કાર્યપાલક ઈજનેર **સેન્ટ્રલ ઝોન**		સુરત મહાનગરપાલિકા **સેન્ટ્રલ ઝોન,નવુ વહીવટી ભવન** મુગલીસરા મેઈન રોડ, સુરત. Ext.૨૦૫ કન્ટ્રોલ રૂમ : ટે.નં.૨૪૨૦૫૪૭ ફેકસ : ૨૪૨૦૫૪૮

પ્રતિ,
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વિષયઃ– સેન્ટ્રલ ઝોન નાનપુરા વિસ્તારમાં વોર્ડ નં.૦૧, જુનું સુડાભવન ખાતે આવેલ ટાઉન પ્લાનીંગની ઓફિસમાં વાર્ષિક ધોરણે સીવીલ રીપેરીંગ કરવાનું કામ.

સંદર્ભઃ– (૧) સ્થા.સ. ઠ.નં. ૯૯૦/૨૦૨૧, તા. ૩૦/૦૯/૨૦૨૧ ના મંજુર ભાવે અને શરતે.

મહાશય,

ઉપરોકત વિષય અને સંદર્ભ અન્વયે જણાવવાનું કે, સેન્ટ્રલ ઝોન નાનપુરા વિસ્તારમાં વોર્ડ નં.૦૧, જુનું સુડાભવન ખાતે આવેલ ટાઉન પ્લાનીંગની ઓફિસમાં વાર્ષિક ધોરણે સીવીલ રીપેરીંગ કરવાનું કામ સ્થા.સ.ઠ.નં. ૯૯૦/૨૦૨૧, તા. ૩૦/૦૯/૨૦૨૧થી મંજુર થયેલ ટેન્ડર અંદાજીત રકમ થી ૨૧.૯૯ % નીંચા ભાવને યુનીટ રેટ તરીકે મંજુર કરવામાં આવેલ હોય, સદર કામગીરી સંદર્ભ (૧) મુજબના ઠરાવ અને ટેન્ડરના મંજુર ભાવ અને શરત મુજબ રૂા.૧૪,૮૬,૫૫૦–૦૦ પૈ. ની મયાર્દામાં ઉકત વિષય મુજબની કામગીરી કરાવવાનું કામ મંજુર કરવામાં આવેલ છે.

ઉપરોકત કામગીરી રૂા.૧૪,૮૬,૫૫૦–૦૦ પૈ. ની મયાર્દામાં સ્થા.સ.ઠ.નં.૯૯૦/૨૦૨૧,તા. ૩૦/૦૯/૨૦૨૧થી મંજુર થયેલ યુનીટ રેટના મંજુર ભાવે અને શરતે કામ કરવા સંમત હોય તો આપશ્રીની લેખિત સંમતિ તેમજ નીચે જણાવેલ ડોકયુમેન્ટ બંધ કવરમાં તા. ૨૧/૦૬/૨૦૨૨ સુધીમાં સેન્ટ્રલ ઝોન ખાતે મોકલી આપવા વિનંતી. ઉપરોકત જણાવેલ તારીખ પછી કોઇ બંધ કવર સ્વીકારવામાં આવશે નહી.

:– શ ર તો :–

૧. અર્નેસ્ટમની ડીપોઝીટની રકમ કમિશનરશ્રી, સુરત મહાનગર પાલિકાના નામનો સુરતની રાષ્ટ્રીયકૃત શીડયુલ બેંકના ડીમાન્ડ ડ્રાફટ / પે. ઓર્ડરથી સંમતિપત્રક સાથે રૂા. ૧૫,૦૦૦/–ની આપવાની રહેશે.

૨. ઈજારદારે ' ઈ–૨ વર્ગ ' રજીસ્ટ્રેશન સર્ટીફિકેટની પ્રમાણીત નકલ સંમતિપત્રક સાથે આપવાની રહેશે.

૩. ઈજારદારે અંદાજીત રકમના ૨૦% એટલે કે રૂા. ૩,૦૦,૦૦૦/– કે તેથી વધુ રકમની વર્તમાન(ચાલુ) વર્ષની રાષ્ટ્રીયકૃત બેંકની સોલવંશી સર્ટીફિકેટ સંમતિપત્રક સાથે આપવાની રહેશે.

૪. ઈજારદારે પૂર્ણ કરેલ કામના/ અનુભવના સર્ટીફિકેટ (Form 3A) ની પ્રમાણીત નકલ સંમતિપત્રક સાથે આપવાની રહેશે.

- ઈજારદારે છેલ્લા ૦૭ (સાત) વર્ષના સરખા પ્રકારના પૂર્ણ કરેલ કામ.

  → અંદાજીત રકમના ૪૦% એટલે કે રૂા. ૬,૦૦,૦૦૦/–કે તેથી વધુ રકમ ના ૦૩(ત્રણ)સરખા પ્રકારના પૂર્ણ કરેલ કામ.

અથવા

→ અંદાજીત રકમના ૫૦% એટલે કે રૂા. ૭,૫૦,૦૦૦/–કે તેથી વધુ રકમ ના ૦૨(બે)સરખા પ્રકારના પૂર્ણ કરેલ કામ.

અથવા

→ અંદાજીત રકમના ૮૦% એટલે કે રૂા.૧૨,૦૦,૦૦૦/–કે તેથી વધુ રકમ ના ૦૧(એક)સરખા પ્રકારના પૂર્ણ કરેલ કામ.

ટેન્ડરના ટેકનીકલ બીડમાં જણાવેલ શરતો મુજબ ઈજારદારે પૂર્ણ કરેલ કામના કુલ વર્કડન પર નાણાકીય વર્ષ મુજબ મલ્ટિપ્લાઈંગ ફેકટર ગણતરીમાં લેવાશે.

૫. ઈજારદારે છેલ્લા ૦૩(ત્રણ) વર્ષના ટર્ન ઓવર સી.એ. ના લેટરપેડ પર સંમતિપત્રક સાથે આપવાના રહેશે.

૬. ઈજારદારે GST રજીસ્ટ્રેશન સર્ટીફિકેટની પ્રમાણીત નકલ સંમતિપત્રક સાથે આપવાની રહેશે.

૭. ઈજારદારે પાન કાર્ડ રજુ કરવાનું રહેશે.

૮. **ઈજારદાર શીડયુલ–બી માં જણાવેલ ભાવ અને ટેકનીકલ બીડની શરતો ને બંધનકર્તા રહેશે.**

૯. કોઈપણ અથવા બધા જ સંમતિપત્રકો રદ કરવાનો અધિકાર સુરત મહાનગર પાલિકાને અબાધિત રહેશે તે અંગે કોઈપણ કારણો આપવામાં આવશે નહીં.

૧૦. તમામ પ્રકારના વેરા ઈજારદારે ભોગવવાના રહેશે.

૧૧. તમામ સરકારી / અર્ધ સરકારી લાગુ પડતા કાયદાનું ઈજારદારે પાલન કરવાનું રહેશે.

૧૨. સદર કામગીરી બાબતે અત્રેના હાઉસીંગ વિભાગના ટેકનીકલ સ્ટાફનો સંપર્ક કરવો.

૧૩. સદર કામગીરી ઉકત મંજુર થયેલ ટેન્ડરના Detail Technical Specification મુજબ કરવાની રહેશે.

કાર્યપાલક ઈજનેર
સેન્ટ્રલ ઝોન
સુરત મહાનગરપાલિકા

સ.ર. એકઝી. આસી.શ્રી(આઈ.એસ.ડી.) પ્રતિ,

સેન્ટ્રલ ઝોન નાનપુરા વિસ્તારમાં વોર્ડ નં.૦૧, જુનું સુડાભવન ખાતે આવેલ ટાઉન પ્લાનીંગની ઓફિસમાં વાર્ષિક ધોરણે સીવીલ રીપેરીંગ કરવાના કામે સંમતિ પત્રક મંગાવવામાં આવેલ છે. જેને સુરત મહાનગરપાલિકાની વેબસાઈડ પર પ્રસિધ્ધ કરવાનું હોય, આ પત્ર અપલોડ કરવા ઘટતું થવા વિનંતી.

કામનું નામ	:–	સેન્ટ્રલ ઝોન નાનપુરા વિસ્તારમાં વોર્ડ નં.૦૧, જુનું સુડાભવન ખાતે આવેલ ટાઉન પ્લાનીંગની ઓફિસમાં વાર્ષિક ધોરણે સીવીલ રીપેરીંગ કરવાનું કામ.
શરૂઆતની તારીખ	:–	તા. ૧૩/૦૬/૨૦૨૨ ના સાંજે ૫.૦૦ કલાક થી
અંતિમ તારીખ	:–	તા. ૨૧/૦૬/૨૦૨૨ ના સાંજે ૫.૦૦ કલાક થી

નં. સી.ઝેડ/એન્જી./આઉટ/૧૦૭૭
તા. ૧૦/૦૬/૨૦૨૨

કાર્યપાલક ઈજનેર
સેન્ટ્રલ ઝોન
સુરત મહાનગરપાલિકા

સ.ર. એકઝી. આસી.શ્રી(આઈ.એસ.ડી.) પ્રતિ,

સેન્ટ્રલ ઝોન નાનપુરા વિસ્તારમાં વોર્ડ નં.૦૧, જુનું સુડાભવન ખાતે આવેલ ટાઉન પ્લાનીંગની ઓફિસમાં વાર્ષિક ધોરણે સીવીલ રીપેરીંગ કરવાના કામે સંમતિ પત્રક મંગાવવામાં આવેલ છે. જેને સુરત મહાનગરપાલિકાની વેબસાઈડ પર પ્રસિધ્ધ કરવાનું હોય, આ પત્ર અપલોડ કરવા ઘટતું થવા વિનંતી.

કામનું નામ	:–	સેન્ટ્રલ ઝોન નાનપુરા વિસ્તારમાં વોર્ડ નં.૦૧, જુનું સુડાભવન ખાતે આવેલ ટાઉન પ્લાનીંગની ઓફિસમાં વાર્ષિક ધોરણે સીવીલ રીપેરીંગ કરવાનું કામ.
શરૂઆતની તારીખ	:–	તા. ૧૩/૦૬/૨૦૨૨ ના સાંજે ૫.૦૦ કલાક થી
અંતિમ તારીખ	:–	તા. ૨૧/૦૬/૨૦૨૨ ના સાંજે ૫.૦૦ કલાક થી

નં. સી.ઝેડ/એન્જી./આઉટ/૧૦૭૭
તા. ૧૦/૦૬/૨૦૨૨

કાર્યપાલક ઈજનેર
સેન્ટ્રલ ઝોન
સુરત મહાનગરપાલિકા

SURAT MUNICIPAL CORPORATION

CENTRAL ZONE

ANNUAL RATE CONTRACT FOR MAINTAINANCE AND REPAIRING WORK OF OLD SUDA BHAVAN (TOWN PLANNING OFFICE) SITUATED IN NANPURA, CENTRAL ZONE(SOUTH) , SURAT.

ESTIMATE

S.O.R. 2015-16

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
		Part -A Civil Work.				
1	112A	Demolition and disposal of unserviceable materials with all lead and lift (ii) Unreinforced cement concrete.	5.00	386.83	C.M.	1934.15
2	112	Demolition including stacking of serviceable materials and disposal of unserviceable materials with all lead & lift.				
		(i) RCC work	5.00	671.65	C.M.	3358.25
3	113	Demolition of brick work and stone masonary including stacking of serviceable materials and disposal of unserviceable materials with all lead & lift.				
		(II) in Cement mortar.	5.00	349.46	C.M.	1747.30
4	114	**Removing the scraping of old deteriosted plaster** of any thickness from wall/R.C.C. member including strcking of serviceable material and disposal of unserviceable from site of work with all lead and lift.	11.91	12.42	S.M.	147.92
5	115	Dismentalling tiled or stone floors laid in mortar including stacking of serviceable materials and disposal of unserviceable materials with all lead & lift.	10.00	30.30	S.M.	303.00
6	115A	Dismantling doors windows ventilators etc. (wood or steel) shutters including chowkhats, Architraves, holdfasts and other attachment etc. comp. and stacking them within all lead & lift. (I) not exceeding 3 sq.m. in area.	10.00	119.18	No.	1191.80
7	116	Dismantling sanitary fittings like wash basin, w.c. pan Indian and Europeans type, flushing tank etc. including stacking the materials with all lead & lift.	10.00	257.55	No.	2575.50
8	Self.Expl.	Dismantling PVC pipe / A.C Rainwater /G.I pipes pipes with fittings and clamps including stacking the materials with all lead and lift. (For all floors).	10.00	47.47	R.M	474.70
9	Self.Expl.	Dismentalling of sheet roofing including ridges,valleys, gutter etc.stacking of serviceable materials and disposal of unserviceable materials with all lead and lift (a) G.I.Sheet Roffing.	0.00	30.30	S.M.	0.00
10	Self.Expl.	Dismentalling barbed wire in fencing including making rolls and also including dismentaling posts including all earth work concrete in base and making good the disturbed ground staking useful materials as directed and disposeing of the unserviceable materials with all lead and lift.	0.00	42.42	R.M	0.00
11	Self.Expl.	Dismentalling G.I. chain link fencing including making rolls and also including dismentaling posts including all earth work concrete in base and making good the disturbed ground staking useful materials as directed and disposeing of the unserviceable materials with all lead and lift.	0.00	25.00	S.M.	0.00
12	Self.Expl.	Dismentalling of Bombay type Railing including dismentaling posts making good the disturbed ground staking useful materials as directed and disposeing of the unserviceable materials with all lead and lift.	0.00	15.00	R.M	0.00
13	Self.Expl.	Refixing of old Bombay type Railing including cutting, welding etc comp...	0.00	25.00	R.M	0.00
14	90	Boring holes 3.5 mt.deep in ordinary soil (for cast in situ piles) & disposal of the surplus excavated soil as directed within a lead of 50 M. For following diameter of piles.				
		(1) 200 m.m.	0.00	167.66	R.M.	0.00
		(2) 250 m.m.	5.00	189.48	R.M.	947.40
		(3) 300 m.m.	5.00	227.45	R.M.	1137.25
15		Excavation for foundation includ.sorting out & stacking of useful materials & disposing of the excavated stuff upto 50 mt. Lead & all lift, watering etc. Comp.				
	1 (A)	**With Machinaries**				
		(A) Loose or Soft soil				
		(1) Up to 1.5 Mt. depth	5.00	67.97	C.M.	339.85
		(2) 1.5 to 3.0 Mt. depth	5.00	75.35	C.M.	376.75
	1 (B)	**With Manual Labour**				
		(A) Loose or Soft soil				
		(1) Up to 1.5 Mt. depth	5.00	123.22	C.M.	616.10
		(2) 1.5 to 3.0 Mt. depth	5.00	136.35	C.M.	681.75
16	88A	Providing & Laying **C.C1:5:10** (1cement :5coarse sand :10 graded stone agg. 40 m.m Nominal size)& curing comp. incl. cost of from work in :Foundation & Plinth	7.00	2058.38	C.M.	14408.66
17	88	Providing & laying cement concrete **1:4:8** (1 cement:4 sand:8 graded stone agg. 40 mm nominal size) & curing comp. incl.cost of form work in **(A) Foundation and Plinth**	7.00	2259.37	C.M.	15815.59

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
18	88B	Providing & laying **C.C 1:3:6** (1cement :3 coarse sand :6 Crushed stone agg 20m.m Nominal size) & curing comp. incl. cost of form work in :(a) foundation & Plinth	7.00	2510.86	C.M.	17576.02
19	3	Providing & laying cement concrete **1:1.5:3** (1 cement:1.5 sand:3 graded stone agg. 20 mm nominal size)& curing comp. Includ.cost of form work but exclu. Cost of reinforcement for reinforced concrete work in : **(A) Foundation, footing, Base of columns and Mass concrete.**	8.00	3666.06	C.M.	29328.48
20	5A	Providing & laying ordinary cement con.**1:1.5:3** (1cement:1.5sand: 3 graded stone agg. 20 mm nominal size) finishing smooth curing etc. comp. Incld. Cost of form work but excl. Cost of reinforcement for R.C.C. Work in : Up to G.L./P.L.				
		(A) COLUMNS:				
		(1)Having c/s area up to 0.085 sq.mt	0.00	7810.09	C.M.	0.00
		(2) Having c/s area more than 0.085 sq. mt. & upto 0.12 sq.mt	0.00	7081.88	C.M.	0.00
		(3) Having cross sectional area more than 0.12 sq. mt.	0.00	6229.44	C.M.	0.00
		(B) BEAMS :				
		(1)Having c/s area up to 0.08 sq.mt	0.00	6523.35	C.M.	0.00
		(2) Having c/s area more than 0.08 sq. mt. & upto 0.12 sq.mt	0.00	6052.69	C.M.	0.00
		(3) Having cross sectional area more than 0.12 sq. mt.	0.00	5502.24	C.M.	0.00
21	7	Providing & fixing **TMT/ CRS Bar** reinforcement for R.C.C. work incl. bending, binding & placing in position etc. comp. Upto G.L./P.L.	0.00	44.84	Kg.	0.00
22	8	Providing & construction brick work using Fly Ash bricks having crushing strength not less than 70 Kg./sq.cm. in foundation & plinth in C.M. 1:6 (1 cement:6 sand) etc. comp. Up to G.L./P.L.	0.00	2914.86	C.M.	0.00
23	14	Filling in trenches **with available excavated earth** in layer not exceeding 20cm in depth consolidating each deposited layer by ramming & watering	0.00	79.79	C.M.	0.00
24	13	Providing & filling in plinth with **yellow soil or selected soil** in layers of 20 cm. Th'. Incl. watering, ramming & consolidation etc. complete.	5.00	254.52	C.M.	1272.60
25	19	Providing & applying **20mm.th. Sand faced cement plaster** on walls or similar surfaces at all floor levels consisting of 12 mm. Av. th'. backing coat of C.M. 1:3(1 cement :3 sand) & 8 mm.th. Finishing coat of C.M.1:1 (1 cement: 1 sand)--- Upto G.L./P.L &	80.00	210.08	S.M.	16806.40
26	5A	Providing & laying ordinary cement con.**1:1.5:3**(1cement:1.5sand:3 graded graded stone agg. 20 mm nominal size) finishing smooth curing etc. comp. Incl.. Cost of form work but excl. Cost of reinforcement for R.C.C. Work in :				
		(A) COLUMNS:				
		(1) Having c/s area up to 0.085 sq.mt				
		Ground Floor	0.00	7810.09	C.M.	0.00
		First Floor	0.00	7844.03	C.M.	0.00
		Second Floor	0.00	7877.96	C.M.	0.00
		Terrace (third) Floor	0.00	7911.90	C.M.	0.00
		(2) Having c/s area more than 0.085 sq. mt. & upto 0.12 sq.mt				
		Ground Floor	0.00	7081.88	C.M.	0.00
		First Floor	0.00	7115.82	C.M.	0.00
		Second Floor	0.00	7149.75	C.M.	0.00
		Terrace (third) Floor	0.00	7183.69	C.M.	0.00
		(3) Having cross sectional area more than 0.12 sq. mt.				
		Ground Floor	0.00	6229.44	C.M.	0.00
		First Floor	0.00	6263.38	C.M.	0.00
		Second Floor	0.00	6297.31	C.M.	0.00
		Terrace (third) Floor	0.00	6331.25	C.M.	0.00
		(B) BEAMS :				
		(1) Having c/s area up to 0.085 sq.mt				
		Ground Floor	0.00	6523.35	C.M.	0.00
		First Floor	0.00	6557.29	C.M.	0.00
		Second Floor	0.00	6591.22	C.M.	0.00
		Terrace (third) Floor	0.00	6625.16	C.M.	0.00
		(2) Having c/s area more than 0.085 sq. mt. & upto 0.12 sq.mt				
		Ground Floor	0.00	6052.69	C.M.	0.00
		First Floor	0.00	6086.63	C.M.	0.00
		Second Floor	0.00	6120.56	C.M.	0.00
		Terrace (third) Floor	0.00	6154.50	C.M.	0.00
		(3) Having cross sectional area more than 0.12 sq. mt.				
		Ground Floor	0.00	5502.24	C.M.	0.00
		First Floor	0.00	5536.18	C.M.	0.00
		Second Floor	0.00	5570.11	C.M.	0.00
		Terrace (third) Floor	0.00	5604.05	C.M.	0.00
		(C) SLABS :				
		(1) Slabs having more than 8cm. and upto 10 cm. Th'.				
		Ground Floor	0.00	5838.57	C.M.	0.00
		First Floor	0.00	5872.51	C.M.	0.00
		Second Floor	0.00	5906.44	C.M.	0.00
		Terrace (third) Floor	0.00	5940.38	C.M.	0.00
		(2) Slabs having more than 10 cm. & upto 13 cm. Th'.				
		Ground Floor	0.00	5561.83	C.M.	0.00
		First Floor	0.00	5595.77	C.M.	0.00
		Second Floor	0.00	5629.70	C.M.	0.00
		Terrace (third) Floor	0.00	5663.64	C.M.	0.00
		(3) Slabs having more than 13 cm. Thickness				
		Ground Floor	1.00	5285.09	C.M.	5285.09
		First Floor	1.00	5319.03	C.M.	5319.03
		Second Floor	0.00	5352.96	C.M.	0.00
		Terrace (third) Floor	0.00	5386.90	C.M.	0.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
		(D) LINTELS:				
		Ground Floor	0.00	5930.48	C.M.	0.00
		First Floor	0.00	5964.42	C.M.	0.00
		Second Floor	0.00	5998.35	C.M.	0.00
		Terrace (third) Floor	0.00	6032.29	C.M.	0.00
		(E) CHAJJAS:				
		Ground Floor	0.00	3942.30	C.M.	0.00
		First Floor	0.00	3976.23	C.M.	0.00
		Second Floor	0.00	4010.17	C.M.	0.00
		Terrace (third) Floor	0.00	4044.11	C.M.	0.00
27	3	Providing & laying ordinary cement con.**1:1.5:3**(1cement:1.5sand:3 graded graded stone agg. 20 mm nominal size) finishing smooth curing etc. comp. Incl.. Cost of form work but excl. Cost of reinforcement for R.C.C. Work in : .				
		(A) Stair cases including landings etc				
		Ground Floor	0.00	4813.13	C.M.	0.00
		First Floor	0.00	4847.06	C.M.	0.00
		Second Floor	0.00	4881.00	C.M.	0.00
		Terrace (third) Floor	0.00	4914.94	C.M.	0.00
		(B) Vertical and horizontal fins				
		Ground Floor	0.00	6885.56	C.M.	0.00
		First Floor	0.00	6919.49	C.M.	0.00
		Second Floor	0.00	6953.43	C.M.	0.00
		Terrace (third) Floor	0.00	6987.37	C.M.	0.00
28	7	Providing & fixing **TMT / CRS Bar** reinforcement for R.C.C. work incl. bending, binding & placing in position etc.comp.				
		Ground Floor	0.00	44.84	Kg.	0.00
		First Floor	0.00	45.45	Kg.	0.00
		Second Floor	0.00	46.06	Kg.	0.00
		Terrace (third) Floor	0.00	46.66	Kg.	0.00
29	9	Providing & construction **brick work** using Fly Ash bricks having crushing strength not less than 70 Kg./sq.cm. in foundation & plinth in **C.M. 1:6** (1 cement:6 sand) etc. comp.				
		Ground Floor	3.00	3081.51	C.M.	9244.53
		First Floor	3.00	3116.86	C.M.	9350.58
		Second Floor	0.00	3152.21	C.M.	0.00
		Terrace (third) Floor	0.00	3187.56	C.M.	0.00
30	12	Providing & constructing **Half brick masonary** in Fly Ash bricks having crushing strength not less than 70 kg/sq.cm in **c.m 1:4** (1 cement: 4 sand) curing etc complete.				
		Ground Floor	20.00	445.41	S.M.	8908.20
		First Floor	20.00	450.36	S.M.	9007.20
		Second Floor	20.00	455.31	S.M.	9106.20
		Terrace (third) Floor	20.00	460.26	S.M.	9205.20
31	139	Uncoursed rubble masonary with hard stone of approved quality in foundations and plinth in **cement mortar 1:6** (1 Cement : 6 sand) including leveling up etc. complete.	0.00	1963.44	C.M.	0.00
32	140	Pointing on Coursed stone masonary with cement mortar 1:3 (1 cement : 3 Sand) ----				
		(A) Flush Pointing	0.00	56.36	S.M.	0.00
		(B) Ruled Pointing	0.00	57.97	S.M.	0.00
33	141	Pointing on Uncoursed stone masonary with cement mortar 1:3 (1 cement : 3 Sand) ---				
		(A) Flush Pointing	0.00	66.66	S.M.	0.00
		(B) Ruled Pointing	0.00	69.08	S.M.	0.00
34	126	Providing **Rubble Pitching** with hard stone of approved quality in cement mortar 1:6 (1 Cement : 6 Coarse sand) including leveling up ,Curing etc. complete excluding pointing	0.00	2410.00	C.M.	0.00
35	127	Providing **Dry Rubble Pitching** of various thicknessto required grade including trimming of earth work hand packing the interstics with Quarry Spalls complete for all leads and lifts.	0.00	907.99	C.M.	0.00
36	36	Providing & fixing **precast C.C. jali** or grill 1:2:4 mix (1cement:2 coarse sand : 4 graded stone agg. 6 mm nominal size) reinforced with1.6mm dia. sand :4 graded stone agg.agg.6mm nominal size)reinforced mild steel wire incl.. roughening,cleaning,fixing& finishing in C.M. 1:3 & curing comp.(A) 40 mm. Thick				
		Ground Floor	1.00	428.24	S.M.	428.24
		First Floor	1.00	434.60	S.M.	434.60
		Second Floor	0.00	440.97	S.M.	0.00
		Terrace (third) Floor	0.00	447.33	S.M.	0.00
37	16	Providing & Applying **10mm.th.cement plaster** in single coat on brick/ concrete walls similar surfaces for plastering & finished even & smooth with a floating coat of cement slurry mixed with admixture of lime or neeru in required proportion etc. comp. in C.M 1:3 (1 cement : 3sand)				
		(A) For wall and similar surfaces				
		Ground Floor	80.00	114.13	S.M.	9130.40
		First Floor	80.00	132.01	S.M.	10560.80
		Second Floor	80.00	149.88	S.M.	11990.40
		Terrace (third) Floor	80.00	167.76	S.M.	13420.80
		(B) For ceilings & soffits of stairs				
		Ground Floor	80.00	129.89	S.M.	10391.20
		First Floor	80.00	146.45	S.M.	11716.00
		Second Floor	80.00	163.01	S.M.	13040.80
		Terrace (third) Floor	80.00	179.58	S.M.	14366.40

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
38	19	Providing & Applying **20mm.th. Sand faced cement plaster** on walls or similar surfaces at all floor levels consisting of 12 mm. Av. Th. backing coat of C.M. 1:3(1 cement :3 sand) & 8 mm.th. Finishing coat of C.M.1:1 (1 cement: 1 sand) - GroundFloor,FirstFloor,Second Floor and Third(Terrace) Floor	50.00	210.08	S.M.	10504.00
39	19A	Providing and Applying 20mm th. Roller Plaster on walls and similar surfaces on all floors levels consisting of 12 mm Avg. backing coat of CM 1:3 and 8mm th. finishing coat of CM 1:1 on all floors	50.00	288.00	SM	14400.00
40	20	Providing **35 mm wide throating or plaster drip** and moulding it to R. C. C. chajja etc. comp.. For all floor	0.00	25.25	R.M.	0.00
41	20A	Providing **20 mm deep finished groove** in plaster in line and level etc. Comp. For all Floor (M.R.)	0.00	27.00	R.M.	0.00
42	44	Providing & Laying **green polished kota stone slab flooring** at all floor levels,over 20 mm av.th.base of C.M. 1:6(1cement: 6 sand) laid over&joined with grey cement slurry incl. Rubbing & polishing etc. comp. (A) 22 mm. (Tolerance +/- 2mm) For all Floor	50.00	595.90	S.M.	29795.00
43	45	Providing & Laying **polished kota stone** of machine cut edge slab 22 mm. th. in riser of steps, tread, dedo & pillars center piece not less than 1.2 mt.in width &side pieces of equal size as per design, laid on 10 mm.th. C.M.1:3(1 cement:3 sand)joined & polishing etc. For all Floor	50.00	651.45	S.M.	32572.50
44	46	Providing & Laying white **glazed tiles** 6mm. th. of Orient, Kajaria, Jhonson,Nitco,Somani ,Bell make at all floor levels, **in flooring**, treads of steps & landings laid on a bed of 20 mm. Av. Th.C.M.1:3(1cement :3 sand) finished with flush pointing in white cement etc.com. For all floors (Basic Rate:- Rs.285.0/S.M.)	20.00	544.39	S.M.	10887.80
45	47	Providing & Laying white **glazed tiles** 6mm. th. Of Orient, Kajaria, Jhonson,Nitco,Somani,Bell make at all floor levels in **skirting** risers of steps & dado on 10 mm. th. C.M.1:3(1cement :3 sand) including necessary cement paste for fixing and joined with white cement slurry etc. complete. For all floors (Basic Rate:- Rs.285.0/S.M.)	20.00	563.58	S.M.	11271.60
46	97	Providing and laying **Ceramic tiles 8mm th.** of Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro make **in flooring treads of steps and landing** laid on bed of 12 mm thick cement mortar 1:3 (1 Cement : 3 Sand) finished with flush pointing in white cement. (Basic Rate:- Rs.306.0/S.M.)	0.00	580.75	S.M.	0.00
47	98	Providing & Laying **ceramic tiles 8mm th.** of Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro make **in skirting, risers of steps and landings** laid on 10mm thick cement mortar 1:3 (1 Cement : 3 sand) pointing in white cement and jointed with white slurry. (Basic Rate:- Rs.360.0/S.M.)	10.00	627.21	S.M.	6272.10
48	101	Providing & laying **marble stone slab flooring** over 20 mm.av. base of C.M.1:6 (1 cement :6 coarse sand) & jointed with grey cement slurry incl. rubbing & polishing comp.(A) Marble slab 25 mm. Thick. (Basic Rate :- Rs.701 / S.M.)	0.00	1358.45	S.M.	0.00
49	102	Providing & laying **granite slab 18mm thick in flooring, treads of steps and landing** laid on bed of 20mm thick cement mortar 1:6 (1 Cement : 6 coarse sand) or lime mortar 1:1.5 laid and finished with flush pointing in white or colour cement including rubbing and polishing complete. (Basic Rate:- Rs.1614.0/S.M.)	0.00	2422.00	S.M.	0.00
50	103	Providing & laying **granite slab 18mm thick in skirting, risers of steps, dedo and pillars** laid on 10mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand) and finished with flush pointing in white or colour cement including rubbing & polishing comp.. (Basic Rate:- Rs.1614.0/S.M.)	0.00	2457.00	S.M.	0.00
51	Self.Expl.	Providing & laying **granite slab 18mm thick in Window-Door seal Frame Etc** laid on 10mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand) with nessary adhesive material and finished with flush pointing in white or colour cement, including rubbing & polishing comp.. (Basic Rate:- Rs.1200.0/S.M.)	0.00	1943.00	S.M.	0.00
52	Self.Expl.	Labour Charges For Half Round Edge For Granite	15.00	150.00	R.M.	2250.00
53	Self.Expl.	Labour Charges For Quater Round Edge For Granite	15.00	90.00	R.M.	1350.00
54	Self.Expl.	Labour Charges For Edge Finished For Granite	15.00	50.00	R.M.	750.00
55	99	Providing & laying **Vitrified tiles of 8mm to 10mm thick** of Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro make **in flooring,treads of steps & Landing** laid on bed of 20 mm (Average) base of cement mortar 1:8 (1 Cement : 8 Coarse sand) or lime mortar 1:1.5 laid and finished with flush pointing in white or colour cement complete. **Size 24" x 24"**				
		(A) Light shade (Basic Rate-Rs.412.0/S.M.)	40.00	660.54	S.M.	26421.60
		(B) Dark shade (Basic Rate-Rs.412.0/S.M.)	40.00	669.63	S.M.	26785.20
56	100	Providing and laying **Vitrified tiles of 8mm to 10mm thick** of Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro make **in skirting, risers of steps and dedo** laid on 10mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand) and finished with flush pointing in white or colour cement comp. **Size 24" x 24"**				
		(A) Light shade (Basic Rate-Rs.412.0/S.M.)	40.00	826.00	S.M.	33040.00
		(B) Dark shade (Basic Rate-Rs.412.0/S.M.)	40.00	826.00	S.M.	33040.00
57	Self.Expl.	Providing and laying **Marbo Granite tiles** 8 to 10 mm thick, 24" x 24" in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand) finishing with flush pointing in white cement. (Basic Rate-Rs.412.0/S.M.)	0.00	660.54	S.M.	0.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
58	41	Providing and laying chequered precast concrete tiles 22mm thick with aggregate of sizes upto 6mm in floors treads of steps and landing on 20mm thick bed of C.M. 1:6 (1 cement : 6 sand) or L.M. 1:1.5 (1 Lime putty : 1.5 sand) jointed with neat cement slurry with pigments to match the shade of the tiles.	0.00	375.72	S.M.	0.00
59	M-49	Providing & Laying polished kota stone of machine cut edge patti of 10cm wide 22 mm. thk. in ramp flooring as per design, laid on 10 mm. th. C.M.1:3(1cement :3 sand) including necessary cement paste for fixing and joined with cement slurry etc. complete. For all floors.	0.00	98.00	R.M.	0.00
60	128	Providing & Constructing **polished Kotah stone cooking platform** 0.6mt. wide & 0.75mt. height, including one end side kota stone(Double Polish) of 1.25mt height & front kota stone patti of 10cm wide ,vertical partitions of half B.M wall in C.M 1:4 and 10mm th plaster in 1:3with finishing smooth with cement slurry as required and steel sink of 0.45mt x 0.45mt size of approved quality and make with required all fittings & Fxitures etc. Comp as per instruction given by site in charge at all floors	0.00	1947.00	R.M.	0.00
61	Self.Expl.	Providing & fixing **35mm.th. Flush Door Solid Double Core type Both Face water proof Ply Vennered** & 1.5 mm th.laminate shall be pasted on both side with adhesives as specified by the manufacturers. The laminate shall be as per approved shade & texture, of make **incl. Sal wood frames of finished size 12cm x 7cm**.incl. S.S. Hinges with nessary screws & Anodized aluminum fixtures & fastenings For all Floor	8.00	3312.00	S.M.	26496.00
		Same as Above But Without Frame	8.00	2300.00	S.M.	18400.00
62	25	Providing & fixing **35mm.th. Indian teak wood shutters** for doors, windows & clearstory windows incl. **Sal wood frames of finished size 12cm x 7cm.**incl. Medium quality anodized aluminum fixtures & fastenings incl. Primer coat of approved quality & two coats of oil painting etc. For all Floor				
		(A) Fully Panelled	10.00	4430.87	S.M.	44308.70
		(B) Partly Panelled and Partely Galzed	0.00	3967.28	S.M.	0.00
		(C) Fully Galzed	0.00	3525.91	S.M.	0.00
63	Self.Expl.	Providing and laying cement concrete flooring 1:2:4 (1 cement : 2course sand : 4 graded stone aggregate 20mm nominal size) laid in one layer finished with a floating coat of neat cement				
		A) 40mm thick	10.00	192.91	S.M.	1929.10
		(B) 50mm thick	10.00	226.24	S.M.	2262.40
64	Self.Expl.	Providing and fixing sal wood frame 12 cm x 7 cm size including anodized fixtures and fastening etc. including primer coat of approved quality and two coats of oil paint.etc complete. (For all floors)	0.00	865.00	S.M.	0.00
65	Self.Expl.	Providing and fixing sheet glass of good quality badded in putty and fixed with wooden beadings incldg.the cost of first class teak wood beading and necessary cutting of glass etc. in the place of damaged/broken sheet glass of the existing windows /ventillations etc. as shown & as ditrected by Engineer-in-charge.(For all floors)				
		(a) 4 mm plain glasss	0.00	724.17	S.M.	0.00
		(b) 6 mm wired figured glasss	0.00	650.44	S.M.	0.00
66	Self.Expl.	Providing and Replace door, Window S.S. Fixtures fix in wooden / Alluminium door - window				
		(A) 4" S.S. Hinge	20.00	75.00	No.	1500.00
		(B) 5" S.S. Hinge	20.00	85.00	No.	1700.00
		(C) 8" S.S. Aldraf	20.00	175.00	No.	3500.00
		(D) 10" S.S. Aldraf	20.00	200.00	No.	4000.00
		(E) 12" S.S. Aldraf	20.00	250.00	No.	5000.00
		(F) 4" S.S. Handle 4mm. Th.	20.00	100.00	No.	2000.00
		(G) 6" S.S. Handle 4mm. Th.	20.00	125.00	No.	2500.00
		(H) 4" S.S. Stopper 4mm. Th.	20.00	75.00	No.	1500.00
		(I) 8" S.S. Stopper 4mm. Th.	20.00	125.00	No.	2500.00
		(J) 6" S.S. Pavan Ankdi Heavy duty	20.00	35.00	No.	700.00
		(H) Alluminium door lock	20.00	200.00	No.	4000.00
		(I) Door Closer	20.00	200.00	No.	4000.00
67	125	Providing and fixing window having extruded aluminium **Powder Coated** section frame main outer size 95 mm x 24 mm x 1.17 mm (of jindal section no:2459 @ Wt. of 0.738 Kg/mt), horizontal **Three track** member size 92 mm x 31.75 mm x 1.30 mm (of jindal section no;8688, @ Wt. 1.07 Kg/mt), vertical member of size 92 mm x 31.75 mm x 1.50 mm (of jindal section no:8933, @ Wt. 1.06 Kg/mt) with sliding shutters of horizontal member size 40 mm x 18 mm x 1.29 mm (of jindal section no:8947 @ wt. of 0.456 kg/mt), vertical member of size 40 mm x 18 mm x 1.29 mm (of jindal section no:8949 @ wt. of 0.456 kg/mt) with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminium fittings & fixtures and transparent silicon sealant glass fixing to frame as per details etc.	5.00	1898.80	S.M.	9494.00
		(A) Same as above but **Colour anodized**	5.00	1889.71	S.M.	9448.55
68	124	Providing and fixing window having extruded aluminium **Powder Coated** section frame main outer size 63.50 x 38.10 x1.95 mm (of Jindal section no.4605, @ Wt. 1.094Kg/mt) horizontal **Two track** member size 61.85 mm x 31.75 mm x 1.20 mm (of jindal section no:8687, @ Wt. 0.695 Kg/mt.) vertical member of size 61.85 mm x 31.75 mm x 130 mm (of jindal section no:8758 @ wt. of 0.659 kg/mt) with sliding shutters of horizontal member size 40 mm x18 mm x 1.29 mm (of jindal section no:8949, @ Wt. of .456 Kg/mt) vertical member of size 40 mm x 18 mm x 1.29 mm (of jindal section no:8947, @ Wt. of 0.456 Kg/mt/section 8948, @ Wt. of 0.457 Kg/mt) with 5 mm thick tranparent bronze colour tineted float glass with powder coated aluminium fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc. complete for window.	5.00	2032.12	S.M.	10160.60
		(A) Same as above but **Colour anodized**	5.00	2042.22	S.M.	10211.10
69	Self.Expl.	Providing and fixing standared extruded of aluminium section of size 61 x 37.0 x0.90 mm (of Jindal section no.14080, @ Wt. 0.471 Kg per mt) with colour **powder coated** alluminium frame for Lovered Glass ventilation with 4 mm thick Figured glass as details etc. complete **for ventilation**.	5.00	1750.00	S.M.	8750.00
		(A) Same as above but **Colour anodized**	5.00	1800.00	S.M.	9000.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
70	Self.Expl.	Providing and fixing standared extruded of aluminium section of size 61 x 37.0 x0.90 mm (of Jindal section no.14080, @ Wt. 0.471 Kg per mt) with **Powder Coated** alluminium frame with 5 mm thick transparent bronze colour tinted float glass as details etc. complete for **fix window**.	2.00	1450.00	S.M.	2900.00
		(A) Same as above but **Colour anodized**	2.00	1525.00	S.M.	3050.00
71	Self.Expl.	Providing & fixing partly panel & partly glass **Powder Coated Aluminium doors** with aluminium section of Hindalco, Jindal , Narmada,Banco or Equivalent approved make having Poder Coated outer frame **Leg Partition section** of 63.50 mm x 38.10 mm having weight 1.158 kg. / R.M. shutter section having size 83.5 mm x 44.45mm (top & bottom: 1.384 kg./rmt. and middle 1.139 kg./rmt.) door vertical 47.62mm x 44.45 mm (vertical:0.881 kg./rmt. & top hing side:0.974 kg./mt.), Glazing Clip (Jindal Section No. 19370 Wt. 0.109 Kg./ Mt.) with 5mm thick sheet glass in acid frogting and 12 mm thick prelaminated sheet of Greenlam, Panama or archid make as approved by Engineer-in-charge including fixing brass pivot, handle, lock etc. complete.	10.00	3125.00	S.M.	31250.00
		(A) Same as above but **Colour anodized**	10.00	3225.00	S.M.	32250.00
72	Self.Expl.	Providing & fixing **Powder Coated Aluminium partly glazed and partly panelled partition** using medium duty sections of Hindalco,Zindal, Narmada, Banco or Equivalent approved make having section 63.50 mm x 38.10mm (Frame-.758 kg/rmt & Middle section- 0.819 Kg./rmt), **Galzing Clip** with 5 mm thick clear float glass of approved make including all other necessary fittings and fixtures. Entire work will have to be made water proof using necessary rubber sectioned wherever required. Gaps all round the frame to be filled with approved water proof sealent. Bottom portion of doors both side to be covered with 12mm thick prelaminated particle board of approved make and quality and as per design.	5.00	1800.00	S.M.	9000.00
		(A) Same as above but **Colour anodized**	5.00	1850.00	S.M.	9250.00
73	Self.Expl.	Providing and fixing **FRP FRAME size 125 x 65 mm and 35 mm thick FRP shutter** with wood grain raised panneled design finish shutter having extra reinforcement on sides & edges in Gel coat finish. The core of the shutter & frmae is to be filed up with injected polyurethene foam done in situ along with embedded wooden pieces for stiffening & also taking hinges & fixtures. The whole FRP frame & shutter is to be water proof weather proof,termite proof &resistance to mild acid/alkali. Rates are to be inclusive of S.S.hinges with fastener sleeve & alluminium fixtures & fastentings. Product should have 3 years performance guarantee and company have ISO 9001-2000 certificate.	20.00	3861.23	S.M.	77224.60
74	Self.Ex pl.	Reparing & Servicing of existing door/window including cost of hardware (Fevicol,Nail and NF screw etc.) but excluding cost of fixtures as directed by Engineer in-charge.				
		(A) Wooden door	50.00	150.00	Nos.	7500.00
		(B) Partly Panelled and Partely Galzed alluminium door	50.00	150.00	Nos.	7500.00
		(C) Wooden Window shutter	50.00	75.00	Nos.	3750.00
		(D) Alluminium Window shutter	50.00	75.00	Nos.	3750.00
75	Self.Ex pl.	Providing & fixing Glass Table Top using 08mm th.clear glass with crystal edge & necessary hardware materials etc. complete as per instruction by engineer in charge.	18.00	1350.00	S.M.	24300.00
76	Self.Ex pl.	Providing & fixing door closer Ozon / Dorma / Hyper / Hardwin / Godrej / Alluminium body ISI brander equivalent make with necessary hardware materials etc. complete as per instruction by engineer in charge.	18.00	1400.00	Nos.	25200.00
77	Self.Ex pl.	Providing & fixing water proof plywood (ISI marks 710 grade) at the door,window and any space in the building. necessary hardware,screws materials etc. complete as per instruction by engineer in charge.				
		(A) 6 mm	5.00	650.00	S.M.	3250.00
		(B) 9 mm	0.00	750.00	S.M.	0.00
		(C) 12 mm	0.00	900.00	S.M.	0.00
		(D) 16 mm	0.00	1125.00	S.M.	0.00
		(E) 19 mm	0.00	1350.00	S.M.	0.00
		(F) 12 mm BSL partical board green or Equalent make	0.00	550.00	S.M.	0.00
		(G) 12 mm plan E board Evrest or Equalent make	0.00	470.00	S.M.	0.00
78	Self.Ex pl.	Providing & fixing laminated sheet 1mm thick suede finished as per approved make with & necessary adhesive,hardware materials etc. complete as per instruction by engineer in charge.	0.00	650.00	S.M.	0.00
79	Self.Ex pl.	Providing & fixing Mortise lock body with 70mm cylinder (make godrej / ozon / inox) fix in wooden door with necessary hardware materials etc. complete as per instruction by engineer in charge.	10.00	1500.00	S.M.	15000.00
80	Self.Ex pl.	Replacement of Revolving chair parts ISI marks with necessary hardware, screws materials etc. complete as per instruction by engineer in charge.				
		(A) P.V.C. moulded Hand rest	30.00	325.00	Nos.	9750.00
		(B) Hydraulic gas pump	30.00	550.00	Nos.	16500.00
		(C) Cushion sheet, back with fabric / rexine	30.00	1850.00	Nos.	55500.00
		(D) Rubber castor / wheels	30.00	100.00	Nos.	3000.00
81	Self.Ex pl.	Reparing & Servicing of wooden office table / file storage using screws and necessary hardware materials complete as per instruction by engineer in charge.	30.00	200.00	Nos.	6000.00
82	Self.Ex pl.	Replacement of wooden office table / file storage parts ISI marks with necessary hardware, screws materials etc. complete as per instruction by engineer in charge.				
		(A) Drawer / shutter locks	50.00	250.00	Nos.	12500.00
		(B) ss 4" D Handles	50.00	80.00	Nos.	4000.00
		(C) Drawer channel	50.00	275.00	Nos.	13750.00
		(D) ss 3" heavy hinges	50.00	80.00	Nos.	4000.00
83	Self.Ex pl.	Providing & laying sun control or frosted milky glass film as approved colour,design,cutting complete as per instruction by engineer in charge.	10.00	480.00	S.M.	4800.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
84	Self Ex pl.	Providing & fixing wooden notice board with Righting laminated board finish using 12mm th.Back commercial plywood approved make, 01mm th. SF finish laminate,teakwood framing & necessary hardware materials etc. inside and liping french polish finish complete in all respects by engineer in charge complete.	15.00	1950.00	S.M.	29250.00
85	34	Providing & fixing **M.S.Grills** of required pattern to wooden frames of windows etc. At all floor levels with M.S. flats at required spacing & frame around square or round bars with round headed bolts & round headed bolts and nuts or by screws incl. Priming coat of Red lead paint etc. comp. (A) Plain grill For all Floors	100.00	66.16	Kg.	6616.00
86	86	Providing & fixing in position **collapsible steel shutters** with vertical channels 20 x10 x 2 mm. Braced with flat iron diagonals 20 x5mm size with top & bottom rails of T-iron 40x40x6mm. with 38mm dia. steel pulleys comp. with bolts, locking arrangements, stoppers, handles incl. applying a priming coat of Redlead paint etc. comp.	0.00	3723.87	S.M.	0.00
87	35	Providing & applying **painting two coats** at all floor levels on new steel other metal surface **with synthetic enemal paint**, brushing interior to give an even shade incl. cleaning the surface of all dirt, dust & other foreign matter etc. Comp. (A) For plain grill For all Floor	100.00	45.85	S.M.	4585.00
88	40	Providing & fixing **M.S.Fan clamp**s at all floor levels type I of 12 mm dia M.S. Bar bent to shape with hooked ends to R.C.C. Slabs during laying all as per standard design For All Floor (M.R.)	15.00	70.00	No.	1050.00
89	21,22	Providing & applying **white washing with lime (three coats)** at all floor levels to give an even shade incl. thoroughly brooming the surface to remove all dirt, dust mortar droppings & other foreign matter etc.. comp. Incl. Prov.& mixing in required proportion, binding agent like "Fevicol dh" or equivalent approved brand etc. For All Floor.				
		(A) For wall & similar surfaces	100.00	11.51	S.M.	1151.00
		(B) For ceilings and soffits	100.00	12.52	S.M.	1252.00
90	106	**Distempering two coats** with oil bound washable distemper of approved brand & manufacture & of required shade on wall surface to give an even shade over and & incl. a priming coat of alkali resistance primer of approved brand after throughly brushing the surface to give an even shade after throughly brushing the surface free from mortar droppings and other foreign matter and also including preparing the surface even and smooth.				
		(A) For wall & similar surfaces	100.00	45.85	S.M.	4585.00
		(B) For ceilings and soffits	100.00	51.01	S.M.	5101.00
91	129	Applying **cement primer & lapi** before applying colour to any new surface making surface even & smooth incl. cleaning the surface of all dirt, dust & foreign matter. (M.R.)	100.00	31.00	S.M.	3100.00
92	130	**Distempering two coats on previously distempering wall** (without primer) with oil bound washable distemper of approved brand & required shade on wall surface to give an even shade after throughly brushing the surfaces clean of all grease, dirt loose places of sceles & also including preparing the surface even and smooth.	100.00	36.66	S.M.	3666.00
93	131	Wall painting with **two coats of Acrylic emulsion plastic paint** of approved brand over existing surface to give an even shade & surface free from mortar dropping & other foreign matter & sand papered smooth etc. comp.	200.00	50.40	S.M.	10080.00
94	35	Applying **Priming coat over new steel and other metal surface** after over and including preparing the surface by throughly cleaning oil, grease dirt and other foreign matter and scoured with brushed fine steel wool, scrapers and sand paper with ready mixed priming paint brushing red lead.	50.00	22.22	S.M.	1111.00
95	35A	Painting **two coats of enamel paint (Excluding priming coat) over previously painted wall** with even shade & surface after removing dirt, dust foreign matter etc. comp.(M.R.)	200.00	51.00	S.M.	10200.00
96	35B	Painting **two coats of enamel paint over priming coat** after removing entire whitewash/colourwash surface dirt, dust foreign matter & also incl. preparing the surface even & sand papered smooth etc. comp.(M.R.)	200.00	63.00	S.M.	12600.00
97	132	Providing & applying **two coats of weather shield max paint** (3 coats may be required in case of darker colours.)of ICI Dulux or Apex Ultima of Asian Paint including applying exterior acrylic primer coat as per manufacturers specification and directions in shade and colour approved by architects, on exterior surfaces of the building including scaffolding, preparing the surface, watering, curing etc. complete and as directed by the architects and manufacturers. **Surface Preparation :** surface is thoroughly clean, dry and free from all loose dirt, chalk, grease, fungi, algae and flaking paint. This can be achieved by brushing with a wire/ stiff coir brush, followed by water jetting if required. Fill up all minor cracks and defects with white cement and sand mixture in the ratio 1:3. For application on previously painted wall, previous coatings of paint must be thoroughly scraped off and Clean the surface thoroughly using wire brushes. **Priming:** Apply a liberal coat of exterior acrylic primer and allow it to dry for 4-5 hours. Application of putty is not recommended. Minimum 4-6 hours duration is required between each coat of weather shield max paint	247.00	75.00	S.M.	18525.00
98	80	Providing & fixing at all floor levels,**both face polished machine cut edge green kota stone slab (30mm) for urinal partition** joined with grey cement slurry (1:1) incl. Rubbing & polishing etc. complete. (M.R.)	5.00	863.00	S.M.	4315.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
99	133	Providing & Fixing including making gisi & fixing at all floor levels **both face polished machine cut edge, granite stone slab for urinal partition** joined with grey cement mortar (1:3) incl. Rubbing & Polishing etc. Complete. Including half round edge for granite. (Basic Rate of Granite : Rs. 1200.00 / S.M.)	2.00	2900.00	S.M.	5800.00
100	3A	Providing & laying **cement concrete 1:2:4** (1 cement:2 sand:4 graded stone agg. 20 mm nominal size)& curing comp. Includ.cost of form work but exclu. Cost of reinforcement for reinforced concrete work in : (A) **Foundation, footing, Base of columns and Mass concrete.**	1.00	3203.72	C.M.	3203.72
101	5A	Providing & laying ordinary cement con.**1:2:4**(1cement:2sand:4graded graded stone agg. 20 mm nominal size) finishing smooth curing etc. comp. Incld. Cost of form work but excl. Cost of reinforcement for R.C.C. Work in : Up to G.L./P.L.				
		(A) COLUMNS:				
		(1)Having c/s area up to 0.08 sq.mt	0.00	7297.25	C.M.	0.00
		(2) Having c/s area more than 0.08 sq. mt. & upto 0.12 sq.mt	0.00	6619.54	C.M.	0.00
		(3) Having cross sectional area more than 0.12 sq. mt.	0.00	5767.10	C.M.	0.00
		(B) BEAMS :				
		(1)Having c/s area up to 0.08 sq.mt	0.00	6061.01	C.M.	0.00
		(2) Having c/s area more than 0.08 sq. mt. & upto 0.12 sq.mt	0.00	5590.35	C.M.	0.00
		(3) Having cross sectional area more than 0.12 sq. mt.	0.00	5039.90	C.M.	0.00
102	2	Providing & laying **C.C 1:3:6** (1cement :3 coarse sand :6 crushed stone agg. 20 m.m Nominal size)& curing comp. incl. cost of from work **in: wall caps/ copings.**	1.00	3160.29	C.M.	3160.29
103	123	**Box Cutting** the road surface to proper slope and camber for making base includinng removing the excavated stuff and depositing on the road side slope as directed up to 50 mt. lead.	0.00	66.16	C.M.	0.00
104	120A	**Preparation of subgrade** with Compacting, Levelling and consolidation of subgrade with miniroller /plate vibrator machine including watering and filling in depressions which occur during the process as directed by engineer in charge.	0.00	4.55	S.M.	0.00
105	Self.Expl.	Providing & filling with **Mix soil** in layers of 20 cm. Th'. Incl. watering, ramming & consolidation etc. complete.	0.00	162.08	C.M.	0.00
106	Self.Expl.	Providing, Supplying & Sprading of Gravel in Play area including dressing etc. comp.	0.00	1150.00	C.M.	0.00
107	119	Supplying & filling **fine sand(pana)** in 150 mm compacted thickness over the base including necessary compaction, watering etc. complete. Item includes leveling by using vibratory plates compacted machine and as directed by engineer in charge.	0.00	451.47	C.M.	0.00
108	121A	Removing & resetting existing readymade c.c. kerb stone of required size & thickness in line .level and in truly vertical position including filling joints in C.M. 1:1 (1 part of cement : 1 part of stone dust) smooth pointing in C.M. 1:1 (1 part of cement : 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge. (M.R)	0.00	41.41	R.M.	0.00
109	122B	Removing and Resetting of Paver block of walk-way with necessary sand / pana filling and make in line and level with necessary vibrating using compactor machine.	0.00	108.00	S.M.	0.00
110	Self.Expl.	Removing and Resetting of Kota Stone paving for footpath in line , level and in proper gradient including 25mm thick bedding in C.M. 1:6 (1 cement:6 sand) with sufficient ramming consolidation. Providing Joints in 1:3 (1 cement:3 sand) and smooth pointing in C.M 1:1 (1 cement:1 sand) including watering etc, complit and as diracted by Engineer in charge.	20.00	107.00	S.M.	2140.00
111	79	Providing and laying rough chiseled dressed stone flooring over 20mm thick base of cement mortar 1:5 (1 cement : 5 coarse sand) or L.M. 1:1.5 including pointing with cement mortar 1:2 (1 cement : 2 stone dust) etc. (A) 25mm thick	0.00	370.67	S.M.	0.00
112	121	Providing 100mm thick readymade **C.C. kerb** of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer & setting in line, level and in truly vertical position, including filling joints in C.M. 1:1 (1 part of cement : 1 part of stone dust) smooth pointing in C.M. 1:1 (1 part of cement : 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	0.00	236.34	R.M.	0.00
		For rounding at the edge of footpath (For fanning portion)	0.00	323.20	R.M.	0.00
113	122A	Providing interlocking type **Rubber moulded cement concrete paver block** of approved shape, design & colour having 60mm thickness **(M-35)** purchased from SMC's approved paverblock manufacturer only & fixing of fine sand bedding. Item includes levelling by using vibratory plates compacted machine. Item also includes all materials, labour, equipments, tools, plants, watering, cleaning etc. complete.				
		With colour	0.00	431.27	S.M.	0.00
		Without colour	0.00	419.15	S.M.	0.00
114	122	Providing & fixing interlocking type **Cement Concrete paver block** of approved shape & design having 60 mm thickness **(M-40)** purchased from SMC's approved paverblock manufacturer only on fine sand bedding. Item includes leveling by using vibratory plates compacted machine. Item also includes all materials, Labour, euipments, tools, plants, watering, cleaning etc. complete.	0.00	365.62	S.M.	0.00
		For Road Junction **80 mm thick (M-50)**	0.00	527.22	S.M.	0.00
115	120	Providing & laying **Granular sub base (GSB)**confirming to Grading-II of Table 400.0 of compacted thick of 150mm with specified graded stone metal and sand mixed in place and laid with mechanical means spreading with motor grader and compacting with vibratory roller having minimum 80-100 KN static weight to acheve desired density of 98% of MDD including all material, labour, machinery with all leads and lift etc. complete.	0.00	1285.73	C.M.	0.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
116	Self.Expl.	Providing & laying cement concrete Pavement using **1:1.5:3** (1 cement:1.5 sand:3 graded stone agg. 20 mm nominal size) & **Vaccuum Dewatering technique** including floating surface with a skim powder floater, curing etc. complete.	0.00	5017.00	C.M.	0.00
117	Self.Expl.	Providing & laying cement concrete Pavement using **1:2:4** (1 cement:2 sand:4 graded stone agg. 20 mm nominal size) & **Vaccuum Dewatering technique** including floating surface with a skim powder floater, curing etc. complete.	0.00	4557.00	C.M.	0.00
118	Self.Expl.	Providing and laying **200 micron plastic sheet** on prepared sub base For V.D.S Concrete	0.00	26.00	S.M.	0.00
119	104	Steel work welded in built up sections, framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint				
		(A) in beams & joists channels angles, tees, flats with connection plates or angle cleats as in main & cross beams,hip & trussed purlins connected to common raffers & the like.	0.00	60.89	Kg.	0.00
		(B)For work like chain link fencing, above compound wall etc.	0.00	60.89	Kg.	0.00
		(C)in trusses & trussed purlins upto 25m.Span &15m.Overall height	0.00	61.66	Kg.	0.00
120	107	Providing and fixing **G.I. chain link** of 50mm x 50mm size x 10 guage thick with nuts, bolts, washer or G.I. pins, excluding M.S. angles etc.complete as per relevent IS specification & directed by engineer in charge. (TATA or Jindal Make)	0.00	265.00	S.M	0.00
121	Self.Expl.	Providing and fixing and fitting TATA or Jindal make **G.I. barbed wire fencing** with necessary barbed wire (12 x 14 guage, weight not less than 0.14 kg. / mt.) pins, hooks, excluding M.S. angles etc. complete as per relevent IS specification.& directed by engineer in charge	0.00	81.00	Kg.	0.00
122	108	Providing and Fixing **hot dip concertina coil** of 610 mm dia. made out of 2.59 mm (12 SWG) hot dip galvanized (G.I. coating not less than 200 gm/sqmt.) th. wire having 80 nos. of spikes and 200 nos. of clips made out of stainless steel (AISI 304) 1.5 mm th. dia., G.I. strips 0.5 mm th. (G.I. coating not less than 120 gm/sq.mt.) weight of one coil should not be lesss than 15 kg. etc., complete at the top of compound wall fixed with S.S. clips and binding wires whereever necessary etc. complete. (NOTE: Strctching length of one coil should not be more than 9 mt.)	0.00	231.00	R.M.	0.00
123	Self.Expl.	Providing and fixing 1.20 meter high fencing with 2.0 meter long M.S. angle post 40mm X 40mm X 6mm and oil painting 3 coats fixed at 2.5 mt.C/C. with five horizantal lines and two diagonals of galvanised steel barbed wire of 'TATA make' weighing 9.38 Kg.per 100 meter, strained and fixed to posts with G.I. staples, including fixing posts in ground with 0.5 m X 0.5 m X 0.5 mt. block in C.C. 1:5:10 etc. comp.	0.00	409.00	R.M.	0.00
124	Self.Expl.	Providing and fixing 20 mm x 20mm x 10 gauge thick (using TATA make G.I.wire) galvanise ironwire mesh (G.I. Crimped net) including cutting fixing etc.complete.	2.00	590.00	R.M.	1180.00
125	109	Providing corrugated **G.I. Sheets roofing** fixed with Galvanised Iron ' J ' or 'L' hooks bolts & nuts 8 mm.dia with bitumen & G.I. Limpet washers filled with white lead comp. excluding the cost of purlins, rafters and trusses.				
		(ii) 0.63mm THick Sheet	80.00	727.00	S.M.	58160.00
126	Self.Expl.	Providing & fixing **colouron galvaniced steel, zinc / aluminium allus coated sheet 0.5 mm. thick roofing** fixed with gslvanised grom J or L hook bolts and bolt 8mm dia with bituman and impet washer filled with white lead etc. Excluding the cost of purlins rafter and trusses.(TATA or Jindal Make)	0.00	668.00	S.M.	0.00
127	110	Providing & fixing **150mm wide 450mm over all semicircular plain G.I. sheet class-3 gutter** with iron brackets 40mm x 3mm size bolts, nuts, washers etc. including marking necessary connection with rain water pipes. **(i) 0.63mm thick**	0.00	379.00	R.M.	0.00
128	111	Providing **ridges or hips 600mm over all in plain G.I. sheet** fixed with G.I. "J" of "L" hooks bolts and nuts 8mm dia G.I. limpet and bitumen washer complete (1) 0.63mm thick sheet	0.00	427.00	R.M.	0.00
129	96	Providing & Fixing UV stabilise **FRP Sheet roofing** with overlapping the main cladding on both edges. All fixing holes must be predrilled oversize as specified for the sheet length and fastener being used. Fasteners must be fitted with approved washers. Fixings should be tightened to ensure a weatherproof seal but they must not be over tightened Side-lap fasteners must also be installed at specified centers with the FRP sheet having clearance holes provided as per the main fasteners Weatherproofing shall be provided at all flashing points under the normal flashing by the fitting of a foam closure strip to match the profile being used. Closure strips will be sealed to the sheet with an appropriate non setting silicone sealant. Excluding the cost of purlins rafter and trusses.				
		(a) 1.5 mm thick	0.00	725.00	S.M.	0.00
		(b) 2 mm thick	0.00	862.00	S.M.	0.00
130	Self.Expl.	Providing & Fixing **Polycarbonate sheet roofing** with surface of the sheet is coated with an anti-UV Co-extrusion layer having good weather resistance, it can maintain its optical properties and mechanical performance for a long time. Fasting is usually done by screws. , The fastening screws should be inserted about 500 mm apart and 300mm apart Along the supporting internal purlin and edge pulin.All fixing holes with diameter at least 2 mm larger than screw must be predrilled into each screw location. The screws should be 6mm diameter with length according to sheet thickness and corrosion resistant, with at least heavy duty hot dripped galvanized or stainless steel. Excluding the cost of purlins rafter and trusses.				
		(a) 1.5 mm thick Solid Sheet	0.00	1018.00	S.M.	0.00
		(b) 2 mm thick Solid Sheet	0.00	1282.00	S.M.	0.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
131	Self.Expl.	Pro.& fixing corrugated **ACRYLIC COLOURED** - 1.m mm roofing fixed with galvanized from 'J' or 'L' hook bolts & bolt 8 mm dia with bitumen and Limpet washer filled with white \lead etc. comp. excluding the cost of purlins rafter & trusses	0.00	500.00	S.M.	0.00
132	83, 84, 85	Providing and fixing Rolling shutter of approved make made of 80 mm wide M.S. laths of 20 gauge inter looks together through their entire length & jointed together at the ends of by end locks mounted on specially designed pipe shaft with bracket plated, guide channels of 14 gauge & arrangement for inside & & out side locking(locking (locking rail/putti of 16 gauge) with push-pull operation including the cost of hood cover of 24 gauge & spring etc. complete.				
		(A) Shutters having width below 3.5m	0.00	3690.54	S.M.	0.00
133	Self.Expl.	Providing & Fixing **80 mm dia M.S. pipe** as vertical post are beded in 1:1.5:3 concrete also horizontaly in line and connecting to purline angle etc by welding rereting etc. (a) **Medium duty "B" Class**	0.00	574.00	R.M.	0.00
134	Self.Expl.	Providing & Fixing 5**0 mm dia M.S. pipe** as vertical post are beded in 1:1.5:3 concrete also horizontaly in line and connecting to purline angle etc by welding rereting etc. (a) **Medium duty "B" Class**	0.00	345.00	R.M.	0.00
135	Self.Expl.	Providing & fixing **black board** on walls of **1.8mt.x1.2mtsize** made up to 12 mmth.B.W.P .Plywood (Brand Saras,Kitply,Uniply, Anchor, Green,Wood Stock or century) fixed with teak wood beading of 65 mmx 50mm size, rubbing & sanding comp., incl. applying two coats of black board paint over a priming coat on plywood & French polishing the frame all round etc. Comp. as per instruction of Engineer in charge (M.R.)	0.00	3915.00	No.	0.00
136	Self.Expl.	Providing & Fixing **Reading table size 8' x 4' and height 2'-6"** with table top 18mm thick (Brand Saras,Kitply,Uniply, Anchor, Green,Wood Stock or century) commercial plywood with 1.0mm thick lamination sheet fitting with teakwood moulding table top supported on 3" x 3" teakwood leg & 3" x 11/2" teakwood framing top and bottom with french polish labour work hardware etc. as per site in charge instruction and as per drawing.	0.00	12450.00	No.	0.00
137	Self.Expl.	Providing & Fixing **Librarian table** with 18mm thick commercial plywood (Brand Saras,Kitply,Uniply, Anchor, Green,Wood Stock or century))with 1.0mm thick lamination sheet table top supported on 2" x 2" teakwood leg & make 3 nos. drawers of 1' 3" width on both side with necessary french polish hardware labour etc. as per site incharge instruction and as per drawing (**Size 4' x 2'-6" x 2'-6"**, all framing other then legs are teak wood of size 2" x 1")	0.00	8040.00	No.	0.00
138	Self.Expl.	Labour work for chiesel shape(Bhala type) of grill square bar or Round Bar.	0.00	10.00	No.	0.00
139	Self.Expl.	Providing & Fixing 8 mm dia Chain For Swing	0.00	120.00	No.	0.00
140	Self.Expl.	Providing & Fixing Kada For Swing	0.00	360.00	No.	0.00
141	Self.Expl.	Steel work of square pipe hollow section, as per reqiure size, welded in built up sections, framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint. (A) In beams and joints channels angles, tees, flats with connection plates or angles cleats as in main and cross beam, hip and trussed purlins connected to common rafters and the like.(Rate analysis)	0.00	81.00	Kg.	0.00
142	Self.Expl.	Cutting out cracks of wall or terrace to V section ,cleaningout, grouting with cement and sand slurry 1:3 (1 cement : 3 sand). at any height	5.00	41.41	R.M.	207.05
143	Self.Expl.	Providing & fixing Wooden file storage/divider 7.00' height with all outer surface laminate finish using 18 mm th vertical,horizontal and shutter , selves commercial plywood approved make, 01 mm th SF finish laminates,teakwood liping,brass hinges, ss handle lock,megnate & necessary hardware materials etc.inside and liping franch polish finish complete in all respects by Engineer in charge	200.00	407.00	Sq.ft.	81400.00
144	Self.Expl.	Providing & fixing hard drawn wire fabrics 75 mm x 25 mm MESH of weight not less than 7.75 kg/s.m to windows/ventilators frames etc. at all floor levels including 60 mm x 20 mm bidding of teakwood incuding providing and fixing salwood frames 7 cm x 7 cm size for ventilators etc complete.				
		For Ventilators all floor.	0.00	1342.00	S.M.	0.00
145	Self.Expl.	Applying polymer modify mortar in proportion at 1:2(one part cement: 2 part white sand(sweet water) with chemical(SBR) dosage of minimum 5 litre pe bag of cement. Also apply bonding agent prior to polymer modify mortar in proportion of (1:1)(1 part SBR : 1 part cement) using Roof, MC and FOSROC				
		Beam / Columns	20.00	1830.00	S.M.	36600.00
		Ceiling	20.00	1830.00	S.M.	36600.00
146	Self.Expl.	Crack Repairs:-Crack filling using fiber reinforced polymer modified mortar after openning crack in "V" grove, Making Surface dust free, with a bond coat of polymer as per the data sheet for crack repairing cracks less than 8mm	20.00	120.00	R.M.	2400.00
147	Self.Expl.	Providing and fixing rebar of following diameter using chemical grout of Swanchore/Hilti/Fischer or equivalent make including cost of all equipments, tools, material, labour, etc. Standard procedure as mentioned in manufacturer's specifications shall be strictly followed, which shall be submitted and got approved from the authority prior to start of work. The rate shall also include cost of drilling of hole of required diameter and depth as mentioned in manufacturer's specification,cleaning the hole with required air blower and other necessary tools and tackles, positioning, providing and grouting chemical, allied fixtures and fasteners, etc. but excluding the cost of reinforcing bar etc. complete. Item includes necessary scaffolding, staging, labour, tools and equipments,etc. complete as directed by the engineer-in-charge.				
		(A) 8 mm dia	5.00	80.00	No.	400.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
		(B) 10 mm dia	5.00	90.00	No.	450.00
		(C) 12 mm dia	5.00	125.00	No.	625.00
		(D) 16 mmm dia	5.00	190.00	No.	950.00
		(E) 20 mmm dia	5.00	340.00	No.	1700.00
		(F) 25 mmm dia	5.00	500.00	No.	2500.00
148	134	Providing and Fixing Stainless Steel (Grade 304) Railing made of Hollow tubes, channels, plates etc. Including Welding, Grinding, Buffing, Polishing and Making Curvature (Wherever Required) and fitting the same with necessary Stainless Steel Nuts and Bolts Complete, i/c fixing the Railing with Necessary Accessories & Stainless Steel Dash Fastenders, Stainless Steel Bolts etc. of Required size, on the top of the floor or the side of waist slab with suitable arrangement as per aprproval of Engineer-incharge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.)	0.00	384.00	Kg.	0.00
		WATER SUPPLY & SANITARY ITEMS				
149	53A	Prov.& Fixing **water closet squatting pan (Orissa type W.C.pan)** at all floor levels, size 580mm incl. 100 mm size "P'or "S" trap for water closet squatting pan joining the trap with the pan & soil pipe in C.M. 1:1 (1cement :1 fine sand) etc. Comp.(A) Vitreous china long pattern of **approved colour** For all Floor				
		Make -Cera,Parry ware, Jaquar, Hindware	10.00	1530.00	No.	15300.00
150	53B	Providing and fixing **Wash Down Water closet European type W.C. pan** with integral P or S trap with normal closing seat cover L bend including jointing the trap with soil pipe in cement mortar 1:1 (1 cement : 1 find sand) (A) Viterous china pattern - I				
		Make -Cera,Parry ware, Hindware - 350 x 500 x 390 mm	6.00	2150.00	No.	12900.00
		Make -Jaquar - 350 x 480 x 390 mm	3.00	3800.00	No.	11400.00
151	53C	Providing and fixing **plastic seat and cover** for wash down water closet with C.P. brass hinges and rubber buffers (B) Black plastic seat and cover.	10.00	343.40	No.	3434.00
152	135	Providing & fixing white viterious china **Urinal** of size 450 x 325 mm as per IS-2556 (Part-2) with C.I. Hangers and 15mm dia. C.P. Spreader, 32mm dia CP bottle trap and pipe to wall with C.P. Flange complete including cutting and making good the walls and floors wherever required.				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	2500.00	No.	12500.00
153	54	Providing & fixing **wash Hung basin** with single hole for pillar tap, Size 550x400mm at all floor levels, with C.I. or M.S. Brackets painted white incl. cutting holes & making good the same etc. complete. For all Floor				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	1500.00	No.	7500.00
154	55	Providing & fixing **600 mm.x 450 mm. mirror** of superior glass at all floor levels, mounted on 6 mm. th. A.C. sheet or plywood sheet & fixed to wooden plugs with C.P.brass screws and washers etc. For all Floor	5.00	530.25	No.	2651.25
155	Self.Expl.	Provinding and fixing **Towel Ring** fabricated from seamless stainless steel tube 2mm thick in Bath room with polished wall flange at end of bars with heavy duty anchor fasteners & accessories				
		Make -Cera,Parry ware, Jaquar, Hindware	7.00	720.00	No.	5040.00
156	Self.Expl.	Providing & fixing **S.S. Towel Rail of 600mm Long** approved make including, provinding & fixing C.P. Brass screws, making holes in wall & making good.				
		Make -Cera,Parry ware, Jaquar, Hindware	7.00	715.00	No.	5005.00
157	Self.Expl.	Providing & fixing stainless steel recessed type **Soap Dish** of approved make. Including providing & fixing screws, washers, cutting & making good the walls.				
		Make -Cera,Parry ware, Jaquar, Hindware	7.00	535.00	No.	3745.00
158	Self.Expl.	Providing & fixing **Health Faucet ABS Body** with wall Hook & 1 Meter Chrome plated PVC Hose Pipe.				
		Make -Cera,Parry ware, Jaquar, Hindware	7.00	715.00	No.	5005.00
159	57A	Prov. & Fixing **S.W. Gully trap** with C.I.grating brick masonary (C.M 1:5)chamber & water tight C.I. cover with frame of 300mmx300mm size (inside) with weight to be not less than 4.53kg, includ. plastering smooth inside & outside 15mm. th' in C.M.1:3 etc. comp. (i) Square mouth traps---				
		(A) 100mm x 300mm Size -P type	15.00	1352.39	No.	20285.85
		(B) 150mm x 100mm Size- P Type	7.00	1297.85	No.	9084.95
160	57	Prov. & Fixing **S.W. Gully trap** with C.I.grating brick masonary (C.M 1:5)chamber & water tight Pre cast R.C.C. cover of 300mmx300mm size (inside) includ. plastering smooth inside & outside 15mm. th' in C.M.1:3 etc. comp. (i) Square mouth traps---				
		(A) 100mm x 300mm Size -P type	10.00	960.26	No.	9602.60
		(B) 150mm x 100mm Size- P Type	5.00	905.72	No.	4528.60
161	58	Prov. & Fix. 10 cm.x15 cm.(4" x 6") **S.W. trap with Inside dimension ,455 x 610 mm & 450 mm deep sewer trap chamber** with 23 cm th' B.B. masonary walls in C.M 1:5 with cement plaster 15 mm th' in C.M. 1:3 inside & outside to exposed faces, R.C.C. top slab with 1:2:4 mix (1 cement: 2 Sand : 4 Grade stone aggregate 20mm size) ,Foundation concrete 1:5:10 & fixing C.I. cover with frame to be not less than 38 kg. On top etc. comp. for single pipe.	5.00	2998.69	No.	14993.45
		.(A).Same as above but Precast RCC heavy duty Cover instead of C.I. Cover	3.00	2579.54	No.	7738.62
		Extra for every additional depth of 0.1 mt beyoung 0.45 mt	2.00	212.10	Each	424.20
162	59	Providing & construction **simple chamber** of 23 cm. th' B.B. Masonary in C.M 1:5 with cement plaster 15 mm th' in C.M. 1:3 inside & outside to exposed faces, R.C.C. top slab with 1:2:4 mix (1 cement: 2 Sand : 4 Grade stone aggregate 20mm size) ,Foundation concrete 1:5:10 & fixing C.I. cover with frame to be not less than 38 kg. On top etc. comp. **Inside dimension,455 x 610 mm &450 mm deep** for single pipe	2.00	2796.69	No.	5593.38

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
		.(A).Same as above but Precast RCC heavy duty Cover instead of C.I. Cover	7.00	2377.54	No.	16642.78
		Extra for every additional depth of 0.1 mt beyoung 0.45 mt	5.00	212.10	Each	1060.50
163	60	Providing, Lowering & laying joining **R.C.C. NP2 CLASS Pipe** In C.M. 1:1 of following nominal internal diameters incl. Testing of pipes and joints etc. Comp				
		(A) 100 mm. dia.	20.00	225.00	R.M.	4500.00
		(B) 150 mm. dia	40.00	192.91	R.M.	7716.40
		(C) 200 mm. dia	20.00	255.53	R.M.	5110.60
		(D) 250 mm. dia	10.00	462.58	R.M.	4625.80
164	62	Providing & laying **in trenches galvanised mild steel tubes**(medium grade) TATA / ZENITH / ASIAN / JINDAL MAKE of the following nominal bore & tube fittings etc. comp..-				
		(A) 25mm.dia.	10.00	225.23	R.M.	2252.30
		(B) 40 mm. dia.	5.00	341.38	R.M.	1706.90
		(C) 65 mm. dia.	5.00	565.60	R.M.	2828.00
165	61	Providing & Fixing to **wall, ceiling floor** at all floor levels, **galvanised mild steel tubes(medium grade)** TATA / ZENITH / ASIAN / JINDAL MAKE of the following nominal bore, tube, fittings & clamps incl. making good the wall ceiling and floor etc. complete.				
		(A) 15 mm. dia.	5.00	158.57	R.M.	792.85
		(B) 25 mm. dia.	5.00	274.72	R.M.	1373.60
		(C) 40 mm. dia.	5.00	421.17	R.M.	2105.85
		(D) 50 mm. dia.	0.00	519.14	R.M.	0.00
166	63	Providing and fixing **15mm Dia bib tap** with wall Flange at all floor levels,polished bright etc. Comp.				
		Make -Cera,Parry ware, Hindware	20.00	675.00	No.	13500.00
		Make -Jaquar	10.00	800.00	No.	8000.00
167	64	Providing & Fixing **gun metal check or non return full way wheel valve** at all floors levels, etc. complete.				
		(A) 15 mm. dia.	10.00	220.18	No.	2201.80
		(B) 25 mm. dia.	10.00	490.86	No.	4908.60
		(C) 40 mm. dia.	5.00	772.65	No.	3863.25
168	Self.Expl.	Providing and fixing Screw down stop taps (a) 15 mm. dia.	40.00	241.39	No.	9655.60
169	65	Providing & fixing Metropole flush valve with wall flange 25mm with lever Knob at all floor levels, of approved quality incl. Fixing in pipe line etc. Comp				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	1690.00	No	8450.00
170	66	Providing & Fixing C.P. Brass screw down bib tap at all floor levels, polished bright etc. comp.-(A) 15mm dia. For all Floors	20.00	194.93	No.	3898.60
171	Self.Expl.	Providing **Flush Cock** consisting lever, cartridge sleeve & flange & concealed part				
		Make -Cera,Parry ware, Jaquar, Hindware	30.00	1050.00	No.	31500.00
172	Self.Expl.	Providing & fixing **15mm C.P. Brass angle valve** (stop cock) with C.P. Copper connecting pipe 450mm long and nuts, washer and brass flange complete, including cutting and making good the wall where required.				
		Make -Cera,Parry ware, Hindware	8.00	550.00	No.	4400.00
		Make -Jaquar	2.00	750.00	No.	1500.00
173	Self.Expl.	Providing and fixing C.P. Brass **pillar cock** with copper connection ,C.P. Brass screws complete				
		Make -Cera,Parry ware, Hindware	20.00	700.00	No.	14000.00
		Make -Jaquar	2.00	800.00	No.	1600.00
174	Self.Expl.	Providing and fixing **waste Pipe** for Washbasin or sink (A) 32 mm Dia	20.00	99.08	No.	1981.60
175	Self.Expl.	Providing and fixing **Supply Pipe** for Washbasin or sink	20.00	80.00	No.	1600.00
176	Self.Expl.	Providing and fixing Jet Sprey Cock at all floor level etc. complete.	4.00	500.00	No.	2000.00
177	Self.Expl.	Providing and fixing				
		(A) 40 mm thick RCC cover for simple chamber,s.w.trap & tank Top	5.00	400.00	No.	2000.00
		(B) PVC water tank cover upto 2000 Lit.	5.00	200.00	No.	1000.00
178	Self.Expl.	Supplying and fixing C.I. cover 300 mm X 300mm. without frame for gully trap (standard pattern) the weight of cover to be not less than 4.53 Kg.	5.00	660.00	No.	3300.00
179	67	Providing and fixing **C.I. Manhole cover 0.60 x 0.45 mt. Size** having weight not less than 35 Kg. etc. complete.	0.00	1116.05	No.	0.00
180	91	Providing & Fixing **U-PVC pipe (SWR)** confirming to IS no. 13592 **(Type "B")** of Prince/Supreme/Jain/Astral/Tulsi make for soil and waste discharge system at all floor levels incl. All fixtures like bends, tees, shoe etc. jointed with resin of approved brand & manufacture etc. comp. (M.R.)				
		(A) 75mm Dia	45.00	225.00	R.M.	10125.00
		(B) 110 mm. Dia.	45.00	313.00	R.M.	14085.00
		(C) 160 mm. Dia.	5.00	552.00	R.M.	2760.00
181	91A	Providing & fixing **U-PVC pipes** Confirming to IS no. 13592 **(Type "A")** of Prince/Supreme/Jain/Astral/ Tulsi make for rain water at all floor levels incl. fixtures like bends, tees, shoe etc joined with resin of approved brand & manufacture etc. comp. (M.R.) .				
		(A) 75 mm. Dia	120.00	141.00	R.M.	16920.00
		(B) 110 mm. Dia.	120.00	227.00	R.M.	27240.00
		(C) 160 mm. Dia.	0.00	449.00	R.M.	0.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
182	Self.Expl.	Providing, Laying and jointing on true line and level **UPVC pipe (SCH-40)** line of **Prince/Supreme/Jain/Astral/ Tulsi/Finolex** make including fittings make or equivalent as approved by angineer-in-charge. Pipe shall be fixed on the wall the help of clamp at every two meter C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.				
		(A) 15 mm dia.	50.00	85.75	R.M.	4287.50
		(B) 25 mm dia.	30.00	108.07	R.M.	3242.10
		(C) 32 mm dia.	30.00	140.39	R.M.	4211.70
		(D) 40 mm dia.	20.00	174.73	R.M.	3494.60
		(E) 50 mm dia.	10.00	231.29	R.M.	2312.90
		(F) 65 mm dia.	0.00	330.00	R.M.	0.00
183	Self.Expl.	Providing & Fixing **P.V.C. pipes (SCH-80)** of **Prince/ Supreme/ Jain/ Astral/ Tulsi/Finolex** make for water supply line at all floor levels incl. fixtures like bends, tees, shoe etc joined with resin of approved brand & manufacture etc. comp. Pipe shall be fixed on the wall the help of clamp at every two meter C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.				
		(A) 15 mm dia.	30.00	83.00	R.M.	2490.00
		(B) 25 mm dia.	30.00	140.00	R.M.	4200.00
		(D) 40 mm dia.	30.00	214.00	R.M.	6420.00
		(E) 50 mm dia.	30.00	274.00	R.M.	8220.00
		(F) 65 mm dia.	30.00	495.00	R.M.	14850.00
184	56	Providing & Fixing **PVC Nanhi trap** $3^1/_2$" ht.of **Prince/ Supreme/ Jain/ Astral/ Tulsi/Finolex** make at all floor levels of self cleaning design with screwed down or hinged grating incl. cost of cutting making good the walls & floors etc. For all Floor	15.00	119.00	No.	1785.00
185	Self.Expl.	Providing and fixing 100x 100 mm Size **P.V.C /C.I Greting (Jali**) for Nani Trap.	15.00	43.63	No.	654.45
186	74	Providing & Fixing in position **PVC Cowl vent** to pipes of Prince/Supreme/Jain make etc.Comp.				
		(A) 75 mm. dia.	7.00	32.00	NO	224.00
		(B) 110 mm Dia.	7.00	52.00	NO	364.00
187	74A	Providing & fixing **M.S. Holder Bat clamps** at all floor levels of approved design to C.I. Or S.C.I pipes including the cost of cutting holes & making good the wall etc. Complete - 100 mm. dia. (M.R.)	10.00	15.00	No.	150.00
188	Self.Expl.	Providing & fixing **G.I./Aluminum Patti clamps** at all floor levels of approved design to C.I. Or S.C.I pipes including the cost of cutting holes & making good the wall etc. Complete - 100 mm. dia. (M.R.)	5.00	10.00	No.	50.00
189	Self.Expl.	Providing & Fixing **Kathi around the vertical PVC drainage pipes** for concealing with cement plaster 20 mm avg thickness(CM 1:3 [1 cement :3 coarse sand]) finishing as per instruction given by Eng. incharge. for				
		(A) 75 mm PVC PIPE	0.00	102.00	R.M.	0.00
		(B) 100 mm /110 mm PVC PIPE	0.00	129.00	R.M.	0.00
190	92	Providing erecting and fixing double coated **Syntex/Super/Reno PVC (ISI)** mark water tank of required capacity each with all necessary fittings & connection etc. complete on terrace.	1000.00	4.65	Lit.	4650.00
191	136	Providing & construction **Septic tank** as per the drawing clear **size 4.0 mt.x 1.40mt.x1.60 mt.** incl. Necessary excavation & refilling & disposing the surplus excavated earth within 50 mt. lead incl. bedding of 25cm th' brick masonary in C.M.1:6 & partition wall in C.M. 1:4 incl. 10mm th' cement plaster in C.M.1:4 to brick wall & 15 cm. th'. R.C.C slab on the top using 1:2:4 C.C excluding reinforcement as per the structural design with fixing C.I cover of 0.60mt.x 0.45mt.size & wt. Not less than 35 Kg. & providing necessary fittings as per drawing or as directed by Engineer in charge etc. comp. (Steel- 84.21 Kg.)	0.00	35378.28	No.	0.00
192	136A	Providing & construction **Septic tank** as per the drawing clear s**ize 8.0 mt.x 2.6mt.x1.34 mt.** incl. Necessary excavation & refilling & disposing the surplus excavated earth within 50 mt. lead incl. bedding of 25cm th' brick masonary in C.M.1:6 & partition wall in C.M. 1:4 incl. 10mm th' cement plaster in C.M.1:4 to brick wall & 15 cm. th'. R.C.C slab on the top using 1:2:4 C.C excluding reinforcement as per the structural design with fixing C.I cover of 0.60mt.x 0.45mt.size & wt. Not less than 35 Kg. & providing necessary fittings as per drawing or as directed by Engineer in charge etc. comp.. (Steel- 315.0 Kg.)	0.00	100560.25	No.	0.00
193	137	Providing & constructing **soak pit** as per drawing clear **size 2.0 mt. dia. & 6mt.depth** with necessary excavation,refilling&disposing of surplus excavated earth within 50 mt. lead, constructing 23 cm th.masonary in C.M. 1:6 for 3.0mt below G.L, incl.10 cm th. R.C.C slab on top using C.C. 1:2:4 excluding the reinf. As per the structural design with fixing C.I. cover 0.6mt. x 0.45mt.size weight not less than 35 Kg. & pro. Necessary filling as per drawing or as directed by Engineer-in-charge etc. (Steel- 31.5 Kg.)	0.00	21582.69	No.	0.00
194	76	Providing & laying ordinary C.C.1:1.5:3 mix for R.C.C. work incl. boxing, centering, vibrating, curing & mixed with approved water proofing cement compound or "CEMWET"or"PIDICRETE LW"integral water proofing admixture as water proofing agent to be mixed with 50 kg. cement bag shall be as recommended by the manufacture of the water proofing material, concrete work for top, bottom slab & side pardi for **Under ground Tank** & Item incl. Necessary excavation & refilling the available earth, 15 cm th' C.C 1:4:8 for bedding concrete, Half B.M. in C.M. 1:4 outside wall, inside R.C.C. pardi as per design, 10mm.th. water proofing cement plaster in C.M. 1:3 with smooth finishing,watering etc.Comp.to all inner face & bottom of tank curing etc. comp. incl. Locking arrangement, outlet, inlet, overflow & wash out pipe arrangement as necessary & C.I. Cover 0.60 x .045 weight not less then 35kg. etc. com. as per structural drawing excluding Steel & as directed by Engineer-in-charge				

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
		Underground tank	0.00	4.60	Lit.	0.00
195	138	Providing & Laying **Commercial Quality white glazed tiles** 6mm. th. in flooring laid on a bed of 20 mm. Av. Th.C.M.1:3(1cement :3 sand) & on wall Of R.C.C. Tank with necessary cement paste for fixing and joined with white cement slurry etc. complete. finished with flush pointing in white cement etc.com.	0.00	0.90	Lit.	0.00
196	89C	Providing and **filling** in depressions of Bath and W.C. At all floor levels, after completing plumbing work of pans, pipes,traps etc.**with cinder or fly ash** as directed by Engineer in charge etc. comp..	0.00	470.00	C.M.	0.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
197	89A	NOTE :- (1) The whole work is to be executed through specialized agency with a guarantee of 10 (Ten) years given on a prescribed proforma duly stamped (2) The rate shall include for work at all floors & conducting water proof test as directed. (M.R.)				
		(A) Providing and laying **water proofing treatment** to vertical and horizontal surfaces of depressed portions of **W.C.,kitchen** and the like consisting of : (a) I course of applying cement slurry @ 4.4 kg/sqm mixed with water proofing compound conforming to IS : 2645 in recommended proportions. (b) II course of a layer of plaster in C.M. 1:3 with water proofing compound confirming to IS:2645 about 25 mm. th' in the floor of the depression & about 18mm th' On the side walls of the depression up to the floor level, water proofing plaster about 18 mm. th' be continued on the walls above the floor level for a height of 600 mm. with surface suitable to receive further treatment (c) Finishing top with stone aggregate 10mm to 12mm nominal size spreading @0.008 C.M./S.M., thoroughly embedad in plaster layer. as per specifications & instructions of Engineer in charge (Cement consumption 0.316 Bags / S.M.)	0.00	261.00	S.M.	0.00
		(B) Providing and laying integral cement based **water proofing treatment** including preparation of surface as required for treatment of **roofs, balconies, terraces** etc. consisting of following operations. (a) Applying and grouting a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with proprietary water proofing compound comforming to IS:2645 over the R.C.C. slab including cleaning the surface before tratment. (b) Laying cement concrete using broken bricks/brick bats 25 mm to 100 mm size with 50% of cement mortar 1:5 (1 Cement : 5 Coarse sand) admixed with proprietary water proofing compound conforming to IS:2645 ,brick bats is finally covered by jointless cement plaster 20mm th. in C.M. 1:4 added with special water proofing compound confirming to IS:2645 & top smooth finished with trowel with false chequered marking of 300 mm.size.The treatment is carried along the vertical surface of the parapet & other adjoining wall up to height of about 300 mm in a shape of quarter round vata Incl. curing etc. Comp. With average thickness of 120 mm and minimum thickness at khurra as 65 mm.	0.00	442.000	S.M.	0.000
		(c) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be down in order and as directed and specified by the engineer-in-charge. With average thickness of 120 mm and minimum thickness at khurra as 65 mm. (Cement consumption 0.511 Bags / S.M.)				
198	89B	Proiding & laying water **proofing treatment to vertical** and horizontal surfaces like consisting of (a) I course of applying cement slurry 4.4 kg per sq.mt. mixed with water proofing compound confirming to IS:2645 in rcommended proportions. (b) II corse of 20mm cement plaster 1:3 mixed with water proofing compound in recommended proportion (c) III course of applying blown or / resideal bitumen applied hot at 1.7 kg per sqm of area. (d) IV course of 400mm micron th. PVC sheet. (Overlaps at joints of PVC sheet should be 200mm wide and pasted to each other with bitumen about 1.7 kg./ sqm.)	0.00	425.00	S.M.	0.00
199	Self.Expl.	Pro & Const. **water Proofing Cement vata** of 10 cm size in C.M 1:1 etc complete.	10.00	22.60	R.M	226.00
200	75	Providing & fixing **G.I. Rain water spout** of 50 mm.dia & 30 cm length etc.	0.00	109.08	No.	0.00
201	53A	Prov.& Fixing **water closet squatting pan (Orissa type W.C.pan)** at all floor levels, size 580mm incl. 100 mm size "P'or "S" trap for water closet squatting pan joining the trap with the pan & soil pipe in C.M. 1:1 (1cement :1 fine sand) etc. Comp.(A) Vitreous china long pattern of **approved colour** For all Floor	2.00	914.25	No.	1828.50
202	53B	Providing and fixing **Wash Down Water closet European type W.C. pan** with integral P or S trap including jointing the trap with soil pipe in cement mortar 1:1 (1 cement : 1 find sand) (seat and cover to be measured and paid for separately) (A) Viterous china pattern - I (i) in **approved colour**	2.00	896.88	No.	1793.76
203	Self Ex pl.	Providing & fixing **wash basin** with single hole for pillar tap at all floor levels, with C.I. or M.S. Brackets painted white incl. cutting holes & making good the same incl. fittings such as **pillar tap**, capstan head screw down high pressure with screws, shanks & back nuts, **C.P. Brass waste trap,** screw down **stop tap 15 mm. dia**. etc. complete. (A) Vitreous china flat back wash basin **550 mm.x 400 mm. size** in **approved colour** For all Floor	3.00	1629.53	No.	4888.59
204	Self Ex pl.	Providing & fixing **Urinal** or approved quality including conecting the Urinal with waste pipe, tap etc. complete. (A) White earthenware flat back or corner type size 430 mm x 260mm x 350mm	0.00	667.61	No.	0.00
205	M-67	Providing & Fixing chromium plated brass half turn **flush cock** at all floor levels, of approved quality incl. fixing in pipe line etc. Comp.-- 25 mm dia.	7.00	311.08	No.	2177.56
206	66	Providing & Fixing **abonite ball cock** of approved qualities directed etc. comp. (A) 25 mm. dia.	7.00	121.20	No.	848.40
207	Self.Expl.	**Part -B WATER BORING**				
A	Self.Expl.	Labour charges for 6" Dia. Drilling in all Kind of soil up to required depth with necessary gravel packing etc,all comp.	0.00	344.40	R.M	0.00
B	Self.Expl.	Providing & Erecting 5"inch P.V.C. plain CS pipe of standard make (Finolex,Sumolex,Ashirwad) to be erected as casing pipe in bore etc.comp.	0.00	393.60	R.M	0.00
C	Self.Expl.	Providing & Erecting 5"inch P.V.C.stainer of standard make (Finolex,Sumolex,Ashirwad) to be erected as casing pipe in bore etc.comp.	0.00	426.40	R.M	0.00
D	Self.Expl.	Providing & Lowering 40" Dia, H.D.P.E. Std. pipe of standard make (Jindal) with required fitting etc. comp. as directed	0.00	80.36	R.M	0.00
E	Self.Expl.	Providing & Lowering 25" Dia, G.I.Std. pipe of standard make with required fitting etc. comp. as directed	0.00	321.44	R.M	0.00
F	Self.Expl.	Providing & fixing bend, Coupling, M.S. clamp, Adaptor Set with Required	0.00	3000.00	No.	0.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
G	Self.Expl.	Providing & Lowering of standard make pump set with necessary ISI cable,SD starter switch all Required, Pump set having capacity of 106 LPM at 40 mtr. head capacity 2HP all comp.	0.00	21500.00	No.	0.00
			AMOUNT			**1905589.04**
			21.99% BELOW AS PER T.C			419039.03
			GRAND AMOUNT			**1486550.01**
			SAY			**1486550.00**

Executive Engineer
Central Zone
Surat Municipal Corporation

SURAT MUNICIPAL CORPORATION
EAST (VARACHHA) ZONE-A
ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS MUNICIPAL AAGANWADI, WARD OFFICE, READING ROOM AND OTHER MUNCIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT.
SCHEDULE-B

S.O.R. 2015-16

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
		Part -A Civil Work.				
1	112A	Demolition and disposal of unserviceable materials with all lead and lift (ii) Unreinforced cement concrete.	10.00	386.83	C.M.	3868.30
2	112	Demolition including stacking of serviceable materials and disposal of unserviceable materials with all lead & lift.				
		(i) RCC work	10.00	671.65	C.M.	6716.50
3	113	Demolition of brick work and stone masonary including stacking of serviceable materials and disposal of unserviceable materials with all lead & lift.				
		(II) in Cement mortar.	10.00	349.46	C.M.	3494.60
4	114	**Removing the scraping of old deteriosted plaster** of any thickness from wall/R.C.C. member including strcking of serviceable material and disposal of unserviceable from site of work with all lead and lift.	10.00	12.42	S.M.	124.20
5	115	Dismentalling tiled or stone floors laid in mortar including stacking of serviceable materials and disposal of unserviceable materials with all lead & lift.	20.00	30.30	S.M.	606.00
6	115A	Dismantling doors windows ventilators etc. (wood or steel) shutters including chowkhats, Architraves, holdfasts and other attachment etc. comp. and stacking them within all lead & lift. (I) not exceeding 3 sq.m. in area.	10.00	119.18	No.	1191.80
7	116	Dismantling sanitary fittings like wash basin, w.c. pan Indian and Europeans type, flushing tank etc. including stacking the materials with all lead & lift.	10.00	257.55	No.	2575.50
8	Self.Expl.	Dismantling PVC pipe / A.C Rainwater /G.I pipes pipes with fittings and clamps including stacking the materials with all lead and lift. (For all floors).	10.00	47.47	R.M	474.70
9	Self.Expl.	Dismentalling of sheet roofing including ridges,valleys, gutter etc.stacking of serviceable materials and disposal of unserviceable materials with all lead and lift (a) G.I.Sheet Roffing.	10.00	30.30	S.M.	303.00
10	Self.Expl.	Dismentalling barbed wire in fencing including making rolls and also including dismentaling posts including all earth work concrete in base and making good the disturbed ground staking useful materials as directed and disposeing of the unserviceable materials with all lead and lift.	10.00	42.42	R.M	424.20
11	Self.Expl.	Dismentalling G.I. chain link fencing including making rolls and also including dismentaling posts including all earth work concrete in base and making good the disturbed ground staking useful materials as directed and disposeing of the unserviceable materials with all lead and lift.	0.00	25.00	S.M.	0.00
12	Self.Expl.	Dismentalling of Bombay type Railing including dismentaling posts making good the disturbed ground staking useful materials as directed and disposeing of the unserviceable materials with all lead and lift.	0.00	15.00	R.M	0.00
13	Self.Expl.	Refixing of old Bombay type Railing including cutting, welding etc comp...	0.00	25.00	R.M	0.00
14	90	Boring holes 3.5 mt.deep in ordinary soil (for cast in situ piles) & disposal of the surplus excavated soil as directed within a lead of 50 M. For following diameter of piles.				
		(1) 200 m.m.	0.00	167.66	R.M.	0.00
		(2) 250 m.m.	15.00	189.48	R.M.	2842.20
		(3) 300 m.m.	10.00	227.45	R.M.	2274.50
15		Excavation for foundation includ.sorting out & stacking of useful materials & disposing of the excavated stuff upto 50 mt. Lead & all lift, watering etc. Comp.				
	1 (A)	**With Machinaries**				
		(A) Loose or Soft soil				
		(1) Up to 1.5 Mt. depth	15.00	67.97	C.M.	1019.55
		(2) 1.5 to 3.0 Mt. depth	10.00	75.35	C.M.	753.50
	1 (B)	**With Manual Labour**				
		(A) Loose or Soft soil				
		(1) Up to 1.5 Mt. depth	15.00	123.22	C.M.	1848.30
		(2) 1.5 to 3.0 Mt. depth	10.00	136.35	C.M.	1363.50
16	88A	Providing & Laying **C.C1:5:10** (1cement :5coarse sand :10 graded stone agg. 40 m.m Nominal size)& curing comp. incl. cost of from work in :Foundation & Plinth	10.00	2058.38	C.M.	20583.80
17	88	Providing & laying cement concrete **1:4:8** (1 cement:4 sand:8 graded stone agg. 40 mm nominal size) & curing comp. incl.cost of form work in **(A) Foundation and Plinth**	10.00	2259.37	C.M.	22593.70

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
18	88B	Providing & laying **C.C 1:3:6** (1cement :3 coarse sand :6 Crushed stone agg 20m.m Nominal size) & curing comp. incl. cost of form work in :(a) foundation & Plinth	10.00	2510.86	C.M.	25108.60
19	3	Providing & laying cement concrete **1:1.5:3** (1 cement:1.5 sand:3 graded stone agg. 20 mm nominal size)& curing comp. Includ.cost of form work but exclu. Cost of reinforcement for reinforced concrete work in : **(A) Foundation, footing, Base of columns and Mass concrete.**	12.00	3666.06	C.M.	43992.72
20	5A	Providing & laying ordinary cement con.**1:1.5:3** (1cement:1.5sand: 3 graded stone agg. 20 mm nominal size) finishing smooth curing etc. comp. Incld. Cost of form work but excl. Cost of reinforcement for R.C.C. Work in : Up to G.L./P.L.				
		(A) COLUMNS:				
		(1)Having c/s area up to 0.085 sq.mt	5.00	7810.09	C.M.	39050.45
		(2) Having c/s area more than 0.085 sq. mt. & upto 0.12 sq.mt	5.00	7081.88	C.M.	35409.40
		(3) Having cross sectional area more than 0.12 sq. mt.	1.00	6229.44	C.M.	6229.44
		(B) BEAMS :				
		(1)Having c/s area up to 0.08 sq.mt	5.00	6523.35	C.M.	32616.75
		(2) Having c/s area more than 0.08 sq. mt. & upto 0.12 sq.mt	5.00	6052.69	C.M.	30263.45
		(3) Having cross sectional area more than 0.12 sq. mt.	1.00	5502.24	C.M.	5502.24
21	7	Providing & fixing **TMT/ CRS Bar** reinforcement for R.C.C. work incl. bending, binding & placing in position etc. comp. Upto G.L./P.L.	300.00	44.84	Kg.	13452.00
22	8	Providing & construction brick work using Fly Ash bricks having crushing strength not less than 70 Kg./sq.cm. in foundation & plinth in C.M. 1:6 (1 cement:6 sand) etc. comp. Up to G.L./P.L.	30.00	2914.86	C.M.	87445.80
23	14	Filling in trenches **with available excavated earth** in layer not exceeding 20cm in depth consolidating each deposited layer by ramming & watering	10.00	79.79	C.M.	797.90
24	13	Providing & filling in plinth with **yellow soil or selected soil** in layers of 20 cm. Th'. Incl. watering, ramming & consolidation etc. complete.	70.00	254.52	C.M.	17816.40
25	19	Providing & applying **20mm.th. Sand faced cement plaster** on walls or similar surfaces at all floor levels consisting of 12 mm. Av. th'. backing coat of C.M. 1:3(1 cement :3 sand) & 8 mm.th. Finishing coat of C.M.1:1 (1 cement: 1 sand)--- Upto G.L./P.L &	120.00	210.08	S.M.	25209.60
26	5A	Providing & laying ordinary cement con.**1:1.5:3**(1cement:1.5sand:3 graded graded stone agg. 20 mm nominal size) finishing smooth curing etc. comp. Incl.. Cost of form work but excl. Cost of reinforcement for R.C.C. Work in :				
		(A) COLUMNS:				
		(1) Having c/s area up to 0.085 sq.mt				
		Ground Floor	5.00	7810.09	C.M.	39050.45
		First Floor	3.00	7844.03	C.M.	23532.09
		Second Floor	2.00	7877.96	C.M.	15755.92
		Terrace (third) Floor	1.00	7911.90	C.M.	7911.90
		(2) Having c/s area more than 0.085 sq. mt. & upto 0.12 sq.mt				
		Ground Floor	3.00	7081.88	C.M.	21245.64
		First Floor	2.00	7115.82	C.M.	14231.64
		Second Floor	1.00	7149.75	C.M.	7149.75
		Terrace (third) Floor	1.00	7183.69	C.M.	7183.69
		(3) Having cross sectional area more than 0.12 sq. mt.				
		Ground Floor	2.00	6229.44	C.M.	12458.88
		First Floor	1.00	6263.38	C.M.	6263.38
		Second Floor	1.00	6297.31	C.M.	6297.31
		Terrace (third) Floor	1.00	6331.25	C.M.	6331.25
		(B) BEAMS :				
		(1) Having c/s area up to 0.085 sq.mt				
		Ground Floor	5.00	6523.35	C.M.	32616.75
		First Floor	5.00	6557.29	C.M.	32786.45
		Second Floor	2.00	6591.22	C.M.	13182.44
		Terrace (third) Floor	1.00	6625.16	C.M.	6625.16
		(2) Having c/s area more than 0.085 sq. mt. & upto 0.12 sq.mt				
		Ground Floor	5.00	6052.69	C.M.	30263.45
		First Floor	2.00	6086.63	C.M.	12173.26
		Second Floor	1.00	6120.56	C.M.	6120.56
		Terrace (third) Floor	1.00	6154.50	C.M.	6154.50
		(3) Having cross sectional area more than 0.12 sq. mt.				
		Ground Floor	2.00	5502.24	C.M.	11004.48
		First Floor	1.00	5536.18	C.M.	5536.18
		Second Floor	1.00	5570.11	C.M.	5570.11
		Terrace (third) Floor	1.00	5604.05	C.M.	5604.05

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
		(C) SLABS :				
		(1) Slabs having more than 8cm. and upto 10 cm. Th'.				
		Ground Floor	2.00	5838.57	C.M.	11677.14
		First Floor	2.00	5872.51	C.M.	11745.02
		Second Floor	1.00	5906.44	C.M.	5906.44
		Terrace (third) Floor	1.00	5940.38	C.M.	5940.38
		(2) Slabs having more than 10 cm. & upto 13 cm. Th'.				
		Ground Floor	2.00	5561.83	C.M.	11123.66
		First Floor	2.00	5595.77	C.M.	11191.54
		Second Floor	1.00	5629.70	C.M.	5629.70
		Terrace (third) Floor	1.00	5663.64	C.M.	5663.64
		(3) Slabs having more than 13 cm. Thickness				
		Ground Floor	2.00	5285.09	C.M.	10570.18
		First Floor	1.00	5319.03	C.M.	5319.03
		Second Floor	1.00	5352.96	C.M.	5352.96
		Terrace (third) Floor	1.00	5386.90	C.M.	5386.90
		(D) LINTELS:				
		Ground Floor	2.00	5930.48	C.M.	11860.96
		First Floor	2.00	5964.42	C.M.	11928.84
		Second Floor	1.00	5998.35	C.M.	5998.35
		Terrace (third) Floor	1.00	6032.29	C.M.	6032.29
		(E) CHAJJAS:				
		Ground Floor	2.00	3942.30	C.M.	7884.60
		First Floor	2.00	3976.23	C.M.	7952.46
		Second Floor	1.00	4010.17	C.M.	4010.17
		Terrace (third) Floor	1.00	4044.11	C.M.	4044.11
27	3	Providing & laying ordinary cement con.**1:1.5:3**(1cement:1.5sand:3 graded graded stone agg. 20 mm nominal size) finishing smooth curing etc. comp. Incl.. Cost of form work but excl. Cost of reinforcement for R.C.C. Work in : .				
		(A) Stair cases including landings etc				
		Ground Floor	1.00	4813.13	C.M.	4813.13
		First Floor	1.00	4847.06	C.M.	4847.06
		Second Floor	1.00	4881.00	C.M.	4881.00
		Terrace (third) Floor	0.00	4914.94	C.M.	0.00
		(B) Vertical and horizontal fins				
		Ground Floor	2.00	6885.56	C.M.	13771.12
		First Floor	2.00	6919.49	C.M.	13838.98
		Second Floor	2.00	6953.43	C.M.	13906.86
		Terrace (third) Floor	0.00	6987.37	C.M.	0.00
28	7	Providing & fixing **TMT / CRS Bar** reinforcement for R.C.C. work incl. bending, binding & placing in position etc.comp.				
		Ground Floor	100.00	44.84	Kg.	4484.00
		First Floor	100.00	45.45	Kg.	4545.00
		Second Floor	100.00	46.06	Kg.	4606.00
		Terrace (third) Floor	70.00	46.66	Kg.	3266.20
29	9	Providing & construction **brick work** using Fly Ash bricks having crushing strength not less than 70 Kg./sq.cm. in foundation & plinth in **C.M. 1:6** (1 cement:6 sand) etc. comp.				
		Ground Floor	20.00	3081.51	C.M.	61630.20
		First Floor	15.00	3116.86	C.M.	46752.90
		Second Floor	5.00	3152.21	C.M.	15761.05
		Terrace (third) Floor	1.00	3187.56	C.M.	3187.56
30	12	Providing & constructing **Half brick masonary** in Fly Ash bricks having crushing strength not less than 70 kg/sq.cm in **c.m 1:4** (1 cement: 4 sand) curing etc complete.				
		Ground Floor	15.00	445.41	S.M.	6681.15
		First Floor	10.00	450.36	S.M.	4503.60
		Second Floor	5.00	455.31	S.M.	2276.55
		Terrace (third) Floor	1.00	460.26	S.M.	460.26
31	139	Uncoursed rubble masonary with hard stone of approved quality in foundations and plinth in **cement mortar 1:6** (1 Cement : 6 sand) including leveling up etc. complete.	5.00	1963.44	C.M.	9817.20
32	140	Pointing on Coursed stone masonary with cement mortar 1:3 (1 cement : 3 Sand) ---				
		(A) Flush Pointing	1.00	56.36	S.M.	56.36
		(B) Ruled Pointing	1.00	57.97	S.M.	57.97
33	141	Pointing on Uncoursed stone masonary with cement mortar 1:3 (1 cement : 3 Sand) ---				
		(A) Flush Pointing	1.00	66.66	S.M.	66.66
		(B) Ruled Pointing	1.00	69.08	S.M.	69.08

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
34	126	Providing **Rubble Pitching** with hard stone of approved quality in cement mortar 1:6 (1 Cement : 6 Coarse sand) including leveling up ,Curing etc. complete excluding pointing	1.00	2410.00	C.M.	2410.00
35	127	Providing **Dry Rubble Pitching** of various thicknessto required grade including trimming of earth work hand packing the interstics with Quarry Spalls complete for all leads and lifts.	1.00	907.99	C.M.	907.99
36	36	Providing & fixing **precast C.C. jali** or grill 1:2:4 mix (1cement:2 coarse sand : 4 graded stone agg. 6 mm nominal size) reinforced with1.6mm dia. sand :4 graded stone agg.agg.6mm nominal size)reinforced mild steel wire incl.. roughening,cleaning,fixing& finishing in C.M. 1:3 & curing comp.(A) 40 mm. Thick				
		Ground Floor	5.00	428.24	S.M.	2141.20
		First Floor	1.00	434.60	S.M.	434.60
		Second Floor	0.00	440.97	S.M.	0.00
		Terrace (third) Floor	0.00	447.33	S.M.	0.00
37	16	Providing & Applying **10mm.th.cement plaster** in single coat on brick/ concrete walls similar surfaces for plastering & finished even & smooth with a floating coat of cement slurry mixed with admixture of lime or neeru in required proportion etc. comp. in C.M 1:3 (1 cement : 3sand)				
		(A) For wall and similar surfaces				
		Ground Floor	100.00	114.13	S.M.	11413.00
		First Floor	50.00	132.01	S.M.	6600.50
		Second Floor	20.00	149.88	S.M.	2997.60
		Terrace (third) Floor	10.00	167.76	S.M.	1677.60
		(B) For ceilings & soffits of stairs				
		Ground Floor	50.00	129.89	S.M.	6494.50
		First Floor	20.00	146.45	S.M.	2929.00
		Second Floor	20.00	163.01	S.M.	3260.20
		Terrace (third) Floor	10.00	179.58	S.M.	1795.80
38	19	Providing & Applying **20mm.th. Sand faced cement plaster** on walls or similar surfaces at all floor levels consisting of 12 mm. Av. Th. backing coat of C.M. 1:3(1 cement :3 sand) & 8 mm.th. Finishing coat of C.M.1:1 (1 cement: 1 sand) - GroundFloor,FirstFloor,Second Floor and Third(Terrace) Floor	100.00	210.08	S.M.	21008.00
39	19A	Providing and Applying 20mm th. Roller Plaster on walls and similar surfaces on all floors levels consisting of 12 mm Avg. backing coat of CM 1:3 and 8mm th. finishing coat of CM 1:1 on all floors	20.00	288.00	SM	5760.00
40	20	Providing **35 mm wide throating or plaster drip** and moulding it to R. C. C. chajja etc. comp.. For all floor	20.00	25.25	R.M.	505.00
41	20A	Providing **20 mm deep finished groove** in plaster in line and level etc. Comp. For all Floor (M.R.)	20.00	27.00	R.M.	540.00
42	44	Providing & Laying **green polished kota stone slab flooring** at all floor levels,over 20 mm av.th.base of C.M. 1:6(1cement: 6 sand) laid over&joined with grey cement slurry incl. Rubbing & polishing etc. comp. (A) 22 mm. (Tolerance +/- 2mm) For all Floor	30.00	595.90	S.M.	17877.00
43	45	Providing & Laying **polished kota stone** of machine cut edge slab 22 mm. th. in riser of steps, tread, dedo & pillars center piece not less than 1.2 mt.in width &side pieces of equal size as per design, laid on 10 mm.th. C.M.1:3(1 cement:3 sand)joined & polishing etc. For all Floor	20.00	651.45	S.M.	13029.00
44	46	Providing & Laying white **glazed tiles** 6mm. th. of Orient, Kajaria, Jhonson,Nitco,Somani ,Bell make at all floor levels, **in flooring**, treads of steps & landings laid on a bed of 20 mm. Av. Th.C.M.1:3(1cement :3 sand) finished with flush pointing in white cement etc.com. For all floors (Basic Rate:- Rs.285.0/S.M.)	20.00	544.39	S.M.	10887.80
45	47	Providing & Laying white **glazed tiles** 6mm. th. Of Orient, Kajaria, Jhonson,Nitco,Somani,Bell make at all floor levels in **skirting** risers of steps & dado on 10 mm. th. C.M.1:3(1cement :3 sand) including necessary cement paste for fixing and joined with white cement slurry etc. complete. For all floors (Basic Rate:- Rs.285.0/S.M.)	20.00	563.58	S.M.	11271.60
46	97	Providing and laying **Ceramic tiles 8mm th.** of Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro make **in flooring treads of steps and landing** laid on bed of 12 mm thick cement mortar 1:3 (1 Cement : 3 Sand) finished with flush pointing in white cement. (Basic Rate:- Rs.306.0/S.M.)	10.00	580.75	S.M.	5807.50

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
47	98	Providing & Laying **ceramic tiles 8mm th.** of Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro make **in skirting, risers of steps and landings** laid on 10mm thick cement mortar 1:3 (1 Cement : 3 sand) pointing in white cement and jointed with white slurry. (Basic Rate:- Rs.360.0/S.M.)	10.00	627.21	S.M.	6272.10
48	101	Providing & laying **marble stone slab flooring** over 20 mm.av. base of C.M.1:6 (1 cement :6 coarse sand) & jointed with grey cement slurry incl. rubbing & polishing comp.(A) Marble slab 25 mm. Thick. (Basic Rate :- Rs.701 / S.M.)	10.00	1358.45	S.M.	13584.50
49	102	Providing & laying **granite slab 18mm thick in flooring, treads of steps and landing** laid on bed of 20mm thick cement mortar 1:6 (1 Cement : 6 coarse sand) or lime mortar 1:1.5 laid and finished with flush pointing in white or colour cement including rubbing and polishing complete. (Basic Rate:- Rs.1614.0/S.M.)	30.00	2422.00	S.M.	72660.00
50	103	Providing & laying **granite slab 18mm thick in skirting, risers of steps, dedo and pillars** laid on 10mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand) and finished with flush pointing in white or colour cement including rubbing & polishing comp.. (Basic Rate:- Rs.1614.0/S.M.)	20.00	2457.00	S.M.	49140.00
51	Self.Expl.	Providing & laying **granite slab 18mm thick in Window-Door seal Frame Etc** laid on 10mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand) with nessary adhesive material and finished with flush pointing in white or colour cement, including rubbing & polishing comp.. (Basic Rate:- Rs.1200.0/S.M.)	30.00	1943.00	S.M.	58290.00
52	Self.Expl.	Labour Charges For Half Round Edge For Granite	10.00	150.00	R.M.	1500.00
53	Self.Expl.	Labour Charges For Quater Round Edge For Granite	10.00	90.00	R.M.	900.00
54	Self.Expl.	Labour Charges For Edge Finished For Granite	100.00	50.00	R.M.	5000.00
55	99	Providing & laying **Vitrified tiles of 8mm to 10mm thick** of Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro make **in flooring,treads of steps & Landing** laid on bed of 20 mm (Average) base of cement mortar 1:8 (1 Cement : 8 Coarse sand) or lime mortar 1:1.5 laid and finished with flush pointing in white or colour cement complete. **Size 24" x 24"**				
		(A) Light shade (Basic Rate-Rs.412.0/S.M.)	200.00	660.54	S.M.	132108.00
		(B) Dark shade (Basic Rate-Rs.412.0/S.M.)	100.00	669.63	S.M.	66963.00
56	100	Providing and laying **Vitrified tiles of 8mm to 10mm thick** of Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro make **in skirting, risers of steps and dedo** laid on 10mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand) and finished with flush pointing in white or colour cement comp. **Size 24" x 24"**				
		(A) Light shade (Basic Rate-Rs.412.0/S.M.)	150.00	826.00	S.M.	123900.00
		(B) Dark shade (Basic Rate-Rs.412.0/S.M.)	70.00	826.00	S.M.	57820.00
57	Self.Expl.	Providing and laying **Marbo Granite tiles** 8 to 10 mm thick, 24" x 24" in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand) finishing with flush pointing in white cement. (Basic Rate-Rs.412.0/S.M.)	10.00	660.54	S.M.	6605.40
58	41	Providing and laying chequered precast concrete tiles 22mm thick with aggregate of sizes upto 6mm in floors treads of steps and landing on 20mm thick bed of C.M. 1:6 (1 cement : 6 sand) or L.M. 1:1.5 (1 Lime putty : 1.5 sand) jointed with neat cement slurry with pigments to match the shade of the tiles.	10.00	375.72	S.M.	3757.20
59	M-49	Providing & Laying polished kota stone of machine cut edge patti of 10cm wide 22 mm. thk. in ramp flooring as per design, laid on 10 mm. th. C.M.1:3(1cement :3 sand) including necessary cement paste for fixing and joined with cement slurry etc. complete. For all floors.	10.00	98.00	R.M.	980.00
60	128	Providing & Constructing **polished Kotah stone cooking platform** 0.6mt. wide & 0.75mt. height, including one end side kota stone(Double Polish) of 1.25mt height & front kota stone patti of 10cm wide ,vertical partitions of half B.M wall in C.M 1:4 and 10mm th plaster in 1:3with finishing smooth with cement slurry as required and steel sink of 0.45mt x 0.45mt size of approved quality and make with required all fittings & Fxitures etc. Comp as per instruction given by site in charge at all floors	5.00	1947.00	R.M.	9735.00
61	Self.Expl.	Providing & fixing **35mm.th. Flush Door Solid Double Core type Both Face water proof Ply Vennered** & 1.5 mm th.laminate shall be pasted on both side with adhesives as specified by the manufacturers. The laminate shall be as per approved shade & texture, of make **incl. Sal wood frames of finished size 12cm x 7cm**.incl. S.S. Hinges with nessary screws & Anodized aluminum fixtures & fastenings For all Floor	10.00	3312.00	S.M.	33120.00
		Same as Above But Without Frame	10.00	2300.00	S.M.	23000.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
62	25	Providing & fixing **35mm.th. Indian teak wood shutters** for doors, windows & clearstory windows incl. **Sal wood frames of finished size 12cm x 7cm.**incl. Medium quality anodized aluminum fixtures & fastenings incl. Primer coat of approved quality & two coats of oil painting etc. For all Floor				
		(A) Fully Panelled	5.00	4430.87	S.M.	22154.35
		(B) Partly Panelled and Partely Galzed	5.00	3967.28	S.M.	19836.40
		(C) Fully Galzed	5.00	3525.91	S.M.	17629.55
63	Self.Expl.	Providing and laying cement concrete flooring 1:2:4 (1 cement : 2course sand : 4 graded stone aggregate 20mm nominal size) laid in one layer finished with a floating coat of neat cement				
		A) 40mm thick	5.00	192.91	S.M.	964.55
		(B) 50mm thick	5.00	226.24	S.M.	1131.20
64	Self.Expl.	Providing and fixing sal wood frame 12 cm x 7 cm size including anodized fixtures and fastening etc. including primer coat of approved quality and two coats of oil paint.etc complete. (For all floors)	5.00	865.00	S.M.	4325.00
65	Self.Expl.	Providing and fixing sheet glass of good quality badded in putty and fixed with wooden beadings incldg.the cost of first class teak wood beading and necessary cutting of glass etc. in the place of damaged/broken sheet glass of the existing windows /ventillations etc. as shown & as ditrected by Engineer-in-charge.(For all floors)				
		(a) 4 mm plain glasss	5.00	724.17	S.M.	3620.85
		(b) 6 mm wired figured glasss	5.00	650.44	S.M.	3252.20
66	Self.Expl.	Providing and Replace door, Window S.S. Fixtures fix in wooden / Alluminium door - window				
		(A) 4" S.S. Hinge	5.00	75.00	No.	375.00
		(B) 5" S.S. Hinge	5.00	85.00	No.	425.00
		(C) 8" S.S. Aldraf	5.00	175.00	No.	875.00
		(D) 10" S.S. Aldraf	5.00	200.00	No.	1000.00
		(E) 12" S.S. Aldraf	5.00	250.00	No.	1250.00
		(F) 4" S.S. Handle 4mm. Th.	5.00	100.00	No.	500.00
		(G) 6" S.S. Handle 4mm. Th.	5.00	125.00	No.	625.00
		(H) 4" S.S. Stopper 4mm. Th.	5.00	75.00	No.	375.00
		(I) 8" S.S. Stopper 4mm. Th.	5.00	125.00	No.	625.00
		(J) 6" S.S. Pavan Ankdi Heavy duty	5.00	35.00	No.	175.00
		(H) Alluminium door lock	5.00	200.00	No.	1000.00
		(I) Door Closer	5.00	200.00	No.	1000.00
67	125	Providing and fixing window having extruded aluminium **Powder Coated** section frame main outer size 95 mm x 24 mm x 1.17 mm (of jindal section no:2459 @ Wt. of 0.738 Kg/mt), horizontal **Three track** member size 92 mm x 31.75 mm x 1.30 mm (of jindal section no;8688, @ Wt. 1.07 Kg/mt), vertical member of size 92 mm x 31.75 mm x 1.50 mm (of jindal section no:8933, @ Wt. 1.06 Kg/mt) with sliding shutters of horizontal member size 40 mm x 18 mm x 1.29 mm (of jindal section no:8947 @ wt. of 0.456 kg/mt), vertical member of size 40 mm x 18 mm x 1.29 mm (of jindal section no:8949 @ wt. of 0.456 kg/mt) with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminium fittings & fixtures and transparent silicon sealant glass fixing to frame as per details etc.	5.00	1898.80	S.M.	9494.00
		(A) Same as above but **Colour anodized**	10.00	1889.71	S.M.	18897.10
68	124	Providing and fixing window having extruded aluminium **Powder Coated** section frame main outer size 63.50 x 38.10 x1.95 mm (of Jindal section no.4605, @ Wt. 1.094Kg/mt) horizontal **Two track** member size 61.85 mm x 31.75 mm x 1.20 mm (of jindal section no:8687, @ Wt. 0.695 Kg/mt.) vertical member of size 61.85 mm x 31.75 mm x 130 mm (of jindal section no:8758 @ wt. of 0.659 kg/mt) with sliding shutters of horizontal member size 40 mm x18 mm x 1.29 mm (of jindal section no:8949, @ Wt. of .456 Kg/mt) vertical member of size 40 mm x 18 mm x 1.29 mm (of jindal section no:8947, @ Wt. of 0.456 Kg/mt/section 8948, @ Wt. of 0.457 Kg/mt) with 5 mm thick tranparent bronze colour tineted float glass with powder coated aluminium fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc. complete for window.	10.00	2032.12	S.M.	20321.20
		(A) Same as above but **Colour anodized**	10.00	2042.22	S.M.	20422.20
69	Self.Expl.	Providing and fixing standared extruded of aluminium section of size 61 x 37.0 x0.90 mm (of Jindal section no.14080, @ Wt. 0.471 Kg per mt) with colour **powder coated** alluminium frame for Lovered Glass ventilation with 4 mm thick Figured glass as details etc. complete **for ventilation**.	5.00	1750.00	S.M.	8750.00
		(A) Same as above but **Colour anodized**	5.00	1800.00	S.M.	9000.00
70	Self.Expl.	Providing and fixing standared extruded of aluminium section of size 61 x 37.0 x0.90 mm (of Jindal section no.14080, @ Wt. 0.471 Kg per mt) with **Powder Coated** alluminium frame with 5 mm thick transparent bronze colour tinted float glass as details etc. complete for **fix window**.	2.00	1450.00	S.M.	2900.00
		(A) Same as above but **Colour anodized**	2.00	1525.00	S.M.	3050.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
71	Self.Expl.	Providing & fixing partly panel & partly glass **Powder Coated Aluminium doors** with aluminium section of Hindalco, Jindal , Narmada,Banco or Equivalent approved make having Poder Coated outer frame **Leg Partition section** of 63.50 mm x 38.10 mm having weight 1.158 kg. / R.M. shutter section having size 83.5 mm x 44.45mm (top & bottom: 1.384 kg./rmt. and middle 1.139 kg./rmt.) door vertical 47.62mm x 44.45 mm (vertical:0.881 kg./rmt. & top hing side:0.974 kg./mt.), Glazing Clip (Jindal Section No. 19370 Wt. 0.109 Kg./ Mt.) with 5mm thick sheet glass in acid frogting and 12 mm thick prelaminated sheet of Greenlam, Panama or archid make as approved by Engineer-in-charge including fixing brass pivot, handle, lock etc. complete.	5.00	3125.00	S.M.	15625.00
		(A) Same as above but **Colour anodized**	5.00	3225.00	S.M.	16125.00
72	Self.Expl.	Providing & fixing **Powder Coated Aluminium partly glazed and partly panelled partition** using medium duty sections of Hindalco,Zindal, Narmada, Banco or Equivalent approved make having section 63.50 mm x 38.10mm (Frame-.758 kg/rmt & Middle section- 0.819 Kg./rmt), **Galzing Clip** with 5 mm thick clear float glass of approved make including all other necessary fittings and fixtures. Entire work will have to be made water proof using necessary rubber sectioned wherever required. Gaps all round the frame to be filled with approved water proof sealent. Bottom portion of doors both side to be covered with 12mm thick prelaminated particle board of approved make and quality and as per design.	8.00	1800.00	S.M.	14400.00
		(A) Same as above but **Colour anodized**	8.00	1850.00	S.M.	14800.00
73	Self.Expl.	Providing and fixing **FRP FRAME size 125 x 65 mm and 35 mm thick FRP shutter** with wood grain raised panneled design finish shutter having extra reinforcement on sides & edges in Gel coat finish. The core of the shutter & frmae is to be filed up with injected polyurethene foam done in situ along with embedded wooden pieces for stiffening & also taking hinges & fixtures. The whole FRP frame & shutter is to be water proof weather proof,termite proof &resistance to mild acid/alkali. Rates are to be inclusive of S.S.hinges with fastener sleeve & alluminium fixtures & fastentings. Product should have 3 years performance guarantee and company have ISO 9001-2000 certificate.	20.00	3861.23	S.M.	77224.60
74	Self.Ex pl.	Reparing & Servicing of existing door/window including cost of hardware (Fevicol,Nail and NF screw etc.) but excluding cost of fixtures as directed by Engineer in-charge.				
		(A) Wooden door	50.00	150.00	Nos.	7500.00
		(B) Partly Panelled and Partely Galzed alluminium door	10.00	150.00	Nos.	1500.00
		(C) Wooden Window shutter	50.00	75.00	Nos.	3750.00
		(D) Alluminium Window shutter	20.00	75.00	Nos.	1500.00
75	Self.Ex pl.	Providing & fixing Glass Table Top using 08mm th.clear glass with crystal edge & necessary hardware materials etc. complete as per instruction by engineer in charge.	5.00	1350.00	S.M.	6750.00
76	Self.Ex pl.	Providing & fixing door closer Ozon / Dorma / Hyper / Hardwin / Godrej / Alluminium body ISI brander equivalent make with necessary hardware materials etc. complete as per instruction by engineer in charge.	5.00	1400.00	Nos.	7000.00
77	Self.Ex pl.	Providing & fixing water proof plywood (ISI marks 710 grade) at the door,window and any space in the building. necessary hardware,screws materials etc. complete as per instruction by engineer in charge.				
		(A) 6 mm	2.00	650.00	S.M.	1300.00
		(B) 9 mm	2.00	750.00	S.M.	1500.00
		(C) 12 mm	5.00	900.00	S.M.	4500.00
		(D) 16 mm	5.00	1125.00	S.M.	5625.00
		(E) 19 mm	5.00	1350.00	S.M.	6750.00
		(F) 12 mm BSL partical board green or Equalent make	2.00	550.00	S.M.	1100.00
		(G) 12 mm plan E board Evrest or Equalent make	2.00	470.00	S.M.	940.00
78	Self.Ex pl.	Providing & fixing laminated sheet 1mm thick suede finished as per approved make with & necessary adhesive,hardware materials etc. complete as per instruction by engineer in charge.	5.00	650.00	S.M.	3250.00
79	Self.Ex pl.	Providing & fixing Mortise lock body with 70mm cylinder (make godrej / ozon / inox) fix in wooden door with necessary hardware materials etc. complete as per instruction by engineer in charge.	2.00	1500.00	S.M.	3000.00
80	Self.Ex pl.	Replacement of Revolving chair parts ISI marks with necessary hardware, screws materials etc. complete as per instruction by engineer in charge.				
		(A) P.V.C. moulded Hand rest	5.00	325.00	Nos.	1625.00
		(B) Hydraulic gas pump	5.00	550.00	Nos.	2750.00
		(C) Cushion sheet, back with fabric / rexine	5.00	1850.00	Nos.	9250.00
		(D) Rubber castor / wheels	20.00	100.00	Nos.	2000.00
81	Self.Ex pl.	Reparing & Servicing of wooden office table / file storage using screws and necessary hardware materials complete as per instruction by engineer in charge.	5.00	200.00	Nos.	1000.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
82	Self.Ex pl.	Replacement of wooden office table / file storage parts ISI marks with necessary hardware, screws materials etc. complete as per instruction by engineer in charge.				
		(A) Drawer / shutter locks	5.00	250.00	Nos.	1250.00
		(B) ss 4" D Handles	5.00	80.00	Nos.	400.00
		(C) Drawer channel	5.00	275.00	Nos.	1375.00
		(D) ss 3" heavy hinges	5.00	80.00	Nos.	400.00
83	Self.Ex pl.	Providing & laying sun control or frosted milky glass film as approved colour,design,cutting complete as per instruction by engineer in charge.	10.00	480.00	S.M.	4800.00
84	Self Ex pl.	Providing & fixing wooden notice board with Righting laminated board finish using 12mm th.Back commercial plywood approved make, 01mm th. SF finish laminate,teakwood framing & necessary hardware materials etc. inside and liping french polish finish complete in all respects by engineer in charge complete.	3.00	1950.00	S.M.	5850.00
85	34	Providing & fixing **M.S.Grills** of required pattern to wooden frames of windows etc. At all floor levels with M.S. flats at required spacing & frame around square or round bars with round headed bolts & round headed bolts and nuts or by screws incl. Priming coat of Red lead paint etc. comp. (A) Plain grill For all Floors	500.00	66.16	Kg.	33080.00
86	86	Providing & fixing in position **collapsible steel shutters** with vertical channels 20 x10 x 2 mm. Braced with flat iron diagonals 20 x5mm size with top & bottom rails of T-iron 40x40x6mm. with 38mm dia. steel pulleys comp. with bolts, locking arrangements, stoppers, handles incl. applying a priming coat of Redlead paint etc. comp.	15.00	3723.87	S.M.	55858.05
87	35	Providing & applying **painting two coats** at all floor levels on new steel other metal surface **with synthetic enemal paint**, brushing interior to give an even shade incl. cleaning the surface of all dirt, dust & other foreign matter etc. Comp. (A) For plain grill For all Floor	20.00	45.85	S.M.	917.00
88	40	Providing & fixing **M.S.Fan clamp**s at all floor levels type I of 12 mm dia M.S. Bar bent to shape with hooked ends to R.C.C. Slabs during laying all as per standard design For All Floor (M.R.)	10.00	70.00	No.	700.00
89	21,22	Providing & applying **white washing with lime (three coats)** at all floor levels to give an even shade incl. thoroughly brooming the surface to remove all dirt, dust mortar droppings & other foreign matter etc.. comp. Incl. Prov.& mixing in required proportion, binding agent like "Fevicol dh" or equivalent approved brand etc. For All Floor.				
		(A) For wall & similar surfaces	50.00	11.51	S.M.	575.50
		(B) For ceilings and soffits	20.00	12.52	S.M.	250.40
90	106	**Distempering two coats** with oil bound washable distemper of approved brand & manufacture & of required shade on wall surface to give an even shade over and & incl. a priming coat of alkali resistance primer of approved brand after throughly brushing the surface to give an even shade after throughly brushing the surface free from mortar droppings and other foreign matter and also including preparing the surface even and smooth.				
		(A) For wall & similar surfaces	100.00	45.85	S.M.	4585.00
		(B) For ceilings and soffits	100.00	51.01	S.M.	5101.00
91	129	Applying **cement primer & lapi** before applying colour to any new surface making surface even & smooth incl. cleaning the surface of all dirt, dust & foreign matter. (M.R.)	100.00	31.00	S.M.	3100.00
92	130	**Distempering two coats on previously distempering wall** (without primer) with oil bound washable distemper of approved brand & required shade on wall surface to give an even shade after throughly brushing the surfaces clean of all grease, dirt loose places of sceles & also including preparing the surface even and smooth.	100.00	36.66	S.M.	3666.00
93	131	Wall painting with **two coats of Acrylic emulsion plastic paint** of approved brand over existing surface to give an even shade & surface free from mortar dropping & other foreign matter & sand papered smooth etc. comp.	40.00	50.40	S.M.	2016.00
94	35	Applying **Priming coat over new steel and other metal surface** after over and including preparing the surface by throughly cleaning oil, grease dirt and other foreign matter and scoured with brushed fine steel wool, scrapers and sand paper with ready mixed priming paint brushing red lead.	20.00	22.22	S.M.	444.40
95	35A	Painting **two coats of enamel paint (Excluding priming coat) over previously painted wall** with even shade & surface after removing dirt, dust foreign matter etc. comp.(M.R.)	20.00	51.00	S.M.	1020.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
96	35B	Painting **two coats of enamel paint over priming coat** after removing entire whitewash/colourwash surface dirt, dust foreign matter & also incl. preparing the surface even & sand papered smooth etc. comp.(M.R.)	50.00	63.00	S.M.	3150.00
97	132	Providing & applying **two coats of weather shield max paint** (3 coats may be required in case of darker colours.)of ICI Dulux or Apex Ultima of Asian Paint including applying exterior acrylic primer coat as per manufacturers specification and directions in shade and colour approved by architects, on exterior surfaces of the building including scaffolding, preparing the surface, watering, curing etc. complete and as directed by the architects and manufacturers. **Surface Preparation :** surface is thoroughly clean, dry and free from all loose dirt, chalk, grease, fungi, algae and flaking paint. This can be achieved by brushing with a wire/ stiff coir brush, followed by water jetting if required. Fill up all minor cracks and defects with white cement and sand mixture in the ratio 1:3. For application on previously painted wall, previous coatings of paint must be thoroughly scraped off and Clean the surface thoroughly using wire brushes. **Priming:** Apply a liberal coat of exterior acrylic primer and allow it to dry for 4-5 hours. Application of putty is not recommended. Minimum 4-6 hours duration is required between each coat of weather shield max paint	100.00	75.00	S.M.	7500.00
98	80	Providing & fixing at all floor levels,**both face polished machine cut edge green kota stone slab (30mm) for urinal partition** joined with grey cement slurry (1:1) incl. Rubbing & polishing etc. complete. (M.R.)	5.00	863.00	S.M.	4315.00
99	133	Providing & Fixing including making gisi & fixing at all floor levels **both face polished machine cut edge, granite stone slab for urinal partition** joined with grey cement mortar (1:3) incl. Rubbing & Polishing etc. Complete. Including half round edge for granite. (Basic Rate of Granite : Rs. 1200.00 / S.M.)	5.00	2900.00	S.M.	14500.00
100	3A	Providing & laying **cement concrete 1:2:4** (1 cement:2 sand:4 graded stone agg. 20 mm nominal size)& curing comp. Includ.cost of form work but exclu. Cost of reinforcement for reinforced concrete work in : (A) **Foundation, footing, Base of columns and Mass concrete.**	5.00	3203.72	C.M.	16018.60
101	5A	Providing & laying ordinary cement con.**1:2:4**(1cement:2sand:4graded graded stone agg. 20 mm nominal size) finishing smooth curing etc. comp. Incld. Cost of form work but excl. Cost of reinforcement for R.C.C. Work in : Up to G.L./P.L.				
		(A) COLUMNS:				
		(1)Having c/s area up to 0.08 sq.mt	2.00	7297.25	C.M.	14594.50
		(2) Having c/s area more than 0.08 sq. mt. & upto 0.12 sq.mt	2.00	6619.54	C.M.	13239.08
		(3) Having cross sectional area more than 0.12 sq. mt.	1.00	5767.10	C.M.	5767.10
		(B) BEAMS :				
		(1)Having c/s area up to 0.08 sq.mt	2.00	6061.01	C.M.	12122.02
		(2) Having c/s area more than 0.08 sq. mt. & upto 0.12 sq.mt	2.00	5590.35	C.M.	11180.70
		(3) Having cross sectional area more than 0.12 sq. mt.	1.00	5039.90	C.M.	5039.90
102	2	Providing & laying **C.C 1:3:6** (1cement :3 coarse sand :6 crushed stone agg. 20 m.m Nominal size)& curing comp. incl. cost of from work **in: wall caps/ copings.**	5.00	3160.29	C.M.	15801.45
103	123	**Box Cutting** the road surface to proper slope and camber for making base includinng removing the excavated stuff and depositing on the road side slope as directed up to 50 mt. lead.	5.00	66.16	C.M.	330.80
104	120A	**Preparation of subgrade** with Compacting, Levelling and consolidation of subgrade with miniroller /plate vibrator machine including watering and filling in depressions which occur during the process as directed by engineer in charge.	10.00	4.55	S.M.	45.50
105	Self.Expl.	Providing & filling with **Mix soil** in layers of 20 cm. Th'. Incl. watering, ramming & consolidation etc. complete.	0.00	162.08	C.M.	0.00
106	Self.Expl.	Providing, Supplying & Sprading of Gravel in Play area including dressing etc. comp.	20.00	1150.00	C.M.	23000.00
107	119	Supplying & filling **fine sand(pana)** in 150 mm compacted thickness over the base including necessary compaction, watering etc. complete. Item includes leveling by using vibratory plates compacted machine and as directed by engineer in charge.	20.00	451.47	C.M.	9029.40
108	121A	Removing & resetting existing readymade c.c. kerb stone of required size & thickness in line .level and in truly vertical position including filling joints in C.M. 1:1 (1 part of cement : 1 part of stone dust) smooth pointing in C.M. 1:1 (1 part of cement : 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge. (M.R)	90.00	41.41	R.M.	3726.90

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
109	122B	Removing and Resetting of Paver block of walk-way with necessary sand / pana filling and make in line and level with necessary vibrating using compactor machine.	80.00	108.00	S.M.	8640.00
110	Self.Expl.	Removing and Resetting of Kota Stone paving for footpath in line , level and in proper gradient including 25mm thick bedding in C.M. 1:6 (1 cement:6 sand) with sufficient ramming consolidation. Providing Joints in 1:3 (1 cement:3 sand) and smooth pointing in C.M 1:1 (1 cement:1 sand) including watering etc, complit and as diracted by Engineer in charge.	40.00	107.00	S.M.	4280.00
111	79	Providing and laying rough chiseled dressed stone flooring over 20mm thick base of cement mortar 1:5 (1 cement : 5 coarse sand) or L.M. 1:1.5 including pointing with cement mortar 1:2 (1 cement : 2 stone dust) etc. (A) 25mm thick	0.00	370.67	S.M.	0.00
112	121	Providing 100mm thick readymade **C.C. kerb** of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer & setting in line, level and in truly vertical position, including filling joints in C.M. 1:1 (1 part of cement : 1 part of stone dust) smooth pointing in C.M. 1:1 (1 part of cement : 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	40.00	236.34	R.M.	9453.60
		For rounding at the edge of footpath (For fanning portion)	10.00	323.20	R.M.	3232.00
113	122A	Providing interlocking type **Rubber moulded cement concrete paver block** of approved shape, design & colour having 60mm thickness **(M-35)** purchased from SMC's approved paverblock manufacturer only & fixing of fine sand bedding. Item includes levelling by using vibratory plates compacted machine. Item also includes all materials, labour, equipments, tools, plants, watering, cleaning etc. complete.				
		With colour	40.00	431.27	S.M.	17250.80
		Without colour	120.00	419.15	S.M.	50298.00
114	122	Providing & fixing interlocking type **Cement Concrete paver block** of approved shape & design having 60 mm thickness **(M-40)** purchased from SMC's approved paverblock manufacturer only on fine sand bedding. Item includes leveling by using vibratory plates compacted machine. Item also includes all materials, Labour, euipments, tools, plants, watering, cleaning etc. complete.	5.00	365.62	S.M.	1828.10
		For Road Junction **80 mm thick (M-50)**	5.00	527.22	S.M.	2636.10
115	120	Providing & laying **Granular sub base (GSB)**confirming to Grading-II of Table 400.0 of compacted thick of 150mm with specified graded stone metal and sand mixed in place and laid with mechanical means spreading with motor grader and compacting with vibratory roller having minimum 80-100 KN static weight to acheve desired density of 98% of MDD including all material, labour, machinery with all leads and lift etc. complete.	50.00	1285.73	C.M.	64286.50
116	Self.Expl.	Providing & laying cement concrete Pavement using **1:1.5:3** (1 cement:1.5 sand:3 graded stone agg. 20 mm nominal size) & **Vaccuum Dewatering technique** including floating surface with a skim powder floater, curing etc. complete.	5.00	5017.00	C.M.	25085.00
117	Self.Expl.	Providing & laying cement concrete Pavement using **1:2:4** (1 cement:2 sand:4 graded stone agg. 20 mm nominal size) & **Vaccuum Dewatering technique** including floating surface with a skim powder floater, curing etc. complete.	15.00	4557.00	C.M.	68355.00
118	Self.Expl.	Providing and laying **200 micron plastic sheet** on prepared sub base For V.D.S Concrete	15.00	26.00	S.M.	390.00
119	104	Steel work welded in built up sections, framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint				
		(A) in beams & joists channels angles, tees, flats with connection plates or angle cleats as in main & cross beams,hip & trussed purlins connected to common raffers & the like.	150.00	60.89	Kg.	9133.50
		(B)For work like chain link fencing, above compound wall etc.	30.00	60.89	Kg.	1826.70
		(C)in trusses & trussed purlins upto 25m.Span &15m.Overall height	10.00	61.66	Kg.	616.60
120	107	Providing and fixing **G.I. chain link** of 50mm x 50mm size x 10 guage thick with nuts, bolts, washer or G.I. pins, excluding M.S. angles etc.complete as per relevent IS specification & directed by engineer in charge. (TATA or Jindal Make)	15.00	265.00	S.M	3975.00
121	Self.Expl.	Providing and fixing and fitting TATA or Jindal make **G.I. barbed wire fencing** with necessary barbed wire (12 x 14 guage, weight not less than 0.14 kg. / mt.) pins, hooks, excluding M.S. angles etc. complete as per relevent IS specification.& directed by engineer in charge	15.00	81.00	Kg.	1215.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
122	108	Providing and Fixing **hot dip concertina coil** of 610 mm dia. made out of 2.59 mm (12 SWG) hot dip galvanized (G.I. coating not less than 200 gm/sqmt.) th. wire having 80 nos. of spikes and 200 nos. of clips made out of stainless steel (AISI 304) 1.5 mm th. dia., G.I. strips 0.5 mm th. (G.I. coating not less than 120 gm/sq.mt.) weight of one coil should not be lesss than 15 kg. etc., complete at the top of compound wall fixed with S.S. clips and binding wires whereever necessary etc. complete. (NOTE: Strctching length of one coil should not be more than 9 mt.)	30.00	231.00	R.M.	6930.00
123	Self.Expl.	Providing and fixing 1.20 meter high fencing with 2.0 meter long M.S. angle post 40mm X 40mm X 6mm and oil painting 3 coats fixed at 2.5 mt.C/C. with five horizantal lines and two diagonals of galvanised steel barbed wire of 'TATA make' weighing 9.38 Kg.per 100 meter, strained and fixed to posts with G.I. staples, including fixing posts in ground with 0.5 m X 0.5 m X 0.5 mt. block in C.C. 1:5:10 etc. comp.	0.00	409.00	R.M.	0.00
124	Self.Expl.	Providing and fixing 20 mm x 20mm x 10 gauge thick (using TATA make G.I.wire) galvanise ironwire mesh (G.I. Crimped net) including cutting fixing etc.complete.	5.00	590.00	R.M.	2950.00
125	109	Providing corrugated **G.I. Sheets roofing** fixed with Galvanised Iron ' J ' or 'L' hooks bolts & nuts 8 mm.dia with bitumen & G.I. Limpet washers filled with white lead comp. excluding the cost of purlins, rafters and trusses.				
		(ii) 0.63mm THick Sheet	30.00	727.00	S.M.	21810.00
126	Self.Expl.	Providing & fixing **colouron galvaniced steel, zinc / aluminium allus coated sheet 0.5 mm. thick roofing** fixed with gslvanised grom J or L hook bolts and bolt 8mm dia with bituman and impet washer filled with white lead etc. Excluding the cost of purlins rafter and trusses.(TATA or Jindal Make)	10.00	668.00	S.M.	6680.00
127	110	Providing & fixing **150mm wide 450mm over all semicircular plain G.I. sheet class-3 gutter** with iron brackets 40mm x 3mm size bolts, nuts, washers etc. including marking necessary connection with rain water pipes. **(i) 0.63mm thick**	10.00	379.00	R.M.	3790.00
128	111	Providing **ridges or hips 600mm over all in plain G.I. sheet** fixed with G.I. "J" of "L" hooks bolts and nuts 8mm dia G.I. limpet and bitumen washer complete (1) 0.63mm thick sheet	10.00	427.00	R.M.	4270.00
129	96	Providing & Fixing UV stabilise **FRP Sheet roofing** with overlapping the main cladding on both edges. All fixing holes must be predrilled oversize as specified for the sheet length and fastener being used. Fasteners must be fitted with approved washers. Fixings should be tightened to ensure a weatherproof seal but they must not be over tightened Side-lap fasteners must also be installed at specified centers with the FRP sheet having clearance holes provided as per the main fasteners Weatherproofing shall be provided at all flashing points under the normal flashing by the fitting of a foam closure strip to match the profile being used. Closure strips will be sealed to the sheet with an appropriate non setting silicone sealant. Excluding the cost of purlins rafter and trusses.				
		(a) 1.5 mm thick	5.00	725.00	S.M.	3625.00
		(b) 2 mm thick	10.00	862.00	S.M.	8620.00
130	Self.Expl.	Providing & Fixing **Polycarbonate sheet roofing** with surface of the sheet is coated with an anti-UV Co-extrusion layer having good weather resistance, it can maintain its optical properties and mechanical performance for a long time. Fasting is usually done by screws. , The fastening screws should be inserted about 500 mm apart and 300mm apart Along the supporting internal purlin and edge pulin.All fixing holes with diameter at least 2 mm larger than screw must be predrilled into each screw location. The screws should be 6mm diameter with length according to sheet thickness and corrosion resistant, with at least heavy duty hot dripped galvanized or stainless steel. Excluding the cost of purlins rafter and trusses.				
		(a) 1.5 mm thick Solid Sheet	5.00	1018.00	S.M.	5090.00
		(b) 2 mm thick Solid Sheet	5.00	1282.00	S.M.	6410.00
131	Self.Expl.	Pro.& fixing corrugated **ACRYLIC COLOURED** - 1.m mm roofing fixed with galvanized from 'J' or 'L' hook bolts & bolt 8 mm dia with bitumen and Limpet washer filled with white \lead etc. comp. excluding the cost of purlins rafter & trusses	5.00	500.00	S.M.	2500.00
132	83, 84, 85	Providing and fixing Rolling shutter of approved make made of 80 mm wide M.S. laths of 20 gauge inter looks together through their entire length & jointed together at the ends of by end locks mounted on specially designed pipe shaft with bracket plated, guide channels of 14 gauge & arrangement for inside & & out side locking(locking (locking rail/putti of 16 gauge) with push-pull operation including the cost of hood cover of 24 gauge & spring etc. complete.				
		(A) Shutters having width below 3.5m	5.00	3690.54	S.M.	18452.70

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
133	Self.Expl.	Providing & Fixing **80 mm dia M.S. pipe** as vertical post are beded in 1:1.5:3 concrete also horizontaly in line and connecting to purline angle etc by welding rereting etc. (a) **Medium duty "B" Class**	10.00	574.00	R.M.	5740.00
134	Self.Expl.	Providing & Fixing 5**0 mm dia M.S. pipe** as vertical post are beded in 1:1.5:3 concrete also horizontaly in line and connecting to purline angle etc by welding rereting etc. (a) **Medium duty "B" Class**	10.00	345.00	R.M.	3450.00
135	Self.Expl.	Providing & fixing **black board** on walls of **1.8mt.x1.2mtsize** made up to 12 mmth.B.W.P .Plywood (Brand Saras,Kitply,Uniply, Anchor, Green,Wood Stock or century) fixed with teak wood beading of 65 mmx 50mm size, rubbing & sanding comp., incl. applying two coats of black board paint over a priming coat on plywood & French polishing the frame all round etc. Comp. as per instruction of Engineer in charge (M.R.)	5.00	3915.00	No.	19575.00
136	Self.Expl.	Providing & Fixing **Reading table size 8' x 4' and height 2'-6"** with table top 18mm thick (Brand Saras,Kitply,Uniply, Anchor, Green,Wood Stock or century) commercial plywood with 1.0mm thick lamination sheet fitting with teakwood moulding table top supported on 3" x 3" teakwood leg & 3" x 11/2" teakwood framing top and bottom with french polish labour work hardware etc. as per site in charge instruction and as per drawing.	1.00	12450.00	No.	12450.00
137	Self.Expl.	Providing & Fixing **Librarian table** with 18mm thick commercial plywood (Brand Saras,Kitply,Uniply, Anchor, Green,Wood Stock or century))with 1.0mm thick lamination sheet table top supported on 2" x 2" teakwood leg & make 3 nos. drawers of 1' 3" width on both side with necessary french polish hardware labour etc. as per site incharge instruction and as per drawing (**Size 4' x 2'-6" x 2'-6"**, all framing other then legs are teak wood of size 2" x 1")	0.00	8040.00	No.	0.00
138	Self.Expl.	Labour work for chiesel shape(Bhala type) of grill square bar or Round Bar.	20.00	10.00	No.	200.00
139	Self.Expl.	Providing & Fixing 8 mm dia Chain For Swing	10.00	120.00	No.	1200.00
140	Self.Expl.	Providing & Fixing Kada For Swing	10.00	360.00	No.	3600.00
141	Self.Expl.	Steel work of square pipe hollow section, as per reqiure size, welded in built up sections, framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint. (A) In beams and joints channels angles, tees, flats with connection plates or angles cleats as in main and cross beam, hip and trussed purlins connected to common rafters and the like.(Rate analysis)	100.00	81.00	Kg.	8100.00
142	Self.Expl.	Cutting out cracks of wall or terrace to V section ,cleaningout, grouting with cement and sand slurry 1:3 (1 cement : 3 sand). at any height	10.00	41.41	R.M.	414.10
143	Self.Expl.	Providing & fixing Wooden file storage/divider 7.00' height with all outer surface laminate finish using 18 mm th vertical,horizontal and shutter , selves commercial plywood approved make, 01 mm th SF finish laminates,teakwood liping,brass hinges, ss handle lock,megnate & necessary hardware materials etc.inside and liping franch polish finish complete in all respects by Engineer in charge	0.00	407.00	Sq.ft.	0.00
144	Self.Expl.	Providing & fixing hard drawn wire fabrics 75 mm x 25 mm MESH of weight not less than 7.75 kg/s.m to windows/ventilators frames etc. at all floor levels including 60 mm x 20 mm bidding of teakwood incuding providing and fixing salwood frames 7 cm x 7 cm size for ventilators etc complete.				
		For Ventilators all floor.	5.00	1342.00	S.M.	6710.00
145	Self.Expl.	Applying polymer modify mortar in proportion at 1:2(one part cement: 2 part white sand(sweet water) with chemical(SBR) dosage of minimum 5 litre pe bag of cement. Also apply bonding agent prior to polymer modify mortar in proportion of (1:1)(1 part SBR : 1 part cement) using Roof, MC and FOSROC				
		Beam / Columns	5.00	1830.00	S.M.	9150.00
		Ceiling	5.00	1830.00	S.M.	9150.00
146	Self.Expl.	Crack Repairs:-Crack filling using fiber reinforced polymer modified mortar after openning crack in "V" grove, Making Surface dust free, with a bond coat of polymer as per the data sheet for crack repairing cracks less than 8mm	20.00	120.00	R.M.	2400.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
147	Self.Expl.	Providing and fixing rebar of following diameter using chemical grout of Swanchore/Hilti/Fischer or equivalent make including cost of all equipments, tools, material, labour, etc. Standard procedure as mentioned in manufacturer's specifications shall be strictly followed, which shall be submitted and got approved from the authority prior to start of work. The rate shall also include cost of drilling of hole of required diameter and depth as mentioned in manufacturer's specification,cleaning the hole with required air blower and other necessary tools and tackles, positioning, providing and grouting chemical, allied fixtures and fasteners, etc. but excluding the cost of reinforcing bar etc. complete. Item includes necessary scaffolding, staging, labour, tools and equipments,etc. complete as directed by the engineer-in-charge.				
		(A) 8 mm dia	10.00	80.00	No.	800.00
		(B) 10 mm dia	5.00	90.00	No.	450.00
		(C) 12 mm dia	5.00	125.00	No.	625.00
		(D) 16 mmm dia	5.00	190.00	No.	950.00
		(E) 20 mmm dia	5.00	340.00	No.	1700.00
		(F) 25 mmm dia	5.00	500.00	No.	2500.00
148	134	Providing and Fixing Stainless Steel (Grade 304) Railing made of Hollow tubes, channels, plates etc. Including Welding, Grinding, Buffing, Polishing and Making Curvature (Wherever Required) and fitting the same with necessary Stainless Steel Nuts and Bolts Complete, i/c fixing the Railing with Necessary Accessories & Stainless Steel Dash Fastenders, Stainless Steel Bolts etc. of Required size, on the top of the floor or the side of waist slab with suitable arrangement as per aprproval of Engineer-incharge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.)	20.00	384.00	Kg.	7680.00
		WATER SUPPLY & SANITARY ITEMS				
149	53A	Prov.& Fixing **water closet squatting pan (Orissa type W.C.pan)** at all floor levels, size 580mm incl. 100 mm size "P'or "S" trap for water closet squatting pan joining the trap with the pan & soil pipe in C.M. 1:1 (1cement :1 fine sand) etc. Comp.(A) Vitreous china long pattern of **approved colour** For all Floor				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	1530.00	No.	7650.00
150	53B	Providing and fixing **Wash Down Water closet European type W.C. pan** with integral P or S trap with normal closing seat cover L bend including jointing the trap with soil pipe in cement mortar 1:1 (1 cement : 1 find sand) (A) Viterous china pattern - I				
		Make -Cera,Parry ware, Hindware - 350 x 500 x 390 mm	3.00	2150.00	No.	6450.00
		Make -Jaquar - 350 x 480 x 390 mm	2.00	3800.00	No.	7600.00
151	53C	Providing and fixing **plastic seat and cover** for wash down water closet with C.P. brass hinges and rubber buffers (B) Black plastic seat and cover.	8.00	343.40	No.	2747.20
152	135	Providing & fixing white viterious china **Urinal** of size 450 x 325 mm as per IS-2556 (Part-2) with C.I. Hangers and 15mm dia. C.P. Spreader, 32mm dia CP bottle trap and pipe to wall with C.P. Flange complete including cutting and making good the walls and floors wherever required.				
		Make -Cera,Parry ware, Jaquar, Hindware	3.00	2500.00	No.	7500.00
153	54	Providing & fixing **wash Hung basin** with single hole for pillar tap, Size 550x400mm at all floor levels, with C.I. or M.S. Brackets painted white incl. cutting holes & making good the same etc. complete. For all Floor				
		Make -Cera,Parry ware, Jaquar, Hindware	3.00	1500.00	No.	4500.00
154	55	Providing & fixing **600 mm.x 450 mm. mirror** of superior glass at all floor levels, mounted on 6 mm. th. A.C. sheet or plywood sheet & fixed to wooden plugs with C.P.brass screws and washers etc. For all Floor	8.00	530.25	No.	4242.00
155	Self.Expl.	Provinding and fixing **Towel Ring** fabricated from seamless stainless steel tube 2mm thick in Bath room with polished wall flange at end of bars with heavy duty anchor fasteners & accessories				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	720.00	No.	3600.00
156	Self.Expl.	Providing & fixing **S.S. Towel Rail of 600mm Long** approved make including, provinding & fixing C.P. Brass screws, making holes in wall & making good.				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	715.00	No.	3575.00
157	Self.Expl.	Providing & fixing stainless steel recessed type **Soap Dish** of approved make. Including providing & fixing screws, washers, cutting & making good the walls.				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	535.00	No.	2675.00
158	Self.Expl.	Providing & fixing **Health Faucet ABS Body** with wall Hook & 1 Meter Chrome plated PVC Hose Pipe.				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	715.00	No.	3575.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
159	57A	Prov. & Fixing **S.W. Gully trap** with C.I.grating brick masonary (C.M 1:5)chamber & water tight C.I. cover with frame of 300mmx300mm size (inside) with weight to be not less than 4.53kg, includ. plastering smooth inside & outside 15mm. th' in C.M.1:3 etc. comp. (i) Square mouth traps---				
		(A) 100mm x 300mm Size -P type	5.00	1352.39	No.	6761.95
		(B) 150mm x 100mm Size- P Type	0.00	1297.85	No.	0.00
160	57	Prov. & Fixing **S.W. Gully trap** with C.I.grating brick masonary (C.M 1:5)chamber & water tight Pre cast R.C.C. cover of 300mmx300mm size (inside) includ. plastering smooth inside & outside 15mm. th' in C.M.1:3 etc. comp. (i) Square mouth traps---				
		(A) 100mm x 300mm Size -P type	5.00	960.26	No.	4801.30
		(B) 150mm x 100mm Size- P Type	0.00	905.72	No.	0.00
161	58	Prov. & Fix. 10 cm.x15 cm.(4" x 6") **S.W. trap with Inside dimension ,455 x 610 mm & 450 mm deep sewer trap chamber** with 23 cm th' B.B. masonary walls in C.M 1:5 with cement plaster 15 mm th' in C.M. 1:3 inside & outside to exposed faces, R.C.C. top slab with 1:2:4 mix (1 cement: 2 Sand : 4 Grade stone aggregate 20mm size) ,Foundation concrete 1:5:10 & fixing C.I. cover with frame to be not less than 38 kg. On top etc. comp. for single pipe.	1.00	2998.69	No.	2998.69
		.(A).Same as above but Precast RCC heavy duty Cover instead of C.I. Cover	3.00	2579.54	No.	7738.62
		Extra for every additional depth of 0.1 mt beyoung 0.45 mt	2.00	212.10	Each	424.20
162	59	Providing & construction **simple chamber** of 23 cm. th' B.B. Masonary in C.M 1:5 with cement plaster 15 mm th' in C.M. 1:3 inside & outside to exposed faces, R.C.C. top slab with 1:2:4 mix (1 cement: 2 Sand : 4 Grade stone aggregate 20mm size) ,Foundation concrete 1:5:10 & fixing C.I. cover with frame to be not less than 38 kg. On top etc. comp. **Inside dimension,455 x 610 mm &450 mm deep** for single pipe	2.00	2796.69	No.	5593.38
		.(A).Same as above but Precast RCC heavy duty Cover instead of C.I. Cover	20.00	2377.54	No.	47550.80
		Extra for every additional depth of 0.1 mt beyoung 0.45 mt	5.00	212.10	Each	1060.50
163	60	Providing, Lowering & laying joining **R.C.C. NP2 CLASS Pipe** In C.M. 1:1 of following nominal internal diameters incl. Testing of pipes and joints etc. Comp				
		(A) 100 mm. dia.	0.00	225.00	R.M.	0.00
		(B) 150 mm. dia	40.00	192.91	R.M.	7716.40
		(C) 200 mm. dia	20.00	255.53	R.M.	5110.60
		(D) 250 mm. dia	10.00	462.58	R.M.	4625.80
164	62	Providing & laying **in trenches galvanised mild steel tubes**(medium grade) TATA / ZENITH / ASIAN / JINDAL MAKE of the following nominal bore & tube fittings etc. comp..-				
		(A) 25mm.dia.	10.00	225.23	R.M.	2252.30
		(B) 40 mm. dia.	0.00	341.38	R.M.	0.00
		(C) 65 mm. dia.	0.00	565.60	R.M.	0.00
165	61	Providing & Fixing to **wall, ceiling floor** at all floor levels, **galvanised mild steel tubes(medium grade)** TATA / ZENITH / ASIAN / JINDAL MAKE of the following nominal bore, tube, fittings & clamps incl. making good the wall ceiling and floor etc. complete.				
		(A) 15 mm. dia.	5.00	158.57	R.M.	792.85
		(B) 25 mm. dia.	5.00	274.72	R.M.	1373.60
		(C) 40 mm. dia.	5.00	421.17	R.M.	2105.85
		(D) 50 mm. dia.	0.00	519.14	R.M.	0.00
166	63	Providing and fixing **15mm Dia bib tap** with wall Flange at all floor levels,polished bright etc. Comp.				
		Make -Cera,Parry ware, Hindware	20.00	675.00	No.	13500.00
		Make -Jaquar	10.00	800.00	No.	8000.00
167	64	Providing & Fixing **gun metal check or non return full way wheel valve** at all floors levels, etc. complete.				
		(A) 15 mm. dia.	10.00	220.18	No.	2201.80
		(B) 25 mm. dia.	10.00	490.86	No.	4908.60
		(C) 40 mm. dia.	5.00	772.65	No.	3863.25
168	Self.Expl.	Providing and fixing Screw down stop taps (a) 15 mm. dia.	75.00	241.39	No.	18104.25
169	65	Providing & fixing Metropole flush valve with wall flange 25mm with lever Knob at all floor levels, of approved quality incl. Fixing in pipe line etc. Comp				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	1690.00	No	8450.00
170	66	Providing & Fixing C.P. Brass screw down bib tap at all floor levels, polished bright etc. comp.-(A) 15mm dia. For all Floors	50.00	194.93	No.	9746.50
171	Self.Expl.	Providing **Flush Cock** consisting lever, cartridge sleeve & flange & concealed part				
		Make -Cera,Parry ware, Jaquar, Hindware	5.00	1050.00	No.	5250.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
172	Self.Expl.	Providing & fixing **15mm C.P. Brass angle valve** (stop cock) with C.P. Copper connecting pipe 450mm long and nuts, washer and brass flange complete, including cutting and making good the wall where required.				
		Make -Cera,Parry ware, Hindware	8.00	550.00	No.	4400.00
		Make -Jaquar	2.00	750.00	No.	1500.00
173	Self.Expl.	Providing and fixing C.P. Brass **pillar cock** with copper connection ,C.P. Brass screws complete				
		Make -Cera,Parry ware, Hindware	10.00	700.00	No.	7000.00
		Make -Jaquar	5.00	800.00	No.	4000.00
174	Self.Expl.	Providing and fixing **waste Pipe** for Washbasin or sink (A) 32 mm Dia	30.00	99.08	No.	2972.40
175	Self.Expl.	Providing and fixing **Supply Pipe** for Washbasin or sink	20.00	80.00	No.	1600.00
176	Self.Expl.	Providing and fixing Jet Sprey Cock at all floor level etc. complete.	8.00	500.00	No.	4000.00
177	Self.Expl.	Providing and fixing				
		(A) 40 mm thick RCC cover for simple chamber,s.w.trap & tank Top	10.00	400.00	No.	4000.00
		(B) PVC water tank cover upto 2000 Lit.	10.00	200.00	No.	2000.00
178	Self.Expl.	Supplying and fixing C.I. cover 300 mm X 300mm. without frame for gully trap (standard pattern) the weight of cover to be not less than 4.53 Kg.	5.00	660.00	No.	3300.00
179	67	Providing and fixing **C.I. Manhole cover 0.60 x 0.45 mt. Size** having weight not less than 35 Kg. etc. complete.	10.00	1116.05	No.	11160.50
180	91	Providing & Fixing **U-PVC pipe (SWR)** confirming to IS no. 13592 **(Type "B"**) of Prince/Supreme/Jain/Astral/Tulsi make for soil and waste discharge system at all floor levels incl. All fixtures like bends, tees, shoe etc. jointed with resin of approved brand & manufacture etc. comp. (M.R.)				
		(A) 75mm Dia	45.00	225.00	R.M.	10125.00
		(B) 110 mm. Dia.	45.00	313.00	R.M.	14085.00
		(C) 160 mm. Dia.	5.00	552.00	R.M.	2760.00
181	91A	Providing & fixing **U-PVC pipes** Confirming to IS no. 13592 **(Type "A")** of Prince/Supreme/Jain/Astral/ Tulsi make for rain water at all floor levels incl. fixtures like bends, tees, shoe etc joined with resin of approved brand & manufacture etc. comp. (M.R.) .				
		(A) 75 mm. Dia	80.00	141.00	R.M.	11280.00
		(B) 110 mm. Dia.	150.00	227.00	R.M.	34050.00
		(C) 160 mm. Dia.	0.00	449.00	R.M.	0.00
182	Self.Expl.	Providing, Laying and jointing on true line and level **UPVC pipe (SCH-40)** line of **Prince/Supreme/Jain/Astral/ Tulsi/Finolex** make including fittings make or equivalent as approved by angineer-in-charge. Pipe shall be fixed on the wall the help of clamp at every two meter C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.				
		(A) 15 mm dia.	50.00	85.75	R.M.	4287.50
		(B) 25 mm dia.	30.00	108.07	R.M.	3242.10
		(C) 32 mm dia.	0.00	140.39	R.M.	0.00
		(D) 40 mm dia.	10.00	174.73	R.M.	1747.30
		(E) 50 mm dia.	10.00	231.29	R.M.	2312.90
		(F) 65 mm dia.	0.00	330.00	R.M.	0.00
183	Self.Expl.	Providing & Fixing **P.V.C. pipes (SCH-80)** of **Prince/ Supreme/ Jain/ Astral/ Tulsi/Finolex** make for water supply line at all floor levels incl. fixtures like bends, tees, shoe etc joined with resin of approved brand & manufacture etc. comp. Pipe shall be fixed on the wall the help of clamp at every two meter C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.				
		(A) 15 mm dia.	50.00	83.00	R.M.	4150.00
		(B) 25 mm dia.	30.00	140.00	R.M.	4200.00
		(D) 40 mm dia.	10.00	214.00	R.M.	2140.00
		(E) 50 mm dia.	10.00	274.00	R.M.	2740.00
		(F) 65 mm dia.	0.00	495.00	R.M.	0.00
184	56	Providing & Fixing **PVC Nanhi trap** $3^1/_2$" ht.of **Prince/ Supreme/ Jain/ Astral/ Tulsi/Finolex** make at all floor levels of self cleaning design with screwed down or hinged grating incl. cost of cutting making good the walls & floors etc. For all Floor	10.00	119.00	No.	1190.00
185	Self.Expl.	Providing and fixing 100x 100 mm Size **P.V.C /C.I Greting (Jali**) for Nani Trap.	10.00	43.63	No.	436.30
186	74	Providing & Fixing in position **PVC Cowl vent** to pipes of Prince/Supreme/Jain make etc.Comp.				
		(A) 75 mm. dia.	5.00	32.00	NO	160.00
		(B) 110 mm Dia.	5.00	52.00	NO	260.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
187	74A	Providing & fixing **M.S. Holder Bat clamps** at all floor levels of approved design to C.I. Or S.C.I pipes including the cost of cutting holes & making good the wall etc. Complete - 100 mm. dia. (M.R.)	20.00	15.00	No.	300.00
188	Self.Expl.	Providing & fixing **G.I./Aluminum Patti clamps** at all floor levels of approved design to C.I. Or S.C.I pipes including the cost of cutting holes & making good the wall etc. Complete - 100 mm. dia. (M.R.)	15.00	10.00	No.	150.00
189	Self.Expl.	Providing & Fixing **Kathi around the vertical PVC drainage pipes** for concealing with cement plaster 20 mm avg thickness(CM 1:3 [1 cement :3 coarse sand]) finishing as per instruction given by Eng. incharge. for				
		(A) 75 mm PVC PIPE	5.00	102.00	R.M.	510.00
		(B) 100 mm /110 mm PVC PIPE	20.00	129.00	R.M.	2580.00
190	92	Providing erecting and fixing double coated **Syntex/Super/Reno PVC (ISI)** mark water tank of required capacity each with all necessary fittings & connection etc. complete on terrace.	10000.00	4.65	Lit.	46500.00
191	136	Providing & construction **Septic tank** as per the drawing clear **size 4.0 mt.x 1.40mt.x1.60 mt.** incl. Necessary excavation & refilling & disposing the surplus excavated earth within 50 mt. lead incl. bedding of 25cm th' brick masonary in C.M.1:6 & partition wall in C.M. 1:4 incl. 10mm th' cement plaster in C.M.1:4 to brick wall & 15 cm. th'. R.C.C slab on the top using 1:2:4 C.C excluding reinforcement as per the structural design with fixing C.I cover of 0.60mt.x 0.45mt.size & wt. Not less than 35 Kg. & providing necessary fittings as per drawing or as directed by Engineer in charge etc. comp. (Steel- 84.21 Kg.)	0.00	35378.28	No.	0.00
192	136A	Providing & construction **Septic tank** as per the drawing clear s**ize 8.0 mt.x 2.6mt.x1.34 mt.** incl. Necessary excavation & refilling & disposing the surplus excavated earth within 50 mt. lead incl. bedding of 25cm th' brick masonary in C.M.1:6 & partition wall in C.M. 1:4 incl. 10mm th' cement plaster in C.M.1:4 to brick wall & 15 cm. th'. R.C.C slab on the top using 1:2:4 C.C excluding reinforcement as per the structural design with fixing C.I cover of 0.60mt.x 0.45mt.size & wt. Not less than 35 Kg. & providing necessary fittings as per drawing or as directed by Engineer in charge etc. comp.. (Steel- 315.0 Kg.)	0.00	100560.25	No.	0.00
193	137	Providing & constructing **soak pit** as per drawing clear **size 2.0 mt. dia. & 6mt.depth** with necessary excavation,refilling&disposing of surplus excavated earth within 50 mt. lead, constructing 23 cm th.masonary in C.M. 1:6 for 3.0mt below G.L, incl.10 cm th. R.C.C slab on top using C.C. 1:2:4 excluding the reinf. As per the structural design with fixing C.I. cover 0.6mt. x 0.45mt.size weight not less than 35 Kg. & pro. Necessary filling as per drawing or as directed by Engineer-in-charge etc. (Steel- 31.5 Kg.)	0.00	21582.69	No.	0.00
194	76	Providing & laying ordinary C.C.1:1.5:3 mix for R.C.C. work incl. boxing, centering, vibrating, curing & mixed with approved water proofing cement compound or "CEMWET"or"PIDICRETE LW"integral water proofing admixture as water proofing agent to be mixed with 50 kg. cement bag shall be as recommended by the manufacture of the water proofing material, concrete work for top, bottom slab & side pardi for **Under ground Tank** & Item incl. Necessary excavation & refilling the available earth, 15 cm th' C.C 1:4:8 for bedding concrete, Half B.M. in C.M. 1:4 outside wall, inside R.C.C. pardi as per design, 10mm.th. water proofing cement plaster in C.M. 1:3 with smooth finishing,watering etc.Comp.to all inner face & bottom of tank curing etc. comp. incl. Locking arrangement, outlet, inlet, overflow & wash out pipe arrangement as necessary & C.I. Cover 0.60 x .045 weight not less then 35kg. etc. com. as per structural drawing excluding Steel & as directed by Engineer-in-charge				
		Underground tank	2000.00	4.60	Lit.	9200.00
195	138	Providing & Laying **Commercial Quality white glazed tiles** 6mm. th. in flooring laid on a bed of 20 mm. Av. Th.C.M.1:3(1cement :3 sand) & on wall Of R.C.C. Tank with necessary cement paste for fixing and joined with white cement slurry etc. complete. finished with flush pointing in white cement etc.com.	2000.00	0.90	Lit.	1800.00
196	89C	Providing and **filling** in depressions of Bath and W.C. At all floor levels, after completing plumbing work of pans, pipes,traps etc.**with cinder or fly ash** as directed by Engineer in charge etc. comp..	5.00	470.00	C.M.	2350.00

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
197	89A	NOTE :- (1) The whole work is to be executed through specialized agency with a guarantee of 10 (Ten) years given on a prescribed proforma duly stamped (2) The rate shall include for work at all floors & conducting water proof test as directed. (M.R.)				
		(A) Providing and laying **water proofing treatment** to vertical and horizontal surfaces of depressed portions of **W.C.,kitchen** and the like consisting of : (a) I course of applying cement slurry @ 4.4 kg/sqm mixed with water proofing compound conforming to IS : 2645 in recommended proportions. (b) II course of a layer of plaster in C.M. 1:3 with water proofing compound confirming to IS:2645 about 25 mm. th' in the floor of the depression & about 18mm th' On the side walls of the depression up to the floor level, water proofing plaster about 18 mm. th' be continued on the walls above the floor level for a height of 600 mm. with surface suitable to receive further treatment (c) Finishing top with stone aggregate 10mm to 12mm nominal size spreading @0.008 C.M./S.M., thoroughly embedad in plaster layer. as per specifications & instructions of Engineer in charge (Cement consumption 0.316 Bags / S.M.)	10.00	261.00	S.M.	2610.00
		(B) Providing and laying integral cement based **water proofing treatment** including preparation of surface as required for treatment of **roofs, balconies, terraces** etc. consisting of following operations. (a) Applying and grouting a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with proprietary water proofing compound comforming to IS:2645 over the R.C.C. slab including cleaning the surface before tratment. (b) Laying cement concrete using broken bricks/brick bats 25 mm to 100 mm size with 50% of cement mortar 1:5 (1 Cement : 5 Coarse sand) admixed with proprietary water proofing compound conforming to IS:2645 ,brick bats is finally covered by jointless cement plaster 20mm th. in C.M. 1:4 added with special water proofing compound confirming to IS:2645 & top smooth finished with trowel with false chequered marking of 300 mm.size.The treatment is carried along the vertical surface of the parapet & other adjoining wall up to height of about 300 mm in a shape of quarter round vata Incl. curing etc. Comp. With average thickness of 120 mm and minimum thickness at khurra as 65 mm.	20.00	442.000	S.M.	8840.000
		(c) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be down in order and as directed and specified by the engineer-in-charge. With average thickness of 120 mm and minimum thickness at khurra as 65 mm. (Cement consumption 0.511 Bags / S.M.)				
198	89B	Proiding & laying water **proofing treatment to vertical** and horizontal surfaces like consisting of (a) I course of applying cement slurry 4.4 kg per sq.mt. mixed with water proofing compound confirming to IS:2645 in rcommended proportions. (b) II corse of 20mm cement plaster 1:3 mixed with water proofing compound in recommended proportion (c) III course of applying blown or / resideal bitumen applied hot at 1.7 kg per sqm of area. (d) IV course of 400mm micron th. PVC sheet. (Overlaps at joints of PVC sheet should be 200mm wide and pasted to each other with bitumen about 1.7 kg./ sqm.)	10.00	425.00	S.M.	4250.00
199	Self.Expl.	Pro & Const. **water Proofing Cement vata** of 10 cm size in C.M 1:1 etc complete.	100.00	22.60	R.M	2260.00
200	75	Providing & fixing **G.I. Rain water spout** of 50 mm.dia & 30 cm length etc.	5.00	109.08	No.	545.40
201	53A	Prov.& Fixing **water closet squatting pan (Orissa type W.C.pan)** at all floor levels, size 580mm incl. 100 mm size "P'or "S" trap for water closet squatting pan joining the trap with the pan & soil pipe in C.M. 1:1 (1cement :1 fine sand) etc. Comp.(A) Vitreous china long pattern of **approved colour** For all Floor	20.00	914.25	No.	18285.00
202	53B	Providing and fixing **Wash Down Water closet European type W.C. pan** with integral P or S trap including jointing the trap with soil pipe in cement mortar 1:1 (1 cement : 1 find sand) (seat and cover to be measured and paid for separately) (A) Viterous china pattern - I (i) in **approved colour**	15.00	896.88	No.	13453.20
203	Self Ex pl.	Providing & fixing **wash basin** with single hole for pillar tap at all floor levels, with C.I. or M.S. Brackets painted white incl. cutting holes & making good the same incl. fittings such as **pillar tap**, capstan head screw down high pressure with screws, shanks & back nuts, **C.P. Brass waste trap,** screw down **stop tap 15 mm. dia**. etc. complete. (A) Vitreous china flat back wash basin **550 mm.x 400 mm. size** in **approved colour** For all Floor	15.00	1629.53	No.	24442.95
204	Self Ex pl.	Providing & fixing **Urinal** or approved quality including conecting the Urinal with waste pipe, tap etc. complete. (A) White earthenware flat back or corner type size 430 mm x 260mm x 350mm	20.00	667.61	No.	13352.20
205	M-67	Providing & Fixing chromium plated brass half turn **flush cock** at all floor levels, of approved quality incl. fixing in pipe line etc. Comp.-- 25 mm dia.	10.00	311.08	No.	3110.80
206	66	Providing & Fixing **abonite ball cock** of approved qualities directed etc. comp. (A) 25 mm. dia.	10.00	121.20	No.	1212.00
207	Self.Expl.	**Part -B WATER BORING**				

Sr. No.	DTS No.	ITEM	Qty.	Rate	Per	Amount
A	Self.Expl.	Labour charges for 6" Dia. Drilling in all Kind of soil up to required depth with necessary gravel packing etc,all comp.	30.00	344.40	R.M	10332.00
B	Self.Expl.	Providing & Erecting 5"inch P.V.C. plain CS pipe of standard make (Finolex,Sumolex,Ashirwad) to be erected as casing pipe in bore etc.comp.	30.00	393.60	R.M	11808.00
C	Self.Expl.	Providing & Erecting 5"inch P.V.C.stainer of standard make (Finolex,Sumolex,Ashirwad) to be erected as casing pipe in bore etc.comp.	30.00	426.40	R.M	12792.00
D	Self.Expl.	Providing & Lowering 40" Dia, H.D.P.E. Std. pipe of standard make (Gindal) with required fitting etc. comp. as directed	30.00	80.36	R.M	2410.80
E	Self.Expl.	Providing & Lowering 25" Dia, G.I.Std. pipe of standard make with required fitting etc. comp. as directed	2.00	321.44	R.M	642.88
F	Self.Expl.	Providing & fixing bend, Coupling, M.S. clamp, Adaptor Set with Required	2.00	3000.00	No.	6000.00
G	Self.Expl.	Providing & Lowering of standard make pump set with necessary ISI cable,SD starter switch all Required, Pump set having capacity of 106 LPM at 40 mtr. head capacity 2HP all comp.	2.00	21500.00	No.	43000.00
			TOTAL AMOUNT			**3692426.11**

Signature Of Contractor

Executive Engineer
East (Varachha) Zone-A
Surat Municipal Corporation

SURAT MUNICIPAL CORPORATION
EAST (VARACHHA) ZONE - A

NAME OF WORK :	**ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS AANGANWADI,WARD OFFICE,READING ROOM AND OTHER MUNICIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT.**

eTENDER(ONLINE) NOTICE NO.Add.City Engineer (Civil)/OLD EZ-A/01/2021-2022
WORK NO.05

VOLUME-I : TECHNICAL BID

Downloading of Tender Documents including Addenda Corrigendum in any	**:**	From **Dt. 03/06/2021 to 18/06/2021** upto 18.00 hrs.
On line E-mail Query	**:**	**Not Applicable**
Submission of Technical Bid	**:**	On or Before **Dt. 18/06/2021** upto 18.00 hrs **https/smc.nprocure.com BY SCANNING**
On line submission (Last Date)	**:**	**Dt. 18/06/2021 upto 18.00hrs.**
Submission of Tender fee, EMD (Only Bander cheque/D.D.), in hard copy.	**:**	Between **Dt.19/06/2021 to Dt. 25/06/2021** upto 18:00 Hrs. in sealed cover stricly by Speed Post/R.P.A.D to Chief Accountant, Surat Municipal Corporation, Muglisara, Surat - 395003
On line Submission of Price Bid	**:**	**On or Before Upto Date Dt. 18/06/2021 18.00hrs.**
Opening of Technical Bid along with other documents submitted online through	**:**	**On Dt.18/06/2021 10.00 hrs. on wards (Probable)**
Tentative Price Bid Opening	**:**	**Dt.28/06/2021 10.00hrs. onwards (Probable)**
Estimated Amount	**:**	**Rs. 36,92,426.11**
E.M.D.	**:**	**Rs.37,000.00**
Document Fees	**:**	**Rs.1,680.00**
Class	**:**	**"E-1"Class with Experience**

TENDER TO BE SUBMITTED TO:
THE CHIEF ACCOUNTANT,
SURAT MUNICIPAL CORPORATION, MUGLISARA
SURAT – 395003.
BY R.P.A.D. / SPEED POST THROUGH POSTAL AUTHORITY ONLY

TECHNICAL BID

NAME OF WORK : **ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS AANGANWADI,WARD OFFICE,READING ROOM AND OTHER MUNICIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT.**

Estimated Amount	:-	**Rs. 36,92,426.11/-**
E.M.D.	:-	**Rs. 37,000.00/-**
Tender Fee	:-	**Rs. 1,680.00/-**

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION.

SIGNATURE OF THE CONTRACTOR.

DATE :

NAME AND ADDRESS :-

SURAT MUNICIPAL CORPORATION

I N D E X

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SURAT MUNICIPAL CORPORATION

1.0 NOTICE INVITING TENDER

(A) RECEIPT AND OPENING OF TENDER :

Online Tenders will be received from the established and reliable contractors on or before 24.00 hours from **03/06/2021 to 18/06/2021** upto 18.00 hrs. on website smc.nprocure.com. The tender received after due time and date specified will not be accepted.

(B) **NAME OF WORK:- ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS AANGANWADI,WARD OFFICE,READING ROOM AND OTHER MUNICIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT.**

1.	Estimated Cost	: **Rs.36,92,426.11/-**
2.	Earnest Money Deposit	: **Rs. 37,000.00/-**
3.	Time Limit	: **12 (Twelve months) (Including Monsoon)**
4.	Document Fee	: **Rs. 1,680.00/-(including CGST 6% + SGST 6%)**
5.	Registration required	: **'E1' Class With Experience**

(C) OPENING OF TENDERS:

The tenders will be opened online in presence of bidders and opening authority subject to receipt of **Tender Fees & EMD in hard copy in account department (Main Office) .But tenderer has to upload relevant documents as required /mentioned in the technical bid in Soft Copy (By Scanning) .**The tenders will be opened in two stages i.e Technical Bid and Commercial Bid.

(D) SPURCHASE OF TENDER DOCUMENTS :

Tender Documents can be downloaded from smc.nprocure.com from **03/06/2021 to 18/06/2021 upto 18.00 hours.**

Tender documents fees of **Rs. 1,680.00/-(including CGST 6% + SGST 6%)** per set which is required for submission of tender towards the cost of tender documents in cash, pay order or by demand draft of any nationalized bank, in favour of "The Commissioner, Surat Municipal Corporation" payable at Surat and shall be submitted alongwith EMD and other documents. The cost of the Tender Documents will not be refunded in any circumstances. The Surat Municipal Corporation shall not be liable for any postal delay in any case.

i. **As per Commissoner Note No. C.N.129, dtd. 9/9/2016**

- **E.M.D & Tender Fee shall be submitted in electronic format only through online(by scanning) while uploading the bid. this submission shall mean that E.M.D and tender fee are received for purpose of opening the bid. Accordingly, offer/tenders of those tenderers whose E.M.D & tender fee is received electronically, shall be opened. However, for the purpose of realization of EMD and Tender fee ,bidder shall send the EMD as well as Tender fee in required format in original through RPAD/Speed post so as to reach to Account Department (Main office) within stipulated date as mentioned in tender notice for the submission of tender FEE & E.M.D. Punitive action shall be initiated for non submission of EMD & Tender fees in original to Account Department (Main Office) by bidder including abeyance of registration and cancellation of E – tendering code for one year. all documents in supporting of bid shall be in electronic format only through online (by Scanning) during the bidding period & hard copy will not be accepted separately.**
- **All documents must be coloured scanned to be seen as original. Scanning in black and white or grayshall not be acceptable.**
- **All the documents must be notarised with clearly displaying stamp, number and name of the notary.**

(E) CONTRACT PERIOD :

The total contract period is hereby fixed as **12 (Twelve) months (Including monsoon)** from the 10th Day of issuance of work order.

(F) Tenderer must comply with and agree to all instructions & requirements in the Notice and in the Instructions to Tenderers, including requirements in the Contract Documents.

G(a) All tenders must be submitted in the prescribed Tender form.

(b) Each Tender must be accompanied by the completion Schedule.

(c) Each tender must be accompanied by the Tender Security (EMD) **Rs.37,000.00/-**as specified in IT-07.

(d) The successful tenderer shall execute the Contract Agreement within fifteen days after the date of Notice of award.

(e) The successful Tenderer will be required to furnish a performance bond (Security Deposit) of and amount equal to (2%) Two percent of the tendered amount. As per clause no. IT-27.

(f) The successful Tenderer shall furnish insurance in accordance with the contract documents.

(g) The Surat Municipal Corporation may withhold issuance of the Notice of proceed for a period not exceeding fifteen days after the date of execution of the contract agreement.

(h) The tender and tender guarantee bond (Earnest Money Deposit) shall be submitted by the Agency in whose name tender has been issued. Transfer of tender documents to any other party is prohibited.

(i) All intending tenderers will have to purchase digital signatures in order to participate in the online bidding process.

(j) All the applicant contractors are required to have their own employers code number under EPF Act, 1952 and are required to comply the applicable provisions of said statute regularly and totally.

(k) Further the contractors for services are required to produce the certified copies of paid challans in respect of employees/workers employed by said contractor in respect of work allotted by Surat Municipal Corporation, along with copies of Pay Roll and Muster Roll. If the same are not produced, the bills will not be released.

(G) RECEIPT OF TENDER DOCUMENTS:

The following details are to be submitted online on smc.nprocure.com :

a. Document fees and EMD Details
b. Commercial Bid
c. Statement A to B along with all necessary supporting documents
d. Bank solvency
e. Pan Card
f. GST Registration
g. Power of attorney
h. Partnership deed in case of Partnership firm.
i. Affidavit of Annexure A on Non Judicial Stamp Paper of **Rs.300/-**
j. Anti-Blacklist Certificate on Non Judicial Stamp Paper of **Rs.300/-**

The following details shall be submitted in hard copy at prescribed address :

a. Tender fees in prescribed format
b. Earnest Money Deposit in prescribed format
c. Affidavit of Annexure A on Non Judicial Stamp Paper of **Rs.300/-**
d.Anti-Blacklist Certificate on Non Judicial Stamp Paper of **Rs.300/-**
e. Other necessary documents mentioned in Technical Bid (if any)

Please note that commercial bid shall not be submitted in hard copy under any circumstances. This will hold the tender liable for rejection.

(H) Tender Validity Period :

The validity period of the tender submitted for this work shall be of one hundred twenty (120) calendar days from date of opening of the price bid for this work and the Tenderer shall not be allowed to withdraw or modify the tender offer on his own during the validity period.

(I) Rights Reserved :

Without assigning any reason, The Surat Municipal Corporation reserves the right to reject the lowest or any other or all tenders or part of its. To waive any informality or irregularity in any tender, which in the opinion of the Surat Municipal Corporation does not appear to be in its best interest and the tenderer shall have no cause of action or claim against the Surat Municipal Corporation or its officers, employee, successors or assignees for rejection of this tender.

The Surat Municipal Corporation further reserves the right to withhold issuance of the notice to proceed, after execution of the contract agreement by the successful Tenderer. The Surat Municipal Corporation is not obliged to give reasons for any such action.
During Tender validity period, if any Tenderer withdraws or makes any modifications or additions in the terms and conditions on his own in this tender, then The Surat Municipal Corporation shall without prejudice to any right or remedy be at liberty to reject the tender and forfeit the Earnest Money Deposit in full. Such Tenderer may be disqualified from tendering for further works under the jurisdiction of The Surat Municipal Corporation.

The Surat Municipal Corporation reserves the right to increase or decrease the scope of work and split the tender in two or more parts without assigning any reason even after the award of contract.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION.

Signature of the Contractor:

SURAT MUNICIPAL CORPORATION

STATEMENT - A

Statement showing the similar works completed in the last seven years, i.e. for a period starting from Dt. 01-04-14 to 31-03-2021

Sr. No.	Name of Department / Client with Address	Name of work	Estimated cost of work put to tender	Tendered Amount	Date of award of contract	Target date of completion of work as per contract and date of completion of work if completed		Actual Amount of work completed	Time limit in year and months		Percentage rate and amount of Penalty	Reasons for delay in completion of work	Remarks
						Target Date	Completion Date		Original Y M	Extended Y M			
1	2	3	4	5	6	7a	7b	8	9a	9b	10	11	12

Signature of contractor

Date

Place

STATEMENT – B

Statement showing the similar works on hand / in progress.

Sr.No.	Name of Department / Client with Address	Name of work	Estimated cost of work put to tender	Tendered Amount	Date of award of contract	Target date of completion of work as per contract and date of completion of work if completed		Actual Amount of work done	Time limit in year and months		Reasons for delay in completion of work	Remarks
						Target Date	% Progress till Date		Original Y M	Extended (if any) Y M		
1	2	3	4	5	6	7a	7b	8	9a	9b	10	11

Signature of the contractor

Address

ANNEXURE-A

AFFIDAVIT

Name of Work: **ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS AANGANWADI,WARD OFFICE,READING ROOM AND OTHER MUNICIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT.**

- I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct. I also understand that in case of wrongful/false information, corporation is entitled to take any civil & criminal punitive action against me / us.
- The undersigned also hereby certifies that neither our firm M/s_____ nor any of its constituent partners have abandoned any work in India nor any contract awarded to us has been rescinded during last five years, prior to the date of this bid.
- The undersigned hereby authorize(s) and request(s) any bank, person, authorities, government or public limited institutions, firm or corporation to urnish pertinent information deemed necessary and requested by the SMC to verify our statements of our competence and general requtation etc.
- The undersigned understands and agrees that further qualifying information may be requested,and agrees to furnish any such information at the request of the SMC.
- The SMC and its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents, and information submitted in connection with this bid and to seek clarification from our bankers and clients regarding any financial and technical aspects. This Affidavit will also serve as authorization to any individual or authorized representative to any institution referred to in the supporting informantion, to provide such information deemed necessary and requested by representative of Surat Municipal Corporation to verify statements and information provided in the Tender or with regard to the resources, experience and competence of the Applicant.

_____

Signed by the Authorize signatory of the firm

_____

Title of the office

_____

Name of the firm

Date:

Note:- The affidavt format as indicated above to be furnished on non-judical stamp paper of **Rs.300**

SURAT MUNICIPAL CORPORATION
EAST (VARACHHA)ZONE - A
CONTRACTOR TO PLEASE READ THIS CAREFULLY

(1) If the tender is taken in favour of the company, a company of attorney in favour of the person who may have signed the tender for the conpany, must accompany the tender.

(2) Solvency certificate of current year Bank or a Revenue Officer of an amount upto 20% of the tender cost plus works on the hand still to be executed will have to be produced by the contractor.

(3) Voucher for earnest money must accompany the tender. Tenderer may pay earnest money in form of a crossed demand draft of a local Bank drawn in favour of the Municipal Commissioner. Earnest Money by cheque shall not be accepted.

(4) In view of the latest circular of IT Department IT clearance certificate is not required. However the contractor shall give zerox copy of the PAN card. Also provide GST Number and necessary documents as per Govt- resolution..

(5) **Copies of certificate as regards previous experience of Govt. or Semi Govt. Dept., if any must accompany the tender**. **An attested copy of registration with MES, Various department of State Govt., Surat Municipal Corporation, CPWD etc.**

(6) Declaration showing all works on hand with the contractor and the value of works that remains to be executed in each case must accompany the tender.

(7) All pages of Schedule: `A & B' & specification should be intialed by the contractor.

(8) All corrections, errasures & over writing should be initialed by the contractor.

(9) Descripancies and adjustment of errors:-Any error in quantity or amount in Schedule-`B' showing item of words to be carried out shall be adjusted in accordance with the following rules:-

(a) In the event of a discrepancy between description in works and figures quoted by a tenderer in the `rates' column, the descriptions in words shall prevail.
(b) In the event of and error occuring in the amount column of the Schedule- `B' showing items of works as a result of worng multiplication of the unit rate and quantity, the units rate shall be regarded as firm and multiplication shall be amended on the basis of the rate.
(c) All the errors in totalling in amount column and in carrying forwarded total shall be corrected.
(d) Any rounding of amounts against item' or in totals' shall be ignored.

The tendered sum so altered shall, for the purpose of the tenders, be substitued for the sum originally tendered and considered for accetpance.

(10) (i) It may please be noted that the tender shall be considered as invalid specially, if the requirements as per insiruction No.1 to 9 above are not compleied with before submitting the tender. Also please read carefully the face sheet and "General Rules and Direction for the suidance of contractor" of his form.
(ii) Right is reserved to reject any or all tender (s) without assigning any person (s) thereof.

(11) In addition to the above the tender will also be liable to rejected outright if :-

(i) The tenderer proposes any alteration in the works specified or in the time allowed for carryin out the work or any conditions or correction made in any code or made of Schedule-`B' or specifications.
(ii) Any of the page or pages of the tender is removed or replaced.
(iii) All corrections, additions or pasted slips are not initaled by the tenderer.
(iv) Any erasures is made by him in the tender
(v) The tenderer or in the case of a firm, each partner or person holding the power of attorny thereof does not signed or the signature/s is/are not attested by awitness on page-9 of the tender in the space for the purpose.

(12) In respect of the tenders from the co-operative society, a solvency certificate of an amount equal to 20% of the amount of the work put to tender will have to be produced alongwith the tender or a certificate regarding the borrowing capacity if the society issued by the leagal Assistant, Directorate of Cottage Industries will have to be produced alongwith the tender.

(13) (1) The serveral documents formining the contract are the essential part of the contract and requirement occuring in one is as binding as through occuring in all, they are intended to be mutually explantory and complementary and to described and provide for a complete work.

(2) In the event of any descrpeaney, the serveral documents forming the contract or in any the document, the following order or precedence should apply:-

(a) Dimension & quantities :-

(i) Drawings.
(ii) Schedule-B of the tender form.
(iii) Specification.

On drawings, figures, dimensions, unless obviously incorrect will followed in preference to seeled dimensions.

(b) Description :

(i) Scheudule-B of the tender form.
(ii) Drawings.
(iii) Specifications.

In case of defective description or ambiguity, the Engineer- in-charge should issue further instructions direction in what meanner the work is to be carried out it being understood that the best modern practice is to followed. The contractor should forthwith comply with such instructions.

(3) The contractor should taken no advantage of any apparent error or ommission in drawings or specification and the Engineer in charge shall make such corrections and interpretation as necessary to fulfil the intent of the Plans and specifications.

(4) No with standing that all proper precautions may have been taken by contractor at all the times during the progress of the work, the contract shall be held responsible for all damages whether to the work under execution or to any other property or to lives of persons during the progress of the work and the period of maintance.

(5) Plans are for rough guidance only when detailed plans are received from the Architect of corporation during the course of execution the same will supersede previous plans

(14) The contractor should appoint a qualified engineer and he must remain present on site during working hours.

(15) The Quantity mentioned in the scheduled "B" is Tentative (indicative) for each item. Tender shall have to execute the concerned work/item as per the site condition and payment shall be madeaccordingly as per the actual measurement of the particular item.

(16) As per Commissioner Note No.C.N.129, dtd. 9/9/2016

- **E.M.D & Tender Fee shall be submitted in electronic format only through online(by scanning) while uploading the bid. this submission shall mean that E.M.D and tender fee are received for purpose of opening the bid. Accordingly, offer/tenders of those tenderers whose E.M.D & tender fee is received electronically, shall be opened. However, for the purpose of realization of EMD and Tender fee ,bidder shall send the EMD as well as Tender fee in required format in original through RPAD/Speed post so as to reach to Account Department (Main office) within stipulated date as mentioned in tender notice for the submission of tender FEE & E.M.D .Punitive action shall be initiated for non submission of EMD & Tender fees in original to Account Department (Main Office)by bidder including abeyance of registration and cancellation of E – tendering code for one year. all documents in supporting of bid shall be in electronic format only through online (by Scanning) during the bidding period & hard copy will not be accepted separately.**

- **All documents must be coloured scanned to be seen as original. Scanning in black and white or gray shall Not be acceptable.**

- **All the documents must be notarized with clearly displaying stamp, number and name of the notary.**

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION.

Contractor Signature with
Address:
Date :

INSTRUCTION TO TENDERERS

IT-01 GENERAL

The Contract documents may be secured in accordance with the notice Inviting Tender for the work called. The work shall include supply of Materials necessary for construction of the work.

IT-02 INVITATION TO TENDER

(C) The Surat Municipal Corporation hereinafter referred to as the Corporation will receive tenders for the work of **ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS AANGANWADI,WARD OFFICE,READING ROOM AND OTHER MUNICIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT.**as per the specifications in the tender documents. The tenders shall be opened in presence of opening authority Surat in the presence of tenderers or their representatives who are present. The Corporation reserves the right to reject the lowest or any other or all tenders or part of it which in the opinion of the Corporation does not appear to be in its best interest, and the tenderer shall have no cause of action or claim against the corporation or its officers, employees, successors or assignees for rejection of his tender.

IT-03 LANGUAGE OF TENDER

Tenders shall be submitted in English, and all information in the tender shall also be in English, Information in any other language shall be accompanies by its translation in English. Failure to comply with this may make the tender liable to reject.

IT-04 QUALIFICATIONS OF TENDERERS

(A) Tenderer shall be required to submit the enlisted documents along with E.M.D. and tender fees online. If documents are insufficient or it does not match the required criteria mentioned below, then the Price Bid of the tenderer shall not be opened.

Mainly tenderer shall fulfill following for pre-qualification,

(B) QUALIFYING CRITERIA OF BIDDER

Sr. No.	Criteria	Documents required for complete submission
1.0 Financial		
1.1	Average Annual financial turnover during the last 3 years, ending 29/03/2018, should be at least 30% of the estimated cost (i.e. **30% of 36,92,426.11/-)**	Copy of certificate from Chartered Accountant along with copy of Balance sheets.
1.2	**Solvency Certificate** Fresh Solvency certificate from bankers of schedule bank / nationalized bank. Minimum value of solvency shall be 20% of estimated cost of the Tender (i.e. **20% of 36,92,426.11/-)**	from bankers of schedule bank / nationalized bank
2.0 Registration		
2.1	Minimum **"E1" class** Registration Class with any government, semi government organization	Registration Certificate
2.2	power of attorney, partnership deed or registration deed.	Attested copy should be submitted
3.0 Relevant Experience		
3.1	Similar works during last 7 years.	
3.1.1	Three similar completed works, each costing not less than amount equal to 40% of the estimated cost put to the tender**(i.e. 40% of 36,92,426.11/-)**	
	Or	

3.1.2	Two similar completed works, each costing not less the amount equal to 50% of the estimated cost put to the tender**(i.e. 50% of 36,92,426.11/-)**	attested copies of certificates from head of the office concerned for completion of the works **Only Govt. or Semi Govt. Works shall be considered for Similer Works**
	Or	
3.1.3	One similar completed works, each costing not less the amount equal to 80% of the estimated cost put to the tender. **(i.e. 80% of 36,92,426.11/-)**	
4.0 Other details		
4.1	**ANNEXURE-A** The Bidders certify that all the statements made in the required attachments are true and correct.and also understand that in case of wrongful/false information, corporation is entitled to take any civil & criminal punitive action against him.	AFFIDAVIT on non-judical stamp paper of **Rs.300**
4.2	**Works on hand & Litigation** The Bidder including any Member shall provide details of all their on-going projects along with stage of litigation, if so, against the Employer / Governments.	STATEMENT-A & B

NOTE:- Similar work shall mean Construction of Reparing and Maintance of Building work done for Govt. or Semi Govt. only.

(b) Turnover during last 3 years, ending 29st March of previous financial year should be atleast 30% of Estimated Cost. An attested copy of annual turnover **(CA certified)** for last 3 years should be enclosed.

(c) Solvency certificate from bankers of schedule bank/Nationalized bank for the 20% of tender amount. Tenderer has to submit higher amount of bank solvency if so desired by Commissioner.

(d) An attested copy of registration with MES, Various department of State Govt., Surat Municipal Corporation, CPWD etc.

(e) List of the works already complete last years in prescribed proforma as per STATEMENT-A and attested copies of certificates from head of the office concerned for completion of the works.

Following enhancement factors will be used for the cost of works executed an financial figures to amount base for the value of the works completed in India.

Financial Year	Multiplying factor
One (2020-21)	1.1
Two (2019-20)	1.21
Three (2018-19)	1.33
Four (2017-18)	1.46
Five (2016-17)	1.61
Six (2015-16)	1.77
Seven (2014-15)	1.95

Bidder should indicate actual figures of cost and the amount for the work executed in Statement-A without accounting for the above mentioned factors.

(f) Declaration regarding the work on hand with the tender should also be given in prescribed performa as per Statement-B.. Attested copies of work orders, interim certificates if any shall also be attach as supporting documents.

(g) Attested copy of partnership deed, power of attorney etc.

(j) **Application Received from joint venture / consortium shall not be considered.**

- attested copy of partnership deed, power of attoney etc.
- passport size photographs of partner / all partners on relevant page of technical bid.
- Tenderer shall submit only one tender for the work put to this tender.
- Tenderer shall submit the certificate of Employers code number under EPF Act.

IT-05 TENDER DOCUMENTS :

Printed and online documents and set of drawings shall comprehensively be referred to as Tender documents. The several sections forming the documents are the essential parts of the contract and a requirement occurring in one shall be binding as though occurring in all. They are to be taken as mutually explanatory and describe and provide for complete works.

IT-06 EXAMINATION BY TENDERERS :

A. At his own expenses and prior to submitting his tender, each tenderer shall (a) examine the contract Documents, (b) visit the site and determine local conditions which may effect the work including the prevailing wages and other pertinent cost factors, (c) familiarize himself with all CENTRAL, State and local laws, ordinance, rules, regulations and codes affecting the material supply including the cost of permits and licenses required for the work and (d) correlate his observations, investigations, and determinations with the requirements of the Tender Documents.

B. The tender quantity is approximate and may increase or decrease. Any increase or decrease in quantity will not entitle tenderer to claim any extra over the quoted rate.

C.Tender Documents be completed by legible ink, checked in a responsible manner, signed, stamped and returned together with the Tender Security Bond by the stipulated date, which shall form the Tender.

The Tenderer is required to complete :

(i) The form of tender, including the Appendices thereto Tender Security Bond and the Tender summary duly signed and stamped.

All the pages in which entries are required to be made by the tenderer are contained in the tender documents and the tenderer shall not take out or add to or amend the text of any of the documents except in so far as may be necessary to comply with any addenda issued pursuant to Clause IT-17 hereof.

IT-07 EARNEST MONEY DEPOSIT

A. The Tender shall be accompanied by of Earnest Money Deposit **Rs. 37,000.00/-**The tenderer shall pay Earnest Money Deposit by pay order/demand draft issued in favour of Commissioner, Surat Municipal Corporation, Surat through Nationalised Bank only. **The Earnest Money Deposit in the form of FDR or cheque shall not be accepted**. The tenderer shall have to mention details of Earnest Money Deposit on the seal cover of Earnest Money Deposit. The tender received without Earnest Money Deposit shall be out rejected.

The instruments for Earnest Money Deposity shall be issued by or payable/encashable at Surat Branch of the said nationalized bank.

1) Indian Bank
2) State Bank of India
3) Punjab National Bank
4) Bank of Baroda
5) Union Bank of India
6) Bank of India
7) Oriental Bank of Commerce
8) Canara Bank
9) Central Bank of India
10) Corporation Bank
11) Allahabad Bank
12) Indian Overseas Bank
13) Dena Bank

14) Syndicate Bank
15) Andhra Bank
16) Punjab & Sind Bank
17) Bank of Maharashtra
18) Vijaya Bank
19) United Bank of India
20) UCO Bank

B. The Earnest Money Deposit(Tender guarantee) will be forfeited in the event, the successful tenderer fails to accept the contract and fails to submit the Performance Guarantee Bond to the owner as stipulated in this tender documents within ten days after receipt of notice of award of contract. In such case owner may disqualify the tenderer from tendering for further works,under the jurisdictions of the Corporation (S.M.C.).

C. The Earnest Money Deposit of the successful tender shall be returned after the performance guarantee bond, as required, if furnished by the contractor.

D. No interest shall be paid by the owner on any tender guarantee.

IT-08 INCOME TAX CLEARANCE CERTIFICATE

In view of the latest circular of IT Department IT clearance certificate is not required. However the contractor shall give zerox copy of the PAN card.

IT-09 PREPARATION OF TENDER DOCUMENTS

Tenderers are requested to note the following while preparing the Tender Documents:

A. Technical bid, EMD and Tender fees shall be submitted on the Tender Form bound herein in English. All tender items and statements shall be properly filled in. Numbers shall be stated both in words and in figures where so indicated, and signatures of all persons signing shall be in longhand.

B. Technical Bid shall be accompanied by the prescribed tender security bond and other required documents and drawings. All witnesses and sureties shall be persons of status and probity and their full names, occupations and address shall be stated below their signatures. All signatures in the Tender Documents shall be dated.

C. Variations to the Contract Documents requested by the tenderer may be affixed to the Tender Document in the space available and duly signed and stamped. Such variations may be approved or refused by the Engineer at the time of adjudications of Tenders, and in either case the Engineer is not obliged to give reasons for his decisions.

D. Delivery of Tenders shall comply with Notice inviting tenders as to place, date and time.

E. Price Bid shall be submitted online. Tenderers are requested to quote for all four parts of the tender.

IT 10 SUBBMISSION OF TENDERER DOCUMENT

Following documents shall be submitted in HARD COPY TO Surat Municipal Corporation:

- Earnest Money Deposit as mentioned in the Tender.
- Tender Fees as mentioned in the tender
- Affidavit of Annexure A on Non Judicial Stamp Paper of Rs.300/-
- Anti-Blacklist Certificate on Non Judicial Stamp Paper of Rs.300/-
- Other necessary documents mentioned in Technical Bid (if any)
- Addenda-Corrigendum (if any) duly signed by Contractor.

Technical bid and price bid are not to be submitted in physical form. Please note that non submission of Technical Bid as well as price bid does not absolve the bidders from any liability created from the bid condition and bidding process. Technical-Bid and Price Bid in hard copy shall be submitted by Successful bidder upon intimation from Surat Municipal Corporation.

Note : -

Demand draft for E.M.D & Tender Fee shall be submitted in electronic format only through online(by scanning) while uploading the bid. this submission shall mean that E.M.D and tender fee are received for purpose of opening the bid .Accordingly offer of those shall be opened whose E.M.D and tender fee is received electronically. However for the purpose of realization of D.D bidder shall send the D.D in original through RPAD/Speed post so as to reach to Account department (Main office), SMC within stipulated date as mentioned in tender notice for the submission of tender FEE & E.M.D.

Penalatative action for not submitting D.D in original to Account Department (Main Office)by bidder shall be initiated and action shall be taken for abeyance of registration and cancellation of E – tendering code for one year.

Any documents in supporting of bid shall be in electronic format only through online (by Scanning) & hard copy will not be accepted separately.

All necessary documents mentioned in Technical bid (if any). shall be submitted online.

(i) COVER-1 : Technical Bid

(D) E.M.D and Tender Fees for the work of **ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS AANGANWADI,WARD OFFICE,READING ROOM AND OTHER MUNICIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT,** along with other Documents in Hard Copy upto **Dt.25/06/2021** up to 18:00 hrs. Also mention the name of tenderer, address, tender notice number etc. on the cover.

(ii) PRICE BID

Price bid for the work of **ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS AANGANWADI,WARD OFFICE,READING ROOM AND OTHER MUNICIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT,** shall be submitted online.

The name of work to be written on cover shall be **ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS AANGANWADI,WARD OFFICE,READING ROOM AND OTHER MUNICIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT,** Also mention the name and the address of tenderer, tender notice number on the cover and to be submitted to the **Chief Accountant, Surat Municipal Corporation, Muglisara, Surat – 395 003**.

2. Tenderer shall be required to submit the enlisted documents as mentioned below in Cover-1. If necessary document founds insufficient then the Price Bid of the tenderer shall not be opened.

   (a) The tender shall be accompanied by Earnest Money Deposit of **Rs.37,000.00/-** The tenderer will pay **Earnest Money Deposit** by **Pay Order/Demand Draft** issued in favour of "Commissioner, Surat Municipal Corporation, Surat" by Nationalized Bank.

   (b) A covering letter detailing various considerations considered in tender shall invariably be given.

   (c) Passport size photographs of all the partners (incase of partnership firm) to be fixed on relevant Page of the tender documents.

3. (a) List of tools, plants and equipments with tenderer in detail.

   (b) Technical establishment/staff of the tenderer in required Performa with their names, qualifications and experience.

   (c) Tenderer shall furnish along with the tender, information regarding Income tax circle of the district in which he is assessed for income tax with PAN No.

4. Submission of a tender by a tenderer shall mean that he has read this notice and contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and nature of required quantities of Materials stores, tools and plants etc. that may be required by him in carrying out the work and of local conditions and laws and bylaws of the Government, Surat Municipal Corporation and other factors bearing influence on the execution and cost of the works.

5. E.M.D., Tender Fee and other necessary document in hard copy shall be received by Registered Post A.D. or by Speed Post through Postal Authority only by the "Chief Accountant, Surat Municipal Corporation, Muglisara, Surat-395003 upto **25/06/2021 up to 18:00 hrs.**

   The same will be opened probably on the **19/06/2021, 10:00 hrs (Technical Bid)(Probable)** in the presence of the tenderers, who shall remain present in the office of "Tender opening officer, Surat Municipal Corporation, Surat. Late tenders (i.e. tenders received after the specified time of opening), delayed tender (i.e. tenders received before the time of opening but after due date and the time of receipt of tender) shall not be considered at all. Tenders received by Registered Post A.D./ Speed Post after the time and the date specified in the tender notice shall not be received by the client from the postman. Such tenders if received will not be opened and will stand rejected.

6. Tender shall stand rejected if:

   1. Any eraser is made in the tender unauthenticated or any page or pages is/are removed or replaced.
   2. The tenderer shall submit the tender which satisfied each and every conditions laid down in the notice tender documents, failing which the tender will be liable for rejection.
   3. Tenderer's tender/quotation containing conditions shall be liable for rejection out rightly without assigning any reason for the same.
   4. Stipulates the validity period less than what is stated in the form or tender.
   5. Stipulates his own conditions.
   6. Does not quote his rates inclusive of Octroi duty and other terminal or sales tax or CENTRAL taxes in his rates.
   7. Does not disclose the full names and address of all his partners in the case of partnership firm.
   8. Does not pay the Earnest Money Deposit by Demand Draft/Pay order and Tender Fees with Technical Bid (Cover-1).
   9. Does not submit the tender before the stipulated time and specified date in the Account Office as directed.
   10. Does not attached the document mentioned.
   11. The tenderer proposes any alteration in the work specified in the tender or in the time limit allowed for carrying out the work or any other condition.

7. All corrections, additions or posted slips to be initialed by the tenderer.
8. All page of tender documents including specifications should be initialed by the contractor.
9. The tenderer shall submit the tender which satisfies each and every conditions laid down in this notice and tender documents failing which the tender is liable for rejection.
10. Notice of inviting tenders shall be a part of the contract documents.
11. Acceptance of tenderer/quotation will rest with the competent authority of Surat Municipal Corporation who does not bind himself to accept the lowest and reserves the right to accept or to reject any or all quotations/tenders and no reasons will be given for acceptance or rejection thereof.
12. The contractor shall also attach list of machineries, tools, plants, equipments which he propose to deploy for this work.
13. All octroi duty and other taxes chargeable by the Municipal Corporation shall be payable by the Contractor.
14. Tender once accepted shall be binding on the contractor even if the formal agreement is not signed.
15. Tender once offered can not be withdrawn except with the permission of head of the concerned department, Surat Municipal Corporation, Surat.
16. The successful tenderer shall be required to enter in to agreement with Municipal Corporation after placing the work order for the said work from SMC.

17. The successful tenderer may be required to furnish surety of 20% of the contract value on stamp paper if so desired by the Municipal Commissioner.

18. The tenderers are requested to give complete specification of work quoted.

19. Unless specifically mentioned by the tenderer for the extra payment of taxes on price quoted by them it will be presumed the prices quoted are inclusive of the all taxes and no claim will be entertained for payment of extra taxes on the bills submitted by them.

20. The Price-bid will be opened only after technical clarifications are clarified.

21. Surat Municipal Corporation reserves the right to open or not to open any or all Price-bid without assigning any reason thereof.

IT-11 TENDER VALIDITY PERIOD

The validity period of the tender submitted for this work shall be of one hundred twenty (120) Calendar day from the date of opening of price bid and that the tenderer shall not be allowed to withdraw or modify the tender offer on his own during the validity period. The tenderer will not be allowed to withdraw the tender or make any modifications or additions in the terms and conditions of his own in his tender. If this is done then the owner shall, without prejudice to any right or remedy, be at liberty to reject the tender and forfeit the Earnest Money Deposit in full.

IT-12 SIGNING OF TENDER DOCUMENTS

If the Tender is made by an individual it shall be signed with his full name above his current address. If he tender is made by a Proprietary firm it shall be signed by the proprietor above his name and the name of his firm with his current address.

If the tender is made by a firm in partnership it shall be signed by all the partners of the firm above their full names and current addresses, or by a partner holding the power of attorney for the firm signing the Tender in which case a certified copy of the power of attorney shall accompany the Tender. A certified copy of the partnership deed, current addresses of all the partners of the firm shall also accompany the tender.

If the tender is made by a limited company or a limited Corporation, it shall be by a duly authorised person holding the power of attorney for signing the Tender in which case a certified copy of the power of attorney shall accompany the Tender. Such limited company or Corporation may be required to furnished satisfactory evidence of its existence before the contract is award.

All witnesses and sureties shall be persons of status and probity and their full names, occupations and addresses shall be stated below their signatures. All signatures in the Tender document shall be dated.

IT-13 WITHDRAWAL OF TENDERS

If, during the Tender validity period, the Tenderer withdraws his Tender, the Tender Security (Earnest Money) shall be forfeited and the Tenderer may be disqualified from tendering for further works under the jurisdiction of SURAT MUNICIPAL CORPORATION

IT-14 INTERPRETATIONS OF TENDER DOCUMENT

Tenderers shall carefully examine the tender documents and fully inform themselves as to all the conditions and matters which may in any way effect the work or the cost thereof. Should a tenderer find discrepancies or omission from the specifications or other documents, or should be in doubt as to their meaning, he should at once address querry to the Divisional Head provided for concerned authority as referred in the Tender Document in Clause GC-01 (Definitions and interpretations) of the (General Condition of Contract). Any resulting interpretation of the Tender documents will be issued to all Tenderers as an addenda corrigendum. Verbal clarification and / or information given by the SMC / Consulting Engineer shall not be binding on the Municipal Corporation.

IT-15 ERRORS AND DISCREPANCIES IN TENDERS

In case of conflict between the figures and words in the rates, the rates expressed in words shall prevail and apply in such cases.

IT-16 MODIFICATION OF DOCUMENTS

Modification of specifications and extension of the closing date of the tender, if required, will be made by an addendum. Copies of each addendum will be sent to all tenderers. These shall be Signed and shall form a part of tender. The tenderer shall not add to or amend the text of any of the documents except in so far as may be necessary to comply with any addenda.

IT-17 ADDENDA

Addenda form part of the contract documents & full consideration shall be given to all addenda in the preparation of tenders. Tenderers shall verify the number of addenda issued, if, any and acknowledge the receipt of all Addenda in the Tender. Failure to acknowledge may cause the Tender to be rejected.

A. The Engineer of the owner may issue Addenda to advise Tenderers of changed requirements. Such addenda may modify previously issued Addenda.

B. No Addendum may be issued after the time stated in Notice Inviting Tenders.

IT-18 TAXES AND DUTIES ON MATERIAL

GST (Goods & Service Tax) has come in existence from 1st July, 2017. Contractor/ Successful Bidder is bound to pay any amount of GST proscribed by the govt. of India as per the Terms of Contract agreed upon during the course of execution of this contract.

During the course of execution of Contract, if there is any change in Rate of GST (Goods & Service Tax) by the Government, the same shall be reimbursed/ recovered separately by SMC, subject to the submission of Original Receipt/ Proof for the amounts actually remitted by the successful Tenderer/ Contractor to the competent Authority along with a Certificate from Chartered Accountant of Contactor/ Successful Bidder certifying that the amount of GST paid to the Government and the same shall be intimated/ submitted/ claimed within 30 (thirty) Days from the date of payment Remittance of GST within stipulated period shall be the sole responsibility of the successful Bidder/ Contractor, failing which, SMC may recover the amount due, from any other payable dues with SMC and decision of Municipal Commissioner shall be final and binding on the Contractor / Successful Bidder in this regard Further, non-payment of GST to the Government may lead to the termination of contract and forfeiture of Security Deposit/ Performance Guarantee Amount.

If imposition of any other new Taxes/ Duties/ Levies/ Cess or any other incidentals etc. or any increase in the existing Taxes/ Duties/ Levies/ Cess or any other incidentals etc. (Excluding GST) are imposed during the course of the contract, the same shall be borne by the Contractor/ Successful Bidder only, in no case SMC shall be liable for the same.

As per the central goods and Service Tax Act-2017 Any Goverment department, local bodies and government undertaking public adventures published tenders amounting more then Rs. 2,50,000 & which commodities/ servies are comes under taxation than 2% TDS (1% for SGST & 1% for CGST) should be deducted. And if commodities/Servies are provided from interstate then 2% TDS should be deducted of IGST.

1% Construction Cess will be deducted from respective R.A. Bill and Final bill in accordance with the prevailing norms of Govt. of Gujarat.

IT-19 EVALUATION OF TENDERS

As per IT (04), Experience of the Contractor shall be considered for Similar kind of works.

IT-20 EVALUATION OF TIME REQUIRED FOR COMPLETION

The time required for completion of work shall be considered as indicated by the tenderer in the completion schedule attached with the tender. The completion period mentioned in this schedule is to be reckoned from 15th day from the date of work order to proceed. Total completion period is calendar months from 15th day from date of issue of work order and tenderers should adhere to this delivery time.

IT-21 POLICY FOR TENDER UNDER CONSIDERATION

Tenders shall be termed to be under consideration from the opening of the tender until such time an official announcement of award is made.

While tenders are under consideration, tenderers and their representative or other interested parties are advised to refrain from connecting by any means Municipal Corporation or representatives on matters related to the tenders under study. The Engineer's representative if necessary will obtain clarification on tenders by requesting information from any or all the tenderers either in writing or through personal contact, as may be necessary. The tenderers will not be permitted to change the substance of his tender after price submission. Non-compliance with this provision shall make the tender liable for rejection.

IT-22 PRICES AND PAYMENTS

The tenderer must understand clearly that the price quoted are for the total works or the part of the totalworks quoted for and include all costs due to Materials labour, equipment, supervisions, other services, royalties and Octroi etc. and to include all extras to cover the cost. No claim for additional payment beyond the prices quoted will be entertained and the tenderer will not be entitled subsequently to make any claim on any ground excepting for the condition laid down in GC-35 (Price Adjustment).

IT-23 PAYMENT TERMS

The terms of payment are defined in the General Conditions of Contract. The Municipal Corporation shall not under any circumstances relax, their terms of payment and will not consider any alternative payment terms. Tenderers should therefore in their own interest note this provision to avoid rejection of their tenders.

IT-24 AWARD

Award of the Contract or the rejection of tenders will be made during the Tender validity period stated in the Notice Inviting Tenders.

A. After all contract contingencies are satisfied and the Notice of Award is issued, the successful Tenderer shall execute the Contract Agreement within the time stated in the Notice Inviting Tenders and shall furnish the Bond as required herein. The Contract Agreement shall be executed in the form stipulated by the owner. A copy of the required form is included in the contract documents.

B. If the Tenderer receiving the Notice of Award fails or refuses to execute the Contract Agreement within the stated time limit or fails or refuses to furnish the Bond as required herein, the SMC may annul his award and declare the tender security forfeited.

C. A Corporation, Partnership firm or other consortium acting as the Tenderer and receiving the Award shall furnish evidence of its existence and evidence that the officer signing the Contract Agreement & Bonds for the Corporation, partnership firm or other consortium acting as the Tenderer is duly authorised to do so.

IT-25 SIGNING OF CONTRACT

The successful tender shall be required to pay the security deposit and to execute the contract within 10 days of receipt of intimation to execute the contract, failing which the Municipal Corporation will be entitled to annul the award and forfeit the Earnest Money Deposit. The person to sign the contract document shall be person detailed in Article IT-12.

IT-26 DISQUALIFICATION

A tender shall be disqualified and will not be taken for consideration if :-

(a) The outer envelope does not show on the outside the reference of bid and thus get opened before the due date of opening (as per Article IT-10 i.e. Submission of Tender Document).

(b) The tender Security Deposit is not deposited in full and in the manner i.e. Earnest Money Deposit.

(c) The tender is in a language other than English or does not contain its English Translation in case of other language adopted for tender preparation.

(d) The tender documents are not signed by an authorised person.

(e) The general performance data for qualification not submitted fully.

(f) The tenderer does not agree to deposit security amount as specified (as per Article IT-25 i.e. Signing of Contract).

(g) The tenderer does not agree to payment terms defined as per Article IT-23 i.e. Payment Terms.)

(h) Conditional tender.

A. Tenderer may further be disqualified if :

(a) Price variation is proposed by the Tenderer on any principles other than provided in the Tender Documents.

(b) Completion schedule offered is not consistent with the completion schedule defined and specified in tender documents.

(c) The validity of tender is less than that mentioned in Article IT-11 i. e. Tender Validity Period.

(d) Any of the page or pages of tender is/are removed or replaced.

(e) All corrections or pasted slips are not initialed by tenderer.

(f) Any erasure is made in the tender.

IT-27 PERFORMANCE GUARANTEE (SECURITY DEPOSIT)

The total Security Deposit is 4% (Four) percent of contract value and shall be as under:

The successful tenderer shall have to pay initial security deposit at 2% (two) percent of the tendered amount.

- Initial Security Deposit (2%) shall be paid in form of Cash or Demand Draft/ Pay Order if the Tender Amount of work is **less than Rs. 2.00 crore.**
- Initial Security Deposit (2%) shall be paid in form of Cash or Demand Draft/ Pay Order / bank Guarantee (encashable at Surat city)/ FDR if the tender Amount of work is **more than Rs. 2.00 crore**

Where the Contractor is required to submit bank guarantee against payment towards any deposit or advance, e.g. S.D., such bank guarantees shall be produced only from any one of the following Nationalized/Scheduled Banks:

1) Indian Bank.
2) State Bank of India.
3) Punjab National Bank.
4) Bank of Baroda.
5) Union Bank of India.
6) Bank of India.
7) Oriental Bank of Commerce.
8) Canara Bank.
9) Central Bank of India.
10) Corporation Bank.
11) Allahabad Bank.
12) Indian Overseas Bank.
13) Dena Bank.
14) Syndicate Bank.
15) HDFC Bank.
16) IDBI Bank.
17) Bank of Maharashtra.
18) ICICI Bank.
19) Axis Bank.
20) UCO Bank.

The person/persons whose tender may be accepted [here-in after called the Contractor, which expression shall unless excluded by or repugnant to the context include his heirs, executors, administrators and assignees shall (within 15 days of the receipt by him of the notification of the acceptance of his tender) deposit with

Municipal Commissioner cash or Government securities endorsed to the Commissioner sum sufficient which will make up the full security deposit specified in the tender.

If the amount of the security deposit to be paid in lump sum within the period specified above is not paid the tender contract already accepted shall be considered as cancelled. The security deposit lodged by Contractor shall be refunded after the expiry of the Defects Liability period as shown in the attached Memorandum after deducting dues, if any, which become liable to be recovered from the Contractor under the terms and conditions of this Agreement.

Regarding remittance and release of Security Deposit (SD), Retention money deposit (RMD) following clause will supersede over and above all the clauses depicted in the tender document.

Tender costing Less than Rs.2.00 Crore.

(a) Remittance of SD/RMD

(i) The total security deposit shall be recovered at the rate of 4% from contractor. Out of which, 50% of amount as Initial Security Deposit shall be payable at the rate of 2% of approved tender cost in form of Cash or Demand Draft/ Pay Order of any Nationalised Bank (encashable at Surat city).

(ii) The remaining amount of the Security Deposit i.e. 2% to be deducted from each running account bill.

(iii) 5% Retention money deposit (RMD) to be retained from each running account bill.

(b) Release of SD/RMD

(i) The 2% Initial security deposit shall be released after clearance of Final bill by Audit Dept.

(ii) Whereas, the 2% security deposit recovered from the each running account bills Shall be released only after clearance of Final bill by Audit Dept. & completion of defect liability period.

(iii) 5% Retention money deposit (RMD) to be released along with final bill.

Tender costing Rs.2.00 Crore. & more than Rs.2.00 Crore.

The amount recovered from the running bills as security deposit shall not be allowed to the transferred in the form of Bank Guarantee. However, the remaining 50% (2% of Security Deposit) of the amount so, deducted from running bills will be allowed for conversion in the form of interest bearing fixed deposit receipt, (FDR) issued in favour of the Municipal Commissioner, Surat Municipal Corporation, Surat by a Nationalized Bank located at Surat only. Additional stamp duty payable as per government prevailing rule shall be paid by contractor for remittance of this FDR.

It is clarified that the amount of security deposit shall be collected on the basis of contract price and not on the basis of Estimated Amount put to tender. As initial Security Deposit as mentioned above, accepted by the competent Authority shall have to be paid toward Security Deposit at the time of execution of agreement.

Interest will be payable on FDR (that is deducted from Running Bill and converted in to FDR for initial SD) for One year, after completion of work. After that no further interest shall be paid for any extended period what so ever.

If the Security Deposit is not paid within 15 days from the date of L.O.I. / Work Order than penalty at the rate of 0.065% per day of the amount of Security Deposit will charged. If the Security Deposit is not paid within one month with interest, necessary actions as per condition of contract will be taken.

Initial Security Deposit (i.e. 2% Of Tender Amount) in form of Bank Guarantee may be accepted as per relevant tender provision, However BG shall be valid till final date of completion of work+1year (Whether final bill is audited and paid or not). It shall be contractor's responsibility to extent the BG On Or Before expiry of time limit of BG. In case of late renewal of BG, penalty of security deposit shall be levied at the rate of 0.065% of per day of BG amount.

The successful tenderer shall have to enter into an agreement on a non-judicial stamp paper of Rs. 300/- if initial Security Deposite paid in form Bank Guarantee or Demand draft as per the form of the agreement approved by the Municipal Corporation, Surat.

If initial Security deposit is paid in form of Fixed Deposit, additional stamp paper amounting As per government's prevailing rule of Security Deposit shall be used to execute the agreement.

The undertaking shall be executed on stamp paper worth Rs. 300/-.

The Surety shall be executed on stamp paper worth Rs. 300/-.

IT-28 STAMP DUTY

The successful tenderer shall have to enter into an agreement on a non-judicial stamp paper of Rs.4.90% of S.D. Amount, if S.D. Amount in FDR and otherwise as per the form of the agreement approved by the Municipal Corporation, Surat.

The agreement shall be executed on stamp paper worth Rs.4.90% of S.D. Amount.

The surety shall be executed on stamp paper worth Rs. 300/-

IT-29 BRAND NAMES

Specific references in the specifications to any Materials by tender's name, or catalogue number shall be construed as establishing a standard or quality and performance and not as limiting competition and the tenderer in such cases, may at their option freely use any other product, provided that it ensures and equal or higher quality than the standard mentioned and meets Municipal Corporation approval.

IT-30 NON-TRANSFERABLE

Tender documents are not transferable.

IT-29 COST OF TENDERING

The owner will not defray expenses incurred by Tenderers in tendering.

IT-32 DEFECT OF TENDER

The Tender for the work shall remain open for a period of 120 calendar days from the date of receipt of the tenders for this work and that the tenderer shall not be allowed to withdraw or modify the offer on his own during the period. If any tenderer withdraws or makes any modifications or additions in the terms and conditions on his own, then the Municipal Corporation, shall without prejudice to any right or remedy, be at liberty to reject the tender and forfeit the earnest money in full.

IT-33 CHANGE IN A QUANTITY

The Surat Municipal Corporation reserves the right to waive any informality in any tender and to reject one or all tenders without assigning any reasons for such rejections and also to very to quantities of items or group as specified in the Schedule of price as may be necessary. Claim what so ever by the contractor on the basis of variation of quantities shall not be entertained.

IT-34 NEW EQUIPMENT AND MATERIAL

All Materials, equipment and spare parts thereof shall be new, unused and originally coming from manufacturer's plant to the Corporation. The rebuilt or overhauled equipment/Materials will not be allowed to be used on work.

IT-35 RIGHTS RESERVED

The SMC reserves the right to reject any or all tenders, to waive any informality or irregularity in any tender without assigning any reasons. The SMC further reserves the right to withhold issuance of the notice to proceed, after execution of the contract agreement, for the period of time stated in the notice inviting tenders and no additional payment will be made to the successful tenderer on account of such withholding. The SMC is not obliged to give reasons for any such action.

IT-30 Municipal Commissioner reserves the right to reduce the scope of work and split the tender in two or more parts without assigning any reason even after the award of contract.

IT-37 No mobilisation advance or advance on machinery will be given.

IT-38 The scope of work is clearly mentioned in the tender documents. The contractor shall have to carry out the work in accordance with the details specifications. No conditions will be accepted. The conditional tender will be liable to be rejected.

IT-39 The surplus excavated earth, after backfilling the trenches shall have to be removed from the site asdirected.After compaction and consolidation, if any short fall of earth is found then contractor has to bring the same to the required quantity in order to meet shortfall at his own cost. More over, if any settlement of road after reinstatement is observed during the defect liability period of the work. Contractor shall be fully responsible for the defective work and patches/ depression / settlement shall be repaired with quarry spoil or metal at contractor's own cost. If contractor fails to repair the patches / depression / settlement in time, corporation will repair it at all risk and cost of contractor.
Surplus earth shall not be disposed off in a way that leads to nuisance to the public or SMC.

IT-40 TAXES

GST CLAUSE FOR CONSTRUCTION / ERECTION / COMMISSIONING / INSTALLATION / REPAIRS / MAINTENANCE / RENOVATION / FABRICATION OF STRUCTURE INCLUDING BUILDING (MEANS ALL WORKS CONTRACT / TURN KEY PROJECTS / SUPPLY OF MATERIAL /GOODS).

GST (Goods & Service Tax) has come in existence from 1st July, 2017. Contractor / Successful Bidder is bound to pay any amount of GST prescribed by the Govt. of India as per the Terms of Contract agreed upon during the course of execution of this Contract.

During the course of execution of Contract, if there is any change in Rate of GST (Goods & Service Tax) by the Government, the same shall be reimbursed / recovered separately by SMC, subject to the submission of Original Receipt / Proof for the amounts actually remitted by the Successful Tenderer / Contractor to the Competent Authority along with a Certificate from Chartered Accountant of Contractor / Successful Bidder certifying that the amount of GST paid to the Government and the same shall be intimated / submitted / claimed within 30 (Thirty) Days from the date of payment. Remittance of GST within stipulated Period shall be the sole responsibility of the Successful Bidder / Contractor, failing which, SMC may recover the amount due, from any other payable dues with SMC and decision of Municipal Commissioner shall be final and binding on the Contractor / Successful Bidder in this regard. Further, the non-payment of GST to the Government may lead to the termination of contract and forfeiture of Security Deposit / Performance Guarantee Amount.

If imposition of any other new Taxes / Duties / Levies / Cess or any other incidentals etc. or any increase in the existing Taxes / Duties / Levies / Cess or any other incidentals etc. (Excluding GST) are imposed during the course of the contract, the same shall be borne by the Contractor / Successful Bidder only, in no case SMC shall be liable for the same.

The Contractor will submit the invoice to the SMC having GSTIN of SMC mentioned therein and the taxes shall be shown separately on the face of the Invoice so as to claim as ITC by SMC.

IT-41 No escalation charge/rates shall be paid by SMC in anycase.

IT-42 Contractor must be submitted The cement/steel (Zerox copy) billwise.

IT-43 Contractor must be submitted royalty pass(zerox).

IT-44 All the taxes should be bear by agency & it should be applicable as per government resolution (of change periodically) & No compensation/Reimbersion should be given to theagency.

IT-45 TAX INVOICE FOR PAYMENT OF WORK (AS PER GST RULES)

The contractor shall submit all bills on the Prescribed format, include in Tender for purpose of payment of the work to the office of the Engineer-in-charge.

IT-46 TESTING OF CEMENT AND STEEL

It should be specifically noted that the cement and steel brought by the contractor at site of work shall be used only after the same is tested at the approved laboratory as per the direction of the Engineer-in-charge. Such approved laboratory may be located at Surat, Baroda, and Ahmedabad or Mumbai.

All the charge for the transport and testing of the samples shall have to be borne by the contractor. The frequency of testing such material shall be in accordance to the relevant Indian Standards as directed by Engineer-in-charge.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

SURAT MUNICIPAL CORPORATION

PERCENTAGE RATE TENDER & CONTRACT FOR WORK

-;GENERAL RULES AND DIRECTIONS FOR THE GUIDANCE OF CONTRACTORS :-

(1) All work proposed to be executed by contract shall be notified in a form of invitation to tender pasted on a board hung up in the office of the Engineer & signed by the Engineer.

This form will state the work to be carried out as well as the date/or submitting and opening tenders and the time allowed for carrying out work, also the amount of earnest money to be deposited with the tender and the amount of the Security Deposit to be paid by the successful tenderer and the percentage, if any, to be deducted from bills. It will also state whether a refund of quarry fees, royalties, octroi dues and ground rent will be granted. Copies of the specifications, designs and drawings and estimated rated scheduled rates and any other documents required in connection with the work which shall be signed by the Engineer- in-charge for the purpose of identification shall also be open for inspection by contractors at the office of the Engineer-in-charge during office hours.

Where the work are proposed to be executed according to the specifications recommended by a contractor and approved by a competent authority on behalf of the corporation, such specifications with designs and drawings shall form part of the accepted tender.

(2) In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof, or in the event of the absence of any partner, it shall be signed on his behalf by a person holding a power of attorney authorising him to do so.

(3) Receipts for payments made on account of any work, when executed by a firm, shall also be signed by all the partners, except where the contractor are described in their tender as a firm, in which case the receipts shall be signed in the name of the firm by one of the partners or by some other persons having authority to give effectual receipts for the firm.

(4) Any persons, who submit tender shall fill up the usual printed form including the `Column' total according to estimated quantities, stating at what rate he is willing to undertake the each item of the works, Tenders which proposal any alterations in the work specified in the said form of invitation to tender or in the time allowed for carrying out the work or which contain any other conditions of any short, will liable to be rejection No.single tender include more than one will liable to be rejection No. single tender include more then one work but contractors who wishs to tender for each. Tender shall have (to which they refer) written outside the envelope.

(5) The Commissioner or his duly authorised assistant shall open tender in the presence of any intending contractors who have submitted tender or their representatives who may be present at the time.In the event of a tender being accepted, the contractor shall there upon for the purpose of identification, sign the copies of the specifications and other documents mentioned in this tender. In the event of the tender being rejected, the divisional officer shall authorised the accountant to refund the amount of earnest money deposited to the contractor making the tender on his giving a receipt for the returned of the money.

(6) The officer competent to dispose of the tender shall have the right of rejecting all or any of the tenders.

(7) No receipts for any payment alleged to have been made by a contractor in regard to any matter to this tender shall be valid and binding on corporation unless it is signed by the Engineer-in- charge.

(8) The memorandum of work to be tendered for and the schedule of Materials to be supplied by the concern department and their rates shall be filled in and completed by the officer of the Engineer- in-charge before the tender form is issued. If a form issued an intending tenderer has not been so filled in and completed, he shall request the said officer to have this done before he completes and delivers his tender.

(9) All works shall be measured net by standard measure and according to the rules and customs of the Public Works Department without reference to any local custom.

(10) Under no circumstances shall any contractor be entitled to claim enhanced rates for any items in this contract.

(11) Every contractor shall unless excepted in writing by the Additional City Engineer concerned, produced alongwith the tender, a solvency certificate of his financial stability from the Collector of the District within which he resides or a Bankers certificates. If he fails to produce such a certificate, his tender may not be considered.

(12) All corrections and additions or pasted slips should be initiated.

(13) The measurement of work will be taken according to the usual method in use in the public works department and no proposals to adopt alternative methods will be accepted. The Engineer-in-charge decision as to what is "the usual method in use in the public works department" will be final.

(14) A.The Insurance Company's bond will not be accepted against the Security Deposit.

(15) The contractor shall have to attach to his tender Income Tax Clearance Certificate to be obtained from the Income Tax Officer.

(16) The Contractor will have to construct a shed for storing control and valuable Materials issued to him under Schedule-`A' of the agreement at work site having double locking arrangement. The Materials will then be taken for use in the presence of the department person. No Materials will be allowed to be removed from the site of work except with the written permission from Engineer- in-charge.

(17) No foreign exchange will be released by the Corporation for the purpose of plant and machineries required for the execution of the work contracted for.

(18) Controlled Materials (Essentiality certificate)

(i) As regard controlled Materials the Corporation will help to arrange for the permit as far as possible and help the contractor in securing for the permit as far as possible and help the contractor in securing the same. All incidental charges met with in procuring these Materials shall be borne by the contractor himself. Though the Corporation will help to arrange for the permit as far as possible and help the contractor in obtaining the Materials it shall not accept any responsibility for any delay or loss on account of delay caused to the contractor while obtaining the same.

(ii) The contractor shall submit to Engineer-in-charge on Close of every calender months, the monthly returns in the prescribed forms as to the receipt and actual use of the controlled Materials during the month.

(iii) The contractor shall permit the Engineer- in- charge or his representatives to inspect the stock of the controlled Materials stored by him at any time, whenever the Engineer-in- charge or his representatives so desired (s).

(19) The tender for work shall remain open for a period of 120 days from the date of opening of the price bid for this works and that the tenderer shall not be allowed to withdraws or modify the offer on his own during this period. If any tenderer withdraws or makes any modifications or addition/s in the terms and conditions of his tender, not acceptable to the corporation them the corporation shall without prejudice to any right or remedy be at liberty in full the said earnest money absolutely (in figures as well as in words). This Blank Space should be filled in while preparing the draft tender papers.

(20) The contractor shall employee only such labourer who shall produce a valid certificate of having been vaccinated against small pox within a period of last 3 years.

(21) Tenderer should submit True Copy of the Certificate of Registration alongwith the tender without which the tender will not be considered.

(22) The contractor shall have to give in writing the date completion of the work within a fortnight from the date of work completed by him. Otherwise the date noted on the record by the department shall be reawakened as final and no excuse or representation in that behalf shall be entertained at later date.

(23) "What ever sales tax is levied by the Government on works contract and if paid by the contractor in the first instance, shall be refunded to the concerned contractor by Corporation.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

GENERAL CONDITION OF CONTRACT

SECTION-I

GC-01 DEFINITIONS AND INTERPRETATIONS

1.0 In the contract documents, as herein defined the following words and expression used shall, unless, repugnant to the subject or context thereof, have the following meanings assigned to them.

1.1 The "Owner/Municipal Corporation, Surat represen-ted by Municipal Commissioner/Add.City Engineer, any officer authorised by the Municipal Corporation.

1.2 The "Contractor" shall mean the person or the persons, firm of company whose tender has been accepted by the owner and includes his legal representative successors and permitted assignes.

1.3 The "Engineer-in-charge" shall mean the person designated as such by the owner from time to time and shall include those who are expressly authorised by the Municipal Corporation to act for and on its behalf for the operation of this contract.

1.4 "Engineer - in - charge's Representative" shall mean any Engineer or Asstt. to the Engineer-in-charge designated from time to time by the Engineer-in-charge to perform duties set forth in the Tender documents whose authority shall be notified in writing to the Contractor by the Engineer-in-charge.

1.5 "Tender" The offer or proposal of the Tenderer submitted in the prescribed form setting forth the prices for the work to be performed, and the details thereof.

1.6 "Contract Price shall mean total money payable to the Contractor under the contract documents.

1.7 "Addenda" shall mean the written or graphic notices prior to submission of tender which modify or interpret the contract documents.

1.8 "Contract Time" - The number of consecultative calendar months for the completion of work as stated in the executed contract agreement.

1.9 "Contract" shall mean agreements between the parties for the execution of works including therein all contract documents.

1.10 "Tender document" shall mean Designs, Drawings, specifica- tions, agreed variations, if any, and such other documents constituting the tender and acceptance thereof.

1.11 "The Sub-Contractor" means any person, firm or company (other than the contractor) to whom any part of the work has been entrusted by the Contractor with the written consent of the Engineer-in-charge and the legal personnel representative, successors and permitted assigness of such person, firm or company.

1.12 "The Specifications" shall mean all directions' the various technical specifications provisions and requirements attached to the contract which pertain to the method and manner or performing the work to the quality of the work and the Materials to be furnished under the contract for the work and any order(s) or instruction (a) thereunder. It shall also mean the latest Indian Standards Institution Specifications for or relative to the particular work or part there of, so far as they are not contrary to the Tender specifications or I.S.I. specifications, and in absence of any tender specifications, the specifications of any other country applied in India as a matter of Standard Engineering practice and apprroved in writing by the Engineer-in-charge with or without modifications.

1.13 The "Drawing" shall include maps, plans, tracings or prints thereof with any modifications approved in writing by the Engineer-in-charge and such other drawings, as may, from time to time, be furnished or approved in writing by the Engineer-in-charge in connection with the work.

1.14 The "Work" shall mean the works to be executed in accordance with the context or the part thereof as the case may be and shall include extra, additional altered or substituted works as required for the purpose of the Contract. It shall mean the totally of the work by expression or implication envisaged in the contract and shall include all material, equipment and labour required for or relative or incidental to or in connection with the commencement, performance and completion of any work and/or for incorporation in the work.

1.15 The "Permanent work"means works which will be incorporation in and form part of the work to be handed over to the owner by the contractor on completion of the contract.

1.16 The "Temporary Work" shall mean all temporary works of every kind required in or about the execution, completion and maintenance ofthe work.

1.17 "Site shall mean the land and other place on, under, on or through which the work is to be carried out and any other lands or places provided by the Municipal Corporation for the purpose of the Contract together with any other places designated in the Contract as forming part of the site.

1.18 "The Construction Equipment" means all appliance/equipments of whatever nature required in or for execution, completion or maintenance of work or temporary works (as hereinafter defined) but does not include Materials or other things intended to form or forming part of the permanent work.

1.19 "Notice in Writing or Written Notice" means a notice written, types or printed form delivered personally or sent by Regisgered post to the latest know private of business address at Registered Office of the Contractor.

1.20 The "Alteration/Variation order" means an orders given in writing by the Engineer-in-charge to effect additions to or deletion from and alterations in the work.

1.21 "Final Test Certificate" shall mean the final test Certificate issued by the owner within the provisions of the Contract.

1.22 The "Completion Certificate" shall mean a certificate to be issued by the Engineer-in-charge when the work has been completed to his satisfaction.

1.23 The "Final Certificate" shall mean the final certificate issued by the Engineer-in-charge after the work is finally accepted by the owner.

1.24 "Defect Liability Period" shall mean the specified period between the issue of completion Certificate and the final certificate as specificed in the tender.

1.25 "Approved" shall mean approved in writing including subsequent modification in writing of previous verbal approval and "Approval" means approved in writing including as aforesaid.

1.26 "Letter of Acceptance"shall mean an intimated by a letter to tenderer that the tender has been accepted in accordance with provisions contained therein.

1.27 "Order" and "Instruction" shall respectively mean any written order or instruction given by the Engineer-in- charge within the scope of his powers in terms of the Contract.

1.28 "Running Account Bill" shall mean a Bill for the payment of "On Account" money to the contractor during the progress of work on the basis of work done and the non-perishable Materials to be incorporated in the work supplied by the Contractor.

1.29 "Security Deposit" shall mean the deposit to be held by the owner as security for the due performance of contractual obligations.

1.30 "The appointing authority" for the purpose of Arbitration shall be the Municipal Commissioner, Surat Municipal Corporation, Surat.

1.29 Retention Money shall mean the money retained from R.A.Bill for due completion of "NET WORK'.

1.32 Unless otherwise specifically stated, the masculine gender shall include the faminine and natural genders and viceversa and the singular shall include the plural and vice-versa.

GC-02 LOCATION OF SITE AND ACCESSIBILITY

The site of works is within the limits of Surat Municipal Corporation. It is served by all weather roads and Western Railway Broad Guage line, Government Irrigation Canal Crossing. The intending Tenderer should inspect the site and make himself familier with site conditions and available communication facilities. Non availability of access/roads shall in no case be the cause to condon any delay in the execution of the work or be the cause for any claims or extra compensation.

GC-03 SCOPE OF WORK

The scope of work is defined broadly in the special conditions of Contract and specifications. The Contractor shall provide all necessary Materials equipment and labour etc. for the execution and of the work till completion. All Materials that go with the work shall be approved by the Engineer-in-charge prior to procurement and use.

Owner at his discretion may endeavour to provide water to the Contractor at the owner's source of supply at one point at the rate charged for such works.

The contractor shall make his own arrangement for the distribu- tion pipe net works from the source of supply after getting prior permission for the same from the Engineer-in-charge. Supply of water shall not be free and the necessary charges as fixed by the Local Body shall have to be paid by the contractor.

However,owner does not guarantee the supply of water and this does not relieve the contractor of his responsibility in making his own arrangements and for the timely completion of the work as stipulated.

POWER SUPPLY

The Contractor shall have to make his own arrangement for power supply.

LAND FOR CONTRACTOR'S FIELD OFFICE, GODOWN & WORKSHOP

Owner will not be a position to provide land required for Contractors shall have to make his own arrangement for the same. No land will be provided by S.M..C. to the contractor for constructing his labour and supervisory comp and other service facilities.

GC-04 RULLING LANGUAGE

The language according to which the contractor shall be constructed and interpreted shall be English. All entries in the contract documents and all correspon-dence between the contractor and the Municipal Corporation or the Engineer shall be in English. All dimensions for the Materials shall be given in metric units only.

GC-05 INTERPRETATION OF CONTRACT DOCUMENT

1. The provisions of the General Conditions of Contract and special conditions of contract shall prevail over those of any other documents of the contract unless specifically provided otherwise. Should there be any discrepancy, inconsistency error or ommission in the several documents forming the contract, the matter may be referred to the Engineer-in-charge for his instructions and decision. The Engineer-in-charge's decision in such case shall the final and binding to the contractor.

2. Works shown upon the drawings but not described in the specifications of described in the specific specifications without showing on the drawings shall be taken as described in the specifications and shown on the drawings.

3. The heading and the marginal notes to the clauses of those general conditions of contract or to the specifications or to any other part of tender documents are solely for the purpose of giving a concise indication and not a summary of contents thereof or be used in the interpretation or construction thereof of the contract.

4. Unless otherwise stated specifically, in this contract documents the singular shall include the plural and vice versa wherever the context so requires. Works implementing persons shall include relevant corporated companies/ registered associations / body of individual / firm of partnership.

5. Not with standing the sub-divisions of the documents into separate sections and volumes every part of each shall be supplementary to and complementary of every other part and shall be read with and into the context so far as it may be practicable to do so.

6. Where any portion of the General Conditions of contract is repugnant to or ar variance with any provisions of the special conditions of contract, then, unless a different intension appears, the provisions of the special conditions of contract shall be deemed to override the provisions of General conditions of Contract and shall to the extent of such repugnancy or variance prevail.

7. The Materials, Design and Workmanship shall satisfy the relevant I.S.S.and Codes referred to. If Additional require- ments are shown in the specifications, the same shall be satisfied over and above I.S.S. and Codes.

8. If the specification mention that the contract shall perform certain work or provide certain facilities, it will mean that the contractor shall do so at his own cost.

9. The correctness of the details given in the tender documents is not guaranteed. The contracotr shall independently obtain all necessary information for making the tender. The contractor shall be deemed to have examined the Contract Documents, to have generally obtained his own information in all matters that might affect the carrying out of the work or the Tenderer rates. Any error in description of quantity or commission there from shall not vitiate the contract or release the contractor from executing the work comprised in the contract according to the Drawings and specifications at the tendered rates. He is deemed to have known the scope, nature and magnitude of the work and the requirements of Materials and labour involved and as to what all works he has to complete in accordance with the contract what-soever be the defects, omissions, or errors that may be found in the contract documents. The contractor shall be deemed to have visited the site and the surroundings,to have satisfied himself to the nature of all existing structures, if any, and also as to the nature and the conditions of railways, roads, bridges and culverts, means of transport and communications, whether by land, air or water and as to possible interceptions thereto and the access and agrees from the site, to have made inquires, examined and satisfied himself as to the sites for obtaining sand, stones, bricks and other Materials, the sites for disposal of surplus Materials, the available accommodation as to whatever required, the depicts and such other buildings as may be necessary for executing and completing the work, to have local independent inquiries as to the subsoil, subsoil water and variation thereof, storms, prevailing winds, climatic conditions and all other similar matters effecting the work. He is deemed to have acquinted himself as to his liability for payment of Government taxes, custom duty and other charges.

Any neglect or failure on the part of the contractor in obtaining necessary and reliable information upon the forgoing or any other matters affecting the contract shall not relieve him from any risks or liabilities or the entire responsibility from completion of the work at the tendered rates and time in strict accordance with the contract documents.

No verbal agreement or inference from conversation with any officer or employee of the worner either before or after the execution of the Contract Agreement shall in any way effect or modify any of the terms of obligations herein contained.

GC-06 CONTRACTOR TO UNDERSTAND HIMSELF FULLY

The contractor by tendering shall be deemed to have satisfied himself, as to consideration and cirucmstances affecting the tender price, as to the possibility of executing the works as shown and described in the contract and to have fixed his prices accordingg to his own view on these matters and to have understand that no additional allowances except as otherwise expressely provided, will after words be made beyond the contract price. The contractor shall be responsible for any misunder-standing or incorrect information given in writting by the Engineer.

GC-07 ERROR IN SUBMISSION

The contractor shall be responsible for any errors or ommissions in the particulars supplied by him. Whether such particulars have been approved by the Engineer or not, provided that such discrepancies, errors or ommissions be not due to inaccurate information or particular furnished in writing to the Contractor by the Municipal Corporation or the Engineer.

GC-08 SUFFICIENCY OF TENDER

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness of the tender rates which rates shall, except as or other wise provided for, cover all the Contractor's liabilities and obligation set forther or implied in the contract for the proper execution of work for compliance with requirements of Article GC-19 thereof.

GC-09 DISCREPANCIES

The drawings and specifications are to be considered as mutually explanatory of each other, detailed drawings being followed in preference to small scale drawings and figures dimension in preference to scale and special conditions in preference to general conditions. Special direction or dimen- sions given in the specifications shall supersede all else. Should any discrepanies however, appear or should any misunderstanding arise as to the meaning and intent of the said specifications or drawings, or as to the dimensions or the quality of the Materials or the due and proper execution of the works, or as to the measurement or quality and valuation of the works executed under this contract or as extra there upon the same shall be explained by the Engineer-in-charge and his explanation shall subject to the final decision of the Additional City Engineer, in case reference be made to him, be binding upon the contractor shall execute the work according to such explanation (subject to aforesaid) and without addition to or deduction from the contract and shall also do all such works and things necessary for the proper completion of the works as implied by the Drawings and specifications, even though such works and things are not specially shown and described in said specifications. In cases where not particular specifications are given for any article to be used under the contract, relevant specifications of the Indian Standard Institution shall apply.

GC-10 PERFORMANCE GUARANTEE : (Security Deposit)

The total Security Deposit is 4% (Four) percent of contract value and shall be as under:

The successful tenderer shall have to pay initial security deposit at 2% (two) percent of the tendered amount.

- Initial Security Deposit (2%) shall be paid in form of Cash or Demand Draft/ Pay Order if the Tender Amount of work is **less than Rs. 2.00 crore.**
- Initial Security Deposit (2%) shall be paid in form of Cash or Demand Draft/ Pay Order / bank Guarantee (encashable at Surat city)/ FDR if the tender Amount of work is **more than Rs. 2.00 crore & 2.00 crore.**

The person/persons whose tender may be accepted [here-in after called the Contractor, which expression shall unless excluded by or repugnant to the context include his heirs, executors, administrators and assignees shall (within 15 days of the receipt by him of the notification of the acceptance of his tender) deposit with Municipal Commissioner cash or Government securities endorsed to the Commissioner sum sufficient which will make up the full security deposit specified in the tender.

If the amount of the security deposit to be paid in lump sum within the period specified above is not paid the tender contract already accepted shall be considered as cancelled. The security deposit lodged by Contractor shall be refunded after the expiry of the Defects Liability period as shown in the attached Memorandum after deducting dues, if any, which become liable to be recovered from the Contractor under the terms and conditions of this Agreement.

Regarding remittance and release of Security Deposit (SD), Retention money deposit (RMD) following clause will supersede over and above all the clauses depicted in the tender document.

Tender costing Less than Rs.2.00 Crore.

(a) Remittance of SD/RMD

(i) The total security deposit shall be recovered at the rate of 4% from contractor. Out of which, 50% of amount as Initial Security Deposit shall be payable at the rate of 2% of approved tender cost in form of Cash or Demand Draft/ Pay Order of any Nationalised Bank (encashable at Surat city).

(ii) The remaining amount of the Security Deposit i.e. 2% to be deducted from each running account bill.

(iii) 5% Retention money deposit (RMD) to be retained from each running account bill.

(b) Release of SD/RMD

(i) The 2% Initial security deposit shall be released after clearance of Final bill by Audit Dept.

(ii) Whereas, the 2% security deposit recovered from the each running account bills Shall be released only after clearance of Final bill by Audit Dept. & completion of defect liability period.

(iii) 5% Retention money deposit (RMD) to be released along with final bill.

Tender costing Rs.2.00 Crore. & more than Rs.2.00 Crore.

The amount recovered from the running bills as security deposit shall not be allowed to the transferred in the form of Bank Guarantee. However, the remaining 50% (2% of Security Deposit) of the amount so, deducted from running bills will be allowed for conversion in the form of interest bearing fixed deposit receipt, (FDR) issued in favour of the Municipal Commissioner, Surat Municipal Corporation, Surat by a Nationalized Bank located at Surat only. Additional stamp duty payable as per government prevailing rule shall be paid by contractor for remittance of this FDR.

It is clarified that the amount of security deposit shall be collected on the basis of contract price and not on the basis of Estimated Amount put to tender. As initial Security Deposit as mentioned above, accepted by the competent Authority shall have to be paid toward Security Deposit at the time of execution of agreement.

Interest will be payable on FDR (that is deducted from Running Bill and converted in to FDR for initial SD) for One year, after completion of work. After that no further interest shall be paid for any extended period what so ever.

If the Security Deposit is not paid within 15 days from the date of L.O.I. / Work Order than penalty at the rate of 0.065% per day of the amount of Security Deposit will charged. If the Security Deposit is not paid within one month with interest, necessary actions as per condition of contract will be taken.

Initial Security Deposit (i.e. 2% Of Tender Amount) in form of Bank Guarantee may be accepted as per relevant tender provision, However BG shall be valid till final date of completion of work+1year (Whether final bill is audited and paid or not). It shall be contractor's responsibility to extent the BG On Or Before expiry of time limit of BG. In case of late renewal of BG, penalty of security deposit shall be levied at the rate of 0.065% of per day of BG amount.

The successful tenderer shall have to enter into an agreement on a non-judicial stamp paper of Rs. 300/- if initial Security Deposite paid in form Bank Guarantee or Demand draft as per the form of the agreement approved by the Municipal Corporation, Surat.

If initial Security deposit is paid in form of Fixed Deposit, additional stamp paper amounting As per government's prevailing rule of Security Deposit shall be used to execute the agreement.

The undertaking shall be executed on stamp paper worth Rs. 300/-.

The Surety shall be executed on stamp paper worth Rs. 300/-.

GC-11 INSPECTION OF WORK

1. The Engineer in charge will have full power and authority to inspect the work at any time wherever in progress either on the site or at the contractor's any other manufacturers workshops or factories wherever situated and the contractor shall afford for Engineer-in-charge every facility and assistance to carry out such inspection. Contractor or his authorised representative shall,at all time during the usual working hours and all other times when so notified remain present to receive orders and instructions, orders given to Contractor's representative shall considered to have the same force as if they had been given to the contractor himself. Contractor shall give not less than 7 days notice in writing to the Engineer-in- charge before covering up or otherwise placing beyond reach of inspection and measuring any work in order that the same may be inspected and measured. In the event of breach of the above,the same shall be recovered at Contractor's expenses for carrying out such inspection or measurment.

2. No material shall be despatched from contract store on site of work before obtaining approval in writing of the Engineer-in-charge, Contractor shall provide at all time during the progress of work and maintenance period proper means of access with ladders, gangways, etc. and the necessary attendance to move and adopt as d irected for inspection or measurement of work by Engineer-in-charge.

GC-12 DEFECT LIABILITY

1. Contractor shall guarantee the work for a period of 12 months from the date of issue of completion certificate. Any damage or defect that may arise or that may remain undis- covered at the time of issue of completion certificate connected in any way with the equipment or Materials supplied by him or in the Workmanship be rectified or replaced by contractor at his own expenses as desired by Engineer-in-charge or in default may cause the same to be made good by other agency and deduct expenses of which the certificate of Engineer-in-charge shall be final from any sums that may then or any time thereafter become due to contractor of sale thereof or of a sufficient portion thereof.

2. From the commencencement to completion of work contractor shall take full responsibility for the case of the work including all temporary works and in case any damage, loss or injury shall happen to work or any part thereof or to any temporary works from any cause whatsoever and shall at his own cost repair and make good the same so that at completion work shall be in good order and in confirmity in every respect with the requirements of contract and as per the instructions of the Engineer-in-charge.

3. If at any time before the work is taken over, the Engineer- in-charge shall -

(a) Decide that any work done or Materials used by the contractor are defective or not in accordance with contract or that work of any portion thereof is defective or do not fulfill the requirements of contract (all such Materials being hereinafter called defects in this clause and (b)as soon as reasonably practicable given to contractor notice in writing of the said defect specifying particulars of the defects alleged to exist or to have occured, then contractor shall at his own expenses and with all speed make good the defects so specified.

(b) In case contractor fails to do so, owner may take at the cost of the contractor, such steps as may in all circumstances,be reasonable to make good such defects. The expenditure so incurred by S.M.C. will be recovered from the amount due to contractor.The decision of Engineer-in-charge with regard to the amount to be recovered from contractor will be final and binding on the contractor.

GC-13 POWER OF ENGINEER TO GIVE FURTHER INSTRUCTIONS

The Engineer shall have the power and authority from time to time and at all times to give further instructions and directions as may appear to him necessary or proper for the guidance of contractor and the works and efficient execution of the works according to the terms of the specifications, and the contractor shall receive, execute, obey and be bound by the same, according to the true intent and meaning thereof, as fully and effectually as though the same had accompanied or had been mentioned or referred to in the specifications. No work which readically changes the original nature of the contract shall be ordered by the Engineer and in the event of any deviation being ordered,which in the opinion of the contractor changes the original nature of the contract, the shall nevertheless carry it out and any disagreement as to the nature of the work & the rate to be paid thereof shall be resolved.The time of completion of works, in the event of any deviations, resulting in additional cost over the contract sum being ordered, then be extended or reduced reasonable by the Engineer. The Engineer's decision in the case shall be final and binding.

GC-14 PROGRAMME

The time allowed for execution of works shall be essence of the contract. The contract period shall commence from date of Notice of intimation to proceed. The tenderer at the time of submitting his tender shall indicate the construction or pipeline schedule, the month-wise programme required for the execution of the works and shall confirm the same within fourteen (14) days of the acceptance of his Tender. The contractor shall provide to the Engineer-in-charge a detailed programme of time schedule for execution of the works in accordance with the specifications & the completion date. The entire programme to be finalised by the Contractor,has to confirm to the execution period mentioned alongwith the Bill of Quantities in the Tender Documents.The Engineer upon scrutiny of such submitted programme by contractor,shall examine suitability of it to the requirement of contract and suggest modifications, if found necessary.

GC-15 SUBLETTING OF WORKS

No part of the contract nor any share or interest thereon shall in any manner or degree be transferred,assigned or sublet by the contractor directly or indirectly to any firm or Corporation whatsoever except as provided for in the succeding subclause without the consent in writing of the owner.

GC-16 SUB-CONTRACTORS FOR TEMPORARY WORKS ETC.

The owner may give written consent to sub-contractors for execution of any part of the work at the site being entered upon by the contractors provided each individuals contractor is submitted to the Engineer-in-

charge before being entered into and in approved by him. List of Sub-Contractors is to be supplied. Not with standing any subletting with such approval as aforesaid and not with standing the Engineer-in-charge shall have received copies of any sub-contractors, the contractors shall be and shall remain solely responsible for the quality and proper expenditions and execution of the works and the performance of all the conditions of contract in all respects as if such submitting or sub-contracting had not taken place and as if such work had done directly by the Contractor.

GC-17 TIME FOR COMPLETION

1. The work covered under this contract shall be commenced from the date of contract is served with a notice to proceed with the work and shall be completed before the date as mentioned in the time schedule of work. The time is the essence of the contract and unless the same is extended as mentioned in clause No. GC-18 (Extension of time) the contractor will be panalised for the delay.

2. The general time schedule for work is given in the tender document. Contractor shall prepare a detailed weekly or monthly programme of work in consultation with Engineer-in-charge soon after the agreement and the work shall be strictly executed accordingly. The time for as construction of road given includes,the time required for testing, rectification if any, retesting and completion in all respects to the entire satisfaction of the Engineer- in-charge.

GC-18 EXTENSION OF TIME

Time shall be considered as the essence of the contract. If however, the failure of the Contractor to complete the work as per the stipulated dates referred to above arises from delays on the part of Municipal Corporation in supplying the Materials of equipment it has undertaken to supply under the contract or from delays in handing over sites or from increase in the quantity of work to be done under the contract, or force Majeure an appropriate extension of time will be given. The Contractor shall request such extension within one month of the cause of such delay and in any case before expirry of the contract period.

GC-19 CONTRACT AGREEMENT

The successful tenderer shall when called upon to do so, enter into and execute the Contract Agreement within (15) fifteen days of the Notice of Award, in the form shown in tender documents with such modifications as may be necessary in the opinion of the Municipal Commissioner. It should be incumbent on the contract to pay the stamp duty and the legal charges for the completion of the contract agreement.

GC-20 A.PENALTY FOR DELAY

If the contractor fails to complete the work within the stipulated completion date for the work or he shall pay liquidated damages at one tenth of Two percent of contract value per day of delay in completion and handing over the work or part thereof as the case may to the Municipal Commissioner. The amount of liquidated damages shall, however, be subjected to a maximum of ten (10) percent of the contract value. Delays in excess of one hundred days will be a cause for termination of the contract and forfeiture of all security for performance.

B.BAR CHART

The successful tenderer shall have to submit the progress bar-chart within fifteen days after the contract, and the contractor should work as per the approved bar-chart, failing the contractor shall have to pay the compensation for delay as per the decision of Municipal Commissioner.

GC-21 FORFEITURE OF SECURITY DEPOSIT

Whenever any claim arises against the contractor for the payment of a sum of money out of or under the contract, the owner shall be entitled to recover such sum by appropriating in part of whole, the security deposit of the contractor. In case the Security deposit is insufficient the balance recoverable shall be deducted from any sum then due or which at any time thereafter may become due to the contractor shall pay to the owner on demand may balance remaining due.

GC-22 ACTION OF FORFEITURE OF SECURITY DEPOSIT

In any case in which under any clause or clauses of the contract, the contractor shall have forfeited the whole of his Security deposit or have committed a breach of any of the terms contained in this contract, the owner shall have power to adopt any of the following courses as he may deem best suited to his interest -

(a) To rescind the contract (of which rescission notice in writing to the contractor under the hand of the owner shall be conclusive evidence) in which case, the security deposit of the contractor shall stand forfeited and be absolutely at the disposal of the owner.

(b) To employ labour and to supply Materials to carry out the balance work debiting contractor with the cost of labour employed and the cost of Materials supplied for which a certificate of the Engineer-in-charge shall be final and conclusive against the contractor and 10% costs on above to cover all departmental charges and crediting him with the value of work done at the same rates as if it has been carried out by the contractor under the terms of his contract. The certificate of Engineer-in-charge as to the value of the work done shall be final and conclusive against the contractor.

(c) To measure up the work of the contractor and to take such part hereof as shall be unexecuted out of his hand to give it to another contractor to complete. In this case the excess -expenditure incurred than what whole have been paid to the original contractor, if the would work had been executed by him, shall be earnest and paid by the original contractor and shall be deducted from any money due to him by the owner under the contract or otherwise and for the excess expenditure, the certificate of the Engineer- in-charge shall be final and conclusive.

In the event any of the above course being adopted by the owner, the contractor shall have no claim to compensation for any less sustained by him by reason of his having purchased or procured any Materials or entered into any agree-ment so or made by advance on account of or with a view to the execution of the work of the performance of the contract. In such case the contractor shall not be entitled to recover or be paid by sum for any work actually performed under this contract unless the Engineer-in-charge will certify in writing the performance of such work and the value payable in respect thereof and the shall only be entitled to be paid the value so certified. In the event of the owner putting in force the powers as stated in a, b, c, above vested in him under the preceeding clause, he may, if he so desire, take possession of all or any tools and plant, Materials and stores in or upon the work or the site thereof belonging to the contractor, or procured by him and intended to be used for the execution of the work or any part thereof paying or allowing for the same in account at the contract rates to be certified by the Engineer-in-charge whose certificate thereof shall be final otherwise the Engineer-in-charge may give notice in writing to the contractor or his representative requiring him to remove such tools plant Materials or stores from the premises within the time specified in the notice and in if the contractor fails to comply with any such notice, the Engineer-in-charge may remove them at the Contractor's expenses or sell them by auction or private sale on account of the contractor and his risks in all respects without any furhter notice as to the date, time to place of the sale and the certificate of Engineer-in-charge as to the expenses of any such removal and the amount of the proceeds and the expenses of any such sale shall be final and conclusive against the contractor.

GC-23 NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK

If at any time from the commencement of work, the owner shall for any reasons whatsoever not require the whole or part thereof a specified in the tender to be carried out, the Engineer-in- charge shall give notice in writing of the contractor, who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from execution of work in full, but which he did not derive in consequence of the full amount of the work not having been carried neither shall be have any claim for compensation by reason if any alternations having been made in original specifications, drawings, designs and instructions which shall involve any curtailment of the work as originally contemplated.

When the contractor is a partnership firm, the prior approval in writing of the S.M.C.shall be obatined before any change is made in the constitution of the firm, where the contractor is an individual or a Hindu Undivided Family business concern, such approval as aforesaid shall, likewise be obtained before sub-contractor enters into any agreement with other parties whereunder the reconstituted firm would have the right to carry out the work hereby undertaken by the contractor. In either case if prior approval as aforesaid is not obtained, the contract shall be deemed to have been allotted in contravention of sub- letting clause hereof and the same action may be taken and the same consequence shall ensure as provided in the sub-letting clause.

GC-24 IN EVENT OF DEATH OF CONTRACTOR

Without prejudice to any of the right or remdies under the contract, if the contractor dies, the owner shall have the option of terminating the contract without compensation to the contractor.

GC-25 MEMBER OF THE OWNER NOT INDIVIDUALLY LIABLE

No official or employee of the owner shall in any way be personally bound or liable for the acts or obligations

of the owner under the contract or answerable for any default or ommission in the observance or performance of the acts, matters or things which are herein contained.

GC-26 OWNER NOT BOUND BY PERSONAL REPRESENTATIONS

The contractor shall not be entitled to any incresse on the Schedule of rates or any other rights or claims whatsoever by reason of representation, explanation or statement or alleged representation, promise or guarantees given or alleged to have been given to him by any person.

GC-27 CONTRACTOR'S OFFICE AT SITE

The Contractor shall provide and maintain an office at the site for the accommodation of his agent and staff and such office shall be opened at all reasonable hours to receive instruc- tions, notice or other communications.

GC-28 CONTRACTOR'S SUBORDINATE STAFF AND THEIR CONDUCT

1. The contractor on award of the work shall name and depute aqualified Engineer having experience of carrying out work of similar nature,to whom equipments,Materials, if, any, shall be issued and instructions for work given.The contractor shall also provide to the satisfaction of Engineer in-charge sufficient and qualified staff to superintend the execution of the work, competent sub- agents, foremen and leading hands including those specially qualified by previous expeditions to a supervise the type of works comprised in the contract in such manner as will ensure work of the best quality and expeditions working, it, in the opinion of the Engineer-in-charge, additional properly qualified supervision staff is considered necessary, if shall be employed by the contractor without additional charge on account thereof. The contractor shall ensure to the satisfaction of the Engineer- in-charge that sub - contractors, it any shall provide competent and efficient supervision over the work entrusted to them.

2. If and whenever any of the contractor 's or sub-contractor agents, sub-agents, assistance, formen or other employees shall, in the opinion of Engineer-in-charge, be guilty of any misconduct or be incompetent or insufficiently qualified or inteligent in the performance of their duties or that in opinion of the owner or Engineer-in-charge, it is undesirable for administrative or any other reason for person or persons to be employed in the works, the contractor, if so directed by the Engineer-in-charge, shall at once remove person or persons from employment thereon. Any person or persons so removed shall not again be remployed in connection with the works without the written permission of the Engineer-in- charge. Any person so removed from the works shall be immediately replaced at the expenses of the contractor by acqualified and competent substitute. Should the contractor be required to repatriate any person removed from the works he shall do so and shall bear all costs in connection therewith.

3. The contractor shall be responsible for the proper behaviour of all the staff, foremen, workmen and others shall exercise proper control over them and in particular and without prejudice to the same. Generally, the contractor shall be bound to prohi-bit,and prevent any employee from trespassing or acting in any way detrimental or prejudicial to the interest of the community or of the properties or occupiers of land and properties in the neigh-bourhood and in the event of such employees so trespassing, the contractor shall be responsible therefore and relieve the owner of all consequent claims, actions for damages or injury or any other grounds whatsoever. The decision of the Engineer-in- charge upon any matter arising under this clause shall be final.

4. If and required by the owner, the contractor's personnel entering upon the owner's premises shall be properly identified by badges of a type acceptable to the S.M.C. which must be worn at all times on owner's premises.

GC-29 TERMINATION OF SUB-CONTRACTOR BY OWNER

If any sub-contractor engaged upon the works at the site executes any work which in the opinion of Engineer-in-charge is not in accordance with the contract documents, the S.M.C. may be give written notice to the contractor request his to terminate such sub-contract and the contractor upon the receipt of such notice shall terminate such sub-contract and the letter shall forthwith leave the works failing which the owner shall have the right to remove such sub-contractors from the site.

No action taken by the owner under the above clause shall relieve the contractor of his liabilities under the contract or give rise to any right to compensa-tion, extension of time or otherwise.

GC-30 POWER OF ENTRY

If the contractor shall not commence the work in the manner previously described in the contract documents or if he shall, at any time, in the opinion of Engineer-in-charge.

(i) Fail to carry out works in conformity with the documents or

(ii) Fail to carry out the works in accordance with the time schedule.

(iii) Substantially suspend work or the works for a period of fourteen days without authority from Engineer-in-charge or

(iv) Fail to carry out and execute the work to the satisfaction of the Engineer-in-charge or

(v) Fail to supply sufficient or suitable construc-tion plant temporary works, labour Materials or things or

(vi) Commit breach of any other provisions of the contract on his part to be performed or observed or persist in any of the above mentioned breached of the contract for fourteen days after notice in writing shall have been given to the contractor by the Engineer-in-charge requiring such breach to be remedied or

(vii) Abandon the work or

(viii) During the continuance of the contract becomes bankrupt, make any arrangement or compromise with his creditors, or permit any execution to be levied or go into liquidation whether compulsory or voluntary not being merly a voluntary liquidation for the purpose of amalgamation or reconstruction then in any such case.

The owner shall have the power to enter upon the works and take possession thereof and of the Materials, temporary works, constructional plant and stock therein, and to revoke the contractor's licence to use the same and to complete the works by his agents, other contractor or workman or to relate the same upon any terms and to such other person, firm or corporation as the owner in his absolute discretion may think proper to employ, and for the purpose aforesaid to use or authorise the use of any Materials, temporary works, constructional plant, and stock as aforesaid, without making payment or allowance to the Contractor for the said Materials other than such as may be certified in written by the Engineer-in-charge to be reasonable and without making any payment or allowance to the contractor for the use of said temporary works, constructional plant and stock or being liable for any less or damage thereto. If the owner shall be reason of his taking possession of the works or of the work being got completed by other contractor incur excess certified by the Engineer-in-charge shall be deducted from any money which may be due for the work done by the contractor under the contract and not paid for. Any deficiency shall fortwith be made good and paid to the owner by the contractor and the owner shall have power to sell in such manner and for such price as he may think fit all or any of the constructional plant, Materials etc. constructed by or belonging to and recoup and retain the said deficiency or any part thereof out of the proceeds of the sale.

GC-29 CONTRACTOR'S RESPONSIBLITY WITH THE OTHER CONTRACTOR & AGENCIES

Without repugnance to any other condition, it shall be the responsibility of the contractor executing the work of civil construction to work in close co-operation and co-ordinate the work with other contractors or their authorised represaentative and the contractor will put a joint scheme with the concurrence of other contractors showing the arrange-ments for carrying his portion of the work to the Engineer-in-charge and get the approval. The Engineer-in-charge before approving the joint scheme will call the parties concerned and modify the scheme if required. No claim will be entertained on account of the above. The contractor shall conform in all respects with the provisions of any statutory regulations, ordinances or by laws of any local or locally consitituted authorities or public bodies which may be applicable from time to time to works or any temporary works. The contractor shall keep the owner indemnified against all penalties and liabilities of every kind arising out of non-adherence to such statutes, ordinanace, laws, rules, regulations, etc.

GC-32 OTHER AGENCIES AT SITE

The Contractor shall have to execute the work in such place and condition where other agencies will also beengaged for other works, such as site grading, filling and levelling, electrical and mechanical engineering works, etc. No claim shall be entertained for works being executed in the above circumstances.

GC-33 NOTICES

Any notice under this contract may be served on the contractor or his duly authorised representative at the job site or may be served by registered post direct to the official address of the contractor proof of issue of any such notice could be conclusive of the contractor having been duly informed of all contents therein.

GC-34 RIGHT OF VARIOUS INTERESTS

The owner reserves the right to distribute the work between more than one contractor. Contractor shall co-operate and afford reasonable opportunity to other contractors for access to the works for the carriage and storage of Materials and execution of their works.

Wherever the work being done by any department of the owner or by other contractor employed by the owner is contingent upon work covered by this contract, the respective rights of the various interests shall be determined by Engineer-in-charge to secure the completion of various portions of the work in general harmoney.

GC-35 PRICE ADJUSTMENT

No Price adjustment in price shall be paid.

GC-30 TERMS OF PAYMENT

The payment of Bills shall be made progressively according to the rules and practice followed by the Municipal Corporation. The progressive payment unless otherwise provided in the Contract Agreement or sub-sequently agreed to by the parties, shall be made generally monthly on submission of a bill by the Contractor in prescribed form in an amount according to the value of the work performed less the aggregate of previous progressive payments and as required by clause GC-37 (Retention money) herein. All such progressive payment shall be regarded as payment by way of advance against final payment.

Payment for the work done by the contractor will be based on the measurement at various stages of the work, in accordance with the conditions at Clause GC-77 (Measurement of Work in Progress)

GC-37 RETENTION MONEY

Pursuant to Clause GC-30 Terms of Payment on all money due to the contractor for work done, **Municipal Corporation will hold as retention money of Five percent (5%) of the value of work.** The retention money will not normally be due for payment until the completion of the entire work and till such period the work has been finally accepted by the Municipal Corporation and completion certificate issued by the Municipal Corporation in pursuant to Clause No.GC-83 (Completion Certificate).

However,after the assurance of completion certificate, and Municipal Commissioner may at its own discreation and having considered the Contractor's performance and diligence during the contract time allow the retention money to converted into a Bond as stipulated in the Clause GC-10 (Performance Bond Security Deposit).

GC-38 PAYMENT DUE FROM THE CONTRACTOR

All costs, damages or expenses, for which under the Contract the Contractor is liable to the Municipal Corporation deducted by the Municipal Corporation from any money due or becoming due to the Contractor under the contract or from any other contract with the Municipal Corporation or may be recovered by action at law or other-wise from the Contractor.

GC-39 CONTINGENT FEE

1. The Contractor warrants that he has not employed any person to solicit or secure the contract upon any agreement for a commission, percentage, brokerage or contingent fee. Breach of this warranty shall give the Municipal Commissioner the right to cancel the contract or to take any other measure as the Municipal Commissioner may deem fit. The warranty does not apply to commissions payable by the contractor to establish commercial or selling agent for the purpose of securing business.

2. No officer, employer of the Municipal Corporation be admitted to any share or part of this contract or to any benefit that may rise therefrom.

GC-40 BREACH OF CONTRACT BY CONTRACTOR

If the contractor fails to perform the work under the contract with due diligence or shall refuse or neglect to comply with instruction given to him by the Engineer-in-charge in accordance with the contract, or shall contravence the provisions of the contract, the S.M.C. may give notice in writing to the contractor to make good such failure, neglect or contravention. Should the Contractor fail to comply with such written notice within twenty eight (28) days of receipt, if the Municipal Commissioner shall think fit, it shall be lawful for the Municipal Corporation, without prejudice to any other rights, the contractor may have under the contract, to terminate the contract for all or part of the works, and to make any other arrangements it shall deem necessary to complete the work outstanding under the contract at the time of termination. In this event Article GC-15 (Subletting of work)and GC-16 (Sub-Contracts for Temporary Works etc.)hereof shall be invoked and the performance Bond shall immediately become due and payable to the Municipal Commissioner the value of the work done on the date of termination and not paid for shall stand forfeited to the Municipal Corporation and the Municipal Corporation shall have free use of any works which the contractor may have at the site at the time of termination of the contract.

GC-41 DEFAULT OF CONTRACTOR

1. The Municipal Corporation may upon written notice of default to the contractor terminate the contract in circumstance detailed hereunder :

(a) If in the judgement of the Municipal Corporation the contractor fails to make completion of works within the time specified in the completion schedule or within the period for which extension has been granted by the Municipal Corporation /Engineer to the Contractor.

(b) If in the judgement of the Municipal Corporation the contractor fails to comply with any of the provisions of this contract.

2. In the event the Municipal Commissioner terminates the contract inwhole or in part as provided in Article GC-48 (Termination of Contract), the Municipal Corporation reserves the right to perchase upon such terms and in such manner as it may deem appropriate, plant similar to that terminated and the contractor will be liable to the Municipal Corporation for any additional costs for such similar and / or for liquidated damaged for delay until such resonable time as may be required for the final completion of works.

3. If this contract is terminated as provided in this paragraph GC - 30 (Power of entry) (1) the Municipal Corporation in addition to any other rights provided in this clause, may require the Contractor to transfer title and deliver to the Municipal Corporation under any of the following cases in the manual and as directed by the Municipal Corporation. (a) Any partially completed information and contract rights as the contractor has specifically produced or acquired for the performance of the contract so termi-nated.

4. In the event the Municipal Corporation does not terminate the contract as provided in the paragraph GC- 48 (Termination of Contract) the Contractor shall continue performance of the contract, in which case the shall be liable to the Municipal Corporation for liquidated damages for delay until the works are accepted.

GC-42 BANKRUPTCY

If the Contractor shall become bank rupt or insolvent or have a receiving order made against him, or compound with the creditors, or being the Municipal Corporation commence to be wound up, not being a member's Voluntary winding up for the purpose of amalgamation or reconstruction, or carry on its business under a receiver for the benefit of his creditors or any of them, the owner shall be at liberty to either (a) terminate the contract forthwith by giving notice in writing to the contractor or to the receiver or liquidator or to any person or organisation in whom the contract may become vested and to act in the manner provided in Article GC-41 (Default of Contractor) as though the last mentioned notice had been the notice referred to in such Article of (b) to give such receiver liquidator or other person in work the contract may become vested the option of carrying out the contract subject to his providing a satisfactory guarantee for the due and faithfully performance of the contract subject to his providing a satisfactory guarantee for the due and faithfull performance of the contract upto an amount to be agreed. In the event that the Municipal Corporation terminates the Contract in accordance with this article, the performance Bond shall immediately become due and payable on demand to Municipal Corporation.

GC-43 OWNERSHIP

Works supplied pursuant to the Contract shall become the property of the Municipal Corporation from whichever is the earlier of the following times, namely,

(a) When the works are completed pursuant to the Contract.

(b) When the Contractor has been paid any sum to which he may become entitled in respect thereof pursuant to clause GC-30 (Terms of Payment).

GC-44 DECLARATION AGAINST WAIVER

The condonation by the Municipal Corporation of any breach of brenches by the stipulations and conditions contained in the contract shall in no way prejudice or effect to the constructed as a waiver of the Municipal Corporation rights, powers and remidies under the contract in respect of any breach or breaches.

GC-45 LAWS GOVERNING THE CONTRACT

The contract shall be constitued according to and Subject to the laws of India and the State of Gujarat and under the jurisdiction of the courts of Gujarat at Surat.

GC-46 OVERPAYMENT AND UNDERPAYMENT

Whenever any claim forths payment of a sum to the Municipal Corporation arises out of or under this Contract against the contractor the same may be deducted by the Municipal Corporation from any sum then due or which at any time thereafter may become due to the contractor under this contract and failing that under any other contract with the Municipal Corporation or from any sum due to the contractor with the Municipal Corporation (which may be available with Municipal Corporation), or from his retention money, or he shall pay the claim on demand. The Municipal Corporation reserves the right to carry out post payment audit and technical examination of the final bill including all supporting vouchers, abstracts, etc.

The Municipal Corporation further reserves the right to enforce recovery of any over payment when detected no withstanding the fact that the amount of the final bill may be included by the Contractor.

It as a result of such audit and technical examination any over payment is discovered in respect of any work done by the Contractor or alleged to have been done by him under the contract, it shall be recovered by the Municipal Corporation from the contractor by way of all the means prescribed above or if any under payment is discovered by the Municipal Corporation, any amount due to the contractor under this contract or under payment may be adjusted against any amount then due or which may at any time thereafter become due before payment is made to the contractor from him to the Municipal Corporation on any other contract account whatsoever.

GC-47 SETTLEMENT OF DISPUTES

Except or otherwise specifically provided in the contract, all disputes concerning question of fact arising under the contract shall be decided by the Engineer-in-charge, subjected to a written appeal by the Contractor to the Engineer and these decisions shall be final and binding on the parties hereto. Any disputes or difference including those considered as such by only one of the parties arising out of or in connection with this contract shall be to the extent possible settled amicably between the parties. If amicable settlement cannot be reached then all dispute issues shall be settled as provided in (a).

(a) DISPUTES OR DIFFERENCE TO BE REFERRED TO:

If at any time, any question, disputes or differences of any kind whatsoever shall arises between the Engineer-in-charge and the Contractor upon or in relation to or in connection with this contract, either party may forthwith give to the other, notice in writing of the existence of such question, dispute of difference as to any decision, opinion, instruction, direction certificate or evaluation of the Engineer.

The question or difference shall be settled by the Municipal Commissioner, who shall state his decision in writing and give notice of same to the Engineer and to the Contractor such decision shall be final and binding upon both parties to the contract and work on contract if not already breached or abandoned shall proceed normally unless and until the same shall be revised (or upheld) due to any judicial proceeding.

Should the Municipal Commissioner fail to give a decision within three (3) calendar months after issuance of notice of a question, dispute or difference or if the Contractor is dissatisfied with any such decision of the

Municipal Commissioner, then the matter may be referred to Standing Committee. Then also, if the said question of difference or dispute remains unsolved / unsettled and if the contractor is dissatisfied with any such decision of the Standing Committee, then the matter may be referred to the court of law subject to SURAT JURISDICTION.

GC-48 TERMINATION OF THE CONTRACT

1. If the Contractor finds it impracticable to continue operation owing to Force Majeure reasons or for any reason beyond his and/or the Municipal Commissioner find site impossible to continue operation when prompt notification in writing shall be given by the party affected to the other.

2. If the delay or difficulties so caused can not be expected to cease or become unavoidable or if operations can not be resumed within six(6) months the party shall have the right to terminate the contract upon Ten (10) days written notice to the other. In the event of such termination of the contract, payment to the Contractor will be made as follows :

a) The Contractor shall be paid for all works approved by the Engineer and for any other legitimate expenses due to him.

b) If the Municipal Commissioner terminates the contract owing to Force Majeure or due to any cause beyond its control, the contractor shall additionally be paid for any work done during the said Six (6) months period including any financial commitment made for the proper performance of the Contract and which are not reasonable defrayed by payment under (a) above;

c) The Municipal Commissioner also release all bonds and guarantees at its disposal except is cause where the total amount of payments made to the contractor exceeds the final amount due to him in which case the contractor shall refund the excess amount within Sixty (60) days after termination and the Municipal Commissioner thereafter shall release all bonds and guarantees, should the contractor fail to refund the amount received in excess within the said period such amounts shall be deducted from the bonds or guarantees provided.

3. On the termination of the contract for any cause the contractor shall see the orderly suspension and termination of operations, with due consideration to the interests of the Municipal Corporation with respect to completion, safeguarding or storing of Materials procured for the performance of the contract and the salvage and resale thereof.

GC-49 CHANGES IN CONSTITUTION

Where the contractor is a partnership firm, the prior approval in writing of the Municipal Commissioner shall be obtained any change is made in the constitution of the firm. Where the contractor is an individual or an undivided family business concern such approval as aforesaid shall like wise be obtained before the contractor enters into any partnership agreement whereunder the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If prior approval as aforesaid is not obtained the contract shall be deemed to have been assigned in contravention of Article thereof.

GC-50 SUB-CONTRACTUAL RELATIONS

All work performed for the contract by sub-contractor shall be pursuant to an appropriate agreement between the contractor and sub-contractor which shall contain provisions to :

a) Protect and preserve the rights of the Municipal Corporation and the Engineer with respect to the work to be performed under the sub-contract so that the sub-contractor thereof will not prejudice such rights.

b) Require that such work be performed in accordance with requirements of the Contract documents.

c) Require under such contract of which the contractor is a party, the submission to the contractor of application for payment and claims for additional costs, extension of time, damages for delay or otherwise with respect to the sub- contracted portions of the work in sufficient time, that the contractor may apply for payment and comply in accordance with the contract Documents for like claim by the Contractor upon the Municipal Corporation.

d) Waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by the property insurance except such rights as they may have to the proceeds so such insurance held by the Municipal Corporation as trustee and,

e) Obligate each sub-contractor specifically to consent to the provisions of this Article.

GC-51 LIEN

If, at any time, there should be evidence of any lien or claim for which owner might have become liable and which is chargeable to the contractor, the owner shall have the right to retain out of any payment then due or thereafter to become due an amount sufficient to completely indemnify the owner against such lien or claim or if such lien or claim be valid the owner may be or become due and payable to the contractor. If any lien or claims remaining, unsettled after all payments are made, the contractor shall refund or pay to the owner all money that the latter may be compelled to pay in discharging such lien or claim including all cost and reasonable expenses.

GC-52 EXECUTION OF WORK

The whole work shall be carried out in strict conformity with the provisions of the Contract Documents, detailed drawings, specifications and the instructions of the Engineer-in-charge from time to time. The Contractor shall ensure that the whole work is executed in the most substantial, proper and best Workmanship using Materials of best quality in strict accordance with the specifications to the entire satisfaction of the Engineer-in- charge.

GC-53 WORK IN MONSOON

When the work continues in monsoon, the contractor shall maintain minimum labour force required, for the work and plan and execute the construction and erection work according to the prescribed schedule. No extra rate will be considered for such work in monsoon. During monsoon and entire constructing period the contractor shall keep the site free from water at his own cost.

GC-54 WORK CLOSED ON SUNDAYS & HOLIDAYS & BETWEEN SUNSET AND SUNRISE

No work shall be carriedout on Sundays and Corporation Holidays and no work shall be carried out between sunset and sunrise. Except with the special permission of Engineer-in-charge in writing perviously obtained and with holding such permissions shall be no ground of complaint on the part of contractor or cause for compensation to them. Working period shall be maximum eight (8) hours per days.

GC-55 EXTRA SUPERVISION CHARGES TO BE BORNE BY CONTRACTOR

Further to clause No.GC-54 when Engineer-in-charge feels necessary to give permission to contractor for carrying out work for period of more than Eight hours working period in a day and/or to continue work on sunday and Corporation holidays. Extra Supervision charges arising due to overtime working of Corporation's staff shall be borne by the contractor at prevailing rates from time to time. Such extra supervision charges shall be deducted by Corporation from the running bill/s of the contractor at Surat Municipal Corporation's description.

GC-56 DRAWING TO BE SUPPLIED BY THE OWNER

The drawings attached with the tender documents shall be for general guidance of the contractor to enable him to visualize the type of work contemplated and scope of work involved. Detailed working drawings according to which the work is to be done shall be furnished from time to time as the work progresses. The contractor shall study the drawings thoroughly in connection with other connected details and discrepancy if any bring to the notice of the Engineer-in-charge before actually carrying out the work.

GC-57 DRAWINGS TO BE SUPPLIED BY THE CONTRACTOR

Where drawings, date are to be furnished by the contractor they shall be as enumerated in special condition of contract and shall be furnished within the specified time. Where approval of drawings has been specified it shall be the Contractor's responsibility to have these drawings got approved before any work is taken up with regard to the same. Any changes becoming necessary in these drawings during the execution of the work shall have to be carried out by the contractor at no extra cost. All final drawings shall bear the certification stamp as indicated below duly signed by both the contractor and Engineer- in-charge.

"Certified true for _____project Agreement No._____ Signed_____ _____

Contractor Engineer-in-charge Drawings will be approved within three (3) weeks of the receipt of the same by the Engineer-in-charge.

GC-58 SETTING OUT WORK

The contractor shall set out the work on the site handed by the Engineer-in-charge and shall be responsible for the correctness of the same. The work shall be carried out to the entire satisfaction of Engineer-in-charge. The approval thereof or partaking by Engineer-in-charge in setting out work shall not relieve contractor of any of his responsibilities.

The contractor shall provide at his own cost all necessary level posts, pegs, bamboos, flage, ranging, rods, strings and other Materials and labourers required for proper setting out of the work. The Contractor shall provide, fix and be responsible for the maintenance of all stakes, temples level marks profiles and similar other things and shall take and necessary precautions to prevent their removal or disturbance and shall be responsible for the conse-quence for such removal or disturbance. The contractor shall also be responsible for the maintenance of all existing Survey Marks, Boundary Marks, Distance Marks and Centre line marks either existing or fixed by the Contractor. The Centre, longitudinal or face lines and cross lines shall be marked by small masonary pillars. Each pillar shall have distance mark at the centre for setting up the theodolite. The work shall not be started unless the setting out is checked by Engineer-in-charge in writing but such approval shall not relive the contractor of his responsibilities. The contractor shall provide all Materials, labour and other facilities necessary for checking at his own cost.

Pillars bearing geodetic marks on site shall be protected by the Contractor. On completion of the work the contractor shall submit the Geodetic documents according to which the work has been carried out.

GC-59 RESPONSIBILITIES OF CONTRACTOR FOR CORRECTTNESS OF WORK

The contractor shall be entirely and exclusively responsible for the correctness of every part of the work and shall rectify completely and errors thereon at his own cost when so instructed by Engineer-in-charge.

1. Materials to be supplied by Contractor

Contractor shall procure and provide all the Materials required for the execution and maintenance of work including M.S. rods, all tools, tackle, construction plant and equipment except the Materials to be supplied by the owner detailed in the contract documents and for the transport thereof, owner, shall made recommendations to the respective authorities if designed by the contractor but assumes no responsibility or any nature. Owner shall insist for procurement of Materials with ISI Marks supplied by reputed firms on the DGS & D List. 2. If however the Engineer-in-charge feels that work is likely to be delayed due to contractor's inability to procure the Materials, the Engineer-in-charge shall have the right to procure Materials from the market and the contractor will accept these Materials at the rates decided by Engineer-in-charge

GC-60 MATERIALS TO BE SUPPLIED BY THE OWNER

1. If the contract provides certain Materials or stores to be supplied by the S.M.C. such Materials and stores shall be transported by the contractor at his cost from S.M.C's stores or Railway Station. The sum due from contractor for the value of Materials supplied by the owner will be recovered from the R.A.Bill on the basis of actual consumption of Materials in the work covered and for which R.A.Bill has been prepared. After completion of the work contract has to account for the full quantity of Materials supplied to him.

2. The value of store Materials supplied by the S.M.C. to the contract shall be charged at rates shown in the contract document and in case any other material not listed in the schedule of Materials is supplied by the S.M.C., the same shall be charged at cost price including carting and other expenses inclurred in procuring the smae. All Materials so supplied shall remain the property of the owner and shall not be removed from the site on any account.Any material remaining un-used at the time of completion of work or termination of contract shall be returned to S.M.C.'s store or any other place as directed by the Engineer-in-charge in perfectly good condition at contractor's cost. When Materials are supplied free of cost for us in work and surplus and unaccounted balances thereof are not returned to the Municipal Corporation, recovery in respect of such balance will be effected at double the applicable issue rate of the Materials or the market rate whichever is higher.

GC-61 CONDITIONS OF ISSUE OF MATERIALS BY THE S.M.C.

a) The Materials specified to be issued by the S.M.C. to the contractor shall be issued by the S.M.C.'s store or at Railway Station and all expenses for its shifting to site shall be borne by the contractor. The Materials will be issued during working hours and as per rules of S.M.C. from time to time.

b) Contractor shall bear all expenses for storage and safe custody at site of Materials issued to him before use in work.

c) Material shall be issued by the S.M.C.in Standard/non-standard sizes as obatined from manufacturer.

d) Contractor shall construct suitable godowns at site for storing the Materials to proect the same from damage due to rain, dampness, fires, theft etc.

e) The contractor should take the delivery of the Materials issued by the S.M.C. after satisfying himself that they are in good conditions. Once the Materials are issued, it will be the responsibility of the Contractor to keep them in good condition and in safe custody. If the Materials get damaged or if they are stolen, it shall be the responsibility of the contractor to replace them at his according to the instruc- tions of the Engineer-in-charge.

f) For delay in supply or for non supply of Materials to be supplied by the S.M.C., on account of natural calamities, act of enemies, other difficulties beyond the control of the S.M.C., the S.M.C. carries non-responsibilities. In no case the contractor shall be entitled to claim any compensation for loss suffered by him on this account.

g) None of the Materials issued to the contractor, shall be used by the Contractor for manufacturing items which can be obtained from manufacturer. The Materials issued by the owner shall be used for the work only and no other purpose.

h) Contractor shall be required to execute indemnity bond in the prescribed form for the same custody and account of Materials issued by the owner.

i) Contractor shall furnish sufficiently in advance a Statement of his requirements of quantities of Materials to be supplied by the S.M.C. and the time when the same will be required for the work, so as to enable Engineer-in-charge to make arrange-ments to procure and supply the Materials.

j) A daily account of Materials issued by the owner shall be maintained by the Contractor showing receipt, consumption and balance in head in the form laid down by Engineer-in-charge with all connected paper and shall be always available for inspection in the site office.

k) Contractor shall see that only the required quantities of Materials are got issued and no more. The contractor shall be responsible to return the surplus Materials in good condition at S.M.C.'s store at his own cost.

GC-62 MATERIALS PROCURED WITH ASSISTANCE OF THE OWNER

Notwithstanding anything contained to the contrary in any of the clauses of this contract, where any Materials for the execution of the contract are procured with the assistance of the S.M.C. either by issue from S.M.C. stock or purchase made under orders or permits or licences issued by the Government, the contractor shall hold the same Materials as trustees for owner and use such Materials economically and solely for the purpose of contract and not dispose them off without the permission of S.M.C.and return, iif required by Engineer-in-charge, all surplus or unserviceable Materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on his being paid or credited such prices as Engineer-in-charge shall determine having due regard to the conditions of the Materials. The price allowed to contractor shall not exceed the amount charged to him excluding the storage charges if any. The decision of Engineer-in-charge shall be final and conclusive in such matters. In the event of breach of the aforesaid condition, the contractor shall in terms of licence of permits and/or for criminal breach of trust be liable to compensateS.M.C. at double rate or any higher rates.In the event of these Materials at that time having higher rate or not being available in the market then any other rate to be determined by the Engineer-in-charge and his decision shall be final and conclusive.

GC-63 MATERIALS OBTAINED FROM DISMANTLING

If the contractor, in the course of execution of work is called upon to dismantle any part for reasons other than on account of bad or imperfect work, the Materials obtained from dismantling will be the property of the S.M.C. and will be disposed of as per instruction of Engineer-in-charge in the best interest of the S.M.C.

GC-64 ARTICLE OF VALUE OR TREASURE FOUND DURING CONSTRUCTION

All gold, silver and other minerals of any discription and all previous stones, coins, treasures, relics, antiquities and other similar things which shall be found in under or upon site shall be the property of the

owner and the contractor shall property preserve the same to the satisfaction of Engineer-in-charge and shall hand over the same to the owner.

GC-65 DISCREPANCIES BETWEEN INSTRUCTIONS

If there is any discrepancy between the various stipulations of the contract documents of instructions to the contractor or his authorised representative or if any doubt arises as in the meaning of such stipulation or instructions, the contractor shall immediately refer in writing to the Engineer-in-charge whose decision shall be final and conclusive and no claim for losses caused by such discrepancy,shall in any event be admissible.

Incase there is any descripancy in measurements shownin drawinge and specifications, the same shown in drawing shall be considered as final and will be binding upon the contractor.

GC-66 SCHEDULE OF QUANTITIES AND EXTRA ITEMS

A. Schedule of Quantities

Variations in the quantities of work in schedule of quantities shall not vitiate the contract. The rates quoted for the individual items shall apply for the quantities of work increased or decreased by not more than twenty percent for each of the items,should the quantities of work actually involved under any item very by more than twenty (20%)percent, the rate for such item of work shall be revised in accordance with the procedures indicated under clause "Extra Items". The payment for the items will, however, continue to be at the original rate till the revised rate decided.

B. Extra Items

Extra Items of work shall not vitiate the contract. The contractor shall be bound to execute extra items of work as directed by the Engineer-in-charge. The rates for extra items shall be derived from the S.O.R.(R&B Division) Year 2015-2016 and quoted premium of tender. If the rate of extra item is not available in S.O.R. it will be derived on prevailing market rate.

GC-67 ACTION WHEN NO SPECIFICATION IS ISSUED

In case of any class of work for which no specification is supplied by the S.M.C. in the tender documents,such work shall be carried out in accordance with I.S.S. do not cover the same, the work should be carried out as per standard Engineering practice subject to the approval of Engineer-in- charge.

GC-68 ABNORMAL RATES

Contractor is expected to quote rate for each item after careful analysis of cost involved for the performance of the completed item considering all specifications and conditions of contract. This will avoid loss of profit or gain in case of curtailment or change or specification for any item. In case it is notice that the rates quoted by a tenderer for any item is usually high or unusually low, it will be sufficient cause for rejection of tender unless the S.M.C. is convinced about the reasonableness of the rates on scrutiny of the analysis for such rate to the furnish-ing by the tenderer or demand.

GC-69 ASSISTANCE TO ENGINEER-IN-CHARGE

Contractor shall make available to Engineer-in-charge free of cost all necessary instruments and assistance in checking of any work made by the contractor for taking measurement of work.

GC-70 TEST OF QUALITY OF WORK

1. All Workmanship shall be of the best kind described in the contract document and in accordance with the instructions of Engineer-in-charge and shall be subjected from time to time to such test at contractor's cost as the Engineer-in-charge may directed at the place of manufacture of fabrication or on site or at any such place.Contractor shall provide assistance, instruments labour and Materials as are normally required for examining measuring and testing any work Workmanship as may be selected and required by Engineer-in-charge.
2. All tests will be necessary in connection with the execution of work as decided by Engineer-in-charge shall be carried out at an approved laboratory at contractor's cost.
3. The contractor shall furnish to Engineer - in - charge for approval when requested or if required by the specification adequate samples of all Materials and finished goods to be used in work and

sufficiently in advance to permit test and examination thereof. All Materials furnished and finished goods applied in work shall be exactly as per the approved samples.

4. All the testing charges shall be borne by the Contractor.

GC-71 ACTION AND COMPENSATION IN CASE OF BAD WORKMANSHIP

If it shall appear to the Engineer-in-charge that any work has been executed with Materials of inferior description, or quality or are unsound or with unsound imperfect or unskilled Workmanship or otherwise not in accordance with the contractor shall, no demand in writing from Engineer-in-charge or his authorised representative specifying the work, Materials or articles compained of, notwithstanding that the same may have been inadvertantly passed, certified and paid for forthwith rectify or remove and reconstruct the work, specified and in the event of failure to do so within a period to be specified by Engineer- in-charge in his aforesaid demand, contractor shall be liable to pay compensation at the rate of one (1) percent of the tendered cost of work for every Ten (10) days limited to a maximum of Ten (10%) Percent of the value of work while his failure to do so continue and in the case of any such failure the Engineer-in- charge may on expiry of the notice period rectify and remove and re-execut the work or remove and replace with other at the risk and cost of the Contractor. The decision of the Engineer-in- charge as to any question arising under this clause shall be final and conclusive.

GC-72 SUSPENSION OF WORK

Contractor shall, if ordered in writing by Engineer-in-charge or his representative temporarily suspended the

work or any part thereof for such time (not exceeding two months) as ordered and shall not after receiving such written order proceed with the work until he shall have received a written order to proceed therewith the contractor shall not be entitled to claim compensa- tion for any loss or damage sustained by him by reason of temporary suspension of work as aforesaid. An extention of time for completion of work will be granted to the contractor corresponding to the delay caused by such suspension of work if the applied for the same provided the suspension was not conse- quent upon any default or failure on the part of the contractor.

GC-73 OWNER MAY DO PART OF THE WORK

When the contractor fails to comply with any instructions given in accordance with the provisions of this contract,the S.M.C. has the right to carry out such parts of work as the S.M.C. may designate whether by purchasing Materials and engaging labour or by the agency of another contractor. In such case the S.M.C.shall deduct from the amount which otherwise might become due to contractor the cost of such work and Materials with Ten (10%) percent added to cover all departmental charges and should the total amount thereof exceed the amount due to contractor, contractor shall pay the difference to S.M.C.

GC-74 POSSESSION PRIOR TO COMPLETION

The Engineer-in-charge shall have the right to take possession of or to use any completed or partly completed work or part of work,such possession or use shall not be deemed to be an acceptance of any work completed in accordance with the contractor. If such prior possession or use by Engineer-in- charge delays the progress of work, equitable adjustment in the time of completion will be made and the contract shall be deemed to be modified accordingly.

GC-75 Deleted

GC-76 SCHEDULE OF RATES

1. The price/rates quoted by the contractor shall be remain firm till the issue of finalcertificate and shall be subject to price ADJUSTMENT CLAUSE GC-35. Schedule of rates shall be deemed to include and cover all costs expenses and liabilities of every description and all risks of every kind to be taken in executing, completing and handling overwork to owner by contractor. Contractor shall be deemed to have known the nature, scope, magnitude and the extent of work and Materials required through contract documents may not fully and precisely furnish them. He shall make such provision in the schedule of rates as he may consider necessary to cover the cost of such items of work and Materials as may bereasonable and necessary to completion work. The opinion of Engineer-in-charge as to the item of work shall be final and binding on Contractor although the same may be not shown on or described specifically in contract documents.

2. The Schedule of rates shall be deemed to include and cover the cost of all constructional plant, temporary work, pumps, Materials, labour and all other Materials in connection with each item in schedule of rates and the execution of work or any portion thereof furnished complete in every respect and maintained as shown or described in the contract document or as may be ordered in writing during the continuance of the contract.

3. The Schedule of rates shall be deemed to include and cover the cost of all royalties and free for the articles and processes, protected by letters patent or otherwise incorporated in or used in connection with work, also all royalities, and other payments in connection with Materials of whatsoever kind for work and shall include an indemnity to-owner which contractor hereby gives against all action, proceeding, claims, damages, costs and expenses arising from the incorporation in use of work of any such articles, processes or Materials. Octroi of other Municipal or Local Board charges if levied on Materials equipment of machineries to be brought to site for use on work shall be borne by the contractor.

4. No exemption or reduction of custom duties excise duties, sales-tax or any other taxes or charges of the Central or State Government any local body whatsoever will be granted to obtained. All of such expenses shall be deemed to have been included in and covered by schedule of rates. Contractor will also obtained and pay for all permits or other privileges necessary to complete work.

5. The schedule of rates shall be deemed to include and cover risk on account of delay or intereference with contractor's conduct of work which may occure from any cause including orders of S.M.C. in the exercise of his power and no account of extension of time granted due to various reasons.

6. For work under unit rate basis no alteration will be allowed in the schedule of rates by reason of work or any part of them being field, altered extended, diminished or ommitted.

GC-77 PROCEDURE FOR MEASUREMENT OF WORK IN PROGRESS

1. All measurements shall be in metric system. All the work in progress will be jointly measured by the representative of Engineer-in-charge and contractor's authorised agent. Such measurements will be got recorded in the measurement book by the Engineer or his authorised representative and signed by contractor or his authorised agent in token of acceptance. If the contract or his authorised agent fails to be present when even required by the Engineer-in-charge for taking measurements for any reasons whatsoever, the measurement will be taken by the Engineer - in - charge or his authorised representative not withstanding the absence of contract and these measurement will be deemed to be correct and binding on contractor.

2. Contractor will submit a bill in approved proforma in duplicate to the Engineer - in - charge of the work giving abstract and detailed measurements of various items executed during a month as mutually agreed. The Engineer-in-charge shall verify the bill and the claim, far as admissible, adjusted if possible, within 10 days of presentation of the bills.

3. In case of Tenders for completed items of work, contractor may be allowed 'Secured Advance' on the Security of Materials brought to site for execution of the constructed items of work the extent of 75% of the value of Materials of unperishable nature and an agreement bedrawn up with contractor under which the owner secured a lien on these Materials and is safe guarded against losses due to any reasons whatsoever. Recoveries of advance paid would not be post-poned till the whole work is completed but shall be adjusted from his work done or the Materials used, the necessary deductions being made when the items of work in which they are used and are billed for. When the mode of measurement is not covered by contract for any item of work it shall be as per latest I.S.I.

GC-78 RUNNING ACCOUNT PAYMENT TO BE RECOVERDED AS ADVANCES

1. All running account payments shall be regarded as payments by way of advance against the final payment only and not as payment for work actually done and completed and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or to be considered as an admission of the due performance of contract or any part thereof.

GC-79 NOTICE FOR CLAIM FOR ADDITIONAL PAYMENT

If the contractor considers that he is entitled to extra payment or compensation or any claim whatsoever in respect of work, he shall forthwith give notice in writing to the Engineer-in-charge about his extra payment and/or compensation. Such notice shall be given to the Engineer-in-charge within Ten (10) days from the happening of any event upon which contractor basis such claims and such notice shall contain full particular of the nature of such claim with full details and amount claimed. Failure on the part of the contractor to

put forward any claim with the necessary particulars as above within the time above specifed shall be an absolute waiver thereof. No commission by S.M.C. to reject any such claim and no delay in dealing therewith shall be waiver by S.M.C. of any rights in respect thereof.

GC-80 PAYMENT OF CONTRACTOR'S BILL

1. The price to be paid by the S.M.C. to contractor for the work to be done and for the performance of all the obligations under taken by the contractor under contract shall be based on the contract price and payment to be made accordingly for the work actually executed and approved by the Engineer-in-charge.

2. No payment shall be made for work costing less than Rs.5,000/-till the work is completed and a certificate of completion given. But in case of work estimated to cost more than Rs.5,000/- contractor on submitting the bill thereof will be entitled to receive a monthly payment, proportionate to the part thereof, approved and passed by Engineer-in-charge whose certificate of such approval and passing of the sum so payable shall be final and conclusive against contractor. This payment will be made after making necessary deductions as stipulated elsewhere in the contract documents for Materials, security deposit, etc. The payment shall be released to the contractor within Thirty (30) days of submission of the bill in case of running bill and with in two (02) months in case of final bill, contractor shall present the bill duly pre-receipted on proper revenue stamp.

Payment due to Contractor shall be made by the by crossed Accounts payee cheque in Indian currency forwarding the same to the registered office of the contractor. Owner shall not be responsible if the cheque is mislaid or misappropriated by unauthorised person.

GC-81 FINAL BILL

The final bill shall be submitted by Contractor within two (02) month of the date of physical completion of work, Otherwise the Engineer-in-charge certificate of the measurement and of total amount payable for work shall be finalised binding on all parties.

GC-82 RECEIPT FOR PAYMENT

Receipt for payment made on account of work when executed by a firm must be signed by a person holding power of attorney in this respect on behalf of contractor except when described in the tender as a limited company in which case the receipt must be signed in the name of the company by one of its principal officers or by some other person having authority to give effectual receipt for the Company.

GC-83 COMPLETION CERTIFICATE

1. When the contractor fulfil his obligation as per terms of contract he shall be eligible to apply for completion certificate. Contractor may apply for separate completion certificate in respecf of each such portion of work by submitting the completion documents alongwith such application for completion certificate.

The Engineer-in-charge shall normally issue to contractor the completion certificate within 2 (Two) month after receiving an application thereof from contractor after verifying from the complete documents and satisfying himself that work has been completed in accordance with and as set out in the construction and erection drawings and the contract document. Contractor after obatining the completion certifi-cate is eligible to present the final bill for work executed by him under the terms of contract.

2. Within 2 (Two) month of completion of work in all respect contractor shall be furnished with a certificate by the Engineer-in-charge of such completion but no certificate shall be given nor shall work be deemed to have been executed, until all (1) scaffolding, surplus Materials and rubbish is clearing off site completely (2) until work shall have been measured by the Engineer-in-charge whose measurement shall be binding and conclusive and (3) until all the temporary works, labour and staff colonies etc.constructed are removed and the work site cleaned to the satisfaction of the Engineer-in-charge. If contractors shall fail to comply with the requirements as aforesaid or before date fixed for the completion of work,the Engineer-in-charge may at the expenses of contractor remove such scaffolding, surplus Materials and rubbish and dispose of the same he thinks fit.

3. The following documents will form the completion documents :

(a) Technical documents according to which work was carried out.

(b) Construction drawings showing therein the modifications and corrections made during the course of execution signed by Engineer-in-charge.

(c) Completion certificate for "Embedded" or "Covered" up work.

(d) Certificate of final levels as set out for various works.

(e) Material appropriation statement for the Materials issued by owner for work and list of surplus Materials returned to S.M.C.'s store duly supported by necessary documents.

4. Upon expiry of the period of defects liability and subject to Engineer-in-charge being satisfied that work Has been duly maintained by contractor during the defects liability period as fixed originally, or as external subsequently and the contractor has in all respects made up by subsidence and performed all his obligations under contract, the Engineer- in-charge shall (without prejudice to the rights of owner in any way) give final certificate to that effect. The Contractor shall not be considered to have fulfilled the whole of his obligation until final certificate shall have been given by the Engineer-in-charge notwithstanding previous entry upon and taking possession, working or using of the same or any part thereof by owner.

5. Final Certificate only Evidence of Completion

Except the final certificate no other certificate or payments against a certificate or an general account shall be taken to be an admission by owner of the due performance of contract or any part thereof or of occupancy validity of any claim by the contractor.

GC-84 TAXES, DUTIES, OCTROI, ETC.

The Contractor shall be liable to payment of all the Central/ State/Local Bodie's Levies,/ GST/ taxes or duties etc. The SMC shall neither bear it nor reimburse at any time but will ensure deduction of Central/State/Local levies/GST and taxes at Source at the rate provided under the relevant statutes from time to time inforce.

1% Construction Cess will be deducted from respective R.A. Bill and Final bill in accordance with the prevailing norms of Govt. of Gujarat.

GC-85 INSURANCE

Contractor shall at his own expenses carry and maintain with reputable Insurance Companies to the satisfaction of owner as follows :

1. Employees State Insurance Act

Contractor agrees to and does hereby accept full and exclusive liability for compliance with all obliga-tions imposed by the Employees' State Insurance Act 1948, and Contractor further agree to defend, indemnify and hold owner harmless from any liability or penalty which may be imposed by the Central or State Government of Local authority by reasons of any asserted violation by contractor or Sub-Contractor of the Employees' State Insurance Act, 1948 and also from all claims, suits or proceedings that may be brought against owner arising tender, growing out of or by reasons of the work provided for by this contract whether brought by employees of Contractor, by third parties or by Central or State Government authority or any administrative Sub-division thereof. Contractor agrees to fill in with the Employees State Insurance Corporation, the declaration from and all forms which may be required in respect Contractor's or Sub-contractor's employees these aggregate remuneration is Rs. 400/-p.m.or less and who are employed in work provided for or those covered by E.S.I from time to time under the agreement. The Contractor shall deduct and secure the agreement of the Sub-contractor to deduct the employees' contribution as per the first Schedule of the Employees' State Insurance Act from wages. Contractor shall remit and secure the agreement of Sub-contractor to remit to the State Bank of India Employees' State Insurance Corporation Accounts, the employees contribution as required by the Act Contractor agrees to maintain all cares and record as required under the Act in respect of employees and payments and contractor shall secure the agreements of the sub-contractors to maintain such records, any expenses incurred for the contributions or maintaining records shall be to contractor's or sub- contractor' account. Owner shall retain such sum as may be necessary from the contract value until contractor shall furnish satisfactory proof that all contribution as required by the Employees' State Insurance Act 1948 have been paid.

2. Workman's Compensation And Employees Liability Insurance

Insurance shall be effected for all contractors employees engaged in the performance of this contact. If any part of work is sublet, contractor shall require the sub-contractor to provide workmans' compensation and employer's liability insurance which may be required by owner.

3. Other Insurance required under law or regulation by owner

Contractor shall also carry and maintain any and all other insurance which may be required under any law or regulation from time to time. He shall also carry and maintain any other insurance which may be required by owner.

GC-86 DAMAGE TO PROPERTY

1. Contractor shall be responsible for making good to the satisfaction of owner any loss of and any damage to all structures and properties belonging to owner or being executed or Procured by owner or of other Agencies within the premises of all work of owner, if such loss or damage is due to fault and / or the negligence or will full act or ommission of contractor, his employees, agent representatives or Sub-contractors.

2. Contractors shall indemnify and keep owner harmless of all claims for damage to properties other than S.M.C's property arising under or by reasons of this agreement if such claims result from the fault and / or negliance or wilful act of ommission of contractor,his employees, agents, representatives or sub-contractors.

GC-87 OUR LAWS AND REGULATIONS

1. The contractor shall be reponsible for the strict compliance of and shall ensure strict compliance by his sub contractor employees and agents of all labours and others laws, rules or regulations having the force of law affecting the relationship of employer and employee between the contractor/ sub-contractor and their respective employees.

2. No labour below the age of eighteen (18) year be employed on work.

3. Contractor shall pay to the labours engaged on work according the law.

4. The Contractor and sub-contractors o f the contractor shall obtain proper authority disignated in this behalf under any application law, rules or regulations (including but not restricted to the factories Act and Contract Labour Abolition and Regulation Act 1970,) in so far as applicable) any and all such licences, consents, Registration and / or other authorisation as shall from time to time be or become necessary for relatint to the execution of work or any part of portion thereof or the storage or supply of any Materials or otherwise in connection with the performance of the contract and shall at all times observance by the sub- contractors, employees and agents of all terms and conditions of the said licences,consents, regulation and other authorisa- tion and laws, rules and regulations applicable thereto.

GC-88 CONTRACTOR TO INDEMNIFY OWNER

1. The Contractor shall indemnify and keep indemnified the owner and every member, officer and employee of owner from and against all action, claims, demands and liabilities whatsoever and in respect of the breach of any of the above clauses and/or against any claim, action or demand by any workman/ employee of the contractor or any sub-contractor and or from any liability and way to any workman / employee of the contractor or any sub-contractor under any law, rule or regulations having the force of law, including but not limited to claims against the owner under the workman compensation Act 1923. The employees' Provident Funds Act 1952 and/or the Contract Labour (Abolition and Regulations) Act, 1970.

2. Payment of claims and damages

If owner has to pay any money in respect of such claims or demands as aforesaid, the amount so paid and the cost incurred by the owner shall be charged to and paid by contractor without any dispute notwithstanding the same may have been paid without the consent or authority of the Contractor.

3. In every case in which by virtue of any provision applicable in the workman's Compensation Act 1923 or any other Act, be obliged to pay compensation to workman employed by Contractor the amount of compensation so paid, and without prejudice to the rights of S.M.C. under sec.(12) Sub-section (2) of the said Act, S.M.C. shall be at liberty to recover such amount from any surplus due to the contractor or the

security deposit. S.M.C. will not be bound to contest any claim made under section (12) Sub-section (2) of the said Act except or written request of Contractor and upon the contesting of such claim.

4. The Contractor shall protect adjourning sites against structural decorative and other damages that could be caused to adjourning premises by the execution of these works and made good at his cost, any such damage, so caused.

GC-89 IMPLEMENTATION OF APPRENTICE ACT 1964

Contractor shall comply with the provisions of the Apprentice Act 1964 and the orders issued thereunder from time to time. If the fails to do so, it will be a breach of contract. Contractor shall also be liable for any particular liability arising on account of any violation of the provisions of the Act by him.

GC-90 HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS

Contractor shall comply with all the rules and regulations of the local sanitary authorities or as framed by owner from time to time for the protection of health and sanitary arrangements of all labour directly or indirectly employed on the work of this contract.

GC-91 SAFETY CODE

GENERAL

Contractor shall adhere to safe construction practice and gurard against hazardous and unsafe working conditions and shall comply with owner's safety rules and set fourth herein.

1. First Aid and Industrial Injuries

1.1 Contractor shall maintain first aid facilities for its employees and chose of his sub-contractor.

1.2 Contractor shall make outside arrangements for ambulance service and for the treatment of industrial injuries. Name of those providing these services shall be furnished to Engineer-in-charge prior to start of construction, and their telephone numbers shall be prominently posted in contractor's field office.

1.3 All injuries shall be reported promptly to Engineer- in-charge, and a copy of Contractor's report covering each personal injury requiring the attention of a physician shall be furnished to owner.

2. General Rules

2.1 Carrying, striking, matches, lighters inside the project area & smoking within the job site is strictly probibited Violators of smoking rules shall be discharged immediately. Within the operation area, not hot work shall be permitted without valid gas safety, fire permits. The Contractor shall also be held liable and responsible for all lapses of his sub-contractors/ employees in this regards.

3. Scaffolding

3.1 Suitable scaffolding shall be provided for workmen for all works that can not safely be done from the ground or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the latter is used for carrying Materials as well, suitable foothold sand handholds shall be provided on the ladder and the same shall be given inclination not steeper than 1 to 4 (1 horizontal and 4 vertical).

3.2 Scaffolding or stagging more than 3.6 M (12') above the ground or floor, swing or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise fixed at least 1.0 M (3') high above the floor or platform of scaffolding or staging and extending along the entire length of the outside ends thereof with only such openings as may be necessary for the delivery of Materials. Such scaffolfing or staging shall be so fastened as to prevent it from swaying from the building or structure.

4. Maintenance of Safety Devices

4.1 All scaffolds,ladders and other safety devices mentioned or described herein shall be maintained in some conditions and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near place or work.

5. Display or Safety Instructions

5.1 These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at the work-spot. The person responsible for compliance of the safety code shall be named

therein by the Contractor.

6. Enforcement of Safety Regulations

6.1 To ensure effective enforcement of the rules and regula-tions relating safety precautions, the arrangements made by the contractor shall be open to inspection by the welfare Officer, Engineer-in-charge of safety Engineer of the owner or their representatives.

7. No Exemption

7.1 Notwithstanding the above clause 1.0 to 13.0 there is nothing to exempt the contractor from the operations of any other Act or rules in force in the Republic of India.

7.2 In addition to the above, the Contractor shall abide by the safety code provision as per C.P.W.D. Safety Code framed from time to time.

GC-92 ACCIDENTS

It shall be the contractor's responsibility to protect against accidents on the work. He shall indemnify the Municipal Corporation against any claim for damage or for injury to persons or property resulting from, and in the course of work and also under the provision of the Workman's Compensation Act. On the occurance of an accident arising out of the works which results in death or which is so serious as to be likely to result in death, the contractor shall within twenty four hours of such accident, report in writing to the Engineer-in-charge, the facts stating clearly and is sufficient details the circumstances of such accident and the subsequent action. All other accidents on the works involving injuries to persons or damage to property other than that of the contractors shall be promptly reported to the Engineer-in-charge stating clarly and in sufficient details and facts and circumstances of the accidents and the action taken. In all cases the contractor shall indemnify the Municipal Corporation against all loss of damage resulting directly or indirectly from the Contractor's failure to report in the manner aforesaid. This includes panalties or fine consequency of failure to give notice under the workman's compensation Act or failure to confirm to the provisions of the said.Act in regard to such accidents.

In the event of an accident in respect of which compensation may become payable under the workmens compensation Act VIII of 1923 including all modification thereof whether such compensation may become payable by the contractor or by the Municipal Corporation as principal employer, the Engineer-in-charge may retain out of money due and payable to the contractor such sum or sums of money as may, in the opinion of the Engineer-in-charge be sufficient to meet such liability. On receipt of award from the labour commission in regard to quantum of compensation, the difference in amount will be adjusted.

GC-93 It is clarified that if the contractor makes his own arrangements for water required for construction and labour camp etc. by drilling bore. No water charges will be recovered from the contractor. On the otherhand, even if the contractor is not taking connection and makes other arrangement to use Municipal water by tanker or tapping water from near private connection even so water charges shall be recovered as per relevant condition of the tender. **As per City Engineer Note No.386, dtd.30/7/2012**

GC-93 (A) PRICE VARIATION CLAUSE:

No Price Variation difference will be paid to the contractor for Labour, Materials, P.O.L. (Fuel) or any other material for the work

GC-93 (B) STAR RATE & DIFFERENCE FOR REINFORCEMENT STEEL & CEMENT:

No star rate or basic rate difference will be paid to the contractor for cement , steel reinforcement or any other material for the work.

GC-94 GOODS AND SERVICE TAX (GST)

GST CLAUSE FOR CONSTRUCTION / ERECTION / COMMISSIONING / INSTALLATION / REPAIRS / MAINTENANCE / RENOVATION / FABRICATION OF STRUCTURE INCLUDING BUILDING (MEANS ALL WORKS CONTACT / TURN KEY PROJECTS / SUPLY OF MATERIAL / GOODS)

GST (Goods & Service Tax) has come in existence from 1 July 2017. Contract / Successful Bidder is boundto pay any amount of GST prescribed by the Govt. of India as per the Terms of Contract agreed upon during the course of execution of this Contract.

During the course of execution of contract. if there is any change in Rate of GST (Goods & Service Tax) by the Government the same shall be reimbursed / recovered separately by SMC subject to the submission of Original Receipt / proof for the amounts actually remitted by the successful Tenderer / Contractor to the competent authority along with a certificate from Chartered Accountant of Contractor / Successful Bidder certifying that the amount of GST paid to the Government and the same shall be intimated / submitted /claimed within 30 Days form the date of payment Remittance of GST within stipulated period shall be the sole responsibility of the Successful Bidder / Contractor, failing which SMC and decision of Municipal Commissioner shall be final and binding on the Contractor / Successful Bidder in this regard Further the non-payment of GST to the Government may lead to the termination of contact and forfeiture of security Deposit / Performance Guarantee Amount.

If imposition of any other new Taxes / Duties / Levies / Cess or any other incidentals etc. or any increase in the existing Taxes / Duties / Levies / Cess or any other incidentals etc. (Excluding GST) are imposed during the course of the contract the same shall be borne by the Contractor / Successful Bidder only in no case SMC shall be liable for the same.

The Contractor will submit the invoice to the SMC having GSTIN of SMC mentioned therein and the taxes shall be shown separately on the face of the invoice so as to claim as ITC by SMC.

GC-95 SECURED ADVANCES:

No Secured advances shall be paid.

GC-96 SUBMISSION / COMPULSION BY CONTRACTOR

The contractor registered with S.M.C. or any other Govt. organisation is required to employ minimal technical staff as detailed in the certificate issued to him. If contractor does not employ same technical staff over works entrusted to him, should submit photo-identity and education qualification of technical staff appointed at site.

"The contractor shall have to keep the record of the labourers employed for the concerned work. The contractor should provide attendance card, identification card, pay slip etc to the labourers employed. Further, the amount of E.S.I. & Provident Fund should be deducted from the salary of the labourers employed and such amount should invariably be deposited to the concerned Government Departments. In addition, the amount of social security under E.P.F. & M.P. act 1952 shall be recovered every month & such amount should invariably be deposited directly to the concern Government Departments. In the same context, the details regarding such amount deposited to the concern Govt. Deptt. and labourers employed shall be furnished to the office of Traffic Cell Department of S.M.C. every month.In case of failure, such amount shall be deducted/recovered from the running bill directly in accordance with the details given by contractor regarding labourers employed and as per the prevailing rules of Government.In absence of detail, an adhoc suitable amount of the total amount of work done shall be recovered directly from the running bills. On submission of evidence of recovery of such amount, the amount recovered/deducted shall be released in the next bill after due sanction of Competent Authority of S.M.C."

GC-97 SPECIAL RISK

If during the contract, there shall be outbreak of war (whether war is declared or not), major epidemic**,** earthquake, or similar occurrence in any part of the world beyond the control of either party to the contract which whether financially or otherwise materially affects the execution of the contract, the contractor shall unless and until, the contract is terminated under the provisions of this article, use his best endeavors to complete the execution of the contract, provided always that the Corporation shall be entitled at any time after the onset of such special risks, to terminate the contract by giving written notice to the contractor and upon such notice being given this contract shall terminate but without prejudice to the rights of either party in respect of any antecedent breach thereof. If any of the works, or materials to be deli subjected to damage or distribution by reasons for the special risks, the contractor shall be entitled to payment for such damage or destroyed materials and to any costs involved in making good damages or destroyed materials as may be required by the Municipal Corporation.

The contractor shall not be liable for payment of compensation for delay or for failure to perform the contract for reasons of Force Majeure such as acts of public enemy, acts of Government fires, floods, cyclone,

epidemics, quarantine restrictions, lockouts, strikes, freight embargoes and provided that the contractor shall within Ten (10) days from the beginning of such delay notify the Engineer-in-charge in writing the cause of delay. The Municipal Commissioner shall verify the facts and grant such extension as the facts justify.

GC-98 SECURITY DEPOSIT

The person/persons whose tender may be accepted (hereinafter called the contractor, which expression shall unless excluded by or repugant to the context include his heirs, executors, administrators and assignees) shall (within 15 days of the receipt by him of the notification of the acceptance of his tender otherwise 0.065% per day of S.D. amount will be charged as penalty) deposit with Municipal Commissioner in cash or Government securities endorsed to the Commissioner sum sufficient which will make up the security deposit specified in the tender.

If the amount of the security deposit to be paid in lump sump within the period specified above is not paid the tender contract already accepted shall be considered as cancelled. The security deposit lodged by contractor shall be refunded after the expiry of the Defects Liability period as shown in the attached Memorandum after deducting dues, ifany, which become liable to be recovered from the contractor under the terms and conditions of this Agreement.

GC-99 COMPENSATION OF THE DELAY

The time allowed for carrying out the work as entered in the ender shall be strictly observed by the contractor and shall be reckoned from the date on which the order to commence work is given to the contractor. The work shall through out the stipulated period of the contract be proceeded with, all due diligence (time being deemed to be the assence of the contract on the part of the contractor) and the contractor shall pay as conpensation a percentage amount (shown in the attached Memorandum) of the tendered cost of the whole work as shown by the tender for every day that the work remains uncommenced or unfinished after the proper days, And further to ensure good progress during the execution of the work the contractor shall be bound, in all cases in which the time allowed for any work exceeds one month, to complete parts of the work during the period shown in the attached Memorandum.

In the event of the contractor failing to comply with these conditions he shall be liable to pay as compensation, the amount mentioned above for every day that the due quantity of work remained incomplete provided always that the total amount of compensation to be paid under the provision of this clause shall not exceed 10 percent of the Tendered cost of the work as shown in the tender.

GC-100 ACTION WHEN WHOLE OF SECURITY DEPOSIT IS FOREFITED

In any case in which under any clause of or clauses this contract the contractor shall have tendered himself liable to pay compensation amounting to the whole of this security deposit (whether paid in one sum or deducted by instalments) or in the case of abandonment of the work owing to serious illness or death of the contractor or any other causes, the Commissioner on behalf of the Corporation shall have power to adopt of the following courses, as he may deem best suited to the interest of Municipal Corporation .

(a) To rescind the contract (of which rescission notice in writting to the contractor under the hand of the Commissioner shall be conclusive evidence) and in that case that security deposit of the contractor shall stand forefeited and be absolutely at the disposal of Municipal Corporation .

(b) To employ labour paid by the related Zone and to supply material to carry out the works, or any part of the work debitting, the contractor with errectness of which cost and price the certificate of Executive Engineer shall be final and conclusive against the contractor and crediting him with the value of the work done,in all respects in the same manner and at the same rates as if it had been carried out by the contractor under the terms of his contract, and in that case the certifate of the Executive Engineer as to the value of the work done shall be final and conclusive agains the contractor.

(c) To order that the work of the contractor be in measured up and to take such part thereof as shall be unexecuted out of his hands, and to give it to another contractor to complete, in which case any expenses which may be incurred in excess of the sum which would have been paid to original ontractor, if the whole work had been executed by him (as to the amount of which excess expenses the certificate in writing of the Executive Engineer shall be finl and conclusive) be borne & paid by the original contractor shall be deducted from any money due to him by Municipal Corporation under the contract or otherwise from his security deposit or the proceeds of sale thereof, or a sufficient part thereof.

Action when the progress of any perticular portion of the work if unsatisfactory

In the event of any of the above courses be adopted by the Commissioner the contractor shall have no claim to compensation for any loss sustained by him by reason of his purchased or procured any materials or entered into any engagements, or made any advances on account of or with a view to the execution of the work or the performance of the contract.And in case the contract shall be reseinded under provision aforesaid, the contractor shall not be entitled to recover, or be paid any sum for any work thereto actually performed by him under this contract unless and until the Executive Engineer shall have certified in writing the performance of such work and the amount payable to him in respect thereof, and he shall only be entitled to paid the Particular amount so certified.

GC-101 COMPENSATION TO LOSS

Contractor remains liable to pay compensation if action not taken under clause(3) If the progress of any particular portion of the work is unsatisfactory the Commissioner shall notwithstanding that the general progress of the work is satisfactory in accordance with clause 2, be entitled to take action under clause 3 (b) after giving the contractor 10 day's notice in writing and contractor will have no claim for compensation for any loss sustaind by him owing to such action.

GC-102 Power to take possession of require to removal of, or self contractor's plan

In any case in which any of the powers conferred upon the Commissioner by clause 3 and 4 hereof shall have become exercisable and same shall not have been exercised the non-exercise thereof shall not constitute a waiver of any of the conditions hereof such powers shall notwithstanding be exercisable in any future case default by the contractor for which by any cluase or clauses hereof he is declared liable to pay compensation mounting to the whole of his security deposit require or and the liability of the contractor for past and future compensation shall remain unaffected.

In the event of the Commissioner taking action under sub-caluse (a) or (c) of clause 3, he may, be he so desire to take possession of all or any tools, plant materials and stores in or upon the works, or the site thereof or belonging to the contractor, or procured by him and intended to be used for the execution of the work of any part thereof, paying or allowing for the same in account at the contract rates, or in the case of contract rates not being applicable, at current market rates,to be cartified by the Executive Engineer whose certificate thereof shall be final. In the alternative the Commissioner may by notice in writing to the contractor or his clerk of the works. Foremen or other authorised agent require him to remove such tools, plant, materials, or stores from the premises within a time specified in such notice; &in the event of the contractor failing to comply with any such requisition, the Commissioner may remove them at the contractor's expense or sell them by action or private sale at the risk and account of the contractor in all respects, and certificate of the Executive Engineer as to the expense of any such removal, and the amount of the proceeds and expense of any of any sale shall be final and conclusive against the contractor.

GC-103 EXTENSION OF TIME

If the Contractor shall desire an extension of the time for completion of the work on the ground of his having been unavoidably hindered in its execution or on any other ground, he shall apply in writing to the Commissioner within 30 days from the date on which he was hindered as aforesaid on or which the cause for asking for extension occurred and the Commissioner may, if in his opinion, there are reasonable grounds for granting an extension, grant such extension as he thinks necessary or proper. The decision of the Commissioner in thismatter shall be final.

GC-104 FINAL CERTIFICATION

On completion of the work the contractor shall be furnished with a certificate by the Executive Engineer (hereinafter called the Engineer- in- charge) of such completion, but no such certificate shall be given nor shall the work be considered to complete until the contactor shall have removed from the premises on which the work shall have been executed all scaffolding, surplus materials and rubbish, and shall have cleaned of the dirt from all woodwork, doors, windows,walls, floors or other parts of any building, in or upon which the work has been executed,or of which he may have had possession for the purpose of executing the work,nor until the work shall have been measured by the Engineer-in-charge or w here the measurement have been taken by his subordinates until they have received the approval of the Engineer-in- charge, the said measurement being binding and conclusive against the contractor.

If the contractor shall fail to comply with the requirements of this clause as to the removal of scaffolding, surplus materials and rubbish. And cleaning off dirt on or before the date fixed for the completion of the work, the Engineer-in-charge may, at the expense of the contractor remove such scaffolding surplus material

and rubbish, and dispose off the same as he thinks fit and clean off such dirt as aforesaid; and contractor shall forthwith pay the amount off all expenses so incurred,but shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

GC-105 PAYMENT ON INTERMEDIATE CERTIFICATE TO REGARDED AS ADVANCE.

No payment shall be made for any work, on estimated to cost less than rupees one thousand, till after the whole of the said work shall have been completed & a certificate of completion given. But in the case of works estimated to cost more than rupees one thousand, the contractor shall, on submiting a monthly bill therefore be entitled to received payment proportionate to the percentage shown in the attached Memorandum of the part of the works than approved and passed by the Engineer-in-charge, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the contractor.

All such intermediate payment shall be regarded as payment by way of advance against the final payments only & not as payments for work actually done and completed and shall not preclude the Engineer-in-charge from requiring bad, unsound imperfect of unskilful work to be removed & taken away & reconstructed, or re-erected. nor shall any such payment be considered as an admission of the due performance of the contract or any part thereof in any respect of the accruing of and claim; nor shall it conclude, determine or affect in any way the Powers of the Engineer-in-charge as to the final settlement and adjustment of the accounts or otherwise, or in any other way very or affect the contract. The final bill shall be submitted by the contractor within one month of the date fixed for the completion of the work, otherwise the Engineer-in-charge's certificate of the measurement and of the total amount payable for the work shall be final and binding on all parties.

GC-106 PAYMENT AT REDUCED RATE ON ACCOUNT OF ITEM OF WORK NOT ACCEPTED AS COMPLETED TO BE THE DISCRETION OF THE ENGINEER-IN-CHARGE

The rates for serveral items of the work agreed to within, shall be valid only when the item concerned is accepted as having been completed fully in accordance with the sanctioned specifications. In cases where the items of works are not accepted at so completed the Engineer-in-charge may make payment on account of such items at such reduced rates as he may consider reasonable in the prepartion of final or on account bills.

CLAUSE-10 Time for Bills to be submitted

A bill may be submitted by the contractor once in each month on or before the date fixed by the Engineer-in-charge for all works executed in the previous months, and the Engineer -in- charge shall take or cause to be taken the requisite measurement for the purpose of having the same verified, and the claim, so far as it is admissible shall be adjusted if possible within fifteen days from the presentation of the bill. If the contractor does not submit the bill within the time fixed as aforesaid, Engineer-in-charge may depute a subordinate to measure up the said work in the presence of the contractor or his duly authorised agent whose counter signature to the measurement list shall be sufficient warrant, and the Engineer-in-charge may prepare a bill from such list which shall be binding on the contractor in all respects.

GC-107 BILLS TO BE ON PRINTED FORMS

The contractor shall submit all bills on the printed forms to be had on application at the office of the Engineer-in-charge. The charges to be made in the bills shall always be entered at the rates specified in the tender or in the case of any extra work ordered in pursuance of these conditions, and not mentioned or provided for in the tender at the rates hereinafter provided for such work.

GC-108 STORES SUPPLIED BY SMC

If the specification or estimate of the work provides for the use of any special description of materials to be supplied from the Municipal Store or if it is required that the contractor shall use certain stores to be provided by the Engineer-in-charge (such materials and stores and the prices to be charged thereof as hereinafter mentioned being so far as practicable for the convenience of the contractor but not so as in any way to control meaning or effect of the contract specified in the schedule or memorandum hereto annexed) the contractor shall be supplied with such materials and stores as may be required from time to time to be used by him for the purpose of the contract only and the value of the full quantity of materials and stores so supplied shall be set off deducted form any sums then due, or thereafter to become due to the contractor under the contract, or otherwise or from the security deposit, or the proceeds of sale thereof shall be deposit is held in Governement securities the same or a sufficient portion there of shall in that case be sold for the purpose. All material supplied to the contactor shall remain the absolute property of Municipal Corporation and shall on no account be removed from the site of the work, and shall at all times be opened to inspection by the Engineer-in-charge.

Any such materials unused and in perfectly good condition at the time of completion or determation of the contract shall be returned to the related zone store, if the Engineer-in-charge so requires by a notice in writing given under his hand, but the contractor shall not be entitled to return any such materials except with such consent and he shall have no claim for compensation on account of any such materials supplied to him as aforesaid but remaining unused by him or for any wastage in or damage thereto.

GC-109 WORKS TO BE EXECUTED IN ACCORDANCE WITH SPECIFICATIONS, DRAWINGS ORDERS ETC.

The contractor shall execute the whole and every part of the work in the most substantial and workman like manner, and both as regards materials and in every other respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to designs, drawings and instructions in writing relating to the work signed by the Engineer-in-charge and lodged in his office and to which the contractor shall be entitled to have access for the purpose of inspection at such office, or on the site of the work during office hours, and the contractor shall, if he so requires, be entitled at his own expense to make or cause to be made copies of the specifications and of all such designs, drawings and instruction on aforesaid.

GC-110 ALTERNATION ON SPECIFICATIONS AND DESIGN NOT TO INVALIDATE CONTRACTORS. RATES FOR WORKS NOT ENTERED IN ESTIMATE OR SCHEDULE TO RATES OF THE SMC

The Engineer-in-charge shall have power to take any alteration in, or addition to the original specifications, drawings, designs and instruction that may appear to him to be necessary or advisable during the progress of the work, and the contractor shall be bound to carry out the work in accordance with any instructions in this connection which may be given to him in writing signed by the Engineer- in-charge and such alteration shall not invalidate the contract and any additional work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respect on which he agreed to do the main work and at the same rates as are specified in the tender for the main work. And if the additional and altered work includes any class of work for which on rates is specified in this contract than such class of work shall be carried out at the rates entered in the schedule of rates of Municipal Corporation or at the rates mutually agreed upon between the Engineer-in-charge and the contractor whichever are lower if the additional or altered work for which no rate is entered in the schedule of Rates of Municipal Corporation is ordered to be carried out before the rates are agreed upon then the contractor shall, within seven days of the date of receipt by him of the order to carry out the work, inform the Engineer-in-charge of the rate which it is his intention to charge for such class of work and if the Engineer-in-charge does not agree to this rate he shall by notice in writing be at liberty to cancel his order to carry out such class of work, and arrange to carry it out in such manner as he may consider advisable provided always that if the contractor shall commence the work or incure any expenditure in regards thereto before the rates shall have been determined as lastly herein before mentioned, then in such case he shall only be entitled to be paid in such case he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of the determination of the rate as aforesaid according to such rate or rates as shall be fixed by the Engineer-in-charge. In the event of a dispute, the decision of the Commissioner will be final.

Where, however, the work shall have to be executed according to the designs; drawings and specifications recommended by the contractor and accepted by the competent authority the alteration above referred to shall within the scope of such designs drawings and specification appended to the tender.

Extension of time in consequence of additions or alterations. The time limit for the completion of work shall be extended in the proportion that the increase in its cost occasioned by alterations or addition the cost of the original contract work, and the certificate of the Engineer-in-charge as to such proportion shall be conclusive.

GC-111 NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORKS TO BE CARRIED OUT

If at any time after the execution of the contract documents the engineer-in-charge shall for any reason whatsoever, require the whole or any part of the work as specified in the tender to be stopped for any period or shall not require the whole or part of the work to be carried out at all or to be carried out by the contractor, he shall give notice in writing of the fact to the contractor who shall thereupon suspend or stop, the work totally or partially, as the case may be. In any such case, except as provided hereunder, the contractor shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not so derive in consequence of the full amount of the work nor having been carried out, or on account of any loss that he may be put to on account of

materials purchased or agreed to be purchased, or for unemployment of labour recruited by him. He shall not also have any claim for compensation by reason of any alteration having been made in the original specifications, drawings, designs and instructions may involve any curtailment of the work as originals contemplated. Where which however, materials have already been purchased or agreed to be purchased by the contractor, before receipt by him of the said notice, the contractor shall be paid for such materials at the rate determined by the Engineer-in-charge, provided they are not in excess of requirements and are of approved quality and/or shall be compensated for the loss, if any that he may be put to in respect of materials agreed to be purchased by him, the amount of such compensation to be determined by the Engineer-in-charge, whose decision shall be final. If the contractor suffers any loss on account of his having to pay labour charges during the period during which to stoppage of work has been ordered under this clause the contractor shall on application be entitled to such compensation on account of labour charges as the Engineer-in-charge, whose decision shall be final, may consider reasonable, provided that the contractor shall not be entitled to any compensation on account of labour charges if, in the opinion of the Engineer-in-charge, the labour could have been employed by the contractor elsewhere for the whole or part of the period during which the stoppage of the work has been ordered as a foresaid.

GC-112 N CLAIM TO COMPENSATION ON ACCOUNT OF LOSS DUE TO DELAY IN SUPPLY OF MATERIALS BY SMC.

The contractor shall not be entitled to claim any compensation from Municipal Corporation for the loss suffered by him on account of delay by Municipal Corporation in the supply of materials entered in schedule A' where such delay is caused by

(1) Difficulties relating to the supply of Railway wagons & availability of Government controlled materials-

(2) Force Majeure.

(3) Act of God.

(4) Act of the Nation's enemies or any other reasonable cause beyond the control of Municipal Corporation .

In the case of such delay in the supply of material the Municipal Corporation shall grant such extension of time for the completion of the work as shall appear to the Commissioner to be reasonable in accordance with the circumstances of the case. The decision of the Commissioner as to the extension of time shall be accepted as final by the contractor.

GC-113

The contractor is to set out and levi the work & will be responsible for the accuracy of same. He is to provide and maintain measuring and surveying instruments including steel tapes, theodolite and dumpy level at all times for proper carrying of the work and for the use of Executive Engineer and his representative including skilled attendance.

GC-114

The Contractor is to cover up and protect the works from the weather, and is suspend all `wet' operations during weather which, in the Executive Engineer opinion, will be detrimental to the work.

GC-115

Samples of each class of material and workmanship shall be submitted by the Contractor for the approval of Executive Engineer and after such approval these samples shall be deposited at any place the Executive Engineer may appoint and the Contractor shall be required to perform all the works of this contract in accordance with the samples.

GC-116

On completion, all work must be cleaned down; rubbish removed and the works and land cleaned of rubbish; surplus materials and other accumulations, and everything left in a clean and ordinary condition.

GC-117

The contractor shall provide, erect and maintain proper sheds and temporary buildings for the storage and protection of materials and goods and for the execution of work which may be fabricated or brought on the site.

GC-118

The contractor is to set out and level the works and will be responsible for the accuracy of the same. He shall also be responsible for the correctness of the positions, levels, dimensions and alignment of all parts of the structures as shown in the drawings supplied to him.If at any time any error shall appear during the progress of any part of the work, the contractor shall at his own expense rectify such error if called upon to the satisfaction of the Executive Engineer.

GC-119

The contractor shall permit the execution of the work not provided for in the tender by artists; tradesman, or others engaged by the Municipal Corporation . The contractor shall allow all reasonable facilities and the use of his scaffolding and water for the execution of such work, but is not required to provide any special scaffolding for the execution of such work except by special arrangement with Municipal Corporation .

GC-120 TIME LIMIT FOR UNFORESEEN CLAIM

Under no circumstance whatsoever shall the contractor be entitled to any compensation from Municipal Corporation on any account unless the contractor shall have submitted a claim in writing to the Engineer-in-charge within one month of cause of such claim occurring.

GC-121 ACTION AND COMPENSATION PAYABLE IN CASE OF BAD WORK:

If at any time before the security deposit is refunded to the contactor, it shall appear to the Engineer-in-charge or his subordinate in charge of the work that any work has been executed with unsound imperfect, or unskillful workmanship or with materials of inferior quality; or that any materials or articles provided by him for the execution of the work are unsound, or of a quality inferior to that contracted for, or other- wise not in accordance with the contract, it shall be lawful for the Engineer-in-charge to intimate this fact in writing to the contractor and them not withstanding the fact that the work, materials or articles complained of may have been inadvertently passed, certified and paid for, the contractor shall be bound forthwith to rectify, or remove and reconstruct the work so specified in whole or in part as the case may require, or if so required shall remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost; and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in the written intimation aforesaid, the contractor shall be liable to pay compensation at the rate of one percent on the amount of the tender for every day not exceeding ten days, during which the failure so contimate and in the event of any such failure as aforesaid the Engineer-in-charge may rectify or remove and execute the work or remove and replace the materials or articles complained or as the case may be at the risk and expense in all respects of the contractor, should the Engineer-in-charge consider that any such inferior work or materials as described above may be accepted or made use of it; shall be within his discretion to accept the same at such reduced rates along with the appropriate penalty as the Commissioner may deem fit.

The period to be counted from that date of final completion and handing over of the work to the Municipal Corporation during which the contractor is so liable for any defects in the work shall be the Defects Liability Period shown in the attached Memorandum.

GC-122 WORK TO OPEN BE INSPECTION

Contractor is responsible agent to be present. All works under in course of execution or executed in pursuance of the contract shall at all time be open to the inspection and supervision of the Engineer-in- charge and his subordinates, and the contractor shall at all times during the usual working hours, and at all other times at which reasonable notice of the intention of the Engineer-in-charge or his subordinate to visit the work shall have been given to the contractor, either himself be present to receive orders and instructions, or have a responsible agent duly accredited in writing present for that purpose. Orders given to the contractor's duly authorised agent shall be considered to have the same force and effect as if they had been given to the contactor himself.

GC-123 NOTICE TO BE GIVEN BEFORE WORK IS CONVERED UP

The contactor shall give not less than five day's notice in writing to the Engineer-in- charge or his subordinate in charge of the work before covering up or other wise placing beyond the reach of measurement any work in order that the same may be measured; and correct dimensions thereof taken before the same is so covered up or placed beyond the reach of measurement any work without the consent in writing of the Engineer- in-charge or his subordinate in charge of the work, and if any work shall be covered up or placed beyond the reach of measurement without such notice having been given or consent obtained, the same shall be

uncovered at the contractor's expense, and in default thereof no payment or allowance shall be made for such work or for the materials with which the same was executed.

GC-124 Contractor Liable For Damage Done, And Or Imperfection For Three Months After Certificate.

If the contactor or his workmen; or servants shall break, deface injure or destroy any part of a building in which they may be working, or any building, road, fence enclosure or grass land or cultivated ground continuous to the premises on which the work of any part thereof is being executed; or if any damage shall be done to the work for any cause whatever while if is in progress or if any imperfection become apparent in it within the Defect liability period mentioned above by Engineer- in- charge the contactor shall make good the same at his own expense, or in default the Engineer in charge may cause the same to be made good by other workmen and deduct the expenses (of which certificate of Engineer-in- charge shall be final) from any sum that may be due or thereafter became due to the contractor or from his security deposit or the proceed of sale thereof or of a sufficient portion thereof.

GC-125 CONTRACTOR TO SUPPLY PLANT, SCAFFOLDING ETC

The contractor shall supply at his own cost all materials (except such special materials, if any, as may be

supplied from the Pubub works department Stores in accordance with the contract).plant tools, appliances implements, ladders, cordage, scaffolding and any temporary works which may be required for the proper execution of the work, in the original; altered or substituted from, and whether included in these specification or, other documents forming part of the contract or referred to in these conditions or not and which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-charge as to any matter on which under these conditions he is entitle to be satisfied, or which he is entitled to require together with carriage thereof. To and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out works and counting, weighing and assisting in the measurement or examination at any time and from time to time of the work or materials, Failing this the same may be provided by the Engineer-in-charge at the expense of the contractor and the expense may be deducted from any money due to the contractor under the contract, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The contractor shall provide all necessary fencing and lights required to protect the public from accident; and shall also be bound to bear the expenses of every suit. Action or other legal proceedings, at law, that may be brought by any person for Injury sustained owing to negligence of the above precautions, and to pay damages and costs which may be awarded in any such suit action or proceedings, to any such person, or which may with the consent of the contractor be paid in compromising any claim by any such person.

GC-126

The contractor shall make his own arrangement for drinking water for the labour employed by him.

GC-127LIABILITY OF CONTRACTOR FOR ANY DAMAGE DONE IN OR OUTSIDE WORK AREA

Compensation for all damage done intentionally or unintentionally or by contractor's labourers whether in or beyond the limits of municipal property shall be estimated by the Engineer-in-charge or such other office as he may appoint & estimates of Engineer-in-charge subject to the decision of the Commissioner on appeal be final & the contractor shall be bound to pay the amount of the assessed compensation of demand failing which the same will be recovered from the contractor as damage from the security deposit or deducted by the Engineer-in-charge from any sum that may by due or become due from Mahanagar Seva Sadan to the contractor under this contract or otherwise.

The contractor shall bear the expenses of defending any action or other legal proceedings that may be brought by any person from injury sustained by him owing to negligence of precautions to prevent the spread of fire & he shall also pay any damages and cost that may be awarded by the court in consequence.

GC-128WORK ON SUNDAY

No work shall be done on Sunday without the sanction in writing of the Engineer-in -charge.

GC-129

Contract may be rescinded by and security deposit forfeited for subletting it without approval or for be inging a public officer or if contractor becomes in solvent:

The contract shall not be assigned or subject without the written approval of the Engineer- in-charge, and if the contactor shall assign or sublet his contract or attempt to do so or become insolvent or commence any proceedings to be adjudicated an insolvent or make any composition with his creditors, or attempt to do the Engineer-in-charge may, by notice in writing rescind the contract. Also if any bribe, gratuity gift, loan, perquisite, reward or directly advantage, pecuniary or otherwise, shall either or indirectly be given, promised, or offered by the contractor, or any of his servants agents to any public officer or person in the employ of Municipal Corporation in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract the Engineer- in-charge may be notice in writing rescind the contract. In the event of contract being rescinded, the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the deposit of the Mahanagar Seva Sadan & the same consequences shall ensue as if the contract had been rescinded under clause-3 hereof and in addition the contactor, shall not be entitled to recover or be paid for any work thereto for, actually performed under the contract.

GC-130SUM PAYABLE BY WAY OF COMPENSATING TO BE CONSIDERED AS REASONABLE COMPENSATION WITHOUT REFERENCE ACTUAL LOSS

All sums payable by a contractor by way of compensation under any of these conditions shall be considered as a reasonable compensation to be applied to the use of Municipal Corporation without reference to the actual loss or damage sustained and whether any damage has or has not been sustained.

GC-129 CHANGES IN THE CONSTITUTION OF FIRM TO BE NOTIFIED.

In the case of a tender by partners any change in the constitution of a firm shall be forthwith notified by the contractor to the Engineer-in-charge for his information.

GC-132 WORKS TO BE UNDER THE DIRECTION OF EXECUTIVE ENGINEER

All works to be executed under the control shall be executed under the directions and subject to the approval in the respects of the Executive Engineer who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

GC-133 DECISION OF THE COMMISSIONER TO BE FINAL

Except where otherwise specified in the contract decision of the Commissioner shall be final conclusive and binding on all parties to the contract upon all questions relating to the meaning of the specification designs, drawings and instructions here in before mentioned and as to the quality of workmanship, or materials used on the work, or as to any ot her question, claim, right, matter, or thing whatsoever in any way arising or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions, or otherwise concerning the works or the execution or failure to execute the same, whether arising, during the progress of the work or after the completion or abandonment thereof.

GC-134 LUMP SUM IN ESTIMATES:

When the estimate on which a tender is made includes lump sums in respect of parts of the work the contractor shall be entitled to payment in respect of the item of work involved or the part of the work in question at the same rates as are payable under this contract of such items of if the part of the work in question is not in the opinion of the Engineer-in-charge capable of measurement the Engineer-in-charge may at his discretion pay the lump sum amount entered in the estimate, and the certificate in writing of the Engineer-in-charge shall be final and conclusive under the provision of the clause.

GC-135 ACTION WHERE NO SPECIFICATION

In the case of any class of work of which there are on such specifications as are mentioned in Rule 1 such work shall be carried out in accordance with the Municipal or Gujarat Government P.W.D. specifications, and in event of there being no Municipal or Government P.W.D. specifications, then in such case the work shall be carried out in all respects in accordance with the instructions & requirement of the Engineer- in-charge.

GC-130 DEFINITION OF WORKS

The expression "works" or "Work" where used in these conditions shall, unless there be something in the subject or context repugnant to such construction be constructed to mean the work of works the contracted to be executed under or in virtue of the contract, whether temporary or permanent, and whether original altered, substituted or additional.

GC-137 REFUND OF QUARRY FEES AND ROYALTIES

All quarry fees and royalties shall be paid by the contractor All octroi taxes shall also be paid contractor according to the Municipal rules in force at the time and no refund shall be given Certificate for refund of quarry fees and royalties in admissible under existing rules shall be given by the Municipal to the contractor after successful completion of the contract. For the levy of water charges for construction work, please see the attached Memorandum.

GC-138COMPENSATION UNDER WORKMEN'S COMPENSATION ACT

The contactor shall be responsible for and shall pay any compensation to his workmen payable under the workmen's Compensation Act 1923 (VIII of 1923) or any statutory modification thereof for injuries caused to workmen.

GC-139 CLAIM FOR QUANTITIES OF WORK ENTERED IN THE TENDER ESTIMATE

Quantities shown in the tender are approximate and no claim shall be entertained for quantities of work executed being either more or less then those entered in the tender of estimate.

GC-140CLAIM FOR COMPENSATION DELAY IN STARTING THE WORK

No. compensation shall be allowed for any delay caused in the starting of the work on account of any acquisition of land and in the case of clearence work, for any delay in accordance to estimate.

GC-141 CLAIM FOR COMPENSATION FOR DELAY IN THE EXCAVATION OF WORK

No compensation shall be allowed for any delay in execution of the work on account of water standing in borrow pits or compartments. The rates are inclusive for hard or cracked soil , excavation in mud, sub- soil water or water standing in borrow pits, and no claim for an extra rate shall be entertained, unless otherwise expressly specified.

GC-142 ENTERING UPON OR COMMENCING ANY PORTION OF WORK

The contractor shall not enter upon or commence any portion of work except with the written authority and instructions of the Engineer-in-charge or of his subordinate in charge of the work failing such authority the contractor shall have no claim to ask for measurements for payment of work,

GC-143 MINIMUM AGE OF PERSONS EMPLOYED THE EMPLOYMENT OF DONKEYS AND OR OTHER ANIMALS & THE PAYMENT OF FAIR WAGES

(i) No contractor shall employ any person who is under the age of 12 years.

(ii) No contractor shall employ donkeys or other animals with breching of string or thin rope. The breeching must be atleast three inches wide and should be of tape (Nawar).

(iii) No animals suffering from sores, lameness or emaciation or which isimmature shall be employed on the work.

(iv) The Engineer-in-charge or his agent is authorised to remove from the work any person or animal found working which does not satisfy these conditions and no responsibility shall be accepted by Municipal Corporation for any delay caused in the completion of the work by such removal.

(v) The contractor shall pay fair & reasonable wages to the workmen employed by him in the contract undertaken by him in the event of any dispute arising between the contractor and his workmen onthe grounds that the wages paid are not fair and reasonable, the dispute shall be referred without delay to the Executive Engineer who shall decide the same.

The decision of the Executive Engineer shall be conclusive and binding.

On the contractor but such decision shall not in any way affect the condition in the contract regarding the payment to be made by Municipal Corporation at the sanctioned tender rates.

GC-144 DELETED

GC-145 ACCEPTANCE OF CONDITION COMPULSORY BEFORE TENDERING FOR WORK.

Any contractor who does not accept these conditions shall not be allowed to tender for works.

GC-146CLAUSE HEADINGS

The clause headings in these conditions are for purposes of reference only and are not to be deemed to from part of this contract.

GC-147

Disputes if any, shall be discussed and mutually settled and in case of disagreement the same shall be referred to Commissioner/Standing Committee. After referring to Commissioner/Standing Committee if the said dispute is not solved, the same shall be referred to the court subject to Surat Jurisdiction only.

GC-148 THE FOLLOWING CONDITION ARE BEING INCLUDED IN THIS TENDER AND SHALL BE CONSIDERED AS A PART OF TENDER DOCUMENT.

(i) In case the total amount of work done is less than 5% of the contract value, prorate S.D. to that extent may be refunded to the contractor while releasing the payment of final bill. In short, the S.D. to be retained by the Corporation after payment of final bill shall be equal to 2% of the amount of final bill as per the prevailing norms or as per the norms decided from time to time.

(ii) If there is increase in amount of work more than 5% of the Contract value. The Additional S.D. shall be recovered from the running bill. When the total of any of work done by the Contractor up to running bills under consideration is more than 5% of the contract value. However, such S.D. shall be recovered in the round figure of Rs. 1000/- i.e. the amount of work done when it exceeds 5% of the contract value it shall be refunded of to the nearest multiple of Rs.25000/- such additional S.D. shall be recovered for the works amount to Rs. 5 Lacs or more at the rate of 4% of the additional amount.

(iii) In many cases, the contractors are stopping the work half-way due to number of reason and when the department has to take actions in accordance to clause 3(a) or (b) or (c) of the contract the remaining work has to be carried out by advertising the tender for the remaining work and the whole administrative process right from inviting tenders to finalising the tender etc.

In such cases a fixed amount of Rs.1000/- should be reversal from the original contract towards the cost of advertisement and other administrative charges incurred by the department in finalising the contract for the remaining work. In case a separate advertisement is issued for a single work actual cost of advertisement shall be recovered such recovery shall be in addition to the recovery to be made under clause-3 or such other relevant clauses.

GC-149

In continuation of clause No.46(i) if any contractor found employing person or persons under the age of 12 years, during course of the construction at any stage, legal actions shall be taken against him as stipulated in Child Labour (Prohibition & Regulation) Act 1986 and also, a penalty of Rs.20,000/-(Rupees Twenty thousand) shall be imposed which shall be deposited with District Collector in Child Labour Rehabilitation cum Welfare Fund.

GC-150 EVALUATION OF SUBMITTED QUALIFICATION OFFER BASED ON SUBMISSIONSMADE BY THE TENDERER

The tenderer shall be fully responsible for correctness of submissions made whether same has been examined and approved by employer or not. In the event of misrepresentation or suppression of the matter/ fact by the tenderer, the action will be taken on the wrong tenderer as per procedure/ provision outlined in the tender document. Price bid will be opened of those tenderers, whose post qualification bids meet requirements of the qualifying criteria as laid down in tender.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION.

SIGNATURE OF THE CONTRACTOR.

Responsibility of contractor under Construction And Demolition Waste (C & D Waste) Rules 2016

Contractor shall remove All Construction and Demolition Waste (C & D Waste) and clean the area every day, or depending upon (1) The type & schedule of the work, (2) The quantity and type of waste generated, appropriate storage and collection facility shall be developed at site. Reasonable time frame shall be worked out in consultation with engineer in charge of the project, for storage & usage of C & D Waste.

If it's found that contractor is irregular and showing negligence to management of C & D Waste, than If deem fit, Engineer in charge would arrange to dispose the said C & D Waste through an Authorized C & D Waste Contractor/agency of Surat Municipal Corporation and All the expenditure made towards disposal of this C & D Waste shall be recovered from the contractor as per the prevailing charges.

Contractor shall have to bear the expenses towards management of C & D Waste as per the prevailing norms, no extra payment shall be entertained for the same.

Contractor shall keep record of the generation and disposal of Construction and Demolition waste (C & D Waste) and proof of its disposal as per the provision of C & D Waste rules and he has to submit along with running bills

If contractor fails to upkeep and maintain records of C & D Waste generation- Disposal records etc. than it shall be calculated as per the provision of the Standing Committee Resolution no. 1621/2016, Dt:01/10/2016 and charges shall be recovered from due of contractor with Surat Municipal Corporation.

Contractor shall also ensure use of recycled products made from SMC authorized C & D Waste agency as far as possible to promote the C & D Waste management project.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION.

SIGNATURE OF THE CONTRACTOR.

SCHEDULE – A

ADDITIONAL INSTRUCTION FOR CEMENT AND STEEL :

Surat Municipal Corporation shall not issued cement and reinforcement steel to be used for this work.The cement and reinforcement steel required for the above said work shall be procured by contractor at its own cost.

The brands for cement shall be be **Ambuja, Ultratech, Sanghi, Hathi, Sidhdhi, JK Laxmi,**company confirming to IS-12269/87 latest amendment ISO-9000 of 53 grade OPC only.

Approved make of TMT reinforcement steel:-TATA, SAIL, Rastriya Ispat Nigam Ltd. (RINL), Electrotherm (ET), Ramswaroop, National, JSW as per confirming to IS 1786/2008 with latest amendments TMT Fe-415/Fe-500. TMT Steel shall be purchased by only manufacturing company/Authorised dealer/ Distributor/ Stockist only shall be allowed to use 6 mm plain steel shall be as per IS 2062/99 with latest emendment of any brand/make.

Any of the above mentioned brands of Cement and Reinforcement steel shall only be used by the contractor at the time of execution.

The brands for structural steel to be used shall be of make TATA, Jindal, SAIL or Asian.

All structural steel shall conform to I.S. 226-1975. The steel shall be free from the defects mentioned in I.S. 226- 1975 and shall have a smooth finish. The material shall be free from loose mill scale, rust pits or other defects affecting the strength and durability. Rivet bars shall conform to I.S. 1148-1992.

When the structural steel is supplied by the contractor test certificates of the manufacturers shall be obtained according to **I.S. 226-1975 and other relevant Indiand Standards**.

Coloured galvanized Roofing sheet shall be of TATA or Jindal make trafford sheet

WASTAGE OF CEMENT AND REINFORCEMENT STEEL

As the contractor is to bring the cement and steel, the question of considering the wastage on the basic of issue rate does not arise i.e.no separate payment shall be made for any kind of wastage in the Materials. The payment for reinforcement bar will be made on theoritical weight basis. The weight shall be computed on the basis of the length of the steel used in the work multiplied by the standard unit weight of MS/HYSD/TMT bar as mentioned in IS code No.1786.

The steel consumption eighter less than 7.5% of the standard consumption shall be penalised either at the double existing corporation issue rate or the prevailing market rate, whichever is more.

Similarly, for cement also, the less consumption beyond 5% shall be penalised at the double existing corporation issue rate or the prevailing market rate, whichever is more.

Basic Rate for the month of October-2020 (1) High strenth TMT steel Rs.66,000/- Per MT (2) High strenth TMT CRS steel Rs.69,000/- Per MT (3) Cement is Rs.6,700/- Per MT

TESTING OF CEMENT AND STEEL

It should be specifically noted that the cement and steel brought by the contractor at site of work shall be used only after the same is tested at the approved laboratory as per the direction of the Engineer-in-charge. Such approved laboratory may be located at Surat, Baroda, Ahmedabad or Mumbai.

All the charge for the transport and testing of the samples shall have to be borne by the contractor. The frequency of testing such material shall be in accordance to the relevant Indian Standards as directed by Engineer-in-charge.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION.

Signature of the Contractor:

MEMORANDUM

I/We _____ the undersigned do hereby Tender for carrying out the work described in the schedule subject to the condition annexed in schedule attached herewith in Tender documents.

1.	General Description of work	:	**ANNUAL RATE FOR MAINTAINANCE AND REPAIRING WORK OF VARIOUS AANGANWADI, WARD OFFICE, READING ROOM AND OTHER MUNICIPAL BUILDING IN EAST (VARACHHA)-A ZONE , SURAT.**
2.	Estimated Cost	:	**Rs. 36,92,426.11/-**
3.	Earnest Money Deposity	:	**Rs.37,000.00/-**
4.	Additional Security Deposit (i) Initial security deposit	:	Rs. 2% of Tender Amount
	(ii) To be deducted from current bills	:	Rs. 2% of each Running Bill Amount
	Total Deposit	:	Rs. 4% of Tender Amount. (Refer GC-10)
5.	Time allowed for the completion of work from date fixed in written order to commence	:	**12 (Twelve) months (Including monsoon)**
6.	Compensation for delayed work under Clause 2	:	Zero Point two percent (0.2%) of the contract price per day maximum upto ten percent (10%) of the contract price.
7.	The progress of work should confirm to the following schedule		
	1/4 of the work in 1/2 of the work in 3/4 of the work in	:	1/4 of the time. 1/2 of the time. 3/4 of the time.
8.	**Percentage to be retained from running Account Bills**	**:**	**5% (Five Percent)** (refer GC-10)
9.	Defect Liability Period	:	12 (Twelve) Months From the actual date of Completion of work.
10.	Water Charges	:	CONDITION FOR THE WATER SUPPLY & ELECTRIC SUPPLY on next page.
11.	Construction Cess will be deducted from respective R.A. Bill and Final bill in accordance with the prevailing norms of Govt. of Gujarat.	:	1% of Work Done Amount in R.A. Bils.
12	**Goods and Service Tax (GST)**	:	**As per GC 94**

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

Signature of the Contractor:

SURAT MUNICIPAL CORPORATION

EAST ZONE (VARACHHA)-A

CONDITION FOR THE WATER SUPPLY & ELECTRIC SUPPLY

FOR WATER CHARGE (As per City Engineer Note No.386, dtd.30/7/2012)

In case of Municipal Network or distribution center availe or not at near by area

OPTION-1:

Contractor has to make his own arrangement for construction work whether from private boring or tankers. Contractor has to submit test report of water weather it is of good quality for construction work or not and contractor has to inform about it within 30 days of starting the work.

OPTION-2:

If contractor wants to use Municipal Water he has to follow procedure within below:

1.Contractor has to apply for water connection by Municipal Licenced plumber in prescribed form.

2.Contractor has follow all procedure with his own expenses.

3.According to rule Municipal Corporation issue bill to contractor for consumption of water and contractor has to paid it within stipulated time and contractor has submit one copy of bill and payment receipt to concern department. If contractor fail to pay the bill the amount of bill/paid receipt can be recover from contractor's bill.

4.If Municipal Corporation network is not available then Contractor can make arrangement of water tanker from nearby distribution center after depositing required amount.

5.After completion of work contractor has to cancelled the water connection and inform the concern department.

6.If network and distribution center/network are both not available in that case contractor has to make his own arrangement for good quality construction water and has to follow the option-1.

7.If contractor is taking water connection or even if the contractor is not taking connection and makes other arrangement to use Municipal Water by tanker or tapping water from near private connection, water charges shall be recovered at the rate of 3% (Three Percent) of the civil items in which water consumed.

(2) The contractor shall make his own arrangement at his cost for electric supply required for operating various plants and machineries required for the works and for general lighting purpose for site, office, labour
colony etc.
The energy bills shall also be paid by the contractor.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

IMPORTANT INSTRUCTION-A TO THE CONTRACTOR

(1) This tender document containing **Page No.01 to 288.** duly signed bythe tenderer, should be furnished to Corporation treasury along with the amount of earnest money deposit as mentioned in tender notice. If any of the drawings or papers removed from the tender, the tender shall be rejected and E.M.D. shall be forefeited.

(2) The tenderer who wants to propose something in written, he should write it on his letter pad or another paper. Anything written on tender papers shall not be considered by Corporation and Contractor shall not be intend to do so.

(3) Following Certificate shall be enclosed with tender.

(a) Solvency Certificate amounting of 20% of tender amount.

(b) **Registration Certificate of required class given by Governement or Semi-Government firm.**

(c) List of work done by Contractor with its volume.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

IMPORTANT INSTRUCTION-B TO TENDERER

[1]

Affix Latest Passpost Size Photo of tenderer

Specimen Signature of the Bidder.

[2] AFFIX LATEST PASSPORT SIZE PHOTOGRAPH OF ALL PARTNERS IN CASE OF PARTNERSHIP AGENCY.

1	2	3	4

Specimen Signature of all partners incase of partnership agency.

1. ---------- Submission of Registered Agreement
2. ---------- is compulsory in case of partnership
3. ---------- agency.
4. ----------

[3] Submission of sale tax certificate, with proof of residence is compulsory for tenderer.

[4] In case of Government royalty applicable to tenderer, it is compulsory to submit a receipt of royalty payment with tender.

[5] The Photograph and specimen signature of bidder will be cross checked, whenever he receives payment in account section of SMC.

[6] The specimen signature of contractor will be cross checked by Account Department of SMC, in case of representative of Contractor alongwith letter of authority of a person who signed an agreement, receives payment.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR

SPECIAL NOTE

(1) The work shall be carried out strictly accoriding the specifications given in Bombay Public Works Department Hand Book Vol.1 and II (The latest edition) whenever applicable as directed by Executive Engineer.

(2) The work shall have to be started by the contractor at as many places as ordered by the Executive Engineer.

(3) If during excavation or carrying out of any item of the work, any electric pole, electric cable, telephone cables, telegraph cable, gas line, drain connection pipeline,water service pipeline, sewer main, water mains,etc. is/are damaged by the contractor shall be liable to pay the full expenditure required and to repair the same or charges for the same (as the case may be) decided by the electric company, Gas Company, Government Authority or the Surat Municipal Corporationwhich ever may be.

(4) The work shall be carried out in workman like manner, and best skilled worker should be employed. If any defect in the work is found out the contractor shall have to rectify within the time fixed by Executive Engineer. If he fails to rectify the defect Executive Engineer after giving due notice shall rectify the defect at the risk and cost of the contractor.

(5) All the work shall be done strictly according to the instruction of Executive Engineer.

(6) No compensation shall be paid if the work is stoped due to defective work or as per the instruction from Engineer-in-charge due to any reasons.

(7) The rates given in the schedule shall hold good for all works done under this contract without reference to quantities or location of work.

(8) The contractors are particularly directed to observe from the specification what is to be included in the items and rates for the serveral portion of the work frame out all their rates for items accordingly.

(9) The date of starting of the work is considered to be the date specificied in the final work order.

(10) If any Clause of Arbitration is there in tender document is deleted here with.

(11) The project under this tender may be executed under strict supervision of P.M.C. if deployed by S.M.C. Contractor shall carryout the instructions of P.M.C.

(12) Third Party Inspection shall be deployed by S.M.C.

(13) The contractor shall submit the advance Pour Card in prescribed form for the type of work which he planned to carryout with the skilled / unskilled labour deployed by him for the work.

(14) The contractor shall establish concrete cube testing machine and other equipments required for quality checking of materials as per instructions of PMC/ Engineer-In-charge.

(15) The contractor shall use the materials of the specified brands only. Request for equivalent brands will be considered only if specified brand is not available in market.

(16) **ACCIDENT LIABILITIES**:

The Contractor shall be responsible for all liabilities under workman compensation act, as under:

(a) On occurrence of accident, resulting in death of workman employed by the Contractor which is so serious as is likely to result in death of such workman who meet with accident, the Contractor shall within 24 hours of accident, will intimate in writing to Engineer-in-charge of such incidence. The Contractor shall indemnify client, against all looses/damages sustained by the client resulting directly or indirectly from his failure to give such intimation to client including penalties/fins if

any, payable by client as a consequence of client's failure to give notice under workman's compensation act or otherwise to conform the provision of this act in regard to such accidents.

(b) In case when such compensations as above becomes payable under workman's compensation act, whether by contractor or by client as principal employer, it shall be law full for the Engineer-in-charge to retain out of money due and payable to the Contractor, such sum or sums of money as may in the opinion of the Engineer-in-charge be sufficient to meet such a liability, the opinion of the Engineer-in-charge shall be final in regard to all matters arising under this clause.

(17) **INSURANCE**:

The Contractor shall take "All Contract Risk Insurance Policy" for the estimated cost of this work "Work's Man Compensation Policy" for all workers and labours of contractor and client working at site and "Third Party Insurance Policy" to fully cover all third party type risk. The insurance policy so taken by the

Contractor for such purposes shall be in the joint name of the Contractor and the client and the policy shall be deposited with the client.

Contractors shall have to use maximum machinery for the work as per the direction of Engineer-In-Charge. If possible, space for stacking the surplus excavated earth will be provided by SMC. Otherwise the contractor shall arrange for the same at no extra cost to SMC.

(18) Contractor has to fixed display board describing the necessary information / particulars of work at specific location and shall submit the evidence to engineer-in-charge along with photographs.otherwise , 0.25% to 1.0% of tender amount as per description of engineer-in-charge shall be kept hold,while making payment to the contractor until the evidences as stated above is submitted. No extra payment shall be payable for fixing display boards.

(19) The Contractor shall paint building numbers & Flat numbers as per guideline of SMC without any extra payment.

(20) **PLEASE READ CAREFULLY**

Following details pertaining to work progress is mandatory.

(A)Bar chart: Contractor shall submit barchart showing schedule of execution of various activities within stipulated time limit

(B)Material Management : Contractor shall provide following details

- Source of materials i.e. yellow earth, Coarse aggregate, Grit, fine aggregates, bricks, cement, steel etc.
- Supply schedule : According to bar chart, the flow diagram of materials.

(1) Man power management :

The contractor shall submit details of manpower of various categories (skilled & unskilled labours) to be deployed for the work as under.

- Minimum no. of skilled and unskilled labors to be deployed on the work
- List of supervisors & engineers for supervision & quality control of the work.

(21) All the applicant contractors are required to have their own employers code number under EPF Act, 1952 and are required to comply the applicable provisions of said statute regularly and totaly.

(22) Further the contractors for services are required to produce the certified copies of paid challans in respect of employees/workers employed by said contractor in respect of work allotted by Surat

Municipal Corporation, along with copies of Pay Roll and Muster Roll. If the same are not produced, the bills will not be released.

(23) **Neutral Technology option:**

If Contractor wish to submit a Bid with Neutral Technology construction then contractor has to submit detail methodology and Subsidised Material used in constrcution with detail specification of each and every material. Contractor have also to submit detail total estimate with rate justification of each and evey non-conventional item in a seperate offer documents.

The contractor has to provide following certificates for any non-conventional materials / technology from CBRI (Central Buliding Rsearch Institute) or IIT (Indian Institute of Technology) or International Affiliate Institution

1. **Certificate of minimum life of structure of 50 years**
2. **Certificate of testing of materials which includes**
    - **Fire resistance capacity of the structure**
    - **Thermal and energy efficienct certificate**
    - **Stability certificate of resistance to the natural Disasters like Flood, Earth quake, Cyclone.**

The material / Technology should be Eco-friendly.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR

SPECIAL CONDITIONS OF CONTRACT

1.1 GENERAL

Clause given under these special conditions shall be read in conjunction with conditions of the contract and in case of any conflict the provisions of special conditions will override the provisions of general conditions of contract.

The tenderer shall acquaint himself with the access to site, availability of local facilities such as transport, materials, labour and shall price his tender accordingly.

1.2 ROAD INFRASTRUCTURE

The bidder shall acqaint himself with the access to site. The successful tenderer shall have make road and other infrastructure facility for the easy access to the site at his own cost.

1.3 SAFETY

All the safety and entry rules shall be strictly followed. The contractor is fully responsible for the safety of his staff and workmen and must equip them with safety appliances and tools.

1.4 TIME SCHEDULE

The work shall be executed strictly as per the time schedule/bar chart submitted alongwith price bid offer. The entire job/project has to be completed within a **period of 18 (Eighteen) (including Monsson)**months from the Date of placement of order.The time limit includes the time limit required for testing, rectification, if any, retesting and completion in all respect to the entire satisfaction of the Engineer-in-charge. The timely completion of this project is very very important for the citizen of Surat City, and hence weightage will be given on strict compliance of work as per the sanctioning schedule of work/bar chart.

1.5 Penalty for delay :

If the contractor fails to complete the whole project by the stipulated completion date, he shall also pay liquidated damages at one fifth of one percent i.e. 0.2% of tender amount per day of delay in completion and handing over the work to the Surat Municipal Corporation. The amount of liquidated damages shall however be subjected to maximum of ten (10) percent of the tender amount. Delays in excess of one hundred days will be a cause for termination of contract and for feiture of all per performance security.

1.6 Scope of Supply of material :

(a) Supply of material :

All materials, consumables, testing applicances, tools, tackles and spares etc. necessary for the successful execution completion, and maintenance till handing over to S.M.C. shall be procured and provided by the tenderer. No materials will be supplied by the owner. Except mention in Schedule-A.

(b) Water :

Contractor shall have to make his own arrangement for water required for construction, testing and for his labour/employees too.

(c) Power :

Power required for the constructions, erection and other allied job shall be arranged by the contractor at his own cost.

The Contractor shall have to make his own arrangement for getting electric power.The S.M.C. will issue only recommendation letter to the contractor if required. No compensation shall be paid for delay in getting power supply.

(d) Cement :

Cement required for the construction shall be arranged by the contractor at his own cost.

(e) Steel :

All types of TMT reinforcement steel shall be arranged by the contractor at his own cost.

1.7 **Construction of Stores and site office :**

Suitable areas will be allocated by the S.M.C. to the Contractor to build storages for storing his equipments, plant, materials etc. and also to build his site offices. He will be solely responsible for watching and guarding of his stores, offices etc.

The contractor shall cover all his equipments and materials at site with requisite insurance against theft, larceny, decoity, fire tempest, flood earthequake etc.

On completion of the works undertaken by the contractor, he shall remove all temporary works erected by him and have the site cleaned as directed by the Engineer. The S.M.C. reserves the right to ask the contractor any time during the tenure of the contract to vacate the land by giving 7 day's notice on security reasons or on national interest or otherwise.

1.8 **Labour and supervisory Camps:**

No land will be provided by the S.M.C. to the Contractor for constructing his labour and supervisory camps and other service facility. Contractor shall make his own arrangements outside the site boundary.

1.9 **Construction Equipments :**

The contractor shall make his own arrangement to procure all constructional plant and equipments for his own. He shall also state the type and number of different equipments with their capacities in good working conditions which he will use on the site to ensure completion of the work in the specified time.

All materials, construction plants and equipments once brought by the contractor to site are not to be removed from there without the written authority of the Engineer-in-charge. Also, the Contractor shall have adequate stock of spare parts for the equipment on the site and work shall not be delayed on this account. Similarly all temporary works built by the Contractor for the main construction undertaken by him, are not be dismantled and removed without the written authority of the the Engineer-in- charge.

1.10 **Co-operation with other contractors :**

The contractor shall execute his work in phased manner as directed by the Engineer from time to time so as not to obstruct or retard the work being executed simultaneously by other agencies.

1.11 **Safety :**

The contractor shall be responsible for provision of safety arrangement and protective clothing for all operators on the site whether or not engaged in actual operation of supervision. The contractor shall also be responsible for safety arrangmenets of all equipment used for construction and shall employ trained workmen conversent with safety regulation.The contractor shall use only tested equipment and tools and shall periodically renews tests to the satisfaction of the Engineer. All test certificate shall be made available to the Engineer at the site of the work. If at any time, in the opinion of the Engineer, this provision is not completion with, the Contractor shall forthewith replace such equipment and tools.

The contractor shall display notices and arrange proper fencing at such places where hazardous work is being carried out. The contractor shall provided at his own expense on the works to the satisfaction of the Engineer at such places, proper and sufficient fire tighting, first and applicances etc. which shall at all times be available for use.

1.12 The contractor shall have to take photographs during various stages of construction activity for each of the work at no extra cost. The photograph shall be of size 4" x 6" on mat paper. The number of photographs shall be not be less than 200.

1.13 No mobilisation advance will be paid.

1.14 It is further to clarify that, the retention money deducted from each running bill will be released at the time of final bill. The security deposit remitted by the contractor will be released after the completion of defect liability period.

1.15 No compensation of any item shall be paid in case any of the item is omited i.e. not executed at all.

1.16 It is clarify once again that, the serviceable materials obtained during dismentaling/clearing of the site or the extra excavated stuff shall have to be carted by the contractor at the places shown by the Engineer-in-charge any where within city limit.

1.17 Out of the amount payable/creditable to contractor's account, the Central Government/State Government tax/taxes shall be deducted at source in accordance with the relevant laws/rules from time to time prevailling.

1.18 Surat Municipal Corporation shall not provide `C' form for tax purpose.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR

SPECIFICATIONS OF MATERIALS

M-1 WATER

1.1 Water shall not be salty or brackish and shall be clean, reasonably clear and free from objectionable quantities of silt and traces of oil and injurious alkalies, salts, organic matter and other deleterious material which will either weaken the mortar or concrete or cause effloresence or attack the steel in R.C.C. Container for transport, storage and handling of water shall be clean. Water shall conform to the standards specified in I.S. 456-2000.

1.2 If required by the Engineer-in-charge it shall be tested by comparision with distilled water. Comparision shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in I.S. 269-1989. Any indication of unsoundness, change in time of setting by 30 minutes or more or decrease of more than 10 percent in strength of mortar prepared with water sample when compared with the results obtained with mortar prepared with distilled water shall be sufficeint cause for rejecttion of water under test.

1.3 Water for curing mortar, concrete or masonary should not be too acidic or too alkaline. It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of mortar or concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surfaces.

1.4 Hard and bitter water shall not be used for curing.

1.5 Portable water shall generally be found suitable for curing mortar or concrete.

M-2 LIME

2.1 Lime shall be hydraulic lime as per I.S. 712-1984. Necessary tests shall be carried out as per I.S. 6932 (Parts I to X) 1995.

2.2 The following field tests for limes are to carried out ---

a] A very rough idea can be formed about the type of lime by its visual examination i.e. fat lime bears pure white colour, lime in form of porous lumps of dirty white colour, indicates quick lime, and solid lumps the unbrunt lime stone.

b] Acid tests for determining the carbonate content in lime. Excessive amount of impurities and rough determination of class of lime.

2.3 Storage shall comply with I.S. 712-1984. The slaked lime, if stored, shall be kept in a weather proof and damp proof shed with impervious floor and sides to protect it against rain, moisture, weather and extraneous Materials mixing with it. All lime that has been damaged in any way shall be rejected and all rejected Materials shall be removed from site of work.

2.4 Field testing shall be done according to I.S. 162-1989 to show the acceptaibility of Materials.

M-3 CEMENT

3.1 Cement shall be ordinary portland slag cement as per I.S. 269-1989 or Portland slag cement as per I.S. 455-1976 and revised latest I.S.

M-4 WHITE CEMENT

4.1 The white cement shall conform to I.S. 8042-1989.

M-5 COLOURED CEMENT

5.1 Coloured cement shall be with white or grey portland cement as specified in the item of the work.

5.2 The pigments used for coloured cement shall be of approved quality and shall not exceed 10% of cement used in the mix. The mixture of pigment and cement shall be properly ground to have a uniform colour and shade. The pigments shall have such properties as to provide for durability under exposure to sun-light and weather.

5.3 The pigment shall have the properly such that it is neigher affected by the cement not detrimental to it.

M-6 SAND :

6.1 Sand shall be natural sand, clean, well graded, strong, durable and gritty particles free from injurious amounts of dust, clay, kankar nodules, soft or flaky particles, shale, alkaly, salts, organic mater, loam, mica or other deleterious substances and shall be got approved from the Engineer-in-charge. The sand shall not contain more than 8% of silt as determined by field tests. If necessary the sand shall be washed to make it clean.

6.2 **Coarse Sand** : The fineness modulus of coarse sand shall not be less than 2.5 and shall not exceed 3.0. The sieve analysis of coarse shall be as under ---

I.S. Sieve Designation	% by weight passing sieve	I.S. Sieve Designation	% by weight passing sieve
4.55 mm	100	600 Micron	30-100
2.30 mm	900-100	300 Micron	5-70
1.18 mm	70-100	150 Micron	0-60

6.3 **Fine Sand** : The finess modulus shall not exceed 1.0. The sieve analysis of fine sand shall be as under ---

I.S. Sieve Designation	% by weight passing sieve	I.S. Sieve Designation	% by weight passing sieve
4.55 mm	100	600 Micron	40-85
2.30 mm	100	300 Micron	5-50
1.18 mm	75-100	150 Micron	0-10

M-7 STONE DUST

7.1 This shall be obtained from crushing hard black tray or equivalent, it shall not contain more than 8% of silt as determined by field test with measuring cylinder. The method of determining silt contents by field test is given as under.

7.2 A sample of stone dust to be tested shall be placed without drying in 200 mm measuring cylinder. The quantity of the sample shall be such that it files the cylinder upto 100 mm mark. The clean water shall be added upto 150 mm mark. The mixture shall be stirred vigorously and the content allowen to settle for 3 hours.

7.4 The height of silt visible as settled layer above the stone dust shall be expressed as percentage of the height of the stone dust below. The stone dust containing more than 8% silt shall be washed so as to bring the silt content within the allowable limit.

7.5 The fineness modulus of stone dust shall not be less than 1.80.

M-8 STONE GRIT

8.1 Grit shall consist of crushed or broken stone and be hard, strong, dense, durable, clean, of proper gradation and free from skin or coating likely to prevent proper adhesion of mortar. Grit shall generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generally comply with the provisions of I.S. 383-1990. Unless a special stone of a particularly quarry is metnioned, grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-charge. The grit shall have no deleterious reaction with cement.

8.2 The grit shall conform to the following gradation as per sieve analysis :

I.S. Sieve Designation	% by weight passing sieve	I.S. Sieve Designation	% by weight passing sieve
12.50 mm	100%	4.75 mm	2.20%
10.00 mm	80-100%	2.30 mm	0.25%

8.3 The crushing strength of grit will be such as to allow the concrete in which it is used to build-up the specified strenght of concerte.

8.4 The necessary tests for grit shall be carried out as per the requirements of I.S. 2338 (Parts I to VIII) 1988, as per instruction of the Engineer-in-charge. The necessity of test will be decided by the Engineering-in-charge.

M-9 CINDER

9.1 Cinder is well brunt furnace residue which has been fused or ssintered into lumps of varying sizes.

9.2 Cinder aggregates shall be well burnt furnace residue obtained from furnace using coal fuel only. It shall be sound clead and free from clay, dirt, ash or other deleterious matter.

9.3 The average grading for cindar aggregates shall be as mentioned below :

20 mm	100
10 mm	86
5.75 mm	70
2.30 mm	52

M-10 LIME MORTAR

10.1 **LIME** : Shall conform to specification M-2. WATER : Water shall conform to specification M-1. SAND : Sand shall conform to specification M-6.

10.2 **Proportion of Mix**: Mortar shall consist of such proportions of slaked lime and sand as may be specified in the item. The slaked lime and shall shall be measured by volume.

10.3 **Preparation of Mortar**: Lime mortar shall be prepared by wet process as per I.S. 1625-1971. Power driven mill shall be used for preparation of lime mortar. The slaked lime shall be placed in the mill in an even layer and ground for 180 revolutions with sufficient water. Water shall be added as required during grinding (care being taken not to add more water) that will bring the mixed material to a consistency of stiff paste. Thoroughly wetted sand shall then be added evenly and the mixture ground for another 180 revolutions.

10.4 **Storage** : Mortar shall always be kept damp, protected from sun and rain till used up, covering it by trapaulin or open sheds.

10.5 **Use**:All mortar shall be used as soon as possible after grinding. It should be used on the day on which it is prepared. But in no case mortar made earlier than 30 hours shall be permitted for use.

M-11 CEMENT MORTAR

11.1 Water shall conform to specification M-1. Cement shall conform to specification M-3. Sand shall conform to M-5.

11.2 **Proportion of Mix**

11.2.1 Cement and sand shall be mixed to specified proportions, sand being measured by measuring boxes. The proportion of cement shall be by volume on the basis of 50 Kg./Bag of cement being equal to 0.0342 cu.m. The mortar may be hand mixed or machine mixed as directed.

11.3 **Preparation of Mortar**

11.3.1 In hand mixed mortar, cement and sand in the specified proportions shall be thoroughly mixed dry on a clean impervious platform by turning over atleast 3 times or more till a homogeneous mixture of uniform colour is obtained. Mixing platform shall be so arranged that no deleterious extraneous material shall get mixed with mortar or mortar shall flow out. While mixing, the water shall be gradually added and thoroughly mixed to form a stiff plastic mass of uniform colour so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be adopted as directed.

11.4 The mortar so prepared shall be used within 30 minutes of adding water. Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-12 STONE COARSE AGGREGATE FOR NOMINAL MIX CONCRETE

12.1 Coarse agrregate shall be of machine crushed stone of black trap or equivalent and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.

12.2 The aggregate shall generally be cubical in shape. Unless special stones of particular quarries are mentioned aggregates shall be machine crushed from the best black trap or equivalent hard stone as approved. Aggregrate shall have no deleterious reaction with cement. The size of the coarse aggregate for plain cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below. However, in case of reinforced cement concrete the maximum limit may be restricted to 6 mm. less than the minimum lateral clear distance between bars or 6mm. less than the cover whichever is smaller.

TABLE

I.S. Sieve Designation	Percentage Passing for single sized aggregates of nominal size			I.S. Sieve Designation	Percentage Passing for single sized aggregates of nominal size		
	40 mm	20 mm	16 mm		40 mm	20 mm	16 mm
80 mm	-	-	-	12.5 mm	-	-	-
63 mm	100	-	-	10 mm	0.5	0.20	0.30
40 mm	80-100	100	-	4.75 mm	-	0.50	0.50
20 mm	0-20	85-100	100	2.75 mm	-	-	-
10 mm	-	-	85-100				

NOTE:- This percentage may be varied somewhat by the Engineer-in-charge when considered necessary for obtaining better density and strength of concrete.

12.3 The grading test shall be taken in the beginning and at the change of source of Materials. The necessary tests indicated in I.S. 383-1990 and I.S. 456-2000 shall have to be carried out to ensure the acceptability. The aggregates shall be stored separately and handled in such a manner as to prevent the intermixng of different aggregates. If the aggregates are covered with dust, they shall be washed with water to make, them clean.

M-13 BLACK TRAP OR EQUIVALENT HARD STONE COARSE

13.1 Aggregate for Design Mix Concrete : Coarse aggregate shall be of machine crushed stone of black trap or equivalent hard stone and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.

13.2 The aggregates shall generally be cubical in shape, unless special stones of particular quarries are mentioned, aggregates shall be machine crushed from the best, black trap or equivalent hard stones as approved. Aggregate shall have no deleterious reaction with cement.

13.3 The necessary tests indicated in I.S. 383-1990 and I.S. 456-2000 shall have to be carried out to ensure the acceptability of the material.

13.4 If aggregate is covered with dust it shall be washed with water to make it clean.

M-14 BRICK BATS AGGREGATE

14.1 Brick bat aggregate shall be broken from well burnt or slightly over burnt and dense bricks. It shall be homogeneous in texture, roughly cubical in shape, clean and free from dirt of any other foreign material. The brick bats shall be of 40 mm to 50 mm size unless otherwise specified in the item. The underburnt or overburnt brick bats shall not be allowed.

14.2 The brick bats shall be measured by volume by suitable boxes as directed.

M-15 BRICKS

15.1 The bricks shall be hand or machine moulded and made from suitable soils and kiln burnt. They shall be firee from cracks and flaws not nodules of free lime. They shall have smooth rectangular faces with sharp corners and shall be of uniform colour. The bricks shall be moulded with a frog of 100mm x 40 mm and 10mm to 20mm deep on one of its flat sides. The bricks shall not break when dropped on the ground from a height of 600 mm.

15.2 The size of modular bricks shall be 190mm x 90mm x 90mm.

15.3 The size of conventional bricks shall be as under ---

225 x 110 x 75mm.

15.4 Only bricks of one standard size shall be used on one work. The following tolerances shall be permitted in the conventional size adopted in a particular work.

Length : 3.00 mm

Width : 1.50 mm

Height : 1.50 mm

15.5 The crushing strength of the bricks shall not be less then 35 Kg./Sq.Cm. The average water absorption shall not be more than 20% by weight. Necessary tests for crushing strength and water absorption etc. shall be carried out as per I.S. 3495 (Part I to IV)-1992.

M-15A FLYASH BUILDING BRICKS

The Flyash building bricks shall conform to Grade-5 of IS-13757. The frog of the 80 to 100 mm x 40 mm x 10 to 20 mm size.

The size of modular bricks shall be 190 mm x 90 mm x 90 mm.

The size of conventional brick shall be 230 mm x 110 mm x 70 mm.

Only bricks of one standard size shall used on one work. The following tolerances shall permitted in the conventional size adopted in a particular work:

Length : ± 4 mm

Width : ± 2 mm

Height : ± 2 mm

The physical characteristic of bricks shall be as follows.

The minimum compressive strength of Flyash building bricks shall not be less than 35 Kg/Sq.Cm. and the test shall be conform to IS-3495 (Part-I).

The averages water absorption not more than 20 percentage by weight and the test shall conform to IS-3495(Part-3). Sampling of Flyash building bricks and criteria for conformity shall be as per I.S.:5454.

M-16 STONE

16.1 The stone shall be of the specified variety such as Granite/Trap stone/Quarzite or any other type of good hard stones. The stones shall be obtained only from the approved quarry and shall be hard, sound, durable and free from defects like cavities, cracks, sand holes, flaws, injurious viens, patches of loose or soft Materials etc. and weathered portions and other structural defects or imperfections tending to affect their soundness and strength. The stone with round surface shall not be more than 5% of dry weight. When tested in accordance with I.S. 1134-1985. The minimum crushing of the strength of the stone shall be 200 Kg./Sq.Cm. unless otherwise specified.

16.2 The samples of the stone to be used shall be got approved before the work is started.

16.3 The khanki facing stone shall be dressed by chisel as specified in the item for khanki facing in required shape and size. The face of the stone shall be so dressed that the bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm nor shall it have depressions more than 10 mm from the average wall surface.

M-17 LATERITE STONE

17.1 Laterite stone shall be obtained from the approved quarry. It shall compacted in texture, sound, durable and free from soft patches. It shall have a minimum crushing strength of 100 Kg/Sq.Cm. in its dry condition. It shall not absorb water more 20% of its own weight, when immersed for 25 hours in water. After quarrying, the stone shall be allowed to weather for some time before using in work.

17.2 The stone shall be dressed into rectangular blocks so that all faces are from waviness and unevenness and the edges true and square.

17.3 Those type of stone in which white clay occurs should not be used.

17.4 Special corner stones shall be provided where so directed.

M-18 MILD STEEL BARS/TMT/CRS BARS

18.1 Mild steel bars reinforcement TMT/CRS Bars for R.C.C. work shall conform to I.S. 432 (Part-II)-1982 and shall be of tested quality. It shall also comply with the relevant part of I.S. 456-1978 and revised latest I.S. Code.

18.2 All the reinforcement shall be clean and free form dirt, paint, grease, mill scale or loose or thick rust at the time of placing.

18.3 For the purpose of payment the bar shall be measured correct upto 10 mm length and weight payable worked out as per the rate specified below :

(i)	6 mm	0.22 Kg/Rmt.
(ii)	8 mm	0.39 Kg/Rmt.
(iii)	10 mm	0.62 Kg/Rmt.
(iv)	12 mm	0.89 Kg/Rmt.
(v)	14 mm	1.21 Kg/Rmt.
(vi)	16 mm	1.58 Kg/Rmt.
(vii)	18 mm	2.00 Kg/Rmt.
(viii)	20 mm	2.47 Kg/Rmt.
(ix)	22 mm	2.98 Kg/Rmt.
(x)	25 mm	3.85 Kg/Rmt.
(xi)	28 mm	4.38 Kg/Rmt.
(xii)	30mm	5.56 Kg/Rmt.
(xiii)	32 mm	6.32 Kg/Rmt.
(xiv)	40 mm	9.86 Kg/Rmt

M-19 HIGH YIELD STRENGTH STEEL DEFORMED BARS

19.1 High yield strength steel deformed bars shall be either cold twisted or hot rolled and shall conform to I.S. 1739-1978 and I.S. 1139-1966 respectively.

19.2 Other provision and requirements shall conform to specification No. M-18 for Mild Steel Bars.

M-20 HIGH TENSILE STEEL WIRES

20.1 The high tensile wires for use in prestressed concrete shall conform to I.S. 2090-1983.

20.2 The tensile strength of the high tensile steel bars shall be as specified in the item. In absence of the given strength and minimum strength shall be taken as per para 6-1 of the I.S. 1785-1962. Testing shall be done as per I.S. requirements.

20.3 The high tensile steel shall be free from loose mill scale, rust, oil, grease or any other harmful matter. Cleaning of steel bars may be carried out by immersion in solvent solution, wire brushing or passing through a pressure box containing carborundum.

20.4 The high tensile wire shall be obtained from manufactures in coils having diameter not less than 350 times the diameter of wire itself so that wire springs back straight on being uncoiled.

M-21 MILD STEEL BINDING WIRE

21.1 The mild steel wire shall be of 1.63mm or 1.22mm (16 or 18 guage) diameter and shall conform to I.S. 280-1978.

21.2 The use of black wire will be permitted for binding reinforcement bars. It shall be free from rust, oil, paint, grease, loose mill scale or any other undesirable coating which may prevent adhesion of cement mortar.

M-22 STRUCTURAL STEEL

22.1 All structural steel shall conform to I.S. 226-1975.The steel shall be free from the defects mentioned in I.S. 226- 1975 and shall hae a smooth finish. The material shall be free from loose mill scale, rust pits or other defects affecting the strength and durability. Rivet bars shall conform to I.S. 1148-1992.

22.2 When the steel is supplied by the contractor test certificates of the manufacturers shall be obtained

according to I.S. 226-1975 and other relevant Indiand Standards.

M-23 GALVANISED IRON SHEETS

23.1 The galvanised iron sheets shall be plain or corrugated sheets of gauge as specified in item. The G.I. Sheets shall conform to I.S. 277-1992. The sheets shall be undamaged in carriage and handling either by rubbing off of zinc coating or otherwise. They shall have clean and bright surface and shall be free from dents, bends, holes, rust or white powdery deposit.

23.2 The length and width of G.I. sheets shall be as directed as per site condition.

M-23-A G.I.VALLEYS GUTTER, RIDGES

23-A.1 The G.I. ridges and hips shall be of plain galvanised sheets class-3 of the thickness as specified in item. These shall be 600 mm width and properly bent up to shape without damage to the sheets in process of bending.

23-A.2 Valleys gutters and flashings shall be also of galvanised sheet of thickness as specified in item. Valleys shall be 900 mm. wide over all and flashing shall be 380 mm wide over all. They shall be bent to the required shape without damage to the sheet in the process of bending.

M-24 ASBESTOSCEMENT SHEETS

24.1 Asbests cement sheets plain, corrugated or semi-corrugated shall conform to I.S. 459-1970. The thickness of the sheets shall be as specified in the item. The sheet shall be free from all defects such as cracks, holes, deformities, chipped edges or otherwise damaged.

24.2 **Ridges and Hips**

24.2.1 Ridges and hips shall be of same thickness as that of A. C. sheets. The types of ridges shall be suitable for the type of sheets and locations.

24.2.2 Other accessories to be used in roof such as flashing pieces, eaves filler pieces, valley gutters, north light and ventilator curves, barge boards etc. shall be of standard manufacture and shall be suitable for the type of sheets and location.

M-25 MANGALORE PATTERN ROOF TILES

25.1 The Mangalore pattern tiles shall conform to I.S. 654-1992 for Class `AA' or `A' type as specified in item. Samples of the tiles to be provided shall got approved from the Engineer-in0charge. Necessary tests shall be carried out as directed.

M-26 SHUTTERING

26.1 The shuttering shall be either of wooden planking of 30mm minimum thickness with or without steel lining or of steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical ballies properly cross bracked together so as to make the centering rigid. In places of ballie props, bricks pillar of adequate section built in mud mortar may be used.

26.2 The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of concrete, live

load of men working with it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.

26.3 If at any stage of work during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete form work shall be got inspected by and approved from the Engineer-in-charge, before the reinforcement bars are placed in position.

26.4 The props shall consists of bullies having 100mm minimum diameter measured at mid length and 80mm at thin end and shall be placed as per design requirement. These shall rest squarely on wooden sole plates 40 mm. thick and minimum bearing area of 0-10 sq.m. laid on sufficiently hard base.

26.5 Double wedges shall further be provided between the sole plate and wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.

26.6 The timber used in shuttering shall not be so dry so as to absorb water from concrete and swell or bulge nor so

green or wet so as to shrink after erection. The timber shall be properly sawn and planed on the sides and the surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.

26.7 As far as practicable, clamps shall be used to hold the forms together and use of nails and spikes avoided.

26.8 The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacture may be applied in place of soap solution. In case of steel shuttering either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances black or burnt oil shall be permitted.

26.9 The shuttering for beams and slabs shall have camber of 4mm per metre (1 in 250) or as directed by the Engineer-in-charge so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the projected length or as directed by the Engineer-in-charge.

M-27 EXPANSION JOINTS - PREMOULDED FILLER :

27.1 The item provides for expansion joints in R.C.C. framestructures for internal joints, as well as exposed joints, with the use of premoulded bituminous joint filler.

27.2 Premoulded bituminous joint filler, i.e. performed stirp of expansion joint filler shall not get deformed or broken by twisting, bending or other handing when exposed to atmospheric condition. Pieces of joint filler that have been damaged shall be rejected.

27.3 Thickness of the pre moulded joint filler shall be 25 mm unless otherwise specified.

27.4 Premoulded bituminous joint filler shall conform to 1.5 1838-1961.

M-28 EXPANSION JOINTS - COPPER STRIPS AND HOLD FASTS

28.1 The item provides for expansion joints in R.C.C. frame structure for internal joints as well as for exposed joints with the use of necessary copper strip and holdfasts.

28.2 Copper sheet shall be 1.25 mm thick and of 1.25 mm with `U' shape in the middle, copper strip shall have holdfast of 3 mm diameter copper rod fixed to the plate soldered on strip at intervals o f about 30 cm. or as shown in the drawing or as directed. The width of each flange (horizontal side) of the copper plate to be embedded in theconcrete work shall be 25 mm Depth of `U' to be provided in the expansion joint, in the copper plate shall be of 25mm.

M-29 TEAK WOOD

29.1 The teak wood shall be of good quality as required for the item to be executed. When the kind of wood is not specifically mentioned, good Indian teak wood as approved shall be used.

29.2 Teak wood shall generally be free from large, loose, dead or cluster knots, flaws, warps, twists, shakes, bends or any other defects. It shall generally be uniform in substance and of straight fibres as far as possible. It shall be free from rot, decay, harmful fungi and other defects of harmful nature, which will affect the strength, durability or its usefulness for the purpose for which it is required. The colour shall be uniform as far as possible. Any effort like painting, using any adhesive or resinous Materials made to hide the defects shall render the pieces liable to rejection by the Engineer-in-charge.

29.3 All scantlings, planks etc. shall be sawn in straight lines and planes in the direction of grains and of uniform thickness.

29.4 The tolerances in the dimensions shall be allowed at the rate of 1.5 mm per face to be planed.

29.5 **First Class Teak Wood**

First clas teak wood shall have no individual hard and sound knots, more than 6 sq.cm. in size and the aggregate area of such knots shall not be more than 1% of area of piece. The timber shall be closed grained.

29.6 **Second Class Teak Wood**

No individual hard and sound knots shall be more than 15 sq.cm. in size and aggregate area of such knots shall not exceed 2% of the area of piece.

M-29-A NON-TEAK WOOD

The non teak wood shall be chemically treated, seasoned as per I.S. Specifications and of good quality. The type of wood shall be got approved before collecting the same on site. Fabrication of wooden members shall be started only after approval. For this purpose wood of Bio, Kalai, Sires, Saded, Behda, Jamun, Sisoo will be used for door frames whereas only Kalai, Siras, ,Halda, Kalam etc. will be permitted for shutters after proper seasoning and chemical treatment.

The non teak wood shall be free from large, loose dead of cluster knots, flows, shakes, warps, bends, or any other defect. It shall be uniform in substance and of straight fibres as far as possible. It shall be free from rots, decay, harmful fungi and other defects of similar nature which will affect the strength, durability or its usefullness for the purpose for which it is required. The colour of the wood shall be uniform as far as possible.The scantalings, planks etc. shall be sawn in straight lines and planes in the direction of grain and of uniform thickness.

The department will use the Agency to produce a certificate from the Forest Department in the event of a dispute and the ddecision of the Department shall be final and binding to the contractor.

The tolerance in the dimension shall be allowed at 1.5 mm. per face to be planed.

M-30 WOODEN FLUSH DOOR SHUTTERS (SOLID CORE)

30.1 The solid core type flush door shutters shall be of decorative or non-decorative type as specified in the drawing. The size and thickness of the shutter shall be as specified in drawings or as directed. The timber species for core shall be used as per I.S. 2202-(Part-I)-1991. The timber shall be free from decay and insect attack. Knots and knot holes less than half the width of cross-section of the members, pitch streaks and harmless pin holes shall be permissible except in the exposed edges of the core members. The commercial plywood, cross bands shall conform to I.S. 303-1298.

30.2 The face panel of the shutters shall be formed by gluing by the hot press process on both faces of the core with either plywood or corss bands, and face veneers. The lipping, rebating, opening of glazing, venetion etc. shall be provided if specified in the drawing.

30.3 All edges of the door shutters shall be square. The shutters shall be free form twist or warp in its plane. Both faces of the shutters shall be sand papered to smoot even texture.

30.4 The shutters shall be tested for ---

i] **End Immersion Test** : The test shall be carried out as per I.S. 2202 (Part-I) 1991. There shall be no delamination at the end of the test.

ii] **Knife Test** : The face panel when tested in accordance with I.S. 1659-1990 shall pass the test.

iii] **Glue Adhesion Test** : The flush door shall be tested for glue adhesive test in accordance with I.S. 2202(Part-I)- 1991. The shutters shall be considered to have passed the test if no delamination occurs in the glue lines in the plywood and if no single delamination more than 80 mm. in length and more than 3 mm. in depth has occured in the assembly glue lines between the plywood face and the style and rail. Delamination at the corner shall be measured continously around the corner. Delamination at the knots knot, hole and other permissible wood defects shall not be considered in assessing the sample.

30.5 The tolerance in size of solid core type flush door as under:-

In nominal thickness # 1.2 mm. In nominal height # 3 mm. The thickness of the shutters shall be uniform throughout with a permissible variation of not more than 0.8 mm. when measured at any two points.

M-31 ALUMINIUM DOORS, WINDOWS, VENTILATORS

31.1 Aluminium alloy used in the manufacture of extruded window sections shall conform to I.S. desgnation HEA-WP of I.S.:733- 1991 and also to I.S. Designation WVG - WP OF I.S.:1285-1991. The sections shall be as specified the drawing and design. The fabrication shall be done as directed.

31.2 The hinges shall be cast or excluded aluminium hinges of same type as in window but or large size.

31.3 The hinges shall normally be of 50 mm projecting type non projecting type of hinges may also be used if directed. The handles of door shall be of specified design. A suitable lock for the door operable either from outside shall be provided. In double shutter door, the first closing shall have a concealed aluminium alloy bolt at top and bottom.

M-32 ROLLING SHUTTERS

32.1 The rolling shutters shall conform to I.S. 6248-1991. Rolling shutters shall be supplied of specified type with accessories. The size of the rolling shutters shall be specified in the drawings. The shutters shall be constructed with interlocking lath sections formed from cold rolled steel strips not less than 0.9 mm. thick and 80 mm. wide for shutters upto 3.5 m. Width not less than 1.25 mm. thick and 80 mm. wide for shutters 3.5 m. in width and above unless otherwise specified.

32.2 Guide channels shall be of mild steel deep channel section and of rolled pressed or built up (fabricated) jointless construction. The thickness of sheet used shall not be less than 3.15 mm.

32.3 Hood covers shall be made of M.S. sheets not less than 0.92 mm. thick. For shutters having width 3.5 mts. and above, the thickness of M.S. sheet for the hood covers shall be not less than 1.25 mm.

32.4 The spring shall be of best quality and shall be manufactured from tested high tensile spring steel wire or strip of adequate strength to balance the shutters in position. The spring pipe shaft etc. shall be supported on strong M.S. or malleable C.I. brackets. The brackets shall be fixed on the or under the lintel as specified with rawl plugs and screws bolts etc.

32.5 The rolling shutters shall be of self rolling type upto 8 sq.m. clear area without ball bearing and upto 12 sq.m. clear area with ball bearing. If the rolling shutters are of larger then gear operated type shutters shall be used.

32.6 The locking arrangement shall be provided at the bottom of shutter at both ends. The shutters shall be opened from outside.

32.7 The shutters shall be completed with door suspension, shafts, locking arrangements, pulling hooks, handles and other accessories.

M-33 COLLAPSIBLE STEEL GATE

33.1 The collapsible steel gate shall be in one or two leaves and size as per approved drawings or as specified. The gate shall be fabricated from best quality mild steel channels, flates etc. Either steel

pulleys or ball bearings shall be provided in every double channel. Unless otherwise specified the particulars of collapsible gate shall be as under ---

i] **Pickets** : These shall be of 20 mm. M.S. channels of heavy sections unless otherwise shown on drawings. The distance centre to centre of pickets shall be 12 cms. with an opening of 10 cms.

ii] Pivoted M.S. flats shall be 20 mm. x 6 mm.

iii] Top and bottom guides shall be from tee or flat iron of approved size.

iv] The fittings like stoppers, fixing hold fasts, locking cleats, brass handles and cast iron rollers shall be of approved design and size.

M-34 WELDED STEEL WIRE FABRIC

34.1 Welded steel wire fabric for general purpose shall be manufactured from cold drawn steel `as drawn' or galvanised steel conforming to I.S. 226-1975 With longitudinal and transverse wire seurely connected at every intersection by a process of electrical resistance welding and conforming to I.S. 4948-1974. It shall be fabricated and finished in a workman like manner and shall be free from injurious defects and shall be ruest proof. The type of mesh shall be oblong or square as directed. The mesh sizes and sizes of wire for square as well as oblong welded steel wire fabric shall be as directed. The steel wire fabric in panels shall be in one whole piece in each panel as far as stock sizes permit.

M-35 EXPANDED METAL SHEETS

35.1 The expanded metal sheets shall be free from flaws, joints, welds, broken, stands, laminations and other harmful surface defects Expanded metal steel sheet shall conform to I.S. 412 - 1992 except that blank sheets need not be with guaranteed mecanical properties. The size of the diamond mesh of expanded metal and dimensions of strands (width and thickness) shall be as specified. The tolerance on nominal weight of expanded metal sheets shall be of + 10 per cent.

35.2 Expanded metal in panels shall be in one whole piece in each panel as far as stock sizes permit. The expanded metal sheets shall be coated with suitable protective coating to prevent corrosion.

M-36 MILD STEEL WIRE (Wire Gauze Jali)

36.1 Mild steel wire may be galvanised, as indicated. All finished steel wire shall be well cleanly drawn to the dimensions and size of wire as specified in item. The wire shall be sound, free from slits, surface flaws, rough jagged and imperfect edges and other harmful surface defects and shall conform to I.S. 280-1992.

M-37 PLYWOOD

37.1 The Plywood for general purpose shall conform I.S. 303-1998. Plywood is made by cementing together thin boards or sheets of wood into panels. There are always an old number of layers 3, 5, 7, 9 ply etc. The plies are placed so that the grain of each layer is at right angles to the grain in the adjacent layers.

37.2 The chief advantage of plywood over a single board of the same thickness is the more uniform strength of the plywood along the length and width of the plywood and greater resistance to cracking and slitting with change in moisture content.

37.3 Usually synthetic resins are used for gluieg. Phenolic resins are usually cured in a hot press which compresses and simultaneously heats the plies between hot plates which maintain a temperature of 90 degree C. to 140 degree C. and a pressure of 11 to 14 Kg./Sq.cm. on the wood. The time of heating may be any thing from 2 to 60 minutes depending upon thickness.

37.4 When water glue are used the wood absorbs so much Water that the finished plywood must be dried carefully, When synthetic resins are used as adhesive the finished plywood must be exposed to atmosphere of controlled humidity until the proper amount of moisture has been absorbed.

37.5 According to I.S. : 303-1998 the plywood for general purpose shall be of three grades namely BWR.WWR and CWR depending upon the adhesives used for bonding the veneers and it will be

further classified into six types namely AA, AB, AC, BB, BC and CC based on the quality of the two faces, each face being of three kinds namely A, B and C. After pressing, the finished plywood should be reconditioned to a moisture content not less than 8 percent and not more than 16 percent.

TABLE

37.6 THICKNESS OF PLYWOOD BOARDS

Board	Thich
3 ply	3 mm
	4 mm
	5 mm
	6 mm
6 ply	5 mm
	6 mm
	8 mm
	9 mm
7 Ply	9 mm
	13 mm
	16 mm
9 Ply	13 mm
	16 mm
	19 mm
11 ply	19 mm
	22 mm
	25 mm

M-38 GLASS

38.1 All glass shall be of the best quality, free from specks, bubbles, smokes, veins, air holes blisters and other defects. The kind of glass to be used shall be as mentioned in the item or specification or in the special provisions or as shown in detailed drawings. Thickness of glass panes shall be uniform. The specifications for different kinds of glass shall be as under ----

38.2 **Sheet Glass**

38.2.1 In the absence of any specified thickness or weight in the item or detailed specifications of the item of work, sheet glass shall be weighing 7.5 Kg./Sq.m. for panes upto 600 mm. x 600 mm.

38.2.2 For panes larger than 600 mm. x 600 mm. and upto 800 mm. x 800 mm. glass weighing not less than 8.75 Kg./Sq.m. shall be used. For bigger panes upto 900 mm. x 900 mm. glass weighing not less than 11.25 Kg./Sq.m. shall be used.

38.2.3 Sheet glass shall be patent flattened glass of best quality and for glasing and framing purposes shall conform to I.S. 761-1963. Sheet glass of the specified colours shall be used, if so shown on detailed drawings or so specified. For important buildings and for panes with any dimensions over 900 mm. plate glass of specified thickness shall be used.

38.3.0 **Plate Glass**

38.3.1 When plate glass is specified it shall be "Polished Patent Plate Glass" of best quality. It shall have both the surface ground flate and parallel and polished to obtain clear undistured vision and reflection. The plate glass shall be of the thickness mentioned in the item or as shown in the

detailed drawing or as specified. In the absence of any specified thickness, the thickness of plate glass to be supplied shall be 6 mm. and a tolerance of 0.20 mm. shall be admissible.

38.4.0 **Obscured Glass**

38.4.1 This type of glass transmits light so that vision is partially or almost completely obscured. Glass shall be plain rolled, figured, ribbed or fluted, or frosted glass as may be specified as required. The thickness and type of glass shall be as per details on drawings or as specified or as directed.

38.5.0 **Wired Glass**

Glass shall be with wire netting embedded in a sheet of plane glass. Electrically welded 13 mm. Georgain square mesh shall be used. Thickness of glass shall not be less than 6 mm. wired glass shall be of type and thickness as specified.

M-39 ACRYLIC SHEETS

39.1 Acrylic sheets shall be of thickness as specified in the item and of a specified shape and size as the case may be. Penels may be flat or curved. It should be light in weight. It shall be colourless or coloured or opaaue as specified in the item. Colourless sheet shall be as transparent as the finest optical glass. Its light transmission rate shall be about 95%. Transparancy shall not be affected for the sheets of larger thickness. It shall be extremely resistant to sunlight, weather and low temperatures. It shall not show any significant yellowing or change in physical properties or loss of light transmission over a longer period of use.

The sheet shall be impact resistant also. Sheets should be available in complete range of standard transparent, translucemtn and opaque colours. Sheets should be available in complete range of standard transparent, translucent and opaque colours. Sheets shall be of such quality that they can be cut, bent and jointed as desired. Solution for the joints shall be used as per the requirement of manufacture.

M-40 PARTICLE BOARD

40.1 The particle boards used for face panels shall of best quality free from any defects. The particle boards shall be made with phenolmaldehyde adhesive. The particle boards shall conform to I.S. 3087-1990. "Specification for wood particle board for general purpose." The size and the thickness of the particle board shall be as specified.

M-41 EXPANDED POLYSTYRENE OR FRAMES STYROPER SLEBS

41.1 The expanded polystyrene ceiling boards and tiles shall be of approved make and shall be of size thickness, finish and colour and indicated. It shall be of high density and suitable for use as insulting material. The insulting material shall be like slab of thermocole etc.

M-42 RESIN BONDED FIBRE GLASS

42.1 The resin bonded fibre glass tiles or rools shall be of approved make and shall be sizes, thickness and finish as indicated.

42.2 For test of Mineral wood thermal insulation Blanket I.S. 2944-1965 followed.

42.3 Insulation wool blanket shall be with the following coverings on one or both sides as indicated.

(1) Bituminised bessian kraft paper suitable for use in position where moisture has to be excluded.

(2) Hessain cloth or Kraft paper for keeping out dust.

(3) G. I. wire netting, suitable or surfaces to be plastered over.

M-43 FIXTURES & FASTENINGS

General ---

i] The fixtures and fastenings, that is, butt, hingers, tee and strap hinges, sliding door bolts, tower bolts, door latch, bath-room latch, handles, door stoppers, casement window fasteners, casement

stays and ventilator catch shall be made of the metal as specified in the item or its specifications.

ii] They shall be of iron, brass, aluminium, chromium plated iron, chromium plated brass, copper oxidised iron, copper oxidised brass or anodised aluminium as specified.

iii] The fixtures shall be heavy, medium or light type. The fixtures and fastenings shall be smooth finished and shall be such as will ensure ease of operation.

iv] The samples of fixtures and fastenings shall be got approved as regards quality and shape before providing them in position.

v] Brass and anodised aluminium fixtures and fastenings shall be bright finished.

Holdfasts :

i] Holdfasts shall be made from mild steel flat 30 cm. length and one of the holdfasts shall be bent at right angle and two nos. of 6 mm. dia. hooles shall be made in it for fixing it to the frame with screws. At the other end, the holdfast shall be forked and bent at right angles in opposite directions.

Butt Hinges :

i] Railway standard heavy type butt hinges shall be used when so specified.

ii] Tee and strap hinges shall be manufactured from M.S. sheet.

Sliding Door Bolts (Aldrops) :

i] The aldrops as specified in the item shall be used and shall be got approved.

Tower Bolts (Barrel Type) :

i] Tower bolts as specified in the item shall be used and shall be got approved.

Door Latch :

i] The size of door latch shall be taken as the length of latch.

Bathroom Latch :

i] Bathroom latch shall be similar to tower bolt.

Handle :

i] The size of the handles shall be determined by the inside grip length of the handles. Handles shall have a base

plate of length 50 mm. more than the size of the handle.

Door Stoppers :

i] Door stoppers shall be either floor door stopper type or door catch type. Floor stopper shall be of overall size as specified and shall have a rubber cushion.

Door Catch :

i] Door catch shall be fixed at a height of about 900 mm. from the floor level such that one part of the catch is fitted on the inside of the shutter and other part is fixed in the wall with necessary wooden plug arrangements for appropriate fixity. The catch shall be fixed 20 mm. inside the face of the door for easy operation of catch.

Wooden Door Stop With Hinge :

i] Wooden door stop of size 100 mm. x 60 mm. x 40 mm. shall be fixed on the door frame with a hinge of 75 mm. size and at a height of 900 mm. from the floor level. The wooden door stop shall be provided with 3 coats of approved oil paint.

Casement Window Fastner :

i] Casement window fastener for single lead window shutter shall be left or right handed as directed.

Casement Stays (Straigot Peg.Stay) :

i] The stays shall be made from a channel section having three holes at appropriate position so that the window can be opened either fully or partially as directed.

Size of the stay shall be 250 mm. to 300 mm. as directed.

Ventilator Catch :

i] The pattern and shape of the catch shall be as approved.

Pivot :

i] The base and socket plate shall be made from minimum 3 mm. thick plate, and projected pivot shall not be less than 12 mm. dia. and 12 mm. length and shall be firmly riveted to the base plate case of iron pivot and in single piece base in the case of brass pivot.

M-44 PAINTS

44.1 **Oil Paints**

Oil paints shall be of the specified colour and shade, and as approved. The ready mixed paints shall only be used. However, if ready mixed paint or specified shade or tint is not available white ready mixed paint with approved stainer will be allowed. In such a case, the contractor shall ensure that the shade of the paint so allowed shall be uniform.

All the paints shall meed with the following general requirements -

i] Paint shall not show excessive setting in a freshly opened full can and shall easily be redispressed with paddle to a smooth homogeneous state. The paint shall show no curdling, livering, caking or colour separation and shall be free from lumps and skins.

ii] The paint as received shall brush easily, possess good levelling properties and show no running or sagging tendencies.

iii] The paint shall not skin within 48 hours in a three quarters filled closed container.

iv] The paint shall dry to a smooth uniform finish free from roughness, grit uneveness and other imperfections.

Ready mixed paid shall be used exactly as received from the manufacturers and generally according to their instructions and without any admixtures whatsoever.

44.2 **(B) Enamel Paints**

The enamel paint shall satisfy in general requirements as mentioned in specification of oil paints. Enamel paints shall conform to I.S. 2933-1991.

M-45 FRENCH POLISH

The french polish of required tint and shade shall be prepared with the below mentioned ingredients and other necessary Materials :

i] Denatured spirit of approved quality.

ii] Shellac.

iii] Chandras.

iv] Pigment.

The french polish so prepared shall conform to I.S. 348-1991.

M-46 MARBLE CHIPS FOR MARBLE MOSAIC TERRAZZO

46.1 The marble chips shall be of approved quality and shades. It shall be hard, sound, dense and homogeneous in texture with crystalline and coarse grains. It shall be uniform in colour and free from stains, cracks, decay and weathering.

46.2 The size of various colours of marble chips ranging from the smallest upto 20 mm. shall be used where the thickness of top wearing layers is 6 mm. in size. The marble chips of approved quality and colours only as per grading as decided by the Engineer-in-charge shall be used for marble mosaic tiles or works.

46.3 The marble chips shall be machine crushed. They shall be free from foreign matter, dust etc. Except as above the chips shall conform to I.S. 2114-1990.

M-47 FLOORING TILES

A] Plain Cement Tiles

47.1.1 The plain cement tiles shall be of general purpose type. These are the tiles in the manufacture of which no pigments are used. Cement used in the manufacture of tiles shall be as per Indian Standards.

47.1.2 The tiles shall be manufactured from a mixture of cement and natural aggregates by pressure process. During manufacture, the tiles shall be subjected to a pressure of not less than 140 Kg./Sq.cm. The proportion of cement to aggregate in the backing of the tiles shall be not leaner than 1:3 by weight. The wearing face, though the tiles are of plain cement,shall be rpovided with stone chips of 1 to 2 mm size. The proportion of cement to the marble chips aggregate in the wearing layer of the tiles shall be three parts of cement to one part of chips by weight. The minimum thickness of wearing layer shall be 3 mm. The colour and texture of wearing layer shall be uniform throughout its face and thickness. On removal from mould, the tiles shall be kept in moist condition continuously atleast for seven days and subsequently, if necessary, for such long period as would ensure their conformity to requirements of I.S. 1237- 1990 requiring resistance to wear and water absorption.

47.1.3 The wearing face of the tiles shall be plain, free from projections, depressions and cracks and shall be reasonably parallel to the back face of the tile. All angles shall be right angle and all edges shall be sharp and true.

47.1.4 The tile sizes shall generally be square shape 24.85cm. x 24.85cm. or 25cm. x 25cm. The thickness of the tiles shall be 20 mm.

47.1.5 The tolerance of length and breadth shall be plus or minus 1 mm. The tolerance on thickness shall be plus 5 mm.

47.1.6 The tiles shall satisfy the tests as regards transverse strength, resistance to wear and water absorption as per I.S. 1237-1980.

47.2 **B] Plain Coloured Tiles**

47.2.1 These tiles shall have the same specifications as for plain cement tiles as per (A) above except that they shall have a plain wearing surface wherein pigments are used. They shall conform to I.S. 1237-1990.

47.2.2 The pigment used for colouring cement shall not exceed 10% by weight of cement used in the mix. The pigments, synthetic or otherwise, used for colouring tiles shall have permanent colour and shall not contain Materials deterimental to concrete.

47.2.3 The colour of the tiles shall be specified in the item or as directed.

47.3 **C] Marble Mosaic Tiles**

47.3.1 These tiles have the same specifications as per plain cement tiles except the requirements as stated below ---

47.3.2 The marble mosaic tiles shall conform to I.S. 1237-1990. The wearing face of the tiles shall be mechanically ground and filled. The wearing face of tiles shall be free of projections, depresssions and cracks and shall be reasonably parallel to the back face of the tiles. All angles shall be right angles and all edges shall be sharp and true.

47.3.3 Chips used in the tiles be from smallest upto 20 mm. size. The minimum thickness of wearing layer of tiles shall be 6 mm. For pattern of chips to be bad on the wearing face, a few samples with or without their full size photographs as directed shall be presented to the Engineer-in-charge for approval.

47.3.4 Any particular samples, if found suitable shall be approved by the Engineer-in-charge, of he may ask for particular sized chips to be more or less in the sample presented. The samples shall have to be made by the contractor till a suitable sample finally approved for use in the work. The

contractor shall ensure that the tiles supplied for the work shall be in conformity with the approved sample only, in terms of its dimensions, thickness of backing layer and wearing surface, Materials, ingredients, colour shade, chips, distribution etc. required.

47.3.5 The tiles shall be prepared from cement conforming to Indian Standards or coloured portland cement generally depending upon the colour of tiles to be used or as directed.

47.4 **D] Chequered Tiles**

47.4.1 Chequered tiles shall be plain cement tiles or marble mosaic tiles. The former shall have the same specification as per (A) above and the latter as per marble mosaic tiles as per (C) except as mentioned below.

47.4.2 The tiles shall be of nominal size of 250mm. x 250mm. or as specified. The centre to centre distance of the chequer shall not less than 25mm. and not more than 50mm. The overall thickness of the tile shall be 22mm.

47.4.3 The grooves in the chequers shall be uniform and straight. The depth of the grooves shall not be less than 3mm. The chequered tiles shall be plain, coloured or mosaic as specified. The thickness of the upper layer measured from the top of the chequers shall not be less than 6mm. The tiles shall be given the first grinding with machine before delivery to site.

47.4.4 Tiles shall conform to relevant I.S. 1237-1990.

47.5 **E] Chequered Tiles for Staircases**

47.5.1 The requirements of these tiles shall be the same as chequered tiles as per (D) above except in following respects :

i] The length of a tile including nose shall be 330 mm.

ii] The minimum thickness shall be 28 mm.

iii] The nosing shall have also the same wearing layer at the top.

iv] The nosing edge shall be rounded.

v] The front portion of the tile for a minimum length of 75mm. from and including the nosing shall have grooves running parallel to nosing and at centres not exceeding 25mm. Beyond that the tiles shall have normal chequer pattern.

M-48 ROUGH KOTAH STONE

48.1 The kotah stones shall be hard, even, sound and regular in shape and generally uniform in colour. The colour of the stone shall generally be green. Brown coloured stones shall not be allowed for use. They shall be without any soft veins, cracks or flaws.

48.2 The size of the stones to be used for flooring shall be size 600mm. x 60mm. and/or size 600mm. x 450mm. as directed. However, smaller sizes will be allowed to be used to the extent of maintaining the required pattern. Thickness shall be as specified.

48.3 Tolerance of minus 30 mm. on account of chisel dressing of edges sahll be permitted for length as well as breadth. Tolerance in thickness shall be plus 3mm.

48.4 The edges of stones shall be truly chiselled and table rubbed with coarse sand before paving. All angles and edges of the stone shall be true, square and free from chipping and the surface shall be true and plain.

48.5 When machine cut edges are specified, the exposed edges and the edges at joints shall be machine cut. The thickness of the exposed machine cut edges shall be uniform.

M-49 POLISHED KOTAH STONES

49.1 Polish kotah stone shall have the same specifications as per rough kotah stone except as mentioned below.

49.2 The stone shall have machine polished smooth surface. When brought on site, the stones shall be single polished or double polished depending upon its use. The stones for paving shall generally be single polished. the stones to be used for dedo, skirting, platforms sink, veneering, sills, steps

etc. where machine polishing after the stones are fixed in situ is not possible shall be double polished.

M-50 DHOLPUR STONE SLAB

50.1 Dholpur stone slab shall be of best quality as approved by the Engineer-in-charge. The stone slab shall be without any veins, cracks,and flaws. The stone slab shall be even, sound and durable, regular in shape and uniform colour.

50.2 The size of the stone shall be as specified in the item or detailed drawing or as approved by the Engineer-in-charge. The thickness of the stone shall be as specified in the item of work with the permissible tolerance of plus of minus 2 mm. The provisions in respect of polishing as for polished kotah stone shall apply to plished Dholpur stone also. All angles and edges of the face of stone slab shall be fine chiselled or polished as specified in the item of work and all the four edges shall be machine cut. All engles and edges of the stone slab shall be true and plane.

50.3 The sample of stone shall be got approved from the Engineer- in-charge for shade and tint for a particular work. It shall be ensured the stones to be used in a particular work shall not differ much in shade or tint from the approved sample.

M-51 MARBLE SLAB

Marble slabs shall be white or of other colour and of best quality as approved by the Engineer-in-charge. Slab shall

be bard, close, uniform and in texture.They shall also be free defects and cracks. The surface shall be machine polished to an even and perfectly plane surface and the edges, machine cut true and square. The rear face shall be rough enough to provide key for the mortar.

Marble slabs with natural veins, if selected shall have to be laid as per the pattern given by the Engineer-in-charge. Size of the slabs shall be minimum 450mm. x 450mm. and preferably 600mm. x 600mm. However, smaller sizes will be allowed to be used to the extent of maintaining required pattern.

The slab shall not be thinner than the specified thickness at its thinest part. A few specimen of finished slab to be used shall be deposited by the contractor in the office for reference.

Except as above, the marble slabs shall conform to I.S. 1130-1993 or as revised from time to time.

M-52 GRANITE STONE SLAB

52.1 Granite shall be of approved colour and quality, The stone shall be hard even, sound and regular in shape and generally uniform in colour. It shall be without and soft veins, cracks or flaws.

52.2 The thickness of the stone shall be specified in the item.

52.3 All exposed faces shall be double polished to tender truly smooth and even relecting surface. The exposed edges and corners shall be rounded off as directed. The exposed edges shall be machine cut and shall have uniform thickness.

M-53 P.V.C. FLOORING

53.1 P.V.C. sheets for P.V.C. floor covering shall be homogenous flexible type, conformint to I.S. 3462-1991. The P.V.C. covering shall neither develop any toxic effect while put to use not shall give off any disagreeable odour.

53.2 Thickness of flexible type covering or tiles shall be as specified in the description of the item.

53.3 The flexible type shall be backed with hessain or other woven fabric. The following tolerance shall be applicable on the nominal dimensions of the sheet rolls or tiles :

(a) Thickness +/- 0.15 mm
(b) Length or width
1. 300 mm Square tiles +/- 0.20 mm
2. 600 mm Square tiles. +/- 0.40 mm
3. 900 mm Square tiles. +/- 0.60 mm
4. Sheets and rolls. +/- 0.10 percent.

53.4 **Adhesive**

53.4.1 The adhesive for PVC flooring shall be of the type and make recomended by the manufacturers of PVC sheets tiles.

M-54 FACING TILES

54.1 The facing tiles (burnt clay facing bricks) shall be free from cracks, flaws, and nodules of free lime. They shall be thoroughly burnt and shall have plane rectangular faces with parallel sides and sharp stright right angled faces. The texture of the finished surface that will be exposed when in place, shall conform to an approved sample consisting not less than four stretcher bricks each representing resistance to penetration by rain and greater durability than common bricks. The tiles shall conform to I.S. 2691-1995.

54.2 The standard size of facing brick tiles shall be 19 x 9 x 4 cms. The facing brick tiles shall be provided with frog which shall conform to I.S. 1077-1992.

54.3 The permissible tolerance in dimensions specified above shall be as follows.

Size	Torrence for	
	1st Class Brick	2nd Class Brice
19 cm	+/- 6 mm	+/- 10 mm
9 cm	+/- 2 mm	+/- 7 mm
4 cm	+/- 1.5 mm	+/- 3 mm

The tolerance for distortion or warpage of face or edges of individual brick from a plane surface and from a straight line respectively shall be as follows :

Facing dimensions.	Permissible tolerance.
Max. below 19 cms.	Max. 2.5 mm.
Max. above 19 cms.	Max. 3.0 mm

54.5 The average compressive strength obtained as a sample of five tiles when tested in accordances with the produre aid as per I.S. 1077-1992 shall be not less than 175 Kg/Sq.cm. The average compressive strength of any individual brick shall not less than 160 Kg/Sq.cm.

54.6 The average water absorption for five brick tiles shall not be exceed 12 percent of average weight of brick before testing. The absorption for each individual brick shall not exceed 25 percent.

54.7 The brick tiles when tested in accordance with I.S. 1077-1992 the rate of efflorescence shall not be more than "Slightly effloresced".

M-55 WHITE GLAZED TILES

55.1 The tiles shall be of best quality as approved by the Engineer-in-charge. They shall be flat and true to shape. They shall be free from cracks, crazing, spots, chipped edges and corners. The glasing shall be of uniform shade.

55.2 The tiles shall be of nominal size of 150mm. x 150mm. unless otherwise specified. The maximum variation from the stated sizes, other than the thickness of tile, shall be plus or minus 1.5mm. The thickness of the tile shall be 6mm. except as above the tiles shall conform to I.S. 777-1988.

M-56 GALVANISED IRON PIPES AHND FITTINGS

Galvanised iron pipe shall be of the medium type and of required diameter and shall comply with I.S. 1239-1990. The specified diameter of the pipes shall refer to the inside diameter of the bore. Clamps, screw and all glavanised iron fittings shall be of the standard `R' or equivalent make.

M-57 BIB COCK AND STOP COCK :

57.1 A bib cock is a draw off tap with a horizontal inlet and a free outlet. A stop cock is a valve with a suitable means of connection for insertion in a pipe line for controlling or stopping the flow.

57.2 They shall be of screw down type and or brass chromium plated and of diameter as specified in the description of the item. They shall conform to I.S. 781-1990 and they shall be of best Indian make. They shall be polished bright.

57.3 The minimum finished weight of bib cock and stop shall be as given below--

Dia.	Bib Cock	Stop Cock	Dia.	Bib Cock	Stop Cock
8 mm.	0.25 Kg.	0.25 Kg.	15 mm.	0.40 Kg.	0.40 Kg.
10 mm.	0.30 Kg.	0.35 Kg.	20 mm.	0.75 Kg.	0.75 Kg.

M-58 GUN METAL WHEEL VALVE

58-1 The gun metal wheel valve shall be of approved quality. These shall be of gun metal fitted with wheel and shall be of gate valve opening full way and of the size as specified. These shall conform to I.S. 778-1990.

M-59 WHITE GLAZED PORCELAIN WASH BASIN

59.1 Wash basin shall be of white porcelain first quality best Indian make and it shall conform to I.S. 2556-(Part-IV)-1994 and I.S. 771-1990. The size of the wash basin shall be as specified in the item.The wash basin shall be of one piece construction with continued over-flow arrangements.All internal angles shall be designed so as to facilitate cleaning. Wash basin shall have single tap hole or two holes as specified. Each basin shall have a circular waste hole which is either rebated or bevelled internally with 65 mm. dia. at top and 10 mm. depth to suit the waste fitting. The necessary stud slot to receive the bracket on the under side of the basin shall be provided. Basin shall have an internal soap holder recess which shall fully drain into the bowl.

59.2 White glazed pedestal of the quality and colour as that of the basin shall be provided where specified in the item. It shall be completely recessed at the back for reception of supply and water pipe. It shall be capable of supporting the basin rigidly and adequately and shall be so designed as to make the height form the floor to top of the rim of basin 750 mm. to 800 mm. as directed.

M-60 EUROPEAN TYPE WATER COLSET/WITH LOW LEVEL FLUSHING

60.1 The European type water closet shall be white glazed conforming to I.S. 2556-1994 and I.S. 771-1692.

60.2 `S' trap shall be provided as required with water seal not leal not less than 50 mm.The solid plastic seat and cover shall be of the best Indian make conforming to I.S. 2548-1996. They shall be made of moulded synthetic Materials which shall be tough and hard with high resistance to solvents and shall be free from blisters and other surface defects and shall have chromium plated brass hinges and rubber butter of suitable size.

M-61 ORISSA TYPE WATER CLOSED

61.1 The specification of Orissa type white glazed water closet of first quality shall conform to I.S. 2556 (Part-III) 1994 and relevant specification of Indian type water closet except that pan will be with the integral squarring pan of size 580 mm x 440 mm. with raised footrest.

M-62 INDIAN TYPE WATER CLOSET

The Indian type white glazed water closet of first class quality, size as specified in the item and conforming to I.S. 771-1979 and I.S. 2556-(Part-II)-1994. Each pan shall have integral flushing ring of suitable type with adequate number of holes all around as directed to have satisfactory flushing. It shall also have an inlet at back of front for connecting flush pipe as directed. The inside of the bottom of the pan shall have sufficient slope from the front towards the outlet and the surface shall be uniform and smooth. Pan shall be provided with 100 mm. diameter `P' or `S' trap with approximately 50 mm. water seal and 50 mm. diameter vent horn.

FOOT RESTS

A pair of white glazed earthen ware rectangular foot rests of minimum size 250 mm. x 130 mm. x 20 mm. shall be provided with the water closet.

M-63 GLAZED EARTHEN WARE SINK

The glazed earthenware sink shall be of specified size, colour and quality. The sink shall conform to I.S. 771- Part-II-1992. The brackets for sinks shall conform to I.S. 775-1990.

The pipes shall conform to I.S. 1239-Part-I-1990 and I.S. 404-1993 for steel and lead pipes respectively. 32 mm. brass waste coupling of standard pattern with brass chain and rubber plug shall be provided with sink.

M-64 GLAZED EARTHEN WARE LIPPED TYPE FLAT BACK URINAL/CORNER TYPE URINAL

The lipped type urinal shall be flat back or corner type as specified in the item and shall conform to I.S. 771-1992. It shall be of best Indian make and size as specified and approved by the Engineer-in-charge. The flat back or corner type urinal must be of first class quality, free from any defects, cracks etc.

M-65 LOW LEVEL ENAMEL FLUSHING TANK

65.1 The low level enamal flushing tank shall be of 15 litres capacity. It shall conform to I.S. 774-1990. The flushing cistern shall be of best quality and free from any defects. The flushing tank shall have outlet 32 mm diameter. The outlet shall be connected with W.C. Pan by lead pipe of P.V.C. pipe as specified. The flushing tank shall be provided with inlet and outlet for fixing G.I. inlet pipes and over flow pi+pes. The flushing cistern shall be provided with chromium plated handle for flushing. The flushing tank shall be provided with bracket of cast iron so that it can be fixed on wall at specified height. The brackets shall conform to I.S. 775-1990.

M-66 CAST IRON FLUSHING CISTERN

66.1 The cast iron flushing cistern shall be of 15 litres capacity. It shall conform to I.S. 774-1990. The flushing cistern shall be of best quality free from any defects.

66.2 The flushing cistern shall have outlet of 32 mm diameter. The outlet shall be connected to lead pipe of 32 mm diameter. The lead pipe shall conform to I.S. 404 (Part-I) 1993. For fixing G.I. inlet pipes and overflow pipe 20 mm dia. inlet and outlet shall be provided. The flushing cistern shall be provided with galvanised iron chain and pull of sufficient length and shall be got approved from the Engineer-in-charge. The cast iron flushing cistern shall be painted with one coat of anticorrosive paint and two coats of paints. The flushing cistern shall be fixed on to C.I. brackets. The brackets shall conform to I.S. 775-1990.

M-67 FLUSH COCK

Half turn flush cock (heavy weight) shall be of gun metal chromium plated of diameter as specified in the description of the item. The flush cock shall conform to relevant Indian Standards.

M-68 CAST IRON PIPES AND FITTINGS

68.1 All soil, waste, vent and antisyphonage pipes and fittings shall conform to I.S. 1729-1991. The pipes shall have spigot and socket ends with head on spigot end. The pipes and fittings shall be true to shape, smooth, cylindrical their inner and outer surfaces being as nearly as practicable concentric. They shall be sound and nicely cast and shall be free from cracks, laps, pin holes or other imperfections and shall be neatly dressed and carefully fettled.

68.2 The end of pipes and fittings shall be reasonably square to their axis.

68.3 The sand cast iron pipes shall be of the diameter as specified in the description and shall be in length of 1.5 M., 1.8 M. & 2.0 M. including socket ends of the pipe unless shorter length are either specified or required at junction etc. The pipes and fittings shall be supplied without ears unless specified or directed otherwise.

68.4 Tolerances : The standard weights and thickness of pipes shall be as shown in the table below. A tolerance upto minus 10% may however be allowed against these standard weights.

Sr. No.	Nominal dia of bore	Overall Thick	Wight of pipe excluding ears		
			1.5 m long	1.m long	2 m long
1.	75 mm	5.00 mm	12.83 Kg.	16.52 Kg.	18.30 Kg.
2.	100 mm	5.0 mm	18.14 Kg.	21.67 Kg.	24.15 Kg.
3.	150 mm				
4.	250 mm				

A tolerance upto minus 15% in thickness and 20 mm. in length will be allowed. For fittings tolerance in lengths shall be plus 25 mm. and minus 10 mm.

The thickness of fittings and their socket and spigot dimensions shall conform to the thickness and dimensions specified for the corresponding sizes of straight pipes. The tolerance in weights and thickness shall be the same as for straight pipes.

M-68-A P.V.C. Pipes & Fittings

1. All soil, waste and vent pipes & fittings shall conform to I.S. 4985-1988 & I.S. 13592:1992. The pipes are provided with an integral rubber ring type socket at one end while the other end in kept plain, smooth & free from burrs. The pipes and fittings shall be true to shape,smooth & cylidical. They shall be free from crackes,laps,pinholes or other imporfection and shall be nearly dressed and carefully fettled.

2. The P.V.C. Pipes shall be of the diameter as specified in the description and shall be in length of 6.0,3.0 & 1.8 m including socket ends of the pipe unless shorter lenght are either specified or required at junction etc. Tolerances on specified length shall be + 10 mm and- 0 mm.

3. Rubber real rings for joints and Access Doors shall be manufactured in accordance with IS: 5382-1998. There are made out or natural rubber with a shore 'A' hardness of 40+5.

4.1 The mean outside diameter, outside diameter at any point and wall thickness manufactured plain or with socket shall be as shown in the following table:-

* All dimensions in millimeters.

Sr. No.	Nomian/Outside dia	Mean outside Diamter		Outside diameter at		Wall whtick	
		Min.	Max.	Min.	Max.	Min.	Max
1.	75	70.0	75.3	74.1	75.9	3.2	3.8
2.	100.	110.00	100.4	108.6	111.4	3.2	3.8

4.2 Minimum Wall thickness of sockets on pipes & Dimensions of sliding socket of pipes shall be as shown in following table.

* All dimensions in millimeters.

Sr. No.	Nominal outside diameter	Minimum wall thick of sockets on pipes.		Socet Depth min.	Mean inaide diamete of societ at mil point	
		S2, Min	S3, Min		Min	Max
1.	75	2.9	2.4	40.00	75.1	75.3
2.	110	2.9	2.4	48.0	110.1	110.4

* The outside diameter of pipe shall be obtained by the method given in IS: 12235(Part-1)-1998, wall thickness shall be measured by the method given in IS:12235(Part-2)1998.

4.3 The permissible variation between the mean outside diameter & the nominal outside diameter of a pipe shall be positive in the form + x, where is less than or equal to greater of the following two values.

a) 0.03 mm, and

b) 0.003 x nominal outside diameter- rounded off to the next higher 0.1 mm.

4.4 The permissible variation between the outside diameter at any point (d1) & the nominal outside diameter (de)of a pipe shall not exceed the greater of the following two values.

a) 0.5mm, and

b) 0.012 de rounde off to the next higher 0.1

4.5 The thickness of fittings and their socket & spigot dimensions shall conform to the thickness and dimensions specified for the corresponding sizes of straight pipes.

M-69 NAHNI TRAP

Nahni trap shall be of cast iron and shall be sound and free from porosity or other defects which affect servicability. The thickness of the base metal shall not be less than 6.5 mm. The surface shall be smooth and free form crack, chips and other flaws or any other kind of defects which affect serviceability. The size of nahni trap shall be as specified and shall be of self cleansing design.

The nahni trap shall be of quality approved by the Engineer- in-charge and shall generally conform to the relevant Indian Standards.

The nahni trap provided shall be with deep seal, minimum 50 mm. except at places where trap with deep seal can not be accommdated. The cover shall be cast iron. Perforated cover shall be provided on the trap of appropriate size.

M-70 GULLY TRAP

Gully trap shall conform to I.S. 651-1992. It shall be sound, free from defects such as fire cracks or hair cracks. The glaze of the traps shall be free from crazing. They shall give a sharp clear note when struck with light hammer. There shall be no broken blisters.

The size of the gully trap shall be as specified in the item.

Each gully trap shall have one C.I. grating of square size corresponding to the dimensions, of inlet of gully trap. It will also have a water tight C.I. cover with frame inside dimensions 300mm. x 300mm. the cover weighing not less than 4,53 Kg. and the frame not less than 2.72 Kg. The grating cover and frame shall be of sound and good casting and shall have truly square machined seating faces.

M-71 GLAZED STONE WARE PIPE AND FITTINGS

The pipes and fittings shall be of best quality as approved by the Engineer-in-charge. The pipe shall be of best quality manufactured from stone-ware of fire clay, salt glazed thoroughly burnt throught the whole thickness, of a close even texture, free from air blows, fire blisters, cracks and other imperfections, which affect the serviceability. The inner and outer surfaces shall be smooth and perfectly glazed. The pipe shall be capable to withstand pressure of 1.5 m. lead without showing signs of leakage. The thickness of the wall shall not be less than (1/12)th of the internal dia. The depth of socket shall not be less than 38 mm. The socket shall be sufficiently large to allow a joint of 6 mm. around the pipe. The pipes shall generally conform to revelant I.S. 651-1992.

M-72 WALL PEG SAIL

72.1 The aluminium wall peg rail shall have three aluminium pegs of approved quality and size. It shall be fixed on teakwood plank of size 450 mm x 75 mm x 20 mm. The teak wood shall be french polished or oil painted as specified.

M-73 G.I. WATER SPOUT

73.1 The G.I. pipes of 40 mm dia shall be of medium quality and specials shall be of `R' brand or equivalent brand of best quality.

73.2 The pipe shall have length as required for the thickness of well in which it is fixed, and at the outside end tee and bend cut at half the length shall be provided and at either end coupling shall be provided and the have better fixing. The water spout shall be provided as per detailed drawings or as directed.

M-74 ASBESTOS CEMENT PIPE (A.C. PIPE)

74.1 The asbestos cement pipe of diameter as specified in the description of the item shall conform to I.S. 1926-1980. Special like bends, shoes cowls, etc. shall conform to relevant Indian Standards. The interior of pipe shall have a smooth finish, regular, surface and regular internal diameter. The tolerance in all dimensions shall be as per I.S. 1926-Part-I-1980.

M-75 CRYDON BALL VALVE

Ball valve of screwed type including polythene float and necessary lever etc. shall be of the size as mentioned in the description of item and shall conform to I.S. 1703-1989.

M-76 BITUMEN FELT FOR WATER PROOFING AND DAMP PROOFING

76.1 Bitumen felt shall be on the fibre bases and shall be of type 2, self finished felt grade-2 and shall confor to I.S. 1322-1998.

M-77 SELECTED EARTH

77.1 The selected earth shall be that obtained from excavated material or shall have to be brought from outside as indicated in the item. If item does not indicate anything, the selected earth shall have to be brought from outside.

77.2 The selected earth shall be good yellow soil and shall be got approved from the Engineer-in-charge. In no case black cotton soil or similar expansive and shrinkable soil shall be used. It shall be clean and free from all rubbish and perishable Materials, stones or brick bats. The clods shall be broken to a size of 50 mm. or less. Contractor shall make his own arrangements at his own costs for land for borrowing selected earth. The stacking of Materials shall be done as directed by the Engineer-in-charge in such a way as not to interfere with any constructional activities and in proper stacks.

77.3 When excavated material is to be used, only selected stuff got approved from the Engineer-in-charge shall be used. It shall be stacked separately and shall comply with all the requirements of selected earth mentioned above.

M-78 BARBED WIRE

78.1. The barbed wire shall he of galvanised steel and it shall generally conform to I.S. 278-1978. The barbed wire shall be of types-I whose nominal diameter for line wire shall be 2.5 mm. and point wire 2 24 mm. The nominal distance between two barbs shall be 75 mm unless otherwise specified in the item. The bribed wire shall be formed by twisting together two tine wires. One containing the barbs. The size of the line and point wires and barb spacing shall be as specified above. The permissible deviation from the nominal diameter of the line wire and point wire shall not exceed + 0.08 mm

78.2. The barbs shall carry four points and shall be formed by twisting two point wires, each two turns tightly round one line wire making altogether four complete turns. The bards shall have a length of not less than 13 mm and not more than 18 mm. The point shall be sharp and cut at an angle not greater than 35 degree of the axis of the wire forming

the barbs.

78.3. The line and point wires shall be circular in section, free from scale and other defects and shall be uniformly galvanized. The line wire shall be in continuous length and shall not contain any welds other than those in the rod before it is drawn. The distance between two successive splices shall not be less than 15 meters.

78.4. The lengths per 100 Kg. of barbed wire I.S. type I shall be as under: Nominal 1000 meter Minimum 934 meter Maximum 1066 Meter.

M- 79 VITRIFIED FLOOR TILES

79.1 Vitrified floor tiles shall be of the best quality from manufacturers such as Orient, Kajaria, Johnson, Nitco, Somani, Bell, Asian, Euro as approved by the Engineer incharge.They shall conform to the IS 4457.

79.2 They shall be monolithic and available in anti-skid finish, having the size of 300 mm. x 300 mm. x 10 mm. thick.

79.3 They shall be rectified, which is the process of sizing & squaring, leading to almost perfect edges and enabling tile installation with very minor joints, giving the installed tiles a joint-free look. They shall be pre-sized and pre-polished.

79.4 Maximum deviation in length +- 0.3 %, maximum deviation in thickness +- 2.0 %, maximum, wedging allowed +- 0.27o, maximum surface flatness shall be +- 0.2 %,water absorption capacity < 0.5 %, maximum Mhos hardness 8.0, flexural strength shall be ot > 45 N/mm², maximum Abrasion resistances 144 mm³, maximum thermal expansion < (, x 10 '- maximum thermal shock resistance shall be of no damage, resistance lo acid (wt. loss) < 0.4 %, Skid resistance (friction coefficient > 0.6, breaking strength shall be 2600 N, density of (g/cm3) shall be 2.4 & no moisture expansion.

M-80 C- P.V.C. PIPES & FITTINGS

C-PVC (Chlorinated Poly Vinyl Chloride) SDR II should confirm to ASTM F 442, specific to C-PVC in Iron Pipe size (IPS) dimension, which also can be applied to C-PVC pipe in Coper Tube Size (CTS) dimension. Fitting should confirm to ASTM D 2846. Pipes and Fittings should be of ASTRAL make or as approved by Engineer-In-Charge.

M-81 GUN METAL WHEEL VALVE

81.1 The gun metal wheel valve shall be of approved quality.These shall be of gun metal fitted with wheel and shall be of gate valve opening full way and of the size as specified. These shall conform to I.S. 778-1971.

M-82 P.V.C. VALVE

82.1 The P.V.C. handle valve shall be of approved quality. These shall be of P.V.C. fitted with handle and shall be of gate valve opening full way and of the size as specified. These shall conform to relevant I.S.

M-83 ACRYLIC EMULSION PAINTS

83.1. It shall be from ICI, Nerolac, Asian Paints, Berger or equivalent, as approved by the Architect and Engineer-in-Charge. It shall conform to the relevant IS codes.

83.2. It shall be used on both interiors and exteriors, on all different types of plaster, wooden surfaces, stone, brickwork, asbestos cement sheets, hard and soft boards, etc. It shall render rich smooth finish and shall provide a tough film that forms a suitable protection against all elements.

83.3. II shall be water thinnable. It shall require no primer. On a well prepared surface, it shall be applied, after one coat of cement primer, in case it is an interior surface and waterproof cement coating, in case it is an exterior surface. On a new but highly absorbent surface, a thin coat of the same shall be applied by adding two parts of water by volume to two parts of acrylic emulsion by volume. On previously painted surfaces, one coal of the same shall be applied by thinning four parts of the emulsion with one or two parts of water. It shall be applied by brush, roller or spray. It shall have a covering capacity of 25 - 30 S.Mts./Liter, depending on the surface and shade used. It can be washed to remove the day-to-day dirt, after the surface has been painted, minimum for a month.

M-84 BALL VALVE

84.1. Ball valve of screwed type including polythene float and necessary level etc shall be of the size as mentioned in the description of item and shall conform to I.S 1703-1977.

M-85 CONCRETE TILES :

85.1 The plain cement concrete tiles shall be manufactured using the basic raw material of white cement with the addition of special chemical & quartz chips, which give the tiles extra strength. The concrete tiles shall be highly durable having very superior structure properties such as high

transverse and compresslve strength, very low water absorption and very low surface abrasion, supplied by manufacturer such as Roughwalk series, "Mozzaterra" by "Vyara Tiles", or Terrarock Tiles by Super Tiles & Marble Pvt. Ltd. or equivalent, as approved by the Architect and Engineer-in- Charge.

The tiles shall be manufactured using a vibration system and rubber moulds, under pressure. The tiles shall be subjected to a pressure of not less than 140 Kg./Cm². The proportion of cement to aggre gate, in the backing of the tiles shall be not less than 1 : 3, by weight.

The tiles shall be ;hot blasted to give it a special texture. The top shall be treated the two coats of acrylic coating, and factory polished and honed, ready to be fix in the exterior.

85.2 The concrete tiles shall be generally square in shape having all angles at perfect right angles and all the edges being sharp & true, having a size of 400 mm. x 40 mm. x 34 mm. thick. The tolerance allowed in length & breadth shall be +- 1.0 mm. & tolerance allowed in thickness shall be + 5 mm..

85.3 The tiles shall satisfy the test as regards transverse strength, resistance to wear absorption as per IS : 1237.

Water' Absorption :

Sampling : 6 tiles out of every 3,000 tiles are taken for testing.

Result : Absorption permissible, shall be at the most 1C) %.

Transveise strength test

Sampling : 12 tiles out of every 3,000 tiles are taken for testing.

Result : When wet : 80 Kg./Cm2.

When dry : 120 Kg./Cm2.

Abrasion test

Sampling : 6 tiles out of every 3,000 tiles are taken for testing.

Result : Average abrasion shall not be more than 3.5 mm.

These tiles shall have plain wearing surface, wherein pigments are used. They shall conform to IS : 1237. The pigments used for coloring cemenf shall not exceed 10 % by weight of cement used in the mix. The pigments, synthetic or otherwise, used for coloring tiles shall have permanent color and shall not contain Materials: detrimental to concrete.

M-86 CERAMIC TILES :

86.1 Ceramic tiles shall be of commercial quality from manufacturers such as Orient, Kajaria, Johnson, Nitco, Somani, Bell as approved by the Engineer incharge.

86.2 Ceramic tiles shall be lighlweight, with 6 mm. thickness with +- 5.0 % deviation. Therefore, they require thinner floor bedding compare to mosaic/stone flooring. Onlaying, they reqi ire no further polishing making the floor ready to live and use.

86.3 Ceramic tiles shall be of dimensions of 300 mm. x 300 mm. with +- 0.50 % deviation. All the sides shall be straight & square and the deviation allowed shall be maximum + - 0.40 %.

86.4 Ceramic tiles shall have plain and smooth surface quality, free of visual defects to the extent of minimum 95 % of tiles.

80.5 Ceramic tiles shall have no warping; their surface shall be flat, with maximum +- 0.5% deviation allowed.

86.6 Ceramic tiles shall have water absorption of no more than 4.0 %.

86.7 The bending strength of the ceramic tiles above 300 Kgs./Cm2.

86.8 The scratch resistant as per Moh's scale shall be minimum 5. The tiles shall be of group III qualify abrasion resistant.

86.9 The crazing resistance of the ceramic tiles shall be in conformity with norms.

86.10 The resistance fo staining of the ceramic tiles shall be minimum class II.

86.11 Ceramic tiles shall be resistant to all acids and alkalis except hydrofluoric acid and its compounds.

86.12 The thermal shock resistance shall be up to 10 cycles.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

SCHEDULE FOR TESTING OF MATERIALS

Sr.No.	Brief description of materials to be tested	Prescription of test which shall be carried out	Frequency @ which test shall be carried out (As per GERI Q.C. Vol-12002)
1.	Sand	(1) Gradation (2) Fineness Modulus (3) Specific Gravity (4) Water Absorption (5) Silt Content	1 per 150 Cumt for concrete or as per requirement of relevant specification.
2.	Coarse Aggregate	(1) Gradation (2) Impact Value (3) Flakiness Index (4) Water Absorption (5) Stripping Value	1 per 150 Cumt for concrete or as per requirement of relevant specification.
3.	C.C.Cube	(1) Compressive Strength	1-5 Cumt. 1-Test 6-15 Cumt. 2-Test 16-30 Cumt. 3-Test 29-50 Cumt. 4-Test 51 Cumt. & above 4 + 1 for each addl. 50 Cumt. or part of thereof.
4.	Flush Door	(1) End Immersion Test (2) Glue Adhesion Test	Randomly as per IS:7638: 1975
5.	Tiles	(1) Wet Transverse Strength (2) Water Absorption	Randamly as per Strength IS:4905:1968
6.	Flyash Brick	(1) Compressive Strength (2) Water Absorption	As per IS:5454:1978
7.	AAC Block	(1) Compressive Strength (2) Dry Density (3) Drying Shrinkage (4) Thermal conductivity	As per IS 2185 Part-3 As per IS 6441
8.	Cement	(1) Consistency test (2) Initial Setting time (3) Final setting time (4) Compressive Strenght (5) Fineness by Dry Sieving (6) Fineness by Specific Surface (7) Soundness by Le-Chatelier (8) Specific Gravity	Every 50 Tons or part thereof
9.	Steel	(1) Weight per meter (2) Yeild Stress/ 0.2 % Proof stress (3) % Elongation (4) Tensile Strenght	**(a) For Consigment below 100 tons** **(i)** Under 10 mm dia One sample for each 25 tons or part thereof (ii) 10 mm to 16 mm dia One Sample for each 35 tones or part thereof (iii) Over 16 mm dia One Sample for each 45 tons or part thereof. **(b) For Consigment over 100 tons** (i) Under 10 mm dia One sample for each 40 tons or part thereof (ii) 10 mm to 16 mm dia One Sample for each 45 tones or part there of
10.	Chemical Mortar for AAC Blocks	As per Relievent Latest IS-code	

Note:-

(1) For Sand and Coarse aggregate two Nos. of full bag for one sample shall be supplied by agency.

(2) For water test 5:00 liters of water shall be supplied by agency in plastic container for each sources.

(3) Sample from the lot shall be selected by authorized representative along with representative of SMC or TPI or PMC.

(4) Selected sample shall be handed over personaly by representative of S.M.C. or TPI or PMC in sealed condition with letter containing sample No. and sampling date.

(5) Test report should be received by the department containing reference of department's letter, sample No. sampling date and date of testing.

(6) All laboratory tests shall be conducted at the laboratory approved by SMC. The contractor can send the material in that laboratory also. The frequency for testing of samples (in either of the laboratories) shall be decided by Engineer-in-charge.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

GENERAL TECHNICAL SPECIFICATION FOR BUILDING WORKS

GENERAL :

1. In the specification "as directed"/"Approved" shall be taken to mean "as directed"/approved by the Engineer-in-charge.
2. Wherever a reference to any Indian Standard appears in the specifications, it shall be taken to mean as a reference to the latest edition of the same in force on the date of agreement.
3. In "Mode of Measurement" in the specification wherever a dispute arises in the absence of specific mention of a particular point or aspect, the provisions on these particular point or aspects in the relevant Indian Standards shall be refered to.
4. All measurements and computations, unless otherwise specified, shall be carried out nearest to the following limits :

   (i) Length, width and depth (height ..... 0.01 Mt.

   (ii) Areas ..... 0.01 Sq.Mt.

   (iii) Cubic Contents ..... 0.01 Cu.Mt.

   In recording dimensions of work.

   The sequence of length, width and height (depth) or thickness shall be followed.
5. The distance which constitutes lead shall be determined along the shortest partical route and not necessarily the route actually taken. The decision of the Engineer-in-charge in this regard shall be taken as final.
6. Where no lead is specified, it shall mean "all leads".
7. Lift shall be measured from plinth level.
8. Definite particulars covered in the items of work, though not mentioned or elucidated in its specifications shall be deemed to be included therein.
9. Reference to specifications of Materials as made in the detailed specification the items of works is in the form of a designation containing the number of the specification of the material and perfix `M' e.g. `M-s'.
10. Approval of the samples of various Materials given by the Engineer-in-charge shall not absolve the contractor from the responsibility of replacing defective material brought on site or Materials used in the work found defective at a later date. The contractor shall have no claim to any payment or compensation whatsoever on account of any such Materials being rejected by the Engineer-in-charge.
11. The contract rate of the item of work shall be for the work completed in all respects .
12. No collection of Materials shall be made before it is got approved from the Engineer-in-charge.
13. Collection of approved Materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent damage, deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.
14. Materials, if and when rejected by the Engineer-in-charge, shall be immediately removed from the site of work.
15. No Materials shall be stored prior to, during and after execution of a structure in such a way as to cause or lead to damage on overloading of the various components of the structure.

16. All work shall be carried out in a workmanlike manner as per the best techniques for the particular item.
17. All tools, templates, machinery and equipment for correct execution of the work as well as for checking lines, levels, alignment of the works during execution shall be kept in sufficient numbers and in good working condition on the site of the work.
18. The mode procedure and manner of, execution shall be such that it does not cause damage or over-londing of the various components of the structure during execution of after completion of the structure.
19. Special modes of construction not adopted in general Engineering practice, if proposed to be adopted by the Contractor, shall be considered only if the contractor provides swatisfactory evidence that such special mode of construction is safe, sound and helps in speedy construction and completion of work to the required strength and quality. Acceptance of the same by the Engineer-in-charge shall not, however, absolve the contractor of the responsibility of any adverse effects and consequences of adopting the same in the course of execution of completion of the work.
20. All installations pertaining to water supply and fixtures thereof as well as drainage lines and sanitary fittings shall be deemed to be completed only after giving satisfactory tests by the Contractor.
21. The contractor shall be responsible for observing the rules and regulations imposed under the "Minor Minerals Act", and such other laws and rules prescribed by Government from time to time.
22. All necessary safety measures and precautions (including those laid down in the various relevent Indian Standards) shall be taken to ensure the safety of men, Materials and machinery on the works as also of the work itself.
23. The testing charges of all Materials shall be borne by the Contractor.
24. Approval to any or the executed items for the work dose not in any way releive the contractor of his responsibility for the correctness, soundness and strength of the structure as per the drawings and specifications.

EXECUTIVE ENGINEER,
EAST ZONE (VARACHHA)-A
SURAT MUNICIPAL CORPORATION ,

SIGNATURE OF THE CONTRACTOR.

ITEMWISE DETAILED TECHNICAL SPECIFICATIONS

Item No.1 (A) :-

Excavation for foundation including sorting out and stacking of useful material and disposing of the excavated stuff upto 50 mt.lead and lift upto 1.5 mt.in all sorts of soil. Item also includes shoring,strutting etc.if required and bailing out of water (dewatering) if necessity arises with contractor's equipment etc.complete.

1.1.0 GENERAL

1.1.1 Any soil which generally yields to the application of pickaxes and shovels or jumpers or scarifiers phawaras rakes or any such excavation implement or organic soil, gravel, silt, sand turf loam, clay, peat etc. fall under this category.

1.2.0 CLEARING THE SITE

1.2.1 The site on which the structure is to be built shall be cleared, and all obstructions, loose stone, materials and rubbish of all kind, bush, wood and trees shall be removed as directed. The materials so obtained shall be the property of the Corporation and shall be conveyed and stacked as directed within 50 Mts. lead. The roots of the trees coming in the sides shall be cut and coated with a hot asphalt.

1.2.2 The rate of site clearance is deemed to be included in the rate of earth work for which no extra amount will be paid.

1.3.0 SETTING OUT

After clearing the site, the centre lines will be given by the Engineer-in-charge. The contractor shall assume full responsibility for alignment, elevation and dimension of each and every part of the work. The contractor shall supply labour, materials etc. required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

1.4.0 EXCAVATION

The excavation in foundation shall be carried out in true line and level and shall have the width and depth as shown in the drawings or as directed. The contractor shall do the necessary shoring and shuttering at his own cost and as approved by the Engineer or his Consultant. The payment for such precautionary measures shall be includedin this work. The bottom of the excavated area shall be levelled both longitudinally & transversely as directed by removing and watering as required. No earth filling will be allowed for bringing it to level, if by mistake or any other reason excavation is made deeper or wider than that shown on the plan or as directed. The extra depth or width shall be made up with concrete of the same proportion as specified for the foundation concrete at the cost of the contractor. The excavation upto 1.5 Mts. depth shall be measured under this item. The site conditions may require excavation in parts as per schedule of excavation. No extra payment will be claimed for this operation schedule.

1.5.0 DISPOSAL OF EXCAVATED MATERIALS

1.5.1 No materials excavated from the foundation trenches, of whatever kind they may be,are to be placed even temporarily upto 1.5 Mts. or at the distance prescribed by the Engineer, from the outer edge of excavation. All materials excavated shall remain the property of the Corporation. Rate of excavation shall include sorting out of useful materials and stacking them separately as directed within the specified lead. Materials suitable and useful for backfilling or other use shall be stacked in convenient places but not in such a way as to obstruct free movement of men, animals and vehicles or encroach upon the area required for constructional purposes.The site shall be left clean of all debris on completion.

1.5.2 Disposal of excavated materials is subject to the following - Unsuitable materials obtained from clearing site and excavation shall be disposed off within a lead or 50 Mts. as directed. Useful materials obtained from clearing site & excavation shall be stacked within lead of 50 Mts. beyond the building area as directed. Materials suitable for back- filling shall be stacked at convenient places within a lead of 50 Mts.and will be allowed to be used by the contractor on payment at rates laid down in the contract or if not so laid down,at scheduled rates of the Division or at mutually agreed rates if there are no such rates in the schedule of rates.

1.6.0 MODE OF MEASUREMENT AND PAYMENT

1.6.1 The measurement of excavation in trenches for foundation shall be made according to the sections of trenches shown on the drawing or as per secitons given by the Engineer- in-charge of as directed. No payment shall be made for surplus excavation made in excess or above requirements or due to stopping and sloping back as found necessary on account of conditions of soil and requirements of safety or construction schedule requiring excavation to be done in parts.

1.6.2 No extra payment shall be made for temporary pumping of water / sewage due to abnormal adverse conditions /climate.

1.6.3 The rate shall be for a unit of one cubic meter.

Item No.1 (B) :-

Excavation for foundation including sorting out and stacking of useful material and disposing of the excavated stuff upto 50 mt. lead includes shoring, strutting etc.if required and bailing out of water (dewatering) if necessity arises with contractor's equipment etc. complete.

1.1.0 WORKMANSHIP

1.1.1 The relevant specification of item No.1(A)shall be followed except that the excavation work shall be carried out in all sorts of soil with lift 1.5 Mts. to 2.0 Mts. & 2.0 to 2.5 mt depth.

1.2.0 MODE OF PAYMENT

1.2.1 The relevant specifications of item No.1(A) shall be followed.

1.2.2 The excavation work of lift 1.5 Mts. to 2.0 Mts. and 3.0 to 3.0 mt depth shall be measured under this item.

1.2.3 The rate shall be for a unit of one cubic metre.

ITEM NO.2 :-

Provding and laying cement concret 1:3:6 [1 cement:3 coarse sand :6 graded stone aggregate 40 mm nominal size] and curing complete including the cost of from work but excluding the cost of -reinforcement etc. complete.

2.1.0 Materials:-

Water shall conform to M-1. Cement shall conform to M.3.Sand shall conform to M-6.Stone aggrigate 40 mm nominal size shall conform to M-12.

2.2.0 WORKMANSHIP :

2.2.1 General :-

Before starting concreting the bed of foundation trenches shall be cleared of all loose materials, levelled, Waterred and rammed as directed.

2.2.2 Proportion of Mix :-

The proporation of cement, sand coarse aggregate shall be one part of cement, 3 parts of sand 6 parts of stone aggregate shall be measured by volume.

2.2.3 Mixing :-

The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consitency. However in such case 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1 1/2 to 2 minutes. The quantity of water shall be just sufficient to produce dense concrete of required workability for the purpose.

2.2.4 Transporting and placing the conrete :-

The concrete shall be handed from the place of mixing to the final position in not more than 15 minutes by the method as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

The concrete shall be laid in layers of 15 cms to 20 cms.

Compacting :-The concrete shall be rammed with heavy iron rammer and rapidly to get the required compaction and to allow the interstices to be filed with mortar.

2.2.5 Curing :-

After the final set,the concrete shall be kept continuously wet, if required by ponding for a period of not less than 7 days from the date of placement.

2.3.0 Mode of measurements and payment :-

The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

ITEM NO.3 :-

Providing and laying cement concrete work 1:1.5:3 [1 cement :1.5 coarse sand: 3 graded stone aggregates 20 mm nominal size] and curing complete including cost of form work and excluding cost of reinforcement for reinforced concrete work in [a] foundation footing, Base of columns and mass concrete [b] independent piers, columns and pillars [c] staircase [d] vertical and horizontal fins.

3.1.0 Materials :-

Water shall conform to M-1, Cement shall conform to M-3. Sand shall conform to M-6. Grit shall conform to M-8. Graded stone aggregate 20 mm nominal size shall conform to M-12.

3.2.0 General :-

3.2.1 The concrete mix is not required to designed by preliminary tests. The proportion of the concrete mix shall be 1:1.5:3 [1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size] by volume Concrete work shall have exposed concrete surface or as specified the item.

3.2.2 The designation ordinary M-100, M-150, M-200, M-250 specified as per I.S.corresponding approximately to 1:3:6 1:2:4, 1:1.5:3 and 1:1:2 nominal mix of ordinary concrete by volume respectively with conforming to IS:456.

3.2.3 The ingredients required for ordinary work, containing one bag of cement of 50 kg. by weight [0.0342 cu.m.] for different proportion of mix shall be as under.

Grade of concrete	Total quantity of dry aggregate by volume per 50 Kg. of cement to be taken as the sum of individual volume of fine and coarse aggregate maximum	Proportion of fine aggregate to coarse aggregate	Quantity of water per 50 Kg. of cement maximum
1.	2.	3.	4.
M-100 [1:3:6]	300 Litres	Generally 1:2 for fine aggregate to	34 litres.
M-150 [1:2:4]	220 Litres	Coarse aggregate by volume but subject	32 litres.
M-200 [1:1.5:3]	160 Litres	To and upper limit of 1:1 ½ and lower	30 litres
M-250 [1:1:2]	100 Litres	Limit 1:3	27 litres

3.2.4 The water cement ratios shall not be more then those specified in the table. The cement content of the mix specified in the table shall be increased if the quantity of water in a mix has to be increased to overcome the difficulties of placement and compaction so that the water cement ratio specified in the table is not exceeded.

3.2.5 Workability of the concrete shall be controlled by maintaining a water cement ratio that is found to give a concrete mix which is just sufficiently wet to be placed and compacted without difficulty with the means available.

3.2.6 The maximum size of coarse aggregate shall be as large as possible within the limits specified but in no case greater than one fourth of the minimum thickness of the member, provided that the concrete can be placed without difficulty so as to surround all reinforcement throughly and to fill the corners of the form.

3.2.7 For reinforced concrete work, coarse aggregates having a nominal size of 20 mm generally considered satisfactory.

3.2.8 For heavily reinforced concrete members as in the case of the ribs of main beams the nominal maximum size of coarse aggregate should usually be restricted to 5 mm, less than the minimum clear distance between the main bars, or 5 mm, less than the minimum cover to the reinforcement whichever is smaller.

3.2.9 Where the reinforcement is widely spaced as in solid slabs, limitations of size of the aggregate may not be so important and the nominal maximum size may some times be as great as or grearar than the minimum cover.

3.2.10 Admixture may be used in concrete only with approval of Engineer-in-charge based upon the evidance that with the passage of time; neither the compressive strength of concrete is reduced nor are other requisite qualities of concrete and steel impaired by the use of such admixtures.

3.3.0 WORKMANSHIP :

3.3.1 General :- The bars shall be kept in position by the following method:

In case of beam and slab construction, sufficient number of precast cover blocks in cement mortar 1:2 [1 cement 2 coarse sand] about 4 x 4 cms. section of thickness equal to the specified cover shall be placed between the bars and shuttering as to secureand maintain the requisite cover of concrete over the reinforcement.

In case or cantilevered or doubly reinforced beams or slabs, the main reinforcing bars shall be held in position by introducing cabin spacers or supports bars at 1.0 to 1.2 metres centres.

In case of columns and wall, the vertical bars shall be kept in position by means of timber timpltes with slotes accurately cut in them, the templtes shall be removed after concreting has

been done below it. The bars may also be suitably tied by means of annealed steel wires to the shuttering to maintain their position during concreting.

All bars projecting from pillars, columns,beams, slabs etc. to which other bars and concrete are to be attached or bounded to lateron, shall be protected with a coat of thin neat cement grout, if the bars are not likely to be incorporated with succedding mass of concrete within the following 10 days. This coat of thin neat cement shall be removed before concreting.

3.3.2Proportioning :-

Proportioning shall be done by volume, except cement which shall be measured in terms of bags of 50 kg. weight. The volume of one such bag being taken as 0.0342 cu. metre Boxes of suitable sizes shall be used for measuring sand and aggregate. The size of the boxes [internal] shall be 35x25 cms.and 40 cms.deep.While measuring the aggregate and sand,the boxes shall be filled without shaking, ramming or hammering. The proportioning of sand shall be on the basis if its dry volume and in case if damp sand, allowances for bulkage shall be made.

3.3.3 Mixing :-

3.3.3.1 For all work, concrete shall be mixed in a mechanical mixer which alongwith other accessories shall be kept in first class working condition and so maintained throughout the construction. Measured quantity of aggregate, sand and cement required for each batch shall be poured into the drum of the mechanical mixer while it is continously running. After about haif a minute of dry mixing measured quantity of water required for each batch of concrete mix shall be added gradually and mixing continued for another one and half minute. Mixing shall be continued till materials are uniformly distributed and uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate shown complete coating of mortar containing its proportinate amount of cement. In no case shall the mixing be done for less than two minutes after all ingredients have been put into the mixer.

3.3.3.2 When hand mixing is permitted by the Engineer-in-charge for small jobs or for certain other reasons, it shall be done on the smooth watertight platform large enought to allow efficient turning over the ingreadients of concrete before and after adding water.Mixing platform shall be so arranged that no foreign material gets mixed with concrete nor the mixing water flow out. Cement in required number of bags shall be placed in a uniform layer on top of the measured quantity of fine and coarse aggregate, which shall also be spread in a layer of uniform thickness on the mixing platform. Dry coarse and fine aggregate and cement shall then be mixed throughly by turning over to get a mixture of uniform colour. Specified quanitty of water shall then be added gradually through a rose can and the mass turned over till a mix of required consitency is obtained. In hand mixing, quantity of cement shall be increased by 10 percent above that specified.

3.3.3.3 Mixer which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch, unless otherwise agreed to by the Engineer-in-charge. The first batch of concrete from the mixture shall contain only two thirds of normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type of cement concrete to another.

3.3.4 Consistency :

The degree of consistency which shall depend upon the nature of the work and methods of vibration of concrete, shall be determined by regular slump test in accordance with I.S. 1199 : 1959. The slump of 10 mm to 25 mm shall be adopted when vibrators are used and 80 mm when vibrators are not used.

3.3.5 Inspection :

3.3.5.1 Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms to permit to inspect and accept the false work and froms as to their strength, alignmentand general fitness but such inspection shall not relieve the contractor of his res-ponsibility for the safety of men, machinary, materials and for results obtained. Immediately before concreting, all forms shall be thoroughly cleaned.

3.3.5.2 Centring design and its erection shall be got approved from the Engineer- in- charge. One carpenter with helper shall invariably kept present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited for reinforcement laid in position. For access to different parts suitable mobile platform shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, mortar blocks of suitable size shall be cast and tied to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose.

3.3.6 Transporting and laying :-

3.3.6.1 The method of transporting and placing concrete shall as approved.Concrete shall be so transported and placed that no contamination segregation or loss of its consituent material takes place.

3.3.6.2 All form work shall be cleaned and made free from standing water dust snow or ice immediately before placing of concrete. No concret shall be placed in any part of structure until the approval of Engineer-in-charge.

3.3.6.3 Concreting shall proceed continously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer. Except where otherwise agreed to by the Engineer-in-charge concrete shall be deposited in horizontal layers to a compacted depth of not more than 0.45 metre when internal vibrators are used and not exceeding 0.30 metre in all other cases.

3.3.6.4 Unless otherwise aggreed to by the Engineer-in-charge, concrete shall not be dropped into place from a height exceeding 2 meters.

3.3.6.5 When trunking or chutes are used they shall be kept close and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept clean, throughly wetted, and covered with a 13 mm thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself, this 13 mm layers of mortar shall be freshly mixed and placed immediately before placing of new concrete. Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislogement of any particles, of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed, and then coated with neat cement grout, The first layers of concrete to be placed on this surface shall not exceed 150 mm in thickness and shall be well rammed against old work, particular attention being given to corners and close spot.

3.3.6.6 All concrete shall be compacted to produce a dense homogeneeous mass with the assistance of vibrators, unless otherwise permitted by the Engineer - in - charge for exceptional cases such as concreting under water where vibrators cannot be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns.

3.3.6.7 Concrete shall be judged to be compacted when the mortar fills the spaces between the coarse aggregate and begins to cream upto form an even surface. Compaction shall be completed before the initial setting starts i.e. within 30minutes of addition of water to dry mixture. During compaction. It shall be observed that needle vibrators are not applied on reinforcement which is likely to destory the bond between concrete and reinforcement.

3.3.7 Curing :-

Immediately after compaction, concrete, weather including rain, running water, shocks, vibration, traffic, rapid tempreature changes frost and drying out process it shall be covered with wet sacking, hossion or other similar absorbant material approved, soon after the initial set and shall be kept continuously wet for a period of not less than 14 days from the date of placement. Masonary work over foundation concrete may be started after 48 hours of its laying but curing of concrete shall be continued for a minimum period of 14 days.

3.3.8 Sampling and Testing of concrete :-

3.3.8.1 Samples from fresh concrete shall be taken as per IS 1199:1999 and cubes shall be made, cured and tested at 7 days and 28 days as per requirements in accordance with IS 516:1959. A random sampling procedure shall be adopted to ensure that each concrete batch shall have a resonable chance of being tested i.e. the sampling should be spreed over the entire period of concreting and cover all mixing units. The minimum frequency of sampling of concrete of each grade shall be in accordance with following.

3.3.8.2

Quantity of concrete in the work	No. of samples
1-5 Cmt.	1
6-15 Cmt.	2
16-30 Cmt.	3
31-50 Cmt.	4
51-and above	4+one additional sample for each additional 50 cmt. or part there of.

Note:- Atleast one sample shall be taken from shift. The test specimens shall be made from each sample, five for testing at 7 days and the ramaining five at 28 days. The samples of concrete shall be taken on each day of the concreting as per above frequency. The number of specimens may be suitably increased as deemed necessary by the Engineer-in-charge when procedure of tests given above reveals a poor quality of concrete and in other special cases.

3.3.8.3 The average strength of the group of cubes cast for each day shall not be less than the specified cube strength of 150 kg/cm2 at 28 days. 20% of the cubes cast for each day may have value less than the specified strength provided the lowest value is not less than 85% of the specified strength. If the concrete made in accordance with the proportion given for a particular grade does not yield the specified strength such concrete shall be classified as belonging the the appropriate lower grade. Concrete made in accordance with the proportions given for a particular grade shall not, however, be placed in a higher grade on the ground that the test strength are higher than the minimum specified.

3.3.9 Stripping :

3.3.9.1 The Engineer- in- charge shall be informed in advance by the contractor of his intention to struck the form work. While fixing the time for removal of form work, due consideration shall be given to local conditions, character of the structure,the weather & other conditions that influence the setting of concrete and of the materials used in the mix. In normal circumstances [generally where temperatures are above 20'c] and where ordinary concrete is used forms may by struck after expiry of period specified in the Item No.4 for respective item of form work.

3.3.9.2 All form work shall be removed without causing any shock or vibration as would damage the concrete. Before the soffit are removed,the concrete surface shall be exposed, where necessary in order to ascertain that the concrete has sufficiently hardened.Centring shall be gradually and uniformly lowered in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually. Where internal metal ties are permitted they or their removeable parts shall be extracted without causing any damage to the concrete and ramaining holes filled with mortar. No permanently embeded metal part shall have less than 25 mm.Cover to the finished concrete surface. Where it is intended to re-use the from work, it shall be cleaned and made good to the satisfaction of the Engineer- in- charge. After removal of form work and shuttering, the Executive Engineer shall inspect the work and satisfy by random checks that concrete prosuded is of good quality.

3.3.9.3 Immediately after the removal of forms all exposed bolts etc. Passing through the cement member and used for shuttering or any other purpose shall be cut inside the cement concrete member to a depth of at least 25 mm. below the surface of the concrete and, the resulting holder be filled by cement mortar. All fins caused by from joints, all cavities produced by the removal of form ties and all other holes and depression, honeycomb spots, broken edges or cornersand other defects, shall be thoroughlly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the proportions used in the grade of concrete that is being finished and so as dry consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure thorough filling in all avoids.Surfaces which are pointed shall be kept moist for a period of 24 hours.

3.3.9.4 If rock pockets/honeycmbs in the opinion of the Engineer-in- charge are of such an extent or character as to effect the strength of the structure materially or to endanger the life of the steel reinforcement, he may declare portions of the structure affected.

3.4.0 Mode of measurement and payment :

3.4.1 The consolidated cubical contents of concrete work as specified in item shall be measured. The concrete laid in excess of section shown on drawings or as directed shall not be measured. No deductions shall be made for.

[a] Ends of dis-similar materials such as joints, beams, posts, girders, rafters, purline, trusses, corbels and steps etc.upto 500 sq.cm. in section.

[b] Opening upto 0.1 sq.m.

[c] The volume occupied by reinforcement shall not be deducted from R.C.C.work.

3.4.2 The rate includes cost of all materials labour, tools and plant required for mixing, placing inposition vibrating and compacting, finishing as directed, curing and all other incidential expenses for producing concrete of specified strength. The rate excludes the cost of form work.

3.4.3 The rate shall be for a unit of one cubic metre.

ITEM NO.3A :-

Providing and laying cement concrete work 1:2:4 [1 cement : 2 coarse sand: 4 graded stone aggregates 20 mm nominal size] and curing complete including cost of form work and excluding cost of reinforcement for reinforced concrete work in [a] foundation footing, Base of columns and mass concrete [b] independent piers, columns and pillars [c] staircase [d] vertical and horizontal fins.

Details specification as per Item No.3 but read 1:2:4 instead of 1:1.5:3 and as directed by Engineer-inc-ahrge.

The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

ITEM NO. 4 :-

Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering strutting and propping etc. Height of propping and centering below supporting floor to ceilling and removal of the same for in site reinforced concrete and plain concrete work in [a] Foundation,footing Bases of columns [b] columns, [c] Beams [d] Slabs [e] Lintels [f] Chaajas [g] Staircases [h] Staircases Landings [i] Vertical and Horizontal fins [j] Mass concrete etc.comp.

4.1.0 Materials :

The shuttering to be provided shall be of ordinary timber planks and shall conform to M-26. The dimensions of scantlings and battens shall conform to the dising. The strength of the wood shall not be less than that assumed in the design.

4.2.0 Workmanship :

4.2.1 The form work shall conform to the shape lines and dimensions as shown on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete. Adequate arrangements shall be made by the contractor to safe- guard against any settlement of the formwork during the course of concreting and after concreting. The form work of shuttering, centering, scaffolding, bracking etc.shall be as per design.

4.2.3 Cleaning and Treatment of forms :

4.2.3.1 All rubbish, particularly chippings shaving and saw dust shall be removed from the interior of the form before the concrerte is placed and the form work in contact with concrete shall be cleand and thoroughly wetted or treated. The surface shall be then coated with soap solution applied before concreting is done. Soap solution for the purpose shall be prepared by dissolving Yellow soap in water to get consistency of paint. Alternatively a coat of raw linseed oil/or form oil of approved manufacturer may be applied in case steel shuttering is used. Soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface.

4.2.3.2 Care shall be taken that the coating does not get on construction joint surface and reinforcement bars.

4.2.4 Stripping Time :

In normal circumstances and where ordinary cement is used forms may be struck after expiry of following period :

(a)	Side of wall columns and vertical fames of beam	24 to 48 hours
(b)	Beams soffits (Props. left under	7 days
(c)	Removal of props under slabs	
	(i) Slabs smpleing upto 4.5 m.	7 days
	(ii) Spanning over 4.5 mt.	14 days
(d)	Removal of props to beams and arches	
	(i) Spanning upto 6 mt.	14 days
	(ii) Spanning over 6 mt.	21 days

4.2.5 Procedure when removing the form work :

All form work shall be removed without such shock or vibrations as would damage the reinforced concrete surface.Before the soffit form work and struts are moved, the soffits and the concrete surface shall be exposed where necessary in order to ascertin that the concrete has suffi-ciently hardened.

4.2.6 Centering :-

4.2.6.1 The centering to be provided shall be got approved. It shall be sufficiently strong to ensure absolute safety of the form work and concrete work before, during and after pouring concrete. Watch should be kept to see that behaviour of centring and form work is satisfactory during concreting. Erection should also be such that it would all allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

4.2.6.2 The props of centring shall be provided on firm foundation or base of sufficient strength to carry the loads without any settlement.

4.2.6.3 The centring and form work shall be inspected and approved by the Engineer-in-charge before concrting. But this will not relive the contractor of his responsibility for strength, adequancy and safety of form work and centering.

4.2.6.4 If there is a failure of form work or centering, contractor shall be respecsible for the damages to the work, injury to life and damage to property

4.2.7 Scaffolding :-

4.2.7.1 All scaffolding,hoisting arrangement and ladders etc. required for the facilitating of concreting shall be provided and removed on completion of work by contractor at his own expense. The scaffolding hoisting arrangement and laddors etc. shall be strong enough to withstand all live, dead and impact loads expected to act and shall be subject to the approval of the Engineer-in-charge. However, contractor shall be solely responsible for the safety of the scaffolding, hoisting arrangements, ladders, work and workmen etc.

4.2.7.2 The scaffolding, hoisting arrangements and ladders shall allow easy, approach to the work spot and afford easy inspection.

4.2.7.4 The rate is applicable to all conditions of working The rate shall include the cost of materials and labour for various operations involved such as

[a] Splayed edges, notching, allowance for overlaps and passing at angle, battens centring, shuttering, propping bolting, Nailing, wedging, easing, striking and removal.

[b] Filleting to form stop chamfored edges of splayed external angles not exceeding 20 mm width to beams, columns and the like.

[c] Temporary openings in the forms for pouring concrete, if reguired, removing rubbish etc.

[d] Dressing with oil to prevent adhesion of concrete with shuttering,and

[e] Raking or circular cutting.

4.2.8 Re-Use:- Before- re- use all forms shall be inspected by Engineer-in-charge and their suitablity ascertained. The forms shall be scarred,cleaned and joints gone over, repaired. Inside surface shall be retreated to prevent adhesion of concrete.

4.3.0 Mode of measurement and payment :

Form work shall be measured as the area in square metres of shuttering in contact with concrete except in the case of inclined member and portion curved pro-file and upper side in which case only are of underside shall be measured for payment.

Form work to secondary beams shall be measured upto the side of main beams but no deduction shall be made from the work of the main beams at the inter section point.

No deduction shall be made from the form work of a column at intersection of beams. The rate is for the completed item.

The rate shall be for a unit of one sq.metre.

ITEMS NO. 5 :-

Providing and laying cement concrete 1:1.5:3 [1 Cement, 1.5 coarse sand:3 graded stone aggregates 20 mm nominal size] and finishing smooth with cement plaster in cement mortar 1:3 and curing etc. completing. including the cost of form work but excluding the cost of reinforcement for R.C.C. work in upto two level [A] Columns: [i] Having cross sectional area 0.05 to 0.08 sq.mt. [ii] Having cross sectional area more than 0.08 sq.mt. and upto 0.12 sq.mt. [iii] Having cross sectional area more than 0.12 sq.mt. and upto 0.18 sq.mt. [B] Beams : [i] Having cross sectional area 0.05 to 0.08 sq. meter. [ii] Having cross sectional area more than 0.08 sq.mt. upto 0.12 sq.meter. [iii] Having cross sectional area more than 0.12 sq.mt. and upto 0.18 sq. mt. [C] Slabs: [i] Slabs upto 8 cms.thickness [ii] Slabs having more than 8 cms. and upto 10 cms.thickness [iii] Slabs having more than 10 cms. and upto 13 cms. thickness [iv] Slab having more than 13 cms and upto 15 cms.thickness [D] Lintels: [E] chhajas etc.comp.

5.1.0 Materials and workmanship:-

The relevant specifications of Item No.3 shall be followed for concrete work and Item No. 4 shall be followed for form work and centering work. The relevant specification Item No. 15 shall be followed for the finishing work in mortar 1:3 [1 cement:3 fine sand] Before the Plastering is done. The surface of the concrete shall be racked roughened Punch for Proper bond Except the reinforced concrete works shall be carried out for the columns, beams slabs and lintels.

[A] The cross sectional are of columns shall be Specified in item.

[B] The cross sectional area of beam lintel shall be specified in item.

[C] The thickness of the slabs shall be specified in the item.

[D] The thickness of the lintel chhajs shall be specified in the item.

5.2.0 Mode of measurement and payment :-

5.2.1 The Consolidated Cubical Contents of Concrete work as Specified in item shall be measured.The concrete laid in excess of sections shown on drawings or as directed shall not be measured. No. deductions shall be made for [A] Ends of dis-similar materials such as joints, bems, posts, girders, refters, purlin trusses, corbels and steps etc. upto 500 sq.cm. in section. [B] Opening upto 0.1 Sq.M.

5.2.2 The rate includes cost of all materials labour, tools and plant required for mixing, placing in position, vibrating and compacting, finishing as directed, curing and all other incidental expenses for producing concrete of specified strength. The rate include the cost of form work. [The rate also includes smooth plaster.]

5.2.3 The volume occupied by reinforcement shall not be deducted from R.C.C.work.

5.2.4 The rate shall be for a unit of one cubic metre.

ITEMS NO.5A :-

Providing and laying cement concrete 1:1.5:3 [1 Cement, 1.5 coarse sand:3 graded stone aggregates 20 mm nominal size] and finishing smooth with cement plaster in cement mortar 1:3 and curing etc. completing. including the cost of form work but excluding the cost of reinforcement for R.C.C. work in upto two level [A] Columns: [i] Having cross sectional area 0.05 to 0.08 sq.mt. [ii] Having cross sectional area more than 0.08 sq.mt. and upto 0.12 sq.mt. [iii] Having cross sectional area more than 0.12 sq.mt. and upto 0.18 sq.mt. [B] Beams : [i] Having cross sectional area 0.05 to 0.08 sq. meter. [ii] Having cross sectional area more than 0.08 sq.mt. upto 0.12 sq.meter. [iii] Having cross sectional area more than 0.12 sq.mt. and upto 0.18 sq. mt. [C] Slabs: [i] Slabs upto 8 cms.thickness [ii] Slabs having more than 8 cms. and upto 10 cms.thickness [iii] Slabs having more than 10 cms. and upto 13 cms. thickness [iv] Slab having more than 13 cms and upto 15 cms.thickness [D] Lintels: [E] chhajas etc.comp.

Details specification as per Item No.5 but read 1:2:4 instead of 1:1.5:3 and as directed by Engineer-inc-ahrge.

The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

ITEM NO.6 : -

Providing and laying cement concrete 1:1.5:3 [1 Cement, 1.5 coarse sand:3 graded stone aggregade 20 mm. nominal size) for reinforceed concrete chhajas not exceeding 10 cms. thickness upto floor two to level including finishing the exposed surfaces with cement mortar 1:3 (1 Cement, 3 fine sand) to give a smooth and even surface, Centering and from work and Curing complete, excluding cost of reinforcement etc. complete.

6.1.0 MATERIALS AND WORKMANSHIP :-

The cement mortar shall conform to M-11. The relevant specification of Item No.3 shall be followed except that the reinforced concrete work shall be carried out for reinforced concrete chhajas not exceeding 10 cms in thickness.

The specifications for form work and centering shall be as per Item No.4.

The finishing work in cement mortar 1:3 (1 Cement : 3 fine sand) shall be carried out as per specifications of Item No. 15 except that the proportion of mortar is C.M. 1:3 insted 1:4 before the plastering is done, the surface of the concrete shall be raked/punch for proper bond.

MODE OF MEASUREMENT AND PAYMENT :

The relevant specifications of Item No.5 shall be followed the rate shall be for a unit of one cubic metre.

ITEM NO.7 :-

Providing and Fixing TMT/CRS bars steel reinforcement for R.C.C.work including bending, binding and placing in position complete upto floor two level etc.comp.

1. MATERIALS

1.1 Mild steel bars shall conform to M-18 Thermo Mechanically Treated steel bars (high yield strength steel deformed bars) shall conform to M-18, Mild steel binding wires shall conform to M-21.

2. WORKMANSHIP

2.1 The work shall consist of furnished and placing reinforcement to the shape and dimensions shown as on the drawings or as directed.

2.2 Steel shall be clean and free from rust and loose mill scale at the time of fixing in position and subsequent concreting.

2.3 Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed, using a proper bar bender, operated by hand or power to attain proper radius of bends, bars shall not be bent or straightened in a manner that will injure the material. Bars bent during transportation or handling shall be straightened before being used on the work. They shall not be heated to facilitate bending. Unless otherwise specified for mild steel a "U" type hook at the end of each bar shall invariably be provided to main reinforcement. The radius of the bend shall not be less than straight part of the bar beyond the end of the curve shall be at least four times the diameter of the bar. In case which are not round and in case of deformed bars, the diameter shall be taken as the diameter of the circle having an equivalent effective area. The hooks shall be suitably encased to prevent any splitting of the concrete. The cold twisted steel bears shall be used without hooks at the ends. Deformed bars without hooks shall, however, comply with relevant anchorage requirements.

2.4 All the reinforcement bars shall be accurately placed in exactly the same position as shown on the drawings, and shall be securely held in position during placing of concrete by annealed binding wire not less than 1 mm. in size, and by using stay blocks or metal chair spacers, metal handers, supporting wires or other approved devices at sufficiently close intervals. Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. All devices used for positioning shall be of non-corrodible material. Wooden and metal supports shall not extend to the surface of the concrete, except where shown on the drawings. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing shall not be allowed. Pieces of broken stone or brick wooden blocks shall not be used. Layers of bars shall be separated by spacer bars, precast mortar blocks or other approved devices. Reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. Special care shall be exercised to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement from corrosion, concrete cover shall be provided as indicated on drawings. All the bars are to be spliced and which are likely to be exceeding 10 days shall be protected by a thick coat of neat cement grout.

2.5 Bars crossing each other where required shall be secured by binding wires (annealed) of size not less than 1 mm. in such a manner that they do not slip over each other at the time of fixing and concreting.

2.6 As far as possible, bars of full length shall be used, in case this is not possible, overlapping of bars shall be done as directed. when practicable, overlapping bars shall not touch each other, but be kept apart by 25 mm. or 125 times the maximum size of the coarse aggregate whichever is greater between them. Where not feasible, overlapping bars shall be bound with annealed wires, not less than 1 mm. thick twisted tight. The overlaps shall be staggered for different bars and located at points, along the span where neither shear nor bending moment is maximum.

2.7 Whereever indicated on the drawings or desired by the Engineer-in-charge, bars shall be joined by couplings which shall have a cross section sufficient to transmit the full stresses of bars. The ends of the bars that are joined by coupling shall be upset for sufficient length so that the effective cross section at the base of threads is not less than the normal cross section of the bar. Threads shall be standard threads. Steel for coupling shall conform to I.S-226.

2.8 When permitted or specified on the drawings, joints of reinforcement bars shall be welded so as to transmit their full stresses. Welded joints shall preferably be located at points when steel will not be subjected to more than 75% of the maximum permissible stresses and welds so staggered

that at any one section not more than 20% of the rods are welded. Only electric welding using a process which excludes air from molten and conforms to any or all other special provisions for the work shall be accepted. Suitable means shall be provided for holding bars securely in postion during welding. It shall be ensured that no voids are left in welding and when welding is done in two or three stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding. Only competent welders shall be employed on the work. The M.S. electrodes used for welding shall conform to I.S. 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of test shall be as directed.

3. MODE OF MEASUREMENT & PAYMENT

3.1 For the purpose of calculating consumption, wastage shall not be permitted beyond 7.5%. Excess consumption over 7.5% will be charged at penalty rate.

3.2 Reinforcement shall be measured in length including overlaps, separately for different diameters as actually used in the work. Where welding or coupling is resorted to, in place do lap joints, such joints shall be measured for payment as equivalent length of overlap as per design requirement. From the length so measured, the weight of reinforcement shall be calculated in tonnes on the same basis of as per M-14 even though steel is supplied to the contractor by the department on actual weight. Length shall include hooks at the ends. Wastage and annealed steel wire for binding shall not be measured and the cost of these items shall be deemed to be included in the rate for reinforcement.

3.3 The rate for reinforcement includes cost of steel binding wires, its transporting from departmental store to work site, cutting, bending, placing and fixing in position as shown on the drawings and as directed. It shall also include all devices for keeping reinforcement in approved position, cost of joining as per approved method and all wastage and spacer bars.

3.4 The rate shall be for unit of one Kg.

Item No. 8 :

Providing & constructing brick masonary work using flyash building bricks having crushing strength not less than 70 Kgs./Sq.Cm.in cement mortar 1:6 (1 cement :6 fine sand) in line, level and plumb including curing, scaffolding etc. comp. as directed by the Engineer-in-charge

8.1.0 MATERIALS

Water shall conform to M-1, Cement shall conform to M-3, Sand shall conform to M-6, Flyash Building Bricks shall conform to M-15(A), Cement mortar shall conform to M-11.

8.2.0 WORKMANSHIP

8.2.1 Proportion : The proportion of cement mortar shall be 1:6 (1 cement, 6 fine sand) by volume.

8.2.2 Wetting of bricks : The bricks required for masonary work shall be thoroughly wetted with clean water for about two hours before use or as directed. The cessation of bubbles, when the bricks are wetted with water, is an indication of thorough wetting of bricks.

8.2.3 Laying : Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete the bond. Closures in such case shall be cut to required size and used near the ends of the walls.

A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be properly bedded and set home by gently tapping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of course, the vertical jjoints shall be fully filled from the top with mortar.

The walls shall be taken up truly in plumb. All courses shall be truly horizontal and all vertical joint shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other. The thickness of brick course shall be kept in uniform.

The brick shall be laid with frogs up wards. A set of tools comprising of wooden straight edges, manson's spirit level, square half metre rub, and pins, string and plumb shall be kept on the site of work for frequent checking during the progress of work.

Both the faces of walls of thickness greater than 23 cms. shall be kept in proper place. All the connected brick work shall be kept not more than one metre over the rest of the work. Where this is not possible, the work shall beraked back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

All fixtures, pipes, outlet of water, hold fasts of doors and windows etc. which are required to be built in wall shall be embeded in cement mortar.

8.2.4 Joints : Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exposed 12 mm. The face joints shall be raked out as directed by raking tool daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to done.

The face of brick shall be cleaned the very day on which the brick work is laid and all mortar droping removed.

8.2.5 Curing : Green work shall be protected from rain suitably. Masonary work shall be kept moists on all the faces for a period of seven days. The top of masonary work shall be kept well wetted at the close of the day.

8.2.6 Preparation of Foundation Bed : If the foundation is to be laid, directly on the excavated bed, the bed shall be levelled, cleared of all loose materials, cleaned and wetted before starting masonary. If masonary is to be laid on concrete footing the top of concrete shall be cleaned and moistened. The contractor shall obtain the engineer's approval for the foundation bed, before foundation masonary is started. When pucca flooring is to be provided flush with the top to plinth, the inside plinth offset shall be kept lower than the outside plinth top by the thickness of the flooring.

8.2.7 Fixtures - The frames of doors, windows, cup-boards etc. shall be housed into the brick work at the correct location and level as directed. The heavy steel doors, window frames etc. shall be built in with brick work, but for ordinary steel doors and windows required opening for frames, hold-fasts etc. shall be left in the wall and frames embeded later on in order to avoid damage to the frames.

8.2.8 Scaffolding - Necessary scaffolding shall be provided. The supports of the scaffolding shall be sound and strong tied together with horizontal pieces, over which the scaffolding plunks shall be fixed. Simple scaffolding shall be allowed normally. In this case scaffolding hole shall rest in hole header horizontal course only. Minimum number of holes shall be left in brick work for supporting horizontal scaffolding poles. The contractor is responsible for providing and maintianing sufficiently strong scaffolding so as to withstand all loads likely to come upon it.

8.2.9 Packing out of Joints - For the face of brick work, where plastering is to be done, joints shall be raked out to a depth not less than thickness of joints. The false of brick work shall be cleaned and mortar dropping removed on very same day that brick work is laid.

8.3.0 MODE OF MEASUREMENTS & PAYMENT :

8.3.1 The measurements of this item shall be taken for the brick masonary fully completed for limiting dimensions not exceeding those shown on the plans or as directed shall be final.

8.3.2 No deductions shall be made from quantity of brick work. No extra payment will be made for embedding in masonary holes is respect of the following items ---

i] Ends of joints, beams, posts, girders, rafters, purlins truses corbel, steps etc. where cross sectional area does not exceed 500 Sq.Cm.

ii] Opening not exceeding 1000 Sq.Cm.

iii] Wall plate sand bed plates, bearing of slab, chajjas, and like whose thickness does not exceed 10 Cms. and the bearing does not extend the full thickness of wall.

iv] Drainage holes and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.

v] Iron fixtures; pipes upto 300 mm. dia. hold fasts of doors and windows built into masonary and pipes etc. for concealed wiring.

vi] Forming charges of section not exceeding 350 Sq.Cm. in masonary.

vii] Apertures for fire places, shall not be deducted nor shall extra labour required to make splaying of jamps, throating and making arches over the aperture be paid for separately.

8.3.3 The rate shall be for a unit of one cubic metre.

ITEM NO.9 :-

Providing and constructing brick work using Flyash building bricks having crushing strength not less than 70 Kg/Sq.cm for super structure above plinth level upto floor two level in cement mortar 1:6 (1 Cement : 6 fine sand) etc. complete.

9.1.0 Materials :

Flyash Building Bricks shall conform to M-15(A). Cement Mortar shall conform to M-11.

9.2.0 Workmanship :

The relevant specifications of Item No. 8 shall be followed except that the masonary work shall be carried out above plinth level to floor two level i.e. for ground floor.

The frames of doors, windows, cupboards etc. shall be housed into the brick work at the correct location and level as directed. The steel doors, window frames etc. shall be built in with brick

work, but for ordinary steel doors and windows required opening for frames, hold fasts etc.shall be left in the wall and frames embedded later on in order to avoid damage to the frames.
Necessary scaffolding shall be provided. The supports of the scaff, olding shall be sound and strongly tied together with horizontal pieces, over which the scaffolding planks shall be fixed.
Simple scaffolding shall be allowed normally. In this case scaffolding hole shall rest in hole header horizontal coarse only. Minimum number of holes shall be left in brick work for supporting horizontal scaffolding poles.
The contractor is responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it.
For the face of brick work, where plastering is to be done, joints of brick work shall be cleaned and mortar dropping removed on very same day that brick work is laid.

9.3.0 Mode of measurements and payments :
The masonary work of G.F. i.e. above plinth level to floor two level shall be measured and paid under this item.
Brick work in parapet shall be included in the corresponding masonary item of story immediately below the floor above which the parapet is built.
No deductions shall be made from quantity of brick work. Not any extra payment made for embedding in masonary or making holes in respect of following itsm.

(i) Ends of joists, beams, posts, girder, rafters, purlins, trusses, corble, steps etc. where cross sectional area does not exceed 500 sq.cm.
(ii) Openings not exceeding 1000 sq.cm.
(iii) Wall plates and bed plates bearing of slabs, chhajas and the like whose thickness does not exceed 10 cms. and the bearing does not extend to the full thickness of wall.
(iv) Drainage holes, and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.
(v) Iron fixtures, pipes upto 300 mm dia hold fasts, for doors and window built into masonary and pipes etc. for concealed wiring.
(vi) Forming cheses of section of exceeding 350 sq.cm. in masonary.
(vii) Apertures for fire places shall not be deducted not shall extra labour required to make splaying of jambs, throating and making arches over the aperture be paid for separately.

The rate shall be for a unit of one cubic metre.

ITEM NO.10 :

Providing and constructing brick work using Flyash building bricks having crushing strength not less than 70 kg./sq.cm. for super structure above floor two level in cement mortar 1:6 (1 Cement : 6 fine sand) etc. comp.

10.1.0 MATERIALS AND WORKMANSHIP :
The relevant specifications of Item No.9 shall be followed except that the masonary work shall be carried out for super structure above fllor two level.

10.2.0 MODE OF MEASUREMENTS AND PAYMENT :
The relevant specification of Item No.9 shall be followed for masonary work.
The extra payment shall be made for additional lift above floor two level to each additional floor over and above the rate of masonary work and shall be measured and paid under this item.
The rate shall be for a unit of one cubic metre per floor.

ITEM NO. 11 :

Providing & Constructing Half brick masonary in Flyash building bricks having crushing strength not less than 70 Kgs. / Sq. Cm.in cement mortar 1:4 (1 cement; 4 coarse sand) with 2 Nos. of 6 mm dia mild steel bars after every three course embaded in cement mortar for super structre above plinth level upto floor two level as directed etc.comp.

11.1.0 MATERIALS
11.1.1 Flyash Building Brick shall conform to M-15, Water shall conform to M-1, Cement shall conform to M-3, Sand shall conform to M-6, Cement mortar shall conform to M-11.
11.2.0 WORKMANSHIP
11.2.1 Relevant specifications of bricks, wetting and laying of bricks, joints, curing etc. shall conform to item No. 9 except the brick work of half bricks shall be carried out.
11.2.2 Cement mortar used in masonary work shall be in proportion of 1 part of cement and 3 parts of sand by volume.
11.2.3 All bricks shall be laid strecher wise, breaking joints with those in the upper and lower courses.
The wall shall be taken truly plumb. All courses shall be laid truly horizontal and all vertical

joints shall be truly veritcal. the bricks shall be laid with frogs upwards. A set of masons tools shall be maintained on work as required for frequent checking.

11.3.0 MODE OF MEASUREMENTS & PAYMENTS

11.3.1 The half brick masonary work in foundation and plinth shall be measured under this item, the limiting dimensions shall not exceed those shown in the plan or as directed. Any work done extra over the specified dimensions shall be ignored.

11.3.2 The rates included laying of 2 Nos. of 6 mm M.S. bars after every three course.

11.3.3 The relevant specifications of Item No.9 shall be followed. The length shall be measured nearest to 1 Cm.

11.3.4 The rate shall be for a unit of 1 Sq.Mts.

ITEM NO.12 :

Providing and construction half Flyash building brick having crushing strength not less than 70 kg/sq.cm. in cement mortar 1:4 (1 Cement : 4 coarse sand) in super structure above floor two level etc. complete.

12.1.0 MATERIAL AND WORKMANSHIP :

The relevant specification for Item No.11 shall be followed except that the masonary work shall be carried out in super structure above floor two level etc. complete.

12.2.0 MODE OF MEASUREMENTS AND PAYMENTS :

The relevant specifications of Item No.11 shall be followed. The payment shall be made for the half brick masonary work carried out above floor two level.

The rate shall be for a unit of one Sq.mt. per floor.

ITEM NO.13 :-

Providing and filling in foundation and plinth with yellow soil or selected soil in layers of 20 cm. thickness including watering ramming and consolidating etc.comp.

13.1.0 Materials :-

Murrum shall be cleaned, of good binding quality, and of approved quality obtained from approved pots/ quarries of disintegrated rock which contain silicious material and natural mixture of clay of calcarious origin. The size of murrum shall not be more than 20 mm.

13.2.0 Workmanship:-

13.2.1 The murrum to be used for filling shall be free from salts, organic or other foreign matter. All clods of murrum shall be broken.

13.2.2 As soon as the work in foundation has been completed and measured the site of foundation shall be cleared of all debris, brick bats, morter dropping etc. and fillied with murrum in layers not exceeding 20 Cms. Each layers shall be adequately watered, rammed and consolidated before the succeeding layer is laid. The murrum shall be rammed with iron rammers where feasible and with the butt ends of crowbars, where rammer cannot be used.

13.2.3 The plinth shall be similarly filled with murrum in layers not exceeding 20 cms. adequately watered and consolidated by ramming with iron or wooden rammers. When filling reaches finished level, the surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated.

13.2.4 The finished level of filling shall be kept to shape intended to be given to the floor.

13.2.5 In case of large heavy duty flooring like factory flooring, the consolidation may be done by power rollers, where so specified. The extent of consolidation shall also be as specified.

13.2.6 The excavated stuff of the selected type shall be allowed to be used in filling the trenches and plinth. Under no circumstances blackcottom soil shall be used for filling the plinth.

13.3.0 Mode of measurement and payment :-

13.3.1 The payment shall be made for filling in plinth and trenches. No deduction shall be made for shrinkage of voids if consolidated as instructed above.

13.3.2 The rate includes cost of collecting and carting murrum or selected murrum of approved quality with all lead and labour required for filling in trenches and plinth.

13.3.3 The rate shall be for a unit of one cubic metre.

ITEM NO.14 :

Filling in trenches with available excavated soil including watering and consolidating etc. complete inclifomg spreading the available soil as per instruction of Engineer-in- charge etc. complete.

1.0 FILLING AND DISPOSAL OF THE EXCAVATED STUFF :

The excavated stuff of the selected type shall be used in filling the trenches and plinth or leveling the ground in layers. Under no circumstances black cotton soil shall be used for filling the trenches

and plinth. The earth to be used for filling shall be free from salts organic or other foreign matter. All clods of earth shall be broken. As soon as the work in foundation has been completed and measured the site of foundation shall be cleared of the debris, brick bats, mortar dropping and filled with earth in-layers not exceeding 20cms. Each layer shall be adequately watered, rammed and console-dated before the succeeding layer is alid. The earth shall be rammed with iron rammers where feasible and with the butt ends of crow-bere where rammers cannot be used. When filling reaches finised level. The surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated.

The blance of the excavated quantity shall be removed by the contractor from the site of work to a place as directed with lead upto 50 M. and all lift.

2.0 MODE OF MEASUREMENTS AND PAYMENT :

2.1 The payment shall be made for filling in plinth and trenches. No deduction shall be made for shrinkage or voids. If consolidated as instructed above.

2.2 The rate shall be for a unit of one cubic metre.

ITEM NO. 15 :-

Providing and applying **10mm. thick cement plaster** in single coat on brick/concretewalls for plastering and finished even and smooth with a floating coat of near cement slurry mixed with proportion etc. complete in cement mortar 1:3 (1 cement : 3 sand)

15.1.0 MATERIALS

Water shall conform to M-1. The cement mortar of proportion 1:3 shall conform to M-11.

15.2.0 WORKMANSHIP

15.2.1 Scaffolding - Wooden ballies, bamboos, planks, treatles and other scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

15.2.2 Preparation of Background - The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, afflorsence and other foreign matter by water or by brushing. Smooth surface be roughened by wire brushing if it is not hard and hacking if it is hard. In case of concrete surface, if a chemical retarder has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface. Trimming of projections on brick/concrete surfaces where necessary shall be carried out to get an even surface.

Raking of joints in case of masonary work where necessary, shall be allowed to dry out for sufficient period before carrying out the plaster work.

The work shall not be soaked but only damped evenly before applying the plaster. If the surface becomes dry, such areas shall be moistened again.

For external plaster, the plastering operation shall be started from top floor and carried downwards. For internal plaster, the plastering operations may be started wherever the building frame and cladding work are ready and the temporary supports of the ceiling resting on the wall of the floor have been removed. Ceiling plaster shall be completed before starting plaster to walls.

15.2.3 APPLICATION OF PLASTER

The plaster about 15 x 15 Cms. shall be first applied horizontally and vertically at not more than 2 metres intervals over the entire surface to serve as gauge. The surface gauges shall be truly in place of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness then brought to a true surface by working a wooden straight edge reaching across the gauges with small upward and sideways movements at a time. Finally, the surface shall be finished off true with a trowel of wooden flat according as a smooth or a sandy granular texture is required. Excessive trowelling or overworking the float shall be avoided. All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering, corners, junctions etc.shall be carried out with proper templates to the size required.

Cement plaster shall be used within half an hour after addition of water. Any mortar or plaster which is partially set shall be rejected and removed forthwith from the site. In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically. When recommending the plaster, the edges of the old work shall be scrapped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and nearer that 15 cms. to any corners or arises. It shall not be closed on the body of features

such as plaster bands and cornices not at the corners or arrises. Horizontal points in plaster work shall not also occur on parapet tops and copings as those invariably lead to leakage. No portion of the surface shall be left out initially to be packed up later on.

Each coat shall be kept damp continuously till the next coat is applied for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking or walls shall be avoided and only as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of building in hot air to dry weather shall be prevented by hanging mattings or gunny bags on the outside of the plaster and keeping them wet.

15.3.0 MODE OF MEASUREMENTS & PAYMENT

15.3.1 The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.

15.3.2 All plastering shall be measured in square metres unless otherwise specified. Length, breadth or height shall be measured correct to a cenimetre.

15.3.3 Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm. at any point on this surface.

15.3.4 This item includes plastering upto floor two level.

15.3.5 The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of conrnices if any, shall be deducted.

15.3.6 Soffits of stairs shall be measured as plastering on ceilings. Blowing soffits shall be measured separately.

15.3.7 For jambs, soffits, sills etc. for openings not exceeding 0.5 Sq.Mts. each in area for ends of joints, beams, posts, girders, step etc. not exceeding 0.5 Sq.Mts. each in area for and for openings exceeding 0.5 Sq.Mts. and not exceeding 3 Sq.Mts. in each area deductions and additions shall be made in the following manner ---

a] No deductions shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 Sq.Mts. each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings for finish to plaster around ends of joints, beams, posts etc.

b] Deduction for openings exceeding 0.5 Sq.Mts. but not exceeding 3 Sq.Mts. each shall be made as follows and no additions shall be made for reveals, jambs, soffits sills etc. of these openings --

i] When both faces of all wall are plastered with same plaster, deduction shall be made for one face only.

ii] When two faces of wall are plastered with different types of plaster or if one face is plastered and the other pointed, deductions shall be made from the plaster or pointing on the side of frame for doors, windows etc. on which width of reveals is less than that on the other side but no deduction shall be made on the other side. Where width of reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from areas of plaster and/or pointing as the case may be.

15.3.8 For openings having door frames equal to projecting beyond the thickness of wall, full deductions for opening shall be made from each plastered face of the wall.

15.3.9 In case of opening of area above 3 Sq.Mts. each deductions shall be made for opening but jambs, soffits and sills shall be measured.

15.3.10 The rate shall be for a unit of one Sq.Mts.

ITEM NO.16 :

Providing and applying 10 mm thick cement plaster in single coat on Brick/concrete structure for plastering above floor two level for every additional storey height and finished even and smooth with a floating coat of neat cement slurry height and finished even and smooth with a floating coat of neat cement slurry etc. comp. in cement mortar 1:3 (1 Cement : 3 sand) for wall.

16.1.0 MATERIALS AND WORKMANSHIP :

The relevant specifications of Item No.15 shall be followed for plastering work except that the whole work is to be carried out above floor two level.

16.2.0 MODE OF MEASUREMENTS AND PAYMENT :

The mode of measurements and payment shall be same as per Item No. 15

The extra payment shall be made over and above the floor two level, rate for every additional floor height.

The rate shall be for unit of one Sq.mt.

ITEM No.17 :

Providing and applying 10 mm thick cement plaster in single coat on ceiling and soffits of stairs for plastering upto floor two level and finished even and smooth with a floating coat of neat cement slurry etc. complete in cement mortar 1:2 (1 Cement, 3 sand)

17.1.0 MATERIALS AND WORKMANSHIP :

The relevant specifications of Item No.15 shall be followed for plastering work except that this work is for ceiling and soffits of stairs upto two floor level instead of plaster on walls.

The smooth concrete surface shall be suitably roughened to provide necessary bond before plastering.

17.2.0 MODE OF MEASUREMENTS AND PAYMENT :

The relevant specification of Item No.15 is shall be followed. The payment shall be made for a unit of one Sq.mt. of work done extra over and above the payment of plaster work on wall surfaces, shall be measured and paid under this item.

The rate shall be for a unit of one Sq.mt.

ITEM No.18 :

Providing and applying 10 mm thick cement plaster in single coat on celing and soffits of stairs for plastering above floor two level for every additional storey height and finished even and smooth with a floating coat of neat cement slurry etc. comp. in cement mortar 1:3 (1 Cement : 3 sand).

18.1.0 MATERIALS AND WORKMANSHIP :

The relevant specifications of Item No.17 shall be followed except that the whole work is to be carried out to above floor two level.

18.2.0 MODE OF MEASUREMENTS AND PAYMENT :

The mode of measurements and payment shall be same as per Item No.17.

The extra payment shall be made over and above the floor two level, rate for every additional floor height.

The rate shall be for a unit of one Sq.metre.

ITEM NO.19 :-

Providing and applying 20 mm.thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12 mm. thick backing coat of C.M.1:3 [1 cement:3 sand and 8 mm.thick finishing coat in C.M. 1:1 [1 cement:1 sand] etc.comp.

19.1.0 Materials :-

Water shall conform to M-1 cement mortar shall conform to M-11.

19.2.0 Workmanship :-

19.2.1 The work shall be carried out in two coats. The backing coat [baseoat] shall be 12 mm. thick in C.M. 1:3. The relevent specifications of Item No.15 shall be followed except that the thickness of back coat shall be 12 mm. average and the proportion shall be of cement mortar 1:3 [1 cement:3 sand]. Before the first coat hardens its surface shall be beaten up by edges of wooden tappers and close dents shall be made on the surface subsequent coat shall be applied after this coat has been allowed to set for 3 to 5 days, depending upon the weather conditions. The surface shall not be allowed to dry during this period.

The second coat shall be completed to 8 mm thickness in C.M. 1:1 as described above, including raising sand facing by bushing.The sample of sand face shall be got approved before the work is started. The whole work shall be carried out uniformly as per sample approved.

19.2.2 Curing :-

The curing shall be started overnight after finishing of plater.The plaster shall be kept wet for a period of 7 days. During this period, it shall be protected from all damages.

19.3.0 Mode of Measurements and payment :-

19.3.1 The relevent specifications of Item No.14 shall be followed except that the sand face plaster in outside upto 10 m. above ground level shall be measured and paid under this item.

19.3.2 The rate shall be for a unit of one sq.metre.

ITEM NO.19 A :-

Providing and Applying 20mm th. Roller Plster on walls and similar surfaces on all floors levels consisting of 12 mm Avg. backing coat of CM 1:3 and 8mm th. finishing coat of CM 1:1 on all floors Details specification as per Self.Expl. and as directed by Engineer-in-charge. The rate shall be for a unit of one square metre.

ITEM NO. 20 :-

Prov 35 mm wide throating of plaster drip etc.comp

20.1.0 Materials :-

Water shall conform to M-1. Cement shall conform to M-3. Sand conform to M-6. Cement mortar shall conform to M-11.

20.2.0 Workmanship :-

The work shall be carried out as directed. The proportion of mix for finishing, touching shall be in C.M. 1:2 by volume. Curing shall be done for not less than 7 days.The work shall be carried out in best workman like manner. The throating or plaster drip and moulding shall be one centimetre in thickness.

20.3.0 Mode of Measurements and payment :-

20.3.1 The rate includes cost of all materials and labour required to complete the item.

20.3.2 The rate shall be for a unit of one R.M.

ITEM NO. 20 A:-

Providing 20 mm deep finished groove in plaster in line and level etc. Comp. For all Floor (M.R.)

1.1.0 Materials :-

Water shall conform to M-1. Cement shall conform to M-3. Sand conform to M-6. Cement mortar shall conform to M-11.

1.2.0 Workmanship :-

The work shall be carried out as directed. The proportion of mix for finishing, touching shall be in C.M. 1:2 by volume. Curing shall be done for not less than 7 days.The work shall be carried out in best workman like manner. The throating or plaster drip and moulding shall be one centimetre in thickness.

1.3.0 Mode of Measurements and payment :-

1.3.1 The rate includes cost of all materials and labour required to complete the item.

20.3.2 The rate shall be for a unit of one R.M.

ITEM NO 21:-

White washing with lime or any colour mix on ceiling and wall surface (three coats) to give an even shade including thoroughly brooming the surface to remove all dirt, dust, mortar drops and other foreign materials at all floors etc.comp.

21.1.0 MATERIALS

21.1.1 The clear colour shall be made from glue and boiling water. The mixture shall be suitably tinted where required for use under coloured distemper if directed. Glue shall conform to I.S. 852-1969 (Specifications for animal glue).

21.1.2 Lime used shall be freshly brunt class `C' lime (fat lime) and white in colour conforming to I.S. 712-1973. Water shall conform to M-1. Best quality of gum shall be used in the preparation of white wash. Ultramarine blue or indigo shall conform to I.S. 55-1970 for points, and shall be used for preparation of white wash. Pigments, mineral colours, not affected by lime shall be used in preparing colour wash.

21.2.0 WORKMANSHIP

21.2.1 Preparation of white wash solution - The fat lime shall be slaked at site and shall be mixed and stirred with about five litres of water for 1 Kg. of unslaked lime to make a thin cream. This shall be allowed to stand for a period of 24 hours and then shall be screened through a clean coarse cloth. 4 Kg. of gum dissolved in hot water shall be added to each cubic metre of lime cream. Small quantity of ultramarine blue (upto 3 gms. per Kg. of lime) shall also be used, the solution shall be stirred thoroughly before use.

21.2.2 Preparation of Surface - The surface shall be thoroughly cleaned of all dust, dirt, mortar droppings and other foreign matter before white wash is to be applied.

The surface spoiled by smoke soot shall be scraped with steel wire brushes or steel scrapers or shall be rubbed with over burnt surkhi or brickbats. The surface shall be then broomed to remove all dust, durt and shall be washed with clean water.

Oil or grease spots shall be removed by suitable chemical and smooth surface shall be rubbed with wire brushes.

All unsound portion of the surface plaster shall be removed to full depth of plaster in rectangular patches and plastered again after raking the masonary joints properly. Such portion shall be wetted and allowed to dry. They shall then be given one coat of white wash.

All unnecessary nails shall be removed, the holes, cracks, patches etc. shall be made good with materials similar in composition to the surface to be prepared.

21.2.3 Scaffolding - Where scaffolding is necessary it shall be erected in such a way that as far as possible no part of scaffolding shall rest against the surface to be white or colour washed. A properly secured strong and well tied suspended paltform (zoola) may be used for white washing. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the floors and walls. For white washing of ceilings, proper stage scaffolding shall be erected where necessary.

21.2.4 Application of White/Colur Wash - On the surface so prepared the white wash shall be applied with `Moon' brush. The first stroke of the brush shall be from top downwards,another from bottom upwards over the first stroke and similarly one stroke from the right another from the left, over the first stroke brush before it dries.This will form one coat. Each coat shall be allowed to dry before the next coat is applied. The number of coats as specified in item shall be applied. It shall present a smooth and uniform finish free from brush marks and it should not come off easily when rubbed with fingers.

Splashing and dropping if any on the doors and windows, ventilators etc. shall be removed and the surface cleaned.

Priming and alkali resistant treatments, scrapping of surface, washing etc. surface spoiled by smoke & soot, removing of oil and grease spots treatment for infection with efforsence moulds, moss, fungi, algae and litchen and patch repairs to plaster wherever done shall not be paid extra.

21.3.0 MODE OF MEASUREMENTS & PAYMENTS

21.3.1 All the works shall be measured in the decimal system as under ---

a] Dimensions shall be measured to the nearest 0.01 M.

b] Area in individual items shall be worked out to the nearest 0.01 Sq.M.

All the works shall be measured in Sq.Mts. Deductions for jambs, soffits, sills etc. for openings not exceeding 0.5 Sq.Mts. each in area, for ends of joints, posts, beams, girders, steps etc. not exceeding 0.5 Sq.Mts. each in area and for openings exceeding 0.5 Sq.Mts. but not 3.0 Sq.Mts.each in area deductions and additions shall be made as under.

21.3.2 No deductions shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 Sq.Mts. each. No additions shall be made for reveals, jambs, soffits, sills etc. of these openings not for finish around ends of joints, beams, posts, etc.

21.3.3 Deductions of openings exceeding 0.5 Sq. Mts. but not exceeding 3 Sq.Mts. each shall be made as follows and no additions shall be made for reveals, jambs, soffits etc. of these openings --

a] When both the faces of walls are provided with finish, deduction shall be made for one face only.

b] When each face of wall is provided with a different finish deduction shall be made for that side of frame for door, windows etc. on which width of reveals is less than that of the other side, where width of reveals on both faces of wall are equal, dedcution of 50% of area of opening on each face shall be made from total area to finish.

c] When only one face of wall is treated and the other face is not treated, full deduction shall be made if the width of reveal on the treated side is less than that on the untreated side, but if the width of the reveal is equal or more than on the untreated side neither deductions nor additions to be made for reveals, jambs, soffits, sills etc.

21.3.4 In case of area of openings exceeding 3 Sq.Mts. each, deduction shall be made for openings but jambs, soffits, sills shall be measured.

21.3.5 No deductions shall be made for attachment such as casing, conducts, pipe, electric wiring and the like.

21.3.6 Cornices and all other features, when they are not picked out in a different finish colour shall be girthed and included in the general area.

21.3.7 The rate shall include the cost of all materials, labour scaffolding, protective measures etc. involved in all the operations described above.

21.3.8 The rate shall be for a unit of one Sq.Mts.

ITEM NO.22 :

Providing and applying white washing with lime on ceiling and / or sloping roofs. (three coats) to give even shade including thoroughly brooming the surface of renove all dist, dust, mortar drops and other foreign matter etc. compl.

22.1.0 MATERIALS AND WORKMANSHIP :

The relevant specifications of Item No.21 shall be followed except that this work shall be carried out for ceiling and/or sloping roof.

22.2.0 MODE OF MEASUREMENTS AND PAYMENTS :

The relevant specifications of Item No.21 shall be followed except that extra payment for white washing on coiling and/or slopping roof shall be measured and paid under this item.

The rate shall be for a unit of one Sq.metre.

ITEM NO. 23 :-

Providing and applying finishing wall with water proofing cement paint on surface [three coats] to give an approved brand and manufactureand of required shape even shade after throughly brushing the surface to remove all dust dirt, and remains of loose powder material etc.comp.

23.1.0 Material:- The water shall conform to M-1 cement water proofing paint shall conform to I.S.5410-1992.

23.2.0 Workmanship:-

23.2.1 Scaffolding - Where scaffolding is necessary it shall be erected in such a way that as far as possible no part of scaffolding shall rest against the surface to be white or colour washed. A properly secured strong and well tied suspended paltform (zoola) may be used for white washing. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the floors and walls. For white washing of ceilings, proper stage scaffolding shall be erected where necessary.

23.2.2 Preparation of Surface :-The relevant specification of Item No. 21 shall be followed except that the work white wash shall be submitted with water proofing cement paint. The surface shall be thoroughly wetted with clean water before cement water proofing paint is applied.

23.2.3 Preparation of Paint :- Portland cement paint shall be prepared by adding paint powder to water and stirring to obtain a thick paste, which shall then be diluted to a brushable consistency. Generally, equal volumes of paint poweder and water make a satisfactory paint. In all cases, the manufacturer's instructions shall be followed. The paint shall be mixed in such quantities as can used up within an hour of mixing as otherwise the mixture will set and thickness, affecting flowing and finish. The lid of cement paint drums shall be kept tightly when not in use.

23.2.4 Application of paint :-

No painting shall be done when the paint is likely to be exposed to a temperature of below 7øC within 48 hours after application.

When weather conditions are such as to cause be carried out "in the shadow" as far as possible. This helps the proper hardening of the paint film by keeping the surface moist for a longer period. To maintain the uniform mixure and to prevent segregation, the paint shall be stirred frequently in the bucket.

The surface shall be treated with minimum three coats of water proof cement paint. Not less than 24 hours shall be allowed between two coats. New coat shall not be started untill the preceeding coat has become sufficiently hard to resist marking by the brush being used. In hot dry weather, the preceeding coat shall be slightly moistened before applying the subsequent coat. The finished surface shall be even and uniform in shade, without patches, brush marks, paint drops etc.

The cement paint shall be apllied with a brush with relatively short stiff hog or fibre bristles. The paint shall be brushed in uniform thickness and shall be free from excessively heavy brush marks. The lamps shall not well brushed out.

Water proof cement paint shall not be applied on surface already treated with white wash, colour wash, distember dry or oil bound varnished paint etc. It shall not be applied on gypsum, wood and metal surfaces.

23.2.6.0 Curing :-

23.2.6.1 Painted surface shall be sprinkled with water two or three times a day. This shall be done between coats, and for atleast two day following the final coat. The curing shall be started as soon

as the paint has hardened so as not to be damaged by the sprinkling of water say about 12 hours after the application.

23.2.6.2 Protection measures shall be taken as per Item No.21.

23.3.0 Mode of measurements and payment :-

The relevant specification of Item No.21 shall be followed. The rate shall be for a unit of one sq.metre.

ITEM NO.24 :

Providing and applying finishing wall with water proofing cement paint on ceiling and sloping roofs (three coats) to give an approved brand and manufacturer and of required shape even shade after thoroughly brushing the surface of remove all dust dirt and remains of loose powder.

24.1.0 MATERIALS AND WORKMANSHIP :

The relevant specifications of Item No.23 shall followed except that this work shall be carried out for ceiling and/or sloping roof.

24.2.0 MODE OF MEASUREMENTS AND PAYMENT :

The relevant specifications of Item No.23 shall be followed except that extra payment for applying cement water proofing paint on ceiling and sloping roof shall be measured and paid under this item.

The rate shall be for a unit of one Sq.metre.

ITEM No : 25 :-

Providing and fixing 35 mm. thick Indian teak wood shutters for doors, windows, ventilators including Salwood frames 12 cm. x 7.0 cm. size including alluminium oxidised fixtures and fastenings including primer coat of approved quality and two coats of oil paints etc. comp. for ----

a] Fully pannelled doors.

b] Partly pannelled and partly glazed windows.

c] Fully glazed ventilators.

25.1.0 MATERIALS

Wood for frame and shutter shall conform to M-29. Fixtures and fastening shall conform M-43. The ready mixed paint for brushing priming for enamels wood wshall conform to I.S. 106-1962 and the paing shall conform to M-44 (the enamels paint shall conform to I.S. 133-1975).

25.2.0 WORKMANSHIP

25.2.1 The item covers the requirement of frames and shutters for doors, windows, clearstory windows,ventilators their supply and fixing.

25.2.2 Frames - All members of frames shall be exactly at right angles. The right angle shall be checked from inside surfaces of the respective members.

All members of frames shall be straight without any warp or bow and shall have smooth surfaces well planned on the three sides exposed at right angles to each other. The surfaces touching the wall may not be planned unless it is required in order to straighten up the member or to obtain the overall sizes within the tolerances as specified.

Frame shall have dovetail joints. When windows is included, it shall be provided by having full length one piece post for door or windows and clearstory window extending the frame on top at the head to the required extent. Horns shall not be provided in the head of the frame. When no sills are provided, the vertical posts of the frame in the ground floor shall be embedded in the sill masonary for 10 cm. on upper floors, the vertical posts shall be fixed in the floor or masonary by forming notches 10 mm. deep. Sight adjustment of spacing as necessary shall be done to have the holdfasts in the joints of masonary course. The frame shall be erected in postion and held plumb with strong support iron both sides and built in masonary as it is being built. The transom shall be through tenoned in the mortices of the jamb post to the full width of the jamb post and the thickness of the tenon shall be not less than 15 mm.

25.2.3 Tolerance - Unless specially mentioned otherwise tolerance of 1.5 mm. shall be allowed for each wrought face.

25.2.4 The tenons shall be closely fitting into the mortices and suitably pinned with wood dowels not less than 10 mm. diameter. The depth of rebates for housing the shutter shall be as shown in the detail drawing or as directed.

25.2.5 The contact surface of tenon and mortise shall be treated before putting together with an adhesive of approved make.

25.2.6 Minimum number of three holdfasts shall be fixed on each side of door and window frames, one at the centre point and the other two at 30 cms. form the top and the bottom of the frames. In case of window and ventilator frames whose height is less than 1 M. two holdfasts, in each side shall be fixed at quarter points of the frames. The size of each holdfasts shall be 300 x 25 x 6 mm. and of mild steel with spit end. The holdfasts shall be fixed with screws to frames.

25.2.7 Mild steel hold fasts shall be protected with a coating of coal asphalt tar. The surface of frame abutting the masonary or concrete faces shall be properly treated by applying a coat of approved coating.

25.2.8 Shutters - Pannelled shutters shall be constructed in the form of timber frame work of styles and rails with panel inserted of type as specified in the detailed drawings. Panel shall be fixed by providing grooves in the styles and rails. The styles and rails shall be joined to each other by mortise and tenon joints at right angles.

All members of the shutters shall be straight without any warp or bow and shall have smooth, well planned faces at right angles to each other.

The size of styles and rails shall be as per drawings or as directed. Styles and rails of shutters shall be made of one piece only.

25.2.9 Timber Panelling - Thickness of the panel shall be as specified in the drawings or as directed. If the panel is made from more than one piece, the piece shall be finished as shown in the detailed drawings and shall be joined with continuous groove with specified size. The end pieces of the panel and the top and the bottom of the panel shall be provided with continuous tongue to frame into groove of the frame shutter. An air space of 1.5 mm. shall be left in the groove of frame of shutter while framing the panel in it.

The faces of the panel as well as various pieces of the panel shall be closely fitted to the sizes of the grooves.

Finishing of the corners or raised panel edge shall be done as shown in drawings or as directed.

The thickness specified shall be finished thickness and no tolerance will be permitted.

25.2.10 Glazing - The glass panels shall be embeded in putty and secured to the rebate by wooden bends, or mouldings shape and size as approved with counter sunk screws of suitable size.

The glass panel shall be properly cut to fit the rebate of the frames and sashes fully with a slight minus margin of about 1.5 mm. of all sides. Before glazing the frame shall be primed and prepared for painting so that wood may not draw oil out of putty. The rebate shall be putted to an extent to provide bedding all round the glass.

The glass shall than be bedded in putty and fitted to frames with wooden beads or moulding as directed and screwed with wooden beads or moulding as directed and screwed with counter sunk screws. The screws shall be spaced not more than 100 mm. from each corner and nor more that 200 mm. apart.

The size of the rebate in the frame and size and shape of beads or moulding shall be as per detailed drawing or as directed. The beads or mouldings shall have mitred corners.

25.2.11 Fixtures & Fastenings - All fixtures and fastening of approved quality shall be provided with necessary screws. The hinges, bolts and other items of iron mongery with moving part shall be properly oiled by the contractor before handing over the building.

25.2.12 Painting - The surface shall be cleaned and rubbed with sand paper to bring it in the one plane. When finished, no scratches from the sand paper should show. After preparing the surface, one coat of white paint shall applied as priming coat.

Little white lead being worked in other mixing to help hardening of putty. The work shall be rubbed down smooth with sand paper and the consequent coats of paint of the specified shade approved by the Engineer-in-charge shall be applied.

The paints shall be applied with brush. It shall be spread as smoothly as possible. Final coat shall be very crossed and laid off, so that brush marks are not visible.

Each coat of paint shall be allowed to dry thoroughly and shall be little rubbed in before the next one is laid.

Finish surface shall not show any hair marks ridges or dry patches of paint and no puddles shall be left in the corners of panels, angles of the mouldings etc.

25.3.0 MODE OF MEASUREMENTS & PAYMENTS

25.3.1 For measurement, the dimensions shall be measured correct upto 1 cm. The quantity shall be worked out correct to 2 places of decimals for rounding.

25.3.2 The item includes all materials, labours and necessary iron oxidised fixtures and fastenings, oil panting in three coats of approved paint. The payment shall be made on Sq.Mts. basis.

25.3.3 The rate shall be for a unit of one square metre.

ITEM NO.26 :

Providing and fixing 35 mm thick shutter for doors, windows and clear storywindows including salwood frames 12 cm x 7 cm. size including alluminium oxidised fixtures and fastening including primer coat of approved quality and two coats of oil painting etc. (I) Fully glazed.

26.1.0 MATERIALS :

Wood for frames and shutter shall conform to M-29. Glass shall conform to M-38, Fixtures and fastening shall conform to M-43. The ready mixed paint for brushing priming for enamels wood shall conform to I.S. 106-1962, and the paid shall conform to M-44. (the enamels paint shall conform to I.S. 133-1975.

26.2.0 WORKMANSHIP :

The relevant specification of Item No.25 shall be followed except that the 35 mm. thick shutters fully glazed for doors, windows and clerestory windows etc. as per drawings.

26.3.0 GLAZING :

The glass panels shall be embeded in putty and secured to the rebate by wooden beads, or moulding shape and size as approved with counter sunk screws of suitable size.

The glass panel shall be properly cut to fit the rebates of tee frames and sashes fully with a slight minus margin of abour 1.5 mm. on all sides. Before glazing the frame shall be primered and prepared or painting so that wood may not draw oil out of putty.

The rebate shall be put to an extent to provide bedding all round the glass.

The glass shall then be bedded in putty and fitted to frames with wooden beads or moulding as directed and secured with counter sunk screws. The screws shall be spaced not more than 100 mm. from each corner and not than 200 mm apart.

The size of the rebate in the frame and size and shape of beads or moulding shall be as per detailed drawings or as directed. The beads or moulding shall have mitred corners.

26.4.0 MODE OF MEASUREMENTS AND PAYMENT :

The relevant specifications of item No.25 shall be followed.

The rate shall be for a unit of one sq.metre.

ITEM NO.27 :

Providing and fixing 35 mm thick shutter for doors, windows and clear storywindows including salwood frames 12 cm x 7 cm. size including alluminium oxidised fixtures and fastening including primer coat of approved quality and two coats of oil painting etc. (III) Partly panelled and partly glazed.

27.1.0 MATERIALS :

Wood for frames and shutter shall conform to M-38. Fixtures, and fastenings shall conform to M-43. The ready mixed paint for brushing priming for enamoils wood shall conform to I.S. 106- 1962 and the paint shall conform to (the enamels paint shall conform to I.S. 133-1975.

27.2.0 WORKMANSHIP :

The relevant specifications of Item No.25 shall be followed except windows and cleare storye window etc. as per drawing.

27.3.0 MODE OF MEASUREMENT AND PAYMENT :

The relevant specifications of Item No.25 shall be followed.

The rate shall be for a unit of Sq.metre.

ITEM NO.28 :

Providing and fixing 35 mm thick shutter for doors, windows and clear storywindows including Indian teak wood frames 12 cm x 7 cm. size including alluminium oxidised fixtures and fastening including primer coat of approved quality and two coats of oil painting eetc. (I) fully glazed.

28.1.0 MATERIALS AND WORKMANSHIP :

The relevant specification of Item No.26 shall be followed except that the frame size be 12 cm x 7 cm etc.as per drawings.

28.2.0 MODE OF MEASUREMENT AND PAYMENT :

The relevant specification of Item No.26 shall be followed.

The rate shall be for a unit one Sq.metre.

ITEM NO.29 :

Providing and fixing 25 mm thick shutter for doors, windows and clear storywindows including Indian teak wood frames 12 cm x 7 cm. size including alluminium oxidised fixtures and fastening including primer coat of approved quality and two coats of oil painting etc. (II) fully panneled

29.1.0 MATERIALS AND WORKMANSHIP :

The relevant specification of Item No.25 shall be followed except that the frame size be 12 cm x 7 cm etc.as per drawings.

28.2.0 MODE OF MEASUREMENT AND PAYMENT :

The relevant specification of Item No.25 shall be followed.

The rate shall be for a unit one Sq.metre.

ITEM NO.30 :

Providing and fixing 35 mm thick Indian took wood shutter for doors, windows and clear storywindows including sal wood frames 12 cm x 7 cm. size including medium quality anodised aluminium fixtures and fastening including primer coat of approved quality and two coats of oil painting etc. (III) Fully panneled.

30.1.0 MATERIALS AND WORKMANSHIP :

The relevant specification of Item No. 25 shall be followed except that the frame size be 12 cm x 7 cm etc.as per drawings.

30.2.0 MODE OF MEASUREMENT AND PAYMENT :

The relevant specification of Item No.25 shall be followed.

The rate shall be for a unit one Sq.metre.

ITEM NO.31 :

Providing and fixing glazed louvered glass window and ventilators with sal wood frame 12 cm x 7 cm size including 3 coats of oil painting to wood work etc.

31.1.0 MATERIALS :

Sal wood shall conform to M-29 glass shall conform to M-38.

31.2.0 WORKMANSHIP :

The relevant specifications of Item No.25 shall be followed for frame work and painting. Ventilators shall be provided with glazed glass louvers. The glass louvers shall be provided as directed. In the groove of 1.25 cms depth made in frames, the thickness of glass shall be 5 mm and glass shall be of best quality. The Ventilation blades shall slope down towards the outside at an angle of 45 degree.

31.3.0 MODE OF MEASUREMENTS AND PAYMENTS :

The area of opening within the frame in which louvers are fixed shall be measured in Sq.metres.

The rate includes painting 3 coats to wood work with ready mix paint.

The rate shall be for a unit of one sq.metre.

ITEM NO.31A :

Providing and fixing in postion aluminium louvered glass ventilators of adjustable type including with frames having section 50 mm x 25mm (weight 0.50 kg/mtr.) glazing cleat section (weight 0.096 kg/mtr) with fixing 4 mm thick bajri / clear glass making frame and glass water tight, making it good, etc. complete at all floor levels.

MATERIAL :

The alluminium section shall confotm to M-31. Bajari glass shall be of 4 mm thickness of approved make.

The frame work : The outer frame made of tubular section of size 50 mm x 25 mm weight 0.55 Kg/Rmt. The tubular section shall be fixed to wall or RCC with wooden phrap and in screws in best workman manner. The demaged surface shall be repair so as to making good to it. Fixing of glass shall be done with 15 mm x 10 mm aluminiium glass clears. Glass shall be 4 mm bajari glass of approved make.

The rate shall be for a unit of one sq.metre.

ITEM NO.32 :

Providing and fixing first class Indian teak wood 75 mm x 60 mm moulded hand rails in strainght length complete, including primer coat and two coat of varnish etc. complete.

32.1.0 MATERIAL :

First class Indian teak wood shall conform to M-29.

32.2.0 WORKMANSHIP :

The teak wood hand rail shall of size 75 mm x 60 mm. The hand rail shall be prepared from first class Indian teak wood. The hand rail shall be moulded as per detail drawings. The hand rail shall be fixed in straight length as per detail drawings with screws. The relevant specifications of Item No.25 shall be followed except that the teak wood shall be for a railing of specified size and two coat of varnishing.

32.3.0 MODE OF MEASUREMENT AND PAYMENT :

The hand rail shall be measured in running metre.

The rate shall be for a unit of one R.M.

ITEM NO.33 :

Providing and fixing M.S. Round or square bars with M.S. flats at required specings in wooden frames of windows and clere windows etc. comp.

33.1.0 M.S. flats shall conform to M-18 and M-22 respectively.

33.2.0 WORKMANSHIP :

The M.S. bars shall be fabricated as shown in the drawing or as directed. It shall conform to I.S. 226-1975 and I.S. 961 and I.S. 1977-1975. The M.S. bars shall be fixed at the required speacing in mild steel flats after drilled holes in the latter.

The diameter and spacing these bars shall be as mentioned in the drawing of as directed. The bars shall be passed through drill holes drilled into the mild steel flats, fixed in the recessing the frames.The flats shall be fixed with iron screws.

33.3.0 MODE OF MEASUREMENTS AND PAYMENT :

The rate shall be for the M.S. round or square bars with M.S. flats provided and fixed in position as per the specifications for the completed item.

The rate shall be for a unit of one Kg.

ITEM NO.34 :-

Providing and fixing M.S. Grill of required pattern to wooden frames of windows etc. with M.S. flats at required spacings and frame aaround square or round bars with round headed bolts and nuts or by screws etc. complete (A) Plain Grill

34.1.0 MATERIALS :

The structural steel shall conform to M-22.

34.2.0 WORKMANSHIP :-

The M.S. Grill s hall be prepared as per the drawings or as directed for fixing to wooden frames of windows etc.

The grill shall be fabricated to the designs and pattern shown in the drawings and the weight shall be as directed, and the joints shall be revetted or welded as shown in the plan or as directed. The grill so formed shall be fixed into the strip frames of the windows etc. before thay arte erected in position. The outside strip frame of the grill shall be housed to its full thickness into the recess cut into the frame of the windows etc. The grill shall be fixed to the frame with number of bolts and nuts or screws viz. bolt nut/screw per 30 cm. of the length of outer strip subject to a minimum o0f 2 Nos. on such side of the frame or as indicated in the drawing or as directed.

The bolts and nuts or screws shall be counter sunk and shall be fixed with the top of their heads flush with the face of the frame strips.

34.3.0 MODE OF MEASUREMENT AND PAYMENT :-

o payment shall be made for weight of screws, bolts and nuts etc. only weight of grill shall be paid.

The rate shall be for a unit one Kg.

ITEM NO.35 :-

Providing and applying painting two coats including priming coat on new steel and other metal surface with enamel paint, brushing interior to give an even shade including cleaning the surface of all dirt, dust and other foreign matter etc.comp.

35.1.0 Materials :

35.1.1 The ready mixed primer, brushing red lead shall conform to IS 102:1972.

35.1.2 The thinner (linsed oil) shall conform to IS 75:1973 if for any reason, thinning is necessary in a case of ready mix paint, the brand of thinner recommended by manufacturer shall be used.

35.1.3 The enamel paints shall conform to M-44 B.

35.2.0 Workmanship :

35.2.1 Preparation of surfaces :

The surfaces before painting shall be cleaned of all rust,scale, dirt and other foreign matter sticking to it with wire brushes, steel wool, scrapers, sand paper etc. This surface shall then be wiped

finally with mineral turpentine which shall also removed greas and perspiration of hand marks. The surface shall then be allowed to dry.

35.2.2 Application of primer :

After the prepartion of the surface, the priming coat shall be applied immediately. The brushing operations are to be adjusted to the spreading capacity advised by the manufactuer of the particular primer. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing alternately in opposite directions, two or three times and then finally brushing lightly in a direction at right angles to the same.In this process no brush marks shall be left after the laying off is finished. The full process of crossing and laying will constitute one coat.

During painting, every time, after the priming coat has been worked out of the brush bristles or after the brust has been unloaded the bristles of the brush shall be opened up striking the brush against portion of the unpainted surface with the end of the bristles held at right angles to the surface, so that bristles thereafter will collect the correct amount of paint when dipped again in to a paint container. The primery coat shall be allowed to dry completely before painting is started.

No hair marks from the brush or clogging at paint puddles in the corner or panels angles of mouldings etc. shall be left on the work.

Specials care shall be taken painting over bolts, nuts, rivets overlaps etc.

The container when not in use shall be kept close and free from air so that paint does not thickned and also shall be kept guarded from dust.

35.2.3 General :

The materials required for painting work shall obtained directly from approved manufacturers are approved dealer and brough to the site in maker's drums, bogs etc. with seal unbroken.

All materials not in actual use shall be kept properly protected lid of containers shall be kept closed and surface of paint in open or partially open containers covered with a thin layer of turpantine to prevent formation of skin. The materials which have become state or flat to improper and long storage shall not be used.The paint shall be stirred throughly in its container before puoring into and shall be continuously stirred in smaller container. No left over paint shall be put back into stock tins. When not in use the containers shall be kept properly closed.

If for reasone, thinning is necessary, the brand of thinner recommended by the manufacturer shall be used.

The surface to be painted shall be throughly cleaned and dusted. All dust, dirt and greas shall be thoroughly removed before painting is started. No painting on exterior or other exposed parts of the work shall be carried out in wet, damp or otherwise unfavourable weather and all the surface shall be thoroughly dried before painting work is started.

35.2.4 Application of paint :

Brushing operations are to be adjusted to the spreading capacity advised by the manufacturer of particular paint. The paint shall be applied evenly and smoothly be means of crossing and laying off. The crossing and laying of consists of convering the area over with paint, brushing the surface hard for the first time over and than brushing alternately in opposite directions to or three times and then finally brushing lightly in direction at right angles to the same. In this process no brush marks shall be left after the laying off is finished. The full process of crossing and laying off will constitute one coat.

Each coat shall be allowed to dry completely and lightly rubbed with every fine grade of sand paper and loose particles brushed off before next coat is applied. Each coat shall vary slightly in the shade and shall be get approved from Engineer-in-charge before next coat is started.

Each coat except the last cost shall be lightly rubbed down with sand paper or fine pumicestone and cleaned of dust before the next coat is applied. No hairmarks from the brush or clogging of paint puddles in the corners of panels, angles of moulding etc. shall be left on the work.

Specials care shall be taken while painting over bolts, nuts, rivets, overlaps etc. Approved quality brushes shall be used.

35.3.0 Mode of measurement and payment :

The new steel and other metal surface shall be measured under this item.

All the work shall be measured net in the decimal system as executed subject to the following limits unless otherwise statted hereinafter.

(a) Dismensions shall be measured to the nearest 0.01 mtr.

(b) Areas shall be worked cut to the nearest 0.01 sq.metre.

No. deductions shall be made for openings not exceeding 0.5 sq.metre each and no addition shall be made for painting to beadings mouldings, edges, jambs, soffits, sills etc.of such openings.

In case of fabricated structural steel and iron work,priming coat of paint shall be included with fabrication. In cash of trusses if measured in sq.m. compound griders,stanchions,lattices, girder and similar work, actual area shall be measured in sq.m.and no extra shall be paid for painting on bolts, heads, nuts, washers, etc. No addition shall be made to the weight calculated for the purpose of measurements of steel and iron works for paint applied on shop or at site.

The different surfaces shall be grouped into one general item. Areas of uneven surface being converted into equivalent paint areas in accord ances with the table given as per Annexure-II for payment.

The rate is for complete item as specified i.e. one primer coat and two coats of oil paint.

The rate shall be for a unit of one sq.meter.

ANNEXURE-II

Equivalent plain Area of a uneven surface (Vide specifications for item relevent to paint and polishing)

Sr. No.	Description of work	How measured	Multiplying factor
1.	Pannled or framed and braced of ledged and battened or ledged and braced joinery cleats etc. shall be deemed to be cluded in the item.	Measured flat (not girthed) including chowkhat or frame. Edges, chocks,	1.30 For each side)
2.	Flush jounery	Measured flat (not girthed) including chowkhat or frame, Edges, Chocks, cleats, etc. shall be deemed to be included in the item.	1.20 For each side)
4.	Fully glazed hauzed joinery	Measured flat (not girthed) including chowkhat or frame, cleats, etc.shall be deemed to be included in the item.	0.80 For each side)
4.	Partly panelled and partly glazed of or glazed journey.	Measured flat (not girthed) including chowkhat or frame etc. shall be deemed cleats, Edges, chocks to be included in the item.	1.0 For each side)
5.	Full Ventilationed or or louzered jonery.	Measured flat (not girthed) including chowkhat or cleats etc. shall be deemed to be included in the item.	1.0 For each side)
6.	Weather boarding	Measurement flat (not girthed) supporting frame work shall not be measured separately.	1.2 For each side)
7.	Wood Shingle roofing	Measurement flat (not girthed)	1.0 For each side)
8.	Boarding with cover fillets and match boarding.	Measurement flat (not girthed)	1.05 For each side)
9.	Tile & slate work one way or two way	Measurement flat over all no deduction shall be made painting for open spaces. supporting over) members shall not be measured separately.	0.08 For each side)
10.	Trellies (or Jafri) work one way or two way for the open spaces	Measured flat over all no deduction shall be madesupporting members shall not be measured separately.	1.00 for painting cover
11.	Guard bars balustrades, rades, gates gratings, grills, expanded metal and	Measured flat over all No deduction shall be made for open	1.00 for painting cover

	railings	spaces, supporting members shall not be measured separately.	
12.	Gates and open palisade fencing including standards.	Measurement flar over all No deductions shall made for open spaces.supporting members shall not be measured separately	1.00 for painting cover
13.	Curved or enriched work	Measured flat over all no no deductions shall be made for open spaces supporting members shall not be measured separately	2.0 (For each side)
14	Steel roller shutters.	Measured flat (size of opening) over all, jamb guides, bottom rails and locking arrangement etc. shall be included in the item (top cover shall be measured seperately).	1.10(for each side)
15.	Plaing sheet steel door and windows)	Measured flat (not girthed) including frame	1.10(for each side)
16.	Fully glazed or gauzed steel door & windows.	Measured flat (not girthed)including frame edges etc.	0.60(for each side)
17.	Partly panelled and partly glazed or gauzed steel doors	Measured flat (not girthed) including frame edges etc.	0.80(for each side)
18.	Collapsible gate	Measured flat (size of opening No separate measurements shall be taken for the top and bottom guide rails, rolls, fittings etc.	1.0 for painting all over

Note : The height shall be taken from the bottom of the lowest rail if the palisades do not go below it (or from the lowerened of palisades, if they protect below the lowest rail) upto the top of palisades but not upto the top of standards if they are higher than the palisades.

ITEM NO.35A:

Painting two coats of enamel paint over priming coat after removing entire whitewash/colourwash surface dirt, dust foreign matter & also incl. preparing the surface even & sand papered smooth etc. complete.

Same as per Item No.35 but read new wall or other similar surface insteald of new steel or other similar surface and as directed by Engineer-in-charge.

The rate shall be for a unit of one sq.meter.

ITEM NO.35B:

Painting two coats (excluding priming coat) on previously painted wood & wood based surface with enamel paint to give an even shade & surface incl. cleaning of all dirt, dust & other foreign matter.

Pure shellac varying from pale orange tolemon yellow colour free from resin dirt, etc. shall be dissolved in motylated spirit at the rate of 0.15 kg. of shellac to 1 litre of spirit suitable pigment shall be added to get the required shade.

The surface of the timber or wood to be french polished shall be cleaned and rubbed down smooth with fine grained sand paper knots if any visible shall be covered with preparation of lead and glue size laid on while hot. Holes and identation on the surface shall be filled with putty and smoothed.

GENERAL :

Mode of payment as per Annexure-II enclosed equivalent plain areas of uneven surfaces as per IS:1200 (Part-XV) 1968.

Rate shall be per square metrer basis for complete item.

ITEM NO.35C:

Wall painting with two coats of acrylic emulsion plastic paint of approved brand over existing surface to give an even shade & surface free from mortar dropping & other foreign matter & sand papered smooth etc. complete.

The brand of the paint shall be as specified and ready made paint of the required colours shall be used. If thining is required pure potable water may be added to the required extent. The water used for thining should be pure and free from floating or suspended debris. It should be free from any of impurity. The surface shall be made perfectly dry and smooth by rubbing with sand paper of the different grades. All holes and open joints in wood or walls shall be filled with strong putty or with a misture of glues and plaster of paris and smoothened by rubbing with fine grade sand paper.

All the surface should be first painted with cement primer of approved over which three/two coats of Acrylic emulsion of approved quality and make be applied so as to give smooth finished surface. The shade of the Acrylic Emulsion shall have to be get approved from the Engineer-in-charge or his representative.

The paint shall be applied with brushes evenly and smoothly. The paint should be stirred in the container immediately before use. The whole work shall have to be carried out to the entire satisfaction of the Engineer-in-charge or his representative.

Patch work or different in colour shades will not be tolerated in such case, extra one coat shall have be applied for which not extra payment shall be made.

Item includes preparation of base, scaffolding using every thing and dismentalled with labour, materials, tools, paints required for satisfactorily completion of work.

Rate shall be per square metrer basis for complete item.

ITEM NO.36 :-

Providing and fixing upto floor two level precast cement concrete jali or grill 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 6 mm nominal size) reinforced with 1.6 mm dia mild steel wire including roughening, cleaning fixing and finishing in cement mortar 1:3 and curing etc. complete (A) 50 mm thick (B) 40 mm thick (C) 25 mm thick (D) 75 mm thick (E) 100 mm thick.

36.1.0 Material :

Water shall conform to M-1 cement shall conform to M-3, sand shall conform to M-6. Mortar shall conform to M-11. Aggregates shall conform to M-12.Mild steel wire shall conform to M-21. shuttering shall conform to M-26.

36.2.0 Workmanship :

It shall be of cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregates (6 mm nominal size) reinforced with 1.6 mm dia Mild steel wire unless otherwise specified.

The thickness of the jali shall be as specified in the item.

The Jali shall be set in position true to line & level before the jambs sills and soffits of the opening are plastered. It shall then be properly cemented with cement mortar 1:3 (1 cement : 3 sand) and recked for levels.Finally the jambs, sills and soffits shall be plastered gripping the jali uniformly on all sides.

36.3.0 Mode of Measurements and payment :

The item shall be measured in square metre.

The rate shall be for a unit of one sq.metre.

ITEM NO.37 :

Providing and fixing above floor two level precast cement concrete jali or grill 1:2:4 (1 Cement : 2 coarse sand : 4 graded stone aggregate 6 mm nominal size) reinforced with 1.6 mm dia mild steel wire including roughening cleaning, fixing and finishing in cement mortar 1:3 and curing etc. complete (A) 50 mm thick (B) 40 mm thick (C) 25 mm thick (D) 75 mm thick (E) 100 mm thick.

37.1.0 MATERIALS AND WORKMANSHIP :

The relevant specifications of Item No.36 shall be followed except that the whole work is to be carried out above floor two level.

37.2.0 MODE OF MEASUREMENTS AND PAYMENTS :

The mode of measurements and payments shall be same as item No.36.

The extra payment shall be made over and above the floor two level rate for every additional floor height.
The item shall be measured in Sq.mt.
The rate shall be for a unit of ane Sq.metre.

ITEM NO.38 :

Providing and fixing precast concrete block masonary in partition walls 10 cm thick with solid block of approved size (including quoins blocks, jambs blocks, closer etc.) made of c.c. 1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm and down gauge) etc. complete.
(A) In C.M. 1:4 for upto floor two level.

38.1.0 MATERIALS :

(a) Aggregate shall conform M-12 (b) Sand shall conform to M-6. (c) Cement shall conform to M-3 (d) Cement mortar of proportion 1:4 shall conform to M-1.
The solid cement concrete block shall be precast with concrete of 1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate) A block shall be deemed, to be solid if the solid materials is not less than 75% of the total volume of the block calculated from overall dimension.
The concrete mix used for blocks shall not be richer than 1 part by volume of cement to 6 parts by volume of combined aggregate.
The actual size of the block, shall be one of the following . Size : A) 39 x 30 x 19 cms.
B) 39 x 20 x 19 cms.
C) 39 x 10 x 19 cms.
The size other than specified above may be used with the approval of Engineer-in-charge.
The block may be either machine made or hand made. The concrete mix, the mixing of concrete, the manufacture of blocks, curing and drying shall be in accordance with para-6 to 10 under I.S. 2185-1967.
Faces of blocks shall be flat and rectangular surface finish shall be rendered smooth or plastered with cement mortar 1:4 (1 Cement : 4 coarse sand).
The average compressive strength of eight blocks when determined in the manner described in I.S. 2185-1967 shall not be less than 50 kg/sq.cm. of gross area. The strength of lowest individual block shall not be less than 75 percemt of average compressive strength of eight blocks.
Concrete blocks shall be stored and stacked properly in such way as to avoid any contract with moisture at site. They shall be stock piled on planks or other supports free from contact with ground and covered to protect against wetting.

38.2.0 WORKMANSHIP :

The blocks need be wetted before or during laying in the walls, In case climatic conditions so required the top and the sides of block may only be slightly moistured so as to prevent absorption of water from the mortar and ensure the development of required bond with mortar.
Operations of laying precast cement concretes block masonary shall be carried out in accordance with instructions detailed in I.S. 6062-1962. The mortar shall not be spread so much ahead of the actual laying of the unit that it tends to stiffen and loose its plasticity thereby resulting in poor bond. For moist of the work, the joints, both horizontal and vertical shall be 10 mm thick except in the case of extended joint construction.
The joints shall be struck of flush with wall surface and the mortar has started stiffening it shall be compressed with rendered or U shaped tool. The mortar shall be pressed against the units with a jointing tool after the mortar has stiffened in effect intimate contact between the mortar and the masonary unit and obtained a weather tight joint.
Quoins & Closers :
Special quoins blocks (with a return face equal to half the lenth of normal face) shall be cast for all building blocks and slabs for external work proper half length closers shall be cast and not cut from full size blocks. The returned ends of blocks for door and windows reveals and quoins shall be ffinished with a fair face in the mould.
Only double scaffolding shall be used. The scaffolding shall be strong and sound. No Holes in the masonary for supporting scaffolding shall be allowed.
Curing :
The curing of concrete block masonary shall be carried out for days.

38.3.0 MODE OF MEASUREMENTS AND PAYMENTS :

All, work shall be measured on the basis of finished dimensions and measured not except where otherwise specified. Only specified dimensions shall be allowed. Anything extra shall be ignored. No deduction shall be made, nor extra payment made for the following :

a) Ends of joints, beams posts, girders rafters, purlins trusses, corbles, etc. each upto 500 Sq.cm. in section.

b) Opening each upto 0.1 Sq.m.

c) Wall plates and bed plates, bearings of chhaja and like upto 10 cm. depth (bearing of floor and roof slabs shall be deducted from masonary)

d) Drain holes and recesses for cement concrete blocks to embeded hold fasts for doors and windows.

e) Building in the masdonary iron fixtures pipes upto 300 mm dia hold fasts of doors and windows.

f) Forming cheses in masonary upto section of 350 Sq.cm.

The rate shall be for a unit of one Sq.metre.

ITEM NO.39 :

Providing and fixing pre-cast concrete block masonary in partition walls 10 cm thick with solid block of approved size (including blocks, jamb block, closer etc.) made of c.c. 1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm and down gauge) etc. complete for above floor two level (A) in C.M. 1:4

39.1.0 MATERIALS AND WORKMANSHIP :

The relevant specification of Item No. 38 shall be followed except that the work shall be carried out for super structure above floor two level.

39.2.0 MODE OF MEASUREMENTS AND PAYMENTS :

The relevant specifications of Item No.38 shall be followed. The extra payment shall be made for addition lift above floor two level to each additional floor over and above the work and shall be measured and paid under this item.

The rate shall be for a unit of one Sq.metre.

ITEM No.40 :-

Providing and fixing M.S.Fan clamps type I of 16 mm dia M.S.bar bent to shape with hooked ends to R.C.C. slabs during laying including painting the exposed portion of the loops, all as per standard design complete etc.comp.

40.1.0 Materials :

M.S.Bar shall conform to M-18.

40.2.0 Workmanship :

The shap and size of fan clamps shall be as directed.

For fixing M.S.fan clams in existing R.C.C.slab a case of size 150 mm x 75 mm shall be cut from the ceiling so as to expose the reinforcement and upto 25 mm clear round the reinforcement bar.This shall be done without any damage to adjoining portion of ceiling. The the arms of the ends of the clamp shall be passed through the space over reinforcement bar from the bottom of the slab. Then the two arms shall be bent down about 15 mm by means of crow bar. The clamp shall be held in position and the case in the ceiling filled with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 raded stone aggregate 20 mm nominal size). The ceiling shall be then finished to match the existing surface and properly cured. The item also includes the painting of the exposed portion of the lopps, as per standard specification of painting work.

40.3.0 Mode of Measurement and Payments :

The rate includes cost of all materials and labour required for satisfactory completion of this item as described above.

The rate shall be for a unit of one number.

ITEM NO.41 :

Providing and laying chequered precast concrete tiles 22mm thick with aggregate of sizes upto 6mm in floors treads of steps and landing on 20mm thick bed of C.M. 1:6 (1 cement : 6 sand) or L.M. 1:1.5 (1 Lime putty : 1.5 sand) jointed with neat cement slurry with pigments to match the shade of the tiles.

41.1.0 Materials :

Water shall conform to M-1 cement shall conform to M-3. Lime Mortar shall conform to M-10. Cement mortar shall conform to M-11. The precast chequered tiles of 20 mm. thick shall be of light shade using white cement and conform to M-47-D.

41.2.0 Workmanhship :

41.2.1 The work shall be carried out as per I.S.1443-1972.

41.2.1 Bedding :

Before spreading the mortar, the sub-base of the floor shall ne cleaned of all dirt,scum and loose materials and then well wetted without fomring any pools of water on the surface.

In case of R.C.C.floors,the top shall be left a little rough, all points,of level for the finished surface shall be marked out. The lime water of proportion 1:6 (1 cement :6 coarse sand) jointed with neat cement slurry mixed with pigment to match the shade of the tiles as directed shall be then evenly and smoothly spread over the base. Bedding layer or mortar shall be not less than 10 mm and average thickness of bedding shall be 25 mm.

41.2.2 Laying :

Before laying the terrazzo (Marble/Mosaic) tiles, the tiles shall be throughly wetted with water. Neat cement grout of required consistency at 4.4 kg.cement/sq.mt.shall be spread on the mortar bed. The tiles shall be laid on the neat cement float and shall be evenly and firmly bedded to the required level and slops. There shall be no hollows left. The joints shall be of uniform thickness and in straight line as per the pattern.

The surface of flooring shall be checked frequently with a straight edge at-least two metres long so as to obtain a true surface with required slope.

The tiles which are fixed in the adjoining the wall shall go about 10 mm under plaster. Skirting or dedo shall be left unfinished for about 50 mm above finished floor level and unfinished strip then left earlier shall be finished.

In places where full tiles can not be fixed.The tiles shall be cut to the size and smoothened at edges to give straight and true joints.

After the tiles have been laid, the surplus cement slurry and the joints shall be cleaned and washed fairly deep before cement hardens.

The day after tiles have been laid, the joints shall be cleaned of every cement grout with a wire brush to a depth of about 5 mm and then grouted with white cement with or without pigment to match the shade of the topping of tiler.

41.2.4 Curing :

The flooring shall be kept wet with damp sand or water for seven days.It shall be kept undisturbed atleast for 14 days. The grinding shall normally be commenced after 14 days.

41.2.5 Polishing : After the tiles are properly cured, first grinding shall be done with carborundum stone of 48 to 60 grade grit fitted in machine. Water shall be properly used during grinding. When the chips show up and the floor has been uniformly rubbed, it shall be cleaned with water, baring all pin holes. It shall then be covered with a thin coat of white cement mixed with or without pigments to match the colour of the topping of the tiles.Pin holes if any shall thus be filled.This grout shall be kept moist for a week. Thereafter second grinding shall be started with carboundum of 120 grit.Grouting and curing shall follow again.Final grinding shall be done when other works are finished.The machine shall be fitted with carborundum of grit 220 to 350 using water in abundance. The floor shall then be washed clean with water. Oxalic acid powder shall than be dusted at 33 grams per square metre on the surface and the surface rubbed with machine fitted with hessian bobs or rubbed hard with pad of wooden rags,The floor shall then be washed clean and dried with a soft cloth or Linen.The finished floor shall not sound hollow when tapped with a mallet.

If any tiles is disturbed or damaged it shall be refitted or replaced properly jointed and polished. Testing of the tiles shall be carried out by the contractor at his own cost as per I.S.requirement for required tests.

41.3.0 Mode of Measurements and payment :

The terrazo tiles flooring shall be measured in Sq.metre for visible area of work done.

No deductions shall be made nor extra paid for any opening in the floor area upto 0.1 Sq.mt.Nothing extra shall be paid for use of cut tiles or for laying the floors at different levels in the same room or court yard. Mosaic tiles laid in floor boarders and bands etc. shall be measured in the same item and nothing extra shall be payable on account of these or similar bonds formed of half or multiples of half size, standard tiles or other uncut tiles.

The treads of stairs and steps paved with tiles without nosing shall also be measured under this item. Extra rate shall however be paid for such area where width of treads does not exceed 30 cms.

The rate shall include the cost of all materials, labour involved in all the operations as described above.

The rate shall be for a unit of one sq.metre.

ITEM NO. 42 :

Providing and laying precast tarrazo tiles (Super/Vyara make) 20 mm thick with white black or white and black or of the colour specification of tender item marble chips of sizes upto 6 mm laid in floors treads of stpes and landing on a bed of 25 mm thick of Lime mortar 1:1.5 (1 Lime putty : 1.5 sand) or of C.M. 1:6 joined with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete with precast tiles of dark shade using ordinary cement.

42.1.0 MATERIALS AND WORKMANSHIP :

The relevant specification of Item 41 shall be followed except that the precast tiles shall be of dark shade using ordinary portland cement.

42.2.0 MODE OF MEASUREMENTS AND PAYMENTS :

The mode of measurements and payments shall be same as Item No.41

The rate shall be for a unit of one Sq.metre.

ITEM NO. 43 :-

Providing and fixing 20 mm thick pre-cast cement concrete tile with aggregate of sizes upto 6 mm laid in floors, treads, treads of staps and landings on 20 mm thick bed of cement mortar 1:6 (1 Cement : 6 coarse sand) or L.M. 1:1.5 joined with neat cement slurry with pigment to mach the shade of tile complete with precast tiles of dark shades using ordinary cement including rubbing and polishing etc. comp.

43.1.0 Materials :

Water shall conform to M-1.Cement shall conform to M-3. Sand shall conform to M-6. Lime mortar 1:1.5 shall confirm to M-10 Cement mortar shall conform to M-10. Tiles shall conform to M- 47 (A).

Cement concrete tiles shall conform to I.S. 1237-1990 and pigments to be admixed with mortar or for grating shall conform to I.S.2114-1962.

43.2.0 Workmanship :

The tiles shall be laid on the sub-grade of concrete of the R.C.C. slab. Bedding shall be lime mortar 1:1.5 or cement mortar (1:6). The amount of water added shall be minimum required for sufficient plasticity and workability in C.M.or lime mortar where the ingreadients shall thoroughly mixed dry, hard lumps removed and water added to give good workability.

The base shall be cleaned of all dust, dirt and scum and properly wetted without allowing water pools, For a bedding of cement mortar he mortar shall be then spread evenly over the base of two rows of tiles and three, to five metres in length. The top shall be kept rough so that cement slurry can be absorbed with the thickness shall be not less then 10 mm at any place. The laying of tiles shall be commenced with neat cement slurry at honey like consistancy and shall be spread over the mortar bed over an area, sufficient to receive about 20 tiles.The tiles shall then be fixed in this grout(one after the other, each tiles being gently tapped and properly bedded in line and level with the adjoining tiles. The joints shall be as narrow as possible and normally shall not exceed 1.5 mm. After the day's work the exess cement slurry on top shall be cleaned as also the joints with a broom stick and washed before the slurry sets hard. Next day the joints shall be filled with the cement grout of the same shade as the matrix of the tiles. Tiles which are fixed in the floor adjoining the wall shall go a minimum of 10 mm, under the wall plaster, skirting or dedo. For the purpose, plaster etc. may be left unfinished by about 50 mm, above the proposed finished level of the floor the unifinished strip shall be plastered laying the floor tiles.Where full tile cement be used,tile shall be cut to the size to be used.

The flooring shall be cured for 7 seven days.

Grinding & rubbing shall normally be commenced after 14 days of laying the tiles, except for skirting small areas, machine shall be used for the purpose.

First grinding shall be done with carborundum stone of 48 to 60 grade grit fitted in machine. Water shall be properly used during grinding. When the chips show up and floor has been uniformly rubbed,it shall be cleaned with water baring all pin holes. It shall then be covered with a thin coat of grey or while cement mixed with or without pigments to match the colour of the topping of the tiles.Pin holes if any shall thus be filled. This grout shall be kept moist for for sufficient period as directed.The after, second grinding shall be started with carborundum of 120 grit Grouting and curing shall be followed again. Final grinding shall be done when other works are finished.The machine shall be fitted with carboundum of grit 220 to 350 using water in abundance.The floor shall then be washed clean with water. Oxalic acid powder shall then be dusted as needed on the surface and the surface rubbed fitted with hessian bobs or rubbed,hard with pad of woolen rags. The floor shall then be washed cleaned and dried with a soft cloth or linen.The finished shall not sound hollow when tapped with a mallet.

If any tile is disturbed or damaged it shall be refitted or replaced jointed and polished.

For skirting,dedo or small areas where it is not possible to do machine polishing all the above operations are to be done manually.

43.3.0 Mode of measurements and payment :

The rate shall be include the cost of materials and labour involved in all the operations described above.

The rate shall be for unit of one sq.metre.

ITEM NO.44 :-

Providing and laying polished kota stone slab flooring over 20 mm thick base of cement mortar 1:6 [1 cement : 6 coarse sand] and joined with grey cement slurry including rubbing and polishing etc. comp. [A] 22 mm thick

44.1.0 Materials :-

Water shall conform to M-1.Lime mortar shall conform to M-10 cement mortar shall conform to M-11 polished kota stone shall conform to M-49.

44.2.0 Workmanship :-

44.2.1 Each slab shall be cut to the required size and shape and fine chisel dressed at all the edges. The sides thus dressed shall have a full contact if a straight edge is laid along. The sides shall be table rubbed with on coarse sand before paving. All angles and edges of the slabs shall be true square and free iron chipping and giving a plane surface. The thickness shall be as specified in the item.

44.2.2 Bedding for the kotah stone slabs shall be cement mortar 1:6 [1 cement : 6 coarse sand] or L.M. 1:1.5 of thickness 20 mm as given in the description ofthe item. Subgrade shall be cleaned wetted and mopped. Mortar of the specified mix and thickness shall then be spread, on an area sufficient to receive one kotah stone slab. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped genetly to bring it in level with the other slabs. It shall than be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar in hollows or depressions. The mortar then be allowed to harden bit. Over this surface, cement slurry of honey like consistency shall be applied. The slab shall then be gently placed in positon and topped with wooden mallet till it is properly bedded in level with and close to the adjoining slab. The joint shall be as fine as possible.The slab fixed in the floor adjoining the wall shall enter not less than 10 mm. under the plaster, skirting or dedo. The junction between the wall and floor shall be finshed neatly. The finished surface shall be in true levels and slopes as directed.

44.2.3 The floor shall be kept wet for a minimum period of 7 days so that bedding and joints set properly.

44.2.4 Polishing shall be normally commenced after 14 days of laying the stone slab. First polishing shall be done with carborundum stone, of 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum stone 220 to 350 grade grit fitted in heavy machine. Water shall properly be used during polishing. The stone shall then be washed clean with water. When directed by the Engineer-in-charge wax polish of approved quality shall be applied on the surface with the help of soft cloth over clean and dry surface then the polishing machinge fitted with beds shall be run over it.

44.2.5 The holes required for Nahni traps, pipes and any other fitting shall be made without extra cost.

44.3.0 Mode of Mesurements & payments:-

The rate shall include the cost of all materials and labour involved in all the operations described above. The kotah stone flooring shall be measuremed in sqaure metres correct to two places of decimal, length and breadth shall be measured correct to a centimeters and between the finished face of skirting dedo or mall plaster and no deduction shall be made nor extra paid for opening in floor of areas upto 0.1 Sq.Mt.

The rate shall be for a unit of one sq.metre.

ITEM No.45 :-

Providing and laying polished kotah stone of machine cut adge, slab 25 mm thick in riser of steps or tread, dedo, and pillars, one piece not less than 1.2 meter laid on 10 mm thick cement mortar 1:3 (1 cement:3 coarse sand) joined and polished etc.comp.

45.1.0 Materials :

Water shall conform to M-1. Cement mortar shall conform to M-11. Kotah stone slab shall conform to M-49.

45.2.0 Workmanship :

The relevant specifications of Item No. 44 shall be followed except that the kotah stone shall be fixed for risers steps, dedo or skirting in C. M 1:5 and the polishing shall be done manually instead of machine polishing, the exposed edge of kotah stone shall be machine cut.

45.3.0 Mode of measurements and payment :

The risers of steps,skirting or dedo shall be meausred in sq. metre. Length shall be measured along the finished faces of risers,skirting or dedo.Height shall be measured from finished level of treads of floor to top. Lining of pillars shall be measured under this item.

The rate shall be for a unit of one sq.metre.

ITEM No. 46 :-

Providing and laying white glazed tiles 6mm. thick of Kajaria, Somani, Orient, Nitco, Jhonson make at all floor levels, in flooring, treads of steps and landings laid on a bed of 12mm. average thick cement mortar 1:3 (1 cement : 3 coarse sand) finished with flush pointing in white cement etc. complete. (BASIC RATE RS.302/-PER SQ.MT.)

46.1.0 MATERIALS

Water shall conform to M-1. Cement mortar shall conform to M-11. WHite glazed tiles shall conform to M-35.

46.2.0 WORKMANSHIP

46.2.1 Bedding - The sub-grade shall be cleaned, wetted and mopped. The bedding shall then be laid evenly over the surface tamped and corrected to desired levels and allowed to harden enough to offer a rigid cushion to tiles and to enable the mason to place wooden planks across and squat on it. The white glazed tiles shall be laid on cement mortar bedding of 12mm. thick in C.M. 1:3. The mortar shall have sufficient plasticity for laying and there shall be no hard lumps that would interfere with the evenness of bedding. The base shall be cleared and well wetted. The mortar shall then be spread in thickness not less than 10mm. at any place and on an average 12mm. thickness. The proportion of the cement mortar shall be as specified in the item.

Fixing Tiles - The tiles before laying shall be soaked in water for at least two hours. Neat grey cement grout at 3.3 Kgs./Cement/Sq.Mts. of honey like consistency shall be spread over the mortar bedding as directed. The edges of the tiles shall be well pressed and gently tapped with a wooden mallet till they are properly bedded and in level with the adjoining tiles. There shall be no hollows in bed or joints. The joints between the tiles shall be as thin as possible in straight line or as per pattern.

The tiles shall not have staggered joints. The joints shall be thereto centre line both ways. The nahni trap coming in the flooring shall be so positioned that its grating shall replace only one tile as far as possible. Where full size tiles cannot be fixed, they shall be cut (swan) to the required size and the edge rubbed smooth to ensure straight and true joints. The joints shall be filled with grey cement grout with wire, brush or trowel to a depth of 5mm. and loose material removed. White cement shall be used for pointing the joints. After fixing the tiles finally in an even plane the flooring shall be kept wet and allowed to stay undisturbed for 7 days.

Cleaning - The surplus cement grout that may have come out of the joints shall be cleared off before it sets. Once the floor has set, it shall be carefully washed, cleared by dilute acid and dried. Proper precautions and measures shall be taken to ensure that the tiles are not damaged in any way till the completion of the construction.

46.3.0 MODE OF MEASUREMENTS & PAYMENTS

46.3.1 The work done shall be measured in Sq.Mts. for visible area of work done. The length and width of the flooring shall be measured between the faces of skirtings or dados or plastered face of wall as the case may be. The paving under dedo or skiritng shall not be measured. No deductions shall be made for extra paid for any opening in the floor of are upto 0.1 Sq.Mts. Nothing extra shall be paid for laying the floors at different levels in the same rooms.

46.3.2 The rate shall be for a unit of one Sq.Mts.

Item No. 47 :-

Providing and laying white glazed tiles 6mm. thick of Kajaria, Somani, Orint, Nitco, Jhonson make at all floor levels, in skirting risers of steps and dedo on 10 mm. thick cement plaster 1:3 (1 cement : 3 coarse sand) including necessary cement paste for fixing and joined with white cement slurry etc. complete. (BASIC RATE RS.302/-PER SQ.MT.)

47.1.0 MATERIALS

Water shall conform to M-1. Cement mortar shall conform to M-11. White glazed tiles shall conform to M-55.

47.2.0 WORKMANSHIP

47.2.1 Preparation of Surface - In case of brick masonary work, the joints shall be raken out to a depth of at least 15 mm. the surface shall be chiselled and roughened with wire brushes. The surface shall be cleaned and wetted thoroughly before commencing the laying work.

Laying - The wall surface shall be covered with 10mm. thick plaster of cement mortar 1:3 mix and allowed to harden. The plaster shall be roughened with wire brushes both ways. The back of tiles shall be floated with grey cement slurry and edges with white cement slurry set in bedding mortar. The tiles shall be gently tapped in position one after the other keeping the joints as thin as possible. Dedo shall be truly horizontal and the joints vertical or as per the required pattern.

Risers of steps, skirting and dedo shall rest on top of treads or flooring. Where full size tiles cannot be fixed, they shall be cut to the required size and the edges to be smoothened.

The joints shall be cleaned and flush pointed with white cement. The surface shall be kept wet for seven days. After curing the surface shall be washed clean.

47.3.0 MODE OF MEASUREMENTS & PAYMENTS

47.3.1 The rate shall include the cost of all materials and labour required for various operations described above. Risers of steps, skirting and dedo shall be measured in Sq.Mts. Length and height shall be measured along the finished face of the skirting or dedo including curves, where special such as covers, internal and external angles etc. used. The length and height shall be measured correct to the cms. except in case of risers and skirting where height shall be measured correct to 3mm.

47.3.2 The rate shall be for a unit of one Sq.Mts.

ITEM NO.48 :

Providing and laying cement concrete work 1:1.5:3 [1 Cement, 1.5 coarse sand:3 graded stone aggregates 20 mm nominal size) and curing complete excluding cost of form work and reinforcement for reinforced concrete work in (A) Staircase (B) Vertical and horizontal fins etc. comp. for above floor two level.

48.1.0 MATERIALS AND WORKMANSHIP :

The relevant specification of Item No. 3 shall be followed except that the concrete work shall be carried out for super structure above floor two level.

48.2.0 MODE OF MEASUREMENT & PAYMENT :

The relevant specifications of Item No.3 shall be followed.

The extra payment shall be made for additional lift above floor two level to each additional floor over and above. The rate of concrete work shall be measured and paid under this item.

The rate shall be for a unit of one cubic metre.

ITEM NO.49 :

Providing and laying ordinary cement concrete 1:1.5:3 [1 Cement, 1.5 coarse sand:3 graded stone aggregates 20 mm nominal size) and finishing smooth with cement plaster in cement mortar 1:3 and curing etc. complete including the cost of form work but excluding the cost of reinforcement for R.C.C. work in (A) Columns (I) Having cross sectional area 0.05 to 0.08 Sq.mt. (II) Having cross sectional area more than 0.08 Sq.mt. and upto 0.12 Sq.mt. (III) Having cross sectional area more than 0.12 Sq.mt. and upto 0.18 Sq.mt. (B) Beams (I) Having cross sectional area 0.05 to 0.08 Sq.mt. (II) Having cross sectional area more than 0.08 Sq.mt. upto 0.12 Sq.mt. (III) Having cross sectional area more than 0.12 Sq.mt. upto 0.18 Sq.mt. (C) Slabs : (I) Slabs upto 8 cms thickness (II) Slabs having more than 8 cms and upto 10 cms thickness (III) Slabs having more than 10 cms and upto 13 cms thickness (IV) Slabs having thickness more than 13 cms and upto 15 cms thickness (D) Lintels etc. complete for above floor two level.

49.1.0 MATERIALS AND WORKMANSHIP :

The relevant specification of Item No.5 shall be followed except that the concrete work shall be carried out for super structure above floor two level.

49.2.0 MODE OF MEASUREMENT AND PAYMENT :

The relevant specification of Item No.5 shall be followed.

The extra payment shall be made for additional lift above floor two level to each additional floor over and above the rate of concrete work shall be measured and paid under this item.

The rate shall be for a unit of one cubic metre.

ITEM NO.50 :

Providing and laying cement concrete 1:1.5:3 [1 Cement, 1.5 coarse sand:3 graded stone aggregate 20 mm nominal size) for reinforced concrete chhajas not exceeding 10 cms thickness above floor two level including finishing the exposed surfaces with cement mortar 1:3 (1 Cement : 3 fine sand) to give a smooth and even surface centering and form work and curing complete excluding cost of reinforcement etc. complete.

50.1.0 MATERIALS AND WORKMANSHIP :

The relevant specification of Item No.6 shall be followed except that the concrete work shall be carried out for super structure above floor two level.

50.2.0 MODE OF MEASUREMENT & PAYMENT :

The relevant specifications of Item No.6 shall be followed.
The extra payment shall be made for additional lift above floor two level to each additional floor over and above. The rate of concrete work shall be measured and paid under this item.
The rate shall be for a unit of one cubic metre.

ITEM NO.51 :

Providing TMT/CRS bars steel reinforcement for R.C.C. work including bending binding and placing in position complete above floor twl level etc. complete.

51.1.0 MATERIALS AND WORKMANSHIP :
The relevant specification of Item No.7 shall be followed except that the work shall be carried out for super structure above floor two level.

51.2.0 MODE OF MEASUREMENT & PAYMENT :
The relevant specifications of Item No.7 shall be followed.
The extra payment shall be made for additional lift above floor two level to each additional floor over and above the work shall be measured and paid under this item.
The rate shall be for a unit of one Kg. per floor.

ITEM No.52 :-

Providing cement vata (10 cms x 10 cms) size quarter round in cement mortar 1:1 including neat cement finishing watering etc.comp.

52.1.0 Material :
Water shall conform to M-1 cement mortar shall conform to M-11.

52.2.0 Workmaship :
The work of cement vata of 10 cms x 10 cms size shall be carried out at junctions of parapets and terraces as directed. The vata shall be finished in quarter round shape. The work shall be carried out in the best work manlike manner.The inlet portion of rain water pipe shall be rounded off properly during constructing the vata. The work shall be cured for 7 days.

52.3.0 Mode of measurements and payment :
The work shall be measured for finished item in running metre. The rate shall be for a unit of one running metre.

ITEM No. 53A :-

Providing and fixing water closet squatting pan (Orissa type W.C. pan) at all floor levels, size 580 mm. including 100 mm. size "P" or "S" trap for water closet squatting pan joining the trap with the pan and soil pipe in cement mortar 1:1 (1 cement: 1 fine sand) etc. complete.(A) Viterous china long pattern of approved colour .For all Floor.

53.1.0 Materials
Water closet squatting pan (Orissa type W.C. Pan) and `P' Trap shall conform to M-62, foot rests shall conform to M- 62A. Cement mortar shall conform to M-11.

53.2.0 WORKMANSHIP

53.2.1 The pan shall be sunk into the floor and embedded in a cushion of average 15 cms. cement concrete 1:5:10 (1 cement; 5 fine sand; 10 graded stone aggregate or brick aggregate 40 mm. nominal size) or as specified. This concrete shall be left 115 mm. below the top level of the pan so as to allow for flooring and its bed concrete. The floor should be suitably sloped so that the waste water is drained into the pan. The pan shall be provided with 100 mm. `P' or `S' trap as specified in the item with approximately 50 mm. seal. The joints between the pan and the trap shall be made leak- proof with cement mortar 1:1 (1 cement; 1 find sand).

53.2.2 The `P' or `S' trap shall be fixed with pan and cast iron pipe with C.M. 1:1. The pan shall be provided with a 100 mm. `P' or `S' trap as specified in the item with an approximately 50 mm. seal. The joint between the pan and the trap shall be made leakproof with cement mortar 1:1 (1 cement; 1 fine sand).

53.2.3 After laying the floor,the floor shall be suitably sloped so that the waste water is drained into the pan. A pair of foot-rests of size 250 mm x 130 mm x 30 mm of white vitreous china shall be set in cement mortar 1:3 (1 cement; 3 coarse sand). The foot rests shall be fixed at a distance of 175 mm. from the inner edge of the back side of the pan and shall be fixed at convenient angle.

53.3.0 MODE OF MEASUREMENT & PAYMENT :

53.3.1 The rate shall include the cost of all materials and labours involved in all the operations described under workmanship.

53.3.2 The rate shall be for a unit of one number.

ITEM No. 53B :-

Providing and fixing Wash Down Water closet European type W.C. pan with integral P or S trap with normal closing seat cover L bend including jointing the trap with soil pipe in cement mortar 1:1 (1 cement : 1 find sand) (A) Viterous china pattern – I

WORKMANSHIP

Closet shall be fixed to the floor by means of 75 mm long 6.5 mm diameter conter sund bolts and nuts embedded in the floor concrete using rubber or fibre washers so as not to allow any lateral displacement. The joint between the trap of W.C. and soil pipe shall be made with C.M. 1:1 (1 Cement : 1 Fine sand).

MODE OF MEASUREMENT & PAYMENT :

The rate shall include the cost of all labours for fixing pans and seat and cover, inlet, connections etc. complete including testing the same.

The payment of seat and cover shall be made separately.

Payment as per Schedule-B and as directed by Engineer. The rate shall be for a unit of one number.

Providing and fixing Plastic seat and cover for wash down water closet with C.P. brass hinger and rubber buffer hinges black/ white/ colour plastic seat and cover.

As per manufacturer's specification. The seat and cover shall be with ISI mark. Payment as per Schedule-B and as directed by Engineer.

ITEM No. 53C :-

Providing and fixing plastic seat and cover for wash down water closet with C.P. brass hinges and rubber buffers (B) Black plastic seat and cover.

Details specification same as per Item No.51A but read Wash Down closet European type W.C. pan instead of water closet squating pan (Orissa type W. C pan)

ITEM No.54 :-

Providing and fixing wash Hung basin with single hole for pillar tap,Size-550x400x200 mm at all floor levels,with C.I or M.S Brackets Painted white incl. cutting holes & making good the same etc. complete For all Floor.(Make - Cera,Parry ware,Jaguar,Hindware)

54.1.0 MATERIALS

54.1.1 The white glazed earthenware wash basin shall be 550 mm. x 400 mm. of 1st quality and make as approved by the Engineer-in-charge. The wash basin shall conform to M-59. The capstan head pillar tap of specified dia. of C.P. over brass shall be of best quality and shall conform to I.S. 1975-1961. The pillar taps shall be of tested quality. The C.P. brass trap and union shall be of 32 mm.dia. and of best quality and make as approved by the Engineer-in-charge. The brass screw down stop cock of specified dia. shall conform to I.S. 781-1977. The stop cock shall be of tested quality.

54.2.0 WORKMANSHIP

54.2.1 The wash basin shall be fixed on the wall as and where directed. The wash basin shall be supported on a pair of M.S. or C.I. brackets fixed in C.M. 1:3 (1 cement; 3 sand). The bracket shall conform to I.S. 775-1962. The wall plaster on the rear shall be cut to rest the top edge of the wash basin. After fixing the basin, plaster shall be made good and surface finished to match with the existing one.

54.2.2 The bracket shall be painted white with ready mixed paint. The C.P. brass trap and union shall be connected to 32 mm.dia. waste pipe which shall be suitably bent towards the wall and which shall discharge into an open drain leading to a gully trap or direct into the gully trap on the ground floor and shall be connected to a waste pipe through a floor trap on the upper floors. C.P. brass trap and union may not be provided where the surface drain or a floor trap is placed directly under the basin and the waste is discharged into vertically.

54.2.3 The height of the front edge of the wash basin from the floor level shall be 80 cms.

54.2.4 The capstan head pillar tap of specified dia. shall be fixed as directed with required washers of selected leather or rubber asbestos composition or plastic as directed. The cock shall be fixed with pipe line with white zink and spun yarn, to make joint water tight. The work shall be carried out in best workman like manner.

54.2.5 C.P. brass waste trap and union shall be connected to 32 mm.dia. waste pipe which shall be connected suitably towards the wall and which shall discharge into the drain through a floor trap. The C.P. brass waste trap shall be provided for wash basin or sink as the case may be.

54.2.6 The stop cock shall be fixed in position by means of jam, nut & socket. The stop cock shall be fixed near the inlet of the water metre or as directed. The joints shall be done with white zinc and spun yarn. The joint shall be tested for leak proofing.

54.2.7 The necessary inlet, outlet connections and fittings such as pillar cocks, C.P. brass waste trap, waste pipe, stop cock etc. shall be fixed as specified above.
54.2.8 The payment of fittings shall be made under this item.
54.3.0 MODE OF MEASUREMENTS & PAYMENTS
54.3.1 The rate includes cost of all labour, materials, tools and plant etc. required for satisfactory completion of this item as specified in workmanship.
54.3.2 The rate shall be for a unit of one number.

ITEM NO.55 :

Providing & fixing 600 mm. x 450 mm. mirror of superior glass at all floor levels, mounted on 6 mm. th. A.C. sheet or plywood sheet & fixed to wooden plugs with C.P. brass screws and washers etc. for all floor

55.1.0 MATERIALS :
The 600 mm x 450 mm size mirror shall be of superior glass with edge rounded off or bevelled as specified. It shall be free from flaws specks, or bubbles and its thickness shall not be less than 6 mm. The glass for the mirror shall be uniformly silver plated at the back and shall be free from silverting defects, silvering shall have a protective uniform covering of red lead paint. The 6 mm. thick plywood shall conform to M-37. The 6 mm. thick A.C. Sheets shall conform to M-24.
55.2.0 WORKMANSHIP :
The mirror of 500 mm x 450 mm size mounted on A. C. Sheet or plywood 6 mm thick with C.P. brass clips shall be fixed as directed by fixing wooden plugs in wall and C.P. brass screws and washers, The work shall be carried out in best workman like manner.
55.3.0 MODE OF MEASUREMENT AND PAYMENT :
The rate includes cost of labour and materials tools and plant etc. required for satisfactory completion of this item. The rate shall be for a unit of one number.

ITEM No. 56 :

Providing & Fixing PVC Nanhi trap 31/2" ht.of Prince/ Supreme/ Jain/ Astral/ Tulsi/Finolex make at all floor levels of self cleaning design with screwed down or hinged grating incl. cost of cutting making good the walls & floors etc. For all Floor

56.1.0 MATERIALS
56.1.1 The UPVC nahni trap shall conform to M-68-A.
56.2.0 WORKMANSHIP
56.2.1 The nahni trap with 100 mm.dia. inlet and 50 mm.dia. outlet shall be fixed as per drawings or as directed.
56.2.2 The nahni trap shall be jointed with PVC pipe, 75 mm.dia. with jointing materials as per manufacturer's instruction.
56.3.0 MODE OF MEASUREMENTS & PAYMENTS
56.3.1 The rate includes cost of all labour, materials, tools and plants etc. required for satisfactory completion of this item including lead jointing and testing.
56.3.2 The rate shall be for a unit of one number.

ITEM No. 56A :

Providing & Fixing cast iron(spun) Nanhi trap at all floor levels of the following nominal diameter of self cleaning design with C.I. screwed down or hinged grating incl. cost of cutting making good the walls & floors 100 mm. Inlet&50 mm outlet etc. For all Floor.

Details specification same as per Item No.56 but read Cast Iron Spun) Nanhi trap instead of U-PVC Nanhi trap and as directed by Engineer-in-charge.

ITEM NO. 57 :

Providing and fixing s.w. Gully trap with C.I. gratting brick masonary chamber and water tight Pre cast R.C.C.cover of 300mm X 300mm size (inside) including plastering smooth inside and outside 15 mm thick in C.M 1:3 etc. comp.i) square mouth traps

57.1.0 MATERIALS :
(1) Water shall conform to M-1. (2) Cement mortar of proportion 1:5 shall conform to M-11. (3) Flyash Building brick shall conform to M- 15(A). (4) The S. W. Gulley trap of 100 mm x 100 mm size shall conform to M-70.
57.2.0 WORKMANSHIP :

Excavation for gulley trap shall be done true to dimensions and levels as indicated on plans or as directed. The excavation work shall generally be done as per relevant specification of item 1(a) or earth work.

Fixing :

The gulley trap shall be fixed over cement concrete 1:5:10 (1 Cement : 5 sand : 10 graded brick bats aggregate 40 mm nominal size) foundation 650 mm square and 100 mm thick. The depth of top of concrete below the ground level shall be 675 mm. The jointing of gulley outlet to the branch drain described in Item No.60.

Brick Masonary Chamber :

After fixing and testing gulley and branch drain, a brick masonary chamber 300 mm x 300 mm inside with bricks in C.M. 1:5 (1 Cement : 5 sand) shall be built with a 100 mm brick work round the gulley trap from the top of bed concrete upto ground level. The space between the chamber walls and trap shall be filled with cement concrete 1:5:10. The appre portion of the chamber i.e. above the top level of the trap shall be plastered inside with cement mortar 1:3 (1 Cement : 3 sand) finished with floating coat of neat cement. The corners and bottom of the chamber shall be arounded of so as to slope towards.

C.I. Cover with frame 300 mm x 300 mm (Inside) size shall then be fixed on the top of the brick masonary with C.C. 1:2:4(1 Cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) 40 mm thick and rendered smooth. The finished top of the cover shall be left about 40 mm above the adjoining ground level so as to exclude the surface water from entering the gulley trap.

57.3.0 MODE OF MEASUREMENTS AND PAYMENT :

The rate includes cost of all labour, materials tools and plant etc. required for satisfactory completion of this item as described above.

ITEM NO. 57 A :

Prov. & Fixing S.W. Gully trap with C.I.grating brick masonary (C.M 1:5)chamber & water tight C.I. cover with frame of 300mmx300mm size (inside) with weight to be not less than 4.53kg, clud. plastering smooth inside & outside 15mm. th' in C.M.1:3 etc. comp. (i) Square mouth traps---

Details specification as per Item No.57 but The Place Of Water tight Cover Pre Cast R.C.C. Cover instead of C.I. Cover Frame and as directed by Engineer-inc-ahrge.

The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

ITEM No 58 :

Providing and fixing 10cm. x15 cm.(4" x 6") S.W. trap with Inside dimension 0.455 x 0.610 mts. & 0.45mts. deep sewer trap chamber with 23cm. th. B.B masonary walls in c.m. 1:5 with cement plaster 15mm. thick in c.m. 1:3 inside and outside to exposed faces bedding concrete 1: 5:10 and fixing C.I. cover with frame to be not less than 38 Kg on top etc. comp. for single pipe(A)Precast RCC heavy duty cover instead of C.I.Cover

General :-

The item refers to provide and fix 10 cms. x 15cms. S.W.trap with 0.45 x 0.60 mts. clear opening sewer trap chamber with 23 cms. thick B.B. masonary walls in C.M. 1:5 with cement plaster inside and outside to exposed faces including fixing C.I. cover of 38 Kgs. on top sewer trap.

58.1.0 MATERIALS

The stone wall sewer trap shall be of 10cms. x 15cms. size conforming to relevant I.S. 651-1980.

58.2.0 WORKMANSHIP

58.2.1 Necessary excavation shall be done as required. The foundation cement concrete of 1:5:10 shall be laid for a thickness of 15cms. The S.W. trap shall be fixed into the position on the main sewer side of the chamber as directed. Brick masonary chamber of one brick thickness in C.M. 1:8 shall be constructed with the inside dimensions 60cms. x 45cms.

58.2.2 The inside of the chamber shall be plastered in 15mm. thick C.M. 1:3 and shall be finished smooth with cement slurry. The outside of the chamber shall be plastered to a depth of 30 cms. from the top of the chamber. The item also includes providing and laying 1:2:4 cement concrete for fixing the Precast RCC heavy duty frame and cover. The Precast RCC heavy duty frame and cover shall be of the specified size.

58.3.0 MODE OF MEASUREMENTS & PAYMENTS

58.3.1 The rate includes costs of all materials, labour, tools, plants, etc. required for carrying out satisfactory completion of items as described above.

58.3.2 Rate shall be as per number basis.

ITEM NO. 59 :

Providing and constructing simple chamber of 23cm. of B.B. masonary wall in c.m. 1:5 incl. 15mm. thick cement plaster in c.m 1:3 inside and out side to exposed faces incl. bedding concrete 1:5:10 & fixing C.I. cover with frame to be not less then 38 k.g. on tp etc. comp. inside dimension 0.455 x 0.610 mt. & 0.45 mt deep for single pipe(A)Precast RCC heavy duty cover instead of C.I.Cover

59.1.0 Materials :

Water shall confirm M-1. Cement shall confirm to M-3. Coarse sand shall confirm to M-6. Flyash Building Brick shall confirm to M-15(A). Cement mortar shall confirm to M-11.

59.2.0 Workmanship :-

59.2.1 The item covers the construction of simple chamber of clear size 0.45 x 0.60 mts.with 23 thick brick wall in C.M.1:5 and smooth plaster 15 mm thick C.M. 1:3 Bedding concrete of C.C. 1:5:10, 150 mm thick, the projected bed concrete beyond chamber wall shall be of 75 mm. The chamber frame & cover shall be of Precast RCC heavy duty cover fixed with C.M. 1:1 etc. comp.

59.2.2 Specification for item No.1[a] shall be read for excavation, & specification for Item No.8 shall be adopted for P.C.C. and specification for Item No.12 shall be read for B.B. Masonary and specification for Item No.14 shall be read for plaster work except that the thickness of plaster shall be 15 mm thick in CM 1:3.

59.3.0 Mode of Measurements and payments :-

[1] The rates including all labours, materials, tools and plats etc. required for satisfactory completion of this work.

[2] The rate shall be for a unit of one number.

ITEM No.60 :-

Providing & laying joining RCC NP2 class pipe in C:M 1:1 of following nominal internal diameter incl. testing of pipes and joints etc. comp.

60.1.0 MATERIALS :

60.1.1 The reinforced concrete light duty non-pressure pipes of specified diameter shall confirm to I. S. 458-1971. Cement mortar of required proportion shall conform to M-7.

60.2.0 WORKMANSHIP :

60.2.1 EXCAVATION OF TRENCHES :

60.2.1.1 The width of the trenches shall be 1.05/1.20 metre and depth shall be corresponding to invert level of the screen chamber and required levels as directed.

60.2.1.2 At joints, the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications of earth work in trenches.

60.2.2 LAYING :

60.2.2.1 The pipe shall be laid accurately and perfectly true to line, levels and gradients. Great care shall be taken to prevent sand etc. from entering the pipes. The pipes between two manholes shall be laid truly in a straight line without vertical or horizontal undulation. All junctions and changes in direction and diameter shall be made inside manholes by means of curved tapered channels formed in cement concrete finished smooth and benched on both sides. The body of the pipe shall rest for its entire length, on an even level bed grips being made of left on the bed to receive the sockets of the pipes.

60.2.3 JOINTING :

60.2.3.1 Tarred gasking or yarn soaked in neat cement slurry shall first be placed around the spigot of each pipe and spigot shall than be placed well home into the socket of the pipe previsously laid. The pipe shall then be adjusted and fixed in the correct position and gaskin caulked home so as to fill not more than 1/4th of the total depth of (13 mm in depth) the socket.

60.2.3.2 The remainder of the socket shall be filled with stiff mixture of cement mortar in proportion of one part of cement and one part of sharp sand. When the a socket is filled, a fillet shall be formed round the joints forming an angle of 45 degree with the barrle of the pipe.

60.2.3.3 The mortar shall be mised as necessary for immediate use.

60.2.3.4 After the joint is made, any extraneous materials shall be removed from the inside of the joints with a suitable scraper or `badger'. The newly made joints shall be protected, until set, from the sun, dry winds, rain or frost, sacking or other suitable materials which shall be used for the purpose.

60.2.3.5 The mortar shall be cured for 10 days.

60.3.0 MODE OF MEASUREMENT AND PAYMENT :

60.3.1 Pounding or bottaning of the trenches bed to fit the lower part of the pipe and `Grips' dug to take socket collars etc. are included in the rate of laying the pipes.

60.3.2 The measurements shall be net without any allowance for cutting and waste. The length of bends, junctions and other connection shall be included in the total length of the pipe drains. Nothing extra shall be paid for the same. The rate excludes necessary excavation, including refilling trenches etc.complete.

60.3.3 The rate shall be for a unit of one running metre.

ITEM No 61 :-

Providing and fixing to walls celling and floor galvanised mild steel tube (medium grade) of the following nominal bore, tube fittings and clamps including making good of the walls, ceiling and floor (a) 25 mm. dia. (b) 15 mm. (c) 40 mm dia.

61.1.0 MATERIALS

Galvanised mild steel tubes of specified dia. nominal bore shall conform to I.S. 1239-1990. The galvanised fittings, clamps, etc. required for specified dia. bore pipes shall be of best quality and make as approved by the Engineer-in- charge.(Galvanised iron pipes and fittings shall conform to M-56)

62.2.0 WORKMANSHIP

62.2.1 Cutting, Laying & Jointing - When the tubes are to be cut or rethreaded, the ends shall be carefully filed out so that no obstruction to bore is offered. The ends of the tubes shall then be threaded conforming to the requirements of I.S. 554- 1955 with pipe dies and taps carefully in such a manner as will not result in slackness of joints when the two pieces are screwed together.

The taps and dies shall be used only for straightening screw threads which have become bent or damanged and shall not be used for turning of the threads so as to make them slack as the latter procedure may not result in a water tight joint. The screw threads for the tube and fittings shall be protected from edge until they are fitted.

In jointing the tubes, the inside of the socket screwed end of the tubes shall be oiled and smeared with white or red lead and wrapping around with a few turns of fine spun yarn round the screwed end of the tube. The end shall then be tightly screwed in the socket, tees, etc. with a pipe wrench. Care shall be taken that all pipes and fittings are properly jointed so as to make the joints completely water tight and pipes are kept at all times free from dust and dirt during fixing. Burr from the joints shall be removed after screwing. After laying the open ends of the pipes shall be temporarily plugged to prevent access of water, soil or any other foreign matter. Any threads exposed after 3 jointing shall be painted or in the case of underground piping thickly coated with approved anti-corrosive paint to prevent corrosion.

61.2.2 Laying in Trenches - The width and depth of the trenches for different diameters of the tubes shall be as - For 15 to 80 mm. dia. tube width of trenches shall be 30 cms. and depth of trenches 60 cms.

At joints, the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications of earth work in trenches.

The pipes shall be painted with two coats of anti-corrosive bitumastic paint of approved quality. The pipe shall be laid on a layer of 75mm. sand filled upto 150mm. above the pipe if so specified. The remaining portion of trench shall be then filled with excavated earth. The surplus earth shall be disposed of as directed.

When the excavation is done in rock the bottom shall cut deep enough to permit the pipe to be laid and cushion of sand 75 mm. In case of bigger diameter of tube where pressure is very high, thrust block of cement concrete 1:2:4 (1 cement; 2 coarse sand; 4 graded stone aggregate of 20 mm. nominal size) shall be constructed on all bends to transmit the hydraulic thrust without imparing the ground and spreading it over a sufficient area if so specified.

61.2.3 Fixing of Tube Fittings to wall ceiling & floors - In case of fixing of tubes and fittings to the walls or ceilings, these shall run on the surface of the wall or ceiling (not in chase) unless otherwise specified. The fixing shall be done by means of standard pattern, holder clamps keeping the pipes about 15mm. clear of the wall. When it is found necessary to conceal the pipes and when specified so, chasing may be adopted or pipe fixed in ducts or recesses etc. provided that there is sufficient space to work on the pipe with usual tools. The pipe shall not ordinarily be buried in walls or solid floors, where unavoidable pipes may be buried for short distances provided that adequate protection is given against damage and where so required joints are not buried. Where required M.S. tube sleaves shall be fixed at a place a pipe is passing through a

wall or floor for expansion and contraction and other movements. In case the pipe is embeded in walls or floors, it should be painted with anti-corrosive bitumastic paint of approved quality. The pipe should not come in contact with lime mortar or lime concrete as the pipe is affected by lime, under the floors, the pipe shall be laid in layer of sand filling.

All pipes and fittings shall be fixed truly vertical and horizontal unless unavoidable. The pipes shall be fixed to walls with standard pattern clamps or required size and shape, one end of which shall be properly plugged or cemented into walls with cement mortar 1:3 (1 cement; 3 coarse sand) and the other tightened round the pipes to hold it securely. These clamps shall be spaced at regular intervals in straight lengths at 2 M c/c interval in horizontal run and 2.5 M. intervals in vertical run. For pipe of 15 mm. dia. upto 25 mm. dia. the holes in the walls and floors shall be made by drilling with chisel or jumper and not by dismantling the brick or concrete. However, for bigger diameter pipes the holes shall be carefully made of the smallest required size. After fixing the pipe holes shall be made good with cement mortar 1:3 (1 cement; 3 coarse sand) and properly finished to match the adjacent surface.

61.2.4 Testing of Joints - After laying and jointing, the pipes and fittings shall be inspected under working conditions of pressure and flow. Any joint found leaking shall be redone, and all leaking pipes removed and replaced without extra cost.

The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 Kg./sq.cm. The pipe shall be slowly and carefully charged with water allowing all air to escape and avoiding all stock and water hammer. The draw off takes and stock shall then be closed and specified hydraulic pressure shall be applied gradually. The pressure gauge must be accurate . The pipes and fittings shall be tested in sections as the work of laying proceeds, veeping the joints exposed for inspection during the testing.

61.3.0 MODE OF MEASUREMENTS & PAYMENTS

61.3.1 The description of each item, shall unless otherwise stated, be held to include where necessary, conveyances and delivery, handling, unloading, storing, fabrication hoisting, all labour for finishing to required shape and size setting fitting in position, straight, cutting and waste, return of packing etc.

61.3.2 The length shall be measured on running metre basis of finished work. The length shall be taken along the centre line of the pipe and fittings. The pipes fixed to walls, ceiling, floors etc. shall be measured and paid under this item.

61.3.3 All the work shall be measured in decimal system as fixed in its place, subject to tolerance given below unless otherwise stated.

[i] Dimension shall be measured to the nearest 0.01 metre.

[ii] Area shall be worked out to the nesrest 0.01 Sq.mt.

61.3.4 In case of fittings of unequal bore, the largest bore shall be measured for the test.

61.3.5 Testing of pipe lines, fittings and joints included for providing all plant and appliances necessary for obtaining access to the work to be tested and carrying out the tests.

61.3.6 The rate includes galvanised steel tubing with screwed socket joints, together with all fittings (such as bends, sockets, springs, elbows, tees, crosses, short pieces, clamps and plug unions etc.) and fixing complete with clamping wall-hooks, wooden plugs etc. and also cutting screwing and waste and for making forged (or hand made) bends on piping as required. The rate also includes cutting through walls, floors etc. and their making good and painting exposed threads with anti-corrosive paint as above and testing. Where tubes are to be fixed to wall, ceiling and flooring, the rates shall not include painting of pipes, providing sleeves and sand filling under floor for which separate payment shall be made.

61.3.7 The rate include painting of pipes and sand filling all round tubes for which separate payment shall not be made. The length shall be measured on running metre basis.

61.3.8 The rate shall be for a unit of one running metre.

ITEM NO. 62 :-

Providing and laying in trenches galvanised mild steel tubes [Medium grade] of the following nominal bore and tube fittings [earth work in trenches to be measured and paid for seperately] etc.comp. (A) 25 mm

62.1.0 Materials :-

Galvanised mild steel tube of specified dia nominal bore and fittings shall conform to I.S. 1239:1990 [Galvanised Iron pipes and fitting shall conform to M-56].

62.2.0 Workmanship :-

62.2.1 The relevents specifications of Item No.61 shall be followed for cutting laying and jointing testing of joints except that the fixing of tube shall be done in trenches.

62.2.2 The width and depth of the trenches for different diameters of the tubes shall be as under:

62.2.3 For 15 to 80 dia tube width of trenches shall be 30 cms.and depth of trenches 60 cm.

62.2.4 At joints,the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications of earth work in trenches.

62.2.5 The pipes shall be painted with two coats of anti-corrosive bitumestic paint of approved quality. The pipe shall be laid on a layer of 75 mm. sand filled upto 150 mm. above the pipe if so specified. The remaining portion of trench shall be then filled with excavatedearth. The surplus earth shall be disposed off as directed.

62.2.6 When the excavation is done in rock the bottom shall be cut deep enough to permit the pipe to be laid and cushion of sand 75 mm. In case of bigger diameter of tube where the pressure is very hign, thrust block of cement concrete 1:2:4 [1 cement:2 coarse:4 graded stone aggregate or 20 mm nominal size] shall be constructed on all bends to transmit the hydraulic thrust without impacting the ground and spreading itover a sufficient area if so specified.

62.3.0 Mode of measurements and payments :

62.3.1 The relevent specification of Item No.61 shall be followed. The authorised quantities shall be measured.

62.3.2 For purpose of calculating cubic content cross section shall normally be taken at suitable intervals i.e. manhole or wall chamber intervals, except in a abnormal cases like sudden change in strata or undulating ground etc. where they may be taken at closer intervals as approved by the Engineer-in- charge whose decision shall be final, conclusive and bidng.

Authorised width :-

[a] Upto one meter depth, the width of the trenches for the purpose of measurements of excavation shall be arrived at by adding 40 cms. to the external diameter of the tube [not the socket] where a pipe is laid on concrete bed/cushioning layer, the authorised width shall be the external diameter of tube plus 40 cms. or the width of the concrete bed cushioning layer whichever is more. [b] For depth exceeding one meter an allowance of 5 cms. per meter of depth for each side of the trench shall be added to the authorised width [i.e. external diameter of the pipe plus 40 cms. This allowance shall by apply to the entire depth of the trench. The authorised width in such cases shall therefore be equal to the depth of trench, plus external diameter of the plus 40 cms.

[c] Where more than one tube is laid, the diametere shall be reckoned at the horizontal distance from outside to outside to outside ofthe outer most pipes.

[d] Where sheeting etc. has been provided the authorised width of the trenches at bottom shall be increased to accommedate for sheeting etc. so the clear width available between faces of sheeting is as per provisions of [a] [b] and [c] above.

[e] If the sides of the trench are not vertical. the toes of the side slopes shall end at the top of the pipe and vertical sided trench of authorised width as per [a] [b],[c] and [d] above shall be excavated from these down to the bed of trenches.

62.3.3 Where the tubes are laid in trenches, the work of excavation and refilling shall be paid of seperately.The rate also does not include painting of pipes and sand filling all round the tubes for which separate, payment shall be made. The length shall be measured on running metre basis.

62.3.4 The rate shall be for a unit of one running metre basis.

IITEM No. 63 :

Providing and fixing Bib tap with wall flange 25 mm with lever knob at all floor levels ,polished bright etc. comp.(Make - Cera,Parry ware,Jaguar,Hindware)

63.1.0 MATERIALS

63.1.1 15mm. dia. brass screw down with bright polished finish shall conform to I.S. 781-1990 & M-57. The bib cock shall be best Indian make and quality.

63.2.0 WORKMANSHIP

63.2.1 The screw down bib cock 15mm. dia. as specified above shall be fixed as directed. THe threaded portion shall be smeared with white or red, lead and around with a few turns of fine spun yarn round the screwed end of the pipe. The bib cock shall be then screwed and fixed to water tight position.

63.3.0 MODE OF MEASUREMENTS & PAYMENTS

63.3.1 The rate includes cost of all labour, materials, tools and plant etc. required for satisfactory completion of this item.

63.3.2 The rate shall be for a unit of one number.

ITEM No. 64 :-

Providing and fixing gun metal check or non return full way wheel valve of Kirlosker,Indian Valve,Williams and Jacks at all floor levels etc. complete. A] 15 mm. dia. B] 25 mm.dia.

64.1.0 MATERIALS

The gun metal check or non-return full way valve of specified dia. shall conform to I.S. 778-1990 & M-58. The non-return valve shall be tested quality.

64.2.0 WORKMANSHIP

The gunmetal check or non-return valve shall be fully cleared of all foreign matter before fixing of valve shall be done means of bolts, nuts and 3 mm. rubber insertions. with flanges of spigot and socketed tail pieces drilled to the same specification as in case of socket and with flanges in ease of flanged pipes. The joining shall be done leak proof.

64.3.0 MODE OF MEASUREMENTS & PAYMENTS

64.3.1 The rate includes all labours, materials, tools and plant etc. required for satisfactory completion of this time.

64.3.2 The rate shall be for a unit of one number.

ITEIM No. 65 :-

Providing and fixing Metropole Flush valve with wall flange 25 mm with Lever knob at all floor levels, of approved quality incl. fixing in pipe line etc. compl.(Make - Cera,Parry ware,Jaguar,Hindware)

65.1.1 MAATERIALS :

Chromium plated brass half turn flush cock shall conform to M-67.

65.2.0 WORKMANSHIP

65.2.1 he half turn flush cock of specified diametre shall be fixed as directed. The flush cock shall be fixed in G.I. pipe line with necessary fittings. The joints shall be made leak proof by using spun yarn and white zinc. The fixing work shall be carried out as per relevant specifications of Item No. 62.

65.3.0 MODE OF MEASUREMENTS & PAYMENTS

65.3.1 The rate includes cost of all materials and labour required for satisfactory completion of this item including fittings.

65.3.2 The rate shall be for a unit of one number.

ITEM No.66 :-

Providing and fixing abonite ball cock of approved quality as directed etc.comp. (A) 25 mm dia. (B) 50 mm dia.

66.1.0 Materials

The ball cock of specified diameter shall conform to M-75.

66.2.0 Workmanship :

The abonite ball cock of specified diameter shall be fixed as directed.The threaded portion shall be smeared with white or read lead around with a few turns of fine spun yarn round the screwed end of the pipe. The ball cock shall be than screwed and fixed to water tight position.

66.3.0 Mode of Measurement and payment :

The rate includes cost of all materials and labour involved for carrying out satisfactory work. The rate shall be for a unit of one number.

ITEM No.67 :-

Providing an/d fixing C.I. manhole cover 0.60 x 0.45 m. size having weight not less than 35 Kg. etc. comp.

67.1.0 Materials :

C. I. manhole cover 0.60 x 0.45 mts. size shall be of best quality. The weight of C. I. cover and frame shall not be less 35 Kg. The C.I. manhole cover shall be of light duly.

67.2.0 Workmanship :

The C.I. manhole cover shall be fixed as and where directed. The frame of manhole cover shall be embedded firmly in R.C.C. slab. After completion of work, manhole covers shall be sealed by means of thick grease.

67.3.0 Mode of Measurement and payment :
The rate includes cost of all labour and materials required for satisfactory completion of this item. The rate shall be for a unit of one number.

ITEM No. 68 :-

Providing and fixing cast iron spigot and socket soil waste water and ventilating pipes of 75 mm dia & 100 mm.dia. including jointing with cement mortar 1:2 (1 cement ;2 find sand) and spun yarn as directed etc. complete.

68.1.0 MATERIALS
The specification dia. C.I. spigot and socket soil or waste and ventilating pipe shall conform to M-68.

68.2.0 WORKMANSHIP

68.2.1 The fixing of C.I. spigot and sockets soil, waste and ventilating pipe shall be carried out as per relevant specifications of item No. 51 except the C.I. spigot and socket shall be fixed. THe joints shall be filled with cement mortar 1:2 (1 cement; 2 sand) and spun yarn. The pipes without ears shall be fixed to wall with M.S. clamps. The pipes with ears shall be secured with 40 mm. before steel or iron barrel distance pieces or bobils and strout galvanised iron nails 10 cms. long driven into hand wool plugs fixed in walls. Access doors to fittings shall be provided with 3 mm. rubber insert packings and secured without screws to make air and water tight.

The spigot of the upper pipe shall be properly fitted into the socket of the lower pipe such that there is uniform annular space. For fitting with the jointing materials one third depth of annular space between the socket and the spigot shall be filled with spun-yarn soaked in bitumen jointing compound and shall be pressed home by means of a caulking tool. The remaining 2/3 depth of the joints shall be filled in with stiff cement mortar 1:2 and shall be pressed with caulking tool and finished smooth at top at an angle of 45 degree sloping up.

68.2.2 All soil pipes shall be carried up above the roof and shall have a wire ballon guard or a cowl.

68.2.3 The ventilating pipe or shaft shall be carried out to a height of at least one metre above the outer covering of the roof of the building or in the case of windows in a gable wall or a dormer windows, it shall be carried upto the ridge of the roof or at least two metres above the top of the windows. In case of flat roof to which access for use is provided, it shall be carried out upto a height of at least one metre above the parapet or two metres measured vertically from the top of any windows or opening which may exist upto a horizontal distance of five metres from the vent pipe into such building and in no case shall be carried out to a height less than three metres.

68.2.4 Where ventilating pipes are carried in pipe shafts, the shaft shall be of a minimum size of one metre. If the shafts are also used to give light and air to room the ventilating pipes must be carried out to a horizontal distance at roof level of not less than five metres from the site of the shaft.

68.2.5 The sand cast iron pipes above parapet shall be fixed with M.S. clamps and stays. The clamps shall be made from 1.5 mm. thick M.S. flat or 3 mm. width band to the required shape and size to fit tightly on the sockets when tightened with screw bolts. It shall be formed of two semi circular pieces with flanged ends on both sides, with holes to fit in the screw bolts and nuts 40 mm. dia. M.S. bars one end of the stay shall be bent to form a hook to be fixed with clamps by means of bolts and the other end shall be bent for embedding in wall in cement concrete block of size 200mm. x 100mm. x 100mm. in 1:2:4 mix. The concrete shall be finished to match the surrounding surfaces.

68.2.6 The connection between the main pipe and branch pipes shall be made by using branches and bends with access doors for cleaning.
The waste from lavatories, kitchens basins, sinks, baths and other floor traps shall be separately connected to respective stacks of upper floors. The waste stack of lavatoreis shall be connected directly to main hole while the waste stack of other shall be separately discharged over gulley trap.

68.3.0 MODE OF MEASUREMENTS & PAYMENTS

68.3.1 The length of pipe shall be measured including all fittings along its length in running metres correct to a centimetre. No allowance shall be made for the portion of pipe length entered in the sockets of the adjacent pipe of fittings.

68.3.2 The rate includes all labours, and materials, tools and plant etc. required for satisfactory completion of this item.

68.3.3 The rate shall be for a unit of one running metre.

ITEM NO. 69:-

Providing and fixing on wall face C.I. Rain water pipe including filling the joints with spun yarn soaked in neat cement slurry and cement motar 1:2 (1 Cement : 2 fine sand) etc. comp. (A) 75 mm.

69.1.0 Materials :

Water shall conform to M-1 The C.I. rain water pipe and fittings shall conform to M-68. Cement mortar shall conform to M-11.

69.2.0 Workmanship :-

69.2.1 C.I.rain water pipes shall be of the specified diameter and shall be in full lengths of 1.8 metres including socket ends of the pipes unless shorter lengths are required at junctions with fittings.

69.2.2 The pipe and fittings shall be fixed in vertical, alignment unless otherwise sopecifiedand shall be secured to the wall at joints with M.S. clamps. The clamps shall be M.S. sheet 30 mm. bent to required with and size so as to fit rightly on the socket of pipe when tightened with 6 mm.dia. M.S. Pin on one side and provided flanged ends on the other side with holes to fit in the screw bolt and nut 40 mm. long. The clamps shall be provided with hook made out of 27 mm long 10 mm.dia. M.S.bar rivetted to the ring at the centre of one semi-circular piece. The clamps shald be fixed to the walls. The clamps shall be kept above 25 mm. clear of finished face of wall so as to facilate cleaning and painting the pipes.

The pipe shall be fixed vertically. The spigot of the upper pipe shall by properly fitted in the lower pipe such that there of uniform annular space for filling with the joining materials. The annular space between the spigot and socket shall be filed with a few turns of spun yern socked in cement slurry or blow bitumen 85/25 grade.These shall be pressed home by caulking tools. The joints shall then be fitted with stiff cement mortar 1:2 [1 cement :2 find sand] well pressed with caulking tools and finished smooth at top at an angle 45 sloping up. The joints shall be kept wet at least for 7 days by tieing four folds of gunny bag to the pipe and keeping it moist constantly.

69.3.0 Mode of measurements and payments :

The pipe shall be measured including of fittings along its length in running metre. No allowance- shall be made for the portion of pipe length entering the sockets of the adjacent pipe of fittings.

The rate includes the cost of all materials and labour involved in all the operations including jointing.

The rate shall be for a unit of one running metre.

ITEM NO.70 :-

Providing and fixing on wall face asbestos cement rain water pipe including jointing with spun yarn soaked in bitumen and cement 1 :2 [1 cement : 2 coarse sand] etc.comp.[A] 80 mm dia [B] 100 mm dia.

70.1.0 Materials :-

Asbestos cement pipes of specified dia shall conform to I.S.1626:1994 for pipes fixed on wall face A.C. pipe shall conform to M-74.

70.2.0 Workmanship:-

Asbestos cement rain water pipes and fittings shall be of the diameter, size and type specified is the item as required. The pipe shall be fixed in full lengths of 2 metre as far as possible. All the pipes shall be fixed on wall face at locations indicated on drawings or as ordered by the Engineer- in-charge.Pipe shall be secured to face of wall below all joints by M.S.clamps with wooden gutties.

The spigot of the upper pipe shall be properly fitted into the socket of the lower pipe such that there is uniform annular space for fitting with jointing materials. One third depth of annular space between the socket and the spigot shall be filled with spun yarn soaked in bitumen jointing compound and shall be pressed home by means of a caulking tool. The remaining 2/3 depth of

the joints shall be filled in with stiff cement mortar 1:2 and shall be pressed with caulking tool and finished smooth at top an angle of 45 degree sloping up.

70.3.0 Mode of Measurements and payments :-

The pipe shall be measurement including all fittings along its length in running metre. No allowance shall be made for the portion of pipe length entering the sockets ofthe adjacent pipe or fittings. The rate includes the cost of all materials and labour involved in all the operations including jointing.

The rate shall be for a unit of one running metre.

ITEM NO.71 :-

Providing and fixing M.S. Holder batclamps of approved design to C.I. or S. C. I. Pipes embeded in and including cement concrete blocks 100 mm x 100 x 100 mm size of 1:2:4 [1 cement:2 coarse :4 graded stone aggregates of 20 mm nominal size] and cost of cutting and making good the wall etc.comp.[A] 75 mm.

71.1.0 Materials and Workmanship :-

The M.S.Holder bat clamps of approved design shall be for C.I.rain water pipe 75 mm.dia. The bat clamps shall consist of a cast iron base with a projecting I shaped lay, teeth web of which the semi circular halves of the flat iron clamps are bolted. The base on the holder bat clamp shall be screwed on a pair of wooden plugs fixed in the wall with screw slotted driven through the holes in the base,The screws shallnot be less than 75 mm. long for 80 mm. diametre pipes. The plugs shall be fized in the wall to a depth of 150 mm in cement mortar 1:2 centrally to the holes in the base of the bat clamps and with their front face projecting to such a length form the brick face that when the bat clamps is fixed, the outer base of its base shall be flush with the plaster face of the wall. The plugs shall be 110 mm. x 50 mm.wide at take increasing to 160 mm. x 70 mm. width at rear and shall be 70 mm.deep through out.

The bat clamps shall be fixed as directed with C.C. blocks of 100 mm x 100 mm x 100 mm size.

The relevent specifications of item No.17 shall be followed for concrete work.

71.2.0 Mode of measurement sand payments :-

The bat clamp of M.S. Holder suitable for 35 mm.dia shall measured for finished item.

The rate includes cost of all materials etc. required for satisfactory completion of this item.

The rate shall be for a unit of one number.

ITEM NO.72 :-

Providing and fixing on wall face asbestos cement fittings for rain water pipe including jointing with spun yarn soaked in bitumen and cement mortar 1:2 [1 cement: 2 coarse sand] etc. complete Bend of required degree [A] 80 mm dia without door.

72.1.0 Materials :

The bend of required degree and size as specified in item shall be best quality and make as approved by the Engineer-in- charge. The fitting shall conform to I.S. 1626:1994 M-74.

72.2.0 Workmanship :-

The fitting [bends required degree] shall be fixed as per relevant specifications of Item No. 43 except that the A. C. bends or required degree shall be provided instead of pipe.

72.3.0 Mode of measurements and payments :-

The rate shall be for a unit of one number.

ITEM NO.73 :-

Providing and fixing on wall face asbestos cement fitting for A.C. rain water pipe including jointing with spun yarn soaked in bitumen and cement mortar 1:2 [1 cement : 2 coarse sand] etc. comp. [A] Standard shoe 80 mm dia [B] 100 mm dia.

73.1.0 Materials and workmanship :-

The relevant specification of Item No. 72 shall be followed except that the standard shoe of A.C. pipe of specified size shall be provided instead of bend.

73.2.0 Mode of measurements and payments :-

The rate shall be for a unit of one number.

ITEM No.74 :-

Providing & Fixing in position PVC Cowl vent to pipes of Prince/Supreme/Jain/Astral/Tulsi/Finolex make etc.Comp.

74.2.0 Workmanship :

Cowl vent diameter size and type shall be specified in the item. All cowl vent shall be fixed at location indicated on drawings or as directed by Engineer-in-charge. Cowl vent shall be secured to face of wall below all joints by M.s.clamps with wooden gutties.

74.3.0 Mode of measurement and payment :

The rate includes all labour materials tools and plants etc. required for satisfactory completion of this item.

The rate shall be for a unit of one number.

ITEM No.74 A:-

Providing & fixing M.S. Holder Bat clamps at all floor levels of approved design to C.I. Or S.C.I pipes including the cost of cutting holes & making good the wall etc. Complete - 100 mm. dia. (M.R.)

1.1.0 Materials and Workmanship :-

The M.S.Holder bat clamps of approved design shall be for C.I.rain water pipe 75 mm.dia.

The bat clamps shall consist of a cast iron base with a projecting I shaped lay, teeth web of which the semi circular halves of the flat iron clamps are bolted. The base on the holder bat clamp shall be screwed on a pair of wooden plugs fixed in the wall with screw slotted driven through the holes in the base,The screws shallnot be less than 75 mm. long for 80 mm. diametre pipes. The plugs shall be fized in the wall to a depth of 150 mm in cement mortar 1:2 centrally to the holes in the base of the bat clamps and with their front face projecting to such a length form the brick face that when the bat clamps is fixed, the outer base of its base shall be flush with the plaster face of the wall. The plugs shall be 110 mm. x 50 mm.wide at take increasing to 160 mm. x 70 mm. width at rear and shall be 70 mm.deep through out.

The bat clamps shall be fixed as directed with C.C. blocks of 100 mm x 100 mm x 100 mm size. The relevent specifications of item No.17 shall be followed for concrete work.

1.2.0 Mode of measurement sand payments :-

The bat clamp of M.S. Holder suitable for 35 mm.dia shall measured for finished item.

The rate includes cost of all materials etc. required for satisfactory completion of this item.

The rate shall be for a unit of one number.

ITEM No.75 :-

Providing and fixing G.I. rain water spout of 50 mm dia and 30 cms length etc. complete.

75.1.0 Materials :

G.I.M.S. tube of 50 mm dia shall conform to M-56.

75.2.0 Workmanship :

The G.I. pipe of 30 cms fixed as rain water pipe as directed. The pipe shall be fixed about 1/4 dia below the floor level so as to make approach of water easy. The inlet of pipe shall be rounded of for easy entry of rain water pipe. The pipe shall be fixed in C.M.

75.3.0 Mode of measurement and payment :

The rate includes cost of all labour and materials required for satisfactory completion of this item.

The rate shall be for a unit of one number.

ITEM No.76 :-

Providing and laying ordinary C.C. 1:1.5:3 mix for R.C.C. work including boxing, centering, vibrating, curing and mixed with approved water proofing cement compound or "CEMWET" or "PIDICRETE LW" integral water proofing admixture as water proofing agent to be mixed with 50 Kg. cement bag. Shall be as recommended by the manufacturer of the water proofing material, concrete work for top, bottom slab and side pardi for under ground and over head water tank, Item includes necesary excavation and refilling the available earth,15 cm. thick C.C. 1:4:8 for bedding concrete, 10 mm. thick water proofing cement plaster in C.M. 1:2 with smooth finishing, watering etc. complete to all inner face of tank and 20 mm. thick sandface cement plaster consisting base coat of 12 mm. thick in C.M. 1:3 and 8 mm. thick finishing coat of C.M. 1:1 on outer surface of tank, curing etc. complete including locking arrangement, outlet, inlet, overflow and washout pipe arrangement as necessary etc. complete, as per structural drawing excluding steel and as directed by Engineer in charge etc. complete. (A) Underground tank

Item includes necessary excavation and refilling available earth, 15 C.M. thick C.C. 1:4:8 for bedding concrete, 10 mm. thick water proofing cement plaster in C.M. 1:2 with smooth finishing watering etc. complete to all inner face of tank and 20 mm thick sand face cement plaster consisting base coat of 12 mm thick in C.M. 1:3 and 8 mm thick.

Finishing coat of C.M.1:1 on outer surface of tank,Curing etc. comp.including looking arrangement, outlet, inlet,overflow and washout pipe arrangement as necessary etc. comp. as per structural drawing and as directed by Engineer-in-charge etc.comp. For under ground water tank and over head water tank.

76.1.0 Material :

Water shall conform to M-1. Cement shall conform to M-3. Graded stone aggregates 20 & 40 mm nominal size shall conform to M- 12,sand shall conform to M-6,Grit shall conform to M-8. The shuttering to be provided shall be of ordinary timber add shall conform to M-26, cold twisted steel bars (High yield strength deformed steel bars shall conform to M-19. Cement mortar shall conform to M-11. G.I. pipe shall conform to M-56. Mild steel binding wire shall conform to M-21.

76.2.0 General :

The item covers constructing R.C.C.,under ground or overhead water tank as detailed specified in the item.

76.2.1 Workmanship :

The relevant specification of Item No.1 (a.b.) shall be followed for excavation work except that work shall be carried out for under ground water tank.

The relevant specification of Item No.2 shall be followed for 15 cm thick bedding concrete work. Except that the proportion shall be 1:4:8 for under ground water tank.

The relevant specification of Item No.5 shall be followed for R.C.C.work. Except that works shall be carried out for water tank in ordinary M-200 i.e. 1:1 1/2:3 proportion volume including boxing centering, vibrating curing and mixed with approved water proofing cement compound or CEMWET as water proofing agent to be mixed with 50 Kgs. bags shall be used recommended by the manufactures of the water proofing materials. Concrete work for top, bottom slab and side pardi for under ground and over head water tank.

The relevant specification of Item No.7 shall be followed for H.Y.S.D.bars/M.S.bars steel reinforcement for under ground and overhead water tank R.C.C.work.

The relevant specification of Item No.15 shall be followed for 10 mm thick cement plaster in proportion 1:2 except that works shall be carried out for water tank including mixing with approved water proofing cement compound for all inner surface or water tank.

The relevant specification of Item No.19 shall be followed for 20 mm thick sand face cement plaster consisting base coat of 12 mm thick in C.M. 1:3 and 8 mm thick finishing coat of 1:1 on outer surface of tank.Except that the work shall be carried out for water tank.

The relevant specification of Item No. 61 and 62 shall be followed for outlet, wash out and over flow pipe as directed by Engineer- in-charge. Looking arrangement or water tank shall be provided as directed by Engineer-in- charge.

76.4.0 Mode of measurement and payment :

The rate includes cost of all labours, materials tools and plants etc.required to satisfactory completion of this item as specified in detailed.

The rate shall be for a unit of one litre.

ITEM No.77 :-

Extra for providing and mixing water proofing material as "CEMWET" or Equivalent as per I.S. 9103- 1979 requirement and approved by Engineer-in-charge in cement concrete in mix proportion 200 gm./50 Kg.of bag.or recommended by the manufacturer etc.comp.

77.2.0 Workmanship :

The proportions of materials for the cement concrete shall be mentioned with the specifications of that item. The quantity of water proofing materials to be added and the method of addition shall be as specified by manufacture.

77.2.1 Mixing :

The mixing of the water proofing materials in cement, water, or concrete shall be done according to the specifications of the manufactuer.

77.3.0 Mode of Measurements and payments :

The payment is extra over and above the rate of concrete for mixing water proofing poweder.

The rate shall be for a unit of 200 gm./50 kg.of cement bag.

ITEM NO. 78 :

Providing and laying cement concrete 1:1.5:3 (1 Cement, 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size) and finishing smooth with cement plaster in cement mortar 1:3 and curing etc. complete for above floor two level including cost of form work but excluding the cost of reinforcement for R.C.C. work in.

(A) Column :

(i) Having cross sectional area 0.05 to 0.08 Sq.metre.

(ii) Having cross sectional area 0.08 to 0.12 Sq.metre.

(iii) Having cross sectional area 0.12 to 0.18 Sq.metre.

78.1.0 MATERIALS AND WORKMANSHIP :

The relevant specification of Item No.3 shall be followed except that the proportion of concrete shall be of 1:1.5:3 and the work shall be carried out for super-structure above floor two level.

78.2.0 MODE OF MEASUREMENT AND PAYMENT :

The relevant specifications of item No.3 shall be followed. The extra payment shall be made for additional lift above floor two level to each additional floor over and above. The rates of concrete work shall be measured and paid under this item.

The rate shall be for a unit of one Cu.meter per floor.

ITEM NO.79:-

Providing and laying Rough chiselled dressed [kotah stone green] stone flooring over 20 mm thick base of cement mortar 1:5 [1 cement : 5 coarse sand] or L.M. 1:1.5 including pointing with cement mortar 1:2 [1 cement :2 stone dust] etc. complete 25 mm thick.

79.1.0 Materials :-

79.1.1 Water shall conform to M-1. Lime morter shall conform to M-10 cement mortar shall conform to M-11. Rough chisel dressed stone shall conform to M-48.

79.2.0 Workmanship :-

79.2.1 The relevant specifications of item No.44 shall be followed except that the rough chisel dressed stone of 25 mm. thickness of approved quality are to be fixed in cement mortar bedding in C.M.1:5 or L.M. 1:1.5 of 25 mm.average thickness.

79.2.2 Dressing of stone slab :-

Every stone slab shall be cut to the required size and shape and rough chisel dressed on top as required, so that the dressed surface shall not be more than 6 mm. from straight edge placed on it. The sides shall also be chisel-dressed to a minimum depth of 20 mm.so that the dressed edge shall at no place be more than 30 mm. From straight edge hutted against it. Beyond this depth, the sides may be dressed slightly splayed so as to form an inverted 'V' shaped joint with adjoining slab. The surface shall be reasonable true and plane and all the angles and edges shall be square and free from chipping. Where the stone slabs are to be used for nosing, exposed shall be rough chisel dressed to full depth and cut to the uniform thickness.

The thickness of the stone slab shall be 25 mm with permissible tolerance of + 2 mm.

79.2.3 Laying :-

The surface of the sub- grade concrete shall be cleaned, wetted and mopped. The bedding of specified mortar mix shall be spread under each slab to the specified thickness. The slab shall be washed clean before laying. It shall then be laid on top, pressed so that all hollows underneath filled with surplus mortar works up through the joints. The top shall be tapped and brought level to the adjoining slab. The thickness of the joints shall not exceed 5 mm. Subsequent slabs shall be laid in the same manner.

79.2.4 Curing and Finishing :-

Any surplus mortar on the surface of the slab shall be cleaned off and joints finished flush. The joints shall be raked out uniformly to a minimum depth of 12 mm when the mortar is still green. The slabs which are fixed in the floor adjoining the wall shall enter not less than 12 mm. under the plaster, skirting or dado. The junctions between wall plasters end floor shall be finished neatly and without waviness. The pointing shall be done with CM 1:2 the pointing shall be cured for a minimum period of seven days. The finished fioor shall not sound hollow when tapped with wooden mallet and the finished surface shall be true to level and slopes as directed.

79.3.0 Mode of measurements and payments :-

The relevant specification of Item No.44 shall be followed.

The rate shall be for a unit of one Sq.Metre.

ITEM No. 80 :-

Providing and fixing at all floor levels, both face polished machine cut edge green kota stone slab (30 mm) for urinal partition joined with grey cement slurry polishing etc. complete.

80.1.0 MATERIALS

Water shall conform to M-1. Lime mortar shall conform to M-10 Cement mortar shall conform to M-11. Marble stone slab 25mm. thick shall conform to M-51.

80.2.0 WORKMANSHIP

The marble stone slab of both faces polished shall be used. The thickness of stone shall be 25 mm. The allowable tolerance shall be 2mm. The tolerance shall be +/- 5mm. in length and breadth.

For fixing of the slab grooves of appropriate size shall be cut out into the masonary of R.C.C. wall and/or slab as required in appropriate position and making holes to receive any pipes etc. The partition slab shall be fixed securely in wall and/or the slab in required position by using C.M. 1:6 to get a firm grip, the slab shall be embedded in the wall and/or in the flooring for a depth of not less than 25mm. or as directed by the Engineer-in-charge whichever is maximum. Grouting of the joints shall be done in neat ordinary white or colour cement to match the adjoining surface as directed by the Engineer. The mortar shall be cured for 14 days. The partition slab shall be cleaned with water and all mortar droppings or stains shall be removed. The slab shall be given required shape as shown on the drawings or as directed by the Engineer.

80.3.0 MODE OF MEASUREMENTS & PAYMENTS

The rate includes cost of all materials, labours, tools and plants etc. required for satisfactory and completion of this item.

The rate shall be for a unit of one Sq.Mts.Dimensions shall be measured for the visible area only.

ITEM NO. 81 :

Providing and fixing ventilator of partly fixed and partly top hung gully glazed 25 mm thick shutter including Indian teak wood framed 10 cm x 7 cm size including black enamelled iron oxidised fixtures and fastening, including primer coat of approved quality and two coats of oil painting etc. Providing wood work in frames of doors, windows and ventilator and other similor works wrought framed and fixed in position.

81.1.0 MATERIALS :

Wood in frames shall conform to M-29, Glass shall conform to M- 38. Fixtures and fastening shall conform to M-43, paints shall conform to M-44.

For other detail specification refer item no.25 above except the 25 mm thick shutter shall be provided instead of for 35 mm thick shutter for ventilator of partly fixed and partly top hung fully shutter.

81.2.0 MODE OF MEASUREMENT AND PAYMENT :

(1) The rate includes cost of all materials, labours tools and plants required to complete the item.

(2) The rate of this item includes cost of providing block and clear for keeping the shutter in open position if directed.

(3) The item shall be measured out to out and paid on one Sq.mt. basis.

ITEM NO. 82 :

Conveying, carting and removing of the surplus excavated stuff from the site to any place within the Municipal limit as directed by the Engineer- in- charge including loading, unloading, carting, dumping and/or spreading as directed etc. complete.

82.1.0 WORKMANSHIP :

82.1.1 The contractor has to convey the surplus excavated stuff from the site to the place within the municipal limit shall be dumped and/or spread in such a way as not to obstruct the path of vehicles but it shall also make approach to lay the earth beyond that dump. Neither any excuse for difficulties for passing the vehicle over the dumped earth shall be allowed nor any extra charge will be paid to the contractor for the same.

82.1.2 The conveying of earth shall be done in such a manner that it should not cause any delay in the progress of the work.

82.1.3 During the conveying of the earth due care should be taken that the earth should not be misused or wasted. The contractor shall have arranged to collect the mix-spread earth with his own cost.

82.1.4 The earth should be loaded, unloaded and spread or dumped in the presence of the Engineer-in-charge or his representative.

82.2.0 MODE OF MEASUREMENTS AND PAYMENT :

82.2.1 The conveyed earth shall be measured by the measurement of the conveying vehicles. The measurement shall be recorded by the Engineer- in- charge or his representative and shall be countersigned by the contractor or his representative in token of his acceptance.

82.2.2 The rate shall be for a unit of a cubic metre.

ITEM NO. 83 :

Providing and fixing rolling shutter of approved make, made of 80 mm wide M.S. laths inter locked together entire length and jointed together at the ends by locks mounted on specially designed pipe shafts with bracket plates. Guide channels and arrangements for inside and outside locking with push pull operation complete excluding the cost of hood cover and spring.

83.1.0 WORKMANSHIP :

83.1.1 Rolling Shutter :

The rolling shutter shall conform to I.S. 6248-1979. Rolling shutter shall be supplied of specified type with accessories. The size of the rolling shutter shall be specified in the drawings. The shutter shall be constructed with interlocking lath sections formed from cold rolled steel stripes not less than 0.9 mm thick and 80 mm wide for shutters upto 3.5 mm. width and not less than 1.25 mm thick and 2.00 mm wide for shutter 3.5 mt. in width and above unless other specified. Guide channels shall be of mild steel deep channel section and of rolled pressed or built up (fabricated) jointless construction. The thickness of sheet not be less than 3.15 mm.

The rolling shutter shall be of self rolling type upto 8 Sq.mt. clear area without ball bearing and upto 12 Sq.m. clear area with ball bearing. If the rolling shutters are of larger, than gear operated type shutters shall be used.

The locking arrangement shall be provided at the bottom of shutters at boch ends.The shutter shall be opened from outside.

The shutters shall be completed with door suspension shafts locking arrangements, pulling hooks handles and other accessories.

83.2.0 MODE OF MEASUREMENT AND PAYMENT :

(i) The rolling shutter shall be measured on Sq.mt. basis, the height of the shutters shall be measured out side to cut of guide rail and width out side to out side of shutters including vertical channels. The rate includes providing handles locking arrangements,other accessories etc. complete.

(ii) The rate includes cost of all materials,labour tools,and plant required to complete the item as specified.

(iii) The rate shall be for a unit of one Sq.mt.

ITEM NO.84 :

Providing and finishing 27.5 cm long wires pring grade No.2 of approved make for rolling shutter.

84.1.0 WIRE SPRING :

The spring shall be of best quality and all be manufactured from tested high tensile spring steel wire of strip of adequate strength to balance the shutters in position. The spring pipe shafts etc. shall be supported on strong M.S. or malleable C.I. brackets. The brackets shall be fixed on or under the lintel as specified with rawl plugs screws bolts etc.

84.2.0 MODE OF MEASUREMENTS AND PAYMENT :

(i) The rate includes cost of all materials, labours, tools, and plant required to complete the item as specified.

(ii) The rate shall be for a unit of one Number.

ITEM NO.85 :

Providing fixing hood covers for rolling shutters having width below 3.5 mt.

85.1.0 HOOD COVER :

Hood cover shall be made of M.S. sheets not less than 0.92 mm thick for shutters having width 3.5 mt. and the thickness of M.S. sheets for the hoold cover shall be not less than 1.25 mm for shutters having width more than 3.5 mt.

85.2.0 MODE OF MEASUREMENTS AND PAYMENT :

(i) The rate includes cost of all materials, labours tools and plant required to complete the item as specified.

(ii) The length of hool cover shall be measured from inside to outside.

(iii) The rate shall be for a unit of one running meter.

ITEM NO. 86 :

Providing and fixing in position collapsible steel shutters with veritical chanels 20 X 10 X2 mm. braced with at iron diagonals 20 X 5 mm. size with top and bottom rails of T, Iron 40 X 40 X 6 mm. with 38 mm. dia steel pilleys comp. with bolts, nuts, locking arrangements, stoppers, handles, including applying a priming coat of red lead paint.

86.1.0 MATERIALS :

The collapsible steel gate shall conform to M-33.

86.2.0 WORKMANSHIP :

Rails shall be fixed to the floor and to the linted at top by means of anchor bolts, embedded in cement concrete of floor and linted. The anchor bolts shall be placed approximetely at 45 mm. centers alternatively in the two flanges of the T-Iron. The bottom runner (T-Iron) shall be embedded in the floor and proper groove shall be formed along the runner for the purpose. The collapsible gate shall be fixed at the sites by fixed the end double chanels in the T-Iron rail and also by holdfasts bolted to the end double chanel and fixed in the masonry of the side walls or the otherwise.

In case where the collapsible gate is not require to the lintel, beams or slab above a tee iron suiteble designe may be fixed at the top embeded in masonary and provided mason with necessary clamps and roller agangement at the top.

All the adjoining work damaged while fixing of gate shall be made good to match the existing work without any extra payment.

All members of the collapsible gate including T-Iron shall be throughly cleaned to rust, scales, dust etc. and given a priming coat of red lead, before fixing them in position.

86.3.0 MODE OF MEASUREMENTS & PAYMENT :

The collapsible gate shall be measured in sq.mt.. The hight of the gate shall measured as the length of double channels and breadth from outside to outside of the end fixed double chanels in open position of the gate. The rate including providing handles, locking arrangements, stoppers etc. The rate shall be for a unit of one sq. metre.

ITEM NO.87 :-

Providing, mixing laying 25 mm thick IPS Topping (1:2:4) by volume on bottom slab of underground water tank as per IS:2571 with mixing of non metallic floor hardner of approved make as per manufacturer's specification including compacting, finishing curing etc.complete as directed by the Engineer- in-charge.

87.1.0 Material :-

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggeated 12.5 mm nominal size shall conform to M-12. Cement concrete to of 1: 2.5 : 3.5 proportion measured by volume shall conform to relevant specifications of ordinary grade concrete.

87.2.0 Workmanship :

87.2.1 The cement concrete flooring of 25 mm thick (Average) is to be laid as per the site condition. The concrete shall be mixed in a mechanical mixer-at the site of work.Hand mixing may however be allowed for smallar quantities of work and in case of failure of machineries or as permitted by the Engineer-in- charge. It shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However,in such cases 10% more cement than otherwise, required shall have to be used without any extra cost. The mechanical mixing shall be done for a period of 1.5 or 2 minutes. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the purpose. Flooring of specified thickness shall be laid in accordance with approved pattern or as directed. Finishing operation shall start shortly after the cessation of beating and shall be spread over period of one to six hours depending upon the temperature and atmospheric condition. The surface shall be left for some time till moistures disappers from it. Fresh quantity of cement shall be mixed with water to form a thick slurry and spread over the surface while the concrete is still green use of dry cement or cement and sand mixture sprinkled on this surface to stiffen the concrete or absorb excessive moisture shall not be permitted. The cement slurry shall then be properly pressed twice by means of iron floats once when the slurry is applied and the second time when cement starts setting and finished floated smooth. The surface shall be marked with starting or B.R.C.fabric jali to Make the surface non-slippery as and when directed. The junction of floors with well plaster, dado or skirting shall be rounded off where so required upto 25 mm radius. Flooring in lavatories and bath rooms shall be laid after flxing of water closet and sqatting pans and floor traps

which shall be plugged while laying the floors and opened after the floors are completed. Any damage done to water supply/or sanitoary fitting during execution of work shall be made good. After the final set, the concrete shall be kept continuously wet, if required by ponding for period of not less than 7 days from the date of placement.

Prior to the laying of cement concrete flooring, non matallic floor hardner of approved make shall be mixed/laid as per the instruction of the Engineer-in-charge.

The form work shall be provided if necessary as directed by the Engineer- in- charge.

Concreting shall be done as per alternate by mehthod with necessary centering either by mastic or cement mortar as directed.

87.3.0 Mode of measurements and payment :

87.1.0 The rate shall include the cost of all materials and labour involved in all the operations described above. No deduction shall be made or extra paid for any opening upto 0.1 Sq.mt. In area in the floor nothing extra shall be paid for laying the floor at different levels in the same room or the courtyard.

The rate shall be for a unit of one Sq.Meter.

ITEM NO.88 :-

Provding and laying cement concret 1:4:8 [1 cement:4coarse sand :8 graded stone aggregate 40 mm nominal size] and curing complete including the cost of from work, for foundation and plinth etc. complete.

88.1.0 Materials:-

Water shall conform to M-1. Cement shall conform to M-3.Sand shall conform to M-6.

Stone aggrigate 40 mm nominal size shall conform to M-12.

88.2.0 WORKMANSHIP :

88.2.1 General :-

Before starting concreting the bed of foundation trenches shall be cleared of all loose materials, levelled, Waterred and rammed as directed.

88.2.2 Proportion of Mix :-

The proporation of cement, sand coarse aggregate shall be one part of cement, 4 parts of sand 8 parts of stone aggregate shall be measured by volume.

88.2.3 Mixing :-

The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consitency. However in such case 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1 1/2 to 2 minutes. The quantity of water shall be just sufficient to produce dense concrete of required workability for the purpose.

88.2.4 Transporting and placing the conrete :-

The concrete shall be handed from the place of mixing to the final position in not more than 15 minutes by the method as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

The concrete shall be laid in layers of 15 cms to 20 cms.

Compacting :-The concrete shall be rammed with heavy iron rammer and rapidly to get the required compaction and to allow the interstices to be filed with mortar.

88.2.5 Curing :-

After the final set,the concrete shall be kept continuously wet, if required by ponding for a period of not less than 7 days from the date of placement.

88.3.0 Mode of measurements and payment :-

The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

ITEM NO.88A :-

Provding and laying cement concret 1:5:10 [1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size] and curing complete including the cost of from work, for foundation and plinth etc. complete.

Details specification as per Item No.88 but read 1:5:10 instead of 1:4:8 and as directed by Engineer-inc-ahrge.

The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

ITEM NO.88 B :-

Providing & laying C.C 1:3:6 (1cement :3 coarse sand :6 Crushed stone agg 20m.m Nominal size)&curing comp. incl. cost of form work in :(a) foundation & Plinth

Details specification as per Item No.88 but read 1:3:6 instead of 1:4:8 and as directed by Engineer-inc-ahrge.

The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

ITEM NO.89(A)

NOTE :-

(1) The whole work is to be executed through specialised agency with a guarantee of 10 (Ten) years given on a prescribed proforma duly stamped (2) The rate shall include for work at all floors and conducting water proof test as directed.

(A) Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc. consisting of following operations.

(a) Applying and grouting slurry coat of neat cement using 2.75 kg/sqm. of cement admixed with proprietary water proofing compound confirming to IS 2645 over the R.C.C. slab including cleaning the surface before treatment

(b) Laying cement concrete using broken bricks/brick bats 25mm to 100mm size with 50% of cement morter 1:5 (1 cement : 5 coarse sand) proprietary water proofing compound confirming to IS 2645 over 20 mm thick layer of cement morter 1:5 (1 cement : 5 coarse sand) admixed with admixed with proprietary water proofing compound confirming to IS 2645 brick bats is fianlly covered by jointless cement plaster 20 mm thk. in C.M. 1:4 added with special water proofing compound confirming to IS: 2645 & top finished with trowel with false chequered marking of 300 mm size. The treatment is carried out along the vertical surface of the paraphet and other adjoining wall upto height of about 300 mm in a shape of quarter round vata including curing, etc. complete with average thickness of 120 mm and minimum thickness at khurra as 65 mm.

(c) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be down in order and as directed and specified by the engineer-in-charge. With average thickness of 120 mm and minimum thickness at khurra as 65 mm. (Cement consumption 0.511 Bags/S.M.)

Details specification same as per Item and as instruction by Engineer-in-charge.

The rate shall be for a unit of one Sq.Meter.

ITEM NO.89(B)

Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of W.C. kitchenand the like consisting of:

(a) I coarse of applying cement slurry @ 4.4 Kg./Sq.m. mixed with water proofing compound conforming to IS:2645 in recommended proportions.

(b) II coarse of 20 mm cement plaster 1:3 (1 Cement : 3 Coarse sand) mixed with water proofing compound in recommended proportion.

(c) III coarse of applying blown or/residual bitumen applied hot at 1.7 Kg./Sq.m. of area.

(d) IV course of 400 micron thick PVC sheet. (Overlaps at joints of PVC sheet should be 100 mm wide and pasted to each other with bitumen @ 1.7 Kg./Sq.m. (Cement consumption 0.316 Bags/S.M.)

Details specification same as per Item and as instruction by Engineer-in-charge.

The rate shall be for a unit of one Sq.Meter.

ITEM NO.89-C :-

Providing and filling in depressions of Bath and W.C. at all floor levels, after completing plumbing work of pans, pipes, traps etc., with cinder or fly ash as directed by Engineer in charge etc.comp.

89.1.0 Material :

Water shall conform to M-1.Cement shall conform to M-3. Sand shall conform to M-6. Brick bat shall conform to M-14, Water proofing compound shall be "CEMWET' or shall conform to I.S. 9103- 1979. Mortar shall conform to M-11.

89.2.0 Workmanship :

89.2.1 General :

Before starting the operation of concreting the surface of base shall be well cleaned.

89.2.2 Proportion of Mix and Mixing :

The proportion of cement,sand, aggregate and water proofing power shall be as specified in the item of the work.

The concrete shall be hand mixed over smooth watertight platform, large enough to allow efficient turning over the ingradients of concrete before and after adding water. Platform shall be so arranged that no foreign material get mixed with concrete nor does mixing flow out. Dry coarse and fine aggregate, cement shall water proofing compound shall then be mixed thoroughly by turning over to get a mixture of uniform colour.

Specified quantity of water shall then be added gradually through a rose can and the mass turned over till a mix of required consistancy is obtained.

89.2.3 Laying and compacting :

Concrete shall always be used while quite fresh,it shall be laid (not thrown) in layers not exceeding 150 mm in thickness and shall be well and quickly rammed with wooden or iron rammers till the required compaction is achieved. The concrete laid shall not be of too fluid consistancy.After it has been mixed,no more water shall be added, but the surface during and after compaction shall be kept damp. In laying consequitive layers, the layer cast shall be well watered and made rough before the upper layer is laid. The concrete shall be kept continiously wet for a period of seven (7) days from the date of placing or untill it is built over which ever is more.

89.3.0 Mode of measurements and payment :

The rate shall include the cost of all materials, tools, and labour involved in all the operation described above.

Concrete work shall be measured in length,breadth,and depth as specified on drawing or as directed correct upto nearest CM and cubical content shall be worked out up to two places of decimals.

The rate shall be for a unit of one cubic metre.

ITEM NO. 90:-

Boring holes 2.50 m. deep in ordinary soil (for cast in situ piles) and getting out the soil and diposal of the surplus excavated soil, as directed within a lead of 50 m. for following diameter for piles (i) 200 mm (ii) 250 mm (iii) 300 mm.

1.1 Workmanship :

1.1 The ground shall be roughly levelled and after making the position of piles, holes shall be bored with a spiral angle to the 2.50 m. depth and specified diameter using boring guide.

1.2 The bore holes shall be truly vertical and of uniform bore throughout specified depth. After boring to the required depth, the bore shall be cleared off the loose soil and disposal of surplus excavated stuff as directed within a lead of 50 m.

2.0 Mode of measurement and payment :

2.1 The rate for boring holes shall include.

(a) Roughly levelling the ground in positions where piles are to be provided.

(b) Making the position of piles by pegs and boring guide and also for shifting of boring guide.

(c) Bailing out water, if any, met with during boring.

(d) Disposal of surplus excavated soil within a lead of 50 m. and.

(e) All tools, plants, equipments and labour required for satisfactory completion of work.

2.2 The rate shall be for a unit of one number.

Extra for under reaming inside the bore holes for under reamed piles of following nominal diameter (i) 200 mm (ii) 250 mm (iii) 300 mm

1.0 Workmanship :

1.1 The relevant specifiations of Item No.4 shall be followed except that after boring to the rquired depth,the broe shall be enlarged at the bottom by un under reamer 2 to 2 1/2 times the dimeter of the bore as directed. It shall be ensured that the bore for the pile shall be enlarged to the correct diameter.

2.0 Mode of measurements and payment :

2.1 The relevant specifications of Item No.90 shall be followed.

2.2 The rate shall be paid extra over and above the rate of Item No.4 for under remaining the piles.

2.3 The rate shall be for a unit of one number.

ITEM NO.91 :

Providing & Fixing U-PVC pipe (SWR) confirming to IS no. 13592 (Type "B") of Prince/Supreme/Jain/Astral/Tulsi/Finolex make for soil and waste discharge system at all floor levels incl. All fixtures like bends, tees, shoe etc. jointed with resin of approved brand & manufacture etc. comp. (M.R.) (a) 75 mm dia (b) 110 mm dia

1.0 MATERIALS :

The specified dia. P.V.C. spigot and socket soil or waste pipe shall conform M-68-A.

2.0 WORKMANSHIP :

2.1.0 The P.V.C. sprigot and Socket soil or waster pipe shall be joint as per following procedure.

2.1.1 Cut the P.V.C. pipe with a fine to the saw to the required lenth pipe should be cut square.

2.1.2 Chamfer the edge of the pipe to be inserted at an angle of about 15 to about 1/3 rd. the wall thickness, using a coarse file.

2.1.3 Make sure the spigot and socket are the roughly clean and dry.

2.1.4 Insert the pipe into the socket without the seal ring and mark along the pipe, when it is fully inserted.

2.1.5 Fix the rubber ring into the groove without rwisting it.

2.1.6 Apply jointing lubricant to the chanfered end of the pipe, upto the make made on spigot or to the socket end of the fitting.

2.1.7 Push the pipe firmly into the socket till the gap between the mark on the sprigot and socket is about 10mm to allow for thermal expansion.

2.2.0 The pipe clips should be spaced at intervals of no more then ten times the outsidde diameter of pipes for horizontal runs & for vartical lines are spaced at intervals of one meter to a maximum of two moters according to pipe diameter.

2.3.0 All entry to main stacks should be protected with minimum 50mm water seal trap. Wherever there is mixing of soil & waste lines.

2.4.0 Smoke just should be avoided and test plug/ socket plug should be used for testing the lines.

2.5.0 All soil pipes shall be carried up above the roof and shall have a wire ballon guard or a cowl.

2.6.0 The vantilation pipe or shaft shall be carried out to a height of atleast one metre above the outer covering of the roof of the building or in the case of windows in a gable wall or a dormer two meters above the top of the windows. In case of flat roof to which access for use is provided, it shall be carried out upto a height of atleast one meter above the parapet or two meters measured vertically from the top of any windows or opening which may exist upto a horizontal distance of five meters from the vent pipe into such building and in no case shall be carried out to a height less than three meters.

2.7.0 Where ventilating pipes are carried in pipe shafts, the shafts, shall be of a minimum size of one meter. If the shafts are also used to give light and air to rooms, the ventilating pipes must be carried out to a horizontal distance at roof level not less than five meter from the site of the saft.

2.8.0 The connection between the main pipe and branch pipes shall be made by using branches and bends with access doors for cleaning.

2.9.0 The waste from lavatories, kitchens basins, sinks, baths and other floor traps shall be separatly connected to respective stacks of upper floors. The waste stack of lavatories shall be connected directly to main hole while the waste stack of other shall be separatly discharged over gully trap.

3.0 MODE OF MEASUREMENTS & PAYMENT :

3.1 The length of pipe shall be measured including all fittings along its length in running meters correct to a centimetre. No allowance shall be made for the portion of pipe length entered in the sockets of the adjacent pipe or fittings.

3.2 The rate includs all labour and materials, tool and plant etc. required for satisfactory completion of this item.

3.3 The rate shall be for a unit of one running meter.

ITEM NO.91 A:

Providing & fixing U-PVC pipes Confirming to IS no. 13592 (Type "A") of Prince/Supreme/Jain/Astral/ Tulsi make for rain water at all floor levels incl. fixtures like bends, tees, shoe etc joined with resin of approved brand & manufacture etc. comp. (M.R.) .

Details specification same as per item No.91 but read IS no. 13592 (Type "B") instead of IS no. 13592 (Type "A") and as directed by Engineer-in-charge.

The rate shall be for a unit of one running meter.

ITEM NO.92 :

Providing and fixing overhead PVC tank Rotationally moulded HDPE storage tank of Equivalent I.S.I. mark including locking arrangement, outlet, inlet, overflow and wash out pipe arrangement as necessary etc. complete.

MATERIAL :

The ready made water tank shall be of any approved manufacture like Sintex, fussion or equivelent quality product as approved by Engineer-in-charge.

WORKMANSHIP :

The water tank shall be approved and fixed as directed by Engineer-in-charge with all fitting and fixtures like over flow pipe, wash out pipe, inlet pipe etc. complete.

MODE OF MEASUREMENT AND PAYMENT :

The rate should cost of all materials labours, tools, plants etc. required to complete the item.

The rate shall be form unit of one litre excluding free brand.

ITEM NO.93

Providing and applying two coats of weathershield max paint (3 coats may be required in case of darker colours) of ICI Dulux or Apex Ultima of Asian paint including applying exterior acrylic primer coat as per manufacturers specification and directions in shade and colour approved by architects, on exterior surfaces of the building including scaffolding, preparing the surface, watering, curing etc. complete and as directed by the architects and manufacturers.

Surface preparation:

Surface is thoroughly clean, dry and free from all loose dirt, chalk, grease, funfi, algae and flaking paint. This can be achieved by brushing with a wire / stiff coir brush, followed by water jetting if required. Fill up all minor cracks and defects with white cement and sand mixture in the ratio 1:3. For application on previously painted wall, previous coatings of paint must be thoroughly scraped off and clean the surface thoroughly using wire brushes.

Priming:

Apply a liberal coat of exterior acrylic primer and allow it to dry for 4-5 hours. application of putty is not recommended. Minimum 4-6 hours duration is required between each coat of weather shield max paint.

Details specification same as per item description and as directed by Engineer-in-charge.

Measurement shall be paid on Sq.mt. basis.

ITEM NO.94 :

Providing and fixing factory made P.V.C. door frame of size 50 x 47 mm with all wall thickness of 5 mm made out of extruded 5 mm rigid P.V.C. foam sheet mitred at comers and joined with 2 Nos. of 150 mm long brckets of 15 x 15 mm M.S. square tube the vertical door profiles to be reinforced with 19 x 19 mm M.S. square tube of 19 gauge EPDM rubber gasket weather seal to be provided through out the frame. The door frame to be fixed to the wall using M.S. screws of 65/100 mm size complete as per manufcturers specification and direction of Engineer-in-cha5rge (For W.C. and bathroom frame).

Details specification same as per item description and as directed by Engineer-in-charge.

ITEM NO.95:

Providing and fixing 30 mm thick factory made PVC rigid foam panelled door shutters (as per IS 4020) made form M.S. tube of 19 gauge thickness, size 19 x 19 mm for styles and 15 x 15 mm for top and bottom rails, covered with heat moulded PVC "C" channel of 5 mm thick sheet and 30 x 50 mm wide to form style and 5 mm thick and 75 mm wide PVC sheets for top rail, lock rail and bottom rail on eithe side and 6 mm thick, 20 mm wide cross PVC sheet as gap insert fr top rail and bottom rail penelling of 5 mm thick PVC sheet fitted in the M.S. frame welded / sealed to the styles and rails with 5 x 30 mm PVC sheet breading on either side and joined together with solvent cement adhesive as per manufacturers specification and direction of Engineer-in-charge, fixed to grames with 4 Nos. M.S. powder coated but hinges including anodized aluminium fixtures and fastening etc. complete (For W.C. and bathroom shutter).

Details specification same as per item description and as directed by Engineer-in-charge.

ITEM NO.96:

Providing & Fixing UV stabilise FRP Sheet roofing with overlapping the main cladding on both edges. All fixing holes must be predrilled oversize as specified for the sheet length and fastener being used.

Fasteners must be fitted with approved washers. Fixings should be tightened to ensure a weatherproof seal but they must not be over tightened Side-lap fasteners must also be installed at specified centers with the FRP sheet having clearance holes provided as per the main fasteners Weatherproofing shall be provided at all flashing points under the normal flashing by the fitting of a foam closure strip to match the profile being used. Closure strips will be sealed to the sheet with an appropriate non setting silicone sealant. Excluding the cost of purlins rafter and trusses.

Details specification same as per item description, manufacturer details and as directed by Engineer-in-charge.

The rate shall be for a unit of one Sq.metre.

ITEM NO.97:

Providing & laying Ceramic tiles 8mm th. of Orient, Kajaria,Jhonson, Nitco, somani,Bell,Asian, or Euro make in flooring treads of steps and landing laid on bed of 20 mm thick C.M. 1:6 (1 Cement : 3 Course Sand) finished with flush pointing in white cement (Basic Rate:- Rs. 360.00/S.M.)

Details specification same as per item No.46 but read Ceramic tiles instead of white glazed tiles and as directed by Engineer-in-charge.

The rate shall be for a unit of one Sq.metre.

ITEM NO.98:

Providing & laying Ceramic tiles 8mm th. of Orient, Kajaria,Jhonson, Nitco, somani,Bell,Asian, or Euro make in flooring treads of steps and landing laid on bed of 20 mm thick C.M. 1:6 (1 Cement : 3 Course Sand) finished with flush pointing in white cement (Basic Rate:- Rs. 360.00/S.M.)

Details specification same as per item No.46 but read Ceramic tiles instead of white glazed tiles and as directed by Engineer-in-charge.

The rate shall be for a unit of one Sq.metre.

ITEM NO.99:

Providing & laying Vitrified tiles of 8mm to 10mm th. of orient, somani or jhonson, kajaria, Bell, Asin or Euro make at all floor levels in flooring, treads of steps and landings laid on a bed of 20mm. average Base of cement mortar 1:6 (1 cement : 6 coarse sand) or lime mortar 1:1½ laid and fineshed with flush pointing in white or colour cement etc. comp. (size : 24" X 24") (Basic Rate-538.00/sm)

Details specification same as per item No.46 but read Vitrified tiles instead of white glazed tiles and as directed by Engineer-in-charge.

The rate shall be for a unit of one Sq.metre.

ITEM NO.100:

Providing and laying Vitrified tiles of 8mm to 10mm th. of orient, somani or jhonson, kajaria, Bell, Asin or Euro make in skirting, risers of steps and dado laid on a bed on10mm. thick cement mortar 1:4 (1 cement : 4 coarse sand) fineshed with flush pointing in white or colour cement etc. comp. (size : 24" X 24") For all Floor.(Basic Rate-538.00/sm)

Details specification same as per item No.47 but read Vitrified tiles instead of white glazed tiles and as directed by Engineer-in-charge.

The rate shall be for a unit of one Sq.metre.

ITEM NO.101:

Providing & laying marble stone slab flooring over 20 mm. average base of C.M.1:6 (1 cement :6 coarse sand) & jointed with grey cement slurry incl. rubbing & polishing comp.(A) Marble slab 25 mm. Thick. (Basic Rate :- Rs.750 / S.M.)

Details specification same as per item No.44 but read Marble stone instead of polished kotah stone and as directed by Engineer-in-charge.

The rate shall be for a unit of one Sq.metre.

ITEM NO.102:

Providing & laying granite slab 18mm thick in flooring, treads of steps and landing laid on bed of 20mm thick cement mortar 1:6 (1 Cement : 6 coarse sand) or lime mortar 1:1.5 laid and finished with flush pointing in white or colour cement including rubbing and polishing complete. (Basic Rate:- Rs.1700.0/S.M.)

Details specification same as per item No.44 but read granite instead of polished kotah stone and as directed by Engineer-in-charge.

The rate shall be for a unit of one Sq.metre.

ITEM NO.103:

Providing & laying granite slab 18mm thick in skirting, risers of steps, dedo and pillars laid on 10mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand) and finished with flush pointing in white or colour cement including rubbing & polishing comp.. (Basic Rate:- Rs.1700.0/S.M.)

Details specification same as per item No.45 but read granite instead of polished kotah stone and as directed by Engineer-in-charge.

The rate shall be for a unit of one Sq.metre.

ITEM NO.104 :

Steel work welded in built up sections, framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint. (a) In beams and joints channels angles, tees, flats with connecting clear as in main and cross bream, hip & jack rafter, purlins connected to common rafter and the like.

LAYING OUT :

The steel structures, as shown in the drawings or as per directions of the Engineer-in-charge, shall be laid out on a level plateform to full scale and to full size in parts. A steel type shall be used for measurements to ensure maximum accurancy.

Wooden templates 12 mm to 19 mm thick or steel templayes shall be made to correspond to each connecting gusset plate and rivet holes shall be accurately marked on them and drilled. The templates shall be laid on the steel members and holes for revetting and bolting marked on them. The ends of the steel members shall also be marked for cutting. The base of steel columns and the position of anchor bolts shall be carefully set out.

FABRICATION :

The steel sections as specified shall be straightened and cut square and accurately to correct lengths. The cut ends exposed to view shall be finished smooth. No. two pieces shall be welded or otherwise jointed to make up required length of a member except as indicated in the drawing or otherwise specifically permitted by the Engineer - in - charge. All straightening and shping to form shall be done by application of pressure and not by mannering. Any bending or cutting shall be carried out in cold condition (unless otherwise directed) in such a manner as not to impair the strength of the metal.

All stiffeners shall be formed by pressure, and where practicable, the metal shall not be cut and welded in making these. In major works or where so specified, shop drawings giving complete details and information for the fabrication of the component parts of the structure, including the locating, type, size, length and details of rivers, bolts or welds shall be prepared in advanced of the actual fabrication and approved by the Engineer-in-charge. The drawing shall indicate the shop and filed rivets, bolts and welds. The steel members shall be distinctly marked or stencilled with paint with the identifica- tion marks as given in the shop drawings.

The bars shall be thickned at the ends so as to provide for screwed threads and gradually tapered off to meet their normal section.

Great accuracy shall be observed in the fabrication of various members. Do that these can be assembled without being unduly packed strained or forced into position and when built-up shall be true and free from twists, bricks buckles or open joints.

Before making holes in individual mambers, for fabrication the steel work intended to be rivetes or bolted to gather shall be assembled or clamped properly and tightly so as to ensure chose abutting or lapping of the surface of the different members. All stiffeners shall be tightly both at top and bottom without being drawn or caulled. The abutting joints shall be cut of dressed true and straight and fitted close together,

We splice plates and fillers under stiffeners shall be cut to fit within 3 mm of flange angles. We plated or girders which have no cover plates shall have their ends flush with the top of angles forming the flangesunless otherwise required. The we plates,when spliced shall have clearance of not more than 6 mm.

The erection clearance for cleated ends of members connecting steel to steel preferably be not grater than 1.5 mm. The erection clearance at the ends of beams without web cleats shall not be more than 3 mm. at each end but where for prectical reasons, greather cleance is necessary, suitably designed seating shall be provided.

Pins and rollers shall be accurately turned to gauge. These shall be straight and smooth and free from flaws. The roller bearing shall be provided with adequate arrangement for holding the girders or truss resting on it, from lateral displacement.

Expension bed plates shall be planed true and smooth. The planning of bed plates shall be done in the direction of the movement of the girder or truss resting on it.

Column splices and but joints of struts and impression members depending on contract for trees transmission shall be accurately machined and closebutted over the whole section. In column caps and bases, the ends of shafts together with the attached gussets, angles, channales etc. after riveting together shall be accurately machinised so that the parts connected but against each other over the entire surface of contract. Connecting angles or channels shall be fabricated and placed in position with great accuracy so that they are not unduly reduced in thickness by machining.

The ends of all bearing stiffeners shall be machined or ground to fit tightly both at the top and bottom.

All holes shall generally be drilled to the required size and at the required position. Sub-punching shall be permitted, provided it is done 3 mm. less in diameter and reamered thereafter to the required size.

Holes for revets and black bolts shall be large by 0.4 to 6 mm. as shown in appendix-I under column "Coarse" than the nominal diameter of the revents or black bolts depending upon the dia of revets. Holes f or turned and fitted bolts shall be drilled or reamered large by 0.2 to 3 mm. depending upon the dia of bolts as shown in Appendix under column "Medium".

When the number of plates or sections to be riveted together exceeds three or when their total thickness is 90 mm or more, holes shall be drilled or reamred in position, after the members are assembled and the parts firmly hold together by clamps. Before reveting or bolting up or welding f inally. The members shall be taken part and all burns removed.

Holes shall have their exist perpendicular to the surface bore through. The drilling or remering shall be free form burrs and the holes shall be clean and accurate.

The work or fabrication shall be completed in the work shop as far as it is practicable to do so. Site jointing shall be done with rivets or turned and fitted bolts, or black bolts or welding as shown in drawings or as directed by the Engineer-in- charge. Generally, the following principles shall govern the use of rivents, turned and fitted bolts and back holts :-

[i] Rivets of turned and fitted bolts shall be used where the connection is such that slip under load has or be avoided.

[ii] Black bolts may be used very sparingly where a force is carried through a connecting without impact, vibration or reversal of stresses (unless such reversal is due to wind forces.)

In the case of welding, holes shall only be made for the bolts used for temporary fasting as shown in drawings.

WELDING :

Welding shall be generally be done by electric process. The electric are method being economical, is usually adopted. Where public electricity is not available, a suitable generator shall be arranged Gas welding shall be resorted to using exyac etylene flame with specific period approval of the Engineer-in-charge.

Gas welding shall not be permitted for structural steel work. Gas welding required heating of the members to be welded along with the welding road and is likely to creat tempreture stresses in the welded members. Precautious shall therefore be taken tol avoid distortion of the members due to these temparature stresses.

The work shall be done as shown in the shop drawings which should clearly indicate various details of the joints to be welded, type of welds, shop and site welds, as well as the types of electrodes to be used symbol for welding on plans and shop drawings shall be according to IS : 813-1061. As far as possible, every effect shall be made to limit the welding that must be done after the structure is erected so as to avoid the improper welding that is likely to be done due to heights and difficult positions of scaffolding etc. a part from the aspect of economy.

PREPARATION OF SURFACE :

Surfaces which are to be welded together, shall be free form loose mild-scale, rust, paint, grease or other foreign matter. A Coating of boiled linseed oil shall be permitted.

PRECAUTIONS :

All operations connected with welding and cutting equipment shall confirm to the safety requirement given in IS : 818-1968 for "Safety and Health requirements in Electric and Gas welding and Cutting Operations".

The following points shall be borne in mind during the process of welding :-

[a] Welds shall be made in the flat position. Whereever practicable.

[b] Are length, voltage and amperage shall be suited to the thickness of materials, type of groove and other circumstance of the work.

[c] The sequence of welding shall be such that where possible, the members which after the greatest resistance to compression are welded first.

All defective welds which shall be considered, harmful to the structural strength shall be cut out and rewelded.

Finishged welds and adjacent parts shall be proetected with clean boiled linseed oil and after all slag has been removed. Welds and adjacent apart shall be painted after the same are approved by the Engineer-in-charge.

All the members shall be throughly cleaned of rust, scales dust etc. and given a priming coat of lead painting before fixing then in position.

RATE :

Item shall be paid in Kg. basis.

ITEM NO.105:

Providing constructing brick masonry inlet chamber of 750 x 600 x 1500 mm internal dimension with necessary excavation refilling 350 mm thick brick masonary in CM 1:4, 150 mm thick PCC and bencing in CC 1:2:4, 12 mm thick plaster in CM 1:3 for inside and cement pointing in CM 1:3 for outside, providing and fixing pre-cast RCC frame and cover of M-30 grade as per drawing and specifications - Rate for 1.5 m depth. Add or ded. Rs. 239 for every 10 cm increase or decrease in depth (A) Same as above but Precast RCC heavy duty Cover instead of C.I. Cover add or ded per every 10 cm increase or decrease in depth.

7.1.0 MATERIALS :

7.1.1 WATER : Water shall conform to M-1of detailed specification of materials.

7.1.2 SAND : Fine aggregate 0.15 mm to 5.00 (about 0.00597 to 3/16") I.S. sieve No.15 to 480 shall confirm to M-4 of detailed specifications of material.

7.1.4 COARSE AGGREGATE :

7.1.4.1 Coarse aggregate 5 mm to 40 mm shall conform to the latest version of relevant I.S. Specification and M-8A of detailed specification of material.

7.1.4.2 SIZE : The maximum size of coarse aggregate shall be as large as possible normally not greater than 1/4 of the minimum thickness of concrete member. In case of R.C.C., this size present no difficulty to surround the reinforcement thoroughly and fill up the form work fully and is less than the minimum cover by 6 mm for plain concrete. Maximum size of the coarse aggregate shall be up to 40 mm subject to the above limitation and provided no limiting size is specified in the special provisions.

7.1.4.3 Generally a maximum size of 20 mm shall be found satisfactory for reinforced concrete work.

7.1.4.4 The grading between the maximum size and minimum size of 5 mm shall be such as to produce a dense concrete of specified proportion and consistency that will work readily in to position without any aggregate and without the use of excessive water content.

7.1.5 CEMENT MORTAR : Sand or fine aggregate size 0.15 to 5 mm I.S. Sieve No.15 to 480 confirming to relevant specification shall be supplied by the contractor and it shall be mixed with portland cement in require proportion by volume. It shall be mixed dry and then requirement quantity of water shall be added before final mixing to have thoroughly mix mortar paste. Mortar shall preferably mixed in mixer.

7.1.6 FLY ASH LIME BRICK :

7.1.6.1 Fly ash lime brick shall be used for this item and shall comply with specification or relevant I.S. (latest version). Sample of Fly ash lime bricks shall be got approved by the Engineer, who will keep it in his office for reference.

7.2.0 WORKMANSHIP :

7.2.1 The chamber of different types and sizes as specified shall constructed in storm line at such places and such levels and dimensions as shown in drawing or as directed. PCC shall be in 1:4:8 cement concrete.

7.2.2 Bed Concrete : The inlet chamber shall be built in bed of cement concrete 1:2:4 as shown in drawing or as directed. The relevant specification if Item No. 4 shall be followed for 1:2:4 concrete proportion by volume.

7.2.3 WALLS : The walls of chamber shall be constructed using Fly ash lime bricks, having crushing strength not less than 75 Kg/Sq.cm. in C.M. 1:4 (1 Cement : 4 fine sand). The Fly ash lime brick masonary shall confirm to relevant specification of M-6A of detailed specification of material. The jointing face of such Fly ash lime brick shall be well buttered with cement mortar before laying so as to ensure that full joints are filled up with mortar.

7.2.4 PLASTER : The inside of wall shall be plastered with 12 mm thick C.M. 1:3 (1 Cement : 3 fine sand) and finished with floating coat of neat cement. All angles shall be rounded to 7.50 cms. radium and all rendered internal surfaces shall hard impervious finish obtained by a steel trowel. The external joints of masonary shall be finished smooth as directed.

7.2.5 CHANNELS AND BENCHING :

7.2.5.1 Channels shall be semicircular in the bottom half and of diameter equal to the pipe of drain. Above the horizontal of diameter the sides shall be extended vertically to the level as the crown of the out going pipe and the top edge shall be suitably rounded off. The branch channels shall also be similarly constructed with respect to the benching but at their junction with the main channel with appropriate fall, suitably rounded off in the direction of flow in the main channel, shall be given.

7.2.5.2 The channel and benching shall be done in 1:2:4 grade rising at a slop in line from edges of channel. The channels of the bottom of the chamber shall be plastered with C.M. 1:2 (1 Cement; 2 coarse sand) and trowelled smooth.

7.2.6 FRAME FITTING : Perforated Precast R.C.C. Jali in CC M-30 as per drawing shall be fitted firmly in the precast frame which shall be laid over plaster on top of masonry. Cement mortar shall 1 part cement and 2 parts of sand and layer shall be 25 mm thick.

7.2.7 TESTING :

7.2.7.1 Chamber shall be tested by filling with water upto top as directed.

7.2.7.2 After completion of work, chamber covers shall be sealed by means of thick grease.

7.3.0 MODE OF MEASUREMENTS AND PAYMENTS :

7.3.1 The rate includes all labours, materials, curing for 14 days, tools and plant, etc. required for satisfactory completion of this item as per drawing and as directed by the Engineer-in-charge.

7.3.2 The rate shall be for a unit of one chamber including RCC cover with frame.

ITEM NO.106 :

Distempering two coats with oil bound washable distemper of approved brand & manufacture & of required shade on wall surface to give an even shade over and & incl. a priming coat of alkali resistance primer of approved brand after throughly brushing the surface to give an even shade after throughly brushing the surface free from mortar droppings and other foreign matter and also including preparing the surface even and smooth. (A) Wall (B) Ceiling

Item is general shall be carried out as per the general specifications on page 413 and specitication No.146 on Page 315 and 316 of P.W.D. H.B. Vol.I 1949 edition. Material shall also confirm to general specification of materials-M-34.

The surface were oil bound distemper is to be filled in creviess, depressions, pot-holes to make surface even and smooth. Lapi shall be allowed to dry and oil bound distemper of approved quality and shades then be applied with brush only. appropriate quality of water shall be added in paste.

Such coat of oil bound distemper shall be applied as directed. Patch work of difference in colour shades will not be tolerated, in such case extra one coat shall have to be applied for which to extra payment shall be made.

Measurement shall be paid on Sq.mt. basis.

ITEM NO.107 :

Providing and fixing G.I. chain link or 50mm x 50mm size x 10 guage thick with nuts, bolts, washer or G.I. pins, excluding M.S. angles etc.complete as per relevent IS specification & directed by engineer in charge. (TATA or eqivalent brand)

The wire shall be of galvanised steel it shall conform to I.S. specification, wire may be galvanised, as indecated. All finished steel, wire shall be well cleanly drown to the dimensions and size of wire as specified in item. The wire shall be sould, free from splits, surface flows rough jugged and imprefect edges and other harmful surface defects shall conform I.S. 280-1978.

G.I. wire for chain line mesh shall be of perfectly 10 gauge thickness size of chain link wire mesh shall be clear 50 mm x 50 mm at inside gap all wire shall be perfectly bounded/tead with each other by making chain shape.

Item include all materials, labours, equipment etc. complete.

Payment shall be made on square metre basis for actual fixed chain link mesh.

ITEM NO.108 :

Providing and Fixing hot dip concertina coil of 610 mm dia. made out of 2.59 mm (12 SWG) hot dip galvanized (G.I. coating not less than 200 gm/sqmt.) th. wire having 80 nos. of spikes and 200 nos. of clips made out of stainless steel (AISI 304) 1.5 mm th. dia., G.I. strips 0.5 mm th. (G.I. coating not less than 120 gm/sq.mt.) weight of one coil should not be lesss than 15 kg. etc., complete at the top of compound wall fixed with S.S. clips and binding wires whereever necessary etc. complete. (NOTE: Strctching length of one coil should not be more than 9 mt.)

Fixing of hot dip concertina coil of 610 mm dia on 17.105 meter long M.S. angles of 50 mm x 50 mm x 6 mm thick, bent at 45 degree. The angles shall be anchored in the RCC column and spaced at minimum distance of 3.0 meteres at the top of the compound wall. concertina coil shall be fixed with S.S. clips and binding wires whenever necessary etc. complete. At every 6th post shall be strutted on both sides and end post with one side only. Also providing barbed wire 14 x 14 gauge iwth three horizontal lines both sides. The exposed steet work shall be painted with 1 coat of red oxide and 2 coats of approved oil paint. The concertina coil and barbed wire fencing shall be fixed as per the drwaing and in good workmanship as directed by Engineer in charge.

MODE OF MEASUREMENTS AND PAYAMENT :

The measurement shall be done with item of compound wall on running meter basis and the payment shall be made on running meter basis.

ITEM NO.109 :

Providing corrugated G.I. Sheets roofing fixed with Galvanised Iron ' J ' or 'L' hooks bolts & nuts 8 mm.dia with bitumen & G.I. Limpet washers filled with white lead comp. excluding the cost of purlins, rafters and trusses.(i) 0.80 mm. Thick sheet (ii) 0.63mm THick Sheet

MATERIALS :
G.I. sheets shall conform to M-23.

WORKMANSHIP :
The maximum spacing of purlins shall be 1.6 metres in case of 7 mm. thick G.I. Sheets and 1.4 metres for 6 mm thick A.C.Sheets.

LAYING AND FIXING OF SHEETS :
The sheets shall be laid on the purlines and other roof members as per code of practice. The top bearing surfaces of all purlins and other roof members be is one plane so that the sheets when being fixed shall not be required to be forced down to rest on the purlins. The finished roof shall present uniform slope and the line of corrugation shall be straight and true. The sheets shall be laid with smooth side upwards.
Corrugated sheets shall be laid starting at the eaves either from left to right or right to left depending upon the direction of wind. Before actual laying of the sheets is started, the purlins spacing and the size of sheets shall be checked to ensure that the arrangements shall provide the laps required and the specified overhang at the eaves. In case the sheets are laid right to left, the first sheet shall be laid uncut but the remaining sheets in the bottom row shall have the top left hand corners cut or mitred. The sheets in the second and other immediate rows shall have the top left hand corners cut or mitred. The sheets in the second and other immediate rows shall have bottom right hand corner of the first sheet cut. All other sheets except the last sheets shall have both bottom right hand corners and top left hand corners cut. The last sheet shall have only top left hand corner cut. The last of the top row sheets shall have the bottom right hand corner cut with exception of the last sheet which shall be left uncut. It the sheets are laid from left to right, the first sheet shall be laid and cut and the remaining pocedure shall be reversed.
The free overhang of the sheets at the eaves shall nto exceed 400 mm. in case of 7 mm. thick sheets and 300 mm. in case of 6 mm thick sheets.
The mitre described above is necessary to provide snug fit. Where 4 sheets meet at a lap the length of mitr=er shall be 150 mm and the width of mitre shall be equal the width of the side lap. The cutting may be done with ordinary wood-saw at site.
Laps :
The sheets shall be laid with an end lap of 150 mm minimum. In case of roof with a pitch flatter than 1 vertical to 2« horizontal (Approx.22ø) or in the case of very exposed situations appropriate larger laps may be provided. The sheets shall be laid with side lap of half a corrugation.

Fixing Accessories : The sheets shall be secured to the purlins and other roof members by means of 8 mm. dia. galvanised iron bolts (J) type hook bolts in case of angle iron purlins and `L' type bolts in case of R.S. joints, precast concrete, or timber purelin, and nuts bearing on galvanised iron washers and bitumen washers. The grip of `J' or `L' bolts on the side of purluns shall not be less than 25 mm. Each galvanised iron `J' or `L' hook bolts shall have a bitumen washer and galvanised iron washer placed over the sheets before the nuts is screwed down from above. On each purlin there shall be one hook bolt on the crown adjacent to the side lap on either side lap on either side bitumen washer shall be of approved quality. The G.I. flat washer shall be 25 mm in diameter and 1.60 mm thick and bitumen washer shall be 35 mm in dia and 1.5 mm thick with hole to suit the required size of fixing accessory. Each nut shall be screwed lightly at first. After a dozen or more sheets are laid, the nuts shall be tightened to ensure a leak-proof joint and also nuts tightened only to extent so as to prevent damage to the sheets. The length of the `J' bolts or crank bolts shall be 75 mm more than the depth of purlins for single sheet fixing and 90 mm more where two sheets overlap of where ridges or other accessories are to be fixed. The minimum length of coach screw for timber purlins shall be 110 mm.
Holes :
The holes for fixing the sheet shall be drilled in the centre of sheets to suit the purlins i.e. on the centre line of the purlins if these are of timber and square head coach screws are used, or as close as possible to the back of putlins if `J' or `L' bolts are used as with steel angles or precast concrete or timber purlins. Holes for hook bolts etc. shall be nearer than 40 mm to any edge of sheet or accessory.
MODE OF MEASUREMENTS AND PAYMENT:
The over lap of the corrugated sheets over valley gutters, roof lights, caves, filler pieces and underlay of the gutters, roof lights, caves, filler pieces and underlay of the corrugated sheets below ridges, hips, north light curves, flashing pieces, roof light sheets and jarge board shall be made for holes cut for extractors or cowl type ventilators. Deductions shall be made for roof light sheets.
The rate shall be for a unit of one sq.metre.

ITEM NO.110:

Providing and fixing **150 mm wide 450 mm. overall semicircular** plain P.V.C. gutter with iron brackets 40 mm x 3 mm size bolts nuts washers etc. including making necessary connection with rain water pipes.

3.1.0 MATERIALS :
These shall be of plain P.V.C. sheet. The gutter shall be designed to carry the maximum dis-charge from the roof without flowing over and all be constructed wherever possible with shunk channel or gutter.
3.2.0 WORKMANSHIP :
The longitudinal edges shall be turned back to the extent of 12 mm. and beaten to form a rounded edge. The ends of the sheets at junctions of pieces shall be hooked into each other and beaten flush to avoid leakages.
The size of gutters shall be as specified in the item.
The gutter shall be laid with a minimum fall 120. Gutter shall be true to line and slope and shall be supported of fixed M.S. Flat iron brackets bent to shape or any other suitable brackets.
3.3.0 MODE OF MEASUREMENT AND PAYMENT :
The measurements of gutters shall be taken for finished work in length along their centre lines. No laps shall be measured.
The rate of gutter shall include the cost of all labour and materials specified above, including all specials such as angles, junctions, dropends or funnelshaped connecting pieces, stop ends etc. flat iron brackets bolts and nuts required for fixing the latter to the roof members.
The rate shall be for a unit of one running metre.

ITEM NO.111 :

Providing and fixing ridges and hips in asbestos cement sheets roofing with G.I. "J" or "L" hooks, bolts and nuts 8mm dia G.I. plain and bitumen washers complete. (1) 0.63mm thick sheet

MATERIALS :
The ridges and hips of Asbestos cement sheet roofing shall conform to M-24.

WORKMANSHIP :
The maximum spacing of purlins shall be 1.6 mters in case of 7 mm thick A.C. sheets and 1.4 meters for 6 mm thick A.C. sheets that the work is to be carried out for ridges and hips in A.C. Sheet roofing.

The ridges shall be laid as per manufacturer's instructions with rolls of the two wings in case of adjustable ridges, fitting closely and with a separation of serrated ridges registering correctly with the sheet underneath. The staggered lapping of two wings of adjustable ridge section and the lap between the adjustment pieces of the same wing of ridges shall be as per manufacturer's instructions. The end portion of the wing of the adjustable ridges which project beyond the verges of the roof shall be cut and trimmed off neatly.

HIPS :-
In laying hip pieces, serrations to suit the corrugations in the sheets below should be cut in them so that they shall be snug fit over the sheets. The wings of ridges shall be fixed to the sheet below with seam bolts and nuts 8 mm dia. G.I. `J' or `L' hook bolts and bitumen and G.I. washers which fix the sheets to the purlins. In addition, in north light adjustable ridges, the roll of the two wings shall be jointed together at their crown, with 8 mm dia. G.I. seam bolts and nuts at the rage of two numbers per pair wings each seam bolt shall be provided with one bitumen and a pair of G.I. washers. Where the plain wing angular or plain wing adjustable ridges are used, the gaps formed by roofing corrugation and the wings shall be filled with C.C. (1:2:4) up to a full length of the overlaps. The exposed face shall be finished perpendicular to the sheeting. Wings of hips shall be fixed to the roof members below with the same 8 mm. dia. G.I. `J' or `L' bolt on each wing at least at every fifth corrugation of the sheets below in case of corrugated and at least every second corrugation of the sheet below in case of semi corrugated sheets. Each seam bolt shall be provided with one bitumen and pair of G.I. washers.

MODE OF MEASUREMENT AND PAYMENT :
Measurements of ridges, hips and other accessories shall be for finished work and the length shall be taken along the centre line. The lap shall not be measured. The under lap of ridges under expansion joint pieces shall be measured.
The rate of ridges and hips shall not include the cost of expansion joint pieces, closing of gap between plain ridge and the sheet corrugation with concrete.
The rage shall be for a unit of one running metre.

ITEM NO.112 :

Demolition including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift (i) RCC work

1.1.0 WORKMANSHIP :-

1.1.1 The term Demolition shall consist of one or more parts of the building as specified or shown in the drawing. Demolisition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant items as specified or shown in the drawings.The demolition shall always be planned before hand and shall be done in reverse order of the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before stating the work. This however will not absolve the contractor from the responsibility of proper and safe demolition.

Necessary propping, the shoring and or under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismentalling and demolishing is taken up and the work shall be carried out the such away no damage is caused to the adjoining property.
Wherever required, temporary enclosers or partitions shall also be provided. Necessary precautions shall be taken to keep dust nuisance down as and where necessary.
Dismentalling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height. The or demolishing roofs, masonary etc. shall be carefully removed first. The dismentalled articles shall be passed by hand where necessary, lowered the ground (as not thrown) and then properly stacked as directed.
All materials obtained from demolition shall the property of Corporation unless otherwise specified and shall be kept in safe custody until handed over to any store to Surat Municipal Corporation as specified the Engineer-in-charge.
Any serviceable materials, obtained during dismentalling demolition, shall be separated out and stacked properly on site or any stoe of S.M.C. as directed, with all lead and lift. All unserviceable materials, rubbish etc. shall be stacked as directed by Engineer-in-charge.On completion of work the site shall be cleared of all debrits rubbish and cleaned as directed.

1.3.0 Rates :

Measurements of all work except hidden work shall be taken before demolition or dismantaling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as the employed for construction of work.

All work shall be measured in deciman system as fixed in its place subject to the following limit, unless otherwise stated hereinafter : (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Areas shall be worked out to the nearest 0.01 cum.

The rate shall include cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary shoring for the safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or partitions where considered necessary.

The rate shall be for a unit of one cubic metre.

ITEM NO.112A :

Demolition Including Stacking of of servicable materials and disposal of unserviceable materials with all lead and lift in Unreinforced cement concrete.

WORKMANSHIP :

The relevant specifications of Item No.112 shall be followed but read Unreinforced cement concrete instead of R.C.C. work. The unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.

The rate shall be for a unit of one cubic metre.

ITEM NO.113 :

Demolition of brick work and stone masonary including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift

(ii) in cement mortar

WORKMANSHIP :

The relevant specifications of Item No.112 shall be followed but read brick and stone masonary instead of R.C.C. work. The unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.

The rate shall be for a unit of one cubic metre.

ITEM NO.114 :

Removing the scraping of old deteriosted plaster of any thickness from wall/R.C.C. member including strcking of serviceable material and disposal of unserviceable from site of work with all lead and lift.

WORKMANSHIP :

The relevant specifications of Item No.112 shall be followed but read cheaping of plaster work from old masonary wall instead of R.C.C. work. The unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.

The rate shall be for a unit of one Sq.metre.

ITEM NO.115:

Dismentalling tiled or stone floors laid in mortar including stacking of serviceable material and disposal of unserviceable material with all lead and lift

WORKMANSHIP :

The relevant specifications of Item No.112 shall be followed but read tiled or stone floor instead of R.C.C. work. The unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.

The rate shall be for a unit of one Sq.metre.

ITEM NO.115A:

Dismantling doors windows ventilators etc. (wood or steel) shutters including chowkhats, Architraves, holdfasts and other attachment etc. comp. and stacking them within all lead & ift.(I) not exceeding 3 sq.m. in area.

WORKMANSHIP :

The relevant specifications of Item No.112 shall be followed but read doors windows ventilators etc. (wood or steel) shutters including chowkhats, Architraves, holdfasts and other attachment instead of R.C.C. work. The

unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.
The rate shall be for a unit of one Number.

ITEM NO.116:

Dismantling sanitary fittings like wash basin, w.c. pan Indian and Europeans type, flushing tank etc. including stacking the materials with all lead & lift.

WORKMANSHIP :

The relevant specifications of Item No.112 shall be followed but sanitary fittings like wash basin, w.c. pan Indian and Europeans type, flushing tank instead of R.C.C. work. The unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.
The rate shall be for a unit of one Number.

ITEM NO.116A:

Dismantling IPS & Rough kota stone flooring laid in mortar incluing stacking of servicable materias and disposal of unservicable materials with lead and lift etc. (For all floors)

WORKMANSHIP :

The relevant specifications of Item No.112 shall be followed but read IPS & Rough kota stone flooring instead of R.C.C. work. The unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.
The rate shall be for a unit of one Sq.mt.

ITEM NO.117:

Providing & fixing partly panel & partly glass aluminium doors with aluminium section of Hindalco, Jindal , Narmada,Banco or Equivalent approved make having Plain anodized outer frame section of 63.50 mm x 38.10 mm having weight 1.158 kg. / R.M. shutter section having size 83.5 mm x 44.45mm (top & bottom: 1.384 kg./rmt. and middle 1.139 kg./rmt.) door vertical 47.62mm x 44.45 mm (vertical:0.881 kg./rmt. & top hing side:0.974 kg./mt.)with 5mm thick sheet glass in acid frogting and 12 mm thick prelaminated sheet of Greenlam, Panama or archid make as approved by Engineer-in-charge including fixing brass pivot, handle, lock etc. complete.
(A) Same as above but Colour anodized

MATERIALS :

Aluminium door and frame shall conform to M-31. Sheet glass shall conform to M-38.2, Rubber gasket as per the detail or instruction given by the site in charge.

WORKMANSHIP :

Preparing the surface for the fixing of aluminium frame. Providing and fixing aluminium door frame as per the details of instruction given by the site in charge with proper alignment and precautions. Providing and fixing sheet glass with acid frosting as per archtects details and as per the details or instruction given by the Engineer in charge with necessary precautions. Aluminium doors, frame, glass etc. shall be cleaned after the completion of the work as per the instruction of Engineer in charge.

MODE OF MEASURMENT AND PAYMENT :

Rates include all materials, labour, tools including providing and fixing aluminium sheet, nails etc. complete. The measurement shall be taken for the finished product.

The rate shall be paid per Sq.mtr.

ITEM NO.118:

Providing & fixing Plain anodized aluminium partly glazed and partly panelled partition using medium duty sections of Hindalco,Zindal, Narmada, Banco or Equivalent approved make having section 63.50 mm x 38.10mm (Frame-.758 kg/rmt & Middle section- 0.819 Kg./rmt) with 5 mm thick clear float glass of approved make including all other necessary fittings and fixtures. Entire work will have to be made water proof using necessary rubber sectioned wherever required. Gaps all round the frame to be filled with approved water proof sealent. Bottom portion of doors both side to be covered with 12mm thick prelaminated particle board of approved make and quality and as per design.
(A) Same as above but Colour anodized

Details specification same as per Item Description and as directed by Engineer-in-charge.

MODE OF MEASURMENT AND PAYMENT :

Rates include all materials, labour, tools including providing and fixing aluminium sheet, nails etc. complete. The measurement shall be taken for the finished product.

The rate shall be paid per Sq.mtr.

ITEM NO.119:

Supplying and filling fine sand (Pana) in 150 mm (Avg.) compacted thickness over the base including necessary compaction, watering etc. complete. Item includes levelling by using vibratary plates compacted machine and as directed by Engineer-in-charge.

MATERIALS :
Fine sand (Pana) shall conform to specification of material M-3.

WORKMANSHIP :
Fine sand (Pana) shall be supplied to worksite and staked at suitable place. It shall be got approved by Engineer-in-charge. Fine sand (Pana) shall be filled in compacted thickness of 150 mm. It shall be compacted and watered thoroughly.

ITEM NO.120:

Providing & laying Granular sub base (GSB)confirming to Grading-II of Table 400.0 of compacted thick of 150mm with specified graded stone metal and sand mixed in place and laid with mechanical means spreading with motor grader and compacting with vibratory roller having minimum 80-100 KN static weight to acheve desired density of 98% of MDD including all material, labour, machinery with all leads and lift etc. complete.

3.1.0 SCOPE:
The work shall consist of laying and compacting well-graded material on prepared subgrade in accordance with the requirements of these Specificatins. The material shall be laid in one or more layers as sub-base or lower sub-base and upper sub-base (termed as sub-base hereinafter) as necessary according to lines, grades and cross-sections shown on the drawings or as directed by Engineer-in-charge.

3.2.0 MATERIALS:
3.2.1 The material to be used for the work shall be natural sand, murrum, gravel, crushed stone, or combination thereof depending upon the grading required. Materials like crushed slug, crushed concrete, brick metal and kankar may be allowed only with the specific approval of the Engineer. The material shall be free from organic or other deleterious constituents and conform to one of the three gradings given in Table 400-1. While the grading in Table 400-1 are in respect of close-graded granular sub-base materials, one each for maximum particle size of 75 mm, 53 mm and 26.5 mm, the corresponding gradings for the coarse graded materials for each of the three maximum particle sizes are given at Table 400-2. The grading to be adopted for a project shall be as specified in the Contract.
3.2.2 Physical requirements: The material shall have a 10 percent fines value of 50 kN or more (for sample in soaked condition) when tested in compliance with BS:812 (Part-III). The water absorption value of the coarse aggregate shall be determined as per IS:2386 (Part-3); if this value is greater than 2 percent, the soundness test shall be carried out on the material delivered to site as per IS:383. For Grading-II and III materials, the CBR shall be determined at the density and moisture content likely to be developed in equilibrium conditions which shall be taken as being the density relating to a uniform air voids content of 5 percent.

TABLE 400-1 GRADING FOR CLOSE GRADED GRANULAR SUB-BASE MATERIALS

US. Sieve Designation Grading-I	Percent by weight passing the IS sieve		
	Grading-.I	Grading-II	Grading-III
75.0 mm	100	--	--
53.0 mm	80-100	100	--
26.5 mm	55-90	70-100	100
9.50 mm	35.65	50-80	65-95
4.75 mm	25-55	40-65	50-80
2.36 mm	20-40	30-50	40-65

0.425 mm	10-25	15-25	20-35
0.075 mm	3-10	3-10	3-10
CBR Value (Minimum)	30	25	20

TABLE 400-2 GRADING FOR COARSE GRADED GRANULAR SUB-BASE MATERIALS

US. Sieve Designation Grading-I	Percent by weight passing the IS sieve		
	Grading-.I	Grading-II	Grading-III
75.0 mm	100	--	--
53.0 mm	--	100	--
26.5 mm	55-75	50-80	100
9.50 mm			
4.75 mm	10-30	15-30	25-45
2.36 mm			
0.425 mm			
0.075 mm	<10	<10	<10
CBR Value (Minimum)	30	25	20

Note:- The material passing 425 micron (0.425 mm) sieve for all the three gradings when tested according to IS:2720 (Part-5) shall have liquid limit and plasticity index not more than 25 and 6 percent respectively.

3.3.0 STRENGTH OF SUB-BASE:
It shall be ensured prior to actual execution that the material to be used in the sub-base satisfies the requirements of CBR and othe physical requirements when compacted and finished.
When directed by the Engineer, this shall be verified by performing CBR tests in the laboratory as required on specimens remoulded at field dry density and moisture content and any othe tests for the "quality" of materials, as may be necessary.

3.4.0 CONSTRUCTION OPERATIONS:
3.4.1 Preparation of subgrade: Immediately prior to the laying of sub-base, the subgrade already finished to Clause 301 or 305 as applicable shall be prepared by removing all vegetation and other extraneous matter, lightly sprinkled with water if necessary and rolled with two passes of 80-100 kN smooth wheeled roller.
3.4.2 Spreading and compacting: The sub-base material of grading specified in the Contract shall be spread on the prepared subgrade with the help of a motor grader of adequate capacity, its blade having hydraulic controls suitable for initial adjustment and for maintaining the required slope and grade during the operation or other means approved by the Engineer- in-chage.
When the sub-base material consists of combination of materials mentioned in Clause 401.2.1, mixing shall be done mechanically by the mix-in-place method.
Manual mixing shall be permitted only where the width of laying is not adequate for mechanical operations, as in small sized jobs. The equipment used for mix-in-place construction shall be a rotavator or similar approved equipment capable of mixing the material to the desired degree. If so desired by the Engineer, trial runs with the equipment shall be carried out to establish its suitablity for the work.
Moisture content of the loose material shall be checked in accordance with IS:2720 (Part-2) and suitably adjusted by sprinking additinal wate from a truck mounted or trailer mounted water tank and suitable for applying water uniformly and at controlled quantities to variable widths of surface or other means approved by the Engineer so that at the time of compaction, it is from 1 percent above to 2 percent below the adding water, due allowance shall be made for evaporation losses. After water has been added, the material shall be processed by mechanical or other approved means like disc harrows, rotavators until the layer is uniformly wet.
Immediately thereafter, rolling shall start. If the thickness of the compacted layer does not exceed 100 mm, a smooth wheeled roller of 80 to 100 kN weight may be used. For a compacted single layer upto 225 mm the compaction shall be done with the help of a vibratory roller of minimum 80 to 100 kN static weight with plain drum or pad foot-drum of heavy pneumatic tyred roller of minimum 200 to 300 kN weight having a minimum tyre pressure of 0.7 MN/Sq.m. or equivalent capacity roller capable of achieving the required compaction.
Rolling shall cimmence at the lower edge and proceed towards the upper edge longitudinally for portions having unidirectinal crossfall and super-elevation and shall commence at the edge and progress towards the centre for portins having crossfall on the both sides.

Each pass of the roller shall uniformly overlap not less than one third of the track made in the preceding pass. During rolling, the grade and crossfall (camber) shall be checked and any high spots or depressions, which become apparent, corrected by removing or adding fresh material. The speed of the roller shall not exceed 5 km per hour.
Rolling shall be continued till the density achieved is at least 98 percent of the maximum dry density for the material determined as per IS:2720 (Part-8). The surface of any lyer of material on complection of compaction shall be well closed, free from movement under compaction equipment and from compaction planes, ridges, crackes or loose material. All loose, segregated or otherwise defective means shall be made good to the full thickness of layer and re-compacted.

3.5.0 SURFACE FINISH AND QUALITY CONTROL OF WORK:
The surface finish of construction shall conform to the requirements of clause-902.
Control on the quality of materials and works shall be exercised by the Engineer in accodance with section 900.

3.6.0 ARRANGEMENTS FOR TRAFFIC:
During the period of constructin arrangement of traffic shall maintained in accordance with Clasue-112.

3.7.0 MEASUREMENTS FOR PAYMENT:
Granular sub-base shall be measured as finished work in position in cubic metres.
The protectin of edges of granular sub-base extended over the full formation as shown in the drawing shall be considered incidental to the work of providing granular sub-base and as such no extra payment shall be made for the same.

3.8.0 RATE:
The contract unit rate for granular sub-base shall be payment in full for carrying out the required operations including full compensatin for:
(i) making arrangements for traffic to Clause-112 excpet for initial treatment to verges, shoulders and construction of diversions;
(ii) furnishing all materials to be incorporated in the work including all royalties, fees, rends where necessary and all leads and lifts;
(iii) all labour, tools, equipments and incidentals to complete the work to the specificatins;
(iv) carrying out the work in part widths of road where directed; and
(v) carrying out the required tests for quality control.

ITEM NO.120 A:

Preparation of subgrade with compacting, levelling and consolidation of subgrade with miniroller/plate vibrator machine including watering and filling in depression shich occur during the process as directed by Engineer-in-charge.

Immediately following the spreading of the subgrade material rolling shall be started with mini roller/plate vibrator machine.

Except on superlevated portion where the rolling shall proceed from inner edge to outer, rolling, shall be from the edges gradually progressing towards the centre. First the edge/edges shall be compacted with roller running forward and backward. The roller shall than move inwards parallel to the centre line of the road, in successive passes uniformly lapping preceding tracks by at least one half way width.

Rolling shall continue untill the subgrade material is throughly keyed and the creeping of the sub-grade ahead of the roller is no longer visible. During the process rolling shall not be done when the sub grade is soft or yielding or when it causes a wave like motion in the sub-grade course.

The rolled surface shall be checked transversely and longitudinally with templates and any irrigularities corrected by loosening the surface, adding or removing necessary amounts of subgrade material and rerolling until, the entire surface conforms to desired camber and grade. In no case shall use of screening be permitted to make up depressions.

The bindage materials where it is required to be used shall be applied, successively in two or more thin layers at a slow and uniform rate. After each applications, the surface shall be continuously sprinkled with water, the resulting slurry swept in with hand brooms or mechanical brooms to fill the voids properly, and rolled during which water shall be applied to the wheels of the rollers if necessary to wash down the binding materials sticking to them. These operations shall continue until the resulting slurry after filling of voids, forms a wave ahead of the wheels of the moving roller. After the final compaction of subgrade course the road shall be allowed to dry overnight. Nixt morning hungry spot shall be filled with screening of binding materials as directed, lightly sprinkled with water, if necessary and rolled. No traffic shall be allowed on the road untill the base has set. The Engineer-in-charge shall have the discretion to stop hauling traffic from using the completed subgrade course if in his openion it would cause excessive damage to the surface.

MODE OF PAYMENT :-

Payment will be made on Sq.mt. basis consolidation of finished work and shall also includes cost of watering, rent of machinery, cost of fuel, wages of drivers and cleaners, earthen and murrum bund etc. and watchman etc.

ITEM NO.121:

Providing 100 mm thick readymade C.C. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved manufacturer and setting in line level and in truly vertical position including filling joints in C.M. 1:1 (1: Part of cement : 1 Part of stone dust) smooth pointing in C.M. 1:1 (1 Part of cement : 1 Part of coarse sand) including watering etc. completed and directed by Engineer-in-charge.

5(A) For regular edge of footpath

5(B) For rounding at the edge of fothpath (for fanning portion) (No.x2 - R)

Item includes all materials, labour, equipment, tools, plants, watering, cleaning etc. complete.

RAW MATERIAL:

CEMENT:-

The cement used in the manufacture of high quality precast concrete paving block shall be conforming to IS 12269 (53 grade) ordinary Portland Cement or IS 8112 (43 grade ordinary Portland cement). The minimum cement content in concrete used for making paver blocks should be 310 kg/Cu.M. And the upper limit of cement shall not be more than 425kg/Cu.M.

AGGREGATES :-

The fine and coarse aggregates shall consist of naturally occurring crushed or uncrushed materials which, apart from the grading requirements comply with IS 383-1970. The fine aggregates used shall contain a minimum of 25% natural silicon sand. Lime stone aggregates shall not be used. Aggregates shall contain no more than 3% by weight of clay and shall be free from deleterious salts and contaminants.

WATER :-

The water shall be clean and free from any deleterious matter. It shall meet the requirements stipulated in IS:4562000.

OTHER MATERIALS :-

Any other material/ingredients used in the concrete shall conform to latest IS specifications.

C.C.BLOCK CHARACTERISTICS:

The C.C. block should have perpendicularities after release from the mould and the same should be retained until the laying.

The concrete mix design should be followed for each batch of materials separately and automatic batching plant is to be used to achieve uniformity in strength and quality.

The C.C. block shall be manufactured in single layer only. Skilled labours should be employed for layinbg blocks to ensure line and level, for laying, desired shape of the surface and aequate compaction of the sand in joint.

The C.C. block must be of size 300 mm x 100 mm x 380 mm and casted in M-200 Grade with 4" (110 mm) radius counding at the top and 2 (two) nos. 12 mm keys at the other vertical face as directed by Engineer-in-charge.

When foot path meets with a junction or approach road at the end of foot path, a turning radius equal to the width of foot path should be made as pe below and as directed by Engineer-in-charge.

Sr No.	Turning Radius	No. of C.C. Block to be fix	Size of C.C. Block in rounding
1.	1.00 mt.	4 Nos.	Oute 370 mm x inner 340 mm x thickness 100 mm x Height 380 mm
2.	1.50 mt.	6 Nos.	

3.	2.00 mt.	8 No.s	

Strength is measure of the ability of the concrete kerb unit to withstand load. It is determined under laboratory conditions using bending strength. A load is uniformly applied though a 401mm swivel paralkled and rigid bearers rounded to a radius of 201mm until is failure reached. For each kerb the individual strength in MPa is determined using the second moment of area. For each of calculation, the second moment of area and distance from the controid to the extreme tensile fibre are incorporated for the profiles specified within the standard. For other profiles please refer to individual manufacturers who will supply the relevent information. The bending strength in MPa is recovered to check compliance with BS EN, The number of the kerbs per sample will very depending on previous production performance assessed statistically by attrributes of veriables. The characteristid bending strength shall not bve less than the value corresponding to the class in the table that follows. None of the individual results shall be less than the corresponding minimum bending strength in the table. Where kerbs, due to their geometry, cannot be tested according to this standard they shall be considered to be in the same class as tested kebrs provided they have at least the Bending strength classes.

Class Strength	Marking (MPa)	Characteristic Bending (MPa)	Minimum Bending Strength
1	S	3.5	2.8
2	T	5.0	4.0
3	U	6.0	4.8

WEATHERING RESISTANCE:
Is a measure of the ability of the concrete kerb to withstand weathering specific conditions exist such as frequent contact of the surface with de icing salt under frost conditions. It can be assessed under laboratory conditions by measuring the amound of spalled material from a surface under the cycle of freezing thawing action using a deicing salt solution, or, if node-icing salt is used, then the measurement of the porosity by measuring the water absorption of the kerb sould be used.
ABRASION RESISTANCE:
Is a measure of the ability of the concrete kerb to withstand erosion caused by trefficking in service. It is assessed under laboratory conditions by abranding the surface of the kerb with a flow of a hard abrasive material while applying a known force. The resulting loss of material from the kerb surface is measured by determining the abraded width.
SLIP/SKIP RESISTANCE:
Is a measure of the ability of the concrete kerb laid in service to withstand slipping for pedestrians and skidding for vehicles. The unpolished slip resistance value is determined using standard rubber material attached to a pendulum friction tester and tested under wet conditons. To determine the polished pvaer value (PPV) for all paving units BS 7932:1988 should be used. This test method measures the slip resistance of the kerb after it has been synthetically trafficked (or plished) under laboratory conditions to replicate the performance of kerb during their life under traffic conditons. For more details please contact interpave.
Kerb and edgings are mainly used as edge restains to paved surfaces or where changes in surface materials or levels occur. They retain any unbound construction material, e.g. laying course material, within the paved area and help support the applied loads by preventing horizontal displacement of the pavement construction. Channels may be used in these applications as well but can also be used to intercept and transport surface water. In velucular areas kerb, edging and channel units will inevitably be overrum or suffer side impact from vehicle tyres sometime in there service life. By selecting the appropriate units and ensuring correct insallation they will give long an durable service.

TOLERANCES:
Performance deviations the value for possible deviation from manufacturer's declared values are as follows.

Length:
1% to the nearest mm, with a minimum of 4mm and not exceeding 10mm.

Other dimentions:
Other faces : 3% to the nearest mm, with a minimum 3 mm not
exceeding 5 mm.
Other parts : 5% to nearest mm, with a minimum of 3 mm not exceeding 10 mm.
Flatness and straightness:

Length of gauge mm	Permissible deviation mm
300	1.5
400	2.0
500	2.5
800	4.0

The difference between any two measurements of single kerb shall be </-5mm.
Installation of concrete kerbs, edging and channel units has five main stages:
- Preparatiojn of support layers.
- Construction of unit foundation.
- Laying to line and level.
- Pedding of units.
- Haunching of units.

The unit foundation itself must be supported, eithef on an extension to the underlaying pavement sub layers or, for thhin pavements (e.g. edgings on pedestrain footwaysd), directly on an adequate subgrade. The depth of the unit and that of the pavement construction will determine on which pavement layer the kerb foundation will sit.
Products should be laid using one of the following alternative methods:
1.Units set on a race of reshly mixed concrete.
2.Units bedded on a mortar bed on top of a hardened concrete race or onto a mortar beding on a carriageway.
3.Units bonded to the pavement surface.

LAYING OF C.C. BLOCK AS KERB :
C.C. block shall be placed in line, level and in turely verticla position with 12 mm gap including filling joints in C.M. 1:1 (1 Part of cement : 1 part of stone dust) and smooth pointing in C.M. 1:1 (1 cement of cement : 1 part of stone dust) including watering.
At the Residential unikts, it shall be kept 8" (200 mm) open above water table and at the commercial complex, it shall be kept 3" (75 mm) open above water table and as directed by Engineer-in-charge.
SAMPLING AND TESTING PROCEDURE FOR C.C. BLOCK:
Sample size:
- Internal : Average of minimum 3 samples per 3000 blocks - for paver block manufacturers.
- External : Minimum 3 blocks per 3000 blocks.

Sampling for testing :
Sampling for testing of C.C. kerb shall be done in accordance with Appendix-A in item no.6.
Compressive strength : testing for 28 days compressive strength shall be undertaken.
Abrasion Resistant: It is assessed under laboratoy conditions by abrasing the surface of the kerb with a flow of a hard abrasive material applying a know force. The resulting loss of material from the kerb surface is measured by determining the abraded width.
Bending strength : The characteristics bending strength shall be be less than the value corresponding to the class. None of the inividual results shall be less than the corresponding minimum bending strength.
The rate shall be for a unit of one R.M.
For ensuring quality control and workmanship, above test shall be taken at 01 (One) test per each 1000 (One thousand) Nos. of C.C. block.
The C.C. block shall be got tested at (R&B) field laboratory of GERI (R&B) or S.V.N.I.T., or Govt. approved laboratory.
Laying on pavement surface:
The units may be laid directly onto a suitable pavement surface which should extend to a width to fully suport the units and any required haunching. The units are bonded to the surface using a suitable synthetic resin compound or with a modified strengthened moratr.

Jointing:
Concrete kerbs are generally laid with unfilled, close joints with a minimum joint width of 12 mm they must not a butt-jointed. Mortar joints should be filled by 1:1 (1 Cement : 1 stone dust) and enlished with the mortar which should be freshly mixed, onsisting or 1:1 (1 Cement : stone dust) where moartar joints are used, they should be complely filled and fully compacted. Joints width should be 12 mm.

Where units are laid over or adjacent to a jointed concrete pavement, suitable joints should extend through the line of the units at the joints and continue through the kerb race. When mortar joints are used, movement joints should be provided. These movement joints should be formed of 12 mm thick easily compressible material, extend through the kerb race. Mortar should be used as soon as possible and any material that has begun to set or has been mixed for more than two hours discarded.

Contractors need to plain the work to ensure risk is kept to an acceptable level. This may involve the following actions.

-Rethink the phasing of the kerb installation to maximise the number of kerbs being laid at one time.
-Lay direct from the pack rather than double handling by stringing out ahead of final laying.
-Use machinery capable of handing both packs and individual kerbs.
-Use mechinery solutions for the handling of non standard kerb details such a feature kerbs, transition kerbs, drop kerbs, quadrants (cheeses) and radius kerbs.
-Ensure that workers are trained in the safe use of mechanical lifting equipment.
-Provide training in safe lifting techniques for works involved with kerb laying.
-Consider use of alternative ligheweight kerb components for certain circumstances.

Kerb laying by hand involves a serious risk of injury to those who are doing the work and therefore employers need to take action to control this risk. When taking the risk, the best solutions will be those which address all three main hazards, the weight of the kerb, the repetitive nature of the operation and poor posture during work. The help find the best solution, the manual handling heirarchy of control measures is suggested. You should try to adop the solution nearest the top of hierarchy first, as these will give the best level of risk control. In ratre cases, where it is not possible to use any mechnical solutions, short streches of kerb may be laid manually. Where this is necessary workers should be trained in good handling techniques. The use of lighter weight kerbs or devices that allow two people to share the lift will reduce the risk of injury.

GENERAL GUIDANCE:

It is important that work procedures are drawn up before commencement to identity any hazards. Failure to do this can result in lack of co-ordination of materials and multiple handling of product. Correct personal protective clothing should be provided.

Planning the work:

Work should be planned and coordinated to void uncessary handling.

For operations where fork lift vehicals are used, kerbs should be stacked onto timber plales. Ensure that pallets are robust as the failure of a pallet could allow kerbs to all.

Stripping and wrapping of packs should only be removing just prior to use of the kerbs.

Care should be taken when cutting bands and/or remvoing wrapping to avoidkerbs falling.

Accurate placement of the concrete bed will minimise shovelling operations.

Accurate preparation of the concrete bed and any excavated trench will reduce the amount of adjustment to kerbs once laid.

Where power tools are used for cutting these should be concrete cutters with diamond blades and water flow lubrication for cooling and dust suppression.

The rate should be for a unit of One R.M.

ITEM NO.121A:

Removing & resetting existing readymade c.c. kerb stone of required size & thickness in line .level and in truly vertical position including filling joints in C.M. 1:1 (1 part of cement : 1 part of stone dust) smooth pointing in C.M. 1:1 (1 part of cement : 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge. (M.R)

Details specification as per Item No.121 and as directed by Engineer-in-charge.

ITEM NO.122:

Providing interlocking type cement concrete paver blocks of approved shape, design and colour, having 60 mm thickness (M-40) purchased from SMC's approved paver block manufactur only and fixing on fine sand bedding. Item also includes levelling by using vibratory plate compactor machine. Item also includes all materials, labour, equipment, tools, plants, watering, cleaning etc. complete.

9.1 RAW MATERIAL

9.1.1 CEMENT:-

The cement used in the manufacture of high quality precast concrete paving block shall be conforming to IS 12269 (53 grade) ordinary Portland Cement or IS 8112 (43 grade ordinary Portland cement). The minimum cement content in concrete used for making paver blocks should be 310 kg/Cu.M. And the upper limit of cement shall not be more than 425kg/Cu.M.

9.1.2 AGGREGATES :-

The fine and coarse aggregates shall consist of naturally occurring crushed or uncrushed materials which, apart from the grading requirements comply with IS 383-1970. The fine aggregates used shall contain a minimum of 25% natural silicon sand. Lime stone aggregates shall not be used. Aggregates shall contain no more than 3% by weight of clay and shall be free from deleterious salts and contaminants.

9.1.3 WATER :-

The water shall be clean and free from any deleterious matter. It shall meet the requirements stipulated in IS:456-2000.

9.1.4 OTHER MATERIALS :-

Any other material/ingredients used in the concrete shall conform to latest IS specifications.

9.2 PAVER BLOCKS CHARACTERISTICS

The concrete pavers should have perpendicularities after release from the mould and the same should be retained until the laying.

The surface should be of anti-skid and anti glare type. The paver should have uniform chamfers to facilitate easy drainage of surface run off.

The pavers should have uniform interlocking space of 2 mm to 3 mm to ensure compacted sand filling after vibration on the paver surface.

The concrete mix design should be followed for each batch of materials separately and automatic batching plant is to be used to achieve uniformity in strength and quality.

The pavers shall be manufactured in single layer only.

Skilled labour should be employed for laying blocks to ensure line and level for laying, desired shape of the surface and adequate compaction of the sand in the joints.

The pavers are to be skirted all round with kerbing using solid concrete blocks of size 100 mm x 200 mm x 400 mm or as directed by the Engineer. The kerbing should be embedded for 100 mm depth. The concrete used for kerbing shall be cured properly for 7 days minimum.

9.3 LAYING OF PAVER BLOCKS :-

9.3.1 PRIMING :-

It will be responsibilities of the Contractors to ensure that the manhole/pipeline cable trenches/circular drainage system etc. raised to driveway level using the requisite materials as per instruction of Engg. The areas of potholes/deep depressions at the isolated locations also have to be filled up before laying the paver blocks. No extra payments will be made for this purpose.

It will be the responsibility of the Contractors to ensure that undulations on the paver blocks are eliminated after the traffic is allowed on it. Proper slope for drainage of water needs to be ensured by the Contractor. All necessary materials, tools, tackles are required to be arranged by the Contractor.

9.3.2 BEDDING SAND COURSE :-

The bedding sand shall consist of a clean well graded sand passing through 4.75 mm sieve and suitable for concrete. The bedding should be from either a single source or blended to achieve the following grading.

In Sieve Size	% Passed
9.52 mm	100
4.75 mm	95-100
2.36	80-100
1.18	60-100
600 Microns	25-60
300 Microns	10-30
150 Microns	5-15
75 Microns	0-10

Contractor shall be responsible to ensure that single-sized, gap graded sands or sands containing an excessive amount of fines or plastic fines are not used. The sand particles should preferably be sharp not rounded as sharp sand possess higher strength and resist the migration of sand from under the block

to less frequently areas even though sharp sands are relatively more difficult to compact than rounded sands, the use of sharp sands is preferred for the more heavily trafficked driveways. The sand use for bedding shall be free of any deleterious soluble salts or other contaminants likely to cause efflorescence. The sand shall be of uniform moisture content and within 4%-8% when spread and shall be protected against rain when stock piled prior to spreading. Saturated sand shall not be used. The bedding sand shall be spread loose in a uniform layer as per drawing. The compacted uniform thickness shall be of 45 mm and within +/- 5 mm. Thickness variation shall not be used to correct irregularities in the base course surface.

The spread sand shall be carefully maintained in a loose dry condition and protected against pre-compaction both prior to and following screeding. Any precompacted sand or screeded sand left overnight shall be loosened before further laying of paving blocks take place.

Sand shall be slightly screeded in a loose condition to the predetermined depth only slightly ahead of the laying of paving unit.

Any depressions in the screeded sand exceeding 5 mm shall be loosened, raked and rescreeded before laying of paving blocks.

9.4 LAYING OF INTERLOCKING PAVER BLOCKS :-

Paver blocks shall be laid in herringbone laying pattern throughout the pavement. Once the laying pattern has been established, it shall continue without interruption over the entire pavement surface. Cutting of blocks, the use of infill concrete or discontinuities in laying pattern is not be permitted in other than approved locations.

Paver blocks shall be placed on the uncompacted screeded sand bed to the nominated laying pattern, care being taken to maintain the specified bond through out the job. The first row shall be located next to an edge restraint. Specially manufactured edge paving blocks are permitted or edge blocks may be cut using a power saw, a mechanical or hydraulic guillotine, bolster or other approved cutting machine.

Paver blocks shall be placed to achieve gaps nominally 2 to 3 mm wide between adjacent paving joints. No joint shall be less 1.5 mm not more than 4 mm. Frequent use of string lines shall be used to check alignment. In this regard the "laying face" shall be checked at least every two meters as the face proceeds. Should the face become out of alignment, it must be corrected prior to initial compaction and before further laying job is proceeded with.

In each row, all full blocked shall be laid first. Closure blocks shall be cut and fitted subsequently. Such closer blocks shall consist of not less than 25% of a full blocks.

To infill spaces between 25 mm and 50 mm wide concrete having screened sand, coarse aggregate mix shall be used. Within such mix the nominal aggregate size shall not exceed one third the smallest dimension of the infill space. For smaller spaces dry packed mortar shall be used.

Except where it is necessary to correct any minor variations occurring in the laying bond, the paver blocks shall not be hammered into position. Where adjustment of paver blocks necessary care shall be taken to avoid premature compaction of the sand bedding.

9.4.1 INITIAL COMPACTION :-

After laying the paver blocks, they shall be compacted to achieve consolidation of the sand bedding and brought to design levels and profiles by not less than Two (2) passes of a suitable plate compactor.

The compactor shall be a high-frequency, low amplitude mechanical flat plate vibrator having plate area sufficient to cover a minimum of twelve paving blocks. Prior to compaction all debris shall be removed from the surface.

Compaction shall proceed as closely as possible following laying and prior to any traffic. Compaction shall not, however, be attempted within one metre of the laying face. Compaction shall continue until lipping has been eliminated between adjoining blocks. Joints shall then be filled and recompacted as described in Cl. 3.5.

All work further than one metre from the laying face shall be left fully compacted at the completion of each day's laying.

Any blocks that are structurally damaged prior to our during compaction shall be immediately removed and replaced.

Sufficient plate compactors shall be maintained at the paving site for both bedding compaction and joint filling.

7.4.2 JOINT FILLING AND FINAL COMPACTION :-

As soon as possible after compaction and in any case prior to the termination of work on that day and prior to the acceptance of vehicular traffic, sand for joint filling shall be spread over the pavement. Joint sand shall pass a 2.36 mm (No.8) sieve and shall be free of soluble salts or contaminants likely to cause efflorescence. The same shall comply with the following grading limits.

In Sieve Size	% Passed
9.52 mm	100
4.75 mm	95-100
2.36	80-100
1.18	60-100
600 Microns	25-60
300 Microns	10-30
150 Microns	5-15
75 Microns	0-10

The Contractor shall supply a sample of the jointing sand to be used in the contract prior to delivering any such materials to site for incorporation into the works. Certificates of test results issued by a recognized testing laboratory confirming that the samples conform to the requirements of this specifications shall accompany the sample.

The jointing sand shall be broomed to fill the joints. Excess sand shall then be removed from the pavement surface and the jointing sand shall be compacted with not less than one (1) Pass by the plate vibrator and joints refilled with sand to full depth.

This procedure shall be repeated until all joints are completed filled with sand. No traffic shall be permitted to use the pavement until all joints have been completely filled with sand and compacted. Both the sand and paver block shall be dry when sand is spread and broomed into the joints to prevent premature setting of sand.

The difference in level (lipping) between adjacent blocks shall not exceed 3 mm with not more than 1% in any 3 m x 3 mm area exceeding 2 mm. Pavement which is deformed beyond above limits after final compaction shall be taken out and reconstructed to the satisfaction of the Engineer.

9.4.3 EDGE RESTRAINT :-

Edge restrains need to be sufficiently robust to withstand override by the anticipated traffic, to withstand thermal expansion and to prevent loss of the laying course material from beneath the surface course. The edge restraint should present a vertical face down to the level of the underside of the laying course.

The surface course should not be vibrated until the edge restraint, together with any bedding or concrete haunching, has gained sufficient strength. It is essential that edge restraints are adequately secured.

9.5 SAMPLING AND TESTING PROCEDURES FOR PAVER BLOCKS :-

9.5.1 SAMPLE SIZE:-

Internal - Average of minimum 3 samples per 5000 blocks - for paver block manufacturers.

External - Minimum 2 blocks per 10000 blocks. Average of minimum 8 blocks per site - for captioned contractors.

9.5.2 SAMPLING FOR TESTING :-

Sampling for testing of paver blocks shall be done in accordance with Appendix-A.

9.5.3 COMPRESSIVE STRENGTH :-

Testing for 28 days compressive strength shall be undertaken in accordance with Appendix-B. The average compressive strength of 60 mm thick paver blocks tested shall be 31.8 MPa.

Note:- 10% lower tolerance limit in compressive strength shall be allowed.

9.5.4 WATER ABSORPTION :-

Testing for water absorption shall be in accordance with IS 2185:1979:Part I (Specifications for concrete masonry blocks) Appendix C

APPENDIX -A

SAMPLING OF PAVER BLOCKS :-

Method of Sampling:

The paver blocks required for carrying out the tests, a sample of 20 block shall be taken from every consignment of 4000 blocks or part thereof the same size, shape and thickness and the same batch of manufacture from these samples the blocks shall be taken at rendam for conducting the tests.

9.5.5 MARKING AND IDENTIFICATION :-

All samples shall be clearly marked at the time of sampling in such a way that the designated section of Part thereof and the consignment represented by the sample, are clearly defined.
The sample shall be dispatched to the approved test laboratory taking precaution to avoid damage to the paving in transit. Protect the paving from damage and contamination until they have been tested. The samples shall be stored in water at 200C + 5o C for 24 hours prior to testing.

APPENDIX - B

PROCEDURE FOR TESTING OF COMPRESSIVE STRENGTH FOR PAVER BLOCK :

Reference: BS 6717 Part I (1993) Specification for Paver Blocks B-1 Testing Machine: The testing machines shall be of suitable capacity for the test and capable of applying the load at the rate specified. It shall comply, as regards repeatability and accuracy with the requirements of relevant IS specification.
B-2 Procedure - The sample specimens shall be tested in wet condition after being stored at least 24 hours, in water maintained at a temperature of 200 C + 5OC before the specimens are submerged in water, the necessary area shall be determined.
The plates of the testing machine shall be wiped clean and any loose grit or other material removed from the contact faces of the specimen. Plywood nominally 4 mm thick, shall be used as packing between the upper and lower faces of the specimen and the machine plates, and these boards shall be larger than the specimen by a marging of at least 5 mm at all points. Fresh packing shall be used for each specimen tested. The specimen shall be placed in the machine with the wearing surface in a horizontal plane and in such a way that the axes of the specimen are aligned with those of the machines plates.
The load shall be applied without shock and increased continuously at the rate of approximately 15 N/sqmm per minute until no grater load can be sustained. The maximum load applied to the specimen shall be recorded.

B-3 ALLCULATION OF CORRECTED STRENGTH:-

The compressive strength of each block specimen shall be calculated by dividing the maximum load by full cross section area and multiplying by an appropriate factors.
Thickness and Chamfer Correction Factors
For Compressive Strength

Work Size thickness in mm	Correction Factors	
	Plain Block	Chamfered
60	1.00	1.06
80	1.12	1.18
100	1.18	1.24

B-4 COMPRESSIVE STRENGTH CALCULATION:-

The average corrected compressive strength for the designed block section shall be calculated.

APPENDIX -C

METHOD FOR THE DETERMINATION OF WATER ABSORPTION:-

The test specimens shall be completely immersed in water at room temperature for 24 hours. The specimens shall then be weighed, while suspended by a metal wire and completely submerged in water They shall be removed from the water and allowed to drain for one minute Visible surfaces water being removed with a damp cloth and immediately weighed
Subsequent to saturation, all specimens shall be dried in a ventilated oven at 100 to 115oC for not less than 24 hours and until two successive weightings at intervals of 2 hours show an increment of loss not greater, than 0.2 percent of the last previously determined mass of the specimen.
Calculate the absorption as follows:

$$\text{Absorption, kg/m3} = \frac{A-B}{B-C} \times 10000$$

$$\text{Absorption percent} = \frac{A-B}{B} \times 100$$

Where

A = wet mass of unit in kg

B = dry mass of unit in kg. And
C = suspended immersed mass of unit in kg.

ITEM NO.122 A:

Providing interlocking type Rubber moulded cement concrete paver block of approved shape, design & colour having 60mm thickness (M-35) purchased from SMC's approved paverblock manufacturer only & fixing of fine sand bedding. Item includes levelling by using vibratory plates compacted machine. Item also includes all materials, labour, equipments, tools, plants, watering, cleaning etc. complete.

Details specification same as per Item No.122 but read Rubber moulded cement concrete paver block (M-35) instead of Rubber moulded cement concrete paver block (M-40)and as directed by Engineer-in-charge.

ITEM NO.122 B:

Removing and Resetting of Paver block of walk-way with necessary sand / pana filling and make in line and level with necessary vibrating using compactor machine.

Details specification as per Item No.122 and as directed by Engineer-in-charge.

ITEM NO.123 :-

Box cutting the road surface to proper slope and camber for making a base for road work including removing the excavated stuff and depositing on road side slope as directed by Engineer-in-charge upto 50 mts. lead and disposing remaining surplus excavated stuff including loading unloading carting etc. complete.

DESCRIPTION :-

The land width required for the roadway, gutters side slopes and catch water gutters shall be cleared of all trees having a girth of 30 cm. and less, loose stones, vegetation bushes, stumps and all other objectionable materials. The roots of trees and stumps shall be removed to a depth of 30 cms. below the grade formation and slopes and excavation filled up with excavated materials and loose. Useful materials shall be arranged in convenient stacks along the roads boundary or as directed at places within 50 metres lead, and handed over to the department in convenient sections. Unsuitable materials shall be burnt or otherwise disposed off by the contractor at his own cost without causing any nuisance, inconvenience or damage to the works, property or people in the neighborhood. If the materials disposed off out side the road land, necessary permission from the private land owners shall be taken by the contractor and royalty etc. if any paid by him without claiming any compensation. All materials shall be disposed off in a neat manner.

After cleaning the site, the alignment of the road shall be properly set out true to line, curves, slopes, grade and sections as shown on the plans or directed by the Engineer-in-charge. The Contractor shall provide all labour and materials such as lime, strings, pegs, nails, bamboos, stones, mortar, concrete etc. required for setting out establishing bench marks and giving profiles. The Contractor shall be responsible for maintaining the B.Ms. profiles, alignments and other marks as long as they are required for the work in the opinion of the Engineer- in-charge. If the Contractor defaults in the respect even after the direction by the Engineer-in-charge within the specified time, they may be restored by the Engineer-in-charge at the cost of Contractor. Levels and
section of the ground shall be taken and recorded in the presence of the Contractor or his authorised representative before the excavation is started so as to serve as the basis of measurement.

The Contractor or his representative shall sign the book in token of his acceptance of the level etc. If there is any disagreement the Contractor shall inform of it in writing to the Engineer-in-charge with the specified reference to the sections before starting further work. Once the work is started no cognizance of any complaint shall be taken merly not signing of the book shall not be deemed as disagreement.

Profiles of the section including the road side gutters to be excavated shall be laid at suitable intervals of 10 m to 50 m or other intervals as directed by the Engineer-in-charge to conform to the curved or straight alignment,section,grade and side slopes. The lineouts shall be clearly marked and profiles of embankments where excavated materials are to be used shall be set up with the toe line marked on each side. The road way section shall first be excavated with vertical side for each lift and the sides slopes for that lift shall be excavated in steps. These steps shall be smoothened to the required slope when the excavation reaches the road formation.

The contractor shall on no account excavate beyond the slopes or below the specified grade unless so directed by the Engineer in writing. If excavation is done below the specified level or outside the section, it shall not be paid for and the contractor shall be required to fill up at his own cost such extra excavation in the road portion, with approved materials of the embankment grade in layer watered and fully loose to attain maximum density laid down for the embankment in its relevant item. The Engineer may required measurement ridges and deadmen to be laft at specified intervals or places and kept in tact till ordered to be removed, for the purposes of check measurements. The excavation shall be finished neatly, smoothly and evenly to the correct lines, curves, grades, section and side slopes as shown on the plans or directed by the Engineer-in-charge. The sub-grade if loose, shall be scarifies, watered and loose to the same density as the embankment. The section, side slopes and catch water gutter shall be maintained by the contractor at his own cost in such a way that the formation and gutters will be well drained by providing necessary diversion etc. and not damaged due to obstruction of any drainage, necessary passages shall be provided for leading away seepage, springs, surface flow or rainwater safely without damaging the work. If any damage occurs due to default of the contractor in this respect, he shall make good the damage at his cost. If it is necessary in the execution of the work to interrupt existing surface drainage, irrigation channels, sewers or under drainage, temporary arrangements shall be provided till such time as is necessary. The Contractor at his own cost shall make good the interrupted drainage and sewer etc. unless separately provided in the tender. Any damage to the existing works or work in hand caused as a result of his operations or negligence shall be made good by the Contractor at his own cost. Road side gutters shall be excavated to the specified section and shall be measured along with the main cutting in cubic metres.

If slides occur in the cutting they shall be removed as ordered by the Engineer-in-charge. If finished slopes slide in to the road way before the final acceptance of the work, such slides shall be removed by the Contractor and shall be paid for at the contract rate for the class of excavation involved provided the slides are not due to any negligence of the Contractor. The classification of the material in slides shall conform to its condition at the time of removal and payment made accordingly regardless of its time of prior conditions. Care shall be taken to see that excavation is arranges in a safe way so that there will be no risk to the work or workman by slides, falling materials, boulders and collapsing slides.

If there is traffic nearby or if there are towns village in the neighborhood barricades and/or traffic signal shall be provided day and night for the duration of the work in such a way as to prevent accidents. Warning signals shall be displayed at 7 mt. from the danger point on both sides to give sufficient warning. If necessary, signalers shall be stationed at each end to regulate traffic where it is heavy. Measures shall be taken to see that the
excavation does not affect or damage adjoining structures or property. If there is damage to property, injury to workers, the members of the public, animals etc. due to the negligence of the Contractor, he will be responsible and liable to all the consequence including compensation.

When the useful excavated materials is to be used in embankment within a lead 50 metre and all lift, it shall be directly deposited at the required location in specified layers. No handling or conveyance charges shall be paid if the materials is temporarily deposited elsewhere and subsequently conveyed to site of deposition. The sequence of operations should be arranged properly, Materials required for items other than bank shall be arranged in neat stacks at convenient places, without interfering with drainage in any way. The excavated materials shall not be deposited within 3 m from the top edge of slope or top of the bank. The lead shall be measured from the junction point of cutting and embankment up to 50 mt. on either side. The contract rate shall be for a unit of one cubic metre for the stratus mentioned in the wording of the item of excavation acceptably completed, as directed by the Engineer-in-charge.

DISPOSAL OF EXCAVATED MATERIALS :-
All the surplus excavated materials shall be the property of the contractor. Suitable material obtained from the excavation of the roadway shoulders, verge, drains, cross drainage works etc. shall be used for

i) Filling for roadway embankments
ii) Filling existing pits in the right of way as directed by the Engineer including levelling and spreading with all leads and lifts.

iii) For landscaping of the road as directed by the Engineer, including levelling and spreading, with all leads and lifts.
iv) Surplus material such as rubble, stones etc. not intended for use as above shall be used as a raw material for crusher with prior permission of Engineer-in-charge.

Unsuitable and surplus material which in the opinion of the Engineer cannot be used in the works shall be removed from site by the Contractor and disposed off including all lead & lifts. No place will be made available by the employer for disposing off the material and no claim will be entertained on that account.

1.1 MEASUREMENTS FOR PAYMENT
Excavation for roadway shall be measured by taking cross sections at suitable intervals in the original position before the work starts and after its completion and computing the volumes in cu.m. by the method of average end areas for each class of material encountered. At the option of the Engineer, the Contractor shall leave depth indicators during excavations of such shape and size and in such positions as directed so as to indicate the original ground level as accurately as possible. The contractor shall see that these remain intact till the final measurements are taken.

1.2 RATES :-
The contract unit rates for the items of roadway and drain excavation shall be payment in full for carrying out the operations required for the individual items including full compensation for :
(i) Setting out
(ii) Transporting the excavated materials and depositing the same on
sites of embankments, spoil banks or stacking as directed within
lifts and lead upto 50 m.
(iii) Trimming bottoms and slopes of excavation
(iv) Dewatering
(v) Desposal of surplus excavated stuff and clearing of site after completion of work.
(vii) Watering where necessary and compacting to requirements.
(viii)Errecting all safety provisions and making necessary diversions as directed by Executive Engineer/Engineer-in-charge.

ITEM NO.124:

Providing and fixing powder coated aluminium windows having **two tracks** with aluminium sections of Hindalco, Jindal, Narmada, Banco or equivalent approved make 61.85 mm x 31.75 mm weight 0.695 kg/mtr for top track and weight 0.695 kg/mt for bottom track, shutter framing size 40 mm x 18 mm, (weight 0.417 kg/mt), interlock .547 kg/mt., sliding on bearing all sections are of powder coated of approved shade including 5 mm clear plain sheet glass, PVC track gasket, EPDM rubber gasket on glass of weather tightening along with locks, handles as approved including sealing gap with marble or any other surfaces with silicon sealants making it water proof in all manner, etc. complete at all floor levels. (colour anodized)

Matt anodized allumium sliding windows shall be made of extruded alluminium sections having thickness not less than 1.5 mm and matt finished colour anodized not less than 20 micron.
The glass 5 mm thick float Saint/Gobain glass white or colour as directed.
At bottom drain section shall be used to drain out rain water. The draina track shall be two track 62 mm x 31.75 weighing not less than 0.695 Kg/mt. The and side track s shall not be weighing less than 0.601 Kg/meter and thickness shall not be less than 1.5 mm. The work shall be carried out as directed by Engineer-in-charge or consultants.

Shutter Frame Work :- The fully glazed shutter frame shall be made from top and bottom section weighing not less than 0.464 Kg/meter. having bearing of Durlin or Nylon 66. All the fixture, fastener bearing, locks, handle, gaskets shaoul be used after getting approved from Engineer-in-charge and architect. The handle section shall be weighing not less than 0.417 Kg/meter. The interlock section shall be weighing not less than 0.464 Kg/mt. and having thickness of 1.5 mm. The glass panel shall be fixed in frame work using EPDM gaskets.

The whole assembly of window shall be fixed in best workman like manner to have smooth operations. All the windows shall be sealed to the R.C.C. or brick work with silicon sealents of dow corning or Wacker Germany as approved by Engineer-in-charge or his consultant.

The rate shall be for a unit of one square metre.

ITEM N0.125:

Providing and fixing in position powder coated aluminium windows having **three track** with aluminium sections of Hindalco, Jindal, Narmada, Banco or equivalent approved make 92 mm x 31.75 mm (weight bottom section 1.07 kg/mtr., top section 0.933 kg/mtr., shutter section 40 mm x 18 mm (weight of handle section 0.417 kg/mtr), interlock .547 kg/mt mounted on bearing to slide on tracks powder coated of approved shade including 5 mm clear plain sheet glass, PVC track gasket, EPDM rubber gasket on glass of weather tightening along with locks, handles as approved including sealing gap with marble or any other surfaces with silicon sealants making it water proof in all manner, etc. complete at all floor levels. (colour anodized)

Matt anodized allumium sliding windows shall be made of extruded alluminium sections having thickness not less than 1.5 mm and matt finished colour anodized not less than 20 micron.

The glass 5 mm thick float Saint/Gobain glass white or colour as directed.

At bottom drain section shall be used to drain out rain water. The draina track shall be three track 92 mm x 31.55 weighing not less than 1.070 Kg/mt. The and side track s shall not be weighing less than 0.933 Kg/meter and thickness shall not be less than 1.5 mm. The work shall be carried out as directed by Engineer-in-charge or consultants.

Shutter Frame Work :- The fully glazed shutter frame shall be made from top and bottom section weighing not less than 0.464 Kg/meter. having bearing of Durlin or Nylon 66. All the fixture, fastener bearing, locks, handle, gaskets shaoul be used after getting approved from Engineer-in-charge and architect. The handle section shall be weighing not less than 0.417 Kg/meter. The interlock section shall be weighing not less than 0.464 Kg/mt. and having thickness of 1.5 mm. The glass panel shall be fixed in frame work using EPDM gaskets.

The whole assembly of window shall be fixed in best workman like manner to have smooth operations. All the windows shall be sealed to the R.C.C. or brick work with silicon sealents of dow corning or Wacker Germany as approved by Engineer-in-charge or his consultant.

The rate shall be for a unit of one square metre.

ITEM N0.126:

Providing Rubble Pitching with hard stone of approved quality in cement mortar 1:6 (1 Cement : 6 Coarse sand) including leveling up ,Curing etc. complete excluding pointing

Details specification same as per item description and as directed by Engineer-in-charge.
The rate shall be for a unit of one C.M.

ITEM N0.127:

Providing Dry Rubble Pitching of various thicknessto required grade including trimming of earth work hand packing the interstics with Quarry Spalls complete for all leads and lifts.

The work shall consist of covering the slopes of guide banks, training works and road embankment with stone or boulders, over a layer of murrum bedding.

Stone subject to marked deterioration by water or weather will not be accepted. The stone shall be sound, hard, durable and fairly regular in shape and its thickness in any one direction shall not be less than the thickness of pitching as specified in the item and thickness of the stone at any place shall not be less by 15% of the thickness specified. The largest stones procurable shall be supplied on site. The sizes of spalls shall be minimun 25 mm and shall be suitable to fill the voids in the pitching. Thickness of the pitching shall be as specified in the pitching item.

Before laying the pitching, the sides of banks shall be trimmed to the required slope' arid profiles put up by means of line and pegs at intervals of 3 metres of ensure regular straight work and uniform slope throughout. Depressions shall be filled and thoroughly compacted.

Murrum for bedding shall be laid over the prepared base and suitably compacted to a thickness 150 mm Quality of murrum will be as per its relevant specifications.

The stone pitching shall commence in a trech below the toe of the slope. Stone shall be placed by derrick or by hand to the required length, thickness and depth conforming to the drawings. Stones shall be set normal to the slope and placed so that the largest dimensions is perpendicular to the face of the slope, unless

such dimensions are greater then the specified thickness of pitching. The largest stones shall be placed in the bottom courses and for use as headers for subsequent course. When full depth of pitching can be formed with a single stone, the stones shall be laid breaking joints and all interstices between adjacent stones shall be filled in with spalls of the proper size and wedged in with hammers to ensure tight packing. Pitching shall be done in panics of 3.0 M x 3.0 M with a 30 CM wide and 8 Cm deeper band all around.

Payment shall be made on Square Meter basis of the finished work. If directed by the Engineer-in-charge, for measurement the materials may have to be stacked at site before laying and nothing extra will be paid to the Contractor for this stacking. Preparation ofbase for laying bedding shall be deemed indicated to the work.

The rate shall include the cost of preparing the base, putting to the profiles, providing, laying and compacting the murrum bedding. and stone pitching of dry rubble as per embankment slopes to specified thickness, lines, curves, slopes levels and all labour and materials as well as tools and plant required of the work.

Details specification same as per item description and as directed by Engineer-in-charge.
The rate shall be for a unit of one C.M.

ITEM N0.128:

Providing & Constructing polished Kotah stone cooking platform 0.6mt. wide & 0.75mt. height, including one end side kota stone(Double Polish) of 1.25mt height & front kota stone patti of 10cm wide ,vertical partitions of half B.M wall in C.M 1:4 and 10mm th plaster in 1:3with finishing smooth with cement slurry as required and steel sink of 0.45mt x 0.45mt size of approved quality and make with required all fittings & Fxitures etc. Comp as per instruction given by site in charge at all floors

Details specification same as per item description and as directed by Engineer-in-charge.
The rate shall be for a unit of one R.M.

ITEM N0.129:

Applying cement primer & lapi before applying colour to any new surface making surface even & smooth incl. cleaning the surface of all dirt, dust & foreign matter. (M.R.)

Details specification same as per item description and as directed by Engineer-in-charge.
The rate shall be for a unit of one S.M.

ITEM N0.130:

Distempering two coats on previously distempering wall (without primer) with oil bound washable distemper of approved brand & required shade on wall surface to give an even shade after throughly brushing the surfaces clean of all grease, dirt loose places of sceles & also including preparing the surface even and smooth.

Details specification same as per item description and as directed by Engineer-in-charge.
The rate shall be for a unit of one S.M.

ITEM N0.131:

Wall painting with two coats of Acrylic emulsion plastic paint of approved brand over existing surface to give an even shade & surface free from mortar dropping & other foreign matter & sand papered smooth etc. comp.

The brand of the paint shall be as specified and ready made paint of the required colours shall be used. If thining is required pure potable water may be added to the required extent. The water used for thining should be pure and free from floating or suspended debris. It should be free from any of impurity. The surface shall be made perfectly dry and smooth by rubbing with sand paper of the different grades. All holes and open joints in wood or walls shall be filled with strong putty or with a misture of glues and plaster of paris and smoothened by rubbing with fine grade sand paper.

All the surface should be first painted with cement primer of approved over which three/two coats of Acrylic emulsion of approved quality and make be applied so as to give smooth finished surface. The shade of the Acrylic Emulsion shall have to be get approved from the Engineer-in-charge or his representative.

The paint shall be applied with brushes evenly and smoothly. The paint should be stirred in the container immediately before use. The whole work shall have to be carried out to the entire satisfaction of the Engineer-in-charge or his representative.

Patch work or different in colour shades will not be tolerated in such case, extra one coat shall have be applied for which not extra payment shall be made.

Item includes preparation of base, scaffolding using every thing and dismentalled with labour, materials, tools, paints required for satisfactorily completion of work.

Rate shall be per square metrer basis for complete item.

ITEM N0.132:

Providing & applying two coats of weather shield max paint (3 coats may be required in case of darker colours.)of ICI Dulux or Apex Ultima of Asian Paint including applying exterior acrylic primer coat as per manufacturers specification and directions in shade and colour approved by architects, on exterior surfaces of the building including scaffolding, preparing the surface, watering, curing etc. complete and as directed by the architects and manufacturers.

Surface Preparation : surface is thoroughly clean, dry and free from all loose dirt, chalk, grease, fungi, algae and flaking paint. This can be achieved by brushing with a wire/ stiff coir brush, followed by water jetting if required. Fill up all minor cracks and defects with white cement and sand mixture in the ratio 1:3. For application on previously painted wall, previous coatings of paint must be thoroughly scraped off and Clean the surface thoroughly using wire brushes.

Priming:

Apply a liberal coat of exterior acrylic primer and allow it to dry for 4-5 hours. Application of putty is not recommended.

Minimum 4-6 hours duration is required between each coat of weather shield max paint

Rate shall be per square metrer basis for complete item.

ITEM N0.133:

Providing & Fixing including making gisi & fixing at all floor levels both face polished machine cut edge, granighte stone slab for urinal partition joined with grey cement mortar (1:3) incl. Rubbing & Polishing etc. Complete. Including half round edge for granite.

(Basic Rate of Granite : Rs. 1200.00 / S.M.)

Details specification same as per item description and as directed by Engineer-in-charge.

The rate shall be for a unit of one S.M.

ITEM N0.134:

Providing and Fixing Stainless Steel (Grade 304) Railing made of Hollow tubes, channels, plates etc. Including Welding, Grinding, Buffing, Polishing and Making Curvature (Wherever Required) and fitting the same with necessary Stainless Steel Nuts and Bolts Complete, i/c fixing the Railing with Necessary Accessories & Stainless Steel Dash Fastenders, Stainless Steel Bolts etc. of Required size, on the top of the floor or the side of waist slab with suitable arrangement as per aprproval of Engineer-incharge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.)

Details specification same as per item description and as directed by Engineer-in-charge.

The rate shall be for a unit of one S.M.

ITEM N0.135:

Providing & fixing white viterious china Urinal of size 450 x 325 mm as per IS-2556 (Part-2) with C.I. Hangers and 15mm dia. C.P. Spreader, 32mm dia CP bottle trap and pipe to wall with C.P. Flange complete including cutting and making good the walls and floors wherever required.

Details specification same as per item description and as directed by Engineer-in-charge.

The rate shall be for a unit of one No.

ITEM N0.136:

Providing & construction Septic tank as per the drawing clear size 4.0 mt.x 1.40mt.x1.60 mt. incl. Necessary excavation & refilling & disposing the surplus excavated earth within 50 mt. lead incl. bedding of 25cm th' brick masonary in C.M.1:6 & partition wall in C.M. 1:4 incl. 10mm th' cement plaster in C.M.1:4 to brick wall & 15 cm. th'. R.C.C slab on the top using 1:2:4 C.C excluding reinforcement as per the structural design with fixing C.I cover of 0.60mt.x 0.45mt.size & wt. Not less than 35 Kg. & providing necessary fittings as per drawing or as directed by Engineer in charge etc. comp. (Steel- 84.21 Kg.)

MATERIALS :
Water shall conform to M-1 cement shall conform to M-3 grades tone aggregate 20mm nominal size shall conform to M-12 steel shall conform to M-19.

WORKMANSHIP :The Septictank shall be of disousion as mentioned above or as per drawing or as directed by Engineer-in-charge. The relevant specification No.1, shall be followed for excavation. Item include bedding cement concrete 1:3:6 or 25cm. thickness. The relevant specification No. shall be followed for cement concrete 1:3:4 Instead of 1:4:8 Item includes 23cm. thick B.B. masonary wall in c.m. 1:6 the relevant specification of item No.8 shall be followed for fmasonary read propertion in C.M. 1:6 instead of c.m. 1:8. Item also includes partition wall in c.m. 1:4 The relevent specification of item No. 11 shall be followed for partition wall read proportion in c.m. 1:4 instead of c.m.1:5 including 10mm thick cement plaster in c.m.1:4. The relevent specification of item No.15 shall be followed for plaster. Item also includes 15cm thick R.C.C. slab on top using 1:2:4 cement concrete including reinforcement as per stuctural design with fixing. The relevant specification of item No.5 shall be followed for cement concrete 1:2:4 for slab and the relevant specification of item No. 7 shall be followed for reinforcement item also includes C.I. cover of 0.60 m X 0.45 size and the weight of cover shall not be less than 35 kg. The item includes all materials and labours required to carry out the work as described above including Excavation, Badding Concrete, Providing masonary, R.C.C. slab, Manhole cover with from. filling etc. comp.

MADE OF MEASUREMENT AND PAYMENT :
The Measurement shall be paid on number basis.

ITEM N0.136 A:

Providing & construction Septic tank as per the drawing clear size 8.0 mt.x 2.6mt.x1.34 mt. incl. Necessary excavation & refilling & disposing the surplus excavated earth within 50 mt. lead incl. bedding of 25cm th' brick masonary in C.M.1:6 & partition wall in C.M. 1:4 incl. 10mm th' cement plaster in C.M.1:4 to brick wall & 15 cm. th'. R.C.C slab on the top using 1:2:4 C.C excluding reinforcement as per the structural design with fixing C.I cover of 0.60mt.x 0.45mt.size & wt. Not less than 35 Kg. & providing necessary fittings as per drawing or as directed by Engineer in charge etc. comp.. (Steel- 315.0 Kg.)

Details specification same as per item No : 136 but The Place Of clear size 4.0 mt.x 1.40mt.x1.60 mt. instead of clear size 8.0 mt.x 2.6mt.x1.34 mt. and as directed by Engineer-in-charge.

The rate shall be for a unit of one No.

ITEM N0.137:

Providing & constructing soak pit as per drawing clear size 2.0 mt. dia. & 6mt.depth with necessary excavation,refilling&disposing of surplus excavated earth within 50 mt. lead, constructing 23 cm th.masonary in C.M. 1:6 for 3.0mt below G.L, incl.10 cm th. R.C.C slab on top using C.C. 1:2:4 excluding the reinf. As per the structural design with fixing C.I. cover 0.6mt. x 0.45mt.size weight not less than 35 Kg. & pro. Necessary filling as per drawing or as directed by Engineer-in-charge etc. (Steel- 31.5 Kg.)

MATERIAL :

Water shall conform to M-1 cement shall conform to m-3 sand shall conform to M-6 brick shall conform to M-15, steel shall conform to m-19 graded stone aggregate 20 mm. nominal soze shall conform to M-12.

WORKMANSHIP :

The relevent specification of item no. 1 shall be followed for excavation work. The Soakpit shall have clear size 2.00 m. dia and depth 6.0 m. The Item including bottom 1.2 mt. depth shall be reffiled by dry brick bat and/or charra filling.

Item including constructing 23 cm. thick brick masonary in C.M. 1:6 for a depth 3.0 m. below ground level. The relevent specification of item No.8 shall be folloed in for brick masonary work except the proportion shall be C.M. 1:6. Item including 10 cm. thick cement plaster in C.M. 1:4 to brick wall as shown in drawing. The relevent specification of item No. 15 shall be folloed for plaster. Item including the R.C.C. slab 10 cm. thick on top using 1:2:4 cement concrete including reinforcement as per structural design drawing with fixing C.I. cover 0.60 m. X 0.45 m. soze the weight of C.I. cover shall not be less than 35 Kg. The relevent specification of item No. 5, shall be followed for 1:2:4 cement concrete work and the relevent specifivation of item No. 7, shall be followed for reinforcement.

The item incldes all materials and labours required to carry out the work as described including excavation providing masonary, R.C.C. rings, top slabs manhole cover with frame, brick bat filling etc. comp.

MODE OF MEASUREMENT AND PAYMENT :

The measurement shall be paid on number basis for complete item work.

ITEM N0.138:

Providing & Laying Commercial Quality white glazed tiles 6mm. th. in flooring laid on a bed of 20 mm. Av. Th.C.M.1:3(1cement :3 sand) & on wall Of R.C.C. Tank with necessary cement paste for fixing and joined with white cement slurry etc. complete. finished with flush pointing in white cement etc.com.

Details specification same as per item description and as directed by Engineer-in-charge.

The rate shall be for a unit of one litre.

ITEM N0.139:

Uncoursed rubble masonary with hard stone of approved quality in foundations and plinth in cement mortar 1:6 (1 Cement : 6 sand) including leveling up etc. complete.

MATERIALS :

The Cement mortar shall conform to M-11, Stone shall conform to M-16.

WORKMANSHIP :

DRESSING OF STONES :

Stone used for uncoursed rubble masonary work shall be harmmer dress on the sides, and beds in which such a way as to close with the adjacent stone in the masonary work as strongly as possible. The face stones shall be dressed in such a manner as to give a specified pattern such as polygonal facing etc. The face of the stones shall be so dressed that bushing on the exposed face shall not project more than 40 mm from the general wall surgace wall surface and on the face to be plastered, it shall not project by more that 19 mm not shall have depressions more than 10 mm from the average wall surface.

LAYING :

All the stone shall be sufficiently wetted before laying to prevent absorption of water from mortar. The wall shall be built to plumb (of true to required batter when so specified). All connected walls in a structure shall be raised up uniformally and regulary. However if for any specific reason, on part of masonary is required to be left behind, the wall shall be racked back at an angle not steeper than 45ø Vertical toothed joints in masonary shall not be allowed. The work shall be carried out regularly and masonary of any day wall not be raised by more than 1 metre in height.

The stone shall be laid in an uncoursed fashin, or random fencing etc. However the masonary is required to be brought to level at varioous stages viz. plinth level window still level roof level and any other level specifically shown in the drawings. This may be done first by adjusting the laying of stone to one level and then by providing levelling coarse of cement concrete 1:6:12 (1 Cement : 6 sand : 12 graded stone aggregate 20 mm nominal size) or as otherwise specified.

Proper bonding shall be acheved by closely filling in adjucent stones as wells by using bond stones or through stones as described herein below. Face stones shall extend back sufficiently and bond well with the masonary. The stone shall be carefully set so as to break joints and avoid formation of vertical joints. The depth of stone from the face of wall inwards shall not be less than weight or breadth at the face. The hearting or interior filling of the wall shall consist of rubble stones which may be of any shape. Neither the face stone nor the hearting stone shall be so small to pass through circular ring of 150 mm. internal diameter in any direction nor shall any there shall have minimum thickness 100 mm.

All stone shall be carefully laid, hammered down by a wooden mallet into position and solidly embedded in mortar, chips and spawns of stone may be used wherever necessary to avoid thick mortar beds or joints at the same measuring that no hollow space is left any where in the masonry.

The chips used shall not be more than 20% by volume of masonry. The herarting shall be lid nearly level with faces tones except that at about one meter intervals vertical vond stone or plumbs projecting about 150 to 200 mm. shall be firmly embeded to from vertical bonding in masonry.

BOND STONE :

Bond stones or through stones running right across the thickness of the wall shall be provided in walls upto 600 mm. thick. In thicker walls two stones overlapping each other by atleast 150 mm shall be provided across the thickness of the wall to form bond stones. There shall be atleast one bond stone for every 0.5 Sq.mt. of wall surface. The bond stone shall be marked by a disting ..... letter during construction for subsequent verfication and shall be laid staggered in subsequent layers.

QUOINS :

The quoins or corners stones shall be selected stone neatly dressed with hammer and/or chisel to form the required corner angle and laid header and stretcher alternatively. The bed top surface of quoins shall be chiselled dressed to give horizontal joints. The quoins shall have a uniform chisel draft of atleast 25 mm width at four edges of each exposed face all the edges of the same face being in one plan. No quoins stone shall be smaller than 0.0025 Cum-in volume.

JAMB STONES :

The jamb stone shall be made with stone specified for quoins, except that the stone provided on the jambs shall have their length equal to thickness of wall up to 600 mm and a line of headers shall be provided for walls thicker that 600 mm specified for bond.

JOINTS :

All the joints shall be completely filled with mortar and their width shall not except 25 mm. when plastering of pointing is not required to be done, the joints shall be struck flush and finished simultaneously while laying the stone. Otherwise the joints shall be racked to a minimum depth of 20 mm by a racking tools. during progress of laying while the mortar is still green.

SCAFFOLDING :

Single or double scaffolding shall be used. The scaffolding shall be strong and sound. The holes left in masonry for supporting scaffolding shall be made good before plastering.

CURING :

Green work shall be protected rom rains by suitably covering the same. Masonry shall be kept constantly moist on all the faces for a period of atleast 7 days. The top of masonry shall be flooded at close of the day.

MODE OF MEASUREMENTS AND PAYMENT :

All work shall be measured on the basis of finished dimenstons and measured net except where otherwise specified. Only specified dimensions shall be allowed. Anything extra shall be ignored. The masonry work in foundation and plinth shall be measured under this item. No deduction shall be made, not extra payment made for the following.

(a) Ends of joints, beams posts, girders rafters, parlins, trusses, corbels, etc. each upto 500 Sq.cm. in section.

(b) Opening each upto 0.1 Sq.m.

(c) Wall plateds and bed plates, bearing of chajja and like upto 10 CM depth (bearing of floor and rood slabs shall be deducted from masonry).

(d) Drain holes and recesses for cement concrete blocks to embed hold fasts for doors windows.

(e) Building in the masonary iron fictures pipes upto 300 mm dia hole fasts of doors and windows.

(f) Forming cheses in masonary upto section of 350 Sq.cm.

The rate shall be for a unit of one cubic metre.

ITEM N0.140:

Pointing on Coursed stone masonary with cement mortar 1:3 (1 cement : 3 Sand) ---
(A) Flush Pointing (B) Ruled Pointing

MATERIALS :

Water shall conform to M-1, Cement mortar to M-11.

WORKMANSHIP :

The flush pointing work shall be carried out with cement mortar of proportion 1:3 (1 Part of cement and 3 part of course sand) by volume.

PREPARATION OF SURFACE :

The joints shall be raked to such depth that the average of new mortar measured from either the sunk surface of finished pointing or from the edge of the stone shall be average 10 mm.

The joints shall be initially formed as for flush pointing and than while the mortar is still green a groove of specified shape shall be formed by running forming tool straight along the centre line of joints till a smooth and hard surface is obtained. The vertical joints shall also be finished in a similar way. The pointing lines shall be uniform in width and truly horizontal and parallel in case of floor and ceiling.

APPLICATION OF MORTAR FINISHING :

The mortar shall be pressed into the raked out joints with a pointing trowel according to the type of pointing specified in item. The mortar shall not spread over the corner edges or surface of the masonary. The pointing shall then finished with the pointed tools.

CURING :

The pointing shall be kept wet for 7 days. During this period, it shall be suitably protected from all damages.

MODE OF MEASUREMENTS AND PAYMENT :

No deductions shall be made for end of joints, beams and posts etc. and openings not exceeding 0.5 Sq.mt. each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings.

Deductions for openings exceeding 0.5 Sq.mt. but not exceeding 3 Sq.mt. each shall be paid as floows and no addition shall be made for reveals, jambs, soffits, sills etc. these openings :

(i) When both faces of walls are pointed with sume type of pointing, deduction shall be made for one face only.

(ii) When two face of walls are pointed with different type of pointing or if one face is plastered and the other is pointed deduction shall be made in the plaster of pointing on the side of frame for door, windows etc. on which the width of reveals is less than that on the other side but no deduction shall be made from plaster or pointing on the other wide.

(iii) When only one face is treated and the other face is not treated, full deduction shall be made, if the width of the reveals on the treated side is less than on the untreated side, but if the width of the reveals is more, than no deduction shall be made nor any addition shall be made for reveals, jambs, soffits, sills etc.

In case of openings of area above 3 Sq.mt. each deduction shall be made for opening but jambs, sills and soffits, shall be measured.

The rate shall be for a unit of one Sq.metre.

ITEM N0.141:

Pointing on Uncoursed stone masonary with cement mortar 1:3 (1 cement : 3 Sand) ---
(A) Flush Pointing (B) Ruled Pointing

Details specification same as per Item No.141 but The Stone used in this type of masonary very much vary in their shape and size and aer directly obtained from quarry.As directed by Engineer-in-charge.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

SPECIAL CONDITION OF CONTRACT FOR ELECTRICAL WORK

1) Equipment & Machinery on Work Site

The contractor shall provide and maintain in working order power driven machines like welding, drilling machine, drilling machine to make a precise hole in RCC wall, Diamond Cutter, zari cutters, meggar (H.V. & L.V.) , multimeter, continuity tester, Lux Meter, Earth Resistance meter etc… till the completion of work.

2) The quantity for measurement will be actual quantity used in electrification:

- The contractor shall bear all incidental charges for the storage and safe custody of the materials at site at his own responsibility.
- The contractor shall make arrangement at the site of works for safe custody of materials to protect from damage by rain, dampness, fire, theft etc.
- In case any materials get damaged the contractor shall replace the same at his own cost.
- The contractor shall furnish to Engineer-in-Charge sufficiently in advance a statement showing hisrequirements of quantities of materials to be supplied by Owner if any and the time when he will require the same.
- A day to day account of the material supplied by Owner/Contractor shall be maintained by the contractor in the agreed Performa.

3) Engineer In charge/Employer will provide operative instructions on regular basis related to project during contract execution period, which are not covered in this tender document. Contractor and his staff at site shall comply all these instructions.

4) Design Consultant's and Client's approval will be final in all concerned matters.

5) All correspondences between contractor and architect will be through client/PMC, and All correspondence with Client \ PMC should/must be cc to Design Consultant.

6) The Electrical contractor must be licensed Electrical contractor.

7) The Electrical contractor must have available all kind of necessary equipment's at site.

8) The Electrical contractor should get approval prior to appoint any sub agencies for specialized jobs. Client /Consultant/Architect have right to reject any contractor at any stage of project.

9) It is required that all insurance formalities & workman's compensation policy should be followed by the contractor.

10) All HT cable jointer should possess necessary license for HT cable jointing/termination and should be well experienced with similar work.

11) The contractor will have to provide senior Electrical site engineer during the execution of work

12) All wiring person must be in possession of wireman license.

9) Factory Testing if required by SMC, should be given at the cost of contractor before supply the product.

12) Any kind of junction box plates should match the Wall / slab colour i.e. on Exposed RCC wall / Slab – Provide Cement sheet as a plate, On wooden wall / False Ceiling – Provide wooden, On painted wall – Same colour acrylic / painted wooden or as per Instruction of Architect.

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

ACRONYMS

SR. NO.	ABBREVIATION	MEANING
1	ACB	Air Circuit Breaker
2	AHU	Air Handling Unit
3	Al	Aluminum
4	AMF	Auto Mains Failure
5	APFCR	Automatic Power Factor Correction Relay
6	IBMS	Integrated Building Management System
7	CAT - 6	Type of cable
8	CCTV	Close Circuit Television
9	Cu.	Copper
10	DG	Diesel Generator
11	DP	Double Pole
12	EB	Electricity Board
9	ELCB	Earth Leakage Circuit Breaker
12	EPABX	Electronic Private Automatic Branch Exchange
15	FP	Four Pole
16	FRLS	Flame Retardant Low Smoke
10	GI	Galvanized Iron
18	HT	High Tension (above 1000 V)
11	HVAC	Heating Ventilation and Air conditioning
14	LDB	Lighting Distribution Board
21	LT	Low Tension (below 1000 V)
22	MCB	Miniature Circuit Breaker
23	MCCB	Molded Case Circuit Breaker
24	MS	Mild Steel
25	OLTC	On Load Tap Changer
26	PDB	Power Distribution Board
27	PVC	Poly Vinyl Chloride
28	RS - 485	Communication Protocol
29	SLD	Single Line Diagram
30	TP	Triple Pole
29	TPN	Triple Pole and Neutral
32	UPS	Uninterrupted Power Supply
34	UTP	Unshielded Twisted Pair
34	VCB/SF6	Type of HT breakers (Vacuum or SF6 gas insulated)

DETAIL TECHNICAL SPECIFICATION FOR ELECTRICAL WORK

STANDARD SPECIFICATION FOR INTERNAL WIRING

GENERAL MATERIAL SPECIFICATION

Scope:

This section covers, definition of point wiring, system of wiring and supply, installation, connection, testing and commissioning of point wiring for light points, ceiling fan points, exhaust fan points, convenience socket outlet points, power socket outlet points, bell outlet points etc. Including fixing of light fixtures, ceiling fan, exhaust fan, wall fan, bell etc

Material specification & workmanship

Standards

Code of practice for electrical wiring installation system voltage not exceeding 653	: IS: 732
Code of practice for fire safety of buildings general) electrical installation	: IS: 1647
Rigid steel conduits for electrical wiring	: IS: 1653
Fittings for rigid steel conduits for electrical	: IS: 2667
Flexible steel conduit for electrical wiring	: IS: 3480
Accessories for rigid steel conduits for	: IS: 3737
Pvc insulated cables (wires)	: IS: 694
Rigid non-metallic conduits for electrical wiring	: IS: 2539
Flexible (playable) non-metallic conduits for	: IS: 6947
Three pin plugs and sockets	: IS: 1293
Conductors for insulated electrical cables and	: IS: 8180
Specification for conduit for electrical installation	: IS: 9537-1180
Accessories for non-metallic conduits for electrical wiring	: IS: 3411
Switches	:IS:3754-1293-4715
Plugs	: IS: 6537
Shunt capacitors for power systems	: IS: 2834-1154
HRC cartridge fuses and links up to 682 volts	: IS: 2148
General and safety requirement for lighting fittings	: IS: 119-1169
Code of practice for lighting public thorough fares	: IS: 2947-1181
3 pin plug sockets	: IS -1293
Specification of conduits for electrical installation	: IS -890
Guide for electrical layout in residential building Indian electricity act and rules	: IS-4748

Rigid and flexible conduits:

All conduits shall be rigid pvc pipe having minimum wall thickness of medium gauge 1.5 to 1.8 approved by fia. &ISI and shall confirm to IS 9537.

Up to 37 mm. Diameter - minimum 1.8 mm. Wall thickness

Above 40 mm. Diameter - minimum 2.2 mm. Wall thickness

14, 25, and 32 mm diameter- minium1.5 mm wall thickness

Flexible conduits shall be formed from a continuous length of spirally wound interlocked steel strip with a fused zinc coating on both sides. The conduit shall be terminated in brass adapters.

Accessories:

Pvc conduit fittings such as bends, elbows, reducers, chase nipples, split couplings, plugs etc. Shall be specifically designed and manufactured for their particular application. All conduit fittings shall conform to is: 2667-1164 and IS: 3757-1166.

Casing and capping

Casing and capping shall be of good quality pvc, free from defects like deformations, unevenness, blisters, cavities, etc.

The casing shall be of square or rectangular body with top of the side walls suitable for tightly fitting slide-in type capping with double grooving. All surfaces shall have smooth finish inside and outside.

Wires:

All wires shall be single core multi-strand/ flexible copper frls type pvc insulated as per is: 694 and shall be 682 v\1100 v grade.

All wires shall be colour coded as follows:

phase	colour of wire
R	red
Y	yellow
B	blue
N	black
Earth	green (insulated)
Control (if any)	grey

All off wires shall be same as phase wire

Switches & sockets:

Switches shall conform to IS:3754, IS:1293 & IS:4715. Switches shall be moulded plate type flush Modular type with silver-coated contacts.

Sockets shall be 3 pin with switch and plate type cover.

Combination of multiple switch units and sockets should be used to minimize the switch boxes.

All screws shall be brass – chromium plated and shall be counter sunk type with half round head or flat headed.

For heavy duty, metal clad sockets MCB/Isolator mounted in a galvanized steel box shall be provided.

Insulation Resistance:

The insulation resistance shall be measured by applying 530 volt megger with all fuses in places,

circuit breaker and all switches closed.

The insulation resistance in mega ohms of an installation, measured shall not be less than 53 mega

ohms divided by the number of points on the circuit.

The insulation resistance shall be measured between

EARTH TO PHASE

EARTH TO NEUTRAL

PHASE TO NEURAL

PHASE TO PHASE

Earth Continuity Path:

The earth continuity conductors shall be tested for electrical continuity and the electrical resistanceof the same along with the earthing lead but excluding any added resistance or earth leakage circuit breakermeasured from

the connection, with the earth electrode to any point in the earth continuityconductor in the completed installation and shall not exceed one ohm.

Workmanship

Point wiring

The size of conduit shall be selected in accordance with the number of wires permitted under table given below. The minimum size of the conduit shall be 25 mm. Diameters unless otherwise indicated or approved. Size of wires shall not be less than 1.5 sqmm copper or 2.5 sqmm aluminium

Nominal dia of wires	Nominal cross sec. Area	14 mm		25 mm		32 mm		37 mm	
(mm)	(mm2)	S	B	S	B	S	B	S	B
1/1.12	1.0	7		9	--	14	--	--	--
1/2.40	1.5	4		8	6	15	9	--	--
1/1.80	2.5	4		6	4	10	8	--	--
1/2.24	4	2		4	3	8	6	--	--
1/2.80	6	1		4	3	6	6	--	--
1/3.55	10	1	--	3	2	5	4	6	5

Note:

S: runs of conduits which have distance not exceeding 4.25 m. Between draw boxes & which do not deflect from the straight by an angle more than 15 degree.

B: runs of conduits which deflect from the straight by more than 15°

Conduits shall be kept at a minimum distance of 100 mm. From the pipes of other non-electrical services. And maintain minimum 300 mm distance between telephone, TV& computer piping (if possible)

Separate conduits/raceways shall be used for :

- Normal lights and 5 a 3 pin sockets on lighting circuit.
- Separate conduit shall be laid from d.b. to switch board or point.
- Power outlets - 15 a 3 pin 14 a/30 a, 2 pin scraping earth metal clad sockets.
- Emergency lighting.
- Telephones.
- Fire alarm system.
- Public address system & music system.
- For all other voltages higher or lower than 230 v.
- T.V. antenna.
- Water level guard.
- Computer wiring
- Call bell wiring

Layout of conduits shall be generally as indicated on drawings and the layout shall be supplemented and complemented by contractor on site with the approval of the engineer.

Wiring for short extensions to outlets in hung ceiling or to vibrating equipment's, motors etc., shall be installed in flexible conduits. Otherwise rigid conduits shall be used. No flexible extension shall exceed 1.25 m.

Conduits run on surfaces shall be supported on gi 12 mm. Thick pressure saddles which in turn are properly screwed to the wall or ceiling. Saddles shall be at intervals of not more than 530 mm. Fixing screws shall be

with round or cheese head and of rust-proof materials. Exposed conduits shall be neatly run parallel or at right angles to the walls of the building. Unseemly conduit bends and offsets shall be avoided by using fabricated mild steel junction/pull through boxes for better appearances. No cross-over of conduits shall be allowed unless it is necessary and entire conduit installation shall be clean and neat in appearance.

Conduits embedded into the walls shall be fixed by means of staples at not more than 530 mm. Intervals. Chases in the walls shall be neatly made and refilled after laying the conduit and brought to the finish of the wall but final finish will be done by the building contractor.

Conduits buried in concrete structure shall be put in position and securely fastened to the reinforcement and got approved by the engineer, before the concrete is poured. Proper care shall be taken to ensure that the conduits are neither dislocated nor choked at the time of pouring the concrete. Suitable fish wires shall be drawn in all conduits before they are embedded.

Where conduit passes through expansion joints in the building, adequate expansion fittings shall be used to take care of any relative movement.

Inspection boxes shall be provided for periodical inspection to facilitate withdrawal and removal of wires. Such inspection boxes shall be flush with the wall or ceiling in the case of concealed conduits. Inspection boxes shall be spaced at not more than 12 meters apart or two 90° solid bends or equal. All junction and switch boxes shall be covered by 6 mm. Clear per plate truly cut and fixed with cadmium plated brass screws. These junction boxes shall form part of point wiring or conduit wiring as the case may be including the cost of removing the Perspex cover for painting and re-fixing. No separate charges shall be allowed except where specially mentioned.

Conduits shall be free from sharp edges and burrs and the threading free from grease or oil. The entire system of conduits must be completely installed and rendered electrically continuous before the conductors are pulled in. Conduits should terminate in junction boxes of not less than 32 mm. Deep.

An insulated earth wire of copper rated capacity shall be run in each conduit. The earth continuity conductor shall be as follows.

Load balancing: balancing of circuit in three-phase installation shall be planned before the commencement of wiring and shall be strictly adhered to.

Minimum size of earth conductor not forming part of same cable as associate circuit conductor

Nominal cross section area of nominal cross section area of largest associated copper circuit earth continuity conductor in

Conductor in sq. Mm	sq. Mm
6.0	2.5
10.0	6.0
16.0	6.0
25.0	16.0
34.0	16.0
53.0	16.0

Lighting & power wiring:

All final branch circuits for lighting and appliances shall be flexible copper wire of appropriate size run inside conduits. The conduit shall be properly connected or jointed into sockets, bends, and junction boxes.

Branch circuit conductor sizes shall be as shown in the schedule of quantities and or drawings.

All circuits shall preferably be kept in a separate conduit up to the distribution board. No other wiring shall be bunched in the same conduit except those belonging to the same phase. Each lighting branch circuit shall not have more than ten outlets or 800 watts whichever is lower. Each conduit shall not hold more than three branch circuits, of the same phase.

Flexible cords for connection to appliances, fans and pendants shall be 653/1100 v grade (three or four cores i.e. With

insulated neutral wire of same size) with tinned stranded copper wires, insulated, twisted and sheathed with strengthening cord. Colour of sheath shall be subject to the engineer's approval.

Looping system of wiring shall be used. Wires shall not be jointed. Where joints are unavoidable, they shall be made through approved mechanical connectors. No such joints shall be made unless the length of the sub-circuit, sub-main or main is more than the length of the standard coil.

Control switches shall be connected in the phase conductors only and shall be `on' when knob is down. Switches shall be fixed in 3 mm. Thick painted or galvanized steel boxes with cover plates as specified. Cadmium plated brass screws shall be used.

Power wiring shall be distinctly separate from lighting wiring. Conduits not less than 25 mm. And wires not less than 2.5 sq.mm. Copper shall be used.

Every conductor shall be provided with identification ferrules at both ends matching the drawings.

PART 7:- INTERNAL ELECTRICAL

PART A:- INTERNAL WIRING

Item No.1: Point wiring for Light/Bell/Fan

Scope of Work: SETC of **Point wiring for Light/Bell/Fan** with 2-1.5 sq.mm & earthwire of 1.5 sq.mm (Green) both are of ISI marked 1.1 KV grade FRLS PVC insulated multistrand copper wires, in following type of pipe to be erected concealed in/ on surface on wall/ceiling complete with 6A Modular type switch / bell push & accessories and earth continuity of following type, erected on PVC / Metallic box, single mounting base frame covered with textured/metallic front plate modules erected on/ in wall / ceiling as per pipe erected, with necessary Lamp holder/ceiling rose / H.D.Connector as directed.(a) With medium class Rigid PVC pipe and accessories - Cat III

Item No.2: Point Wiring for Secondary Light

Scope of Work: SETC of Secondary Light Point, to be looped from Primary Point, with 2-1.5 sq.mm & earth wire of 1.5 sq.mm (Green) both are of ISI marked 1.1 KV grade FRLS PVC insulated multistrand copper wires, in following type of pipe to be erected Open/ concealed in/ on surface on wall/ceiling complete with 6A Modular type switch / bell push & accessories and earth continuity of following type, erected on PVC / Metallic box, single mounting base frame covered with textured/metallic front plate modules erected on / in wall / ceiling as per pipe erected, with necessary Lamp holder/ ceiling rose / H.D. Connector as directed. With medium class Rigid PVC pipe and accessories - Cat III

Item No.3:Point wiring for Individual Plug Point

Scope of Work: **SETC of Point wiring for Individual Plug** with & earthwire of 1.5 sq.mm (Green) both are of ISI marked 1.1 KV grade FRLS PVC insulated multistrand copper wires, in following type of to be erected concealed in / on surface of wall / ceiling complete with Modular type switch & 5 pin Plug erected on PVC / Metallic box covered with appropriate front plate modules erected on / in wall / ceiling as per pipe erected with following type of accessories**. (a) with medium class Rigid PVC pipe and accessories - Cat-III(I) For 6A Plug with 2-1.5 sq.mm Cu. Wire**

Item No.4: Point wiring for Individual 16A Plug Point

Scope of Work: SETC of Point wiring for Individual Plug with & earth wire of 1.5 sq.mm (Green) both are of ISI marked 1.1 KV gradeFRLS PVC insulated multistrand copper wires, in following type of to be erected Open/ concealed in / on surface of wall / ceiling complete with Modular type switch & 5 pin Plug erected on PVC / Metallic box covered with appropriatefront plate modules erected on / in wall / ceiling as per pipe erected with following type of accessories. **[II] For 16A Plug with 2-2.5 sq.mm Cu. Wire (a) with medium class Rigid PVC pipe and accessories**

Item No.5: Point wiring for Looped Plug

Scope of Work: SETC of Point wiring for **looped Plug with tissino** type single pole ISI marked Switch and socket erected with necessary connections erected on polished wooden block / Metal / PVC Box covered with 3 mm. thick laminated sheet for open / concealed wiring. Cat. III

Iterm No.6: Two Way Controlled Light Point

Scope of Work: SETC of Point wiring for **Two Way Controlled Light Point** with 2-1.5 sq.mm & earthwire of 1.5 sq.mm (green) both are of .ISI marked 1.1 KV grade FRLS PVC insulated multistrand copper wires, in following type of pipe to be erected concealed in / flushed on wall/ceiling ,complete with 6A Modular type switches and following type of accessories erected on PVC / Metallic box, single mounting base frame covered with textured / metallic front plate modules erected on / in wall / ceiling as per pipe erected. with necessary batten/angle holder or ceiling rose or H.D.Connector as directed. (a) with medium class Rigid PVC pipe and accessories - Cat III

Item No.7: Two Pin/RJ-11 Telephone Socket

Scope of Work: SETC of following type of Modular Type Accessories mounted with pvc / metallic box, single mounting baseframe covered with textured / metallic front plate , modules erected with necessary connection. As desired by Engineer-in-charge(3) Two Pin/RJ-11 Telephone Socket (A) For One Gang-Cat. III

Item No.8: TV Co-axial Socket outlet

Scope of Work: SETC of following type of Modular Type Accessories mounted with pvc / metallic box, single mounting base Scope of Work: frame covered with textured / metallic front plate , modules erected with necessary connection. As desired by Engineer-in-charge(4) TV Co-axial Socket outlet - Cat III

Item No.9: Blank Plate Single

Scope of Work: SETC of following type of Modular Type Accessories mounted with pvc / metallic box, single mounting base frame covered with textured / metallic front plate , modules erected with necessary connection. As desired by Engineer-in-charge(7) Blank Plate Single- Cat. III

Specification: As per standard Material Specification as mentioned above

Item No.10: Modem Jack for Computer Open RJ-47

Scope of Work: SETC of following type of Modular Type Accessories mounted with pvc / metallic box, single mounting base frame covered with textured / metallic front plate , modules erected with necessary connection. As desired by Engineer-in-charge(8) Modem Jack for Computer Open RJ-47- Cat III

Item No.11: UPVC cable 75 mm x 53 mm trunking

Scope of Work: Supplying and laying UPVC cable trunking system comprising unplasticised polyvinyl, chloride rigid material with ignition free & flame proof confirming BS. With All necessary accessories (Like elbow, tee, bank etc.) and measuring of following sizes**. (1) 75 mm x 53 mm trncking**

Item No.12: UPVC cable 100 mm x 53 mm trunking

Scope of Work: Supplying and laying UPVC cable trunking system comprising unplasticised polyvinyl, chloride rigid material with ignition free & flame proof confirming BS. With All necessary accessories (Like elbow, tee, bank etc.) and measuring of following sizes **(2) 100 mm x 53 mm trunking**

Item No.9: Wiring Mains 2 wire 1.5 sq. mm + 1.5sqmm green earth wire

Scope of Work: SETC of Mains with **1.1 KV grade FRLS PVC** insulated ISI marked stranded Copper conductor wirein following type of pipe to be erected concealed in /flushed on wall/ceiling, with **1.5 sq. mm copper conductor FRLS PVC** insulated stranded wire of green colour for earth continuity of following size **(a) with medium class Rigid PVCpipe and accessories**

Size: 2 wire 1.5 sq. mm

Specification: As per standard Material Specification as mentioned above

Item No.12:Wiring Mains 2 wire 2.5 sq. mm + 1.5sqmm green earth wire

Scope of Work: SETC of Mains with **1.1 KV grade FRLS PVC** insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected concealed in /flushed on wall/ceiling, with **1.5 sq. mm copper conductor FRLS PVC** insulated stranded wire of green color for earth continuity of following size **(a) with medium class Rigid PVC pipe and accessories**

Size: 2 wire 2.5 sq. mm

Specification: As per standard Material Specification as mentioned above

Item No.15: Wiring Mains 2 wire 4 sq. mm + 2.5 sqmm green earth wire

Scope of Work: SETC of Mains with **1.1 KV grade FRLS PVC** insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected concealed in / flushed on wall / ceiling with **2.5 sq. mm copper conductor FRLS PVC** insulated stranded wire of green color for earth continuity of following size **(a) with medium class Rigid PVC pipe and accessories**

Size: 2 wire 4 sq. mm

Specification: As per standard Material Specification as mentioned above

Item No.16:Wiring Mains 2 wire 6 sq. mm + 2.5 sqmm green earth wire

Scope of Work: SETC of Mains with **1.1 KV grade FRLS PVC** insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected concealed in / flushed on wall / ceiling with **2.5 sq. mm copper conductor FRLS PVC** insulated stranded wire of green color for earth continuity of following size **(a) with medium class Rigid PVC pipe and accessories**

Size: 2 wire 6 sq. mm

Specification: As per standard Material Specification as mentioned above

Item No.10:Wiring Mains 4 wire 4 sq. mm + 2.5 sqmm green earth wire

Scope of Work: SETC of Mains with **1.1 KV grade FRLS PVC** insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected concealed in / flushed on wall / ceiling with **2.5 sq. mm copper conductor FRLS PVC** insulated stranded wire of green color for earth continuity of following size **(a) with medium class Rigid PVC pipe and accessories**

Size: 4 wire 4 sq. mm

Specification: As per standard Material Specification as mentioned above

Item No.18:

Scope of Work: Supplying & erecting approved make **LAN cable** of following size in existing pipe as per direction**[D] CAT - 6 e (For Telephone & Computer Distribution)**

Item No.11:

Scope of Work: Supplying & erecting Approved make call **bell indicator with buzzing sound** and Red light indicating lamp with Red light button to attend the call suitable for 240 v 53 c/s supply to be erected.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.14: RIGID PVC PIPES 14mm

Scope of Work: SETC of ISI mark Medium class RIGID PVC PIPES of following size complete to be erected on/in wall or ceilingerected with necessary PVC fittings & Junction boxes fixed with adhesive solution & Clamps with following dia ofpipes, in approved manner as directed**(a) 14 mm**

Item No.21: RIGID PVC PIPES 25mm

Scope of Work: SETC of ISI mark Medium class RIGID PVC PIPES of following size complete to be erected on/in wall or ceilingerected with necessary PVC fittings & Junction boxes fixed with adhesive solution & Clamps with following dia ofpipes, in approved manner as directed**(b) 25 mm**

Item No.22:

Scope of Work: Decorative call bell Ting-tong box type 253 volts complete erected

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

STANDARD SPECIFICATION FOR INDOOR LIGHT FIXTURES

GENERAL MATERIAL SPECIFICATION

General

- This section relates to technical specification for indoor & outdoor lighting equipments of the project.
- All fixtures shall be complete with accessories necessary for installation whether so detailed under fixture description or not.
- Fixture housing, frame or canopy shall provide a suitable cover for the fixture outlet box or fixture opening.
- Fixtures shall be installed at mounting heights as detailed on the drawings or instructed on site by the engineer in charge.
- Fixtures and/or fixture outlet boxes shall be provided with hangers to adequately support the complete weight of the fixture. Design of hangers and method of fastening other than shown on the drawings or herein specified shall be submitted to the engineer in charge for approval.
- Pendant fixtures within the same room or area shall be installed plumb and at a uniform height from the finished floor. Adjustment of height shall be made during installation as per engineer in charge instructions.
- Flush mounted and recessed fixtures shall be installed so as to completely eliminate light leakage within the fixture and between the fixture and adjacent finished surface.
- Fixture mounted on outlet boxes shall be tightly secured to a fixture stud in the outlet box. Extension pieces shall be installed where required to facilitate proper installation.
- Fixture shall be completely wired and constructed to comply with the regulations and standards for electric lighting fixtures, unless otherwise specified. Fixtures shall bear manufacturer's name and the factory inspection label unless otherwise approved.
- Wiring within the fixture and for connection to the branch circuit wiring shall not be less than 2.5 sqmm copper for 253 volt applications. Wire insulation shall suit the temperature conditions inside the fixture and wires bypassing the choke/ballast shall be heat protected with a heat resistant sleeve.
- Metal used in lighting fixtures shall be not less than 22 swg or heavier if so required to comply with the specification or standards. Sheet steel reflectors shall have a thickness of not less than 14 swg. The metal parts of the fixtures shall be completely free from burrs and tool marks. Solder shall not be used as mechanical fastening device on any part of the fixture.
- Ferrous metal shall be bowdlerized and given a corrosion resistant phosphate treatment or other approved rust inhibiting prime coat to provide a rust-proof base before application of finish.
- Non-reflecting surfaces such as fixture frames and trim shall be finished in baked enamel paint.
- All parts of reflector shall be completely covered by finish and free from irregularities. After finish has been applied and cured, it shall be capable of withstanding a 6 mm radius bend without showing sign of cracking, peeling or loosening from the base metal. Finish shall be capable of withstanding 72 hours exposure to an ultraviolet sun lamp placed 10 cm from the surface without discoloration, hardening or warping and retain the same reflection factor after exposure. Test results shall be furnished for each lot of fixtures.
- Fixture with visible frames shall have concealed hinged and catches. Pendant fixtures and lamp holders shall be provided with ball type algiers or similar approved means. Recessed fixtures shall be constructed so as to fit into an acoustic tile ceiling or plaster ceiling without distorting either the fixture or the ceiling plaster rings/flanges shall be provided for plaster ceiling. Fixtures with hinged diffuser doors shall be provided with spring clips or other retaining device prevent the diffuser from moving.
- Detailed catalogue cuts for all fixtures, or, if so required by the engineer in charge sample fixtures shall be submitted for approval to the architect/consultant before orders for the fixtures are placed.

Shop drawings for non-standard fixture types shall be submitted for approval to the architect/consultant.

- Recessed fixtures shall be constructed so that all components are replaceable without removing housing from the ceiling.

LED FIXTURES

- Indoor fittings with LEDs of wattage required Watt assembled on single MCPCB,
- With housing used as a heat sink shall be made of thick sheet Steel conforming to IS: 59/CRCA polyester powder coated and high U.V. & corrosion resistance with diffuser and/or Polycarbonate optics with company mark/name
- 114 to 300 V,
- Power Factor more than 0.9,
- THD < 10 %,
- CCT 4000 K to 6530K,
- Luminaire efficacy> 85 lumens/watt ,
- LED driver efficiency > 85 %
- Each fitting required LM-79 & LM-80 Certificates

LAMPS

- Lamps shall be supplied and installed in all lighting fixtures furnished under this contract. All lamps shall be rated for 253 volts.
- Lamps used for temporary lighting service shall not be used in the final lighting of fixtures units.
- Lamps shall be of wattage and type as shown on the drawings and schedule. Where not shown, the details shall be ascertained from the architect / engineer in charge before procurement.
- Lamps for permanent installation shall not be placed in the fixtures until so directed by the architect / engineer-in-charge, and this shall be accomplished directly before the building portions are ready for occupation.
- Lamp should be of the same make as of control gear/ballast.

FLUORESCENT FITTINGS WITH HI - FREQUENCY BALLAST:

- Only single and/or two lamp ballast shall be used in any one fixture. Ballast shall be completely enclosed inside sheet steel casing and shall have corrosion - resistant finish. Ballast shall contain a thermosetting type compound not subject to softening or liquefying under any operating conditions or upon ballast failure. Compound shall not support combustion. All ballast shall be of high power factor compensated to above 0.9pf. Ballast temperature and sound rating shall be specified by the manufacturer and guaranteed. Ballast shall be for operation at the voltages and frequencies indicated and under temperature conditions prevailing in the various locations of the premises. Tapped ballast is preferred.
- Ballast general/technical specification must be within the specified limit as mentioned in is 9021 part-i&ii with latest amendments. The e.m.i&r.f.i values must be as per is 6842 with latest amendments, if any. The ballast should have over voltage protection circuit and transient/spike suppression circuit. Total harmonic distortion should be less than or equal to 34%, current crest factor (peak/rms current value) should be <=2.
- All fluorescent fixtures shall be provided with separate wiring channel with cover plate and an earth terminal. All screws shall be chromium brass screws. Lamp and starter holders shall be out of tough molded plastic with spring loaded rotor type contactors rendered shock and vibration proof. Condensers shall be low loss paper impregnated hermetically sealed complying with is 1169-116. Internal wiring shall be neatly clipped and where by passing the ballast, a suitable heat resistant barrier or sleeve shall be provided.

- Minimum working (burning) life of fluorescent lamp should be more than or equal to 15300 hours. (necessary confirmation must be sought from the manufacturer). Lamp lumen output should be>=91 lumen/watt. Depreciation of lumen output over life span of lamp should not exceed 10%.
- The combined power factor should be more than or equal to 0.92 at 230 volt.
- Surface mounted fixtures longer than two feet shall have one additional point of support besides the outlet box fixture stud when installed individually. Pendant individually mounted fixtures four feet long and smaller shall be provided with twin stem/conduit hangers. Stems shall have ball aligners or similar devices and provided for a minimum of 25 mm vertical adjustment. Stem shall be of appropriate length to suspend fixtures at required mounting height.
- Lamps shall have bi-pin bases and a minimum approximate rating.

EMERGENCY SIGNAGE

Scope

- Customized Hospital Signage/ Emergency Signage/ Evacuation Signage/ Any other type of signage - Single/ Double Sided, of Slim Display Light, Emergency/ Non-Emergency, housing made of aluminum, Hanging or Wall mounting type, complete with SMPS/Driver, hanging chain or wall mounting clamps etc. ready to install. The Model equivalent to PROLITE of size mentioned in the price schedule.

Code & standards

National building code of india	SP 7:1405
Specification for emergency lighting unit	IS 9583 : 1181
Code of practice for safety colors and safety signs	IS 9477 : 1405
Fire protection safety sign	IS 12349 : 1188
Fire safety in hotels-code of practice	IS 9716 : 1193

Code of practice for fire safety of building(general)

Exit requirement and personal hazards	:-	IS 1647 : 1188
Code of practice for fire safety of building (electrical Installation)	:-	IS 1647 : 1197
Graphic symbols for fire protection plans	:-	IS 12407 : 1188

TECHNICAL SPECIFICATIONS

- Ac supply for charging of battery: 240vac, 53/82hz.
- Recharging period should be 10-12 hours and regulated battery charging with constant voltage tapering current characteristics and goes into trickle charge when the battery attains full charge
- Emergency light switches on instantly on ac mains failure. Switches off automatically and reverts back to battery charging mode after supply resumption.
- Automatic low battery cut-off.
- Over voltage protection
- Manual switch for switching of emergency light when not required.
- Rugged metal body with powder coated finish.
- Provision of wall mounting of the light fixture should be provided.
- It should be with ni-mh/ni-cd rechargeable battery of constant current charge type.

- All emergency lighting should be tested in accordance with en82598-2-22.
- Inbuilt push test switch should be provided.
- Battery backup: 3 hour for emergency signages& 1 hour for the emergency light

GENERAL NOTE: LM-79 & LM-80 reports shall be from company's own NABL approved laboratory or NABL approved third party laboratory. Reports submitted by the contractor must be certified by appropriate authority of respective manufacturing company. If desired, SMC may send one or more fittings to a third party NABL laboratory for testing of light fittings and if fitting does not match with Test Certificates submitted by the contractor, SMC will not only reject said/all products of that company but will also in liberty to take disciplinary actions for submitting misleading information. All drivers shall be constant current type only. All drivers shall IP14 for Indoor application and IP65 for outdoor application. Heat Sink could be Active and/or passive as per design of luminaries. Cost of Testing should be borne by contractor.

PART 7:- INTERNAL ELECTRICAL

PART B:- INDOOR LIGHT FIXTURES

Item No.1: **1400-2140lumens Tube Light,4 feet with integral/ non-integral driver**

Scope of work: Supplying and erecting LED indoor fittings with LEDs of wattage 0.2 Watt to 0.5 Watt assembled on single MCPCB, with housing used as a heat sink shall be made of thick sheet Steel conforming to IS: 59/CRCA polyester powder coated and high U.V. & corrosion resistance with diffuser and/or Polycarbonate optics with company mark/name 114 to 300 V,Power Factor more than 0.9, THD < 10 %, CCT 4000 K to 6530K, Uniformity ratio >0.7, Luminaire efficacy> 85 lumens/watt , LED driver efficiency > 85 % CREE / OSRAM / PHILIPS Lumileds / NICHIA / SEOUL/Bridgelux (U.S.A.) make LED used for luminaire. (Each fitting required LM-79 & LM-80 Certificates) (d) 14-22 Watts, Surge - 4KV,IP-14, 4 feet Cat-llI

Specification:

Lumen Package	:1400-2140 lumens
Surge Protection	: 4KV
Each fitting required	: LM-79 & LM-80 Certificates, (NABL approved company's or third party's laboratory)
Voltage	: 114 to 300 V,
Power Factor more than	: 0.9,
THD	:< 10 %,
CCT	: 4000K to 6530K,
LED driver efficiency	:> 85 %
IP Rating	: IP 14

Item No.2:

Scope of wok: Supply, Erection, Testing & Commissioning of 10 watt LED Bulk Head luminary, having min. 814 lumen out put, with housing made of high pressure die cast aluminum & Poly carbonate front diffuser, IP66 protected & having impact resistance of IK09. Make: Crompton, Philips, Havells, Bajaj Contractor has to submit NABL approved Laboratory LM 79 and LM80 Test Certificate of model to be offered for confirmation of above specification.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.3:

Scope of Work: SITC of IP65 Surface / suspension mounted waterproof luminaire, Polycarbonate housing and linear prismatic ribbed cover providing excellent distribution of light, Convenient Polycarbonate fastening clips and hinged diffuser to make it easy to replace lamps, Press fit CRCA gear for ease of maintenance. complete with tube holders, lead wire and connections. with wall/Ceiling Mounting Clamp. (Min Two Clamp for tube Luminary) and with 1 LED Tube 2100 Lumen Make : Crompton, Philips, Havells, Bajaj (To be used for ceiling Mounting). Contractor Has to submit NABL approved Laboratory Test certificate of model to be offered for confirmation of above specification.

Specification:

Lumen Package	:1400-2140 lumens
Surge Protection	: 4KV
Each fitting required	: LM-79 & LM-80 Certificates, (NABL approved company's or third party's laboratory)
Voltage	: 114 to 300 V,
Power Factor more than	: 0.9,
THD	:< 10 %,
CCT	: 4000K to 6530K,
LED driver efficiency	:> 85 %
IP Rating	: IP 65

STANDARD SPECIFICATION FOR OUTOOR LIGHT FIXTURES

GENERAL MATERIAL SPECIFICATION

PART 8:- EXTERNAL ELECTRICAL

PART C:- OUTDOOR LIGHT

NOTE: Relevant Specification for Outdoor Light Fixtures shall be followed as per Standard Specification for Indoor Light Fixtures.

Item No.1:

Scope of Work

- Supplying & Installing/Erecting 7.5 mtr. Long Swaged Steel tubular pole

Material Specification & Workmanship

- Steel tubular pole (Swaged) shall be confirming to IS - 279 (Part-II) 1180. Manufacturing process of steel tubular pole should be as per IS specification. Basic steel tube should be ISI Marked. Pole should be painted by one coat of Zinc comet Primer and two coat of Aluminium /approved paint to be erected on / in existing Foundation.
- The Pole shall be supplied with hot deep galvanized foundation bolts.
- The pole should be made as per IS code 410-SP-4With M.S. Base plate 300 X 300 X 16 mm
- The Pole shall be Primered and The Pole shall be painted two coats of polyurethane based paintcompany made paint in paint booth with spray machine to have better finish. The paint shall bestabilized against UV rays
- The column shall also be provided with flush door at the bottom, riveted hinged door, with properstrengthening to the cut-out of the door opening.
- A junction / looping box with heavy duty 3 phase connector shall be built into the pole.
- It should be supplied with GI foundation bolts & nuts as required
- The Pole shall be painted two coats of polyurethane based paint company made paint in paint boothwith spray machine to have better finish. The paint shall be stabilized against UV rays
- The 6 Amp SP MCB of "B" Curve shall be provided with pole.
- The pole shall be earthed with GI earth strip along with the foundation itself.
- All the arrangement to mount the fixture on the pole shall be done according to requirement of lightfixture supplier.

Item No.2: 6 meter long Octagonal poles

Specifications

Scope of Work

- Supplying & Installing/Erecting 6 meter longOctagonal poles.
- The Pole shall be supplied with hot deep galvanized foundation bolts.

Material Specification & Workmanship

- Octagonal poles (Medium Duty) Made from sheet steel.
- The pole should be made as per IS. and shall be coated with hot dip galvanizing as per IS 2629/4759.
- With required base plate as erected on existing foundation.
- With Base Plate 15mm
- The Pole shall be Primered and The Pole shall be painted two coats of polyurethane based paintcompany made paint in paint booth with spray machine to have better finish. The paint shall bestabilized against UV rays

- **Size: 6 Mtr. Long 70 mm Top X 94 mm bottom dia, 3 mm thickness**.
- The column shall also be provided with flush door at the bottom, riveted hinged door, with properstrengthening to the cut-out of the door opening.
- A junction / looping box with heavy duty 3 phase connector shall be built into the pole.
- It should be supplied with GI foundation bolts & nuts as required
- The Pole shall be painted two coats of polyurethane based paint company made paint in paint boothwith spray machine to have better finish. The paint shall be stabilized against UV rays
- The 6 Amp SP MCB of "B" Curve shall be provided with pole.
- The pole shall be earthed with GI earth strip along with the foundation itself.
- All the arrangement to mount the fixture on the pole shall be done according to requirement of light fixture supplier.

Item No.3:253 Watt Flood Light

Scope of Work: Providing and erecting, heavy duty flood light integral luminaire comprises die cast aluminium body with heat resistant toughened front glass, silicon rubber gasket,anodised reflector hot deep powder coated cradle clamp with suitable size of necessary built in control gear complete with lamp.

[c] Suitable for 253 W HPMH Cat. III (Flood Type)

Specifications

- It should be consisting of painted die-cast aluminium alloy body and cover.
- The body should contain removable lamp holder support and control gear plate.
- The optical compartment consists of hardened glass sealed onto the body and a reflector made of deep drawn polished and anodised aluminium.
- It should be suitable for 253 MH lamp and is with lamp.
- It should be complete with choke, capacitor, Igntor, holder, etc., pre-wired and complete with Lamp.
- Sample to be approved by consultant architect.
- Cost of dismantling existing fitting on the high mast & fixing new flood light fixture to the high mast should be included.

Mode of Measurement and Payment

It should be measured in unit number. The unit rate shall be considered for Supplying and fixing one fixture. The rate shall include following.

- All fixing accessories, mounting bracket, Lamp, ballast condensers and control gear wherever applicable.
- Earthing of fittings.
- Electrical connections to fittings from the junction box and feeder.
- In case fitting is mounted on the compound wall, mounting bracket price is included (unless until specified)
- Per Unit for Supplying, assembling, installing, connecting, testing and commissioning of Out Door Light fixture etc. shall be considered as one unit for measurement and payment

Item No.4:400 Watt Flood Light

Scope of Work: Providing and erecting, heavy duty flood light integral luminaire comprises die cast aluminium body with heat resistant toughened front glass, silicon rubber gasket,anodised reflector hot deep powder coated cradle clamp with suitable size of necessary built in control gear complete with lamp.

(d) With one no. 400 watt HPSV / Metal halide lamp - Cat III

Specifications

- It should be consisting of painted die-cast aluminium alloy body and cover.
- The body should contain removable lamp holder support and control gear plate.
- The optical compartment consists of hardened glass sealed onto the body and a reflector made of deep drawn polished and anodised aluminium.
- It should be suitable for 400MH lamp and is with lamp.
- It should be complete with choke, capacitor, Igntor, holder, etc., pre-wired and complete with Lamp.
- Sample to be approved by consultant architect.
- Cost of dismantling existing fitting on the high mast & fixing new flood light fixture to the high mast should be included.

Mode of Measurement and Payment

It should be measured in unit number. The unit rate shall be considered for Supplying and fixing one fixture. The rate shall include following.

- All fixing accessories, mounting bracket, Lamp, ballast condensers and control gear wherever applicable.
- Earthing of fittings.
- Electrical connections to fittings from the junction box and feeder.
- In case fitting is mounted on the compound wall, mounting bracket price is included (unless until specified)
- Per Unit for Supplying, assembling, installing, connecting, testing and commissioning of Out Door Light fixture etc. shall be considered as one unit for measurement and payment

Item No.5:Decorative Street Light Bracket

Specification

- Providing street light pole bracket consisting of Light Class MS. pipe of 4.2 cms. outside dia.
- Complete with suitable GI sleeve tubing of approximate 47 cms. and length suitable for 76.5 mm / 80mm. / require size pole top having sufficient fasteners for fixing the brackets
- Having spread of 1 mtr. length with suitable rise as per site condition & suitable welded stiffener reducer and nipple with check nut complete.
- The Bracket shall be Primered&painted two coats of polyurethane based Paint Company made paint in paint booth with spray machine to have better finish. The paint shall be stabilized against UV rays
- **Single Arm bracket 1 Mtr. , Type -1 Assembly, Mounting @ 8 Meter Height**

Item No.6:

Scope of Work: Supplying and erecting LED **street light / Flood Light** fittings with High power White LEDs wattage of 1Watt and above assembled on single MCPCB, efficiency more than 90 lm/w and corrosion free High pressure die cast aluminum housing with smooth finish powder coated and heat sink extruded aluminium with diffuser and Polycarbonate optics / lenses with company mark / name engraved or embossed.

(b) 15 to 24 wattes Cat. III

Specification

Lumen Package	: 15 to 24 watts
Minimum Surge Protection	: 4KV
Each fitting required laboratory)	: LM-79 & LM-80 Certificates, NABL approved company's or third party's
Voltage	: 114 to 300 V
Power Factor	: >0.95
THD	:< 10 %,

CCT	: 5300K to 5700K,
Uniformity ratio	: > 0.47
Luminaire efficacy	: > 85 lumens/watt
Minimum LED driver efficiency	:> 85 %
Ingress Protection	: IP65

(c) above 24 watts to 30 watts Cat. III

Specification

Lumen Package	: 24 to 30 watts
Minimum Surge Protection	: 4KV
Each fitting required laboratory)	: LM-79 & LM-80 Certificates, NABL approved company's or third party's
Voltage	: 114 to 300 V
Power Factor	: > 0.95
THD	:< 10 %,
CCT	: 5300K to 5700K,
Uniformity ratio	: > 0.47
Luminaire efficacy	: > 85 lumens/watt
Minimum LED driver efficiency	: > 85 %
Ingress Protection	: IP65

Item No.7:

Scope of Work: Providing M-14 / 1:2:4 cement concrete foundation & 70 % PCC from bottom including excavation for the pole of size 82 x 82 x 114 cms. Deep in below ground level with plinth of 47 cms x 47 cms(or 47 cms dia x 47 cms) high upper ground level with necessary curing and finishing in approved manner. (for 7.5 & 8/8.5 mtr pole)

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.8: CC Foundation for Pole up to 6 Meter Height Pole

Scope of Work: SETC of CC Foundation for Pole up to 6 Meter Height Pole as per detail drawing.

Size: 530x530x940mm

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

STANDARD SPECIFICATION FOR LT SWITCHGEAR, DISTRIBUTION BOARD & LT PANEL

GENERAL MATERIAL SPECIFICATION:

LT SWITCHGEARS & LT PANELS

This specification is intended to cover the design, manufacture, assembly, testing at manufacturer's works, packing, transportation, receipt at site, installation, testing and commissioning of all Low voltage switchgear Panel, Main PCC Panel, UPS Panels, Lift Panels, Outdoor Lighting Feeder Panels, etc. and complete with all materials and accessories for efficient and trouble-free operation

The LT Panel shall be manufactured as per the relevant Indian and International Standards &from CPRI Approved Panel Manufacturer Only.

All the components in the panel shall be of the panels shall be as per approved make. The panels shall be manufactured with sheet steel prepared using CNC Machines for accurate cutting, bending and drilling etc. The sheet metal shall be pre-treated before painting. The assembly of the panels shall be with new techniques for easy removal and refitting of the components. The panel shall have a high degree of reliability and safety of the operating personnel. The components of identical feeders should be fully compatible to each other. The panel manufactured shall be fully conforming to the following standards.

Codes & Standards

IS 1248 & 2907	: Direct acting Electrical indicating instruments
IS 2959	: AC contactors up to 1000V
IS 9947	: AC Circuit Breakers
IS 2705	: Current Transformers
IS 2956 & 4127	: Potential Transformers
IS 4047	: Specification for air break switches and combination fuse Switch units for voltage not exceeding 1000V
IS 6875	: Control switches for voltages up to and including 1000V AC and 1140V DC.
IS 1822	: Motor duty Switches
IS 11421	: Specification for control transformer
IS 8623	: Factory built assembly of switchgear & control gear for voltage not exceeding 1000V
IS 9947 (Part I)	: Degree of protection for enclosure
IS 3742	: Specification for electrical relays for AC system
IS 2148 & 9224	: Specification for HRC fuses
IS 5382	: Wrought Al. and aluminium alloys, bars, rods, tube and sections for electrical purposes.
IS 4237	: General requirement for switchgear & control gear for voltage not exceeding 1000V
IS 3229	: Electrical relays for power system protection 151
IS 375	: Marking and arrangement for switchgear bus bars, main connection and control aux. wiring
IS 5578	: Guide for marking of insulated conductors.
IS 3018	: Pre-treatment of MS sheets for phosphatizing

AIR CIRCUIT BREAKER (A.C.B)

General

- ACB shall be equipped with a trip unit that offers the appropriate level of protection performance to fit to the application. All trip units could be proposed with versions that provide measurement, and communication functions

- ACB shall be available in fixed or withdraw able versions as well as in 3-pole and 4-pole versions. For withdraw able versions,a safety trip shall provide advanced opening to prevent connection and disconnection of a closed circuit breaker
- It shall be possible to supply power either from the top or bottom side without reduction in performance.
- For an ACB rating frame given, dimensions shall be the same whatever the ultimate breaking capacity.
- ACB shall have a rated operational voltage (Ue) of 690 V, a rated insulation voltage (Ui) of 1000 V (AC 53/82 Hz) and a rated impulse voltage (Uimp) of 12kV,
- ACB shall suitable for isolation according to IEC 82 947-1 and –2 for the rated insulation voltage of 1000 V and for the overvoltage category IV.
- No safety clearance shall be required around draw out circuit breakers. For fixed circuit breakers, 153 mm of free space shall be provided above the arc chutes to allow removal of the latter.
- The operating mechanism shall be of the Open/Closed/Open stored-energy spring type. The closing time shall be less than or equal to 70 milliseconds for rating <4000A.

Applicable Standards

Reference	Title	Scope
EN /IEC 82947-1 & 2	Low-voltage Switchgear and control gear Part 2 : Circuit Breaker	Characteristics of circuit-breakers; operation and behaviour in normal service; operation and behaviour in case of overload and operation and behaviour in case of short-circuit, including co-ordination in service (discrimination and back-up protection); - dielectric properties;
IEC 82947-2, annex B	Circuit Breaker incorporating residual current protection	
IEC 82947-2, annex F	Additional tests for circuit-breakers with electronic over-current protection	Electronic trip unit (rms current measurement, EMC)
IEC 82664-1	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	Category IV for a rated insulation voltage up to 690 V, class II insulation between the front and internal power circuits
IEC 84000-4-1	Electromagnetic compatibility (EMC) Testing and measurement techniques	EMC Immunity
IEC 84557-12	Combined performance measuring and monitoring devices for electrical parameters	Accuracy class
IEC 81468-2	Environmental testing	Climatic withstand

Circuit Breaker Design

Safety

- For maximum safety,
- Air circuit breakers main contact shall be encased in a reinforced polyester casing and offer double insulation from

  the operators on the breaker front face.
- Air circuit breakers shall be equipped with metal filters to reduce effects perceptible from the outside during current interruption
- The circuit breaker shall be equipped with a safety interlock which keeps the circuit breaker open if the trip unit is not installed.
- Mechanical indicators on the front panel of Air circuit breakers shall indicate the following status conditions:

"ON" (main contacts closed)	Spring charged
"ON" (main contacts closed)	Spring discharged
"OFF" (main contacts open)	Spring charged – circuit breaker ready to close
"OFF" (main contacts open)	Spring charged – circuit breaker not ready to close
"OFF" (main contacts open)	Spring discharged

- ACB shall be equipped with anti-pumping function: If opening and closing orders occur simultaneously, the circuit breaker shall remain in the open position. After fault tripping or intentional opening using the manual or electrical controls, the closing order must first be discontinued, then reactivated to close the circuit breaker.
- The drawout operation shall be possible through a closed door.
- Three positions of the moving part shall be possible:
- connected position - all auxiliary and main circuits engaged
- test position - all auxiliary circuits engaged all main circuits disconnected
- isolated position - all circuits disconnected
- The positions shall be clearly indicated and no intermediate position shall be possible
- Each position shall be acknowledged before moving to a new position
- The racking handle shall be stowed on the air circuit breaker in such a manner as to be accessible without defeating the door interlocking.
- The drawout mechanism shall be part of the fixed frame to reduce the weight of withdrawable part.
- A door interlock shall be provided so that it shall not be possible to open the door until the air circuit breaker moving part is in the disconnected position.
- Insulated safety shutters shall be provided over the incoming and outgoing main circuits and over the auxiliary circuits. An interlocking shall be provided to prevent insertion of a circuit breaker having a rating higher than the current rating of the fixed part, into that fixed part.
- In electronic trip units, protection functions shall be electronically managed independently of measurement and communication function by a dedicated ASIC.

Breaking capacity, durability, discrimination,

- The ACB breaking capacity performance certificates shall be available for category B according to IEC 82 947-2 standards. The test shall be carried out with a breaking performance during operation (Ics) and admissible short time withstand (Icw) equal to the ultimate breaking capacity (Icu).) up to 85kA
- The rated ultimate breaking capacity (Icu) of each ACB shall be equal to at least the value of the short-circuit current (Isc) at the point of installation on the electric circuit.
- The ACB range will offer several level of Icu capacity up to 153kA @470V to fit to the application.
- ACB's manufacturer shall provide selectivity and coordination tables with other devices such as other ACB, ACBs,

  switchesetc.
- Mechanical durability shall be at least 12530/ 10000 / 5300 operation for ratings <1814 / <3140 / >4000

Auxiliaries and accessories

Generals

- All electrical auxiliaries including the motor spring charging mechanism shall be field adaptable without adjustment or the necessity for any tool (except a screwdriver). They shall be fitted into a compartment which under normally loaded conditions has no metalwork energized from the main poles exposed with it.
- Any adaptation carried out shall not increase the breaker overall dimensions.
- It shall be possible to connect all auxiliary wiring from the front face of the air circuit breaker, this wiring shall be taken through a set of disconnecting contacts, so that all auxiliary wiring is automatically disconnected in the isolated position.
- Screws that held removable parts shall be self-contained

Remote operation

Coils

- The breaker could be equipped with one closing release, one shunt opening release, one additional shunt or under voltage opening release
- Coils shall be designed for continuous-duty.
- Voltage release auxiliary power supply
- AC: 24 48 100/90 140/253 277 370/480 VAC
- DC 12 24/30 48/82 100/90 140/253 VDC
- Opening time with shunt opening release 53ms +/- 10ms
- Closing time closing release 70ms +/- 10ms In<= 4000A
- Closing time closing release 80ms +/- 10ms In> 4000A

Electric motor for spring charge

- Motor auxiliary power supply:
- AC: 24 48 100/90 140/253 277 370/415 400/470VAC
- DC 12 24/30 48/82 100/90 140/253 VDC
- Charging time: <=4sec
- Operating frequency <=3 cycle / min

Protections requirements

General

- The ACB shall be available in 4-pole (neutral protection) versions. On 4-pole circuit breakers, a 3-position switch shall be provided to set neutral protection to any of the following levels: unprotected neutral (4P3D), half-protected neutral (4P3D+N/2) or fully protected neutral (4P4D).
- The trip units shall not increase overall circuit breaker dimensions.
- All electronic components shall withstand temperatures up to 105 °C.
- Trip units shall be adjustable and it shall be possible to fit lead seals to prevent unauthorised access to the settings
- Protection settings shall apply to all circuit breaker poles
- It shall be possible to adjust protections with a knob without any power supply or when the main is off
- Electronic trip unit shall be fitted with thermal memory
- It shall be possible to equip ACBs with an auxiliary contact signalizing an electrical fault operated by the trip unit
- The following monitoring functions shall be integral parts of electronic trip units:
- 1 LED for load indication lighted above 105 % of Ir
- a test connector shall be installed for checks on electronic and tripping mechanism operation using an external device
- Trip unit protection functions
- ACB shall be equipped with a trip unit that offers the appropriate level of performance to fit to the application:
- Basic protection (LI) with or without energy measurement
- These trip units shall offer
- Long time protection
- Adjustable Ir threshold settings from 40% to 100 % of the trip unit rating
- Adjustable tr time delay
- Instantaneous protection
- Adjustable Isd threshold settings from 1.5xIr to 10xIr
- Selective protection (LSI) with or without energy measurement:
- These trip units shall offer
- **Long time protection**
    - ✓ Adjustable Ir threshold settings from 40% to 100 % of the trip unit rating
    - ✓ Adjustable tr time delay
- **Short time protection**
    - ✓ Adjustable Isd threshold settings from 1.5xIr to 10xIr
    - ✓ Adjustable tsd time delay
- **Instantaneous protection**
    - ✓ Adjustable Ii threshold settings from 2xIn to 15xIn with an OFF position
    - ✓ Selective protection & Ground fault or Earth leakage protection (LSIG) with or without energy measurement

Trip unit measurement function:

- If required by the application, the trip unit shall offer measurement (including energy) without additional module whatever the protection type (LI, LSI, LSIG).
- Minimum measurements shall be:
- Currents & Energy
- Demand Current, Maxim Demand Current
- Voltage, active power, reactive power, power factor,
- Demand Power, Maxim Demand Power
- Accuracies of the entire measurement system, including the sensors: shall be
- Current: 1,5%
- Voltage: 0.5 %
- Power and energy: 2%
- Rogowski current transformers shall be used to ensure accurate measurements from low current up to high currents
- For safety reason, protection functions shall be electronically managed independently of measurement function by a dedicated ASIC.
- The measurements shall be displayed on the breaker itself and on a remote system via Modbus communication. In addition to these solutions it shall be possible to connect a remote display

Advanced protection trip unit

In addition to the previous protection functions trip units with Under/Over Voltage, Under/Over Frequency and Reverse Power protection could be proposed.

Operating & Maintenance

Maintenance

- The arc chutes shall be removable on site.
- The main contacts shall be equipped with a visual wear indicator that may be accessed by removing the arc chutes, for immediate assessment of contact wear without requiring measurements or specific tools

Operating assistance function

- Electronic trip units with measurement and communication capability shall offer operating assistance function:
- trips history (Fault type, date and time)
- Pre-alarm
- Trip and pre-alarm could activate relay output(s)
- These functions and indicators shall be available on the display, by communication or setting PC tool.

Maintenance indicators

- Electronic trip units with measurement and communication capability shall offer maintenance indicators:
- Operation and trip counters,
- Operating hours counter,
- Load profile
- These functions and indicators shall be available by communication or PC tool.

- Commissioning and operating tool.
- A test connector shall be installed for checks on electronic and tripping mechanism operation using an external dedicated tool.
- A software tool available for all electronic trip unit shall be provided:
- To visualize and configure trip unit parameters
- To create and save setting files
- To display tripping curve
- To set time and date
- To display tripping and alarms histories

Alarms (Advanced protection trip units)

- User shall be able to activate alarms based on measurement (I, U, F, Q, Idemand, Pdemand,)
- Alarms shall be time stamped
- Alarms could activate up to 6 relay output(s)
- These functions and indicators shall be available by display and/or communication and/or setting PC tool.

Communication

- ACB shall be equipped easily with MODBUS communication.
- Whatever the trip unit is:
- The following information shall be accessible:
- Open / Close position / fault-trip indication (SDE) / Ready to close/ Position in the Chassis (Withdraw able version).
- The following commands shall be possible
- Open / close.
- When trip units with measurement functions are used the following information shall be accessible:
- Instantaneous and demand values, maxi meters/minimeters, Energy, Current demand and power demand.
- Timestamp trip and alarm histories and event table.
- Maintenance indicators.

Environment

- Production site organization shall be non-polluting and certified to comply with ISO 9002 and ISO 11401 standards.
- Air circuit breakers shall be supplied in recyclable packing complying with environmental directives RoHS and WEEE.
- The manufacturer shall implement nonpolluting production processes that do not make use of chlorofluorocarbons, chlorinated hydrocarbons, ink for cardboard markings, etc…
- The manufacturer shall provide product environmental profile of the ACB
- The manufacturer shall provide instructions on the removal, dismantling and processing of circuit-breaker materials at the end of service life.

MINIATURE CIRCUIT BREAKER

- Miniature circuit breakers shall be quick make and break and break type non-welding self-wiping silver alloy contacts for 10 KA short circuit both on the manual and automatic operation, confirm with British standard BS : 3771 (Part-I) 1165 and IS :8825 (1196) with facility for locking in OFF position.
- The housing of MCBs shall be heat resistant and having high impact strength. The fault current of MCBs shall not be less than 10KA, at 230 volts. The MCBs shall be flush mounted and shall be provided with trip free manual operating mechanism with mechanical "ON" and "OFF" indications. 'C' characteristic current limiting type, 10 KA and having quick break with trip free operating mechanism. Each pole of the breaker shall be provided with inverse time thermal over load and instantaneous over current tripping elements, with trip-free mechanism. In case of multi-pole breakers, the tripping must be on all the poles and operating handle shall be common. Pressure clamp terminals for stranded/solid conductor insertion are acceptable up to 4 sqmm Aluminum or 2.5 sqmm copper and for higher ratings; the terminals shall be suitably shrouded. Wherever MCB isolators are specified they are without the tripping elements.
- The MCB contact shall be silver nickel and silver graphite alloy and tip coated with silver. Proper arc chutes shall be provided to quench the arc immediately. MCB's shall be provided with magnetic fluid plunger relay for over current and short circuit protection

SWITCH FUSE UNIT

- This unit shall be approved make triple pole metal clad switch fuse unit 415 volt, required ratings, with link type H.R.C. fusesand natural link confirming to I.S.S. erected on angle iron frame, double break type suitable for load break duty (AC 23), quick make and break action. Separate neutral link shall be provided. The door of panel shall be duly interlocked with operating mechanism so as to prevent closing of the switch when the door is not properly secured. It shall be provided with at least 2 auxiliary contacts. All contacts shall be silver plated and all live parts shall be shrouded. The incoming and outgoing terminals of switches shall be adequately sized to receive Required size of XLPE Aluminum/Copper cables. High rupturing capacity of not less than 34MVA at 415 volts HRC fuse links shall be provided with visible indicators to show that they have operated. The switch fuse unit shall be manufactured in accordance with IS: 4047-1167 as amended to date.

FUSE

- Fuses shall be of high rupturing capacity (HRC) fuse links and shall be in accordance with IS: 1400-1162 and having rupturing capacity of not less than 34 MVA at 415 Volts. The backup fuse rating as per site requirements / equipment. HRC fuses shall be of L & T /Siemens /G.E. make or approved equal.

MOULDED CASE CIRCUIT BREAKER

- The MCCB shall be air break type and having quick break with trip free operating mechanism confirmed to IS : 8825 and IEC-82947-1/2 standard.
- It should have thermal magnetic trip unit, adjustable thermal protection from 0.8 -1 In for 400 amp. and short circuit protection from 5 -10 In for rating more than 4000amp.It should be of rated operational voltage of 690 V AC (53 Hz) and insulation voltage of 753V AC. It should have electrical life of 4000 (2530) operations and mechanical life of 10000 (8000) operations for rating 400 amp. (>400 amp.) All the MCCB above 400 shall be have breaking capacity of 53KA. And 25 KA for MCCB <400-amp rating
- Housing of the MCCB shall be of heat resistant and flame retardant insulating material. Operating handle of the MCCB shall be in front and clearly indicate ON / OFF / TRIP positions. The electrical contact of the circuit breaker shall be of high conducting non deteriorating silver alloy contacts. The MCCB shall be provided with thermal / magnetic type bi-metal over load release and electro-magnetic short circuit protection device. All the releases shall operate on common trip bus bar so that in case of operation of any one of the releases in any of the three phases, it will cut off all the three phases and thereby single phasing of the system is avoided. The MCCB whenever called for in the appendix drawings shall provide an earth fault relay. The MCCB shall provide two sets of extra auxiliary contacts with connections for additional controls at future date. The electrical parameters of the MCCB shall be as per the descriptions given in the attached drawings.

CONTACTOR

- Contactor shall be air break type, having 3 power contact and 4 nos. of auxiliary contact conforming to IS: 2959, Contactor provided shall be AC4 Duty type for capacitor and AC3 duty type for motor loads. It shall be suitable for minimum class II intermittent duty. It shall be capable of making and breaking starting current of motors and require capacity of capacitor load of corresponding rating. Auxiliary contacts shall be rated for at least 6A and shall be capable of carrying the maximum estimated current, also shall be break before make type. No volt coil working voltage shall be 300 V to 470V. It should be complete with over current relay with single phasing protection.

MAIN BUS BAR

- All bus bar size shall be Aluminum & with current density 0.6 A/mm²
- Only bus bar of ACB first joint shall be of Copper with 1.2 A/mm²
- 3 Phase and Neutral bus bar shall be designed for minimum specified rated current. Bus bar shall be high quality, air insulated, high conductivity, high strength, tinned copper with non-hygroscopic colored sleeve. Bus bar copper shall be electrolytic grade**.** Minimum bus bar size used must be derived by considering current density of Bus bar and shall be mounted with standard bus bar SMC (Seat Molded Compound)/DMC support at sufficient interval to avoid sag and effectively **withstand** electromagnetic stress in the event of short circuit capacity of 53 KA RMS symmetrical for 1 sec. and pick short circuit current of 105 KA. The bus bar shall be housed in separate compartment and shall be isolated with at least 3mm thick Bakelite sheet or higher grade material. Bus bar and panel board design shall be as per Indian Electricity Rule and CPRI norms and standards. Bus bar shall be extendible type for future expansion. Necessary cut out arrangement shall be provided for the same. The size of neutral bus bar shall be same as that of phase bus bar for main panel and lighting panel. The bus bar shall be arranged such that minimum distance between them does not remain lower than below.

Between phase	: 25 mm
Between phase and Neutral	: 25 mm
Between phase and Earth	: 25 mm
Between neutral and earth	: 14 mm.

- The bus bar and interconnections shall be insulated with heat shrinkable PVC sleeve with standard color identification codes. The bus bar shall be connected by chromium plated or tinned plated brass bolts and nuts and washers shall be used for tightening. All connection between bus bar and circuit breaker/ switch and terminals shall be thoroughly insulated aluminum strips of proper size to carry rated current.

TIME SWITCH

- Approved make ASTRONOMICAL TIME SWITCH with single pole air break contacts suitable for 230 V / 16A, complete with self-starting motor driven clock ON & OFF automatic arrangement at any predetermined time during each 24 hours, with nickel cadmium rechargeable battery backup erected as directed
- Technical specification:

Operating Voltage	240 V AC
Supply Frequency	53-82 Hz
Power Consumption	Less Than 4 W
Ambient Temperature	-10 0C to 55 0C
Clock Accuracy	+/- 1 Sec./day at 14 0C
Switching contact	2 C/O contact
Manual Over ride	Provided
Mounting	DIN rail

CONTACTORS

- Contactor shall be of the electromagnetic type for uninterrupted duty suitable for AC-3 utilization category.
- Main contacts of contactor shall be of silver plated copper.
- Each contactor shall be provided with minimum two NO and two NC auxiliary contacts.
- Unless specified otherwise, the coil of the contactor shall be suitable for operation on 214 V, 1-phase, AC supply and shall work satisfactorily between +/- 10 % of rated voltage.
- Contactors shall comply with all other requirements of applicable standards.

PANEL FEEDER METER

- It shall be provided for generator feeder. It shall be dial flush mounted digital power meter. It shall have metering capacity of all three phase Voltage, Current, KW, KVA, KVAR, PF, Frequency Phase angle. It should show three phase parameter at a same time on display. Instrument shall have measuring capacity of accuracy Class-1.

INDICATION LAMP

- Indicator assembly shall be screw type with built in resistor having non fading color lens. LED type lamps are required. Wiring for remote ON, OFF, TRIP indicating lamp is required.

Color shade for the indicating lamps shall be as below:

ON indicating lamp	: Red
OFF indicating lamp	: Green
TRIP indicating lamp	: Amber
PHASE indicating lamp	: Red, Yellow, and Blue.
TRIP circuit healthy lamp	: Milky
Closing circuit D.C. supply	: Milky
Tripping circuit D.C. supply	: Milky
D.C. fail	: Yellow

CURRENT TRANSFORMERS

- The current transformers shall have synthetic cast resin insulation and be of the single phase type, with number of cores as per the specific requirements.
- The primary & secondary connections shall be clearly labeled.
- All current transformers shall have insulation level and short time rating as per main switchgear. All current transformers shall be dimensioned to carry continuously a current of 114% of the rated current. The ratios shall be as per the specific requirements.

VOLTAGE/POTENTIAL TRANSFORMER (PT)

- The voltage transformers shall be insulated for full voltage rating.
- The PT shall have synthetic resin insulation and be of single phase type. Rated secondary voltage shall be 110 V/√3 unless otherwise specified.
- PT shall be capable of withstanding thermal and mechanical stresses resulting from short circuit and momentary current rating of breaker/switches.

CAPACITORS

- Capacitor banks shall comprise of identical delta connected three phase units. The capacitor shall be vacuum impregnated with liquid/gas dielectric having high thermal stability. The phase terminal connections of the capacitor unit shall be brought out at the top through metal insulators which should be soldered to the fabricated top cover. The capacitor shall be provided with suitably rated discharge

resistors. The capacitors shall be designed to withstand the Electro dynamic and thermal stresses caused by transient over current during switching.

- Capacitor Bank shall be provided with a bus bar chamber. The chamber shall be dust and vermin proof in construction, fabricated from 2 mm thick sheet steel. Continuous neoprene rubber gaskets shall be provided on all mating surfaces. TP bus bars shall be of Cu supported on epoxy insulators of adequate rating and strips.
- The bus bar sizes and clearances shall be suitable for connection of cables through crimping type cable lugs. Bus bars chamber shall be extended suitably on one side to enable termination of cable. There shall be a provision of cable end box at the end of bus bar chamber un drilled removable gland plate and access covers to be provided for cable entry as required.
- The enclosure of capacitor unit shall be provided with 2 nos. of 10 mm earth terminals each complete with two plain and one spring washer, nuts etc. These terminals shall be effectively bonded to the common sheet steel frame work. Each bank will have two external earth terminals in the bus bar chambers complete with hardware.
- Besides having above mentioned technical & general specifications, capacitors offered must have following features:

1. High Inrush Current withstand Capability
2. High Over current handling Capacity
3. High Over voltage withstand Capacity
4. Internal fuse protection
5. Eco-friendly Design
6. Rust & Shock proof
7. Best suited for indoor/outdoor applications

NOTE: -

The Bidder must attach catalog having specifications for offered make. The Bidder must furnish Technical particular for capacitors offer. Test certificates of manufacturer must be supplied with at the time of delivery of capacitors.

Applicable Standard	IS 9485 (Part- 1), IS 2834
Voltage	480 Volt
Phase/connection	3/Delta
Frequency	53 Hz +/- 5 %
Duty	Heavy Duty, Indoor suitable for panel mounting
Ambient Temperature	400 C
Type of cooling	Natural
Dielectric use	High purity, 6 Micron plain Aluminum foil plus 2 layer of P.P (**APP**) film.
Sealing	Hermetic or Specify, if any other type
Insulation Class	3 KV
Degree of Protection	IP 14
Permissible Losses	Preferably Less than 1.5 W/KVAR
Discharge Device	Resistor must be included
Dimension	To be furnish by bidder.

APFC RELAY & CONTROLLER

- Each set of the APFC panel should comprise with following specifications.
- The automatic power factor controller should be of microprocessor based.
- Automatic step selection should be depending upon the system power factor and targeted Power Factor. Relay should sense the capacity of each bank automatically and accordingly only required nos. of capacitor should be switched on in any case.
- Controller should sense phase current and voltage from both incoming of LT panel.
- It shall have automatic selection of C/K ratio (min. capacitor step size/C.T. ratio)
- It shall indicate real time P.F.-lagging or leading.
- Audio (Hooter) and Visual alarm shall be provided reset Push button for low P.F. below targeted.
- The APFC relay should have RS-485 communication port to communicate PLC/SCADA.
- The P.F. controller should operate capacitor in required step depending upon system power factor. The capacitor must be disconnected in the event of power supply failure and should be protected against high in rush current, when power supply restored or at the time of automatic and time delayed switching of capacitor.

CONTROL SWITCHES/SELECTOR SWITCHES

- Control and meter selection switches shall have integral name plate and for all other devices, the same shall be located below the respective devices. Instrument and devices mounted on the face of the panels shall also be identified on the rear with the same number.
- All control switches shall be rotary, back connected type having cam operation contact mechanism. Phosphor bronze contacts shall be used on switches
- The handle of control switches used for circuit breaker operation shall turn clockwise for closing and anti-clockwise for tripping and shall be spring return to neutral from close/trip with lost motion device.
- Control switch for DG and Incomer panels shall have one set of lost motion spare contacts.
- Ammeter selector switches shall be with off position and with make before break feature and shall have 3 positions to read the three phase currents. Voltmeter selector switches shall also be of 3 positions and off position, suitable to

  read phase to phase voltages.
- The control switches, operating handles, meters, relays etc shall be mounted at the front of the switchgear panels. The instruments shall not be mounted less than one meter or more than two meters from the floor level. Ammeters and Voltmeters are to be provided with selector switches. Operating handles shall not be mounted at a height more than 1.75 meters. Breaker Control switches wherever provided shall be so designed that when released by the operator it shall automatically return to a neutral position. They shall be fitted in sequence with lock to avoid inadvertent operation and shall be arranged such that after passing the "closed" position the control switch cannot be moved into the "Closed" position again without passing the "open" position. Each panel shall have indicating lamps for "ON","OFF", "TRIP" "TRIP CIRCUIT HEALTHY" and “SPRING CHARGED”.

AUXILIARY SUPPLY

- Auxiliary DC and AC supply shall be derived from the incoming source of the panel with suitable control arrangements for indication circuits, closing circuits, space heaters etc.
- Separate DC Insulated wire buses shall be provided. DC supply required for protection/ indication/ tripping shall be taken from the above wire bus bars through protective fuses.
- Suitable fuses and links shall be provided for individual circuits for protection and also for isolation from bus wire without disturbing the other circuits. Bus wires from panel to panel shall be wired through necessary control terminals.

- Panel heaters and thermostats shall be provided in all the panels.

WIRING AND CONTROLS

- Control supply of each individual feeder shall be taken from the Auxiliary contact of the MCB, so by switching the MCB, control supply of the concern feeder will be controlled. The main object of doing this is to cut-off Power as well as control supply from the feeder at the time of Maintenance / repairing. The wiring inside the modules for power and control protection and instrumentation shall be done using 1.1 KV grade, PVC insulated FRPS copper conductor cables confirming to IS 694 and IS 890. Power wiring inside the starter module shall be rated for full current rating of contactor but not less than 4.0 sqmm size. For C.T. 2.5 sq.mm. Cu. Wire shall be used whereas other control wiring shall be done using 1.5 sq. mm wire. Control wiring and indicating lamps shall have protective fuses (HRC type). The necessary ferrules shall be filled to all wire terminals for ease of identification. Only one conductor shall be permitted to one termination.

CABLE COMPARTMENT

- Cable compartment should have adequate space to accommodate required number XLPE insulated copper or aluminum conductor both in incoming & outgoing. There should be ample space for the termination of this cable.

CONSTRUCTION

- The panel shall comprise fully compartmentalized bottom entry, extensible type cubicle pattern, and front operated, suitable for floor / stand mounting as per site requirement. The panel board shall be divided into distinct vertical sections comprising of completely metal enclosed bus compartment running horizontally
- The schematic diagrams are interned as a guide and manufacturer shall develop his own general arrangement and schematic drawing adding necessary auxiliary devices,accessories, components peculiar to supplied equipment's, ferrules number, terminal number etc. which are required for safe,convenient, efficient an proper operation of the 415 volts switchboard / M.C.C.

FOLLOWING SHALL BE TAKEN CARE

- Main bus bar should be electrolytic tin copper type with heat shrinkable PVC sleeves with colour code.
- All internal wiring and all connection shall be with copper wires and strips as required. Copper flexible wire shall be used below 100 Amps.
- All component, frame etc shall be earthed. A common internal earth bar with two separate earthling leads shall be provided.
- Powder coating to be done on all sheet metal works as required.
- Panel should have MS base frame for floor mounting unless otherwise specified.
- The board should be front operated and extendible type.
- Compression type brass glands and crimping lugs for incomer and outgoing ends.
- All ammeters to be provided with C.T's and selector switch and control fuses.
- Panel components shall be specified.
- The design and location of damp panel to be approved by the Engineer-in-charge before fabrication and instalment.
- All panels should be dust and vermin proof.
- All panels should be fabricated out of 12 gauges CRCA sheet. The door should be made from 12 gauge CRCA sheet.
- All meters should be digital type only unless and otherwise specified.
- Panel builder shall be CPRI approved.

- The board should meet with requirement of IS2127/1162.
- All the switches used should be capable of withstanding the AC23 duty for motor operation. The switches should have quick break. The contacts should be silver plated double break type. The switch should confirm to IEC 947-III.
- If it is possible panel component as well as accessories should be one make.
- The board should with stand the system prospective fault current.
- The switches shall confirm to IS: 4047 the fuses shall conform to IS: 214 the fuses shall be of HRC type.
- Engraved plastic labels shall be provided indicating the feeder details, capacity, cable size, and load in KW and danger signs.
- The entire panel board should be with adequate height width & Depth as per relevant prevailing standard
- Include foundation bolts of suitable size as per requirement.
- All compartment doors should be concealed hinged type & handles of feeders to be interlocked mechanically with the doors such that door cannot be opened when the switch is in "ON" position & switch cannot be "ON" when the doors is on open position.
- Detailed drawing shall be got approved prior to manufacture.
- If required only front opened and operated panel for LDB and AHU panels will be accepted.
- If capacitors of APFCR panels are not mounted in the panel itself than separate closed/covered rack with sufficient ventilation shall be included.
- Engraved PVC labels shall be provided on incoming and outgoing feeders.
- SLD showing circuit inside the D. B. shall be posted inside of door and covered with transparent laminated plastic sheet.
- The name plate with panel designation shall be fixed at the top of central panel. And name plate showing feeder details shall be provided on each feeder module as well as termination door.

GENERAL REQUIREMENT OF THE PANEL

- The tenderer must have CPRI approval for manufacturing panel for the tenderer, who has not CPRI approval has to make panel from CPRI approved panel manufacturer only.
- Each switch fuse unit must be complete with the operating handle interlock, suitable H.R.C. fuses etc as per site requirement.
- The entire L.T. switch gear unit should confirm to IS-9947.
- All the CT's shall have cast resin type only with class I accuracy and each CT should have short link.
- Indication lamp shall be LED type panel mounted, low power consumption, Min.100000 hours of Life, O/L and S/C protected with its holders etc. suitable for specified voltage shall be used.
- All the measuring instruments should be of Accuracy Class 1.0.
- Each door of the panel should be earthed separately by Flexible link.
- The above cubicle pattern L.T. switch board comprising of Incoming and Outgoing described above must be complete with necessary floor stands, foundations bolts, copper inter connections between bus bars and incoming / outgoing / ATS / Variable Frequency Drive, inter wiring with PVC copper cables, labels marked for incoming /outgoing / ATS / Variable Frequency Drive, earthing terminal etc. and other required major / minor items.
- All internal wiring work should be permanently marked / labelled at terminations with numbers or letters corresponding to diagram.
- A copper earth with bus must also run throughout the panel.

- Ample space in each compartment shall be provided for easy maintenance and repairing.
- Extra fans should be provided for cooling the panel if required and as per directed by Engineer-In-Charge
- The complete board should be scraped, cleaned and painted with powder coated paint after application of 7 tank process and primer using SIEMENS grey shade coat at manufacturer's works as per relevant IS.. An easy access to bus bar should be kept for testing, maintenance and checking. The board should be prepared and erected in accordance with the prevailing Indian Electricity Rules and Regulations. The appearance of the panel board should be neat, clean and pleasant. The panel should be fabricated from suitable size angles and 12 SWG CRCA sheet steel and angle / channel iron sections. Sufficient space should be available for cable jointing. All live parts must be covered with non- hygroscopic insulated sheet. The lifting Lugs / Hooks should also be provided for handling the board. The necessary sufficient louvers should be provided for heat dissipation and air cooling.
- The space requirement for board must be specified. The board is to be installed on the R.C.C. Platform having cable trench 1.0 Metre. Size. Cable entry to panel board should be at bottom long. A floor stand and operating platform having minimum width of 1 Metre. should also be incorporated.

SAFETY SHUTTER DEVICES

- Shutters shall be provided at bus bar chamber cut out for closing the same when the draw able chassis of the modules aredrawn out.
- The bus bar shutters shall be automatically operated by the movement of the carriage.

INSULATORS

- Insulators of moulded or resin bonded material shall have a durable, non-hygroscopic surface finish having a high anti-tracking index. Insulators, barriers made out of hylam, synthetic resin bonded paper, treated wood will not to be accepted.
- Insulators shall be mounted on the switchgear structure such that there is no likelihood of their being mechanically over-stressed, during normal tightening of the mounting and bus bars, connections etc.

EARTHING:

- Copper earth bar of minimum 25mm x 3mm (or specified size) size shall be run through whole length of panel. The frame work of panels shall be connected to this earth bar and it shall be provided to facilitate connection with main earth coming from earth pit on both sides of panels. The earth continuity conductor of each in/out feeder shall be connected to this earth bar. The armor shall be properly connected to earthing clamp, and clamp shall be ultimately bonded with earth bar.

DANGER BOARD

- 470 Volt danger board as per IS: 2551-1182 in English and Gujarati shall be fixed on all sides of panel.
- The board shall be glass enameled with red background and white letterings.
- The Danger Notice Plate shall be made out of 1.6mm thick mild steel sheet. Approximate size should be 140mm x 153 mm.
- The letters, figures, the conventional skull and bones etc shall be positioned on the plate as per IS 2551-1182. The said figures & pictures shall be painted in single red color as per IS5-1178

PAINTING

- The panel shall undergo chemical de-rusting and blasting and shall be effectively prophesied as per IS-8145. The panel shall be thoroughly rinsed with clean water after phosphate followed by final rinse with dilute dichromate solution and even drying. The phosphate coating shall be scaled by the application of two coasts of ready mixed staving type zinc chromate primer.
- Two coats of finishing powder coated paint shall be applied. The final finished thickness of paint film on steel shall not be less than 100 microns and shall not be more than 153 microns. The color for the finishing paint shall be approved by the Engineer. The finished appearance of panels shall present an aesthetically pleasing appearance free from dust and uneven surfaces.

BRIEF DESCRIPTION OF THE ATOMIZATION

- The atomization is meant to control the ACBs, MCCBs, Contactors and other switchgears fully automatically as directed in drawing or elsewhere. The main features to be take care are.
- The Bus coupler ACB must be off when any Generator is ON LOAD or Outgoing from DG or Incoming from DG to LT main Panel ACB is ON
- The APFCR and fixed capacitors feeders must be electromechanically interlocked in such a way that, any of the capacitor does not come in line when any DG is on load.
- The transformer outgoing ACB (Incomer-1 of Main LT panel) and Outgoing ACB of DG as well as incomer of Main LT panel can never be "ON" together.
- All the switchgears should be mechanically interlocked in such a way that, all above conditions must be fulfilled even on manual mode of operation of DG / ACBs.
- If client needs to provide additional back-up protection of REVERSE CURRENT/ REVERSE POWER RELAY it must be included.

TESTS AND INSPECTION

- All site tests as per Indian standards and high voltage test of bus bars in presence of Engineer-In-Charge.

DRAWINGS

- Manufacturers Shall submit for approval the single line, general arrangement drawing including material list, accessories, components peculiar to supplied equipments, ferrules numbers, terminal numbers, foundation drawings and control wiring drawings. Approval of schematic drawings, single line and control wiring drawings shall be obtained before starting the manufacturing of panel board. Manufacturer shall submit the 04 Copies of final prints with Laminations and 01 reproducible tracing of each and every drawing. Out of these 04 copies, 01 Copy should be affixed in the Panel as directed by Engineer-In-Charge.

TEST CERTIFICATES

- Type test certificates of all standard component parts, e.g. contactors, breakers, switches, fuses, relays, CT's, VT's, and for the standard factory built assembly shall be submitted by the supplier.

INSTRUCTION MANUALS

- The supplier shall furnish specified number of copies of the instruction manual which would contain detailed instructions for all operational & maintenance requirement. The manual shall be furnished at the time of dispatch of the equipment and shall include the following aspects:
- Outline dimension drawings showing relevant cross-sectional views, earthing details and constructional features.
- Rated voltages, current, duty-cycle and all other technical information, which may be necessary for correct operation of the switchgear.
- Catalogue numbers of all components liable to be replaced during the life of the switchgear.
- Storage for prolonged duration.
- Unpacking.
- Handling at site.
- Erection.
- Pre commissioning tests.
- Operating procedures
- Maintenance procedures.
- Precautions to be taken during operation and maintenance work.

DATA SHEET FORANY PANEL BOARD ENCLOSING SWITCHGEAR OR EQUIPMENT

OPERATIIVE CONDITION	
VOLTAGE	415 V =/- 10%
NO. OF PHASE	3
SYSTEM	3 Phase, 4 WIRE
FREQUENCY	53 HZ
FAULT CURRENT	53 KA
NETURAL GROUNDING	NOT REQUIRED
CONTROL SYSTEM	
VOLTAGE FOR INDICATION FOR METERING FOR PROTECTION	240 V A.C 240 V A.C 240 V A.C
CONTROL WIRING	2.5/1.5 MM2 COPPER WIRE
BUS BAR	
PHASE BUS BAR MATERIAL SUPPORT NO. OF FLATS PER PHASE CURRENT DENSITY MINIMUM CLEARANCE INSULATING BARRIERS	 ELECTROLIYTE TINNED COPPER SMC/DMC ONE 1.4 AMP/ SQ.MM 25 MM MINIMUM BAKELITE SHEET OF 3.0 MM THICK
NETURAL BUS BAR	ELECTROLIYTE TINNED COPPER
EARTH BUS BAR	ELECTROLIYTE TINNED COPPER
FABRICATION MAIN STRUCTURE MOUNTING PLATE DOOR	 12 SWG 16 SWG 12 SWG
DEAD BACK/ BACK ACCESS	BACK ACCESS
SINGLE FRONT/DOUBLE FRONT	SINGLE FRONT
CABLE ENTRY/EXIT	BOTTOM
CONTROL SUPPLY	230 V AC
SITE CONDITION	
TYPE	INDOOR
MOUNTING	FLOOR

AMBIENT TEMPRATURE	53 DEG.CEL.
ATMOSPHERE	HUMID
VENTILATION	Air cooled
PAINTING	
SHEET SHOULD BE 7 TANK PROCESSED, OVEN BAKED AT 290 DEG. C. WITH POWDER COATING	YES
TYPE OF PRIMER	AS PER IS
TYPE OF PAINT	AS PER IS
TYPE OF SHADE	RAL 7032 Siemens Gray
HARDWARE (ZINC PLATED)	YES
SPACE HEATER	230 V AC
CABLE ALLEY ILLUMINATION	YES
POCKET FOR DRAWINGS AT DOOR	YES

EARTH LEAKAGE CIRCUIT BREAKER/RESIDUAL CURRENT CIRCUIT BREAKER

- The RCCB should suffice all the requirements of is as per code is - 12640 - 1188. The arc should be current operated and not on line voltage.
- The RCCB should ensure mainly the following functions:
- Measurement of the fault current value.
- Comparison of the fault current with a reference value.
- The RCCB should have a torrid transformer which has the main conductors of primary (p - n) which check the sum of the current close to zero
- All metal parts should be inherently resistant to corrosion and treated to make them corrosion resistant
- It should be truly current operated
- It should operate on core balance torrid transformer
- Its accuracy should be ± 5 %.
- It should operate even in case of neutral failure.
- It should trip at a present leakage current within 30ma or as specified.
- Its enclosure should be as per ip 30.
- Its mechanical operation life should be more than 14,000 operations.
- It should provide full protection as envisaged by ie rules - 84-a, 71-ee, 73-ee, 1185 and also rule 53 of ie rule1156.
- It should conform to all national and international standards like is: 8828-1193, is: 12640-1188, bs 4293 - 1183, cee 27 (international commission rules for the approved of electrical equipment).

DISTRIBUTION BOARDS

- Distribution board using TPN/ DP/ SP MCB/MCCB isolator, earthing terminal, connector strip for phase neutral and earth for each circuit, CRCA sheet steel housing and complete.
- Common banking of neutral & earth conductor is not allowed. It shall be suitable to operate on 415/214 volt, 53hz. A. C. Supply and withstand short circuit current of 10ka.

Construction

- Distribution boards shall be fabricated from 2mm. Gauge CRCA sheet or shall be factory readymade as specified in the material list. It shall be of double door type with hinged (lockable if required) door suitable for recessed mounting in wall and dead front operated. Distribution boards shall be powder coated with 7-tank process application. The distribution boards shall be provided with phase barriers, wiring channels to accommodate wires and individual per phase neutral links.
- There shall be separate or individual earth link as per requirement. Proper arrangement shall be made for mounting of MCB's and other accessories. Distribution boards shall meet with the requirements of is 2675 and marking arrangement of bus bars shall be in accordance with i.s. standards.
- It should be totally enclosed and made dust, vermin and weather-proof such that, it meets to the ip-51 and ip-54 protection for indoor and outdoor application respectively.
- A detachable cover plate of 2mm. CRCA sheet shall be on front of board such that, all live parts of the electrical accessories mounted on board shall be accessible only on removal of said cover plate. The cover plate shall be fixed to the board with adequate size zinc passivity metal screws. Above the detachable cover plate, one additional hinged door of 2 mm thick crca sheet should be provided with necessary locking arrangement and suitable gasket capable of withstanding corrosive and humid atmosphere.
- Inter connection of wiring shall be done with 682/1100 v. Grade, PVC insulated, flexible copper conductor of one size higher current carrying capacity than that of switch rating.
- Bus bars shall be suitable for the incoming switch rating and sized for a temperature rise of 34° C over the ambient. Each board shall have two separate earthing terminals.
- Circuit diagram indicating the load distribution shall be pasted on the inside of the DB as instructed. One earthing terminal for single phase and two terminals for 3 phases DB's shall be provided with an earth strip connecting the studs and the outgoing ecu earth bar.
- The top and the bottom faces of the D.B. shall be provided for conduit entry of minimum 1.5" dia if required and shown in drawing, copper cable entry provision shall be made. The circuit connection from MCB's shall be brought to elemex type connector provided on top/bottom of the db. The connector shall be suitable to receive phase, neutral and earth wire/cable coming from each individual circuit. The connectors shall have identification tag. The faces if asked shall be kept detachable. All outgoing feeders shall terminate on a terminal strip which in turn is interconnected to the mcb/fuse base by means of insulated single conductor copper wires as follows

  Up to 15 amp 2.5 sqmm

  25 amp 4.0 sqmm

  32 a 6.0 sq.mm.

  40 amp 10 sqmm

  69 a 16 sq.mm.
- Each DB shall have indicating lamp, preferably neon type denoting power availability in the board. Indicating lamps shall be complete with fuse.

IP66 CABLE JUNCTION BOX

Specification

- Degree of Protection: IP 66 & IK08 (5 Joule)
- Material: halogen free thermoplastic
- Cable entry: cable/conduit entry via metric knockouts
- Designed in accordance with IEC 82,670-22
- Halogen-free silicone-free "halogen-free" in accordance with the examination of the cables and insulated wires - corrosiveness of fumes - as per IEC 754-2.

- Flame resistant self-extinguishing

Ambient Temperature

- Average value over 24 hours + 55° C
- Maximum value + 70° C
- Minimum value - 25° C

PART 7:- INTERNAL ELECTRICAL

PART C:- LT SWITCHGEAR, DISTRIBUTION BOARDS & LT PANEL

Item No.1: Main PCC Panel

Scope of Work: Supply, Erection, Testing & Commissioning of Main PCC Panel. As per SLD & Specification

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.2: Busbar Chamber for 140 Amp. Capacity

Scope of Work: SETC of **Busbar chamber** confirming to IS-375 fabricated from 16 G.M.S. sheet, dust & vermin proof having hinged door with rubber gasket and necessary busbar supports with COPPER busbar having current density not more than 1.6 Amp. / sq.mm (Rated current / cross section area) duly wrapped with colour insulation tape for phase sequence, three phase & neutral each suitable for following current capacity with necessary painting mounted on wall or pedestal frame of required size with necessary connections.**(B) Suitable for 140 Amp. Capacity**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.3: Single-phase 4-way SS Double door

Scope of Work: Providing and erecting Sheet Steel powder coated **MCB Distribution board** - flush / surface mountedfitted with busbar, neutral link, earth bar and DIN rail, confirming to IS 9032 and BS 5486-1186 without MCB tohouse appropriate nos. of MCBs. (The DBs should be used of same company of MCB to be used)**(B) Single phase 4-way SS Double door**

Specification: As per standard Material Specification as mentioned aboveand as per Engineer-in-charge.

Item No.4: Single-phase 12-way SS Double door

Scope of Work: Providing and erecting Sheet Steel powder coated **MCB Distribution board** - flush / surface mounted fitted with busbar, neutral link, earth bar and DIN rail, confirming to IS 9032 and BS 5486-1186 without MCB to house appropriate nos. of MCBs. (The DBs should be used of same company of MCB to be used) **(H) Single phase 12 way SS Double door**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.5: Three phase 8-way SS Double door

Providing and erecting Sheet Steel powder coated **MCB Distribution board** - flush / surface mounted fitted with busbar, neutral link, earth bar and DIN rail, confirming to IS 9032 and BS 5486-1186 without MCB to house appropriate nos. of MCBs. (The DBs should be used of same company of MCB to be used) **(N) Three phase 8 way SS Double door for horizontal single phase outgoing**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.6:415 V MCB 32 Amp. Four Pole

Scope of Work: Providing & erecting **415 V MCB Four Pole** Switch for Lighting Load **(B curve)** having 10KA breaking capacity & confirms to IS :8828 in existing box having following capacity**(A) 32 Amp Cat-III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.7: 415 V MCB 40 Amp. Four Pole

Scope of Work: Providing & erecting **415 V MCB Four Pole** Switch for Lighting Load **(B curve)** having 10KA breaking capacity & confirms to IS : 8828 in existing box having following capacity**(B) 40 Amp Cat-III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.8: 415 V MCB 69 Amp. Four Pole

Scope of Work: Providing & erecting **415 VMCB Four Pole** for Motor & Inductive Load **(C Curve**) having 10KA breaking capacity & confirms to IS :8828 in existing box having following capacity **(C) 69 Amp Cat-III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.9:Up to 32 Amps. DP ELCB/RCCB

Scope of Work: Providing and erecting approved make **ELCBs / RCCBs** conforming to IS: 12640 and having sensitivity of 30 mA and Short Circuit withstand capacity of 6 KA and suitable for operation on **single phase240 V**. having characteristic of quick action & tripping with all advance feature & do not incorporate any electronic component. for following Max. rating erected as directed. **(i) Up to 32 Amps. DP- Cat III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.10: 40 Amps. DP ELCB/RCCB

Scope of Work: Providing and Erecting Approved make ELCBs / RCCBs conforming to IS: 12640 and having sensitivity of 30 mA and Short Circuit withstand capacity of 10 KA and suitable for operation on **single phase240 V**. having characteristic of quick action & tripping with all advance feature & do not incorporate any electronic component. for following Max. rating erected as directed. **(ii) 40Amps. DP Cat III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.11: 40 Amps. FP ELCB/RCCB

Scope of work: Providing and erecting approved make **ELCBs / RCCBs** conforming to IS: 12640 and having sensitivity of 30 mA and Short Circuit withstand capacity of 6 KA and suitable for operation on **3 phase and neutral 415V**. having characteristic of quick action & tripping with all advance feature & do not incorporate any electronic component for following Max. rating erected as directed. **(ii) 40 Amps. FP Cat.III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.12: 69 Amps. FP ELCB/RCCB

Scope of work: Providing and erecting approved make **ELCBs / RCCBs** conforming to IS: 12640 and having sensitivity of 30 mA and Short Circuit withstand capacity of 6 KA and suitable for operation on **3 phase and neutral 415V**. having characteristic of quick action & tripping with all advance feature & do not incorporate any electronic component for following Max. rating erected as directed. **(iii) 82 Amps. FP Cat.III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.9: 240 V MCB 6 to 32 Amp. DP

Scope of Work: Providing & erecting **240 V MCB double pole** switch for motor & inductive load **(C Curve)** having 10 KA breaking capacity & confirms to IS : 8828 in existing box having following capacity**(A) 6 to 32 Amp. Cat.III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.12: 240 VMCB 6 to 32 Amp. DP

Scope of Work: Providing & erecting **240 V MCB double pole** switch for motor & inductive load **(C Curve)** having 10 KA breaking capacity & confirms to IS : 8828 in existing box having following capacity **(A) 40 Amp. Cat.III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.15: MCB 6A to 32A Single Pole

Scope of work: Providing and erecting approved make Miniature circuit breaker single pole 6A to 32A suitable to operate on 240 V A.C. system and having overload and short circuit tripping elements and breaking capacity 10 KA to be erected in existing M.S. box confirming to IS 8828/1196 with ISI mark, Cat.III

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

PART 8:- EXTERNAL ELECTRICAL

PART A:- LT SWITCHGEAR, LT PANEL, DBS & MCBS

Item No.1 CCMS With G.I. Box / Frame feeder Pillar

Scope of Work: SETC of CCMS with G.I. Box/ Frame Feeder pillar,(Capacity 6 KW, 1 Ø) with Energy Conservation Provision

Specification:

CENTRALIZED CONTROL AND MONITORING WITH BYPASS FACILITY

Technical Specifications & Special Conditions of the Tender: -

Scope of work

Under the scope of this project, contractor should install Centralized Control & Monitoring System (CCMS)Units and presently SMC is using conventional feeder pillar (with electro-mechanical/ astronomical timers,contactors etc.) to operate & control the streetlights. To enhance operational efficiency through optimumusage, remote control & monitoring, installation of CCMS system is considered. Bidder should supply, install,test, commissioning and maintenance of lighting controls (Centralized Control & Monitoring System –CCMS) for LED streetlights to be installed in the city. Hence, it is proposed to install CCMS systems at eachswitching point.

For technical specification & features, please refer below: -

Technical Specifications: System with Communication Facilities and Centralized Control and Monitoring (cluster/ group control)

Features

Controller and Metering unit: -

- Schedule the timing of lights (pre-programmed based on astronomical clock or on field or through central control)
- ON/ OFF Switch (on field or centrally)
- CCMS System for Capture the energy usage and other parameters at pre-determined interval and store data for30 days
- Ability to connect with a communication device
- Ability to download data in field
- System protection against surges
- Ability to upgrade firmware on field using a communication device

Enclosure

- Enclosure should be made of fire retardant FRS/ SMC material and with impact resistance of IK 10 & IP 65.
- Dimensions of the enclosure box should be such as there should be adequate space to access components of the box for R & M purpose. The vendor must also ensure at least 14% space is left in the box for future upgradation/ devices to be added.
- The enclosure box must have a standard lock which cannot be opened by all kinds of commonly available tools.

- SMC shall be providing the design and size/specification of sticker including the logo after the award of work. For placement of sticker, an area of 9" x 7" should be available on the front of the box.
- Wiring inside the enclosure box should be done neatly with proper use connectors & numbering with use of Ferrule PVC Tube.

Communication Module

- Ability to communicate securely with via cellular networks (GSM / GPRS) and/ or RF networks
- Communication technology between CCMS unit and central server should be 3G hardware device which should be capable to run 2G/3G/4G as per availability in the site.
- Two-way communicator
- Ability to send data regarding energy usage, ON/OFF status etc. from controller
- Ability to give commands from a central level for switching ON/OFF scheduling etc. The software for CCMS UI should have provision for providing dimming in case same is provided in the lights.
- Ability to remotely upgrade the CCMS device firmware from central server

Software

- A web-based/ mobile based software package with a detailed information dashboard
- Ability to show the status of each controller on the dashboard.
- Inter-operability of all support services related to CCMS units.
- Ability to schedule and switch ON/OFF controllers remotely through the dashboard
- Reports in form of matrix as well as graphical representation
- Incorporate logics to determine fault detection at switching point level and power thefts and execute a userdefined Standard Operating procedure to aid in issue remediation.

Hardware

- Server uptime should be minimum 99.99% with disaster backup and sufficient storage capacity and processingpower to ensure stable operation of CCMS throughout the contract period. Maintenance of the server andsoftware is the responsibility of the vendor.

Specifications

- Single phase (240 Volt P-N, Whole Current, Class 1.0) or a Three phase system (Wires 3 * 240 Volts P-N,Whole Current, Class 1.0) electronic controller and energy controller compiled as per IS: 9779 & CBIP-88with add on MCB.
- Single phase or Three phase system electronic controller and energy controller compiled as per IS: 9779 &CBIP-88 with add on MCB. Rating of the CCMS units for each phase (including rating of safety equipment's - MCB, Relay, etc.) should be 10/15 kW as per requirements.
- Controller is also compatible for remote communication using GPRS/GSM modem for operations like controller data downloading, & relay ON-OFF for maintenance purpose. Controller Records events like supply ON-OFF and relay ON-OFF for analysis etc.
- The controller should be type tested in a NABL certified Lab The controller should be interfaced with a communication module which would wirelessly transmit data recorded to a dedicated server or on cloud based architecture. The communication module also relays commands to schedule and control the cluster of street lights.

Note: The above-mentioned quantities may vary with respect to each cluster based on the detailed field survey to becarried out by the vendor before project execution. The survey report shall be submitted to the Engineer-in-charge and the work shall be carried out under his/her consent.

Street Light Controller

Rated Electrical Parameter

- Connection type System for Single Phase/Three Phase Switching points
- Voltage 240 volts P-N (+14% to -40% Vref) on each phase
- Current 05 - 69 A for each phase (Withstands 114% Imax), Starting current- 0.2% Ib
- Frequency 53 Hz ± 5% (47.5 to 49 A.5) Hz
- Power Factor Zero (lag)- Unity-Zero (Lead)
- Accuracy 1.0
- Withstand Voltage 470 V up-to 5 minutes between Phase – Phase
- Rating Rating of the CCMS units for each phase (including rating of safety equipment's - MCB, Relay, etc.)should be - 5/ 10 kW

Functional Specifications

1. Data

The CCMS unit should be able to capture (record) and provide following parameters at variable time-intervals

- Cumulative Active Energy
- Average Power Factor
- Power on hours
- Monthly Load on/off

Controller has the provision to store last 30 days data at one hour interval. All these data are accessible for reading,recording by downloading through HHT (Hand Held Unit) through optical port or USB/Bluetooth given on controller front. For HHT, a Smartphone-based solution for collecting/accessing data is also acceptable

2. RTC

- The controller has a built-in calendar & clock, having an accuracy of +/- 1 minute per year or better, however meter may confirm to accuracy as per IS 9779. A separate internal Lithium battery back-up is provided for continuous operation of controller RTC for at least two years under controller un-powered conditions.

3. Tampers

Following tampers are logged with occurrence and restoration in FIFO manner:

- Low Load
- Over load
- Low Power Factor
- Under voltage
- Over voltage
- Magnet

4. Astronomical Calendar for switching operation

- Based on latitude and longitude of the installation place controller itself decides switch on –off timings.

5. Maintenance Mode of switching

- In case of any emergency or for maintenance purpose, switching can be done using keypad -before operation passwordshould be punched using keypad. For maintenance, the interface for data access should be available.

6. Switch Weld & Switch Fail events

When Switch "on" operation failed condition is logged as switch fail event and when Switch "off" operation failscondition is logged as switch weld event.

7. Switch on - off operation events

Switching events with the following reasons will be logged:

- 4 Timed operations- As per astronomical calendar
- 5 Unscheduled operations – In maintenance mode
- 6 Event based like on over current, overload switching

8. Power on-off events

- Last 14 power on-off events with power off duration will be logged.

9. Separate Energy Consumption registration for unscheduled switch on period

- Last 14 events of maintenance mode with snap of energy register and date/time is logged in meter. In BCS, with theseevents, duration of these events and energy consumption during that period is also shown.

10. Switching on Overload/ over current

- Controller will continue monitor over current & overload condition against the threshold defined in controller and ifcondition persist for predefined time period (default 5 minutes) then disconnection of switch will be occurred.Controller will reconnect the switch after some predefined time interval (default 10 minutes) and will check again forthe event condition, if condition persist again, switch will be disconnected again else will run normally.
- In case of disconnection, controller will try for defined trial count (default 5 count) and after that will disconnect theswitch for long defined sleep period (default 30 minutes).
- After sleep period switch reconnect activity will restart in same described manner. Every switching operation will belogged in meter.

11. LED Flashing RED LED is provided on controller front.

12. Communication

- Controller stored data can be downloaded through its optical port or USB using HHT (Hand held Unit) or directly byLaptop using Base computer software.Controller should be able to interface with the communication module through a serial port

9. Surge Protection

- Standard CAT B 8140 V protection (IEC 84000-4-5)

12. Programmable Scheduling

The schedule for light operations can be programmed on field or during installation overriding the astronomical- clock.

15. Operating temperature 0° C to 70° C

16. Storage temperature -14° C to 80° C

10. Humidity 95% non-condensing

Display and keypad

- LCD (Six Digits, 10 mm*5 mm, 40" UHD) is provided to display the controller parameters.
- A keypad/ optical/ USB port/ Bluetooth/ suitable interface should be provided to access the information storedin the module and system programming.
- and Held Unit should be universal & have a provision for secure login.

Constructional specifications:

1 Controller sealing: As per IS 9779 and CEA Metering Regulation 1406

2 Guarantee: 18 months from the date of supply

3 Insulation: Withstand an insulation test of 4 KV and impulse test at 6 KV

4 Resistance of heat and fire: The terminal block and Controller case have safety against the spread of fire. Theywill not be ignited by thermal overload of live parts in contact with them as per therelevant IS 9779.

5 Latching Relay/Bi-Stable Switch/Isolation device: Should conform to IEC - 84030/ 84037

Contactor: Contactor confirming to relevant IEC/IS Standard

6 Polycarbonate Box – Enclosure: Enclosure should be made of fire retardant FRS/ SMC material and with impactresistance of IK10.

7 Dimensions of the enclosure box should be such as there should be adequate space to access components of the box for R&M purpose. The vendor must also ensure at least 14% space is left in the box for future up-gradation/devices tobe added.

8 The enclosure box must have a standard lock which cannot be opened by commonly available tools

9 SMC shall be providing the design and size/ specification of sticker including the logo after the award of work. For placement of sticker, an area of 9"X7" should be available on the front of the box.

10 Wiring inside the enclosure box should be done neatly with proper use connectors & numbering with use of Ferrule

PVC Tube.

11. The enclosure should have theft control mechanism and generate alerts when opened or if the unit experiences motion of any kind beyond a configured threshold

MCB

Should conform to IEC 61453/ 61454

MCB along with design for protection & auto-recovery/ self-healing is accepted.

Controller Gateway (Communication Module)

1. Power Supply 240 V AC
2. Mobile / Communication Network GSM/ GPRS: Quad band 853/900/1800/1100 MHz
3. Communication Method TCP – IP via GPRS / 3G and/ or RF SMS
4. Status of Sim Based on LED on the module

Features

- Remote ON/ OFF in case bad weather, maintenance or emergency
- Remote RTC Synchronisation of Street Light Controller
- Communication should be encrypted by 128-bit encryption
- Alert message in pre-defined abnormal system conditions through SMS (5 numbers) and mobile/web basedapplication through GSM/GPRS/RF for:
- Phase-wise currents on crossing threshold values*
- Phase-wise voltages on crossing threshold values*
- MCB trips
- Theft alerts
- Group failure of lights
- No output supply

Web based software

Central Control and Monitoring System functionalities

- CCMS shall have a web-server to receive and record all data from the streetlight controllers.
- The Main page of software to shows real-time information about the cumulative load, number of faulty lights,total number of lights on/off (uptime %), number of faulty lights, number of faulty switching points.
- A separate tab in the software to show the list of CCMS units installed in the project area along with the meterparameters being showcased against each CCMS Unit.
- Alert in case of fault – describing the fault. Along with colour coding for unresolved faults based on time e.g.Onecolour for fault which is unresolved since 0-12 hours, different colour for 12-24 hours and so on and soforth.
- A separate tab in the software to show the switch point summary which showcases the meter parameters,active alerts, link to the map page, etc.
- A separate tab in the software for - monitoring & controlling, Alerts, Maps, Configuration page, Reports - uptime, fault penalty, history, energy savings, power failure, operational hour, lamp failure
- The server should display the faulty lights in each phase separately, instead of giving a total figure of faultylights for all the 3 phases together
- It should be able to communicate with any individual switching points or collectively amongst networkedswitching points for control and monitoring.
- It should able to record, by association to a switch point, glowing and non-glowing hours of a group of LEDluminaires attached to a particular switching point.
- It should be able to display the power failure details of a particular switching point.
- It should register all fault conditions like excess voltage/ current drawn, lamps failure (by association to asignificant drop in consumption), no-power supply, etc. through the instantaneous alert messages sent by theCCMS unit.
- It can generate MIS reports in Matrix as well as in Graphical format based on Power supply status, EnergyConsumption, Over/ Under Voltage/ Load, System parameter/ controllers i.e. Voltage, Current, Power factor,Cumulative kWh/ kVAh for individual switching points
- It should be able to track the failure of lamps in aparticular switching point by triggering alarm due to significant drop in power consumption.
- Different user authorization levels should be settable and the central server should be capable of handling hightraffic.
- GIS Mapping should be done covering all switching points and the details of each switch point shall beviewable in the web application software through a Google-map interface or web based digital map.
- All the CCMS units should be remotely configured from the Central Control Unit:
- Setting new ON/OFF timings
- Setting the RTC time of Automation unit
- Knowing the current status of any particular switching point.
- Reset the unit.
- The minimum interval for the update of data should be 15 minute but programmable up to 1 minute.
- Auto synchronization of controller with server timing to be further synchronized with standard GPS clocktiming.
- Further, system can indicate various faults as below: -
- Failure of lights (by association to a drop-in power consumption against a set benchmark)

- Failure of contactor
- Status of the incoming supply (power failure)
- High /low voltage
- Overload on the phases
- System to report Jamming/ hacking attempts and maintain status-quo in case of Jamming/ hacking attemptsi.e. if lights are ON, they should remain ON till the default OFF time recorded in the system. In case lights areOFF at the time of Jamming attempt/ hacking, lights should remain OFF till default ON time recorded in thesystem.
- Software to have asset management features for tracking of each street light, unique asset tag no., make, wattage, date of installation, date of replacement, reason for replacement.
- Software to have complaint handling system for light failures, with citizen interface and means ofcommunicating repair update to complaining citizen through SMS.
- Ability to remotely upgrade the CCMS device firmware from central server.

Hardware, Security and Other features

- Each central CCMS unit is capable of handling minimum 5300 number switching point units.
- CCMS shall have server preferably dedicated server set-up or cloud based arrangement to ensure 100%guarantee of the data transmission and real time data storage for last 2 years (24 Months) and archived data to7 years for the contract period.
- Data authenticity and validation must be ensured.
- Cyber security, safe database management, data retrieval and trouble free operation of software and alliedsystems (24*7) to be ensured.
- One dedicated or multiple display screen of UHD Resolution each of 32” size at SMC main office at Suratrespectively for monitoring of CCMS operation. + One of laptop having core i3 5th generation processor, min.4 GB, 1 TB HDD, 15.6" LED Display, 64-bit, Windows 7 professional OS, DVD Optical drive along withwireless mouse & USB external keyboard and other standard features. The cost of these system should beconsidered while quoting the rates.
- Maintain a TOLL-FREE no(s) to lodge a complaint by utility Officials/ Public in respect of system problems.

Bill of Quantity

- The proposed CCMS unit(s) will be a part entire streetlight system having qty. more than 2,530 Nos. Any other item/ material/ equipment/ system as may be required to be supplied for completing the work and successful commissioning under this contract in all respects in accordance with the provisions of the contract and/or to ensure the safety of installation during and after execution should be carried out by successful vendor at ‘No extra to SMC’.
- Following is mandatory list of materials (but not limited to) to be included in the streetlight controller for configuration - 1. Bidder shall use required material per unit to ensure the entire specifications as given in the tender document are met.
    (1) IP 65 or better enclosure box with min. IK-10 impact resistance
    (2) Miniature Circuit Breaker (MCB)
    (3) Class 1.0 accuracy Energy Meter with IS-9779
    (4) Switched Mode Power Supply (SMPS)
    (5) Mechanical Timer (during bypass mode)
    (6) Battery of required Ah
    (7) GSM/GPRS Module
    (8) Microcontroller Module

(9) Contactor

(10) Door Tamper Switch

(11) 8 nos. Hand held unit device (HHT) per ULB

1. Warranty of the product will be minimum 12 months from the date of commissioning or 18 months from the date of satisfactory supply at site.

2. The feature proposed for CCMS is indicative. However, bidders are free to offer their lighting control technology which should encompass all key features as above. But, the same time, software must have open source code, compatible with all relevant software(s) are in use by SMC. It means control, supervision, data acquisition must be possible with the software to be provided.

3. Offered brand has a TOLL-FREE no. to lodge a complaint by PROJECT AREA Officials/Public in respect of system problems.

4. For comprehensive on-site Warranty: Successful bidder shall ensure 97% service level through CCMS Unit at any point of time during the contract period. In case of failure of CCMS Unit which is brought to the notice of successful bidder (by mail, letter etc.). The same should be replaced within 48 hours of intimation. If vendor fails to correct the fault within 48 hours, the penalty starts with first penalty being levied on completion of 72 hours from logging of complaint. Penalty rate @ Rs. 14.00 per day per fitting connected to the CCMS unit shall be imposed and the amount shall be deducted from the vendor payment.

5. Ceiling limit of 10% on penalty shall be set, over and above the LD Limit of 10%. SMC is at liberty to carry out Third Party Inspection at any time during the contract period.

General Requirements

- The materials and components not specifically stated in these specifications but which are necessary forsatisfactory operation of the feeder pillar are deemed to be included in the scope of supply unless specificallyexcluded.
- All nut, bolts and washers used should be of GI Necessary bolt nut and washers required for cable terminationshall be provided.
- Cable entry hole shall be provided on bottom plates with cable gland according to the size of cable.
- All the GI parts shall be in single run. Any unnecessary joint shall not be allowed.
- Un-detachable canopy with slope shall be provided for weather proof outdoor use.
- Power Terminal Block of suitable size depending upon current should be provided at incoming as welloutgoing.
- Feeder pillar box shall be manufactured from CPRI approved panel manufacturer.

Construction of Box (Optional in case, in case FRP material is not used):

- The box shall be of stand mounting self-supportive type. Its enclosure shall be of robust construction ofcubical pattern.
- The size of box should be as per requirement of relevant standard/ prevailing with sufficient workability.
- The box must have sufficient space for CCMS box, energy meter, incoming & outgoing MCBs and MCB forbypass facility and connection terminals.
- It will be outdoor type thus its enclosure should have protection of IP 54.
- It shall be dust, damp and vermin proof.
- It shall be fabricated from 3 mm GI sheet. It shall be erected on appropriate stand made from GI Sheet. Sheetused for fabrication should be of standard make & having appropriate steel grade only.
- It should be fabricated of sheet of fine finish. There shall be no welds or bolt heads apparent from outside.
- The pillar shall have hinged door with panel type lock with keys in duplicate, Cable glands etc.

- It should also have provision for viewing energy meter without opening the door i.e. a glass window withscreen be provided. This Glass should be covered with Flip type cover of GI which can be opened to above.
- The fabricated body shall be thoroughly cleaned and treated by chemical agents as required to produce asmooth surface free of scales, grease and rust. The complete pillar shall be powder coated with Siemens Greypaint only. The paint should be carefully selected to withstand tropical heat, rain and environmental effects.
- The paint shall not scale off or crinkle or be removed by abrasion due to normal handling. All insulators,current carrying parts shall be cleaned properly after painting.
- The item includes earthing of the feeder pillar as described under and includes bringing the power supply.
- It has neoprene rubber gasket for proper protection. A danger notice board to be made from 2 mm GI plate tobe provided on the front door of the feeder pillar box.
- The details of connected load in kW, service/ consumer number, energy meter number, name of road/ society,year of erection, feeder pillar id/ zone name shall be labelled using radium sticker/ radium paint.
- Insulation resistance between live parts and earth terminal shall be 5 MΩ minimum.
- It shall be able to withstand high voltage (HV) test at 1.5 kV for 1 minute between live parts (current carrying parts) and earth terminal without breakdown of insulation.
- The box should have CCMS along with following items: -
- UV & OV protection- monitoring relay/ facility
- ELCB (out going from Energy meter): 4 Pole, 69 A or appropriate rating
- MCB (for Bypass facility): 4 Pole, 69 A or appropriate rating
- MCB (out going from CCMS): 4 Pole, 40 A or appropriate rating
- Neutral Link: 1 No. of 69 A with copper connector strip of 25 x 3 mm size
- Bakelite sheet of HYLAM of 11 kV grade with min. thickness of 12 mm.
- Copper wiring should be used for connections with 6 mm² size wires.

All these components are mentioned as particular requirements. It may be changed, if sufficient cares are takenwith alternative/ proper arrangement as required.

BYPASS FACILITY

In case of mal-functioning or non-functioning of the CCMS, streetlight operation can be done manually without any additional installation a 4 Poles MCB having 69 A or appropriate capacity will be provided. The MCB should be connected with outgoing wires from energy meter/ OV-UV relay and outgoing MCB of CCMS.

Detailed Specifications of Various Components are as under:

- Detailed specifications for MCB/ ELCB:
- Characteristic – B
- Breaking Capacity – as per relevant IS/ International Standard
- Rated voltage - 240/ 415 V (as applicable)
- Frequency - 47 to 82 Hz, Rated operating voltage – 240 V
- Fixing - Snap fixing on standard DIN rail profile EN 53 023 - 34 x 7.5

Detailed specifications for UV & OV Monitoring Relay

- The UV & OV Monitoring relay: should continuously monitor supply voltage. It shall be programmable enough to set its UV & OV limits. It should provide settable trip time during UV & OV condition. It should have auto restoration facility available when supply voltage being monitored come under permissible limits. It should have following technical characteristics. Following UV & OV relay of L & T is suitable for our application. Equivalent relay can be chosen.e.g. 6 kW, 1 phase CCMS FP: SM 530 (L&T Catalogue No. MD71BF or equivalent)

Technical specifications

- Operating Voltage: 3 Ø 4-wire, 415 V ~, 53 Hz/ 1 Ø 2-wire, 240 V ~, 53 Hz
- Ambient Temperature: -0° C to +53° C
- Mounting: DIN rail
- Switching Contacts: 2 CO (Potential Free)
- Programming: UV & OV limit Setting

Detailed specifications for ELCB

- Earth Leakage Circuit Breaker confirming to IS- 12640/ 1188 & BS 4293/ 1183 with latest amendment(s) havingsensitivity 100 mA and breaking capacity of 16 kA and suitable for 1 Ø & 3 Ø, 4 pole having characteristic ofquick acting & tripping with all advance feature with suitable enclosure box/ mounting rail.

Frame of CCMS, C.C. foundation &Earthing of CCMS

- Appropriate size frame with chain-link having 3 mm Ø GI Wire and GI Strip of 25 mm (width) x 3 mm (thickness)must be provided around the CCMS box for protection & fixing the same on foundation. The size should be suchthat it accommodates the CCMS properly.CCMS fixing should be done on foundation & frame with appropriate size GI nuts/ bolts or welded so that itcannot be separated from the foundation easily. The design of frame should be provided to SMC before preparing& installation of CCMS.
- Foundation is not considered in scope of work. However, requirement (size) should be provided to SMC/streetlight contractor.
- Earthing is also not considered in scope of work. 2 Nos. of earthing shall be provided by the streetlight contractor.However, provision for earthing terminal for earthing strip connections should be provided on frame/ CCMS.

Item No.2:

Scope of Work: SETC of Approved make Four Pole LT Heavy Duty Switch Disconnector Fuse Unit Cubical type for panel mounting complete with operating mechanism suitable to operate on 415V A.C. With HRC fuses of suitable load confirming to IS. 9947 (Part I & III). of following capacities **(c) 125 Amp Cat. III**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.3:

Scope of Work: Providing and erecting busbar chamber confirming to IS-375 fabricated from 16 G.M.S. sheet, dust & vermin proof having hinged door with rubber gasket and necessary busbar supports with COPPER busbar having current density not more than 1.6 Amp. / sq.mm (Rated current / cross section area) duly wrapped with colour insulation tape for phase sequence, three phase & neutral each suitable for following current capacity with necessary painting mounted on wall or pedestal frame of required size with necessary connections.**(A) Suitable for 69/100 Amp. Capacity**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.6:

Scope of Work: Providing & erecting approved make street light / wall mounting Junction Box compression moulded from DMC (thermoset plastic) vertical sliding cover having locking with square head stud loop in /

loop out in built terminal suitable for four core cable, waterproof of I.P. 54 protected with clamp or bolt nut & earth bolt of following size.

Size: (2) 253mm x 140mm x 105mm

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.7:Junction box Size: 93mm X 93mm X 62mm

Scope of Work: Supply, Erection, Testing & Commissioning of Cable Junction box of following size, IP 66, halogenfree and weather proof for outdoor installation.

Specification:

Size : 93mm X 93mm X 62mm

Ingress Protection : IP66

Impact Resistance : IK08

Material : Halogen free, silicone-free thermoplastic

Cable entry : Cable/Conduit entry via metric knockouts designed in accordance with IEC82,670-22

Flame resistant self-extinguishing

Item No.8:

Scope of Work: Providing & erecting approved make street light / wall mounting Junction Box compression moulded from DMC (thermoset plastic) vertical sliding cover having locking with square head stud loop in / loop out in built terminal suitable for four core cable, waterproof of I.P. 54 protected with clamp or bolt nut & earth bolt of following size**.**

Size: (1) 230 mm X 100 mm X 105 mm

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

STANDARD SPECIFICATION FOR EARTHING SYSTEM

GENERAL MATERIAL SPECIFICATION

All the non-current carrying metal parts of the electrical installation and mechanical equipment shall be earthed properly. The cables armour and sheath, electric panel boards, lighting fixtures, ceiling and exhaust fan and all other parts made of metal shall be bonded together and connected by means of specific earthing system. An earth continuity conductor shall be installed with all the feeders and circuit shall be connected from the earth bar of the panel boards to the conduit system, earth stud of the switch box, lighting fixtures, earth pin of the socket outlets and to any metallic wall plates used. All the enclousers of the motors shall be also connected to the earthing system.

Scope of Work

The scope of work shall cover supply, laying, installation, connecting, testing and commissioning of :

Earthing station.

Earthing G.I/Copper strips from earthing station to equipotential bar.

Earthing G.I/Copper strips/ wires from equipotential bar to lay feeder mains and circuit to connect power panels, DBs, switchboards etc.

Bonding of Non-current carrying parts, and metallic parts of the electrical installation.

Standards

The following standards and the rules shall be applicable.

IS: 3047 – 1166 Code of practice for earthing.

Indian Electricity Act and Rules

All codes and standards mean the latest.

Where not specified otherwise the installation shall generally follow the Indian Standard Code of Practice or the British Standard Code of Practice in absence of Indian standards.

Type of Earthing Station

Plate Earthing Station

- The equipment neutral earthing shall be with copper plate earthing station and equipment body earthing shall be with hot dip galvanized iron earthing station.
- The plate electrode shall be 814 x 814 x 3.15 mm copper plate for neutral earhing and shall be of hot dip galvanized iron plate having dimension 470 x 470 x 3.5 mm thick for body earthing.
- The earthing station shall be as shown in the drawing.
- The earth resistance shall be maintained with suitable soil treatment as shown in the drawing.
- The resistance of each earth station **should not exceed 1 ohm**.
- The earth lead shall be connected to the earth plate through Hot Dip G.I bolts.
- The earthing conductors shall be of copper strip in case of copper earthing and hot dip galvanized iron strip in case of G.I earthing. G.I pipe with funnel of approved quality shall be used for watering the earthing electrodes/station.
- The block masonry chamber with chequered plate shall be provided for hosing the funnel and the pipe for watering the earthing electrodes/ station.
- The hardware and other consumable for earthing installation shall be of copper/brass in case of G.I earthing.
- The link/test pit covers through chequered plate.

Installation and Connection:

- The plate / pipe electrode, as far as practicable, shall be buried below permanent moisture level but in no case less than 3Mtr below finished ground level.
- The plate / pipe electrode shall be kept clear of the building foundation and in no case; it shall be neared by less than 2Mtr from outer face of the respective building wall /column.
- The plate electrode shall be installed vertically and shall be surrounded with 153 mm thick layers of charcoal dust and salt mixture.
- 14 mm dia. G.I. pipe for watering shall run from top edge of the plate / pipe electrode to the mid-level of block masonry chamber.
- Top of the pipe shall be provided with G.I. funnel and screen for watering the earth /ground through the pipe.
- The funnel with screen over the G.I. pipe for watering to the earth shall be housed in a block masonry chamber as shown in the drawing.
- The masonry chamber shall be providing with a cast iron hinged cover resting over the cast iron frame which shall be embedded in the block masonry
- Contraction of the earthing station shall bin general be as shown in the drawing and shall conform to the requirement on the earth electrodes mentioned in the latest edition of Indian standard IS: 3047, Code of Practice for Earthing installation.
- The earth conductor (Strips / wires, G.I. / copper) inside the building shall properly be clamped / supported on the wall with Galvanized iron clamps and hot dip GI screws / bolts. The conductor outside the building shall be laid at least 814 mm. below the finished ground level.
- The earth conductor shall either terminate on earthing socket provide on the equipment or shall be fastened to the foundation bolt and /or on frames of the equipment. The earthing connection to equipment body shall be done after removing paint and other oily substance from the body and then properly be finished.
- Over lapping of earth conductor during straight through in joints, where required, shall be of minimum 75 mm. long.
- The earth conductor shall be in one length between the earthing grid and equipment to be earthed.

Earth leads and Connection:

- Earth lead shall be bare copper or galvanized steel as specified with sizes shown on drawings. Copper lead shall have a phosphor content of over 0.15%. Galvanized steel buried in the ground shall be protected with bitumen and Hessian wrap or polythene faced Hessian and bitumen coating. At road crossing necessary Hume pipes shall be laid. Earth lead run on surface of wall or ceiling shall be fixed on saddles so that strip is at least 8 mm away from the wall surface.
- The complete earthing system shall be mechanically and electrically bonded to provide an independent return path to the earth source.
- Wherever crossing is required, earth jumper shall be of insulated wires.

Equipment Earthing

- All apparatus and equipment transmitting or utilizing power shall be earthed in the following manner. Copper / G.I. earth strips /wires shall be used unless other-wise indicated in the Schedule B.

Power Transmission Apparatus

- Metallic conduit shall not be accepted as earth continuity conductor. A separate insulated continuity conductor of size 100% of the phase conductor subject to the minimum shall be provided.

Nominal Cross-Sectional Area Of Largest Associated Copper Circuit Conductor Sq. Mm	Nominal Cross-Sectional Area Of Earth-Continuty Conductor Sq. Mm
2.5	2.5
4	4
6	6

- The earth continuity conductor be drawn inside the conduit shall be insulated.
- Nor metallic conduit shall have an insulated earth continuity conductor of the same size for metallic conduit. All metal junction and switch boxes shall have an inside earth stud to which the earth conductor shall be connected. The earth conductor shall be distinctly colored (green or green / yellow) for easy identification.
- Armored cable shall be earthed by two distinct earth connections to the armoring at both the ends and the size of connection being as for the metallic conduit.
- In the case of unarmored cable, an earth continuity conductor shall either be run outside along with the cable or should from a separator insulated core of the cable.
- Three phase power panel and distribution boards shall have two distinct earth connections of the size correlated to the incoming cable size. In case of single phase of DB's a single earth connection is adequate.

Method of Measurement

- Provision of earthing station complete with excavation, electrode, watering pipe, soil treatment. Masonry chamber with cast iron cover etc. shall be treated as one unit of measurement.

Test

- The entire earthing installation shall be tested as per requirements of Indian standard Specification IS: 3047.
- The following earth resistance values shall be measured with an approve earth megger and recorded.
  1. Each earthing station.
  2. Earthing system as a whole.
  3. Earth continuity conductors
- Earth conductor resistance for each earthed equipment shall be measured which shall not exceed 5 ohm in each case.
- Measurements of earth resistance shall be carried out before earth connections are made between the earth and the object to be earthed.
- All tests shall be carried out in presence of the Corporation's representative.

Codes & Standards

- The design, material, assembling, inspection and testing shall comply with all currently applicable statutes, regulations and safety codes in the locality where the system will be installed. The equipment shall also confirm to the latest applicable standards and codes of practice as mentioned below

Sr No.	Description	Relavant Code & Standards
1	Code of practice for earthing	IS 2309 BS7470
2	Insulation co-ordination application guide	IS 3716
3	Code of practice for protection of buildings and allied structures against lightning	IS 3047 BS 6651
	IEEE guide for safety in AC sub-station grounding	IEEE 80
	Standard for qualifying permanent connections used in Substation grounding.	IEEE 837
4	Indian electricity rules, 1156 with latest amendments	
5	Indian electricity act, 1110	
6	National electrical code	

Wherever, reference to any specification appears in this document, it shall be

Taken as a reference to the latest version of that specification unless the year of issue of the specification is specifically stated.

PART 7:- INTERNAL ELECTRICAL

PART D:- EARTHING SYSTEM

Item No.1:

Scope of work: Providing and erecting required size **HOT deep Galvanized iron strip** for earthing of H.T. , OCB/ ACB/ Transformer LT pannel board, Motors etc. using proper clamp.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.2:

Scope of work: Providing and erecting required size **COPPER strip** for earthing of H.T., OCB/ ACB/ Transformer LT panel board, Motors etc. using proper clamp.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.3: 3 Meter Safe Earthing Electrode

Scope of Work: Supplying & erecting earth pit of minimum bore dia. 153mm size approved make Safe Earthing Electrode consisting Pipe-in-Pipe Technology as per IS 3047-1187 made of corrosion free G.I Pipes having Outer pipe dia of 53mm having 80-140 Micron galvanising, Inner pipe dia of 25mm having 140-253 Micron galvanising, connection terminal dia of 12mm with constant ohmic value surrounded by highly conductive compound with high charge dissipation suitable for following type of applications.

(b) For Electrical Installation up to 11KV in normal soil.

Length of Pipe : 3.00mtrs

Back filling Compound : 2 no. Bag of 25kg.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

PART 8:- EXTERNAL ELECTRICAL

PART D:- EARTHING SYSTEM

Item No.3:Pipe type earthing

Pipe type earthing having 153 cms. long and 2.5 cms. dia. galvanized iron pipe with coupling and buch buried in specially prepared earth pit complete with necessary 8 SWG earth wire. (for Street Light) . With using salt and charcoal / coke as required for pipe type earthing. - to be used for each Street. Light

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

STANDARD SPECIFICATION FOR LT CABLES &CABLE TERMINATION

GENERAL MATERIAL SPECIFICATION

1.1 KV GRADE L.T. CABLES:

Scope

- This section shall cover supply, laying, testing and commissioning of medium voltage XLPE Cables. This specification gives the general requirement of cables. However, it is the responsibility of the vendor to take the joint measurement, prepare the cable schedule and obtain client's (SMC) approval before the placement of orders to the main supplier /manufacturer. The quantity mentioned in the Schedule-B is tentative. Cut lengths will not be accepted.

Standards

The following standards and rules shall be applicable:

IS: 7098 Part I	XLPE insulated electric cables (heavy duty)
IS: 3984	Recommended current ratings for cables
IS: 890	Aluminum conductors for insulated cables

Indian Electricity Act Rules.

GENERAL

- The medium voltage cables shall be supplied, laid, connected, tested and commissioned in accordance with the drawings, specifications, relevant Indian standards specifications, manufacturer's instruction, all cables run in parallel between L.T. side of the existing transformer, L.T. incomer A.C.B.'S of L.T. switch board panel / outgoing of panel to motor terminal etc as required and as directed by the engineer-in-charge. Excavation and refilling using bricks, road crossing using RCC pipe, sand etc. Will be in the scope of contractor and shall be done as per relevant is standard.
- The cable shall confirm to relevant is which should be specified and shall bear ISI mark. The quantities mentioned above are approximate only. The cables should be supplied after taking actual measurement jointly. No straight joint in any cables shall be permitted. Any piece or cut length shall have to be taken back by contractor. The contractor should plan and purchase the cable to avoid wastage / cut length / excess length as the client will not accept the same under any circumstances. The cable shall be genuine and of approved make only.
- Root marker shall be provided for every 10 meter length of underground cable and cable identifier for every 14 meter length of cable not covered in underground.
- RCC half round muff of standard make shall be provided for protection of underground cable.
- All above item should be got approved from engineer-in-charge before execution.
- The cables shall be delivered at site in the original drums with manufacturer's name, size and type clearly written on the drums.
- All cables shall be adequately protected against any risk of mechanical damage to which they may be liable in normal conditions of handling during transportation, loading, unloading etc.
- The cable shall be supplied in single length i.e. Without any intermediate joint or cut unless specifically approved by the client. The cable ends shall be suitably sealed against entry of moisture, dust, water etc. With cable compound as per standard practice.
- All Cable shall be FRLS Type only

CONDUCTOR

- Uncoated, annealed copper / aluminium, of high conductivity, up to 4 mm2 size the conductor shall be solid and above 4 sq. Mm, the conductor shall be concentrically stranded as per IEC: 228.

Insulation

- Cross link polyethylene (XLPE) extruded insulation rated at 70oc.

Core Identification

Two cores	: red and black
Three cores	: red, yellow and blue
Four core	: red, yellow, blue and black
Single core	: green, yellow for earthing.

Black shall always be used for neutral.

Assembly

- Two, three or four insulated conductors shall be laid up, filled with non-hygroscopic material and covered with an additional layer of thermoplastic material.

Armour

- Galvanized steel flat strip / round strips applied helically in single layers complete with covering the assembly of cores
- For cable size up to 10 sqmm :armor of 1.4 mm diag.i. round wire
- For cable size above 10 sqmm :armor of 4 mm wide 0.8 mm thick gi strip

Sheath

- St -2 PVC along with polypropylene fillers to be provided. Inner sheath shall be extruded type and shall be compatible with the insulation provided for the cables. Outer sheath shall be of an extruded type layer of suitable pvc material compatible with the specified ambient temp. Of 53oc and operating temperature of cables. The sheath shall be resistant to water, ultra violet radiation, fungus, termite and rodent attacks. The colour of outer sheath shall be black. Sequential length marking along with size and other standard parameters shall be required at every 1.0 meter on the outer sheath.

Testing

- The finished cables shall be tested at manufacturer's works for all the routine tests for all the length and size of cables to be delivered at site and the certificate for the same shall be furnished to client. If required, the cables shall be tested in presence of the client's representative.
- Voltage test: each core of cable shall be tested at room temperature at 3 kv A.C. R.M.S. for duration of 5 minutes.
- FRLS Test

Conductor Resistance Test

- The D.C. resistance of each conductor shall be measured at room temperature and the results shall be corrected to 14 degree centigrade to check the compliance with the values specified in the is 890 – 1176.

Cable tests before and after laying cables at site:

- Insulation resistance test between phases, phase to neutral and phase to earth.
- Continuity test of all the phases, neutral and earth continuity conductor.
- Earth resistance test of all the phases and neutral.
- All the tests shall be carried out in accordance with the relevant is code of practice and INDIAN electricity rules. The vendor/contractor shall provide necessary instruments, equipment's and labour for conducting the above tests and shall bear all the expenses in connection with such tests. All tests shall be carried out in the presence of client and the results shall be prescribed in forms and submitted.

CABLE MARKING

- The outer sheath shall be legibly embossed at every meter with following legend: electric cable: 1100 v, size: ___c x ____ mm^2 with manufacturer's name, year of manufacturing and ISI symbol.

SEALING DRUMMING AND PACKING

- After tests at manufacturer's woks, both ends of the cables shall be sealed to prevent the ingress of moisture during transportation and storage. Cable shall be supplied in length of 530 metres or as required in non-returnable drums of sufficiently sturdy construction. Cables of more than 253 meters shall also be supplied in non-returnable drums. The spindle hole shall be minimum 110 mm in diameter.
- Each drum shall bear on the outside flange, legibly and indelibly in the english literature, a distinguishing number, the manufacturer's name and particulars of the cable i.e. Voltage grade, length, conductor size, cable type, insulation type, and gross weight. The direction for rolling shall be indicated by an arrow. The drum flange shall also be marked with manufacturer's name and year of manufacturing etc.

L.T. CABLE TERMINATIONS

Cable Termination

- Cable terminations shall be made with aluminium crimped type solder less lugs for all aluminium cables and stud type terminals. For copper cables copper crimped solder less lugs shall be used. Crimping shall be done with the help of hydraulically operated crimping tool. For joints where cable is with aluminium conductor and bus bars are aluminium, bimetallic lugs shall be used with compound. Cupal type of washers, crimping tool shall be used for crimping any size of cable.

Cable Glands

- Cable glands shall be of brass single compression type. Generally single compression type cable glands shall be used for indoor protected locations and double compression type shall be used for outdoor locations. Glands should be of nickel-plated brass, with pvc shrouds over it. Before applying PVC shrouds, all bare metal shall be wrapped with pressure sensitive adhesive tape.
- For cable above 10mm², glands shall be Double compression type only

Ferrules

- Ferrules shall be of self-sticking type and shall be employed to designate the various cores of the control cable by the terminal numbers to which the cores are connected, for ease in identification and maintenance.

Cable Joints

- Kit type joint shall be done and filled with insulating compound. The joint should be for this 1.1 kv grade insulation, cable termination for conductors up to 4 sqmm may be insertion type and all higher sizes shall have compression type lugs. Cable termination shall have necessary brass glands. The end termination shall be insulated with a minimum of six half-lapped layers of pvc tape. Cable armouring shall be earthed at both ends. Cable joints shall be done as per regular practice and check shall be carried out for loose connections and leakages. Insulation cutting shall be done properly taking care that no area of the conductor remains exposed. Crimping shall be done with the help of hydraulic tool. Proper insulation tape shall be applied at the cable and lug joint.

Saddles and Clips

- Saddles and clips shall be pvc covered or of g.i. fixing screws shall be round head brass, where screws are used. Nuts shall be or brass, square pressed type.

Jointing Sleeves

- Jointing sleeves shall be of brass with standard termination. Solder type cable connectors / cable sleeves shall be used to join the cable / conductors. The solder used shall comply with B.S. 211 type no corrosive flux only shall be used.

RCC Hume Pipe

- The Concrete Pipes shall be conforming to IS: 478/1403 (Fourth Revision) with up-to-date amendment with regards to Design /Dimensions / Tolerances / Workmanship & Finish / Materials used for making the Pipes. The Pipes shall be manufactured by spinning process. The ends of the

concrete pipes shall be suitable for flush joints or collar joints or suitable for Socket & Spigot, roll on joints or confined gasket joints as per the requirements of the purchaser.

DWC Pipe

- Double walled corrugated pipes (DWC) of polyethylene (conforming to is 12930 ii) with necessary connecting accessory of same material at required date for laying of cable below ground / road surface for enclosing the cable and back filling the same to make ground as per original.
- Diameter mentioned in the abstract sheet shall be considered Inner Diameter.
- Excavation and covering the cable:
- The DWC duct shall be prominently marked with indelible ink, with the following information at interval of every meter to enable identification of the pipe. The size of the ink markings shall be distinct, clear and easily visible.
- All Specified Size are considered to be Internal Diameter
- Ink marking would have following written:
    - ✓ Manufacturer's name (can be in abbreviated form)
    - ✓ Name of the duct with size
    - ✓ Lot no. Of the product
    - ✓ Date of manufacture
    - ✓ Product length

CABLE TRAY

General

- The cable tray shall be fabricated out of 3 mm thick slotted/ perforated MS sheets as channel sections, single or double bended. The channel sections shall be supplied in convenient lengths and assembled at site to the desired lengths. These may be galvanized or painted as specified.
- The jointing between the sections shall be made with coupler plates of the same material and thickness as the channel section. Two coupler plates, each of minimum 140mm length, shall be bolted on each of the two sides of the channel section with 8mm dia round headed bolts, nuts and washers. In order to maintain proper earth continuity bond, the paint on the contact surfaces between the coupler and cable tray shall be scraped and removed before the installation.
- The permissible uniformly distributed load for various type of cables trays and for different supported span shall be as per IS.
- The width of the cables tray shall be chosen so as to accommodate all the cables in one tier, plus 30 to 53% additional width for future expansion. This additional width shall be minimum 100mm. The overall width of one cable tray shall be limited to 1000mm.
- Factory fabricated bends, reducers, tee / cross junction. Etc shall be provided as per good engineering practice. The radius of bends, junctions etc. shall be less than the minimum permissible radius of bending of the largest size of cable to be carried by the cable tray.
- The cable tray shall be suspended from the ceiling slab with the help of 10 mm dia MS round or 25 mm x 5 mm flats at specified spacing. Flat type suspenders may be used for channels up to 470 mm width bolted to cable trays. Round suspenders shall be threaded and bolted to the cable trays or to independent support angle 53 mm x 53 mm x 5mm at the bottom and as specified These shall be grouted to the ceiling slab at the other end through an effective means, as approved by the Engineer – in – charge, to take the weight of the cable tray with the cables.
- The entire tray (except in the case of galvanized type) and the suspenders shall be painted with two coats of red oxide primer paint after removing the dirt and rust, and finished with two coats of spray paint of approved make synthetic enamel paint.
- The cable tray shall be bonded to the earth Terminal of the switch bonds at ends.

- The cable tray shall be measured on unit length basis, along the centre line of the cable tray, including bends, reducers, tees, cross joints, etc.
- The ladder type of cable tray shall be fabricated of double bended channel section longitudinal members with single bended channel section rungs of cross members welded to the base of the longitudinal members at a centre to centre spacing of 253 cm as per IS.

Cable Laying

Route

- Before the cable laying work is undertaken, the route layout of the cable shall be submitted to the Engineer -in-Charge and the work shall be undertaken only after approval of the route layout.
- Whenever cables of different voltages are laid following points shall be noted while laying along well demarcated or established roads, the LV / MV cables shall be laid further from the kerbed line than HV cables.
- Cables of different voltages and also power and control cables shall be kept in different trenches with adequate separation. Where available space is restricted such that this requirement cannot be met, LV / MV cables shall be laid above HV cables.
- Where cables cross one another, the cable of higher voltage shall be laid at a lower level than the cable of lower voltage.
- Proximity to communication cables
- Power and communication cables shall be as far as possible cross each other at right angles. The horizontal and vertical clearance between them shall not be less than 82 cm.

Methods of Laying

- The cables shall be laid direct in ground, pipe, closed or open ducts, cable trays or on surface of wall etc. The method(s) of laying required shall be specified in the tender / schedule of work.

Laying Direct in Ground

- This method shall be adopted where specified in the schedule of works. Normally this method shall be adopted when the cable route is through open ground, along roads, lanes, etc. and where no frequent excavations are likely to be encountered and where re-excavation is easily possible without affecting other services.

Trenching

- Width and depth of the trench shall be as shown in the drawing. When more than one tier of cables is unavoidable and vertical formation of laying is adopted, the depth of the trench shall be increased by 30 cm for each additional tier to be formed
- The trenches shall be excavated in reasonably straight lines. Wherever there is a change in the direction, a suitable curvature shall be adopted complying with the minimum bending radius specified inTable – 11. Where gradients and changes in depth are unavoidable, these shall be gradual. The bottom of the trench shall be level and free from stones, brick bats etc.

TABLE – 2

System voltage	Minimum bending radius		
	Single Core	Multi-Core	
		Armored	Unarmored
11KV	14D	12D	15D
22KV	25D	15D	14D
34KV	30D	14D	25D

Note: Where “D” is the overall diameter of the cable

- Excavation should be done by suitable means – manual or mechanical. The excavated soil shall be stacked firmly by the sideof the trench such that it may not fall back into the trench.
- Adequate precautions should be taken not to damage any existing cable(s), pipes or any other such installations in the route during excavation. Wherever bricks, tiles or protective covers or bare cables are encountered, further excavation shall not be carried out without the approval of the Engineer-in-Charge.
- Existing property, if any, exposed during trenching shall be temporarily supported adequately as directed by the Engineer-in-Charge. The trenching in such cases shall be done in short lengths, necessary pipes laid for passing cables there in , if required. If there is any danger of a trench collapsing or endangering adjacent structures, the sides should be well shored up with sheeting as the excavation proceeds. Where necessary, these may even be left in place when backfilling the trench.
- Excavation through lawns shall be done in consultation with the department concerned.

Laying of Cable in Trench

- Sand cushioning: The excavated trench shall be provided with a layer of clean, dry sand cushion of not less than 8 cm in depth, before laying the cables therein. However, sand cushioning may not be provided for MV cables, where there is no possibility of any mechanical damage to the cables due to heavy or shock loading on the soil above if so specified in the tender document and as per approval of the Engineer-in-Charge. Sand cushioning shall however be invariably provided in the case of HV cables.
- The cable drum shall be properly mounted on jacks, or on a cable wheel at a suitable location, making sure that the spindle, jack etc. are strong enough to carry the weight of the drum without failure and that the spindle is horizontal in the bearings so as to prevent the drum creeping to one side while rotating.
- The cable shall be pulled over in rollers in the trench steadily and uniformly without jerks and strain. The entire cable length shall be far as possible laid off in one stretch. PVC / XLPE cables less than 114 sq.mm size may be removed by “Flaking” i.e. by making one long loop in the reverse direction. For short runs and sizes up to 53 sq.mm of MV cables, any other suitable method of direct handling and lying can be adopted without strain or excess bending of the cables.
- After the cable has been so uncoiled, it shall be lifted slightly over the rollers beginning from one end by helpers standing about 10 m apart and drawn straight. The cable shall then be lifted off the rollers and laid in a reasonably straight line.
- Testing before covering. The cables shall be tested in presence of the Engineer -in-Charge for continuity of cores and insulation resistance and the cable length shall be measured, before closing the trench.
- Sand covering: Cables laid in trenches in a single tier formation shall have a covering of dry sand of not less than 10 cm above the base cushion of sand before the protective covers laid. In the case of vertical multi -tier formation, after the first cable has been laid, a sand cushion of 30 cm shall be provided over the base cushion before the second tier is laid. If additional tiers are formed, each of the subsequent tiers also shall have a sand cushion of 30 cm as stated above. Cables in the top most tier shall have a final sand covering not less than 10 cm before the protective cover is laid. Sand covering as stated above need not be provided for MV cables where a decision is taken by the Engineer -in-Charge as per sub clause (iii-a) above, but theater tier spacing should be maintained with soft soil instead of sand between tiers and for covering. Sand cushioning shall however be invariably provided in the case of HV cables.

Extra Loop Cable

- At the time of original installation, approximately 3 m of surplus cable shall be left on each terminal end of the cable and on each side of the underground joints. The surplus cable shall be left in the form of a loop. Where there are long runs of cables such loose cable may be left at suitable intervals as specified by the Engineer-in-Charge.

- Where it may not be practically possible to provide separation between cables when forming loops of a number of cables as in the case of cable emanating from a substation, measurement shall be made only to the extent of actual volume of excavation, sand filling etc and paid for accordingly.
- Mechanical protection over the covering: Mechanical protection to cables shall be laid over the covering to provide warning to future excavators of the present of the cable and also to protect the cable against accidental mechanical damage by pick-axe blows etc. as follows:
- Unless otherwise specified, the cables shall be protected b y second class brick of nominal size 22 cm x 11.4 cm x 7 cm or locally available size, placed on top of the sand (or, soil as the case may be). The bricks shall be placed breadth wise for the full length of the cable. Where more than one cable is to be lai d in the same trench, this protective covering shall cove all the cables and projects at least 5 cm over the sides of the end cables.
- Where bricks are not easily available, or are comparatively costly, there is no objection to use locally available mat erial such as tiles or slates or stone / cement concrete slabs. Where such an alternative is acceptable, the same shall be clearly specified in the tender specifications.

Backfilling

- The trenches shall be then backfilled with excavated earth, free from stones or other shall edged debris and shall be rammed and watered, if necessary in successive layers not exceeding 30 cm depth.
- Unless otherwise specified, a crown of earth not less than 53 mm and not exceeding 100 mm in the centre and tapering towards the sides of the trench shall be left to allow for subsidence. The crown of the earth, however, should not exceed 10 cms so as not to be a hazard to vehicular traffic.
- The temporary restatements of roadways should be inspected at regular intervals, particularly during wet weather and settlements should be made good by further filling as may be required.
    - ✓ After the subsidence has ceased, trenches cut through roadways or other paved areas shall be restored to the same density and materials as the surrounding area and repaved in accordance with the relevant building Specifications to the satisfaction of the Engineer -in-Charge.
    - ✓ Where road berms of lawns have been cut out of necessity, or kerb stones displaced, the same shall be repaired and mad e good, except for turfing /asphalting, to the satisfaction of the Engineer -in-Charge and all the surplus earth or rock shall be removed to places as specified.

Laying Of Single Core Cables

- Three single core cables forming one three phase circuit shall normally be held enclose trefoil formation and shall be bound together at intervals of approximately 1m. The relative position of the three cables shall be changed at each joint at the time of original installation, complete transposition being effected in every three consecutive cable lengths.

Route Markers

- Location: Route markers shall be provided along with the runs of cable allocations approved by the Engineer -in-Charge and generally at intervals not exceeding 100m. Markers shall also be provided to identify change in the direction of the cable route and locations of underground joints.
- **Plate type marker:** Route markers shall be made out of 100 mm x 5 mm G.I. /aluminium plate welded / bolted on 34 mm x 34 mm x 6 mm angel iron, 82 cms long. Such plate markers shall be mounted parallel to and at about 0.5 m away from the edge of the trench.
- **CC marker:** Alternatively, cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate of 14 mm in size) shall be laid flat and centered over the cable. The concrete markers, unless otherwise instructed by the Engineer -in-Charge, shall project over the surrounding surface so as to make the cable route easily identifiable.
- **Inscription:** The words IITG-MV / HV CABLE as the case may be shall be inscribed on the marker.

Laying in Pipes / Closed Ducts

- In locations such as road crossing, entry in to buildings, paved areas etc., and cable shall be laid in pipes or closed ducts. Stone ware pipes, GI, CI or spun reinforced concrete pipes shall be used for cables as specified in the schedule of works.
- Where cables pass through foundation walls or other underground structures, the necessary ducts or openings will be provided in advance for the same. However, should it become necessary to cut holes in existing foundations or structures, the electrical contractor shall determine their location and obtain approval of the Engineer in Charge before cutting is done.
- At road crossing and other places where cables enter pipe sleeves adequate bed of sand shall be given so that the cables do not slack and get damaged by pipe ends.
- At road crossings, the top surface of pipes shall be at a minimum depth of 1 m from the pavement level. When pipes are laid cutting existing road, care shall be taken so that the soil filled up after laying the pipes is rammed well in layers with watering as required to ensure proper compaction. A crown of earth not exceeding 10 cm should be left at the top. After the subsidence has ceased, the top of the filled up trenches in road ways or other paved areas shall be restored to the same density and material as the surrounding area in accordance with the direction of the Engineer -in-Charge (Civil) up to his satisfaction.
- All G.I. pipes shall be laid as per layout drawings and site requirements. Before fabrication of various profiles of pipe by hydraulically operated bending machine (which is to be arranged by the Contractor), all the burrs from the pipes shall be removed. G.I. pipes with bends shall be buried in soil / concrete in such a way that the bends shall be totally concealed. For G.I. pipes buried in soil, bitumen coating shall be applied on the buried lengths. Installation o f G.I. pipes shall be undertaken well before paving is completed and necessary coordination with paving agency shall be the responsibility of Electrical Contractor. The open ends of pipes shall be suitably plugged with G.I. plugs after they are laid in fin al position. G.I. plugs shall be supplied by the Contractor at no extra cost.

Laying In Open Ducts

- Open ducts with suitable removable covers (RCC slabs or chequered plates) are generally provided in substations, switch rooms, plant rooms, and workshops etc. for taking the cables. The cable ducts should be of suitable dimensions for the number of cables involved.
- For lying of cables with different voltage ratings in the same duct shall be avoided. Where it is inescapable to take HV & MV cables same trench, they shall be laid with a barrier between them or alternatively, one of the two (HV / MV) cables may be taken through pipe(s). Splices or joints of any type shall not be permitted inside the ducts.
- The cables shall be laid directly in the duct such that unnecessary crossing of cables is avoided.
- Where specified, cables may be fixed with clamps on the walls of the duct or taken in hooks / brackets / cable trays through in ducts.
- Where specified, ducts may be filled with dry sand aft er the cablesare laid and covered as above, or finished with cement plaster, especially in high voltage applications.

Laying on Surface

- The method may be adopted in places like switch rooms, workshops, tunnels, rising (distribution) mains in buildings etc. This may be necessitated in the works of additions and / or alternations to the existing installation, where other methods of laying may not be feasible. Cables may be laid in surface by any of the following methods as specified:
    - ✓ Directly clamped by saddles or clamps
    - ✓ Supported on cradle
    - ✓ Laid on troughs / trays duly clamped.

Laying on Cable Tray

- This method may be adopted in places like indoor substations, air - conditioning plant rooms; generator rooms etc. or where long horizontal runs of cables are required within the building and where it is not convenient to carry the cable in open ducts. This method is preferred where heavy sized cables or a number of cables are required to be laid. The cable trays may be either of perforated sheets Type or ladder type as specified.
- Cable dressing with heavy duty PVC UV protected cable ties & Final clamping with Aluminum 2mm thickness strips at the interval of 400mm

MS Fabrication

- Providing, fabricating and fixing in position works such as ladders, making suitable cable trays as directed by Engineer-in- charge, screens, etc. as directed by Engineer-in-charge. The detailed drawing or sketch shall be given by the department as and when required depending on the site condition. The final drawing as per fabrication done will be supplied by the contractor. The fabrication shall have to be done using various M.S. steel sections like round, square, flats, angles, channels or M.S. joists as per site requirement. The complete fabricated structure shall be scraped, cleaned and galvanizing coating. This item also includes breaking of R.C.C. slab, beam etc. as per site requirement and make it finish. Sand, cement etc. will be supplied by the tenderer for the same work.

PART 7:- INTERNAL ELECTRICAL

PART E:- LT CABLES & CABLE TERMINATION

Item No.1:LT Cables: 3 1/2 core 34 Sq. mm (25 Sq. 1/2 mm core)

Scope of work: Providing and erecting **XLPE(IS:7098)(I)-88 ISI armoured cable** multistrand Aluminium conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench / pipe of following size of cables.

Size: (B) 3 1/2 core 53 Sq. mm (25 Sq.1/2 mm core)

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.2: LT Cables: 4 core 6 Sq. mm

Scope of work: Providing and erecting **XLPE (IS:7098)(I)-88 ISI armoured cable** multistrand Aluminium conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench/pipe at road crossing or floor of following size of cables.

Size: (B) 4 core 6 Sq. mm

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.3: 3 Core x 2.5 Sq. mm Flat Flexible Submersible copper cable

Scope of Work: Providing and erecting ISI marked PVC insulated PVC Sheathed Flat flexible Submersible copper cable approved make of following Size.

Size: (b) 3 Core x 2.5 Sq. mm.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.4: Making trench in soft soil

Scope of Work: Making trench in soft soil of suitable width of 90 cms deep for laying cable or locating the fault all over the run and backfilling the same and making the surface as normal ground, As per standard workmanship & specification.

Item No.5: R.C.C. Hume pipe 153mm Dia

Scope of Work: Providing & laying. R.C.C. hume pipe for cable to be laid 90 cms. below ground across the road crossing or on floor with necessary material in an approved manner and making the ground as per original.

Size: 153 mm dia

The Concrete Pipes shall be conforming to IS: 478/1403 (Fourth Revision) with Amendment 1 with regards to Design /Dimensions / Tolerances / Workmanship & Finish / Materials used for making the Pipes.

The Pipes shall be manufactured by spinning process. The ends of the concrete pipes shall be suitable for flush joints or collar joints or suitable for Socket & Spigot, roll on joints or confined gasket joints as per the requirements

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.6: 90mm Dia. Double walled corrugated (DWC) pipes

Scope of Work: Providing & laying Double walled corrugated pipes (DWC) of polyethylene (conforming to IS 12930II) with necessary connecting accessories of same material at required depth for laying of cablebelow ground / roadsurface for enclosing cable and back filling the same to make ground as per original.

Size : Inner Diameter of pipe 90mm.

Excavation and covering the cable: The DWC duct shall be prominently marked with indelible ink, with the followinginformation at interval of every meter to enable identification of the pipe. The size of the ink markings shall be distinct,clear and easily visible.
Ink marking would have following written:
Manufacturer's name (can be in abbreviated form)
Name of the duct with size
Lot no. Of the product
Date of manufacture
Product length
Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.7:2 to 4 core 6 Sq. mm Cable Termination with Gland

Scope of Work: Providing and, fixing heavy duty flange type brass cable gland with rubber ring for PVC insulated armoured cable complete without going tails, insulating tape etc. for following size of cables, as per standard material specification & workmanship.

Size: 2 to 4 core 6 Sq. mm

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.8:3 core 34/53 Sq. mm Cable Termination with Gland

Scope of Work: Providing and, fixing heavy duty flange type brass cable gland with rubber ring for PVC insulated armoured cable complete without going tails, insulating tape etc. for following size of cables. as per standard material specification & workmanship.

Size: 3 core 34/53 Sq. mm

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.9:1.5/ 2.5/4/6 Sq.mm Cable End Termination with Lugs

Scope of Work: Providing and, fixing Solder less crimping type **Aluminium lug**s conforming to IS suitable for cable of following size evenly crimped with high pressure tool & connected to switchgear terminals with brass/cadmium plated nut bolts in an approved manner, as per standard material specification & workmanship.

Size: 1.5/ 2.5/4/6 Sq.mm.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.10: 34/53 Sq.mm. Cable End Termination with Lugs

Scope of Work: Providing and, fixing Solder less crimping type **Aluminium lugs** conforming to IS suitable for cable offollowing size evenly crimped with high pressure tool & connected to switchgear terminals with brass/cadmium platednut bolts in an approved manner, as per standard material specification & workmanship.

Size: 34/53 Sq.mm.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

PART 8:- EXTERNAL ELECTRICAL

PART B:- CABLES,WIRES & TERMINATION

Item No.1:

Scope of Work: Supplying & erecting Flexible PVC insulated multistrand multicore 1.1 KV grade ISI marked Copper Wires of following Size to be erected as directed.**(h) 3 core 2.5 Sq. mm round PVC sheathed**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.2:

Scope of Work: Providing and erecting XLPE(IS:7098)(I)-88 ISI armoured cable multistrand Aluminium conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench / pipe at road crossing or floor of following size of cables.**(A) 3 1/2 core 25 Sq.mm (16 Sq. mm 1/2 core)**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.3:

Scope of Work: Providing and erecting XLPE(IS:7098)(I)-88 ISI armoured cable multistrand Aluminium conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench / pipe at road crossing or floor of following size of cables.

(A-1) 3 1/2 core 34 Sq. mm (16 Sq. mm 1/2 core)

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.4:

Scope of Work: Providing and erecting XLPE(IS:7098)(I)-88 ISI armoured cable multistrand Aluminium conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench /pipe at road crossing or floor of following size of cables. **(C) 3 1/2 core 70 Sq. mm (34 Sq. mm 1/2 core)**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.5:

Scope of Work: Providing and erecting XLPE (IS:7098)(I)-88 ISI armoured cable multistrand Aluminium conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench / pipe of following size of cables.**(C) 4 core 10 Sq. mm**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.6:

Scope of Work: Providing and erecting XLPE (IS:7098)(I)-88 ISI armoured cable multistrand Aluminium conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench / pipe of following size of cables. **(D) 4 core 25 Sq. mm**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.7:

Scope of Work: Providing and erecting XLPE(IS:7098)(I)-88 ISI armoured cable multistrand Copper conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench /pipe at road crossing or floor of following size of cables.**(A-1) 4 core 4 Sq. mm**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.9:

Scope of Work: Providing and erecting ISI marked PVC insulated PVC Sheathed Flat flexible Submersible copper cable approved make of following Size. **(c) 3 Core x 4 Sq. mm**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.11: R.C.C. Hume pipe 253mm Dia

Scope of Work: Providing & laying. R.C.C. hume pipe for cable to be laid 90 cms. below ground across the road crossing or on floor with necessary material in an approved manner and making the ground as per original.

Size: 253 mm dia

The Concrete Pipes shall be conforming to IS: 478/1403 (Fourth Revision) with Amendment 1 with regards to Design /Dimensions / Tolerances / Workmanship & Finish / Materials used for making the Pipes.

The Pipes shall be manufactured by spinning process. The ends of the concrete pipes shall be suitable for flush joints or collar joints or suitable for Socket & Spigot, roll on joints or confined gasket joints as per the requirements

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.9: O.D. 53 /I.D. 37 mm dia. Double walled corrugated (DWC) pipes

Scope of Work: Providing & laying Double walled corrugated pipes (DWC) of polyethylene (conforming to IS 12930 II) with necessary connecting accessories of same material at required depth for laying of cablebelow ground / road surface for enclosing cable and back filling the same to make ground as per original.

Size : O.D. 53 /I.D. 37 mm dia.

Excavation and covering the cable: The DWC duct shall be prominently marked with indelible ink, with the following information at interval of every meter to enable identification of the pipe. The size of the ink markings shall be distinct, clear and easily visible.

Ink marking would have following written:

- Manufacturer's name (can be in abbreviated form)
- Name of the duct with size
- Lot no. Of the product
- Date of manufacture
- Product length

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.12: **O.D. 90 /76 I.D. mm Dia. Double walled corrugated (DWC) pipes**

Scope of Work: Providing & laying Double walled corrugated pipes (DWC) of polyethylene (conforming to IS 12930 II) with necessary connecting accessories of same material at required depth for laying of cablebelow ground / road surface for enclosing cable and back filling the same to make ground as per original.

Size : O.D. 90 /76 I.D. mm Dia.

Excavation and covering the cable: The DWC duct shall be prominently marked with indelible ink, with the following information at interval of every meter to enable identification of the pipe. The size of the ink markings shall be distinct, clear and easily visible.

Ink marking would have following written:

- Manufacturer's name (can be in abbreviated form)
- Name of the duct with size
- Lot no. Of the product
- Date of manufacture
- Product length

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.15: 114mm Dia. Double walled corrugated (DWC)pipes

Scope of Work: Providing & laying Double walled corrugated pipes (DWC) of polyethylene (conforming to IS 12930II) with necessary connecting accessories of same material at required depth for laying of cablebelow ground / roadsurface for enclosing cable and back filling the same to make ground as per original.

Size : Inner Diameter of pipe 114mm

Excavation and covering the cable: The DWC duct shall be prominently marked with indelible ink, with the followinginformation at interval of every meter to enable identification of the pipe. The size of the ink markings shall be distinct,clear and easily visible.

Ink marking would have following written:

- Manufacturer's name (can be in abbreviated form)
- Name of the duct with size
- Lot no. Of the product
- Date of manufacture
- Product length

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.10: 2 to 4 core 10 Sq. mm Cable Termination with Gland

Scope of Work: Providing and, fixing heavy duty flange type brass cable gland with rubber ring for PVC insulated armoured cable complete without going tails, insulating tape etc. for following size of cables, as per standard material specification & workmanship.

Size: 2 to 4 core 10 Sq. mm

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.18: 2 to 4 core 16 Sq. mm Cable Termination with Gland

Scope of Work: Providing and, fixing heavy duty flange type brass cable gland with rubber ring for PVC insulated armoured cable complete without going tails, insulating tape etc. for following size of cables, as per standard material specification & workmanship.

Size: 2 to 4 core 16 Sq. mm

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.11:10 sq.mm Cable End Termination with Lugs

Scope of Work: Providing and, fixing Solder less crimping type **Aluminium lugs** conforming to IS suitable for cable offollowing size evenly crimped with high pressure tool & connected to switchgear terminals with brass/cadmium platednut bolts in an approved manner, as per standard material specification & workmanship.

Size: 10 Sq.mm.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.14: 25 sq.mm Cable End Termination with Lugs

Scope of Work: Providing and, fixing Solder less crimping type **Aluminium lugs** conforming to IS suitable for cable of following size evenly crimped with high pressure tool & connected to switchgear terminals with brass/cadmium plated nut bolts in an approved manner.

Size: 25 Sq.mm.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.21: 1.5/ 2.5/4/6 Sq.mm Cable End Termination with Lugs

Scope of Work: Solder less crimping type **Aluminium lugs** conforming to IS suitable for cable of following size evenlycrimped with high pressure tool & connected to switchgear terminals with brass/cadmium plated nut bolts in anapproved manner, as per standard material specification & workmanship.

Size: 1.5/ 2.5/4/6 Sq.mm.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

STANDARD SPECIFICATION FOR FAN & RELATED ACCESSORIES

GENERAL MATERIAL SPECIFICATION

FANS, REGULATORS AND CLAMPS

Ceiling fan should follow the below mentioned standards

- Is 374(part 0/sec 0):1179 : electric ceiling type fans and regulators (thirdRevision)
- Is 2997(part 0/sec 0):1164 : air circulator types electric fans and regulators
- Is 302 (part 2/sec 80):1403: safety of household and similar electricalAppliances
- Part 2 particular requirements, sec 80 fans (superseding is 12155:1187)

Ceiling fans including their suspension shall conform to relevant ISS with secondary safety device incorporated against free fall of fans from their hooks.

Fan hooks made of MS rods of 15mm diameter shaped in 'u' form with their legs projecting horizontally on the top at least 11 cm on either side and tied over the top reinforcement of the roof shall be laid in the concrete slabs.

The body of the ceiling fan, exhaust fan and fan regulator shall be connected to the earthing system by proper earth leads.

EXHAUST FANS

Exhaust fans shall conform to IS 302(part 2/sec 80):1403 : safety of household and similar electrical appliances: part 2 particular requirements, Sec. 80 - fans (superseding is 12155:1187) and other relevant ISS.

PART 7:- INTERNAL ELECTRICAL

PART F:- FAN & RELATED ACCESSORIES

Item No.1:SETC of 1140 mm Ceiling Fan

Scope of Work: Providing and erecting Approved make Power Saving Max. 53 Watt Ceiling fan with double ball bearing ISI mark with condenser A.C. 23OV.53 c/s.1140 mm. sweep complete having 3 blades with aluminium blades with canopy and 30 cms. down rod erected on existing hook or clamp with 24/0.2 , 3 core flexible wire with earthing. [Latest 5 star Rating as per list declared by BEE]

Minimum Air Delivery: 210 cu m/min

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.2: Fan Hook

Scope of work: Supplying & Erecting **Fan Hook of 10 mm** M.S. Round Bar bounded to the R.C.C bars up to 53mm length each side and pierced through a 16 Gauge M.S. Box/Heavy Duty PVC box complete erected concealed in Ceiling with necessary finishing

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.3:305 mm dia. Industrial exhaust fan

Scope of work: Supplying and erecting Single phase approved make **Industrial Exhust fan** suitable for medium duty ring mounted low noise operation suitable for medium duty having following bdia size and maximum speed in RPM. **(A) 305 mm dia and 900 RPM- Cat.II**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.4: 470 mm dia. Industrial exhaust fan

Scope of work: Supplying & erecting single phase approved make **industrial exhaust fan** suitable for medium duty ring mounted low noise operation suitable for medium duty having following dia size and maximum speed in RPM **[D) 470 mm dia and 900 RPM. Cat.II**

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.5:

Scope of Work: Providing suitable M.S. louver shutter of the Exhaust fan.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

Item No.6:
Scope of Work: Supplying and erecting Single phase Wall mounted Air Circulater having size 470mm/18 Inch with its all accessories.Make: Almonard, Electromech, Crompton

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge.

STANDARD SPECIFICATION FOR SAFETY EQUIPMENTS

HAND APPLIANCES FOR FIRE FIGHTING

- Fire extinguishers shall be located at convenient locations and shall be readily accessible and clearly visible at all times.
- The maximum running distance to locate an extinguisher shall not exceed 15 m. The extinguisher shall be installed insuch a way that its top surface is not more than 1.5 m above floor/ground level.
- Hand appliances like DCP (Dry Chemical Powder), Sand Bucket, CO2 are used to extinguish initial stage of fire. Eachextinguisher shall be operated as per operation instructions given on each extinguisher.

PART 7:- INTERNAL ELECTRICAL

PART G:- SAFETY EQUIPMENTS

Item No.1:Instruction Chart

Scope of work: Providing printed **instruction chart** both in English and Gujarati and duly framed with front glasses, for treatment of person suffering from Electric shock

Material specification

Providing printed instruction charts both in English & Gujarati and duly framed with front glassed for shock treatment chart.

Workmanship

The printed instruction chart should be provided in panel room, substation space, feeder pillar etc.

Mode of Measurement

It should be measured in unit numbers. The rate should include the fixing charges

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.2:First Aid Box

Scope of work:Supplying stand first AID box with antiseptic cream, medicine for use on wounds due burn, crepe bandage, gauge bandage, medicated ready to use bandage (Band-Aid) adhesive tape for medicinal user, Scissors, anti-septic solution (Savlon or similar) etc. (All above contents shall be of standard makes). It should be as per MCI Norms

Material specification

- Minimum quantities for low risk establishments and activities may be considered as a general guidance leaflet on first aid.
- 14 individually wrapped sterile adhesive dressings (assorted sizes) appropriate for the activity (detectable dressings(colored blue) should be available (if catering is to be undertaken).
- sterile eye pads.
- individually wrapped triangular bandages (preferably sterile)
- safety pins (optional)
- medium size individually wrapped sterile unmedicated wound dressings (approx.12cm × 12cm)
- large sterile individually wrapped unmediated wound dressings (approx. 18cm × 18cm)
- pair of disposable glove

Workmanship

- The first aid box should be provided in substation area, panel room, etc.
- It should be place in location which is easy in access & visibility.

Mode of Measurement

- The first aid box should be measured in unit number (set), including all required first aid items according to Indian

  medical standard

Detail standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.3:Carbon dioxide (CO2) fire extinguisher having 4.5 Kg capacity

Scope of work: Supplying & erecting carbon dioxide (CO2) fire extinguisher user of following capacity with necessary clamps made from 53 x 6 mm M.S. Flat with nut & bolts grouted in wall complete.

Standard: - Confirming to IS: 15683-1406 with ISI Mark.

Size:-4.5 kg

Unit of Measurement:-Price Per Each No.

The fire extinguisher of 4.5 kg CO2 (wheel) type, design, construction and testing as per I.S. No.15683 with fire rating21b. operating temperature-30`c to +55` c, supplied with body bearing I.S. No.7285 mark and approved by CCOE tested at 253 kgf/cm² , fitted with ISI marked & CCOE approved valve as per is 3224. CO2 gas as per I.S. No.129 A22.

Externally painted with PO red shade No.537 of I.S. No.5, supplied with standard accessories. The latest hydro testcertificate tested by manufactures is to be submitted along with the supply.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.4:Carbon dioxide (CO2) fire extinguisher having 5.5/6.5 Kg capacity

Scope of work: Supplying & erecting carbon dioxide (CO2) fire extinguisher user of following capacity with necessary clamps made from 53 x 6 mm M.S. Flat with nut & bolts grouted in wall complete.

Standard: - Confirming to IS: 15683-1406 with ISI Mark.
Size:- 5.5/6.5 kg
Unit of Measurement:- Price Per Each No.

The fire extinguisher of 5.5/6.5 kg CO2 (wheel) type, design, construction and testing as per I.S. No.15683 with fire rating 21b. operating temperature-30`c to +55` c, supplied with body bearing I.S. No.7285 mark and approved by CCOE tested at 253 kgf/cm² , fitted with ISI marked & CCOE approved valve as per is 3224. CO2 gas as per I.S. No.129 A22.

Externally painted with PO red shade No.537 of I.S. No.5, supplied with standard accessories. The latest hydro test certificate tested by manufactures is to be submitted along with the supply.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

STANDARD SPECIFICATION FOR MOTOR& STARTER

PART 7:- INTERNAL ELECTRICAL

PART H:- MOTOR & STARTER

Item No.1: Direct on-line Electronics starter

Scope of work: Supplying and erecting Direct On-line Electronics Starter with 2-5/4-10/8-12/10-16 Amp. Rating relay (variable current setting) directly operated in totally insulated elegant enclosure and 18 Amp. Rating power relay with start - stop button for single phase operation up to 3 HP as per complete erected on P.W. Block with following features.

Low voltage cut off below 114 V

High voltage cut off above 280 V

Overload protection

Indicating LEDs for motor on lv, hv & overload tripping. [Cat.II]

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.2: Direct on-line Electronics starter

Scope of Work: Supplying and erecting Direct on line starter with 30 Amp. (resistive @ 230v) power relay and with 2 to 5/ 4 to 10 / 8 to 14 amp. Range C.T. Operated electronic overload relay in engineering grade plastic enclosure for 3 ph 415v 53 HZ A.C. motor up to 7.5 HP with high voltage protection (above 480 v) and under voltage protection (below 340 v) current sensing single phasing protection. Reverse phasing protection, inverse current characteristic overload protection with indication for On, OL, HV,LV SPP in a single unit with feather touch start / stop push button, high temperature with standing Bakelite terminals complete erected on P.W. Block with necessary connection. [Cat.II]

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.3: Open well horizontal mono block pump

Scope of work: Providing & erecting open well type **horizontal mono block pump** set with stainless steel body having following specification

(B) 1 H.P. single phase open well motor pump set suitable for 185 LPM discharge @ 25 mtr. head, suitable for 32 mm dia. Delivery pipe with control panel. - Cat II

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.4: Automatic liquid level controller

Scope of work: Supplying & erecting approved make Automatic liquid level controller 6A.as per instruction of Engineer in charge on site complete with wiring connection with existing wires , with copper conductor from pump to upper and lower tank.

For Priming Tank

The controller used to control the water level in the Tank.

The Pump Motor STARTS when water level is bottom of the tank and STOPS when water level is reached to top of thetank.

DIN Rail Mounted or Wall Mounted

Operates on 230 V 1 phase

AC Sensing Voltage, so no corrosion of sensors

Very Low Power Consumption

Light weight & Reliable

It should be provide with sensor & sensing cable

Pump Motor switched on automatically when level falls below set low.

Controller must electric shock proof

Controller should be suitable for pump motor

Sensor should be Standard Conductive type and Optional Magnetic (PP) Float Switch also available.

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.5:

Scope of Work: SETC of **submersible pump** set suitable for bore of 100 mm. dia. or more having three phase motor capacity not more than 3 H.P. of different range with following capacity

(A) (14 stage) 100 to 185 LPM discharge at 57 to 48 mtrs. Respectively head suitable for 53 mm dia. delivery pipe. Cat III

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

PART 8:- EXTERNAL ELECTRICAL

PART E:- PUMP SETS & STARTERS

Item No.1:

Scope of Work: Providing & erecting open well type horizontal mono block pump set with stainless steel body having following specification

(A) 1 H.P. Three phase open well motor pump set having discharge of 110 LPM @ 21 mtr. head suitable for 32 mm dia. delivery pipe with control panel Cat-II

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.2:

Scope of Work: Providing & erecting open well type horizontal mono block pump set with stainless steel body having following specification

(B) 3.0 H.P. three phase open well motor pump set having discharge of 85 LPM @ 11mt to 34 mtr. head suitable for 53/65 mm dia. delivery pipe with control panel Cat-II

STANDARD SPECIFICATION FOR WATER COOLERS & PURIFIRE

PART 7:- INTERNAL ELECTRICAL

PART I:- WATER COOLERS & PURIFIRE

Item No.1: Water Cooler

Scope of work: Providing & erecting water cooler having storage capacity 80 Ltr. & cooling capacity 40 Ltr.per hour @ an ambient temp of 470 C. The outlet temp. of the water should drop by 153C within a hour, The water cooler should be comprising of hermetically sealed compressor, fan motor, condensing unit, water tank surrounded by evaporating, coil, thermostats, relay etc.complete with necessary inlet & outlet connection. The body of water cooler will be made from Stainless Steel.

153 Litre Storage/153 Litre Cooling

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

Item No.2: Water Purifire

Scope of Work: SITC of Water Purifire Eureka Forbs Make AG 140 or Equivalent

Specification: As per standard Material Specification as mentioned above and as per Engineer-in-charge

STANDARD SPECIFICATION FOR WATER COOLERS & PURIFIRE

PART 7:- INTERNAL ELECTRICAL

PART J:- SOLAR WATER HEATER

Item No.1:

Scope of Work: Supplying, installing, testing & commissioning of SOLAR WATER heating system comprising of Solar flat locket collector, stainless steel hot water storage isolated tank with S.S. heat exchanger, absorber made of copper sheet & copper tube of following capacity in liter / day (LPD) with "B" size aluminium box collector with appropriate capacity electrical backup arrangement (Excluding inlet & outlet pipe lines)**[E] Capacity of 1000 LPD**

Specification: Detail specification as per item description, as per manufacture and as per Engineer-in-charge**.**

Item No.2:

Supplying, erecting and Installing of **2KW ON GRID ROOF TOP SOLAR POWER SYSTEM** with necessary solar panel, mounting structure, 5KVA Solar Inverter, AC & DC Protection System, Junction Box, Lightning Arrestor , Earthing , With Necessary AC & DC Cable, holder & accessories. Structure should be duly painted with two coats of red oxide and corrosive resistant paint. Complete erected connected & commissioned in approved manner.

Specification: Detail specification as per item description, as per manufacture and as per Engineer-in-charge**.**

STANDARD SPECIFICATION FOR LIFT & DG SET

LIFT

Scope of Work

Supplying, Erecting, Testing & Commissioning the machine room less 15/16 passenger / stretcher lift, Ground plus 2 upper floor with Rated Speed of 1.0 m/sec with micro proce/PLC control and ACVVV

Specifications

- GEAR LESS LIFT DRIVE comprising of High Starting torque Lift duty 3 phase 470 V A. C. Permanent magnetic synchronous motor of proper rating with high efficiency shall be used.
- Micro processor based / PLC, ACVVF, vector control drive with encoder feedback closed loop system shall be used for lift car and door operation which shall be full collective selective operation hall call demand response, UP/DOWN hall stops, Main, Up/ Down Contactor with overload and phase reversal relay and safety controls.
- Car with M S platform with bracings of adequate size and to sustain the impact load cabin + passenger with safety factor of fire for steel and side panels of Stainless steel of sheet of grade 304 duty. Car ceiling will be S.S. finishes with aesthetic appearance with LED ceiling lights. Car flooring shall be of anti skid PVC with choice of colour of engineer in charge. Car doors shall be of stainless steel grade 304, hairline finish with centre opening / telescopic automatic doors. Car panel will also be S.S.304 finished with emergency stop device, mechanical door safety device, facility of auto/ attended mode. All car panel buttons and all floor switches must be with brail language as per lift act.
- All landing doors shall be fully automatic centre opening/ telescopic opening made of hairline finish steel grade of 304 with key holes and infrared curtains with Unlocking facility from outside.
- Appropriate battery operated emergency light in the car along with alarm switch shall be provided.
- Digital scrolling indicator system for up-down arrow along with floor position indicator shall be provided inside the car and at all floors.
- Full height infra red curtain with multiple criss / crossing light beams shall be provided.
- Automatic Rescue Device (ARD) shall be provided accordingly of passenger capacity.
- Audio visual indication in the lift car showing over loading shall be provided such that doors kept open till excess load is removed.
- Spring buffers/PU Buffers shall be provided.
- Car fan with automatic sleep timer shall be provided.
- Voice annunciater with suitable music shall be provided in lift car.
- Self diagnostics system for operational and safety parameters shall be provided in control panel.
- Mechanical over speed governor, door key holes in the floor doors, fireman switch shall be provided.
- Lift machine hoisting arrangement in the lift upper shaft and monkey ladder for lift pit should be provided by the lift agency, along with the other steel structure works, foundations for the machine etc…
- In the hoist way fascia plate shall be provided without any extra cost, where ever required as / if directed by engineer in charge.
- Permanent wiring in lift well with proper numbers of light points, with fixtures, exhaust fan and plug points shall be provided by the agency. Power supply of 3 phase 470 V shall be made available by department in lift machine.
- Any civil/ electrical works for additional and alteration in lift shaft related to erection of lift shall be made by lift agency without any extra cost.(granite/marble fixing around all landing door openings are not in lift agency's scope.)

- Agency has to provide all working drawings and documents and liaison services for obtaining all necessary permission from lift inspector and other authorities.
- As per statutory requirement of Got. Of Gujarat lift & escalator act 1400, lift agency has to provide
    1. Car top safety barricade
    2. Push & talk communication system.
    3. Fireman's switch operation at Ground Floor

EMERGENCY RESCUE DEVICE

Scope of Work

Supplying and erecting approved make, solid stat inbuild emergency rescue Device, for automatically rescues Passengers trapped in the lift car in between floors in the event of power failure

Specifications

- Automatic operation & immediate action in the event of mains failure capable to move the lift to the nearest landing, opens the automatic doors of the lift car & floor.
- Sealed, maintenance free battery back-up of suitable size with automatic charging unit & auto change over device on mains failure.
- RESCUE OPERATION message indicator in the lift car
- Applicable to Passanger, Goods cum Passenger, Stretcher cum Passenger lifts with AC2, ACVV, ACVVVF drives & automatic doors suitable for Lifts from 15 Passenger to 14 Passenger capacity (900Kg.) having 2 Nos. of 24 Ah batteries

LIFT ANNOUNCING SOLID STATE SYSTEM

Scope of Work

Supplying & erecting approved make Lift Announcing solid state system in the Passenger/ Stretcher lifts having AC2 / ACVV / ACVF drives & automatic doors only.

Specifications

- Announcing floor message, message to close period
- Announcing ‘Emergency Message’ when lift is stuck between floors due to power failure or any other reason.
- Instrumental Music between floor announcing.
- Announcement in English / Hindi & Gujarati Languages..
- Flexible to accommodate special pre-programmed message such as name of the building /office.
- Volume adjustment control

OVERLOAD NON-START FEATURE & OVERLOAD WARNING INDICATOR SYSTEM

Scope of Work

Providing & erecting approved make overload non-start feature & overload warning Indicator system in the lift with making use of sound isolated floating platform & micro switches on SI frame to get sensation of live load inside lift cage at any given moment, with provides new fixtures of overload warning inside lift cage with new relay in the existing control panel to activate ‘Overload Non-Start Function’ with carrying out additional wiring including laying of new travelling cable, include minor civil work & without changing the existing capacity speed stops, travel & operation of the desired lift

DGSET

Scope of Work

Supplying and erecting, commissioning and testing diesel generating set

Specifications

DGSEt having continuous rating of 30 KVA ,BHP not less than 42 BHP, 3 phase, 415 volts, 53 cycles A.C. supply comprising of a totally enclosed air cooled diesel engine with multi-cylinders developing suitable BHP not less than following capacity at 1530 RPM with 10% overload for one hour in 24 hours with standard accessories like fly wheel, lubricating oil cooler, "A" class governor, heavy duty fuel wheel and lubricating oil filter, oil bath air filler, lubricating oil pressure gauge, end exhaust manifold, standard set of tools with adjustable spanners, screw drivers, feeder gauge, cylinder head to cover, joint cylinder head to exhaust, element lube oil filter, 12/24 volts electric starting equipment complete with standard battery, dynamo, cut-outs, ammeter, necessary wiring, pressure gauge, starter etc and heavy duty Residential type exhaust silencer and vertical hot air duct both logged with asbestos rope, save oil trays, exhaust piping of required length, standard wall/floor mounted fuel with level indicator and piping and drip proof alternator, self excited, self regulated, screen protected, with excitation system, capable of delivering the rated system output at 415 volts, 3 phase, 0.8 PF, 53 Hz, 4 wire, running at 1530 RPM, conforming to IS-4722- 1168 with voltage regulation +/- 5% of rated voltage from no load to full load. Both the engine and alternator fitted on a common fabricated steel base plate with antivibration mounting engine and alternator both connected to each other by flexible flange coupling and with floor/wall mounted control panel box comprising of voltmeter ammeter, selector switches, ACB / MCCB / MCB of adequate capacity, indicator Lamps duly wired with HRC fuses.

The alternator & control panel shall be connected with provided suitable capacity armoured cable and complete with Acoustic enclosure (canopy) made out of 18 SWG CRCA Sheet, sound absorbing material Rockwool of 64 density & 100 mm thick conforming to IS:8183 The resin bonded rockwool covered from inside the canopy by perforated sheet with 3/4 mm holes, sound level not more than 75 dB at a distance of 1 mtr, as per PVCT norms. Erection, commissioning and satisfactory testing as per requirement with first filling of fuel, oil, etc. with guarantee of complete system for One year. & with obtaining all necessary certificate from Electrical Inspector. The Capacity and Ratings of DG sets are as below.

(A) Continuous Rating of 30 KVA ,BHP not less than 42 BHP

AMF Control Panel

Scope of Work

Providing & erecting approved make AMF control panel suitable for following size of 3 phase, 415 V., 53 cycles

Specifications

- Power module: A pair of electromechanically interlocked contactors (for mains & generator) Overload relay for generator contactor Neutral contactor for mains and generator Power socket for connections.
- Control and metering module: Line voltage monitor. Generator voltage monitor Ammeter 3 items attempt start facility. Air circuit breakers/MCB/MCCB of suitable rating for auto/manual operation. Auto/manual switch. Emergency stop push buttons. Manual start push button. frequency meter. Engine hour meter. Two earthing studs.
- Protection module: The engine shutdown in the unlikely event of Low lube oil pressure High cylinder head temperature. V belt failure.
- Indicators with alarm Load on generator.
- Indicators Load on mains Engine fails to start . Emergency stop battery charger.
- The AMF Panel for suitable 30 KVA capacity DG Set

EXECUTIVE ENGINEER,
EAST (VARACHHA) ZONE -A,
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

APPROVED VENDOR LIST

CIVIL MATERIAL MAKE LIST		
SR. NO.	**ITEMS**	**MAKE/BRANDS**
1	Cement	Ultratech, Ambuja, Sanghi, Siddhi, J K Laxmi, Hathi (53 Grade)
2	High Yield Strength Deformed steel bars Thermo mechanically treated (TMT) / Structural steel	TATA, SAIL, Rastriya Ispat, Electrotherm (ET), Ramswaroop, National, Mono Steel India Ltd., Gallantt (Conditional), JSW
3	Mild steel structure	Tata, SAIL, RINL, JSW, Electrotherm, National, RINL
4	Vitrified tiles	Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro
5	Telephone Black granite	With metallic ringing Sound (Approved by Architect or engineer in charge)
6	Dark original green UdaIpur marble,Khatu Stone	Without any stain or color coating (Approved by Architect or engineer in charge)
7	Glazed tiles	Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro
8	Aluminum Section (Powder coated)	Jindal, Banco, Hindalco
9	Acrylic emulsion plastic Paint	Nerolac, Asian, ICI, Berger
10	Weather shield max paint	ICI, Asian apex ultima, Dulux
11	Sanitary fittings	Cera, Hindware, Perryware, Nicer, Duravit, Jaguar
12	PVC or UPVC fittings	Astral, Supreme, Prince, Finolex, Jain
9	PTMT fittings	Prayag, Wilson
12	PVC (Triple layer coated) water tank	Sintex, Super, Reno
15	Construction chemicals	Basf, Fosroc, Roff, Perma,Sunanda, Sika, OR equivalent
16	Door-window fittings & fixtures	Brass-sonal make c.p. heavy section
10	Wood	100% natural (pure) seasoned wood
18	Ply wood	Century or Anchor
11	Glass	Saint gobain , Modi, AIS,
14	Ready mixed concrete	Ultratech / Lafarge
21	Rebars	Hilti, Fisher
22	Binding Wires	Galvenised coated wire
23	Epoxy Joints	Laticretes, Pidilite,Mapei

24	Veneer / Laminates	Century, Greenlam
25	FRP Frame and Shutters	Sintex or equivalent approved by Consultant
26	Aluminium Section	Jindal, Hindalco, Banco
27	Lapi / Putty	JK White, Birla
28	SS Pipes	Grade 296, Jindal or its equivalent
29	Sanitary fittings	Jaguar,Cera, Hindware, Hindustan
30	Toilet fittings	Cera, Hindware, Perryware, Nicer, Duravit, Jaguar
29	Water Proofing Cool Gaurd	Panas, Cembo
32	Concrete Admixture	Basf, Fosroc, Roff, Perma,Sunanda, Sika, OR equivalent
34	Waterproofing to Terrace or Sunken Slab	Basf, Fosroc, Roff, Perma,Sunanda, Sika, OR equivalent
34	Special Repairs Job including Polymer Mortar, Protective Coating, Injection Grout, Micro Concrete, Crack filling etc.	Basf, Fosroc, Roff, Perma,Sunanda, Sika, OR equivalent
34	Anchor Grouts	Basf, Fosroc, Roff, Perma,Sunanda, Sika, OR equivalent
30	Foundation Grouts	Basf, Fosroc, Roff, Perma,Sunanda, Sika, OR equivalent
37	Construction and Expansion Joint Sealant	Basf, Fosroc, Roff, Perma,Sunanda, Sika, OR equivalent
37	Paver Block	Anjani Cement Articals, Laxmi Tiles, Shree Arihant Precast Products, Vyara Tiles Pvt. Ltd, Krishna Precast, Bansal Buidling Material Pvt. Ltd., Kismat Tiles & Flyash Product
39	Precast Kerb	Anjani Cement Articals, Laxmi Tiles, Shree Arihant Precast Products, Vyara Tiles Pvt. Ltd, Krishna Precast, Bansal Buidling Material Pvt. Ltd., Kismat Tiles & Flyash Product

NOTE ON APPROVED VENDOR LIST: -

1. Equipment's/ items for which no make is specified, approval shall be obtained from Consultant and Engineer-in-Charge prior to supply. Contractor will have to propose Minimum three vendors for such item, right to selection/rejection of particular make offer by contractor is with consultant and client.
2. Various options are given in the above vendor's list. However, choice as to the selection of particular make will rest to Consultant and Engineer-in-Charge.
3. No deviation in the make list shall allowed.

SIGNATURE OF THE CONTRACTOR.
Date :- - -1411

VENDOR LIST OF ELECTRICAL WORK		
Sr. No.	**Item**	**Approved Make**
1	MCCB	Siemens, Schneider, ABB, Legrand, L&T
2	Other LT Switchgear	Siemens, Schneider, ABB, Hager, Legrand,L&T
3	MCB, ELCB, & MCB Distribution Boards	Hager, Siemens, Schneider, ABB, Legrand
4	Aluminium XLPE Armored Cables	R.R. Kable, Havells, Finolex, KEI,Torrent,Gloster,CCI,Incab,Avocab,Bharatcab,Unistar,
5	Aluminium & Copper XLPE Un-armor Cables	R.R. Kable, Havells, Finolex, KEI, Torrent,Gloster
6	Flexible Wire	R.R. Kable, Havell's, Finolex,
7	Capacitor (Double layer MPP/ APP type)	Epcos, L&T, Siemens, ABB, Schneider, Yesha, Ducati, Asian,Crompton,KHATAU,SUBODHAN
8	Motor Pumps, Motor Pumps Starter, & Accessories	Havells, BCH, C&S, L&T, Siemens, Alsthom, CG, ABB, KSB, CRI
9	Power & Control Panel accessories	C&S, Trinity, Nippen, Standard, L&T, Elico, Legrand, Schneider
10	Shockproof Accessories (Modular)	Legrand, Schneider, MK, Northwest, Norrisis,
11	Cable Gland	Jaison/3d/ Commet / HMI
12	Lugs & Sockets	Dowells / Ismal /3d / Jaison, HEI ,HMI
13	Panel Board Manufacturer	CPRI Approved
14	Time Switch	Siemens, GIC, Schneider, Legrand, Protime, Theaben, L&T, MDS, CG, SIEMENS
15	Digital Meters	Rishabh (L&T), Conzerve, HPL, Enercon, Krycard, Yocogava, Abb, Siemens,DECURE,SOCOMEC,TRINITY
16	Selector Switch	Keycee, Salzer, Siemens, PACTIL,C&S
17	C.T (Cast Resin)	Ashmor, Kappa, Jyoti, ABB, Silkana, Gilbert, Precise, L&T
18	LED Indicating Lamp	Raas Control, Teknik, Vaishno, Binay,Esbee (L&T), SIEMENS,SCHNEDIER,ABB
19	Push Button	Siemens, Raas Control, L&T, Binay, ABB, Schneider
20	Rigid PVC Pipe & Accessories	Precision, Nihir
21	APFC Relay	Enercon, Epcos, Triniti, L&T, KBR, Ducati ,BELLUK,SCHNEDIER,ABB
22	DWC Pipe	REX, Gemini, SY-Aron , Duraline
23	Guard Pipe	Jindal, Asian, Tata, CTC, Apollo

24	Contactor	L & T, Siemens, Havells, Schneider, ABB, BCH, TC,GE,CG
25	Rubber Mat (ISI Marked)	Sintex or equivalent
26	IP66 Junction BOX	Hensel, Legrand ,SINTEX OR EQUVIVALENT
27	Tools & Tackle	TAPARIA
28	Maintenance free Earthing	ETP, Ashlok, E-Link,RIP
29	Lighting Fixtures, Indoor & Outdoor	Keselec, Osram, Philips, Trilux, Wipro
30	Ceiling Fan	Havells, Crompton, Usha, Bajaj, Khetan, Orient, Ortem,
29	Exhaust Fan	Havells, Crompton, Usha, Bajaj, Khetan, Orient, Ortem,
32	Motor Pumps Starter, & Accessories	Havells, BCH, C&S, L&T, Siemens, Alsthom
34	Conical Pole	Bajaj, Volmont, transrail
34	High Mast	Bajaj, Volmont, transrail, Utkarsh
34	Cable Trays	Indiana, Sharda, B.M. Engineering, Tushartech, Superfab, Bvk Enterprise
30	Air condition	BEE (5 Star rating)
37	CO2-Kg Fire Extinguisher	Kanex, Safex, Minimax.
37	DGSET	
39	Lift	KONE, Schinddler, Otis, Mitsubishi, TRIO, Omega, Firozgar

NOTE ON APPROVED VENDOR LIST: -

1. Equipment's/ items for which no make is specified, approval shall be obtained from Consultant and Engineer-in-Charge prior to supply. Contractor will have to propose Minimum three vendors for such item, right to selection/rejection of particular make offer by contractor is with consultant and client.
2. Various options are given in the above vendor's list. However, choice as to the selection of particular make will rest to Consultant and Engineer-in-Charge.
3. No deviation in the make list shall allowed..

SIGNATURE OF THE CONTRACTOR.
Date :- - -

FORMAT FOR BANK GAURANTEE

To,

The Commissioner,

Surat Municipal Corporation,

SURAT.

[1] In consideration of the Terms and Conditions of an Agreement made between Commissioner, Surat Municipal Corporation, Surat (herein after called" Surat Municipal Corporation") and ……..... (Contractor) (hereinafter called "Contractor") for the work (Name of work)

.....

.....for the Earnest Money deposit for the due fulfillment by the contractor of the terms and conditions contained in the said agreement, We Bank ..... (hereinafter referred to as the Bank) at the request of .....(Name of Contractor) do hereby undertake to pay the Surat Municiapl Corporation an Amount not exceeding **Rs. .....** (i.e. 50% of Total E.M.D. Amount) against any loss or damage caused to or suffered by Surat Municipal Corporation by reason of any breach of any term or condition contained in the said agreement by the said Contractor.

[2] We Bank of.....,do hereby undertake to pay the amount due and payable under this Guarantee without any demur merely on a demand from the Surat Municipal Corporation stating that the0 amount claimed in due by way of loss of damage caused to or would be caused to or suffered by the Surat Municipal Corporation by the reason of breach by the said contractor of any of the terms and conditions in the said agreement of by reason of the contractor failure to perform the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee shall be restricted to an amount not exceeding **Rs. .....** (50% of Total of Amt. of EMD)

[3] We undertake to pay the Surat Municipal Corporation any money so demanded notwithstanding dispute or disputes raised by the contractor. In any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by under this bond shall be a valid discharge of our liability for payment thereunder and the contractor shall have no claim against us for making such payment.

[4] We Bank of.....,further agree that the guarantee herein contained shall remain in full force and effecting during the period that would be taken for the performance of the said agreement and that under or by virtue of said agreement have been fully paid and its clime satisfied or discharged or till Commissioner, Surat Municipal Corporation, Surat clarified that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor and accordingly discharge this guarantee. Unless a demand or claim under this agreement is made on us in writing on or before **Dtd** _____ we shall be discharged from all liability under this Guarantee thereafter.

[5] We Bank of.....,further agree with the Surat Municipal Corporation that the Surat Municipal Corporation shall have the fullest liberty without our consent and without in any manner our obligations hereunder to very and of the terms and conditions of the said agreement or to extend the time of performance by the said contractor from time to time or to postpone for any time or time to time any of the power excersizable by the Surat Municipal Corporation against the said contractor and to Forces or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any variation or extension being granted to the said contractor or for any biarnaise, act or omission of the part of the Surat Surat Municipal Corporation or any indulgence by the Surat Municipal Corporation to the said contractor or by any such matter or thing whatsoever which under the law relating to sureties would but for his provision have of a relieving us.

[6] This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

[7] We Bank of ....., lastly undertake not to revoke during its currency except with the previous consent of the Surat Municipal Corporation in writing.

[8] Not withstanding anything contained here-in-above our liability under this guarantee is restricted to **Rs. Rs. .....** (50% Amt. of EMD) shall remain in force until **Dtd.**_____ unless a claim or demand under the guarantee is made against us in writing and received on or before **Dtd.**_____ all your rights under the said guarantee shall be forfeited and we shall be relieved discharged from all liabilities there under.

Seal, stamp and signature
of Bank's authorized signatory

Date :-

COVERING LETTER

To,
Municipal Commissioner,
Surat Municipal Corporation,
SURAT.

S i r,

I / We have tendered for the work…… of .....……
……..and have paid Earnest Money Deposit Amounting to Rs..... drawn by ...…….....

(Name of the Bank)

The receipe No. ..... dated ..... by the Corporation is attached herewith.

In case, my / our tender is not accepted, therefore kindly arrange to refund the amount of Earnest Money Deposit paid by me / us as per the details referred to above.

Advance, stamped Receipt duly signed on Revenue Stamp of Rs. 1.00 p. is also enclosed here with.
Signature of the Contractor.....

Address :- .....

.....

.....

Encl : As Stated Above.

ADVANCE STAMP RECEIPT

Received with thanks the sum of Rs. ..... (In Words.....) only from the Surat Municipal Corporation being the refund of Earnest Money Deposit placed by me/us vide SMC's Receipt No. ..... dated ..... along with the tender paper for the……

(Name of the work)

Date :- Revenue Stamp

Signature of the Tenderer.

F.W.C. to the Accountant,

2. For remarks whether the .....deposit amounting to Rs. ..... placed on ..... by Shri/M/s. ..... in connection with the work of ……..... ..... stands in full in the name of the aforesaid party (R.No. ..... dated .....)

EXECUTIVE ENGINEER
EAST ZONE (VARACHHA)-A
SURAT MUNICIPAL CORPORATION

F.W.Cs. to EXECUTIVE ENGINEER, EAST ZONE (VARACHHA) A

To deposit of Rs. ..... placed on ..... by Shri/M/s. ..... stands in full in the name of the aforesaid party.

Accountant.

Submitted,

For favour of sanction of refund Rs. ..... being the amount of ..... deposit placed on.....vide Receipt No..... by Shri/M/s..... in connection with the work of .... as the tender of the above party has been accepted / had not been accepted and the concerned contractor has paid security deposit of Rs. ..... for the above referred work on Dt. ..... The party has also executed an agreement for the above work. The above deposit stands in full in the name of the said party as certificed by the Accountant on..... The expenditure will be debited on B.H.G. Tender Deposit Account.

Assistant Engineer / Jr. Engineer.

Dy. Engineer,

Sanctioned Accordingly.

EXECUTIVE ENGINEER
EAST ZONE (VARACHHA)-A
SURAT MUNICIPAL CORPORATION

ANTI-BLACKLISTING CERTIFICATE

(on Non Judicial Stamp Paper of Rs.300/-)

(To be provided by Bidder)

I M/s. _____ (Name of the Bidder along with name and address of registered office) hereby certify and confirm that we or any of our promoter/s/ director/s are not barred by Government of Gujarat (GoG)/ any other entity of GoG or blacklisted by any state government or central government/ department/ agency/local self Government/Surat Municipal Corporation in India from participating in Project/s, either individually or as member of a Consortium as on _____ (Bid Submission Date).

We further confirm that we are aware that our Bid for the captioned Project would be liable for rejection in case any material misrepresentation is made or discovered with regard to the requirements of this Tender at any stage of the Bidding Process or thereafter during the agreement period. Dated this ____ day of _____ 1414

_____

To be signed by:

Authorised Signatory with name & designation

Name of the Bidder

સુરત મહાનગરપાલિકાની સ્થાયી સમિતિની તા.૩૦–૯–૨૦૨૧ ના રોજ મળેલ સભામાં નીચે મુજબનો ઠરાવ પસાર થયો હતો :–

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મ્યુ.કમિશનરશ્રીના તા.૨૩–૯–૨૦૨૧ ના પત્ર નં.સી.સ્થા.સ./૫૬૯ થી વિદિત થઈ, પુખ્ત ચર્ચા વિચારણા કર્યા બાદ, પૂર્વ ઝોન–એ વિસ્તારમાં આવેલ સુરત મહાનગરપાલિકાની મિલ્કતો જેવી કે આંગણવાડી, વોર્ડ ઓફિસ, રીડીંગ રૂમ વિગેરેમાં વાર્ષિક ધોરણે મરામત તથા નિભાવ કરવાના કામે ટેન્ડર નોટીસ પ્રસિધ્ધ કરી માંગવામાં આવેલ ટેન્ડરોના સંદર્ભમાં નિયત સમયમર્યાદામાં આવેલ કુલ–૩ ટેન્ડરો પૈકી ક્વોલીફાઈડ થયેલ કુલ–૨ ટેન્ડરો પૈકી નીચા ભાવના ટેન્ડરના ટેન્ડરરશ્રી હિતેશ જે. પટેલનું ટેન્ડરની અંદાજી રકમ રૂા.૩૬,૯૨,૪૨૬–૧૧ થી ૨૧.૯૯% નીચુ એટલે કે રૂા.૨૮,૮૦,૪૬૧–૬૧ નું ટેન્ડર ફાયદાકારક જણાતુ હોય કબુલ રાખવાનું તથા તેઓ સાથે કરારનામુ કરવા મ્યુ.કમિશનરશ્રીને અધિકૃત કરવાનું તથા સદર ટેન્ડરના ભાવોને આગામી ૧ (એક) વર્ષ સુધી અથવા નવા યુનિટ રેઈટનું ટેન્ડર મંજૂર ન થાય ત્યાં સુધી એ બે માંથી જે વહેલુ હોય ત્યાં સુધી યુનિટ રેઈટ તરીકે મંજુર કરવાનું ઠરાવવામાં આવે છે.

ઠરાવ નં.૯૯૦/૨૦૨૧ સર્વાનુમતે મંજુર.

સ.૨.મ્યુ.કમિશનરશ્રી પ્રતિ,

Received On
Dt. 1-10-21

નં. સીસ્થાસ/ઠ/ 568
તા. ૫/૧૦/૨૦૨૧

AE (RAC) W/OS

HDP.

OS

ડે.મ્યુ.કમિશનર
અને
ઈ.ચા.મ્યુ.સેક્રેટરી,
સુરત મહાનગરપાલિકા
તા.૦૧–૧૦–૨૦૨૧.

Dmc (D)
/
Ex Eng (EE-A)

આર.એ.સા./૨/૪/ ૪૯૦
તા. ૦૪/૧૦/૨૧