours for the work.

2.11 Reinforced Cement Concrete Porcupine:-

The R.C.C. Porcupine basically consists of 9 (nine) R.C.C. members of dimension 150cm x 10cm x 10cm. Such 3 (three) members are casted monolithically by cement concrete (1:1.5:3) and requisite reinforcement in triangular shape in such a manner that the inner side form an equilateral triangle of dimension 60 cm and the rest part projected. A hole of diameter more

than 25 mm will be made at mid length of each member. Such two nos of monolithically casted members will be joined with three nos. of individual member with 25mm dia nut & bolts along with washers. For smooth finished surface the shuttering will be finished with polythene sheet. The reinforcement will be 4 nos. 6mm dia HYSD bars as main reinforcement and 6mm dia stirrups @ 200 mm c/c. After casting, curing and fitting, fixing complete, the Porcupines will be placed at the bank or bed of the river / sea or dumped from the boat under water as directed by the Engineer-in-charge.

3.0 Special items for Sluices:

General:

Shutters, fixtures, hoisting arrangements etc. shall be designed and proportioned in such a way so that the sections are commensurate to the water pressure and permit smooth drainage, whenever required, at a minimum head difference.

All materials / bought out components for embedded parts, gates, hoists and allied works shall conform to relevant Indian standards / technical specifications and approved drawings.

The basic rates are inclusive of cost of all materials, machinery, labour, fabrication, erection, commissioning and testing of gates, hoists and other related components as per technical specifications.

3.1 Detail Components:-

Shutter Leaf:

Minimum thickness of the skin plate and angle stiffeners shall not be less than greater of the following unless specifically mentioned otherwise by the Design Wing. Designed thickness plus 1.5 mm as corrosion allowance.

8mm for shutters of R.C.C. spun pipe inlets and other box inlets/sluices upto discharge of 5.5 cubic metre /sec. and 10 mm for all other sluices. Continuous fillet welding, not less than 6 mm size, shall be done all along the members as per IS: 9595 with electrodes as per IS: 824. Mild steel shall conform to IS: 226/2062 depending on requirement of weld ability and Manufacturer's test certificates are to be furnished, if required by the Engineer-in-charge.

3.1.1 Hoisting Fixtures:-

Draw shutter

The screw gear rod shall be of mild steel conforming to IS : 226. Cast iron guide channels conforming to IS: 210, adequately proportioned to allow for upward and downward movement of the shutter with sufficient clearance and inside machined and shall be true to plumb and fixed with the R.C.C. / masonry with necessary hold fasts. The cost of necessary R.C.C. / masonry work is included in the item. The guide channel shall permit proper abutting of the rubber seal. The wheel and the pedestal shall be of cast iron, and the pedestal shall be compatible with the wheel and the gear rod. Minimum thickness of cast iron members shall not be less than 20 mm. The pedestal shall be properly anchored with concrete sill beams by anchor studs / bolts of diameter not less than 20 mm.

Flap Shutter:-

Suitable double hinge fixture shall be manufactured from forged steel of thickness not less than 16 mm conforming to IS: 2004 and the junction of the bent portion shall be continuously welded. Long tie rods shall be mild steel of not less than 28 mm diameter. Angle members partly engraved in concrete/masonry for supporting the tie rod shall preferably be cast steel of Grade 23-45 (W) of IS: 1030 for better corrosion resistance than mild steel. Thickness of such members shall not be less than 25 mm.

Sealing Arrangement:

Suitably designed 'Flat type' or 'Musical note type' rubber seal made up of molded/extruded natural or synthetic rubber conforming to IS: 4622 shall be used. The rubber seal along with MS/CI flats is to be fitted with shutter leaf with suitably spaced nuts and bolts, cost of which is included in the item.

The rubber seal, particularly in case of flap shutter, shall abut against smooth and perfectly aligned steel surface to ensure water tightness. For this purpose, a suitably designed M.S./Cast steel liner frame may be manufactured and fixed with concrete/masonry surface, by suitable anchor bolts/studs.

Bituminous Paint:

Bituminous 'paint of approved make and brand shall be used as per Manufacturer's specification. Bituminous paint is specially suitable in painting of shutters and other accessories like pedestal/ capstan Block, C.I. wheel etc. where aesthetics is not much of importance particularly for inlet structures and small sized drainage sluices. No extra primer is required to be provided for bituminous paints. The rate of removing old paint and preparing the surface is included in the item.

ABBREVIATION USED IN USoR

<u>Abbreviated Form</u>		<u>Expanded Form</u>
ASTM	:	American Society for Testing and Material
av.	:	Average
Cft, ft ³	:	Cubic foot (feet)
CI	:	Cast Iron
Cm	:	Centi meter
Cum, m ³	:	Cubic meter
DBL	:	Designed Bed Level
Deptt.	:	Department
dia, Dia.	:	Diameter
1 st	:	First
ft	:	Foot, feet
G.L.	:	Ground Level
GI	:	Galvanised Iron
GM	:	Gun Metal
gm	:	Gram
GSM	:	Gram per Square Metre
H.P.-Hr	:	Horse power-Hour
I&WD	:	Irrigation & Waterways Department.
I&W Dte	:	Irrigation & Waterways Directorate.
in ³	:	Cubic inch
IRC	:	Indian Road Congress
IS	:	Indian Standard
Kg	:	Kilogram (s)
Km, K.M.	:	Kilometer (s)
KN/M	:	Kilo Newton per Metre
lb	:	Pound
Lit	:	Litre
M., m.	:	Metre (s)
mm, MM	:	Mili meter
MS	:	Mild Steel
M.T., M.Ton	:	Metric Ton
No., no., nos.	:	Number (s)
N	:	Newton
PW	:	Public Works
PWD	:	Public Works Department
RCC	:	Reinforced Cement Concrete
R.C.	:	Reinforced Concrete
Rly.	:	Railway
Sec.	:	Second
Sq cm, cm ²	:	Square centimetre
Sq m, m ²	:	Square meter
SWG	:	Standard wire gauge
W.B.F.	:	West Bengal Form

GENERAL CONDITIONS

1. This Unified Schedule of Rates (USoR) is divided in 4 Chapters according to the nature of works involved viz. Chapter-I, covering Earthwork for Rivers, Channels, Embankments, Chapter-2, covering Protective Works & Flood Protective Measures, Chapter-3, covering Special items for Sluice Structures and Chapter-4, covering Miscellaneous items
2. The Executive Engineer of the concerned Division will be the Engineer-in-Charge in respect of the tender contract and all correspondences concerning rates, claims, change in specifications and/or design and similar important matters will be valid only if accepted/recommended by the Engineer-in-Charge. Instructions given by the Sub-Divisional Officer/Assistant Engineer and the Junior Engineer on behalf of the Engineer-in-Charge shall also be valid (who have been authorized to carry out the work on behalf of the Engineer-in-Charge) regarding specification, supervision, approval of materials and workmanship. In case of dispute relating to specification and work, the decision of Engineer-in-Charge shall be final and binding. The Engineer-in-Charge will however invariably take all decisions relating to tender contract only after consultation with the Tender Accepting Authority.
3. All construction materials, tools and plants / machinery, all labour (both skilled and unskilled) including their accommodation, sanitation, procurement of food stuff, medical aid, drinking water and all other basic needs, unless otherwise specified, are to be arranged by the Contractor. Cost for transportation of labour, materials and all items shall have to be borne by the Contractor.
4. The Contractor/bidder shall have to comply with the provisions of (a) Contract Labour (Regulation & Abolition) Rules, 1970 including its revisions (b) Minimum Wages Act 1948 and the modification thereof or any other laws relating thereto as will be in force from time to time.
5. Renewal works include dismantling and taking out old work and mending good damages after renewal and clearing the worksite of all spoils and dismantled materials, as per direction of the Engineer-in-charge.
6. Any materials brought to site by the contractor subject to approval of the Engineer-in-Charge. The rejected materials must be removed by the contractor from the site at his own cost within 24 hrs of issue of the order to that effect. The rates in the schedule are inclusive of cost and carriage of all materials to worksite. The materials will have to be supplied in phase with due intimation to the Sub-Divisional Officer/Assistant Engineer concerned in conformity with the progress of the work. For special type of materials, i.e. Geo Synthetic Bags, HDPE Bags, Geo Textile Filter, Geo jute Filter etc. if any, relevant Data Sheet containing the name of the Manufacturers, Test Report etc. will also be submitted in each occasion. Engineer-in-Charge may conduct independent test on the samples drawn randomly before according approval for using the materials at site. In this regard decision of Engineer-in-Charge shall be final and binding.
7. Cess @ 1% of the cost of construction works shall be deducted from the Gross value of all works Bill in terms of Finance Department order No. 853-F dated 01.02.2006. Also it is

instructed to register his establishment under the Act, under the competent registering Authority, i.e. Assistant Labour Commissioner / Dy. Labour Commissioner of the region.

8. All possible precautions should be taken for the safety of the people and work force deployed at worksite as per safety rule in force. Contractor will remain responsible for his labour in respect of his liabilities under the Workmen's Compensation Act etc. He must deal with such cases as promptly as possible. Proper road signs as per P.W.D. practice will have to be erected by the contractor at his own cost while operating public thoroughfares.
9. All working tools & plants, scaffolding, construction of vats & platforms and arrangement of Labour Campus will have to be arranged by the contractor at his/her own cost.
10. The contractor shall supply mazdoors, bamboos, ropes, pegs, flags etc. for laying out the work and for taking and checking measurements for which no extra payment will be made.
11. The contractor(s) shall not deposit material on any site which will seriously inconvenience the public. The Engineer-in-charge may require the contractor(s) to remove any materials, which are considered by him to be a danger or inconvenience to the public or cause them to be removed at the contractor's cost.
12. The contractor undertakes to have the site clean, free from rubbish to the satisfaction of the Engineer-in-charge. All surplus materials, rubbish etc. will be removed to the places fixed by the Engineer-in-charge and nothing extra will be paid.
13. Materials obtained by excavation/digging at site or dismantling of Govt. structures or part thereof shall remain the property of the Govt. The Contractor shall sort out and stack materials at site as per direction. He shall also dispose of the unserviceable rubbish etc. as per instruction of the Engineer-in-charge or his representative. The Contractor shall remain the custodian of such dismantled materials till the charge of the same is taken over by the Engineer-in-charge or his representative.
14. The Contractor must see that all damages to any property which in the opinion of the Engineer-in-charge are due to the work of the Contractor are promptly rectified as per his direction and to his satisfaction.
15. All the islands situated under North and South 24 Parganas, which are not connected by major bridges from the main land, the Schedule rates shall be enhanced by 20%. For works of Bhutnir ghat in Malda district, the rates shall be enhanced by 15%. This conditions are not applicable for items related to Earthwork. The carriage cost involved for the execution of works shall be based on shortest distance.

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P R E A M B L E

1. The items used in implementing various nature of works of Irrigation & Waterways Department not covered in the Schedule of Rates of PW Department have been attempted for inclusion in this Unified Schedule of Rates (USoR) in terms of Irrigation & Waterways Department order no. 13-(W)/2016-17 dated 30.05.2016 and 19-(W)/2017-18 dated 20.11.2017, arising out subsequent upon publication of SoR of PWD effective from 01.11.2017 considering the GST aspect.
2. While arriving at the rates, the analysis of the prevailing items of various circles including the publications of Central Design Office, Irrigation & Waterways Directorate have been consulted. Since, the rates have been prescribed in this USoR against the four zones so sub-divided viz. –
Zone-I – covering Jalpaiguri, Coochbehar, Alipurduar districts and plains of Siliguri Sub-Division,
Zone-II – covering North & South Dinajpur, Malda, Murshidabad and Nadia districts,
Zone-III – covering Purba & Paschim Bardhaman, Birbhum, Bankura and Purulia districts,
Zone-IV – covering North & South 24-Parganas, Howrah, Hoogly, Purba and Paschim Medinipur, Jhargram and Kolkata districts
-variation in the labour oriented items have been cropped up for the changes in labour wages mainly in terms of the prevailing wages prescribed by the Joint Labour Commissioner, West Bengal vide his no.- 420/Stat/2RW/32/94/LCS/JLC dated 05.06.2017.
3. While formulation of the USoR, the items presently used by all the construction wings have been sort listed with similarity in nature and in essence of implementation of works and also to cover all the prevailing items as far as practicable. Effort has been made to minimise the number of items by deriving items under such nomenclature so that the same may cover works of all zones duly adhering to the specifications of individual construction wings.
4. Attempt has been made within the stipulated time frame to incorporate the items having extensive use by the major construction wings. Items of seldom use by some construction wings are not included in this USoR. Such items are left at the discretion of the construction wing. For analysing such rates during implementation of the works from their end on requirement.
5. Prices of the different construction materials in analysing items , other than the items already covered in the PWD SoR, have been considered from the market rates.
6. In analysing the rates, in terms of I.& W.Deptt. memo.no.- 140-IB dated 10.08.2016, the following provisions have been considered –
 - a) Overhead charges @ 8% on basic cost.
 - b) Contractor's profit @ 10% over basic cost including overhead charges.
7. In terms of essence of the USoR ,various similar nature of items being followed by the different construction wings have been amalgamated to reduce the number of items / sub-items.
8. Machinery usage rates for analysing items have been obtained from the different agencies/authorities in the trade in renting out such machinery / implementation of similar nature of works.

9. All item rates for works involved in construction of buildings, sanitary & plumbing works and Electrical works, bridges, hydraulic structures etc. including issue rates of cement, steel etc. specifications thereof required for framing of all categories of estimates/DPRs would henceforth have to be compulsorily taken from the latest Schedule of Rates (SoR) of Public Works & Public Works (Roads) Directorate, Govt. of West Bengal, in respect of all such items for which are available in the SoR of Public Works & Public Works (Roads) Directorate. In this USoR, in terms of the requirement for implementation of works of this department, provision, other than the items already covered in the SoR of PW Department, have been made in the following Chapters-
Chapter-I – covers the item of works relating to Earthwork for rivers, Channels, Embankments.
Chapter-2 – covers the item of works relating to Protective and lining works and Flood Protective Measures
Chapter-3 – covers the Special items for Sluice Structures
Chapter-4 – covers the Miscellaneous items
10. Items of Jute Geo-textile, Polypropylene Geo-textile (woven and non-woven type), High Density Polyethylene (HDPE) bag and other similar items for filter materials have been incorporated in Chapter-2 of this USoR duly mentioning their salient properties in terms of the minutes of the Departmental Monitoring Meeting held on 14.07.2016. While arriving at the rates, support of the approved sources have been taken into consideration.
11. After promulgation of GST Act, 2017, the rates of the items have been derived in this USoR considering only the basic price exclusive of GST and Construction Labour Welfare Cess.
12. For consideration of GST rates by the construction wing, recently issued memos. of I.& W.Deptt. bearing nos.-323(107)-IB/IW/O/IB/Misc-46/2017-18(Pt) dated 12.09.2017(Annexure-3) and 429(107)-IB/IW/O/IB/Misc-46/2017-18(Pt) dated 14.11.2017(Annexure-4) are referred to and stated in brief for guidance -

Sl. No.	Types of Works / Services	Description of services in the context of GST	SAC Code	WBGST	CGST	Total GST
1	All types of works (original/maintenance/special repair) in Irrigation flood management and connectivity sectors including building, but other than those in cases where value of earthwork (including earth to be transported or disposed) is more than 75% of the total value of the work.	Composite supply of works contract as defined in Clause 119 of section 2 of CGST / WBGST Act under construction services (other than irrigation works, roads & bridges and works under JNNURM)	9954	6%	6%	12%
2	All types of works (original/maintenance/special repair) in Irrigation flood management and connectivity sectors, involving earthwork and material and value of earthwork (including transported or disposed earth) is more than 75% of the total value of the work.	Composite supply of works contract related to canal, dam or other irrigation works.	9954	2.5%	2.5%	5%
3A	Works comprising only earthwork in embankment or in excavation/re-excavation of canals/rivers/channels by mechanical/ manual means.			NIL	NIL	NIL

	with or without transportation / disposal, in relation to water management (including drainage, flood control, Irrigation), sanitation conservancy (including disposal of sewage and drainage), protection of the environment (including removal of drainage congestion).	Pure services (excluding works contract services or other composite supplies involving supply of any goods), provided to the Central / State Government / Local Authority / Government Authority / Organizations by way of any activity in relation to any function entrusted to a Panchayat under 243G or to a Municipality under 243W of the constitution.				
3B	Works comprising only removal of water hyacinth jungles, etc. from canals/rivers/channels by mechanical/ manual means, with or without transportation / disposal, in relation to water management (including drainage, flood control, Irrigation), sanitation conservancy (including disposal of sewage and drainage), protection of the environment (including removal of drainage congestion).			NIL	NIL	NIL
4	OMMITTED					
5	OMMITTED					
6	Consultancy services for designs preparation of DPR, IT related matters, project management etc. for various engineering projects and also for technical testing and analysis, certification of bridges, dams, barrages etc.	Other professional, technical & business services.	9983	9%	9%	18%
7	Internet access services in wired or wireless mode, internet based audio and video conference, fax and fixed telephony services.	Telecommunication, broadcasting and information supply services.	9984	9%	9%	18%
8	Supply of guards, support staff, labour etc. on contractual basis.	Support services.	9985	9%	9%	18%
9	AMC of computers and peripherals.	Maintenance, repair & installation services.	9987	9%	9%	18%

Note: GST rates stated for different categories of services under works contract will be applicable uniformly over all the items of works, considered in the estimate for the purpose of entering into a contract. It is clarified here that GST rates for all the items in a particular contract would be 12% (as stated in Sl.No.1 in the Table), even though such items may be related to earthwork, or removal of water hyacinth, jungles, etc. not involving supply of any goods, provided the total summed up value of earthwork related items, is not greater than 75% of the total value of work. It is further clarified that, in case the total summed value of earthwork is greater than 75% of the total value of work, total GST @ 5% will apply to all the items (as stated in Sl.2). Therefore, the same item of work may be subjected to different rates of GST, depending on the apportioned weightage of such items in the overall estimated cost.”

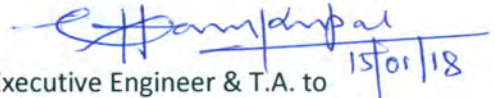
- For any changes in the GST rates, construction wings are required to keep track by visiting the relevant web portals, i.e. ‘GST’ Menu on wbcomtax.nic.in (for WBGST) and www.cbec.gov.in

(for CGST), on regular basis and consider the modified rates (if applicable) for preparation of the estimates. Copy of IWD Memos stated in Para-12 above, may further be perused at Annexure-3 & Annexure-4, respectively”.

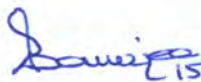
14. GST as applicable and Construction Labour Welfare Cess @ 1.00% are to be added with schedule of rates while arriving the estimated rate for preparation of estimate and BoQ as well.
15. Sample proforma for preparation of estimates incorporating GST as applicable as per GST Act and Notifications in vogue till November 2017, and Construction Labour Welfare Cess CLWC) @ 1% is given in Annexure-1A, 1B & 1C to further illustrate the implications of GST stated in Para-12 (along with Note) and Para-15 hereinabove.”
16. In addition to above a sample BOQ for inviting tenders is also given in Annexure -2A, 2B & 2 C.


15/01/2018


Executive Engineer,
Chief Engineers' Drawing Office
I & W Directorate


15/01/18

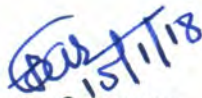
Executive Engineer & T.A. to
S. E., Greater Calcutta Drainage Circle
I & W Directorate


15/01/2018

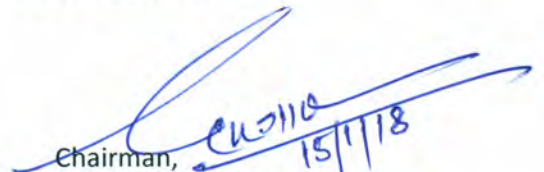
Project Manager (H.Q.),
Sundarban Embankment Reconstruction Project
I & W Directorate


15/01/18

Director,
Advance Planning, Project Evaluation & Monitoring Cell
I & W Directorate


15/1/18

Member-cum- Convener
Superintending Engineer,
Metropolitan Drainage Circle
I & W Directorate


15/1/18

Chairman,
Secretary to the Govt. of West Bengal
I & W Department

RATE OF WAGES FOR DIFFERENT CATEGORY OF WORKERS

Sl. No.	Category of workers	Unit	Rate (₹) Per Day			
			Zone I	Zone II	Zone III	Zone IV
1	Head mason	Each	383.00	347.00	383.00	383.00
2	Ordinary Mason	Each	349.00	315.00	349.00	349.00
3	Mazdoor (Male/Female)	Each	288.00	261.00	288.00	288.00
4	Mazdoor (for night work)	Each	317.00	317.00	317.00	317.00
5	Head Carpenter	Each	383.00	347.00	383.00	383.00
6	Ordinary Carpenter	Each	349.00	315.00	349.00	349.00
7	Helper for Carpenter	Each	317.00	287.00	317.00	317.00
8	Bhistee	Each	288.00	261.00	288.00	288.00
9	Santras	Each	317.00	287.00	317.00	317.00
10	Mathor Mistry	Each	383.00	347.00	383.00	383.00
11	Mathor Mazdoor / Tarmar	Each	349.00	315.00	349.00	349.00
12	Head Blacksmith	Each	383.00	347.00	383.00	383.00
13	Ordinary Blacksmith	Each	349.00	315.00	349.00	349.00
14	Helper for Blacksmith	Each	317.00	287.00	317.00	317.00
15	Fitter	Each	383.00	347.00	383.00	383.00
16	Helper for Fitter	Each	349.00	315.00	349.00	349.00
17	Painter	Each	383.00	347.00	383.00	383.00
18	Plumber	Each	383.00	347.00	383.00	383.00
19	Helper for Plumber	Each	317.00	287.00	317.00	317.00
20	Head Rod Binder	Each	383.00	347.00	383.00	383.00
21	Ordinary Rod Binder	Each	349.00	315.00	349.00	349.00
22	Helper for Rod Binder	Each	317.00	287.00	317.00	317.00
23	Pilling mate	Each	383.00	347.00	383.00	383.00
24	Mate	Each	383.00	347.00	383.00	383.00
25	Welder	Each	383.00	347.00	383.00	383.00
26	Helper for Welder	Each	317.00	287.00	317.00	317.00
27	Hammerman	Each	317.00	287.00	317.00	317.00
28	Ordinary Gharamee	Each	317.00	287.00	317.00	317.00
29	Tube-well Mechanic	Each	349.00	315.00	349.00	349.00
30	Stone cutter	Each	349.00	315.00	349.00	349.00
31	Beater	Each	317.00	287.00	317.00	317.00
32	Beater (Female)	Each	317.00	287.00	317.00	317.00
33	Vehicle Driver	Each	383.00	347.00	383.00	383.00
34	Boat Mazhi (for whole day)	Each	349.00	315.00	349.00	349.00
35	Boat Dandy (for whole day)	Each	288.00	261.00	288.00	288.00
36	Skilled Labour / Khalasi	Each	349.00	315.00	349.00	349.00
37	Mixer Machine Operator	Each	383.00	347.00	383.00	383.00
38	Vibrator Operator	Each	383.00	347.00	383.00	383.00
39	Pump Operator	Each	383.00	347.00	383.00	383.00
40	Sheet Pile driver	Each	383.00	347.00	383.00	383.00
41	Roller Driver	Each	383.00	347.00	383.00	383.00
42	Mali	Each	317.00	287.00	317.00	317.00
43	Ordinary Security Guard	Each	288.00	261.00	288.00	288.00
44	Security Guard (with fire arms)	Each	383.00	347.00	383.00	383.00
45	Mosaic Mistry	Each	383.00	347.00	383.00	383.00
46	Electrician	Each	383.00	347.00	383.00	383.00
47	Helper for Electrician	Each	288.00	261.00	288.00	288.00
48	Glazier	Each	317.00	287.00	317.00	317.00
49	Driller	Each	349.00	315.00	349.00	349.00
50	Blaster	Each	349.00	315.00	349.00	349.00
51	Operator (Excavator)	Each	349.00	315.00	349.00	349.00
52	Skilled mechanic for excavator	Each	383.00	347.00	383.00	383.00
53	Compressor Operator	Each	349.00	315.00	349.00	349.00
54	Spray Painter	Each	349.00	315.00	349.00	349.00

Note : Above labour rates do not include 10% Contractors' Profit, 8% Overhead Charges & 1% Labour Welfare Cess.



**Government of West Bengal
Irrigation & Waterways Department
Jalasampad Bhaban, 3rd Floor, Western Block
Bidhannagar, Salt Lake City, Kolkata 700091**

Memo No. 323(107) – IB
IW/O/IB/Misc-46/2017-18 (Pt)

Dated, 12th September 2017

From: D SenGupta
Joint Secretary to the
Government of West Bengal

To: 1 The Superintending Engineer

2 The Executive Engineer & DDO

3 The Revenue Officer & DDO

Sub: Clarifications on GST related issues offered by the officials of CGST, Gol and Commercial Tax, West Bengal in the Workshop held at Jalasampad Bhaban on 18th August 2017.

Apropos above, the undersigned is directed to furnish clarifications on GST related issues, as discussed in the Workshop on 18th August 2017 as Annexure, for perusal and further action on the part of DDOs. A sample document on GST Tax Invoice, Debit Note & Credit Note is also enclosed for guidance and to have better understanding of the issues.

2. Replies to further queries or modifications of clarifications, if any, will be issued in due course.


D SenGupta

Joint Secretary to the
Government of West Bengal
Irrigation & Waterways Department

Encl. 1 Annexure
2 Sample document on GST Tax Invoice

Memo No.323(107)/1(3) – IB

Dated, 12th September 2017

Copy with copy of Annexure forwarded for information to:

- 1 The Financial Adviser
Irrigation & Waterways Department
Government of West Bengal
- 2 Finance (Audit) Department, Group-T
Government of West Bengal
Nabanna
325, Sarat Chatterjee Road
Shibpur, Howrah 711102
- 3 Sri S Saha
Deputy Director
Advance Planning, Project Evaluation &
Monitoring Cell
Irrigation & Waterways Directorate

– with a request to upload in the departmental website.


D SenGupta
Joint Secretary to the
Government of West Bengal
Irrigation & Waterways Department

Encl. as stated

**Clarifications on GST related issues received in the Workshop held at
NIC's Conference Room at Ground Floor, Jalasampad Bhaban,
Bldhannagar on 18th August 2017**

Following Officials / Consultants deliberated in the workshop attended by the DDOs of Irrigation & Waterways (I&W) Department having offices in South Bengal.

- | | | | |
|-------|-------------------|-----|---|
| (i) | Sri R S Sengupta | ... | Joint Commissioner
Directorate of Commercial Tax
Government of West Bengal |
| (ii) | Sri K Chakraborty | ... | Deputy Commissioner
Directorate of Commercial Tax
Government of West Bengal |
| (iii) | Sri J B Datta | ... | Assistant Commissioner
CGST, Kolkata North Commissionerate |
| (iv) | Sri D Chatterjee | ... | Superintendent, CGST |
2. Joint Commissioner, Commercial Tax, Government of West Bengal gave a brief overview on the broad perspective of the GST, over a power point presentation.
 3. Following clarifications were offered by the concerned officials and the tax consultant, based on question-answer session and also query sheet prepared by the I&W Department.
 - (a) Supply of services and goods received by the DDOs of the Irrigation & Waterways Department (service recipients) from the vendors, i.e. agencies / contractors / suppliers (service providers) registered under GST through works contract or otherwise are generally taxable under GST Laws with effect from 1st July 2017. In case of intra-State (i.e. within the State) supply both CGST and WBGST (having equal rate) will be applicable and for inter-State supply Integrated GST (IGST) rate will apply, which is in effect the summation of CGST and State GST. In case, annual turnover of a vendor exceeds ` 20 lakh, registration is compulsory. However, a vendor having lesser annual turnover may also opt for voluntary registration.
 - (b) It is the responsibility of the supplier (i.e. vendor) to pay GST and not the service recipient. Bidders participating to all tenders invited for (a) procurement of goods and services, and (b) works related contract involving supply of goods and services by the contractor will be required to submit;
 - (i) Valid PAN issued by IT Department,
 - (ii) Valid 15 digit Goods and Services Taxpayer Identification No. (GSTIN);

and to issue tax invoice(s) for raising claim under the contract showing separately the tax charged in accordance with provision of GST Act 2017. Rule 47(9)(b) of WBFR, Vol.1 has accordingly been amended (vide Notification No.4374-F(Y) dated 13th July 2017 of Finance Department (Audit Branch).

It is implied that henceforth business transaction will have to be made only with the bidders registered under GST Act, 2017. Standard e-NIT is also being modified accordingly.

- (c) There are separate HSN Codes for goods and SAC Codes for Services. Rates of GST for goods and also exempted goods may be seen at Notification No.1125-FT and 1126-FT, available in 'Notification Link' under GST Tab on the website of Commercial Tax Directorate wbcomtax.nic.in. Number of digits of HSN Code is restricted to maximum four and is linked with preceding financial year's turnover. Refer to Notification 1152-FT for further details. Similarly GST rates on services, along with description and Codes may be seen at Notification No.1135-FT, whereas list of exempted services is at 1136-FT. However, linkage between description of services in the context of GST and various types of works contracts / services handled / received by the I&W Department, 4-digit corresponding SAC Codes and rates of GST have summarily been shown in Annex-1 as ready reckoner. Working knowledge on rates of GST is desirable for the DDOs, to verify the tax invoices of the agencies.
- (d) Clarifications / guidelines regarding issues pertaining to contracts by the State Government due to introduction of GST, have already been issued in No.5050-F(Y) dated 16.08.2017 of the State Finance Department. Copy of which is also available on the departmental website www.wbiwd.gov.in and Finance Department's website wbfin.nic.in. Following issues relevant to this Department are once again clarified.
- (i) Pre-GST Contract, which may be ongoing.
- (1) In case of Goods supplied before 1st July 2017 and invoice / bill raised on or after 1st July 2017, WBGST and CGST rates will be applicable, onus of payment of which lies with the supplier. No TCS/STDS under WB VAT Act, 2003 is to be deducted. Also, there shall be no TDS on account of WBGST and CGST by the DDOs.
 - (2) In case of consultancy or cleaning / upkeepment services etc. where services supplied before 1st July 2017, and invoice / bill raised at current date (after 1st July 2017), after expiry of 30 days from supply of service, service tax is applicable, but not CGST / WBGST, as the date of completion of service (as per MB) precedes the date of issue of invoice and also date of receipt of payment. There shall be no TDS on account of WBGST and CGST.
 - (3) In case of works contract (involving supply of both goods and services) where works / part of works completed before 1st July 2017, and invoice / bill raised at current date (after 1st July 2017), after expiry of 30 days, VAT and/or Service Tax is applicable, but not CGST / WBGST, as the date of completion of work (as per MB) precedes the date of issue of invoice and date of receipt of payment. There shall, however, be no TCS/STDS under WB VAT Act, 2003 to be deducted by the DDO. Also, there shall be no TDS on account of WBGST and CGST.
 - (4) Portions of supplies / works provided / executed after enactment of GST Laws and recorded in the MB on or after 1st July 2017, will attract SGST and WBGST, for which contractor is liable for payment and not the DDO. There

shall be no TDS on account of WBGST and CGST till the system of registration of DDOs becomes operative and further notification is issued by the Finance Department. The Supplier / Contractor / Vendor have to raise tax invoice and that should be treated by the DDOs as sub-voucher. That invoice number has to be entered into the e-billing module / portal during preparation of bill.

- (ii) Post-GST Contracts will be analogous to (i)(4).
- (iii) Under no circumstances, there will be a revision of any contractual values in the pre-GST Contracts, still ongoing, due to impact of change of tax rate(s), if any, from VAT / Service Tax to GST.
- (iv) There is a provision of deduction of 2% (1% for CGST and 1% for WBGST) by the DDOs from the payment made or credited to the supplier (deductee) of taxable goods, or services or both, where the total value of such supply (excluding GST components) under a contract exceeds ` 2.50 lakh. Such deduction will also have to be made even if the individual R/A bill(s) under a contract of value exceeding ` 2.50 lakh, have bill values less than ` 2.50 lakh. However, the system of registration of DDOs is still inoperative throughout the country. So, there would be no TDS by the DDO, until issue of further order by the Finance Department.
- (v) Procedure for issuing tax invoice has been illustrated by the Commercial Tax Department along with prescribed Rules (vide Annex-2 / 4 sheets). It is also imperative that such tax invoice has to be raised by the contractors / suppliers for ongoing contracts, for the portion of works / supplies executed / provided after 1st July 2017, as per records of the MB. It has been stated in 5050-F(Y) dated 16th August 2017 that for Pre-GST and ongoing contracts, value of bill together with WBGST and CGST for intra-State supply or IGST for inter-State supply, should not exceed the value that such contractor / supplier would have billed for prior to 1st July 2017, inclusive of VAT and Service Tax (if any). An illustrative example for (i) Mode of deduction in Pre-GST regime, (ii) Mode of deduction in post-GST regime (with TDS) and (iii) Mode of deduction in post-GST regime (with TDS, when it will be applicable) has been shown in Annex-3. It is desirable to segregate on bills of ongoing contracts into pre-GST and post-GST bills, as post-GST bills will have to be submitted along with tax invoices, to be raised by the contractors / agencies.

4. In view of the preceding paragraphs and considering the DDOs are advised,

- (i) to segregate works/supplies executed till 30th June 2017 and to finalize bills of all works, supplies, etc. executed upto that period as per MB for both completed and ongoing contracts, without any TCS for VAT, but following other usual formalities, which was in vogue prior to introduction of GST, and submit these bills to treasuries for

payment, if not already done. Job Completion Certificate also Annexure / Sheet-4/4 issued to the vendors, if asked for. There shall not be any deduction / withholding for GST.

- (ii) to go ahead with the preparation and submission of bills for works executed after roll out of GST in the second stage, both for pre-GST contracts as well as for post-GST contracts, on production of tax invoice from the agency, but without any TDS / withholding any amount for TDS, since the TDS will only apply with prospective effect (and not retrospective) after publication of Notification / registration by the DDOs when the system would be made operative.
5. Training programme on registration of DDOs / issuance of separate guidelines, if required for this purpose, will be taken up in due course.

Sd/-
D SenGupta
Joint Secretary to the
Government of West Bengal
Irrigation & Waterways Department

**4-digit SAC Code of various services received by the Irrigation
& Waterways Department from agencies through works
contracts and rates of GST therefor**

Sl. No.	Types of Works / Services	Description of services in the context of GST	SAC Code	WBGST	CGST	Total GST
1.	All types of works (original / maintenance / special repair) in flood management sector , including protection works, hydraulic structures, paintings etc., with earthwork naturally bundled and supplied / done in conjunction with the above categories or without such earthwork, geo-technical investigation in flood management sector and also building related works.	Composite supply of works contract as defined in Clause 119 of Section 2 of CGST / WBGST Act under construction services (other than irrigation works, roads & bridges and works under JNNURM).	9954	9%	9%	18%
2.	All types of works (original / maintenance / special repair) in irrigation sector including canal lining works, hydraulic structures & components, automated gate operation, with earthwork naturally bundled and supplied / done in conjunction with the above categories or without such earthwork, etc. including geo-technical investigation in irrigation sector.	Composite supply of works contract related to canal, dam or other irrigation works.	9954	6%	6%	12%
3A	Works comprising only earthwork in embankment or in excavation / re-excavation of canals / rivers / channels by mechanical / manual means, with or without transportation / disposal, in relation to water management (including drainage, flood control, irrigation), sanitation conservancy (including disposal of sewage and drainage), protection of the environment (including removal of drainage congestion).	Pure services (excluding works contract services or other composite supplies involving supply of any goods), provided to the Central / State Government / Local Authority / Government Authority / Organizations by way of any activity in relation to any function entrusted to a Panchayat under 243G or to a Municipality under 243W of the Constitution.		Nil	Nil	Nil
3B	Works comprising only removal of water hyacinth jungles, etc. from canals / rivers / channels by mechanical / manual means with or without disposal in relation to water management (including drainage, flood control, irrigation), sanitation conservancy (including disposal of sewage and drainage), protection of the environment (including removal of drainage congestion).			Nil	Nil	Nil
4.	All types of works (original / maintenance / special repair) related to roads and bridges.	Composite supply of works contract related to roads and bridges.	9954	6%	6%	12%

Sl. No.	Types of Works / Services	Description of services in the context of GST	SAC Code	WBGST	CGST	Total GST
5.	Any original works under JNNURM.	Composite supply of works contract in relation to a civil structure or any other original works under JNNURM.	9954	6%	6%	12%
6.	Consultancy services for designs, preparation of DPR, IT related matters, project management etc. for various engineering projects and also for technical testing and analysis, certification of bridges, dams, barrages etc.	Other professional, technical & business services	9983	9%	9%	18%
7.	Internet access services in wired or wireless mode, internet based audio and video conference, fax and fixed telephony services.	Telecommunications, broadcasting and information supply services	9984	9%	9%	18%
8.	Supply of guards, support staff, labour etc. on contractual basis.	Support services	9985	9%	9%	18%
9.	AMC of computers and peripherals.	Maintenance, repair & installation services	9987	9%	9%	18%

Note: 1 For further classification of services, refer to Notification No.1135-FT dated 28th June 2017 of the Finance (Revenue) Department, available under 'GST' Menu on wbcomtax.nic.in and No.20/2017. Central Tax (Rate) of the Department of Revenue, Ministry of Finance, Government of India dated 22nd August 2017 under 'GST' Menu is available on www.cbec.gov.in.

- 2 There are cases, particularly relating to improvement of channels/canals, which serve both irrigation development and flood management purposes. It is advised to carefully select the work under "irrigation" or "flood management" depending on the predominant / principal purpose of taking up the work. This is all the more important as tax rates are different for "irrigation" and "flood management" works.
- 3 Payment of GST may not be required to be made by the service provider, for providing vehicles and launches on annual contract / seasonal basis, if he/she is unregistered, for having annual turnover less than ` 20 lakh.



**Government of West Bengal
Irrigation & Waterways Department
Jalasampad Bhaban, 3rd Floor, Western Block
Bidhannagar, Salt Lake City, Kolkata 700091**

Memo No. 429(107) - IB
IW/O/IB/Misc-46/2017-18 (Pt)

Dated, 14th November 2017

From: D SenGupta
Joint Secretary to the
Government of West Bengal

To: 1 The Superintending Engineer

2 The Executive Engineer & DDO

3 The Revenue Officer & DDO

Sub: Further change of rates of GST.

In partial modification of earlier Memo No.323(107)-IB dated 12th September 2017, the undersigned is directed to state that consequent upon changes of rates of GST by Notifications issued by the Government;

- i) Contents of all the seven columns corresponding to Sl. No.1 & 2 of the Table shown in Annex-I (Sheet-1/12) of the said Memo are to be replaced by the contents as shown corresponding to Sl.1 & 2 of the Table in the Annex to this Memo.
- i) Contents in all the seven columns corresponding to Sl. No.4 & 5 of the Table shown in the abovesaid Annex-I are to be omitted, since those have already been subsumed in the Sl.1 of the present Annex.

2. Henceforth, all concerned are requested to keep track of the changes brought about in GST rates, by visiting the web portals, www.cbec.gov.in and wbcomtax.nic.in on regular basis and consider these modified rates in processing bills, even if there is no further communication from the Department in this regard.

D SenGupta
Joint Secretary to the
Government of West Bengal
Irrigation & Waterways Department

Encl. Annex


Memo No.429(107)/1(3) – IB

Dated, 14th November 2017

Copy with copy of Annex forwarded for information to:

- 1 The Financial Adviser
Irrigation & Waterways Department
Government of West Bengal
- 2 Finance (Audit) Department, Group-T
Government of West Bengal
Nabanna
325, Sarat Chatterjee Road
Shibpur, Howrah 711102
- ✓ 3 Sri S Saha
Deputy Director
Advance Planning, Project Evaluation &
Monitoring Cell
Irrigation & Waterways Directorate

– with a request to upload in the departmental website.


D SenGupta
Joint Secretary to the
Government of West Bengal
Irrigation & Waterways Department

Encl. as stated

Annex

Modified rates of GST for works contract

Sl. No.	Types of Works / Services	Description of services in the context of GST	SAC Code	WBGST	CGST	Total GST
1.	All types of works (original / maintenance / special repair) in irrigation flood management and connectivity sectors including buildings , but other than those in cases where value of earthwork (including earth to be transported or disposed) is more than 75% of the total value of the work.	Composite supply of works contract as defined in Clause 119 of Section 2 of CGST / WBGST Act under construction services.	9954	6%	6%	12%
2.	All types of works (original / maintenance / repair / special repair) in irrigation, flood management and connectivity sectors , Involving earthwork and material and value of earthwork (including transported or disposed earth) is more than 75% of the total value of the work.	Composite supply of works contract involving predominantly earthwork.	9954	2.5%	2.5%	5%

(Vide Notification No.31/2017 – Central Tax (Rate) dated 13th October 2017 and No.24/2017 – Central Tax (Rate) dated 21st September 2017, both issued in partial amendment of principal Notification No.11/2017 – Central Tax (Rate) dated 28th June 2017).

[TO BE PUBLISHED IN THE GAZZETE OF INDIA, EXTRAORDINARY, PART II,
SECTION 3, SUB-SECTION (i)]

Government of India
Ministry of Finance
(Department of Revenue)

Notification No. 24/2017-Integrated Tax (Rate)

New Delhi, the 21st September, 2017

G.S.R.....(E).- In exercise of the powers conferred by sub-section (1) of section 5, sub-section (1) of section 6 and clause (iii) and clause (iv) of section 20 of the Integrated Goods and Services Tax Act, 2017 (13 of 2017) read with sub-section (5) of section 15 and sub-section (1) of section 16 of the Central Goods and Services Tax Act, 2017 (12 of 2017), the Central Government, on the recommendations of the Council, and on being satisfied that it is necessary in the public interest so to do, hereby makes the following amendments in the notification of the Government of India, in the Ministry of Finance (Department of Revenue), No. 8/2017-Integrated Tax (Rate), dated the 28th June, 2017, published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (i), *vide* number G.S.R. 683(E), dated the 28th June, 2017, namely:-

In the said notification, in the Table, against serial number 3, for item (vi) in column (3) and the entries relating thereto in columns (3), (4) and (5), the following shall be substituted, namely:-

(3)	(4)	(5)
"(vi) Services provided to the Central Government, State Government, Union Territory, a local authority or a governmental authority by way of construction, erection, commissioning, installation, completion, fitting out, repair, maintenance, renovation, or alteration of – (a) a civil structure or any other original works meant predominantly for use other than for commerce, industry, or any other business or profession; (b) a structure meant predominantly for use as (i) an educational, (ii) a clinical, or (iii) an art or cultural establishment; or (c) a residential complex predominantly meant for self-use or the use of their employees or other persons specified in paragraph 3 of the Schedule III of the Central Goods and Services Tax Act, 2017.	12	-

