
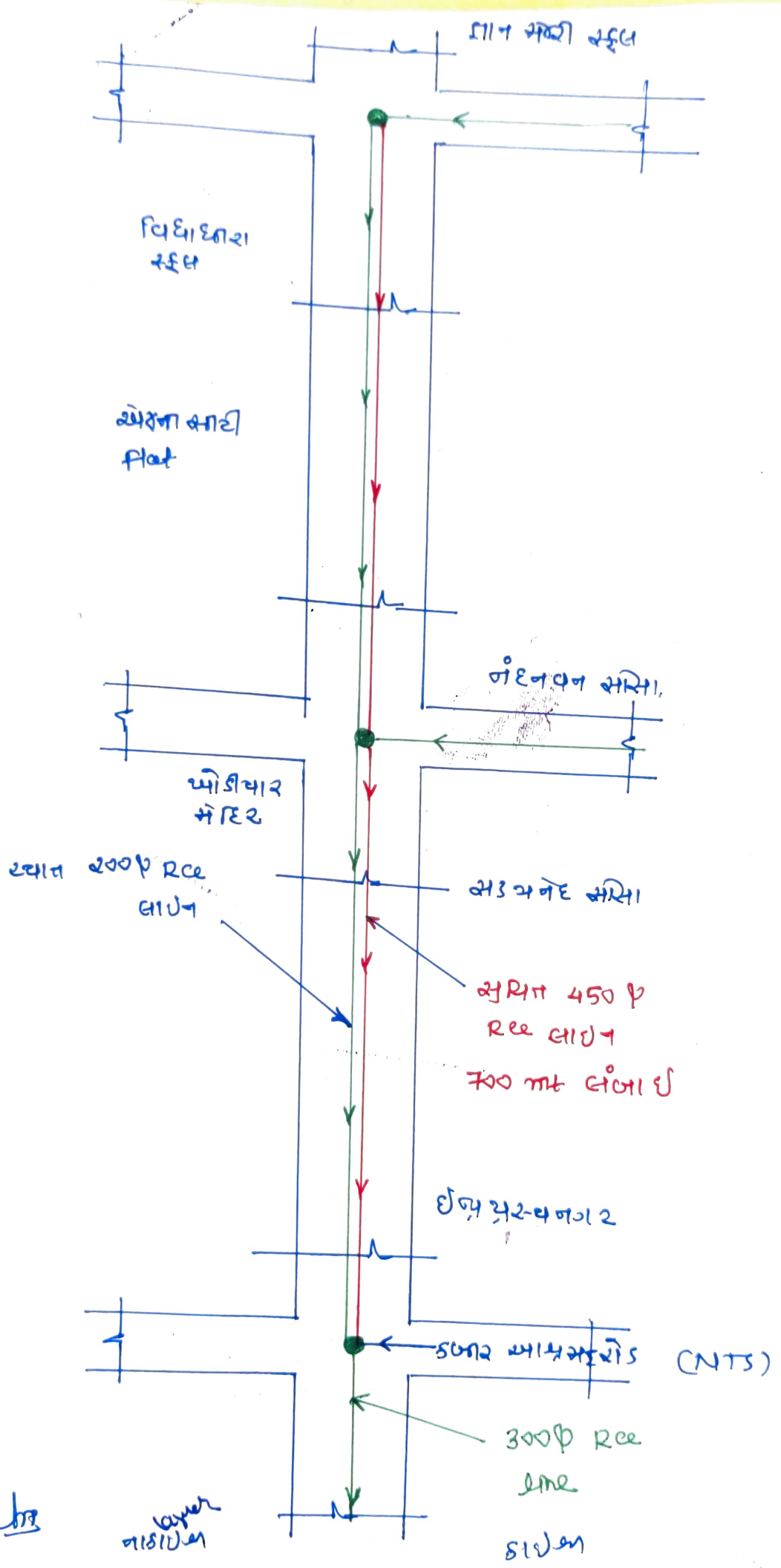


GWSSB SOR - 2022-23


 કાર્યપાલક ઈજનેર
 ડ્રેનેજ વિભાગ
 મહાનગરપાલિકા ભાવનગર





Technical drawing of a circular component. The drawing shows concentric circles representing different sections. A central circular area is hatched with a cross-hatch pattern. A dashed circle is labeled "Sec-G Extra Details". A vertical section line is labeled "A-A" at the top and bottom. A horizontal section line is labeled "B-B" at the left and right. The drawing is oriented with the hatched area at the top.

1. ALL DIMENSIONS ARE IN MM.
2. 'D' IS DIA. OF SEWER PIPELINE.
3. 100 THICKNESS OF CONCRETE CAN BE VARIED TO FLUSH MANHOLE COVER AND FRAME WITH ROAD SURFACE.
4. CI STEP FIXED WITH CEMENT MORTAR 1:3.
5. SFRCC MANHOLE FRAME & COVER AS PER I.S.12592-2002.
6. THE BENCHING AT THE SIDE OF THE CHANNEL SHALL START FROM 0.8D FROM BASE AND THEN RISE WITH A SLOPE OF 1 IN 6 TOWARDS THE SIDE OF THE MANHOLE. SEMICIRCULAR PORTION WILL BE ACHIEVED IN CEMENT CONCRETE FINISHING ITSELF.
7. INTERNAL PLASTERING SHALL BE SULPHATE RESISTANT CEMENT (SRC).

TYP	-----	TYPICAL
DIA	-----	DIAMETER
UN	-----	UNLESS NOTED
THK	-----	THICK
PCC	-----	PLAIN CEMENT CONCRETE
EQ	-----	EQUAL
C.I.	-----	CAST IRON
SFRC	-----	STEEL FIBRE REINFORCED CONCRETE



Diagram illustrating the Plan view of a circular structure, likely a culvert or tunnel. The structure is defined by concentric circles. A central hatched circle is labeled "Sec-G Extra Details". A dashed circle within the structure is labeled $\phi 500$. Section lines A-A and B-B are indicated, with arrows pointing to the respective sections. The word "PLAN" is written below the diagram.

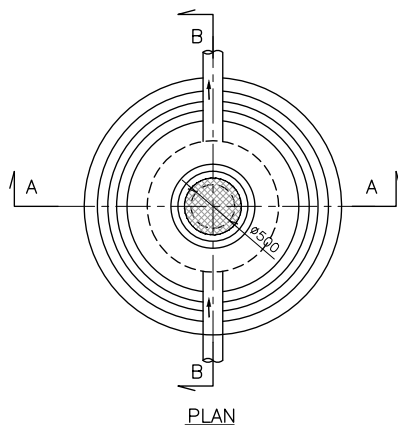
Sec-G Extra Details



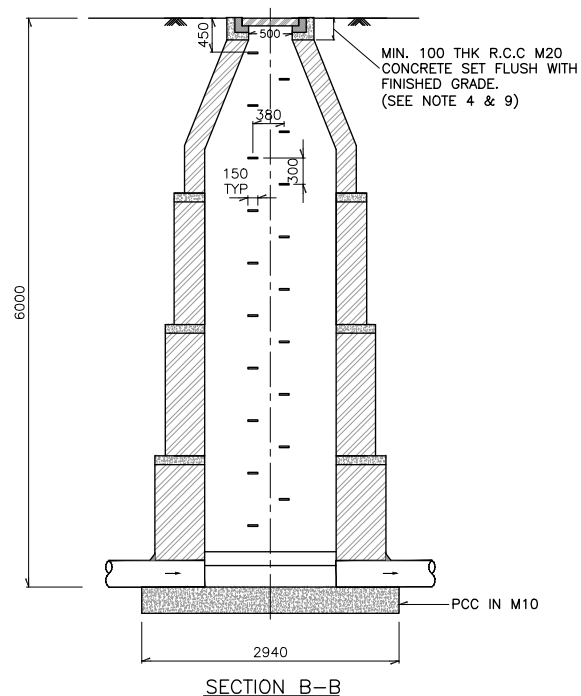
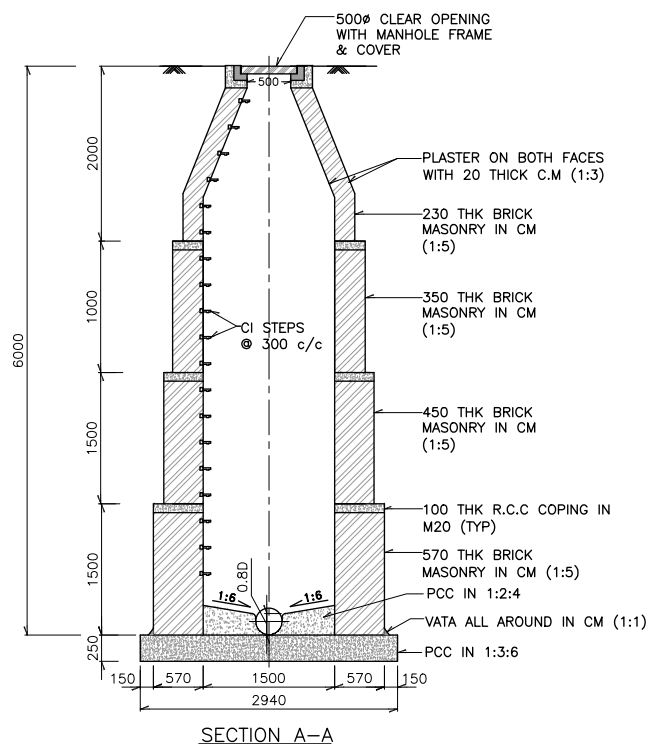
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'C' TYPE CIRCULAR MANHOLE
FOR 150mmØ TO 1500mmØ (Depth 4.0M To 6.0M)



Sec-G Extra Details



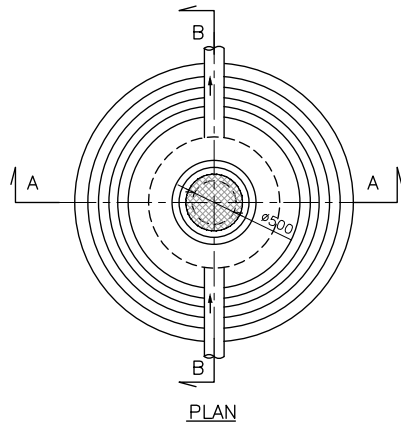
LEGEND:

TYP	-----	TYPICAL
DIA	-----	DIAMETER
UN	-----	UNLESS NOTED
THK	-----	THICK
PCC	-----	PLAIN CEMENT CONCRETE
EQ	-----	EQUAL
C.I.	-----	CAST IRON
SFRC	-----	STEEL FIBRE REINFORCED CONCRETE

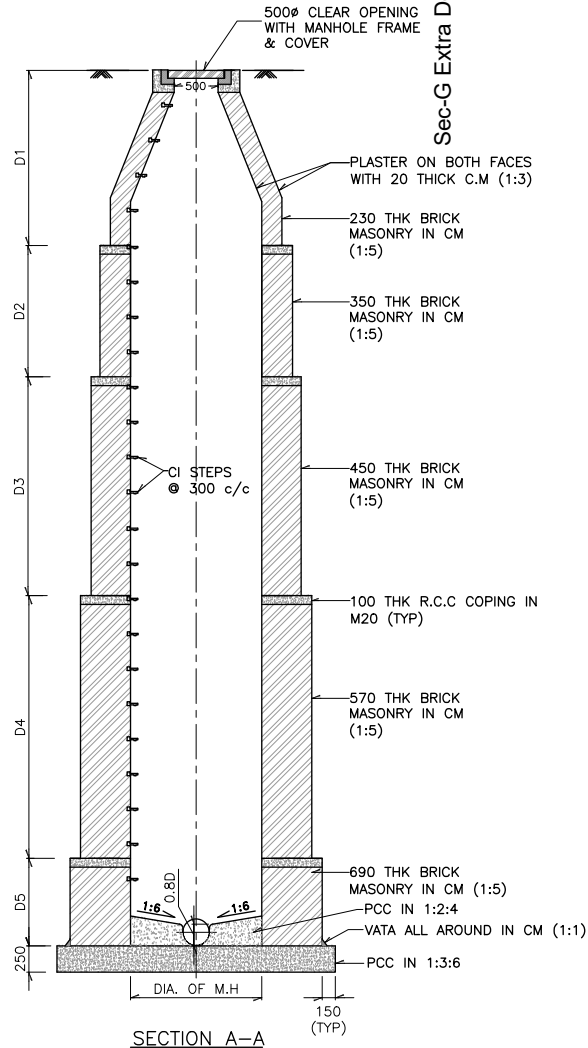
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES EXCEPT OTHERWISE STATED.
2. 'D' IS DIA. OF SEWER PIPELINE.
3. VATA IN C.M.(1:1) SHALL BE PROVIDED ALL AROUND THE PIPE ENTERING AND LEAVING THE MANHOLE AND ALSO AT THE JUNCTION OF BRICK MASONRY AND CONCRETE BASE SLAB.
4. 100 THICKNESS OF CONCRETE CAN BE VARIED TO FLUSH MANHOLE COVER AND FRAME WITH ROAD SURFACE.
5. AT A GIVEN DEPTH THE THICKNESS OF BRICK MASONRY SHALL NOT BE LESS THAN THAT SHOWN IN THIS DRAWING.
6. THICKNESS SPECIFIED FOR BRICK MASONRY IS EXCLUDING THE THICKNESS OF CEMENT PLASTER ON BOTH FACES.
7. CHANNELS FOR MANHOLE ARE TO BE CONSTRUCTED DULY CONSIDERING THE DIRECTION OF FLOW AS WELL AS ALIGNMENT AND INVERT LEVEL OF PIPES ENTERING/LEAVING THE MANHOLE AND AS DIRECTED BY ENGINEER.
8. CI STEP FIXED WITH CEMENT MORTAR 1:3
9. SFRC MANHOLE & FRAME OF AS PER I.S.12592-2002.
10. THE BENCHING AT THE SIDE OF THE CHANNEL SHALL START FROM 0.8D FROM BASE AND THEN RISE WITH A SLOPE OF 1 IN 6 TOWARDS THE SIDE OF THE MANHOLE. SEMICIRCULAR PORTION WILL BE ACHIEVED IN CEMENT CONCRETE FINISHING ITSELF.
11. INTERNAL PLASTERING SHALL BE SULPHATE RESISTANT CEMENT (SRC).

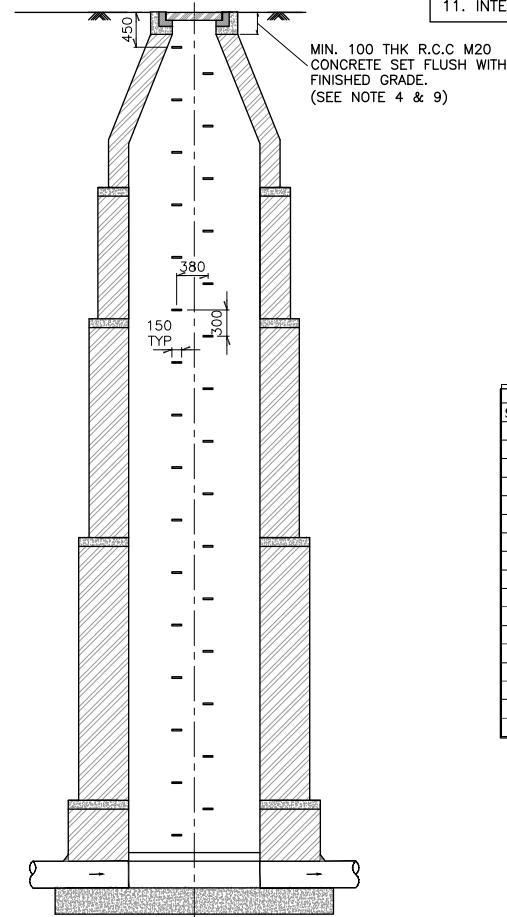
'D' TYPE CIRCULAR MANHOLE
FOR 150mmØ TO 1500mmØ (Depth 4.0M To 10.0M)



PLAN



Sec-G Extra Details



NOTES

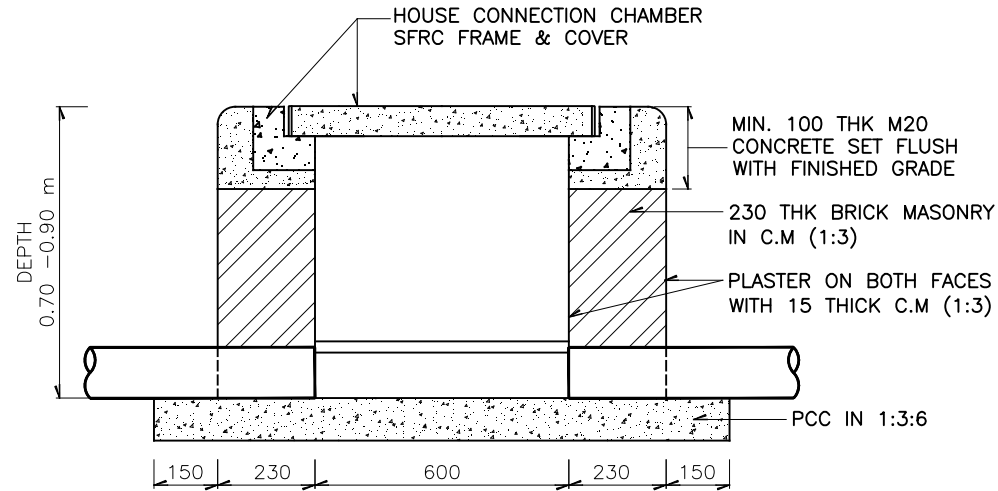
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LEGEND								
S. No	TYPE	UNIT	D1	D2	D3	D4	D5	DIA. OF MH
1	D1 (6.0)	DEPTH	2,250	750	2,000	1,000	-	1,500
		WALL THK	230	350	450	600	-	
2	D1 (10.0)	DEPTH	2,250	750	2,000	4,000	1,000	1,500
		WALL THK	230	350	450	600	750	
3	D2 (6.0)	DEPTH	2,250	750	2,000	1,000	-	1,500
		WALL THK	230	350	450	600	-	
4	D2 (10.0)	DEPTH	2,250	750	2,000	4,000	1,000	1,500
		WALL THK	230	350	450	600	750	
5	D3 (6.0)	DEPTH	2,250	750	2,000	1,000	-	1,900
		WALL THK	230	350	450	600	-	
6	D3 (10.0)	DEPTH	2,250	750	2,000	4,000	1,000	1,900
		WALL THK	230	350	450	600	750	

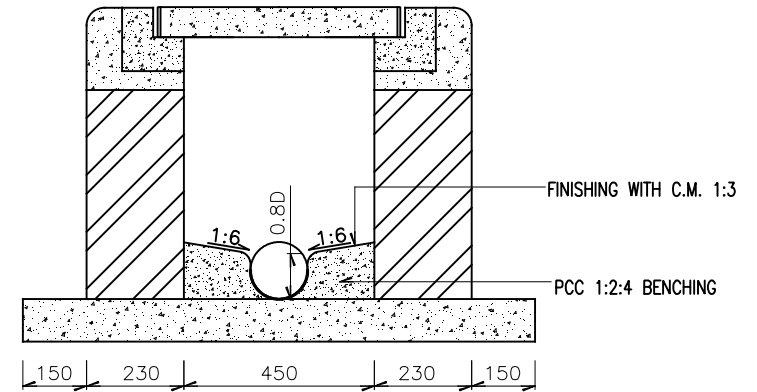
LEGEND:

TYP ----- TYPICAL
DIA ----- DIAMETER
UN ----- UNLESS NOTED
THK ----- THICK
PCC ----- PLAIN CEMENT CONCRETE
EQ ----- EQUAL
C.I. ----- CAST IRON
SFRC ----- STEEL FIBRE REINFORCED CONCRETE

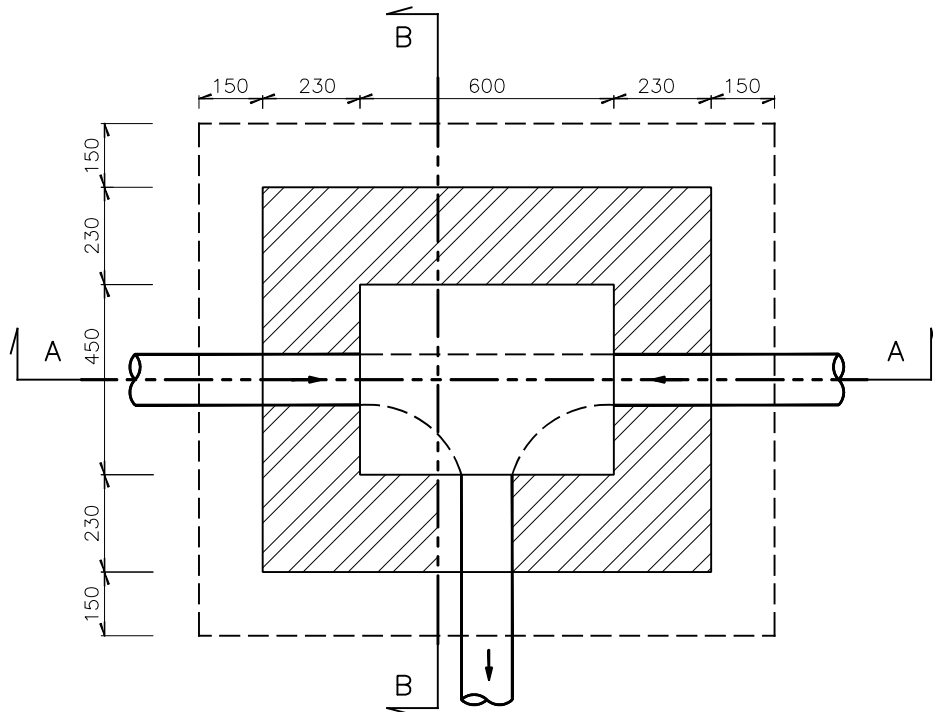
TYPICAL DETAILS OF HOUSE CONNECTION CHAMBER



SECTION A-A



SECTION B-B



PLAN

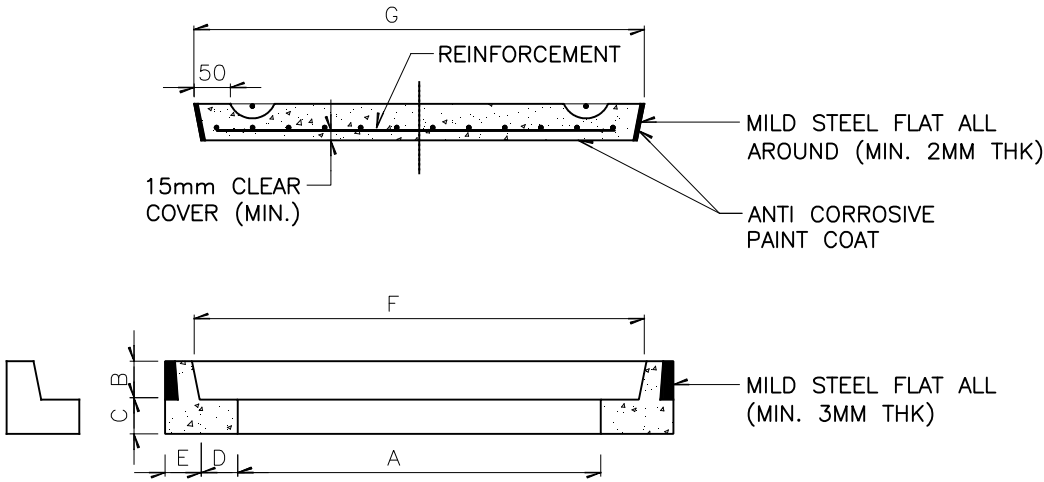
NOTES

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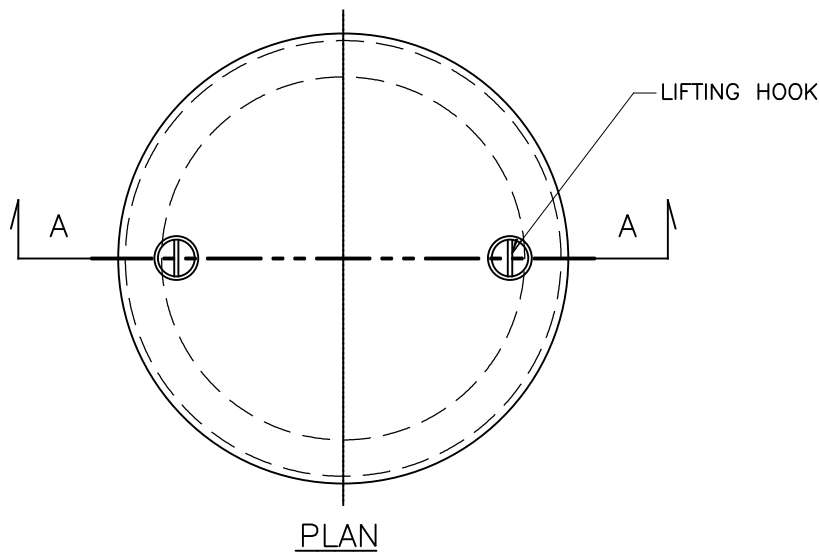
LEGEND:

TYP	—	TYPICAL
DIA	—	DIAMETER
UN	—	UNLESS NOTED
THK	—	THICK

TYPICAL DETAILS OF R.C.C FRAME & COVER



SECTION A-A



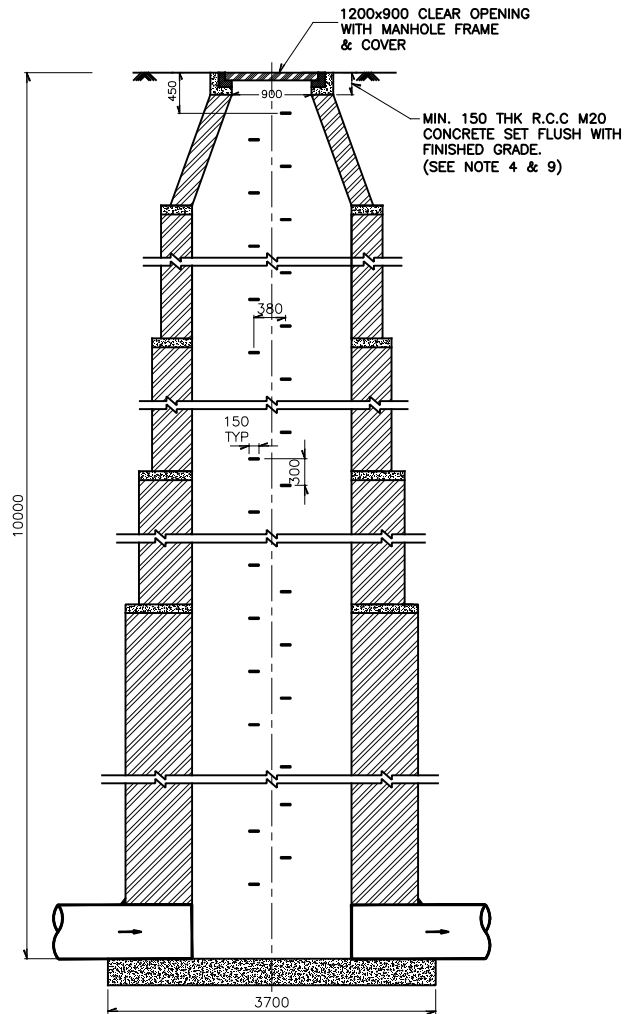
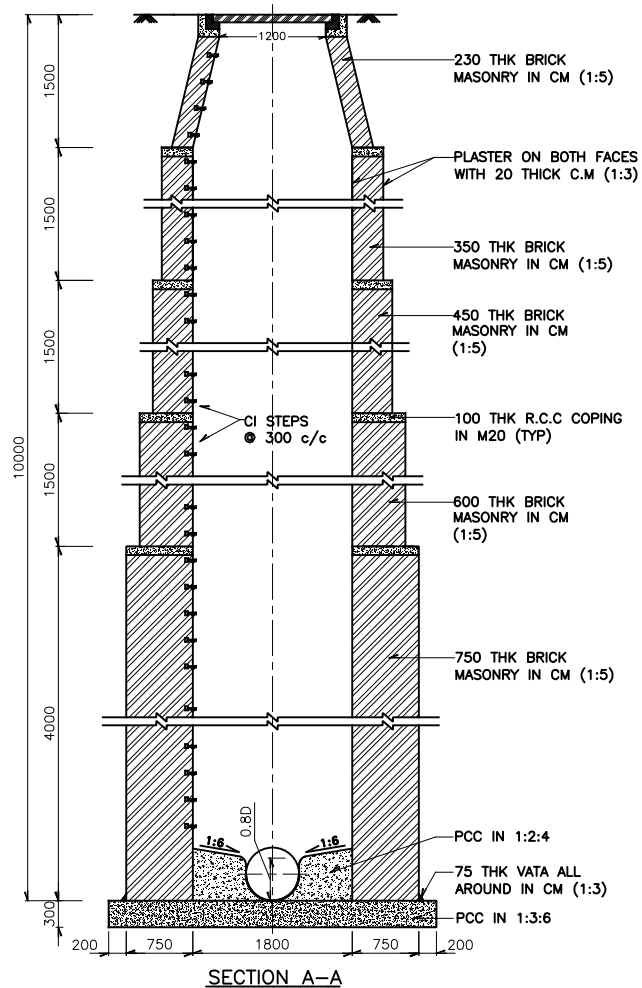
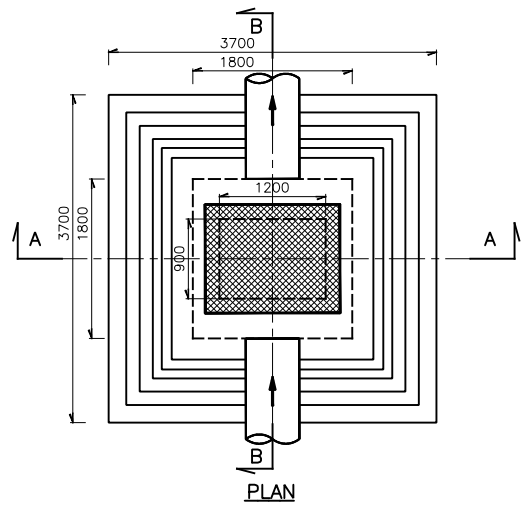
NOTES

1. ALL DIMENSIONS ARE IN MM.
2. THE MANHOLE FRAME AND COVER SHALL BE DULY MARKED BY BIS CERTIFICATION MARKING.
3. OUTSIDE DIMENSION OF COVER AT TOP SHALL MATCH WITH THE CORRESPONDING FRAME SO THAT THE MAXIMUM CLEARANCE AT THE TOP BETWEEN THE FRAME AND THE COVER ALL AROUND THE PERIPHERY IS NOT MORE THAN 5MM.
4. THE TOP SURFACE OF FRAME AND COVER SHALL BE IN LEVEL WITH THE TOLERANCE OF ± 5 MM.
5. TOLERANCE ON C SHALL BE ± 5 MM .
6. TOLERANCE ON A,B,D & E SHALL BE 0.0MM-5MM.
7. FOR FACILITY OF REMOVING MANHOLE COVER , SUITABLE UPWARD TAPER OF NOT MORE THAN 5° MAY BE PROVIDER TO THE INNER PERIPHERY OF THE FRAME.
8. IF REQUIRED FOR THE REMOVAL OF MOLDS,SUITABLE TAPER NOT MORE THAN 5° CAN BE GIVEN AT THE LOWER INNER PERIPHERY OF THE FRAME AS INDICATED.
9. LIFTING HOOKS SHALL BE HOT DIP GALVANISED AND PROVIDED AS FOLLOWS:

LIGHT AND MEDIUM DUTY - 12MM (MIN.)
HEAVY DUTY - 16MM (MIN.)
EXTRA HEAVY DUTY - 16MM (MIN.)

S.No	Grade	Desciption	A	B	C	D	E (Min)	F (Min)	G
1	LD - 2.5	Light Duty Circular	500	50	50	50	50	608	600
2	LD - 2.5	Light Duty Rectangular	450 x 600	50	50	50	50	558 x 708	550 x 700
3	MD - 10	Medium Duty Circular	500	70	50	50	50	610	602
4	MD - 10	Medium Duty Rectangular	450 x 600	70	50	50	50	560 x 710	552 x 702
5	HD - 20	Heavy Duty Circular	500	90	75	75	75	660	652

SCRAPER MANHOLE



NOTES

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LEGEND:

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DIA	-----	DIAMETER
UN	-----	UNLESS NOTED
THK	-----	THICK
PCC	-----	PLAIN CEMENT CONCRETE
EQ	-----	EQUAL
C.I.	-----	CAST IRON
SFRC	-----	STEEL FIBRE REINFORCED CONCRETE

1000

1000

1000

(A)LIST OF APPROVED VENDORS FOR CIVIL WORKS

Sr. No.	ITEMS	Approved Brands / Quality
1	CEMENT PPC 53 Grade & SULPHATE RESISTANT CEMENT,S.R.C.	Ambuja, Hathi, Ultra Tech, Sanghi, Siddhi, Hi-bond
2	BRICKS	MBM, Arjun, PBM, 555, Kisan, ABM, TRD, Paresh, Dhara, B.R.C., Kiran, BMB, Kirit, Sonal
3	Steel TMT, CRS	TISCO, SAIL, VIZAG, Kamdhenu, NATIONAL, Electrotherm, JSW, Welspun steel, Pollad Steel, DIAMOUND TMT, M. G. Steel, Friends Steel, Crown next TMT, Briskon TMT
4	VITRIFIED TILES	Asian, Kajaria, Jonson, Varmora, Simpolo, OASIS
5	CERAMIC TILES	Asian, Kajaria, Johnson, Varmora, Simpolo, OASIS
6	GLAZED TILES	Asian, Kajaria, Johnson, Varmora, Simpolo
7	ACRYLIC PAINT	ICI, Asian, Nerolac, Burger
8	OIL BOUND DISTEMPER	ICI, Asian, Nerolac, Burger
9	EXTERIOR WEATHER PROOF EMULSION PAINT	ICI, Asian, Nerolac, Burger
10	Oil Paint	ICI, Asian, Nerolac, Burger
11	SANITARY WARE	Cera, Hindware, Parryware
12	CAST IRON PIPES AND FITTINGS.	NECO, Swayarhoo, Bengal, Oriental Castings, Electro steel Castings
13	P.V.C. PIPES AND FITTING (UPVC/CPVC)	Finolex, Supreme, Jain, Kisan, Astral, Dutron, Prince
14	CHROMIUM PLATED WATER SUPPLY FITTINGS	Jaquar, Ess Ess, Plumber ,ESSCO, Crown, Metro, Prince
15	GALVANIZED PIPE	Tata, Essco, Jaquar, Ess Ess, Plumber
16	GALVANIZED FITTINGS	'R' Brand, 'RV' Brand, Kranti
17	C.I. MANHOLE COVER	Manish, Sil, NECO
18	PLUMBING FIXTURES	Jaguar, Plumber, Essco
19	PVC WATER TANK (100% VIRGIN PVC)	Sintex, Aqua
20	ALUMINIUM SHEETS AND ACCESSORIES	Nalco, Jindal, Hindalco, Banko

Sr. No.	ITEMS	Approved Brands / Quality
21	ALUMINIUM EXTRUDED DOOR/ WINDOW SECTION	Jindal, Hindalco, Banko, Ajin India, Aldowin, Alumilite
22	ALUMINIUM HARDWARE	Rajdoot, Belu, Diamond, Glider, Ajin India, Aldowin, Alumilite
23	WATER PROOFING MATERIALS	Zycosil, Dr. Fixit, Kerakoll, Pidilite, Roff
24	DOOR CLOSER	Efficient Gadget, Everite, Hardwin, Aldowin, Ozone
25	DOOR FITTINGS	Godrej, Efficient Gadgets (E.G.) Dunex, Doorset, Suzu, Coral
26	HINGES	Suzu, Yama, E.P.P.W.
27	SCREW AND BOLTS	Nettle Folds, GKW, Stud
28	BOLTS & FASTENERS	Hilti, Fisher
29	LIFT	Top, Express, Omega, OTIS, Schander, TRIO, Aegis Elevator, Mitsubishi, Aditya, Siemens slider
30	ROOFING MATERIAL – Galvalume sheets	TATA, Essar, Jindal
31	Slag Cement	SANGHI CEMENT Sanghipuram
32	CPVC PIPES FOR AUTOMATIC SPRINKLER FIRE EXTINGUISHING SYSTEM	ASTRAL POLY TECHNIK LIMITED પાર્કિંગ એરિયા, બેઈઝમેન્ટ એરિયા જેવા વિસ્તારો સિવાય માત્ર કન્સીલ્ડ પાઈપીંગ માટે આ કંપનીના CPVC pipe નો ઉપયોગ fire sprinkler piping માટે કરવાની મંજૂરી આપવામાં આવે છે.
33	AAC Blocks	NXTBLOC
34	Jointing Mortar	NXTFIX Block
35	Ready Mix Plaster	NXTPLAST
36	Block joining Masonry Mortar	Unifix
37	Tile adhesive	Unifix
38	RCC bench	Sardar Pre cast
39	Rubber mould garden curbin	Sardar Pre cast

Sr. No.	ITEMS	Approved Brands / Quality
40	Rubber mould Paver block	Sardar Pre cast
41	Fencing Pole	Sardar Pre cast
42	RCC Masonry block	Sardar Pre cast
43	Pre cast wall	Sardar Pre cast

(B) LIST OF APPROVED VENDORS FOR MECHANICAL & ELECTRICAL WORKS

Sr. No.	Description	Name of Manufacturer
1	HSCF Pump	Crompton Greaves Ltd
		Kirloskar Brothers Limited (KBL)
		JASCO
		Mather & Platt Pumps Ltd.
		Jyoti Ltd.
2	Electric Motor	Lubi Industries LLP
		Bharat Bijlee Ltd.
		Jyoti Ltd.
		JSL Industries Ltd.
		Jeumont Electrical India Pvt. Ltd.
3	Electrical Panel	LHP
		Crompton Greaves Ltd
		Bhagyashree Power Control
		Dynamic Control System
		Elembica Services
4	Kinetic Air Valve	JSL Industries Ltd.
		Nutral Power Tech
		Kirloskar Brothers Limited (KBL)
		FOURESS Engineering (India) Limited.
		Durga Valves Pvt.Ltd
5	Expansion Bellows	Orbinox
		શ્રી કિર્લોસ્કર ઇન્ડસ્ટ્રીઝ
		Precise Engineers
6	Dewatering (Drain) Pump(Submersible/ Horizontal)	KSB Pumps
		Kirloskar Brothers Limited (KBL)
		JASCO
		Crompton Greaves Ltd
		La Gajjar Machinery Pvt Ltd.
7	Sluice Valves and Sluice Gate	Pullen Pumps Industries Pvt. Ltd.
		MBH
		Kirloskar Brothers Limited (KBL)
		DURGA Valves Pvt.Ltd
		L & T Valves
8	UPVC Pipe	Jupiter
		SACHDEVA
		Supreme Industries Ltd.,Mumbai
		Dutron Polymers Ltd
		Parixit Industries Ltd., A'bad
9	HDPE Pipe	Jain Irrigation Systems Ltd., Jalgaon
		Parixit Industries Ltd., A'bad
		Jain Irrigation Systems Ltd., Jalgaon
		Dutron Polymers Ltd
		Jindal
10	C.I. Pipe	Essar Steel
		Electro Steel, Kejriwal, Oriental Castings, BIC,
		Jindal, Lanco Industries Ltd.,Chennai, Kesins
13	EOT Crane	
		Grip Engineering Pvt. Ltd., JAPS Project, Brady & Morris Engineering Co. Ltd., Techno Industries

Sr. No.	Description	Name of Manufacturer
14	Cable & Wires	KEI Industries Ltd.
		Polycab Wires Pvt. Ltd.
		Aerolex Cables Pvt. Ltd.
		Allwin Industries
		Finolex Cables
		L&T Cables
		ULTRA CAB (India) Limited
15	Transformer	Atlanta Electricals Pvt. Ltd.
		Powerlite Electricals
		Voltamp Transformers Ltd.
		SKP Transformers
		Arya Electronics
16	Components for MCC :	
	Switch	L&T, Siemens
	HRC Fuse	L&T, Siemens
	Timer	L&T, Siemens
	Relay	L&T, Siemens
	Push Button Stations	L&T, Siemens
	Indicating Lamp	L&T, Siemens
	Cable Jointing Kit	CCI, M. Seal
	MCB/DB's	MDS, Siemens, Indokupp
17	Capacitors	L&T, Crompton, Khatau Note: Capacitors shall be oil fill type
18	KWH Meter	Simco, Jaipur, GEC
19	Light Fittings: (Indoor & Outdoor Luminaries)	Philips, Crompton, Bajaj, NESSA Illumination
20	Exhaust Fans	Crompton, Bajaj,
21	Ceiling Fans	Crompton, Bajaj, Havells
22	Air Blowers	Everest Ltd.
		Swan Pneumatics (P) Ltd
23	Alum Dosing Pumps	Asia LMI
		VK Pumps
		Swelore
24	Pressure Gauges	General Instruments
		Bells Control
		H. Guru Marketing
25	Level Gauge / Indicator	R K Dutt
		Levecon
		S. B. Electromec
26	Clarifier Equipment	Enviro Control Associates
		Voltas Ltd
		Hindustan Dorr-Oliver
		Geomiller/Triveni
27	Chlorination System	Industrial Device (I) Pvt. Ltd
		Metito
		Chloroequip
		Pennwalt
28	Gear Box	Greaves
		Radicon
		Elecon
		Shanti

Sr. No.	Description	Name of Manufacturer
29	Level Switches	Level-Tech
		Revathi Electronics
		Levec
30	Refrigerator	LG, Samsung, Kelvinator
31	PVC Pipes for Fluid	Finolex, Jain Irrigation
32	PVC Conduits for Electricals	Precision, Shakti
33	Butterfly Valve	KIRLOSKAR Brothers Limited(KBL), DURGA valves Pvt Ltd, L & T valves, R&D MULTIPLE, Jupiter, श्री कृष्ण वैद्युत IVC, IVI, Audco, R & D multiple, Jupiter, Cair, Orbit Engineers
34	Check Valve (Dual Plate check Valve)	KIRLOSKAR Brothers Limited(KBL), DURGA valves Pvt Ltd, Orbinox, R&D MULTIPLE, Orbit Engineers
35	Metallic Expansion Bellow	Beloflex(B.D. Engineers), Stanfab Engineering Pvt. Ltd., D. Wren Engineering Pvt. Ltd., Sur Industries,
36	Centrifugal / Centrifugal Non Clog Pumps	Beacon Weir, KSB, Mather & Platt (Wilo), Worthington, WPIL, Xylem pumps, Grundfos Pumps Pvt. Ltd., MBH, JASCO
37	Submersible non Clog Pumps / Submersible Centrifugal Pumps	Kirlosker, KSB, ABS, ITT- Flyght, Xylem pumps, Grundfos Pumps Pvt. Ltd., MBH, JASCO, AQUA, Jyoti, PULLEN PUMPS, Alpha, Het Pump
38	Screw Pump	Roto, Netzsch, Tushaco, Seepex
39	Metering / Dosing Pumps	Swellore, V.K. Pumps, Shapotools
40	Non Return Valves (Single / multi door) / Dual Plate Check Valves	Kirlosker, IVC, IVI, R & D multiple, Durga, Jupiter, Cair, Orbit Engineers
41	Knife Gate valves	Jash, Fouess, Vass (Dezurick), Vag, Orbinox, Orbit Engineers
42	Sluice gates / open Chanel Gates	Jash Engineering, IVC, R & D Multiple, Jupiter
43	Mechanical Fine Screens – Step (Mat) Type / Drum Type	Jash, Huber, Johnson, Savi, Italy, Apollo Screens
44	Mechanical Course bar Screen	Jash, Huber, Johnson, HDO, Triveni, Savi, Italy
45	Manual Bar Screen	Jash, Japs, HDO, Triveni, Auric
46	Grit mechanism	EIMCO – KCP, Hindustan Dorr – Oliver, Jash-Shivpad, Triveni, Voltas
47	Diffused Aeration System	EDI, OTT, Rehau
48	Air Blower	Kay, Swam, Everest, Usha Compressors, Gardner Denver
49	Agitator / mixer	Remi, Schurtek, Fibre & Fibre, Milton Roy
50	Gear Boxes	Greaves, Elecon, CPEC, PEPL, Bonfiglioli
51	Centrifuge	Humboldt, Alpha Laval, Hiller

Sr. No.	Description	Name of Manufacturer
52	HDPE Pipes	Astral, Dutron, Duraline, Narmada, RIL (PIL), Penwalt, Anjney, Jain Irrigation, Sangir
53	Air Compressor	Ingersoll – Rand, Khosla, Kirlosker, CPE, Alpha
54	Bearing For All Equipments	SKF, FAG, Tata
55	Fasteners	Precision, Durakhanawala, Echjay, Tata, Sundaram
56	Mechanical Seals	Eagle Seals (Sealol), Durametallic, Burgman
57	Electric Actuator	Auma, Rotork, Emerson, Pentair
58	(1) CATEGORY III Indoor LED fittings, LED Panel light, LED down light, outdoor LED light (street light, LED flood light, LED Post top lantern, LED bollard) (2) Solar LED Light	NESSA ILLUMINATION TECHNOLOGIES PVT.LTD., Litsun, Nextray
59	STREET LIGHT POLES	AMBICA POLES (for octagonal poles, swage poles, street light poles, high mast poles, decorative poles, conical poles, JETCOTECH Engineering LLP
60	Resilient Seated Slice Valve	Cair
61	Air Valve	Cair, Orbit Engineers
62	Flow Control valve	Cair
63	Altitude Control valve	Cair, Orbit Engineers
64	Pressure reducing valve	Orbit Engineers
65	Pressure relief valve	Orbit Engineers
66	Ball valve	Orbit Engineers
67	Mast pole	JETCOTECH Engineering LLP
68	Earthing material	JETCOTECH Engineering LLP
69	Hot dip galvanizing	JETCOTECH Engineering LLP
70	LED Highbay	Litsun

(C) LIST OF APPROVED VENDOR FOR INSTRUMENTATION SYSTEM

SR NO	DESCRIPTION	Name Of Manufacturer
1	Electromagnetic Flow Meter	E+H, Siemens, Abb, Fuji, Yokogawa, Krohne-Marshall, AAROH Embedded System Pvt Ltd., Emerson, SBEM
2	Pressure Gauges	Wika, H.Guru, General Instruments Consortium Manometer (India) P. Ltd. , Baumer, Waaree
3	Pressure Switch	Danfoss , Indfoss , Switzer
4	Process Analyzers (pH, DO, Free / Residual Chlorine , BOD / COD)	E+H , Emerson , Hach , Chemitech , Polymetron, Wtw (Forbes Marshall),Yokogawa
5	Ultrasonic transmitter level / diff. level / flow	E+H, Siemens – Milltronics, Krohne, Vega
6	Hydraulic level transmitter	E+H,Siemens, ABB, Forbes- Marshall, Emerson, SBEM
7	Displacer/Float Switches	Levcon, Nivo, Toshbro, Pune Techtrol , SBEM
8	PP Float / Buoyancy switch	Pepprl + Fuchs, Baumer, Waaree, E+H , Pune Techtrol , SBEM
9	Float & Board Type Level Gauge	Levcon, Nivo, Toshbro, Pune Techtrol, SBEM
10	Electromagnetic Flow Meter	E+H, Siemens, ABB, Fuji, Yokogawa, Krohne-Marshall
11	Field Transmitter (P, DP,F, L , T)	ABB, Fuji, Yokogawa, Honeywell, Emerson
12	Pressure Gauges	Wika, H.Guru, General Instruments Consortium Manometer (India) P. Ltd., Baumer, Waaree
13	Panel Mounted Process Indicator & Flow Integrator	Masibus, Nishko, Nivam, Selectron, Radix, Yokogawa, ABB
14	Pressure Switch	Danfoss, Indfoss, Switzer
15	Programmable Logic Controllers	Rockwell (Allen Bradeley), Siemens, Schneider, Fuji, ABB, GE Fanuc
16	Control Panel Enclosure	Rittal, Enklotek, Bartakke, BCH, Eldon
17	Alarm Annunciator	Aplab Ltd., Minilec , IIC
18	Solenoid valves	Asco, Rotex, Schrader
19	Tube Fitting	Excel Hydropneumatic, Multimetal, Placka

20	Instrument Valves , Manifolds	Aptek, Anmol (Superlok), Excel Hydropneumatic, General
21	Fitting	Instrument Consortium , Multimetal, Technomatic, Placka
22	Pneum , Brass Fitting	Swagelok, Multimetal Industries, SMC, Festo
23	Control Panel Accessories / Components	
a.	Miniature Relay	Wago, Omron,Phoenix, Rockwell
b.	Indication Pilot Lamps (LED Type)	Teknic, Schneider, Siemens
c.	Push Button / Selector Switch (with NO/NC Elements)	Teknic, Schneider, Siemens
d.	DC Power Supplies (DIN Rail mounted)	Phoenix, Omron, Schneider, Rockwell
e.	Terminals	Elmex, Phoenix, Wago, Connectwell
f.	Panel Wires	Finolex , Havell's , R R Kabel
g.	Panel Illumination	Philips , Crompton , GE
24	Instrument Cables (Power , Signal , Control)	Associated Cables, Associated Flexible and Wires P.Ltd., Brooks Cables, Thermo Cables, Udey Pyro
25	Cable Glands	Ex- protecta, Braco, Sudhir, Comet, Connectwell
26	Junction Box	Ex- protecta, CEAG, Sudhir, Baliga, FCG
27	Cable Tray	M.M.Engineering, Globe, Jacinth, Equi. Reputed, JETCOTECH Engineering LLP
28	Computer System	HP-Compaq, Dell, IBM, Sony, Samsung
29	UPS	Hirel-Hitachi, Emerson, APC
30	1. PLC (Programmable Logic Controller) 2. SCADA (Supervisory Control and Data acquisition) 3. VFD (Variable Frequency Drive Up to 500 KW) 4. ACB (Air Circuit Breaker up to	MITSUBISHI ELECTRIC INDIA PRIVATE LIMITED, Emerald House, EL-3, J Block, M.I.D.C., Bhosari, Pune 411026

	6000A) 5. MCCB (Moulded Case Circuit Breaker up to – 1600 A) 6. MCB (Miniature Circuit Breaker up to – 63 A) 7. ELCB (Earth Leakage Moulded Case Circuit Breaker up to 1600 A) 8. Contractor up to – 800 A & OLR (Over load Relay) up to 630 A 9. Multi Functional Meters 10. MPCB (Motor Protection Circuit Breaker up to 32 A)	
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**(D) LIST OF APPROVED VENDORS FOR MATERIALS RELATED TO WATER
SUPPLY AND SEWERAGE NETWORK**

SR. NO.	ITEMS	NAME OF AGENCIES
1	A C Pressure pipe MAZZA process	Lotus, Kirti
2	A C Pressure pipe MEGHNANI process	Lotus, Kirti, Hindustan
3	Sluice Valve	Durga, kartar, Kirloskar, Jupiter, SACHDEVA (C.I. & D.I.), શ્રી કિર્તી ઇન્ડસ્ટ્રીઝ, Cair, Orbit Engineers
4	DI Pipe	Electrotherm (I) Ltd.,Ahmedabad, Lanco Industries Ltd.,Chennai, Electrsteel, Jindal Saw Ltd.,Ahmedabad, Kesins, Welspun
5	R.C.C. PIPE (COLLAR JOINT & SOCKET SPIGOT JOINT) CLASS NP3 & NP4, & R.C.C. COLLARS	VIPUL SPUN PIPES (SIHOR & LATHIDAD,BOTAD), KATARIYA & CO. (DHASSA), OMKARESHVAR PIPES (NAVAGAAM), OMKAR PIPES (LATHIDAD, BOTAD), MARUTI PIPES (BAGODARA ,AHMEDABAD), KALATHIYA PIPES(BAGODARA ,AHMEDABAD), R. S. PIPES (BODELI), UMA HUME PIPES (KALOL, GANDHINAGAR), SIDHDHIVINAYAK (KARDEJ ,BHAVNAGAR)
6	R.C.C. MACHINEOLE FRAME & COVER, INLET FRAME COVER 10T.(600*450 MM.) , 20T.,35T., & 50T.	SONI CEMENT PRODUCT , VIPUL SPUN PIPES, KATARIYA & CO., OMKARESHVAR PIPES, OMKAR PIPES, MARUTI PIPES, KALATHIYA PIPES , R. S. PIPES, UMA HUME PIPES, SIDHDHIVINAYAK , S.K. Corporation, Laxmi Price Industries, S.J.Corporation, Sardar pre cast
7	Stone ware PipeManufacturer having BIS Certificate for ISI marking	Krishna Pipe, j.K. Pipe, Taya ceramic, Burn & co., perfect Potteries, Navroji Vakil, Kashmira
8	D.I. & C.I. FITTINGS	RG BRAND, ESSEM Engineering Industries, Bikaners Engineers works
9	CID Joints	ESSEM Engineering Industries
10	Valves & Graded Castings	ESSEM Engineering Industries
11	Pipe Fittings	ESSEM Engineering Industries, Bikaners Engineers works
12	CI/DI/MS graded castings	Bikaners Engineers works
13	Scaper machine hole	Sardar Pre cast

BHAVNAGAR MUNICIPAL CORPORATION		
Notice Inviting On -Line Tender		
E-Tender Notice No. 01 BMC/DRAINAGE/SJMMSVY/tender/2025-26		
Department Name	:-	Drainage Department
IFB No.	:-	No.01 BMC/DRAINAGE/SJMMSVY/tender/2025-26
Name of Project	:-	swarnimjayanti mukhya mantri saheri vikas yojana 2024-25
Name of Work	:-	Drainage line upgradation work at Anjani city society opp. Gyan manjari school to Indraprasthngar kabir Asharm road in Kaliyabid ward, Bhavnagar City
Estimated Contract Value (INR)	:-	60,000,00.00 (sixty lacs)
Class of Registration required	:-	Duly registered with State/ Central Govt./Municipal Corporations/P.S.U./ Agencies in Class “ D ” or above.
Period of Completion (in month)	:-	12 (Twelve) Months Including monsoon period
Bidding Type	:-	Open (Percentage Rate Tender)
Bid Call (Nos)	:-	1
Tender Currency Type	:-	Single
Tender Currency Settings	:-	Indian Rupee (INR)
Joint Venture	:-	N.A.
Rebate	:-	N.A.
<u>Amount Details</u>		
Bid Document Fee	:-	Rs. 2400/-
Bid Document Fee Payable To	:-	Commissioner, Municipal Corporation, Bhavnagar
Bid Security / EMD (INR)	:-	Rs. 60,000/- it must be in the form of Demand Draft only
Bid Security / EMD in favour of	:-	Commissioner, Municipal Corporation, Bhavnagar
<u>Tender Dates</u>		
Bid Document Downloading Start Date	:-	03 / 04 / 2025
Bid Document Downloading End Date	:-	12/ 04 /2025 18:00 hours
Pre Bid Meeting	:-	No
Last Date & Time of Receipt of Bid (Online Submission Of Bid)	:-	12/ 04 /2025 18:00 hours
Physical submission of tender fee, EMD, Registration and other documents by RPAD/Speed Post:	:-	Upto 17 / 04 /2025 upto 16:00 hours
Bid Validity Period	:-	120 Days
<u>Remarks</u>	:-	<p>Corrigundam : Availability of bid documents on N-procure singht is true, bidder has to understood N-procure only. Miles stone dates shown in news paper Advertise may be wrong date. This is for bidders information.</p> <p>CLASS OF REGISTRATION REQUIRED FOR BIDDER MUST BE "D" CLASS AND ABOVE. Demand Draft for Tender fee & EMD shall be submitted in Electronic Format through online scanning alongwith all the supporting documents such as Registration, Bank Solvency Certificate etc. while uploading the bid. Offer of those shall be opened whose EMD & Tender Fee is received alongwith the bids. Physical submission of tender fee, EMD, Registration and other documents send them in original through Speed Post/Reg. A.D. end Dt. 17/04/2025, 16:00 hours, so as they reach to the office of Executive Engineers - Drainage Dept., Bhavnagar Municipal Corporation, Bhavnagar . If possible, all the successfull bids will be opened on Dt. 17 / 04 /2025, 17:30 pm at the City Engineer's Office, Bhavnagar Municipal Corporation, Bhavnagar.</p>
Bid Opening Date	:-	Upto 17/04/2025 upto 17:35 hours (if possible)
<u>Other Details</u>		
Officer Inviting Bids	:-	Executive Engineer (Drainage Dept.), Municipal Corporation, Bhavnagar.

Bid Opening Authority Members in committee	:-	Tender Committee, BMC	
Address	:-	1st Floor, Office of the Executive Engineer (Drainage Dept.) , Municipal Corporation Bhavnagar, Sir Mangalsinhji road, Bhavnagar- 364001.	
Contact	:-	Phone no. (Office) 0278 2430256 , Mobile No. 9978400931 mail ID:- bmedrainage@gmail.com.	E-

E-tendering relate instructions

- (1) Bidders can download the tender document free of cost from the website **www.nprocure.com**
- (2) Bidders have to submit Technical bid on **www.nprocure.com** website till the Last Date & time for submission.
- (3) Offers in physical form will not be accepted in any case.
- (4) Free vendor training camp will be organized every Saturday between 4.00 to 5.00 p.m. at (n)code solutions - A Division of GNFC Ltd., Bidders are requested to take benefit of the same.

All bids should be digitally signed, for details regarding digital signature certificate related training involved, kindly, contact the below mentioned address.

(n) Code Solutions A Division of GNFC Ltd.

403, GNFC Infotower, Bodakdev,

Ahmedabad - 380 054 (India)

Tel. +91 79 26854511/12/13 (EXT :501,512,516,525) +91 79 26857316/17/18 (EXT :501,512,516,525)

Fax. +91 79 26857321, 40007533

E-mail : nprocure@gnvfc.net

Web-site : www.nprocure.com

Toll Free : 1800-233-1010 (EXT :501,512,516,525)

BHAVNAGAR MUNICIPAL CORPORATION

ONLINE E-Tender

Notice No.01 BMC/DRAINAGE/SJMMSVY/tender/2025-26



Bid Documents For
Drainage line Up gradation work at Anjani city society opp. Gyan manjari
school to Indraprasthnagar kabir Aashram road, in Kaliyabid ward,
Bhavnagar City

VOLUME –I **TECHNO COMMERCIAL BID**

Milestone Datesonline	
Date of issue of placing tender document start date	03/04/2025
Date of pre-bid meeting and site visit	NA
Last date of Online Tender Submission	12/04/2025, 18:00 hour
Last date of submission of physical Documents	17/04/2025, 16:00 hour
Online Opening date of the Technical Bid (If convenient.)	17/04/2025, 17:30 hour

CLIENT: contact person

Executive Engineer (Drainage Department),
Bhavnagar Municipal Corporation.,
Sir Mangalsinhji Road,
Bhavnagar- 364 001



BHAVNAGAR MUNICIPAL CORPORATION

E-Tender Notice No.BMC/DRAINAGE/SJMMSVY/tender/2024-25

City Engineer, Bhavnagar Municipal Corporation, invites On-Line Percentage rate tenders for the following work as per tender provisions in single stage two bid system for the works shown in the schedule given below including 12 month defect liability.

1	Work Description	Drainage line Upgradation work at Anjani city society opp. Gyanmanjari school to Indraprasthnagar kabir Aashram road, in Kaliyabid ward, Bhavnagar City.
	Estimated Cost	Rs. 60,00,000/-including 12 month defect liability
3	EMD	Rs/-60,000/-
4	Tender Fee	Rs./-2400/- not refundable
5	Registration Class	Duly registered with State/Central Govt./Municipal Corporations / PSU/Agencies in Class-"D" or above

The detail tender notice & Bid Documents will be available on the website: <https://bmc.nprocure.com> and notice can be seen on www.bmcgujarat.com from date :03/04/2025 to 12/04/2025, 18.00 Hrs. The Municipal Commissioner reserves the right to reject any or all offers received without assigning any reasons thereof. Further details, if any, may be obtained from The office of Executive Engineer, Drainage Department.

Executive Engineer

Date: 03 /04/ 2025

Drainage department

Place: Bhavnagar

Municipal corporation Bhavnagar

DETAIL TENDER NOTICE:		
Tender NoticeNo.	E-Tender Notice No.BMC/DRAINAGE/SJMMSVY/tender/2024-25	
Organization Name	BHAVNAGAR MUNICIPAL CORPORATION	
Department Name	DRAINAGE Executive Engineer Bhavnagar Municipal Corporation., Sir Mangalsinhji Road, Bhavnagar- 364 001	
Scope of work	Drainage line Up gradation work at Anjani city society opp. Gyan manjari school to Indraprasthnagar kabir Aashram road, in Kaliyabid ward, Bhavnagar City	
Tender Type	PERCENTAGE RATE WORK Open Online	
Bidder Nationality	LCB (Local Competitive Bidding)	
Qualification of Bidder	Duly registered with State/ Central Govt./Municipal Corporations/P.S.U./ Agencies in Class "D " or above.	
Type of Contract	PERCENTAGE RATE Work	
Bidding Currency	Single (Rupees)	
JV/Consortium	Not Allowed	
Schedule of E-Tender	Document downloading last date & time	03/04/2025 to 12/04/2025, up to 18:00 Hrs.
	Pre-Bid Meeting date & time	NA
	Last date & time of online Bid submission	12/04/2025 up to 18:00 hrs
	Physical submission of EMD, Document Fee, PQ bid and Supporting documents	On or before 17/04/2025 up to 16:00 hrs at Office of Executive Engineer (Drainage Department), BMC, Bhavnagar
	Opening of PQ Bid (Online) & Technical Bid	17/04/2025 at 17:30 hrs BMC, Bhavnagar
	Opening of Price Bid (Online)	Intimation through letter
	Bid validity period	180 days on receipt of tender
	Project Duration	12Months including monsoon period
Payment Details	Document Fee	Rs.2400/- (not refundable)
	EMD	Rs.60,000.00
	Estimated Value	Rs. 60,00,000.00
General Terms & Conditions	Bidders who wish to participate in this E-Tender will have to procure valid digital certificate as per information Technology Act 2000. Bidders can procure this certificate from any of the Government approved certifying agency i.e. (n) Code Solution.	

	<p>DOWNLOAD OF TENDER DOCUMENT: - The tender document for these work are available only in Electronic format which can be download free of cost by the bidder.</p> <p>SUBMISSION OF TENDER:- Tenderer shall submit their offer in Electronicformat on above mentioned website on or before the scheduled date and timeas mentioned, after Digitally Signing the same. Bidders shall upload the tender documents after submitting the DD details for tender fees and EMD in form of Demand Draft only. The Demand Draft toward Tender Document fees can be submitted along with Earnest Money Deposit before the due date as specified above. This should be as per details given online and it should be drawn before last date of the uploading of the tender. The intending bidders shall have to submit the following documents in Physical form along with the EMD and tender fees.</p> <ul style="list-style-type: none"> (a) Documents required for evaluation as sought in different annexure dully digitally signed. (b) Power of attorney. (c) Company's profile and certificate of Registration of company under the law. <p>The Bidder should submit price Bid electronically only. <u>Price bid in physical form shall Not be accepted</u> and any such offer if received by Bhavnagar Municipal Corporation same will be out rightly rejected. Technical bid in physical form is not required to be submitted by all bidders. However, non submission of technical bid does not absolve bidders from and liability of the tender. Only successful bidders have to submit the technical bid duly signed in physical form upon intimation from BMC</p>
	<p>OPENING OF TENDER: - The TechnicalBidwillbe opened on the specified date online on website https://bmc.nprocure.com Bidders or their representativewho wish to participate in online tenderopeningcan log on to https://bmc.nprocure.com on the due date and time, mark their presence and participate in online tender opening. Bidders who wish to remain present at Bhavnagar Municipal Corporation, Only one representative of each firm will be allowed to remain present.</p>
Information for online participation	<ol style="list-style-type: none"> 1. Internet siteaddressfor e-Tendering activities willbehttps://bmc.nprocure.com 2. Interested bidders can view detailed tender notice and download tender documents from the above mentioned website. 3. Bidders who wish to participate in online tender have to register with the website through the "New User Registration" link provided on the home page. Bidder will create login id & password on their own in registration process. 4. Bidders who wish to participate in this tender need to procure Digital CertificateasperInformationTechnologyAct-2000 using that they can digitallysign their electronic bids. Bidders can procure the same from any of

	<p>the CCA approved certifying agencies, or they may contact (n) code Solution at below mentioned address and they will assist them in procuring the same. Bidders who already have a valid Digital Certificate need not to procure the same. In case bidders need any clarification regarding online participation, they can contact</p> <p>M/S (n)code Solution 301, G.N.F.C. Info Tower, Near grant Bhagwati Hotel, Ahmedabad 380015, India. Tel: +91 79 26857316 Tel: +91 79 26857317 Tel: +91 79 26857318 E-Mail: URL: https://bmc.nprocure.com</p> <p>5. Bidders who wish to participate in e-Tender need to fill data in predefined forms of tender fee, EMD, PQ (Technical) or experience details and Price bid only.</p> <p>6. Bidder should upload scan copies of reference documents in support of their eligibility of the bid.</p> <p>7. After filling data in predefined forms bidders need to click on final submission link to submit their encrypted bid. Bidder can also submit Document Fees, EMD, Technical bid document & Reference Documents in hard copy if such instructions are given by tendering authority.</p>
Contact person	<p>For further details of any query regarding the tender Contact to: Executive Engineer (Drainage Department), Bhavnagar Municipal Corporation., Sir Mangalsinhji Road, Bhavnagar- 364 001 Phone No: (O)-0278-2424801 to 10 Mobile no. 9978400931 E-mail address: bmcdrainage@gmail.com</p>

Date: **03/0/2025**
Place: Bhavnagar

Deputy Commissioner(Admin),
Bhavnagar Municipal Corporation,
Bhavnagar

BHAVNAGAR MUNICIPAL CORPORATION**TENDER DOCUMENT****I N D E X**

SR. NO.	PARTICULARS
	VOLUME - I TECHICAL BID
1.	NOTICE INVITING TENDER
2.	INFORMATION TO TENDERER
3.	CHECK LIST
4.	GENERAL DETAILS OF WORK IN BRIEF
5.	INSTRUCTIONS TO TENDERER
6.	ADDITIONAL INSTRUCTIONS TO TENDERER
7.	GENERAL CONDITIONS OF CONTRACT
8.	SPECIAL CONDITIONS OF CONTRACT
9.	PERCENTAGE RATE TENDER AND CONTRACT FOR WORKS
10.	PREAMBLE TO TECHNICAL SPECIFICATIONS (PRICE BID)
11.	MEMORANDUM
12.	GENERAL SPECIFICATIONS
13.	DETAILED SPECIFICATION OF MATERIALS
14.	GENERAL TECHNICAL SPECIFICATION FOR BUILDING WORKS
15.	ITEMWISE DETAILED TECHNICAL SPECIFICATIONS
16.	IMPORTANT INSTRUCTION TO TENDERER
17.	ADVANCE STAMP RECEIPT
18.	FORM OF BID SECURITY (BANK GUARANTEE)
19.	FORM OF CONTRACT AGREEMENT
20.	FORM OF PERFORMANCE SECURITY (BANK GUARANTEE)
21.	VENDOR LIST
	VOLUME -2 PRICE BID
22.	PAYMENT BREAKUP
23.	PRICE SCHEDULE(ESTIMATE)
23.	DRAWINGS AS PER VOLUME NO. 03

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 18.00 hours on website bmc.nprocure.com. The tender received after due time and date specified will not be accepted.

(B) NAME OF WORK:

Drainage line Up gradation work at Anjani city society opp. Gyan manjari school to Indraprasthnagar kabir Aashram road, in Kaliyabid ward, Bhavnagar City

ESTIMATED COST	Rs.60,00,000/-IncludingDefect Liability12 month
EARNEST MONEY DEPOSIT	Rs./- as per detailed tender notice
TIME LIMIT	12 (TWELVE Months) [Including monsoon]
Document Fee	Rs.2400/-as per detailed tender notice
Registration required	_as per detailed tender notice

(C) OPENING OF TENDERS :

The tenders will be opened online in presence of bidders and opening authority subject to receipt of Tender Fees, EMD and other Documents in hard copy. The tenders will be opened in **two stages**.i.e**Technical Bid and Commercial Bid.**

(D) PURCHASE OF TENDER DOCUMENTS :

Tender Documents can be downloaded from bmc.nprocure.com upto as per detailed tender notice.

Tender documents fees of Rs. 2400/-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, Bhavnagar Municipal Corporation"** payable at Bhavnagar and shall be submitted **alongwith EMD** and other documents. The cost of the Tender Documents will not be refunded in any circumstances. The Bhavnagar Municipal Corporation shall not be liable for any postal delay in any case.

(E) CONTRACT PERIOD :

The total contract period is hereby fixed as **12 (Twelve Months)** including monsoon from the 15th Day of issuance of Letter of Intent(LOI).

No Execution work shall be permitted on site from 15st June to 15th October, but in special case WA have to sought permission from the EIC. However material procurement shall be permitted.

(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.

(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 (Earnest Money Deposit) as specified.

(d) The successful tenderer shall execute the Contract Agreement within fifteen days after the date of Letter of Intent (LOI).

(e) The successful Tenderer will be required to furnish a performance bond (Security Deposit) of an amount equal to (5%) Five percent of the tendered amount.

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

(g) The Bhavnagar 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.

(G) RECEIPT OF TENDER DOCUMENTS :

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

- a. Document fees and EMD Details
- b. Commercial Bid

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. Annexure I to X along with all necessary supporting documents

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 the last days of receipt of tender 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 Bhavnagar 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 Bhavnagar Municipal Corporation does not appear to be in its best interest and the tenderer shall have no cause of action or claim against the Bhavnagar Municipal Corporation or its officers, employee, successors or assignees for rejection of this tender.

The Bhavnagar 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 Bhavnagar 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 Bhavnagar 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 Bhavnagar Municipal Corporation.

The Bhavnagar 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.

Scope of Work:-Drainage line Up gradation work at Anjani city society opp. Gyan manjari school to Indraprasthnagar kabir Aashram road, in Kaliyabid ward, Bhavnagar City.

The Broad scope of work for the Project is described as below:

- Dismantling the existing road within proposed route for pipeline and MHs, as instructed by engineer in charge (EIC). Old pipe, Paving blocks will be carted by WA up to store or as instructed by EIC. No extra payment will be done for this work , it will be a part of excavation work.
- Excavating for new pipeline, MH, Inlet chambers work.
- Providing, Supplying, Lowering and Laying 300mm and 600mm dia. RCC NP3 pipeline for up gradation of sewer line and making job connections with existing storm water disposal point

- Road Restoration work as instructed by EIC.
- The bidder has to carry out level survey as per the instruction and guidance of the EIC or its official representative. The LS accordingly shall have to prepared and submitted to the monitoring department for approval. The work on site shall be carried out only after getting the approval of LS.
- As the work to be carried out in urban area the bidder shall have to restore all the service like water, drainage,septic tank, gas, electricity, electric- telephone cable etc. at his own cost
- The alignment of the proposed storm water pipe line will be along new constructed road side or as instructed by the EIC, any extra item will be paid as per the prevailing rates of BMC or GWSSB SOR whichever is less for the year in which the item is executed.
- The up gradation work ismay be in previously excavatedvery loose strata or RCC road and Paving Blocked roads and it may be for hard rock or soft road strata . Gas pipe line, HT cables or Telecommunication's cable trench, adequate safety precautions shall have to be adhered to while working to prevent accident and any loss of property or life.
- **Contractor has to inform concerned Under Ground services provider's representative before digging to prevent Govt. or other Private property by informing through "CallBefore Dig", Mobile App. and other Whatts App groups" after trial pits , line out will be given to work agency.**
- All RCC Pipe shall be manufactured for socket and spigot joint with EPDM rubber ring in SRC/**OPC**cement and **having ISI mark.**
- The scope of work includes removal of pipeline, wherever necessary.

The schedule of quantities is given separately in tender. The broad scope of work is as follows and shall be carried out strictly in accordance with specifications and instructions of Engineer-in-charge issued from time to time. The contractor shall provide all necessary materials, equipment, labour etc. for the execution and maintenance of work till completion unless otherwise mentioned in the tender documents. All materials that will be used for the work shall be approved by the Engineer in charge prior to procurement and use.

" Drainage line Up gradation work at Anjani city society opp. Gyan manjari school to Indraprasthnagar kabir Aashram road, in Kaliyabid ward, Bhavnagar City "

- Manufacture, testing and delivery of RCC-NP3class ISI marked pipe manufactured with Sulphate Resistive Cement / OPC and shall be laid as per item specification.
- Excavation of trenches and pits for laying of pipes and construction of man/Machine holes etc., in all kinds of soil etc., including dewatering whenever and wherever for the work under this contract is necessary and back filling including compacting. Excavation of asphalt pavement/RCC road of any thickness including demolishing the asphalt carpet/RCC road, metal, soling etc.
- Construction of inlet chamber as per type design provided by engineer in charge.

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SIGNATURE OF THE
CONTRACTOR.

EXECUTIVE ENGINEER,
BHAVNAGARMUNICIPAL CORPORATION,
BHAVNAGAR.

2.0 INFORMATION TO TENDERER :

1. Tender validity period 180 days (One hundred & Twenty days) from the last date of receipt of tender
2. Earnest Money Deposit Rs.60000.00/- as per detailed tender notice
3. Security Deposit Five Percent (5%) of contract Amount.
- 4 A Retention Money 5%, Deducted from every bill
5. Time of Completion For the complete contract 12(Twelve Month)
(Including monsoon)
6. Period for O & M Contract NA
7. Period of liability for defects. 12 months after completion of work
8. Penalty for delay Zero Point one percent (0.1%) of the contract price per day, maximum upto ten percent of the contract price.
9. Last date of download of tender Date :- as per detailed tender notice upto 18.00 hrs from bmc.nprocure.com
10. Last date of submission of online Tender Date :-----as per detailed tender notice
- 11 . Last date of submission of Tender fees, EMD and other Documents as per detailed tender notice

Executive ENGINEER,
BHAVNAGAR MUNICIPAL CORPORATION,
BHAVNAGAR.

3.0 CHECK LIST

1. Tenderers to note last date and time of submission of Tender Fees, EMD and other documents and that they are to be posted by **Registered Post A. D. / Speed Post only.**
2. Tender (Technical Bids and Documents) should be duly sealed and the covering envelope is to be only super scribed as **"Drainage line Up gradation work at Anjani city society opp. Gyan manjari school to Indraprasthnagar kabir Aashram road, in Kaliyabid ward, Bhavnagar City**
3. Tender Security Bond for Earnest Money Deposit should be submitted as per Articles **IT-07** (Earnest Money Deposit)
4. Conditional tender will be rejected outright by the Bhavnagar Municipal Corporation, without giving any reason.
5. All information as demanded should be submitted.
6. Information regarding capability etc. as per clause No.**IT-04** (General Performance Data) should be submitted in hard copy alongwith tender fee and EMD.
7. Please verify before SEALING that Tender (Technical Bids and Documents) are signed, wherever required in each and every respect.

4.0 GENERAL DETAILS OF WORK IN BRIEF :

1. NAME OF WORK :- Drainage line Up gradation work at Anjani city society, opp. Gyan manjari school to Indraprasthnagar Kabir Ashram road -Kaliyabid ward, Bhavnagar City
2. Estimated cost of the work : Rs. 60,00,000.00includingDefect Liability.
3. Amount of Earnest Money Deposit : Rs.60,000.00per detailed tendernotice
4. Tender cover to be superscribed as :

1. NAME OF WORK :“Drainage line Up gradation work at Anjani city society, opp. Gyan manjari school to Indraprasthnagar Kabir Ashram road -Kaliyabid ward, Bhavnagar City”

1. Tender Notice (online) No. as per detailed tender notice
2. Name and Address of Tenderer.

EXECUTIVE ENGINEER,
BHAVNAGAR MUNICIPAL CORPORATION,
BHAVNAGAR.

5.0 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 :

The Bhavnagar Municipal Corporation hereinafter referred to as the Corporation will receive tenders for **Drainage line Upgradation work at Anjani city society, opp. Gyan manjari school to Indraprasthnagar Kabir Ashram road -Kaliyabid ward, Bhavnagar City** as per the specifications in the tender documents. The tenders shall be opened in the office of the City Engineer, BMC, Bhavnagar in the presence of tenderers or their representatives who choose to remain 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 accompanied 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 in hard copy along with the Technical Bid, EMD and tender fees. **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.**

(B) **Joint Venture is not allowed.**

(C) Tenderer shall submit only one tender for the work put to this tender.

IT-05 TENDER DOCUMENTS :

Not Applicable

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 affect 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 Each Tender must be accompanied with Earnest Money of Rs.60,000.00(DD only)per detailed tender notice in the following manner.
100% of EMD amount shall be in the form of Demand Draft of Local Schedule/nationalized Bank(except SBI, and encashable at Bhavnagar) in favour of the Municipal Commissioner, Bhavnagar Municipal Corporation payable at Bhavnagar.

The tender bond, shall be valid for a period of not less than One hundred and twenty (120) days from the last date of receipt of tender and shall comply with the requirements for Bond as stipulated in the general conditions of contract. The tender guarantee bond will be held by the Corporation as a guarantee that the tenderer, if awarded the contract, will enter into the contract agreement in good faith and furnish the required bonds. Any tender not accompanied by a Tender Guarantee in the form of earnest money deposit as stated above for the sum stipulated in the Tender Document will be summarily rejected.

- B. The Earnest Money Deposit will be refunded to the unsuccessful tenderers after the award has been finalized.
- C. 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 jurisdiction of the Corporation (BMC).

- D. The Earnest Money Deposit of the successful tender shall be returned after the performance guarantee bond, as required, is furnished by the contractor.
- E. 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 xerox copy of the **GST number**, PAN card and last return's acknowledgement copy.

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 only.**

IT-10 SUBMISSION OF TENDERER DOCUMENT :-

1. Tenderer shall submit his tender in sealed covers as described under:

- (i) COVER-1 : Documents for qualifications for the work of "**Drainage line Up gradation work at Anjani city society, opp. Gyan manjari school to Indraprasthnagar Kabir Ashram road - Kaliyabid ward, Bhavnagar City.**" along with E.M.D and Tender Fees. Also mention the name of tenderer, address, tender notice number etc. on the cover and to be submitted to the

Executive Engineer (Drainage), Bhavnagar Municipal Corporation, MangalSinhji Road, Bhavnagar - 364001.

2. Tenderer shall be required to submit the enlisted documents along with their bid (Volume-I) (i.e. Cover-1). If this bid founds insufficient documents then the Price Bid of the tenderer shall not be opened.
 - (a) The tender shall be accompanied by Earnest Money Deposit as stated in para IT-07(A).
 - (b) All relevant documents for qualifications and details sought in All Annexure.
3.
 - (a) List of tools, plants and equipment's 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 all 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, Bhavnagar Municipal Corporation and other factors bearing influence on the execution and cost of the works.
5. Technical Bid shall be received by Registered Post A.D. or by Speed Post through Postal Authority only by the **"Executive Engineer (Drainage Department)**, 1st Floor , Bhavnagar Municipal Corporation, MangalSinhji Road, Bhavnagar - 364001, as per Mile stone dates and time stated in tender.

If possible the same will be opened on the date of pre-qualification opening on line 12.00 hours onwards in the presence of the tenderers, who shall remain present in the office of "Deputy Municipal Commissioner(A) or City Engineer, Bhavnagar Municipal Corporation, Bhavnagar. 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. 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.
 2. Tenderer's tender/quotation containing conditions shall be liable for rejection out rightly without assigning any reason for the same.
 3. Stipulates his own conditions.

4. Does not quote his rates inclusive of all taxes , insurance, labor overhead charges, contractor's profit, royalties etc **including GST.**
 5. Does not disclose the full names and address of all his partners in the case of partnership firm.
 6. Does not pay the Earnest Money Deposit by Demand Draft/B.G. and Tender Fees with the Bid (Cover-1).
 7. Does not submit the tender before the stipulated time and specified date in the Account Office as directed.
 8. Does not attached the document mentioned.
 9. 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. 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.
 8. Notice inviting tenders shall be a part of the contract documents.
 9. Acceptance of tender/quotation will rest with the competent authority of Bhavnagar 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.
 10. Tender once accepted shall be binding on the contractor even if the formal agreement is not signed.
 11. Tender once offered cannot be withdrawn except with the permission of Commissioner, Bhavnagar Municipal Corporation, Bhavnagar.
 12. The successful tenderer shall be required to enter in to agreement with Municipal Corporation after placing the LOI for the said work from BMC.
 13. The tenderers are requested to study complete specification of work quoted.
 14. Bhavnagar 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 (180) Calendar day from the last date of receipt of tender 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 the 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 signed 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 BHAVNAGAR 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 query 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 BMC / 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 online, if, any and acknowledge the receipt of all Addenda in the Tender. Failure to acknowledge may cause the Tender to be rejected.

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

IT-18 TAXES AND DUTIES ON MATERIAL :

The quoted rates should be inclusive of all taxes , insurance, labor overhead charges, constructor's profit, royalties etc including GST. Other duties on material obtain for the works from any source shall be borne by the Contractor. 'P' and 'C' form shall not be supplied by the Municipal Corporation.

All the taxes, including GST shall be borne by the Contractor and EPF data/certificate shall be submitted at the time of all the running bill by the contractor.

IT-19 EVALUATION OF TENDERS : Tenders shall be evaluated as per the qualification criteria mentioned.

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 LOI to proceed. Total completion period is calendar months from 15th day from date of issue of LOI and tenderers should adhere to this completion 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 contacting 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 this is a storm water/sewage water infrastructure project, the price quoted are for the total works or the part of the total works quoted for and include all costs due to materials labour, equipment, supervisions, any restorations, other services, taxes and royalties etc. including GST 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 owners.
- 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 BMC may annul his award and declare the tender security forfeited.

C. 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 authorized to do so.[JV not allowed]

IT-25 SIGNING OF CONTRACT :

The successful tender shall be required to pay the security deposit and to execute the contract within 15 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 as specified as per Article IT-07 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 authorized person (as per Article IT - 12 i.e. signing of tender documents).
- (e) The general performance data for qualification not submitted fully (As per Article IT-04 General Performance Data).
- (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) :10% as Tender

As a contract security the tenderer to whom the award is made shall furnish a performance guarantee (Security Deposit) for amount equal to Five percent (5%) of the contract price to guarantee the faithful performance completion and maintenance of the works of the contract in accordance with all the conditions and terms specified herein and to the satisfaction of the Engineer and ensuring the discharge of all obligations arising from the execution of contract, in one of the forms mentioned below.

- (a) 100% By a demand draft of a Scheduled/Nationalized bank Acceptable to owner on the Bhavnagar Branch.
OR
- (b) 100% by a fixed deposit receipt of a Scheduled Bank or Government securities duly, located at Bhavnagar pledged in favour of the Municipal Commissioner, Bhavnagar Municipal Corporation, Bhavnagar.
OR
- (c) 100% By Bank Guarantee of a Scheduled /Nationalized Bank and Bank Guarantee encashable at Bhavnagar City

The performance guarantee shall be delivered to the Municipal Corporation within Ten (10) days of the notice of award.

Security deposit shall be paid in time and if it is paid next fifteen(15) days from the date of LOI then the penalty of 0.065 % per day of the amount of security deposit shall be recovered from the contractor while receiving the security deposit. On due performance and completion of the contract in all respects, the performance guarantee (security deposit) which will be released after the total completion of contract after payment of final bill. 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. If contractor fails to pay S.D. in stipulated time it will cause of cancellation of award and forfeit EMD etc.

Additional Five percent (5%) security deposit shall be deducted from running bills as **retention money** which will be released after completion of defect liability period but if contractor wants to convert such amount in the form of Fix Deposit Receipt in the name of the commissioner, during intermediate period can be permitted after such approval by commissioner.

IT-28 STAMP DUTY :

The successful tenderer shall have to enter into an agreement on a non-judicial stamp paper of Rs. 300/- as per the form of the agreement approved by the Municipal Corporation, Bhavnagar.

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

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

Additional Stamp of amount equivalent to 4.25% of Security deposit is to be paid in case of SD paid in cash or in the form of Fixed Deposit receipt

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 with prior approval, 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-31 COST OF TENDERING :

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

IT-32 DEFECTION 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 Bhavnagar 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 vary 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 BMC reserves the right to reject any or all tenders, to waive any informality or irregularity in any tender without assigning any reasons. The BMC 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 BMC is not obliged to give reasons for any such action.

IT-36 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 deleted

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 Bhavnagar Municipal Corporation may appoint **PMC/TPI/BMC** supervisor for monitoring, supervision and material inspection for this project/work, the work agency has to convey activity schedules, coordinate and support them during the execution without any objection.

Contractor has to arrange all equipments and test materials like pipes, steel, bricks, cement, Concrete etc. for inspection /test at factory for bought out items and at site for other items executed at site or at laboratory at his own cost and submit QAP for approval and 'inspection call' time to time in prescribed form to TPI agency through Executive Engineer (Drainage Department), BMC.

IT-40 Drawings shall be approved and provided by BMC to contractor after submission by him of GL survey in 3 sets of hard copy to BMC .

IT-41 Contractor has to display sign board showing details of items and specifications at site as per instruction of Eng. In-charge. This is mandatory as per order of state vigilance commission.

IT-42 GENERAL INSTRUCTIONS & ERRATA

1. In case of any minor/major change in the alignment of proposed line due to site condition the department will be at the sole discretion and in such case work agency can not arise any objection.
2. Cement concrete blocks of crushing strength not less than 100 kg/cm² will be allowed without any extra cost for construction of chambers (manhole, scrapper manholes, vertical drop arrangement) and instructed that any Fly ash bricks containing lime will not allowed for any brick masonry work.
3. In the case of Existing RCC road slab, bidder has to calculate it as Hard rock strata and In the case of Existing Asphalt Paver road as Soft rock strata for Excavation.

As per above consideration Bidder has to calculate excavation of different soil strata at site of alignment and quote the rate for Excavation items " for specified lift and all type strata ".

4. Contractor has to excavate trench with manually labor in congested roads. In every alignment it should be inspected by trial pit or cross trenches up to required depth to detect the existing network of BSNL, PGVCL or other company's underground cable network, BMC's or other's water/sewer pipe line and submit a sketch of existing network to finalize the final alignment of sewer line will be laid and after instruction/permission of engineer in charge for excavation further work can be started. In case of any service line's breakages, damages shall be repaired and restored by contractor at his own cost.
5. Quantities of RCC pipes etc. shown in BOQ are tentative, contractors are instructed to procure as per actual requirement at site but not more than shown in BOQ.
6. Agency have to carry out level and alignment survey of the proposed network before execution of work and submit it in auto cad 2006.in soft and hard copy to the department for approval. Existing Bench Marks can be obtain from the Project department, BMC. Agency must cross check R.L.s of Bench Marks This survey should be carried out in & with consultation with BMC's technical representative.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER,
BHAVNAGAR MUNICIPAL CORPORATION
BHAVNAGAR.

Date:

Signature

Name

6.0 ADDITIONAL INSTRUCTIONS TO THE TENDERERS

(For Drainage Department Works only)

1. Successful contractor shall have to work under supervision of BMC representative and/or representative of third party inspection agency appointed by the Bhavnagar Municipal Corporation. However, decision of the Bhavnagar Municipal Corporation shall be final and binding to the Contractor.
2. Successful Contractor shall have to provide site office for BMC supervisors without any extra cost if instructed by engineer in charge(the Executive Engineer ,Drainage Department).
3. The bidder understood that this is an up gradation project, Hence, The contractor shall take utmost care during excavation to protect existing underground utilities. All water

- main lines / water connections, storm / sewage main / house connection, electricity cable, telephone cable, gas pipeline or any other utilities and structures shall be protected by the contractor. However, if met during excavation, any damage caused shall be rectified by the contractor at the earliest and all the rectification cost shall be borne by the contractor. If the bill for rectification work (if carried out by the concerned agencies / departments) is put by such agencies / department, the same shall be payable by the contractor, if not so it will be deducted and recovered from the running bills to be paid to contractor.
4. Contractor may construct manhole intermittently/before laying of lines. But in case if any manhole has to be abandoned due to any reason. Contractor has to bear the cost for the same.
 5. The whole work of excavation, laying and jointing of pipes shall have to be carried out with the help of leveling instruments only. The leveling instrument to be used for the purpose shall be provided by the contractor. In no case the work shall be allowed to be carried out with help of boning rod.
 6. The contractor will have to construct shed for storing controlled and valuable materials like cement and other materials etc. purchased by the contractor or supplied by the department. The material will be taken for use in the presence of the Department person. No materials will be allowed to be removed from the site of work.
 7. No foreign exchange would be released by Department for the purchase of material, plants and machineries required for the execution of the work contracted for.
 8. No price escalation shall be paid in any case.
 9. The surplus excavated earth, after backfilling the trenches shall have to be removed from the site as directed.

After compaction and consolidation, if any short fall of earth is found then contractor has to bring the required quantity to meet shortfall at his own cost. Moreover, 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 spall 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 BMC.

SIGNATURE
OF THE
CONTRACTOR

EXECUTIVE ENGINEER,
BHAVNAGAR MUNICIPAL CORPORATION,
BHAVNAGAR

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7.0 GENERAL CONDITION OF CONTRACT

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, Bhavnagar represented by Municipal Commissioner / City Engineer / Executive Engineer, any officer authorised by the Municipal Corporation.
- 1.2 The "Contractor" shall mean the person or the persons, firm or company whose tender has been accepted by the owner and includes his legal representative successors and permitted assignees.
- 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 consecutive 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, specifications, 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 assignees 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) there under.

It shall also mean the latest Indian Standards Institution Specifications for or relative to the particular work or part thereof, 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 approved 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 of the 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 Registered 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 specified 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 Intent" 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 Retention Money shall mean the money retained from R.A.Bill for due completion of "NET WORK'.
- 1.31 Unless otherwise specifically stated, the masculine gender shall include the feminine and natural genders and vice-a-versa 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 Bhavnagar Municipal Corporation. It is served by all weather roads and Western Railway Broad Gauge line. The intending Tenderer should inspect the site and make himself familiar with site conditions and available communication facilities.

Non availability of access/roads shall in no case be the cause to condone any delay in the execution of the work or be the cause for any claims or extra compensation.

GC-03 SCOPE OF WORK :

The bidder are instructed that this is drainage pipe line up gradation project. 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 endeavor 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 distribution pipe networks 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 provide land required for; Contractors shall have to make his own arrangement for the same.

GC-04 RULING LANGUAGE :

The language according to which the contract shall be constructed and interpreted shall be English. All entries in the contract documents and all correspondence 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 omission 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 be the final and binding to the contractor.

2. Works shown upon the drawings but not described in the specifications or 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 corporate companies / registered associations / body of individual / firm of partnership.
5. Notwithstanding 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 at variance with any provisions of the special conditions of contract, then, unless a different intention 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 requirements 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. CONTRACTOR TO OBTAIN HIS OWN INFORMATION :-

The correctness of the details given in the tender documents is not guaranteed. The contractor shall independently obtain all necessary information for making the tender. The contractor shall be deemed to have examined 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 whatsoever 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 inquiries, 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 acquainted 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 owner 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 circumstances 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 according to his own view on these matters and to have understand that no additional allowances except as otherwise expressly provided, will after words be made beyond the contract price. The contractor shall be responsible for any misunderstanding or incorrect information given in writing by the Engineer.

GC-07 ERROR IN SUBMISSION ;

The contractor shall be responsible for any errors or omissions in the particulars supplied by him. Whether such particulars have been approved by the Engineer or not, provided that such discrepancies, errors or omissions 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 further 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 dimensions given in the specifications shall supersede all else. Should any discrepancies 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 Executive 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)

1. A A sum of 5% of the accepted value of the tender contract price shall be deposited by the tenderer (hereinafter called. The Contractor while tender is accepted) as Security deposit with the BMC for the faithful performance, completion of the works in accordance with the contract documents and to the satisfaction of the Engineer and assuring the payment of all obligations arising from the execution of the contract.

This shall be deposited at 5 % of the value of the contract within ten days of the receipt by him or the notification of acceptance of tender and at least three (3) days before the contract agreement is executed in the forms mentioned below :

- (a) In cash or by a demand draft of a Schedule Bank / Nationalized Bank acceptance to owner on the Bhavnagar Branch.
OR
- (b) A fixed deposit receipt (FDR) of a Schedule Bank /Nationalized Bank located at Bhavnagar duly endorsed in favour of the Municipal Commissioner, Bhavnagar Municipal Corporation, Bhavnagar.

OR

(c) 5.00% of tender amount shall be acceptable in form of form of Bank Guarantee of any Schedule Bank / Nationalized bank (en cashable at Bhavnagar) having validity of duration of work plus ninety (90) days.

- 1 B If the value of the work as per actual execution exceeds the accepted value of tender because of allotment of further work further recoveries towards security deposit shall be effected at five percent (5%) of R. A. Bill to make up the total amount of security deposit equal to five percent (5%) of the revised value of contract. Alternatively the Contractor may at his option deposit the full amount of security deposit as per the revised value of the contract within fifteen days of receipt by him on the notification accepting the tender in the form as aforesaid.
2. If the Contractor, sub - contractor or their employees shall break, deface or destroy any property belonging to the owner or other agency during the execution of the contract, the same shall be made good by the contractor at his own expenses and in default thereof, the Engineer-in-charge may cause the same to be made good by other agencies and recover expenses from the Contractor (for which the certificate of the Engineer-in-charge shall be final). These expenses can be recovered from the security deposit if recover from other sources is not possible. The amount so reduced in security deposit will be made good by deduction from the next R.A. Bill of the Contractor.
3. All compensation or other sums of money payable by the contractor to the owner under terms of this contract may be deducted from or paid by the sale of sufficient part of his security deposit or from any sums which may be due or become due to the contractor by the owner on any account whatsoever and in the event this Security deposit being reduced by reasons of any such deductions or sale of security deposit or part thereof as aforesaid, the Contractor shall within fifteen days thereafter make good them in cash, bank drafts or Government Securities endorsed as aforesaid. No interest shall be payable by the owner for sum deposited as security deposit.
4. The security deposit shall be extendable upto the date as decided by Engineer in accordance with Requirement of contractual obligations under the contract.
5. The security deposit less any amounts due shall be returned to the contractor without any interest after the defects liability period is over and subject to the Engineer-in-charge certifying that no liability attaches to the contractor.
6. The performance guarantee shall be delivered to the Bhavnagar Municipal Corporation within 10 (Ten) days of the notice of award/L.O.I. Security deposit shall be paid in time and if it is paid next fifteen (15) days from the date of LOI then the penalty of 0.065 % per day of the amount of the security deposit shall be recovered from the contractor while receiving the security deposit. It is also clarified that the amount of the security deposit shall be calculated on the basis of contract value and not on the basis of estimated amount put to tender.(see IT – 27)

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 measurement.

2. No material shall be dispatched 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 directed 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 undiscovered 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 commencement to completion of work contractor shall take full responsibility for the case of the work including all temporary works and in case any damage, less 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 conformity 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 occurred, 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 BMC will be recovered 1.5 times 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 radically 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 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 programmed to be finalised by the Contractor, has to confirm to the execution period mentioned along with the Bill of Quantities in the Tender Documents. The Engineer upon scrutiny of such submitted programed 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 succeeding sub clause 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 notwithstanding 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 expeditions 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 contractor 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 panelized for the delay.
2. The general time schedule for construction is given in the tender document. Contractor shall prepare a detailed weekly or monthly construction programme in consultation with Engineer-in-charge soon after the agreement and the work shall be strictly executed accordingly. The time for construction 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 expiry 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 from 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 contractor to pay the stamp duty and the legal charges for the completion of the contract agreement.

GC-20 A. PENALTY FOR DELAY/LIQUIDATED DAMAGES:

If the contractor fails to complete the work within the stipulated completion date for the work or Amount retain at One tenth of one percent of contract value for that particular time period, per day of delay in completion of work or part thereof as the case may be. The amount of retention shall, however, be subjected to a maximum of ten (10) percent of the contract value.

Moreover he shall pay liquidated damages at One tenth of one 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. In case of contractor achieves total target of progress in next quarter , BMC will release the amount recovered in previous quarter.

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 or 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 said 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 loss sustained by him by reason of his having purchased or procured any materials or entered into any agreement 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 preceding 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 further 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 as specified in the tender to be carried out, the Engineer-in-charge shall give notice in writing to 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 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 BMC shall be obtained 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 where under 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 subletting clause hereof and the same action may be taken and the same consequence shall ensure as provided in the subletting clause.

GC-24 IN EVENT OF DEATH OF CONTRACTOR :

Without prejudice to any of the right or remedies 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 omission 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 increase 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 instructions, 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 a qualified 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 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, if 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, Foreman or other employees shall, in the opinion of Engineer-in-charge, be guilty of any misconduct or be incompetent or insufficiently qualified or intelligent 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 reemployed 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 qualified 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 behavior 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 prohibit, 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 neighborhood 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 BMC 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 BMC may 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 compensation, 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 construction 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 merely 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 license to use the same and to complete the works by his agents, other contractor or workman or to re-let 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 authorize 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 loss or damage thereto. If the owner shall have 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 forthwith 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-31 CONTRACTOR'S RESPONSIBILITY 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 authorized representative and the contractor will put a joint scheme with the concurrence of other contractors showing the arrangements 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 constituted 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, ordinance, 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 be engaged for other works, such as site grading, filling and leveling, 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 harmony.

GC-35 PRICE ADJUSTMENT :

No adjustment or variation or enhance rate on any ground in price shall be allowed

GC-36 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 subsequently 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-78 (Measurement of Work in Progress)

GC-37 RETENTION MONEY :

Pursuant to Clause GC-36 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-84 (Completion Certificate).

However, after the issuance of completion certificate, and Municipal Commissioner may at its own discretion 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 contravene the provisions of the contract, the BMC 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 judgment 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 in whole or in part as provided in Article GC-49 (Termination of Contract), the Municipal Corporation reserves the right to purchase 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 damages for delay until such reasonable 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 performance and contract rights as the contractor has specifically produced or acquired for the performance of the contract so terminated.
- (4) In the event the Municipal Corporation does not terminate the contract as provided in the paragraph GC-49 (Termination of Contract) the Contractor shall continue performance of the contract, in which case he 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 bankrupt 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 organization 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 faithful 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-36 (Terms of Payment).

GC-44 DECLARATION AGAINST WAIVER :

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

GC-45 LAWS GOVERNING THE CONTRACT :

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

GC-46 OVERPAYMENT AND UNDERPAYMENT :

Whenever any claim for the 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 notwithstanding the fact that the amount of the final bill may be included by one of the parties as an item of dispute and notwithstanding the fact that the amount of the final bill figure will be decided by appropriate authority.

If 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.

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 or which may at any time thereafter become due before payment is made to the contractor shall be paid to Contractor by 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 questions of fact arising under the contract shall be decided by the Engineer, subject 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.

GC-48 DISPUTES OF DIFFERENCE TO BE REFERRED TO :

Disputes if any, shall be discussed and mutually settled as per GC-47 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 Bhavnagar Jurisdiction only.

GC-49 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 control and/or the Municipal Commissioner finds it impossible to continue operation then 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 there 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-50 CHANGES IN CONSTITUTION :

Where the contractor is a partnership firm, the prior approval in writing of the Municipal Commissioner shall be obtained if 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 where under 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-51 SUB-CONTRACTUAL RELATIONS :

Shall be modified and read as under :-

“Sub contracting / Sub-letting the work is prohibited under this contract“

GC-52 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 later may be compelled to pay in discharging such lien or claim including all cost and reasonable expenses.

GC-53 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-54 WORK IN MONSOON :

When the work continues in monsoon if so desired by Engineer-in-charge, 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-55 WORK CLOSED ON SUNDAYS & HOLIDAYS AND BETWEEN SUNSET AND SUNRISE:

No work shall be carried out 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 previously 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-56 EXTRA SUPERVISION CHARGES TO BE BORNE BY CONTRACTOR:

Further to clause No. GC-55 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 Bhavnagar Municipal Corporation's description.

GC-57 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. Contractor should make demand for drawing prior 15 days.

GC-58 DRAWINGS TO BE SUPPLIED BY THE CONTRACTOR :

Where drawings 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-59 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 taking part 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, bamboo, flag, 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 necessary precautions to prevent their removal or disturbance and shall be responsible for the consequence 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 masonry 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 relieve 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-60 RESPONSIBILITIES OF CONTRACTOR FOR CORRECTNESS 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 make recommendations to the respective authorities if desired 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-61 MATERIALS TO BE SUPPLIED BY THE OWNER : (NA)

1. If the contract provides certain materials or stores to be supplied by the BMC such materials and stores shall be transported by the contractor at his cost from BMC'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 contractor has to account for the full quantity of materials supplied to him.
2. The value of store materials supplied by the BMC to the contractor 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 BMC, the same shall be charged at cost price including carting and other expenses incurred in procuring the same. 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 BMC's store or any other place as directed by the Engineer-in-charge in perfectly good condition at contractor's cost. When materials are issued/ 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-62 CONDITIONS OF ISSUE OF MATERIALS BY THE BMC: (Not Applicable)

- a) The materials specified to be issued by the BMC to the contractor shall be issued by the BMC'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 BMC 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 BMC in Standard/non-standard sizes as obtained from manufacturer.
- d) Contractor shall construct suitable godowns at site for storing the materials to protect the same from damage due to rain, dampness, fires, theft etc.
- e) The contractor should take the delivery of the materials issued by the BMC 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 cost according to the instructions of the Engineer-in-charge.

- f) For delay in supply or for non supply of materials to be supplied by the BMC, on account of natural calamities, act of enemies, other difficulties beyond the control of the BMC, the BMC 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 BMC and the time when the same will be required for the work, so as to enable Engineer-in-charge to make arrangements 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 hand 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 at BMC's store at his own cost.

GC-63 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 BMC either by issue from BMC stock or purchase made under orders or permits or licenses 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 BMC and return, if 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 license of permits and/or for criminal breach of trust be liable to compensate BMC 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-64 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 BMC and will be disposed of as per instruction of Engineer-in-charge in the best interest of the BMC

GC-65 ARTICLE OF VALUE OR TREASURE FOUND DURING CONSTRUCTION:

All gold, silver and other minerals of any description and all precious stones, coins, treasures, relics, antiques 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-66 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 discrepancy in measurements shown in drawing and specifications, the same shown in drawing shall be considered as final and will be binding upon the contractor.

GC-67 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. Quantities shown in the tender are approximate and no claim shall be entertained for quantities of work executed being either more or less than those entered in the tender of estimate.

B. Extra Items :

The rate of extra item shall be decided as above or below tender with respect to G.W.S .& S. B SOR or BMC SOR whichever is lesser during which item is executed. If any Item is not available in the same SOR, then latest SOR of R&B (Bhavnagar) – shall be referred. And if any extra or miscellaneous item which is not mentioned in the Government S.O.R. The Contractor shall be bound to execute the same item as per current market rate as agreed by Engineer-in-Charge.

GC-68 ACTION WHEN NO SPECIFICATION IS ISSUED :

In case of any class of work for which no specification is supplied by the BMC in the tender documents, such work shall be carried out in accordance with I.S.S. However if ISS 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-69 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 noticed that the rates quoted by a tenderer for any item is unusually high or unusually low, it will be sufficient cause for rejection of tender unless the BMC is convinced about the reasonableness of the rates on scrutiny of the analysis for such rate to be furnished by the tenderer on demand.

GC-70 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-71 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 direct 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 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-72 ACTION AND COMPENSATION IN CASE OF BAD WORKMANSHIP :

If it appears 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 contract shall, on demand in writing from Engineer-in-charge or his authorised representative specifying the work, materials or articles comprises of, notwithstanding that the same may have been inadvertently 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-execute 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-73 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 compensation for any loss or damage sustained by him by reason of temporary suspension of work as aforesaid. An extension of time for completion of work will be granted to the contractor corresponding to the delay caused by such suspension of work if applied for the same provided the suspension was not consequent upon any default or failure on the part of the contractor.

GC-74 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 BMC has the right to carry out such parts of work as the BMC may designate whether by purchasing materials and engaging labour or by the agency of another contractor. In such case the BMC 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 BMC

GC-75 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 contract. 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-76 COMPLETION CERTIFICATE :

As soon as the work has been completed in accordance with contract (except in minor respect that do not effect their use for the purpose for which they are intended and except for maintenance thereof) as per general conditions of contract and has passed the tests on completion, the Engineer-in-charge shall issue a certificate (hereinafter called completion certificate) in which he shall certify the date on which work has been completed and has passed the said tests and BMC shall be deemed to have taken over work on the date so certified. If work has been divided in various groups in contract, BMC shall be entitled to take over any group or groups before the other or others and there-upon the Engineer-in-charge will issue a completion certificate which will, however, be for such group or groups so taken over only. In order that contractor could obtain a completion certificate, he shall make good, with all speed any defect arising from the defective materials supplied by contractor or workmanship or any act or omission of contract that may have been discovered or developed after the work or group of works has been taken over. The period allowed for carrying out such work will be normally, one month. If any defect be not remedied within a reasonable time, BMC may proceed to do work at contractor's risk and expenses and deduct from the final bill such amount as may be decided by BMC. If by reason of any default on the part of the contractor, a completion certificate has not been issued in respect of every portion of work within one month after the date fixed by contractor for completion of work, BMC shall be at liberty to use work or any portion thereof in respect of which a completion-certificate has been issued, provided that work or the portion thereof so used as aforesaid shall be afforded reasonable opportunity for completion of this work for the issue of completion certificate. This clause shall be read in conjunction with GC-84.

GC-77 SCHEDULE OF RATES :

1. The price/rates quoted by the contractor shall remain firm till the issue of final certificate 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 handing overwork to owner by contractor. Contractor shall be deemed to have known the nature, scope, magnitude and the extent of work and materials required though 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 be reasonable and necessary for completion work. The opinion of Engineer-in-charge as to the item of work shall be final and binding on Contractor although the same might 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 fee for the articles and processes, protected by letters patent or otherwise incorporated in or used in connection with work, also all royalties, 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 Municipal corporation 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. 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 including GST 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.
5. The schedule of rates shall be deemed to include and cover risk on account of delay or interference with contractor's conduct of work which may occur from any cause including orders of BMC in the exercise of his power and no account of extension of time granted due to various reasons.

GC-78 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 contractor or his authorised agent fails to be present when ever 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 notwithstanding the absence of contractor 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 to the extent of 75% of the value of materials of unperishable nature and an agreement be drawn 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 postponed 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-79 RUNNING ACCOUNT PAYMENT TO BE RECOVERED AS ADVANCES :

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-80 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 specified shall be an absolute waiver thereof.

GC-81 PAYMENT OF CONTRACTOR'S BILL :

The price to be paid by the BMC 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.

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 Forty five (45) days of submission of the bill in case of running bill and with in Three (03) 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 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 unauthorized person.

GC-82 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 finalized binding on all parties.

GC-83 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-84 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 respect 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 obtaining the completion certificate 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 cleared 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.
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- (e) Material appropriation statement for the materials issued by owner for work and list of surplus materials returned to BMC'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 extended 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.

This clause shall be read in conjunction with clause no GC-76

GC-85 TAXES, DUTIES ETC. :

1. Contractor agrees to and does hereby accept full and exclusive liability for the payment of any and all taxes, including sales taxes, duties etc. imposed, increased or modified from time to time in respect of work and materials and all contributions and taxes for unemployment compensation, insurance and old age pension or annuities now or herein after imposed by CENTRAL or State Government authorities with respect to or cover and by the wages, salaries or other compensation paid to the persons employed by Contractor. If the contractor is not liable to sales tax assessment, a certificate to that effect from the competent authority shall be produced without which final payment to the contractor shall not be made. No. "P" "C" or "D" from shall be supplied by the Municipal Corporation, and the contractor shall be required to pay full sale tax as applicable.
2. Contractor shall be responsible for compliance with all obligations and restrictions imposed by the labour law or any other law affecting employer employee relationship.
3. Contractor further agrees to comply and to secure the compliance of all sub-contractors with applicable CENTRAL, State, Municipal and Local law and regulations and requirements. Contractor also agrees to defend, indemnify and hold harmless the owner from any liability or penalty which may be imposed by CENTRAL, State or Local authorities by reasons of any violation by contractor or sub-contractor or such laws, regulation of requirements and also from all claims, suits or proceedings that may be brought against owner arising under, growing out of or by reasons of work provided for by this contract, by third parties or by CENTRAL or State Government Authority or any administration sub-division thereof.

No work contract Tax or service Tax shall be paid/reimbursed by BMC. Any increase or decrease in any taxes, duties levies etc. during the contract period shall not be reimbursed or deducted. However, any new taxes, duties levies imposed during the contract period shall be reimbursed of submission of proof of payment before preparation of Final bill.

GC-86 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 obligations 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 or 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 form and all forms which may be required in respect Contractor's or Sub-contractor's employees whose 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-87 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 willful act or omission 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 BMC's property arising under or by reasons of this agreement if such claims result from the fault and / or negligence or willful act of omission of contractor, his employees, agents, representatives or sub-contractors.

GC-88 LABOUR LAWS AND REGULATIONS :

1. The contractor shall be responsible for the strict compliance of and shall ensure strict compliance by his sub contractor employees and agents of all labors 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 labors engaged on work according the law.
4. The Contractor and sub-contractors of the contractor shall obtain proper authority designated in this behalf under any applicable 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 licenses, consents, Registration and / or other authorisation as shall from time to time be or become necessary for relating to the execution of work or any part or 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 licenses, consents, regulation and other authorisation and laws, rules and regulations applicable thereto.

5. Contractor shall submit labor license for this work.

GC-89 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 anyway 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 BMC under sec.(12) Sub-section (2) of the said Act, BMC shall be at liberty to recover such amount from any surplus due to the contractor or the security deposit. BMC will not be bound to consent any claim made under section (12) Sub-section (2) of the said Act except or written request of Contractor and upon the consenting of such claim.
4. The Contractor shall protect adjoining sites against structural decorative and other damages that could be caused to adjoining premises by the execution of these works and made good at his cost, any such damage, so caused.

GC-90 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 he 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-91 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-92 SAFETY CODE :**GENERAL :**

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

1. First Aid and Industrial Injuries :

- 1.1 Contractor shall maintain first aid facilities for its employees and those 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 prohibited 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. Contractor's Barricades :

- 3.1 The contractor shall erect and maintain barricades without any extra cost required in connection with his operation to guard or protect during the entire phase of the operation of this contract.
 - (i) Excavation
 - (ii) Housing areas,
 - (iii) Areas hazardous by the contractor's or the owners inspectors.
 - (iv) The owner's existing property liable to damage by the contractors operation, in the opinion of the Engineer-in-charge.
 - (v) Railroad unloading spots.
- 3.2 The contractor's employees & those of his sub-contractors shall become acquainted with the owner's barricading practice and shall respect the provision thereof.
- 3.3 Barricades and hazardous areas adjacent to but located in normal routes of travel shall be marked by red lantern at night.
- 4.0 Demolition :

- 4.1 Before any demolition work is commenced and also during the process of the work all roads and open area adjacent to the work site shall either be closed or suitably protected.
- 4.2 No electric cable or apparatus which is liable to be a source of danger shall remain electrically charged.
- 5. Scaffolding :
 - 5.1 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 ladder is used for carrying materials as well, suitable foothold and 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).
 - 5.2 Scaffolding or staging 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 scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
- 6.0 Safety Equipment :
 - 6.1 All necessary personal safety equipment as considered adequate by the Engineer-in-charge should be made available for the use to persons employed on the site and maintained in a condition suitable for immediate use, and the Contractor should take adequate steps to ensure proper use of equipment by those concerned.
 - 6.2 Workers employed on mixing materials cement and lime mortars shall be provided with protective footwear and protective gloves.
 - 6.3 Those engaged in white washing and mixing or stacking of cement bags or any materials which are injurious to the eyes shall be provided with protective goggles.
 - 6.4 Those engaged in welding and cutting works shall be provided with protective face and eye-shield, hand gloves etc.
 - 6.5 Stone breakers shall be provided with protective goggles and protective clothing, and seated at hand gloves etc.
 - 6.6 When workers are employed in sewers and manholes are in use, the contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manholes, and the

manholes opened shall be cordoned off with suitable railing and providing with warning singals or boards to prevent accident to the public.

7.0 Hoisting Equipment :

7.1 Use of hoisting machines and tackles including their attachments, and storage and supports shall conform to the following standards or conditions :

7.1.1 These shall be of good mechanical construction sound materials and adequate strength and free from patent defect and in good working order.

7.1.2 Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.

7.1.3 Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding.

7.1.4 In case of every hoisting machine and of every chain ring, hook, shackle swivel and pulley block used in hoisting or lowering or as means of suspension the same working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

7.1.5 In case of departmental machine, the safe working load shall be notified by the Engineer-in-charge. As regards contractor's machines, the contractor shall notify the safe working load of the machine to the Engineer-in-charge, whenever he brings any machinery to the site of work and get it verified by the Engineer-in-charge concerned.

8.0 Maintenance of Safety Devices :

8.1 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.

9.0 Display or Safety Instructions :

9.1 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.

10.0 Enforcement of Safety Regulations :

- 10.1 To ensure effective enforcement of the rules and regulations relating safety precautions, the arrangements made by the contractor shall be open to inspection by the welfare Officer, Engineer-in-charge or safety Engineer of the owner or their representatives.
- 11.0 No Exemption :
- 11.1 Notwithstanding the above clause ,there is nothing to exempt the contractor from the operations of any other Act or rules in force in the Republic of India.
- 11.2 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-93 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 occurrence 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 clearly 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 or damage resulting directly or indirectly from the Contractor's failure to report in the manner aforesaid. This includes penalties or fine consequence 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-94** 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 though water charges shall be recovered as per relevant condition of the tender.

GC-95 TESTING AND INSPECTION CHARGE :-

The contractor shall have to borne all charges for testing and inspection purpose. The contractor shall have to bear the to and fro travelling allowance of BMC official.

GC-96 SPECIAL CLAUSES REGARDING REFUND/RECOVERY OF EXCESS/ADDITION SECURITY DEPOSIT :-

In case the total amount of work done is less by 5% of the contract value, prorata 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 5% of the amount of final bill as per the prevailing norms or as per the norms decided from time to time.

The Additional S.D. shall be recovered from the running bill. When the total of any of work done by the Contractor upto 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 rounded of to the nearest multiple of Rs. 25000/- such additional S.D. (5% of the additional amount) shall be recovered for the works amounting to Rs. 5/- Lacs or more.

GC-97 If the contractor fails to complete the work and the Commissioner on behalf of the Corporation takes actions in accordance to 2(a) or (b) or (c) of clause GC-49 of the contract then in such cases the remaining work shall be carried out at the risk and cost of the original contractor by advertising the tender for the remaining work and the whole administrative process right from inviting the tenders to finalising the tender etc. shall have to be repeated. For this, a fixed amount of Rs. 1000/- shall be recovered from the original contractor towards the cost of re-advertisement and other administrative charges incurred by the department in finalising the contract for the remaining work. If however, separate advertisement is issued for the instant work, actual cost of advertisement shall be recovered. Such recovery shall be in addition to the recovery to be made under such other relevant clauses.

GC-98 No Contractor shall employ any person who is under the age of 15 years. If any contractor found employing person or persons under the age of 15 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-99 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 no rates is specified in this contract then 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 incur 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 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.

GC-100 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-101 PATENTS AND ROYALTIES :

1. Contractor, if licensed under any patent covering equipment, machinery, materials or composition of matter to be used or supplied or methods and process to be practiced or employed in the performance of this contract agrees to pay all royalties and

license fees which may be due with respect thereto. If any equipment, machinery materials composition matters, to be used or supplied or methods practiced or employed in the performance of this contract, is covered by a patent under which the contractor is not licensed, then the contractor before Supplying/ using the equipment, machinery, materials, compositions methods of process shall obtain such license and pay such royalties and license fees as may be necessary for performance of this contract. In the event contractor fails to pay such royalty or obtain any such license any suit for infringement of such patents which is brought against the contractor or the owner as a result of such failure will be defended by the contractor at his own expenses and the contractor will pay any damages and costs awarded in such suit. The contractor shall promptly notify the owner if the contractor has acquired knowledge of any plant under which a suit for infringement could be reasonably brought because of the use by the owner of any equipment, machinery, materials, process methods to be supplied hereunder. Contractor agrees to and do hereby grant to owner together with the right to extend the same to any of the subsidiaries of the owner an irrevocable royalty free license to use in any country, any invention made by the contractor or his employees in or as a result of performance of work under the contract.

2. With respect to any sub-contract entered into by the contractor pursuant to the provisions of the relevant clause hereof, the contractor shall obtain from the sub contractor an understanding to provide the Surat Municipal Corporation with the same patent protection that contractor is required to provide under the provisions of this clause.
3. The owner shall indemnify and save harmless the contractor from any loss on account of claim against contractor for the contributory infringement of patent rights arising out of and based upon the claim that the use by the owner of the process included in the design prepared by the owner and used in the operation of the plant infringes on any patent rights.

GC-102 AS BUILT COMPLETION DRAWINGS:

Contractor shall have to prepare and submit AS BUILT DRAWINGS with detailed L/S C/S of component etc. showing Alignment plan, Chainage, RL of invert, RL of Ground level at every section of MH, HCs or inlets, with position of each every manhole etc. in soft copy(Auto Cad - 2013), hard copy (3 sets) with readable and proper standard scale. Drawing should be submitted time to time with physical completion progress done by the contractor on site.

GC-103 CONNECTIONS AT EXISTING LINE/MANHOLE/PS

Contractor shall complete the job with existing connections for manholes, line orStrom Drains where required as per separate in BOQ.

EXECUTIVE ENGINEER,
BHAVNAGAR MUNICIPAL CORPORATION,
BHAVNAGAR.

Signature and seal of Contractor :-

Name :-

Address :-

8.0 SPECIAL CONDITIONS OF CONTRACT

1.0 GENERAL CONDITIONS :

- 1.1
- i] Service roads are laid within and upto the site of the work. These will be available to the contractor subject to any limitations imposed by BMC.
 - ii] The contractor shall have to obtain tokens for himself and to obtain gate passes for removing any of his materials outside the premises. The contractors persons entry and exit will be through main gate only.
 - iii] Non availability of access roads or railway siding or permits for entry of vehicles and equipment at any specific area shall in no case be the cause to condone any delay in the execution of the works or be the cause for any claims or extra compensations.

1.2 Water Supply & water charges

For all the purposes connected with the work, the contractors shall be allowed the use of water from the Municipal mains wherever available at prevailing rates of Rs 6.00 per 1000 liters of water. The contractors, however, will have to make their own arrangements to get at their cost necessary metered water connections from the Municipal mains.

In no case water will be supplied free of cost.

If Municipal mains are not available nearby the contractor shall have to make his own arrangements at his cost for water required for construction purpose.

1.3 Electric Supply for construction purpose.

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

2.0 DOCUMENTS :

2.1 The Tenders as submitted will consists of the following :

- i] Complete set of tender documents as sold duly filled in and signed by the tenderer as prescribed in different clauses of the tender documents.
- ii] Declaration showing all works of similar types and magnitudes carried out and on hand with the contractor and the value of works that remains to be executed must accompany the tender.

iii] Solvency Certificate of Bank or a Revenue Officer of desired amount as stated

iv] Tender Fees and Earnest money deposit must accompany the tender.

v] Tenderer should submit the True Copy of the Certificates of Registration and all relevant document for Qualification along with the tender without which the tender will not be considered.

2.2 Signature of Tenderer

The tender shall contain the name, residence and place of business of person or persons submitting the tender and shall be signed by the tenderer with his usual signature. In case of partnership firm name of all the partners shall be given and tender shall be signed by duly authorised representative followed by the name and designation of the person signing. Tender by a corporation limited company shall be signed by an authorised representative and a power of attorney in behalf shall accompany the tender. A copy of the constitution of the firm with the name of all the partners to be furnished.

3.0 TRANSFER OF TENDER DOCUMENTS :

Transfer of tender documents purchased by on intending tenderer to another is not permissible.

4.0 RIGHT TO OWNER TO ACCEPT OR REJECT TENDER :

The right to accept the tender will rest with the BMC The BMC, however, does not bind itself to accept the lowest tender, and reserves to itself the authority to reject any or all the tenders received without assigning any reason whatsoever. Tenders in which any of the particulars and prescribed information are missing or are incomplete in any respect and/or the prescribed condition are not fulfilled are liable to be rejected.

5.0 CO-ORDINATION OF WORK :

The Engineer-in-charge shall co-ordinate the works of various agencies engaged at site to ensure minimum disruption of work carried out by different agencies. It must be the responsibility of the contractor to plan and execute the work strictly in accordance with site instructions to avoid hindrance to the work being executed by other agencies.

6.0 INTERPRETATION OF CONTRACT DOCUMENTS :

6.1 Except if and to the extent otherwise provided by the contract, the provisions of the General Conditions of Contract and special conditions shall prevail over those of any other documents forming part of the contract. Several documents forming the contract are to be taken as mutually explanatory, should there be any discrepancies, inconsistencies, errors or omissions in the contracts or any of them, the matter may be referred to the

Engineer-in-charge who shall give his decisions and issue to the contractor instructions directing in what manner the work is to be carried out. The decision of the Engineer-in-charge shall be final and conclusive and the contractor shall carry out the work in accordance with this decision.

6.2 Works shown upon the drawings but not mentioned in the specifications or described in the specifications without being shown on the drawings shall nevertheless be held to be included in the same manner as if they had been specifically shown upon the drawings and described in the specifications.

6.2.1 The tender GA drawings are for the guidance of the arrangement of the various components, however at site the location of the component may change as per site conditions.

6.3 i] The various documents forming the contract are the essential parts of the contracts and a requirement occurring in one is as binding as though occurring in all, they are intended to be mutually explanatory and complementary and to describe and provide for a complete work.

ii] In the event of any discrepancies, the various documents forming the contract or in any one document, the following order of precedence should apply ---

a] Dimensions & quantities ---

i] Drawings.

ii] Schedule 'B' of the tender form.

On drawings, figures, dimensions, unless obviously incorrect will be followed in preference to shown dimensions

b] Description ---

i] Schedule 'B' of the tender form.

ii] Drawings

iii] Specifications

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

iii] The contractor should take no advantage of any apparent error or omissions in drawings or specifications and the Engineer-in- charge shall make such corrections and interpretations as necessary to fulfill the intent of the plans and specifications.

7.0 FORCE MAJEURE :

Any delays in or failure of the performance of either part hereto shall not constitute default hereunder or give rise to claims for damages, if any, to the extent such delays or failure of performance is caused by occurrences such as Acts of God or the public enemy; expropriation or confiscation of facilities by Government authorities, compliance with any order or request of any Governmental authorities, acts of war, rebelling or sabotage or fires, floods, explosions, riots or illegal strikes. The contractor shall keep records of the circumstances referred to above and bring these to the notice of the Engineer-in-charge in writing immediately on such occurrences.

8.0 FORFEITURE OF RETENTION MONEY :

Whenever any claim against the contractor for the payment of a sum of money arises out of or under the contract, the BMC shall be entitled to recover such sum by appropriating in part or whole of the retention money of the contractor. In case, the retention money is insufficient or if no retention money has been taken from the contractor, then the balance or the total sum recoverable, as the case may be, be deducted from any sum then due or which at any time thereafter may become due to the contractor. The contractor shall pay on demand any balance remaining due.

9.0 NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK :

If at any time after the commencement of the work, the corporation shall for any reason whatsoever not require the whole or part thereof as specified in the tender to be carried out, the Engineer-in-charge shall give notice in writing of the fact to 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 the execution of the work in full, but which he did not derive in consequence of the full amount of the work not having been by reason of any alterations having been made in the original specifications, drawings, designs and instruction which shall not involve any curtailment of the works as originally contemplated.

10.0 RIGHT OF THE CORPORATION TO DETERMINE/TERMINATE CONTRACT :

- i] The Corporation shall, at any time, be entitled to determine and terminate the contract, if in the opinion of the Corporation the cessation of the work becomes necessary owing to paucity of funds or for any other cause whatsoever, in which case the cost of approved materials at the site as verified and approved by the Engineer-in-charge and of the value of the work done to date by the contractor shall be paid for in full at the rate specified in the contract. A notice in writing from the Corporation to the Contractor of such determination and the reason, thereof shall be the conclusive proof of the fact that the contract has been so determined and terminated by the Corporation.

- ii] Should the contract be determined under sub-clause (i) of this clause and the contractor claims payments to compensate expenditure incurred by him in the expectation of completing the whole of the work, the Corporation shall consider and admit such claims as are deemed fair and reasonable and are supported by vouchers to the satisfaction of the Engineer-in-charge. The decision of the Commissioner on the necessity and propriety of any such expenditure shall be final and conclusive and binding on the contractor.

11.0 DRAWINGS TO BE SUPPLIED BY THE CORPORATION :

- 11.1 The tender purpose drawings are attached herewith.

12.0 RESPONSIBILITY FOR LEVEL & ALIGNMENT :

The contractor shall be entirely and exclusively responsible for the horizontal and vertical alignment, the level and correctness of every part of the work and shall rectify any errors or imperfections therein. Such rectification shall be carried out by the contractor at his own cost, when instructions are issued to that effect by the Engineer-in-charge.

13.0 CONTROLLED MATERIALS (ESSENTIALITY CERTIFICATE) :

- [i] As regards controlled materials, the corporation will help to arrange for the permit as far as possible and help the contractor in securing the same. All incidental charges not within procuring these materials shall be borne by the Contractor himself. Though the Corporation will help to manage 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 calendar month, the monthly returns in the prescribed forms as to the receipt and actual use of the controlled materials during the months.
- [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 representative(s) desire(s).

14.0 DISCREPANCIES BETWEEN INSTRUCTIONS :

Should any discrepancy occur between the various instructions furnished to the contractor, his agents or staff, or any doubt arises as to the meaning of any such instruction or, should there be an misunderstanding between the instructor's staff and the Engineer-in-charge's staff, the Contractor shall immediately report the matter in writing to the Engineer-in-charge whose decision thereon shall be final and conclusive and no claim for losses alleged to have been caused by such discrepancies between instructions, doubts or misunderstanding shall in any event be admissible.

15.0 INSPECTION OF WORK :

The Engineer-in-charge or his representative will have full power and authority to inspect the works at any time wherever in progress, either on the site or at the Contractor's premises/ workshops wherever situated, premises/workshop of any person, firm or corporation where materials are being made or are to be supplied, and the contractor shall afford or procure for the Engineer-in-charge or his representative every facility and assistance to carry out such inspection. 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 representative to visit the works 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 the purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the Contractor himself. The Contractor shall give not less than seven day's notice in writing to the Engineer-in-charge or his representative before covering up or otherwise placing beyond reach of inspection and measurement any other work in order that the same work may be inspected and measured. In the event of breach of the above, the same shall be uncovered at contractor's expense for carrying out such measurements or inspections.

16.0 TESTS FOR QUALITY OF WORK :

All workmanship shall be of the respective kinds described in the contract documents and in accordance with the instructions of the Engineer-in-charge and shall be subjected from time to time to such tests at Contractor's cost as the Engineer-in-charge may direct at the place of manufacture or fabrication or on the site or at all or any such places. The Contractor shall provide assistance, instruments, labour and materials as are normally required for examining, measuring and testing any workmanship as may be required and selected by the Engineer-in-charge.

17.0 THE CORPORATION MAY DO PART OF THE WORK :

Upon failure of the Contractor to comply with any instructions given in accordance with the provisions of this contract, the Corporation has the alternative right, instead of assuming charge of entire work, to place additional labour force, tools, equipments and materials on such parts of the works, as the Corporation may designate or also engage another Contractor to carry out the work. In such cases, the Corporation shall deduct from the amount which otherwise becomes due to the Contractor, the cost of such work and materials with 10% added to overall departmental charges and should the total amount thereof exceed the amount due to the Contractor, the Contractor shall pay the difference to the Corporation.

18.0 ACCIDENT LIABILITIES :

18.1 The Contractor shall be responsible for and shall pay the expenses of providing medical aid to any workmen who may suffer a bodily injury as a result of an accident. If such expenses are incurred by Government, the same shall be recoverable from the

contractor for with and be deducted, without prejudice to any other remedy of Government from amount due or that may become due to the Contractor.

18.2 The contractor shall provide all necessary personal safety equipment and first aid apparatus available for the use of the person employed on the site and shall maintain the same in suitable condition for immediate use at any time and shall comply with the following regulations in connection therewith. The workers shall be required to use the equipment so provide by the Contractor and Contractor shall take adequate steps to ensure proper use of the equipment by those concerned. When work is carried on in approximates to any place where there is a risk of drowning all necessary equipment shall be provided and kept for use and all necessary steps shall be taken for the prompt rescue of any person, in danger. Adequate provision shall be made for prompt first aid treatment of all injuries to be sustained during thecourse of the work.

19.0 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 labors 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.

20.0 Contractors shall have to use maximum machinery for the work as per the direction of Engineer-In-Charge.

21.0 If possible, space for stacking the surplus excavated earth will be provided by BMC. Otherwise the contractor shall arrange for the same at no extra cost to BMC.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER,
BHAVNAGAR MUNICIPAL CORPORATION,
BHAVNAGAR.

9.0 PERCETAGERATE TENDER& CONTRACT FOR WORKS

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 Posted on a board hung up in the Municipal Office and signed by the Commissioner.

This form will state the work to be carried out, as well as the date for submitting and opening tenders, and the time allowed for carrying out the work; also the amount of earnest money to be deposited with the tender, and the amount of the security deposit to be deposited 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 dues ground rents & water-charges will be granted. Copies of the specifications, designs drawings and estimated rates; schedule rates and any other documents required in connection with the work which will be signed by the Executive Engineer, for the purpose of identification shall also be opened for inspection by contractors at the office of the Executive Engineer, during office hours.

Where the works are proposed to be executed according to the specifications recommended by a contractor and approved by a competent authority on behalf of the Bhavnagar Municipal Corporation such specification 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 by each partner thereof, and in the event of the absence of any partner, it shall be signed on his behalf by a person holding a power of attorney authorizing him to do so.
- (3) Receipt for payments made on account of any work when executed by a firm, should also be signed by all the partners, except where the contractors 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 person having authority to give effectual receipt for the firm.
- (4) Any person who submits a 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 each item of the work. Tenders which propose any alteration 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 sort, will be liable to rejection. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit a separate tender for each. Tenders shall have the name and the number of the works to which they refer written outside the envelope.
- (5) The Commissioner or his duly authorised Assistant will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in suitable form. In the event of a tender being accepted, the contractors shall thereupon, for the purpose of identification sign copies of the specifications and other documents mentioned. In the event of a tender being rejected the deposit will be refundable on application.

ITEM SPECIFICATION

0.0 PREAMBLE TO TECHNICAL SPECIFICATION (PRICE - BID)

- 1.0 The Schedule of Quantities and Rates are to be read for the purpose of pricing in conjunction with instructions of tenderers, technical specifications, drawings and General conditions for contract for Civil works.
- 2.0 The price shall be quoted in the respective item sheets of schedule of quantities and rates shall be of all inclusive value for the work described including all costs and expenses which may be required in for the execution of the work described together with all general risks, liabilities and obligations set forth or implied in the document on which the tender is based.
- 3.0 The quantities furnished are approximate. In the event of actual quantities varying from those furnished herein below or items deleted or added, Rate quoted for the that work shall remain, firm and no extra claims in this respect will be entertained. The payment shall be made based on the actual quantities executed for the completion of work.
- 4.0 All works shall be carried out strictly as per detailed specification whether actually specified or not. If not specified, as per directions of owner/Engineer-in-charge.
- 5.0 Percentage rate quoted by tenderer shall be firm even if the contract is split.
- 6.0 Percentage rate and the total amount entertained in the summary of cost, sheet of schedule of quantities and Rates shall be written in ink or may be filled online as the case may be and shall be entered both in figures and words.
- 7.0 Detailed specifications of items of work are described under section Detailed Technical Specification for each item of schedule of quantities and Rates. The section gives guidelines to the reference of relevant clauses of specifications and mode of measurement. Tenderer shall read this in conjunction with other technical specifications and quote accordingly.
- 8.0 The measurements shall be as described in the detailed Technical specification of items of work, all measurements being not in accordance with the drawings with no allowance for waste.
- 9.0 If Tenderers need any clarifications, they should obtain the same in writing from Owner/Engineer-in-charge. No notice will be taken of any verbal discussion in such matters.

mm	: Millimeters	R.C.C.	: Reinforced Cement Concrete
cm	: Centimeters	Wt.	: Weight
mt.	: Meters	Kg	: Kilogramme
Km.	: Kilometers	M.T.	: Metric Tonne
Sq.mt.	: Square Meters	M.D.	: Meter Depth
Cu.mt.	: Cubic Meters	M.S.	: Mild Steel
R.mt.	: Running Meters	I.S.	: Indian Standard
No.	: Numbers	CRS	: Corrosion Resistance Steel
C.I.	: Cast Iron		

11.0 MEMORANDUM

I / We _____ the undersigned do hereby tender for carrying-out the work described in the schedule subject to the conditions annexed in Schedules attached herewith in tender documents.

1. "Drainage line Up gradation work at Anjani city society, opp. Gyan manjari school to Indraprasthnagar Kabir Ashram road -Kaliyabid ward, Bhavnagar City"

2. Estimated Cost : Rs. . 60,00,000.00
detailed tendernotice

3. Earnest Money Deposit : Rs. 60,000.00 as per detailed Notice [only DD]

3 A. Retention money deducted 5% from every bill

4. Security Deposit : 5% (Five) of the Contract Amount.

5. Time allowed for the completion of work from date fixed : 12 Months
in written order to commence (Including monsoon)

6. Penalty for delay : 0.1% (Zero point one percent) of the contract price per day maximum upto 10% (Ten Percent) of the Tender Amount.

7. The progress of work should confirm to : 1/4 of the work in 1/4 of the time.
1/2 of the work in 1/2 of the time.
3/4 of the work in 3/4 of the time.

8. Retention money deduction from Running Account Bill.. : 5%(Five percent)

9. Period for O & M Contract : N.A

10. Period of liability for defects : 12 months after completion of work

(Description on this page will supersede all relevant data/Detail /Interpretation mentioned in the Tender)

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12. GENERAL SPECIFICATIONS

1.0 GENERAL :

- 1.1 All the items occurring in the work and as found necessary during actual execution shall be carried out in the best workman like manner as per specification and the written order of the Engineer-in-charge.
- 1.2 Extra claim in respect of extra work shall be allowed only if such work is ordered to be carried out in writing by the Engineer-in-charge.
- 1.3 The Contractor shall engage a qualified Engineer for the Execution of work who will remain present for all the time on site and will receive instructions and orders from the Engineer-in-charge or his authorised representative. The instruction and orders given to the contractor's representative on site shall be considered as it will be to the contractor himself.
- 1.4 **The work order book** as prescribed shall be maintained on the site of the work by the Contractor and the contractor shall sign the orders given by the inspecting officers and shall carry out them properly.
- 1.5 Quantities specified in the tender may vary at the time of actual execution and the contractor shall have no claim for compensation on account of such variation.
- 1.6 Figured dimensions of drawings shall supersede measurements by scale,. Special dimensions in the specification shall supersede all other dimensions.
- 1.7 Use of I. S. Code shall mean its latest applicable version for respective items.

2.0 CLASSIFICATION OF STRATA : (NOT APPLICABLE 2.1 to 2.4)

- 2.1 All materials encountered in excavation will be classified in the following groups irrespective of excavating the materials and the decision of the Engineer-in-charge in the regard shall be final and binding to the contractor.

2.2 SOILS :

Soils of all sorts, silt, sand gravel soft murrum, stiff clay, kankar and other soft excavation not covered in the item mentioned hereunder.

2.3 HARD MURRUM :

Hard materials comprising of all kinds of disintegrated rock or shale of indurate conglomerate interspersed with boulders of size between 0.02 Cu.mt. and 0.75 Cu.mt., weathered and decomposed rock which could be removed with pick, bar shovel, wedges and hammers, though not without some difficulties.

2.4 SOFT - ROCK :

This shall include all materials which is rock but which does not need blasting and can be removed with a pick, bar, wedges, pavement breakers, pneumatic tools etc.

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BHAVNAGAR.

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13 DETAILS SPECIFICATION OF MATERIAL

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 tract of oil and injurious alkalis, salts, organic matter and other deleterious materials which will either weaken the mortar or concrete or cause efflorescence of attach 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. 456-1978.
- 1.2 If required by the Engineer-in-charge it shall be tested by comparison with distilled water. Comparison shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in I.S. 269-1976. Any indication of unsoundness, charge 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 sufficient cause for rejection of water under test.
- 1.3 Water for curing mortar, concrete or masonry 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 Potable water will be generally found suitable for curing mortar or concrete.

M-2 LIME:

- 2.1 Lime shall be hydraulic lime as per I.S. 712-1973. Necessary tests shall be carried out as per I.S. 6932 (Parts I to X) 1973.
- 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 color, lime in form of porous lumps of dirty white color, indicates quick lime, and solid lumps the unburnt 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. 712-1973. 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. 162-1974 to show the acceptability of materials.

M-3 CEMENT :

- 3.1 Cement shall be Sulphate Resistant Cement conforming to IS : 12330, ordinary Portland cement as per I.S. 269-1976 or Portland slag cement as per I.S.455-1976.
- 3.2 Testing of Cement : It should be specifically noted that the cement brought by the contractor at site of work shall be used 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 Bhavnagar, Baroda, Ahmedabad or Mumbai. All the charges for transport and testing of the samples shall have to be borne by the contractor. The frequency of testing of such materials shall be in accordance to the relevant Indian standard as directed by the Engineer-in-charge.

M-4 SAND :

- 4.1 Sand shall be natural sand, clean, well graded, hard strong, durable and gritty particles free from injurious of dust, clay, kankar nodules, soft or flaky particles shale, alkali salts, organic matter, loam, mica or other deleterious substances and shall be got approved from the Engineer-in-charge. The sand shall not contain more than 8 percent of silt as determined by field test. If necessary the sand shall be washed to make it clean.

4.2 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 sieve	Percentage by weight passing	I. S. Sieve Designation through sieve.	Percentage by weight passing
4.75 mm	100	600 Micron	30 - 100
2.36 mm	90 - 100	300 Micron	5 - 70
1.18 mm	70 - 100	150 Micron	0 - 50

4.3 FINE SAND :

The fineness modulus shall not exceed 1.0. The sieve analysis of fine sand shall be as under :

I. S. Sieve Designation	Percentage by weight passing	I. S. Sieve Designation	Percentage by weight passing
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	through sieve		through sieve.
	4.75 mm	100	600 Micron
2.36 mm	100	300 Micron	40 - 85
	1.18 mm	75 - 100	150 Micron
			5 - 50
			0 - 10

M-5 STONE GRIT :

- 5.1 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 for as possible flaky elongated pieces shall be avoided.

It shall generally comply with the provisions of I. S. 383-1970. Unless special stone of particular quarried is mentioned. Grit special stone of particular quarries is mentioned. 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.

- 5.2 The grit shall conform to the following gradation as per sieve analysis :

I. S. Sieve Designation	Percentage passing through sieve	I. S. Sieve Designation	Percentage Passing through sieve
12.50	100%	4.75	0.20%
10.00	85 - 100%	2.36	0.25%

- 5.3 The crushing strength of grit will be such as to allow the concrete in which it is used to build up the specified strength of concrete.
- 5.4 The necessary tests for grit shall be carried out as per the requirements of I. S. 2386 (Parts I to VIII) 1963, as per instruction of the Engineer-in-charge. The necessity of test will be decided by the Engineer-in-charge.

M-5A STONE COARSE AGGREGATE FOR NOMINAL MIX CONCRETE :

- 5A.1 Coarse aggregate 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.
- 5A.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. Aggregate 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 reinforcement cement concrete the maximum limit may be restricted to 6 mm less than the minimum lateral clear distance between bars of 6 mm. 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	-	-	10.0 mm	0.5	0.20	0.30
40 mm	85-100	100	-	4.74 mm	-	0.50	0.50
20 mm	0-20	85-100	100	2.35 mm	-	-	-
16 mm	-	-	-	85-100	-	-	-

NOTE :- The percentage may be varied by the Engineer-in-charge when considered necessary for obtaining better density and strength of concrete.

- 5A.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. 383-1970 I. S. 456-1978 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 inter mixed on different aggregates. If the aggregates are covered with dust, they shall be washed with water to make them clean.

M-5B BLACK TRAP OR EQUIVALENT HARD STONE COARSE :

- 5B.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.
- 5B.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.
- 5B.3 The necessary tests indicated in I. S. 383-1970 and I.S.456-1978 shall have to be carried out to ensure the acceptability of the material.
- 5B.4 If aggregate is covered with dust it shall be washed with water to make it clean.

M-6 LIME MORTAR:

- 6.1 LIME: Shall conform to specification M-2. WATER: Water shall conform to specification M-1. SAND : Sand shall conform to specification M-4.

6.2 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 be measured by volume.

6.3 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.

6.4 STORAGE : Mortar shall always be kept damp, protected from sun and rain till used up, covering it by tarpaulin or open sheds.

6.5 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 36 hours shall be permitted for use.

M-7 CEMENT MORTAR :

7.1 Water shall conform to specification M-1. Cement shall conform to specification M-3. Sand shall conform to M-5.

7.2 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.

7.3 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 at least 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.

7.4 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-8 BRICK BATS AGGREGATE :

- 8.1 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 under burnt or over burnt brick bats shall not be allowed.
- 8.2 The brick bats shall be measured by volume by suitable boxes as directed.

M-9 BRICKS :

- 9.1 The bricks shall be hard or machine molded and made from suitable clay and kiln burnt. They shall be free from cracks and flaws and 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 100 mm x 40 mm and 10 mm to 20 mm deep on one of its flat sides. The bricks shall not break when thrown on the ground from a height of 600 mm.

- 9.2 The size of modular bricks shall be 190 mm x 90 mm.
- 9.3 The size of the conventional bricks shall be as under :

$$\left(9'' \times \frac{4''}{4} \times \frac{2''}{4} \right) 225 \times 110 \times 25 \text{ mm.}$$

- 9.4 Only bricks of one standard size shall be used on one work. The following tolerance shall be permitted in the conventional size adopted in a particular work.
Length : = 1/8" (3.0 mm) Width : = 1/16" (1.50 mm)
Height : = 1/16" (1.50 mm)
- 9.5 The crushing strength of the bricks shall not be less than 35 Kg/Sq.cm. The average water absorption shall not be more than 20 percent by weight. Necessary tests for crushing strength and water absorption etc. shall be carried out as per I.S. 3495 (Part-I to IV) - 1976.

M-10 STONE:

- 10.1 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 veins, 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. 1134-1974. The minimum crushing of the

strength of the stone shall be 200 Kg./Sq.Cm. unless otherwise specified.

- 10.2 The samples of the stone to be used shall be got approved before the work is started.
- 10.3 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-11 HIGH YIELD STRENGTH STEEL DEFORMED BARS :

- 11.1 Reinforcement shall be CTD of high strength deformed corrosion resistant (CRS) bars as per IS:1786-1985-Fe 500. Wire mesh or fabric shall be in accordance with IS:456. Substitution of reinforcement will not be permitted except upon written approval from engineer in charge.

All reinforcement and structural steel required for construction, erection and other allied job shall be procured by the contractor at his own cost. All the reinforcement steel to be used for the RCC work for the proposed water treatment plant at all levels, shall be CRS (Corrosion Resistant Steel) type of Fe 500 Grade confirming to IS:1786 (Latest addition). The Manufacturer company shall only be RINL, SAIL, TATA, JSW Steel Ltd or Electrotherm(i) Ltd. The steel shall be purchased by the contractor directly from these manufacturers or from their authorized local dealer / distributor. In case of unavailability of steel from these manufacturers, steel may be purchased from other brands purchased/approved by Municipal Store but only after written approval from Engineer-in-charge, SMC.

If JSW or Electrotherm steel is to be used then contractor has to produce test certificate for said project named from time to time & as asked by the engineer in charge. However, Contractor has to take prior approval from engineer in charge before procurement of same.

11.2 STORAGE

- a. The reinforcement shall not be kept in direct contact with the ground but stacked on the top of an arrangement of timber sleepers or the like.
- b. If the reinforcing rods have to be stored for a long duration, they shall be coated with cement wash before stacking and/or be kept under cover or stored as directed by the engineer in charge.
- c. Fabricated reinforcement shall be carefully stored to prevent damage, distortion corrosion and deterioration.
- d. It should be seen that reinforcement will not be exposed to direct sunlight and preventive measures should be taken for the same.

11.3 Quality

All reinforcement shall be clean free from grease, oil paint, dirt, loose mill scale, loose rust, dust, bituminous materials or any other substances that will destroy or reduce the bond. All rods should be thoroughly cleaned before being fabricated. Pitted and defective rods shall not be used. No welding is approved the works shall be allowed unless approved by engineer in charge. If welding is approved the works shall be carried out as per IS: 1786-Fe500 according to the best modern practices and as directed by the engineer in charge. In all cases of important connections, tests shall be made to prove that the joints are of full strength of bars welded. Special precautions as specified by the Engineer in charge shall be taken in the welding of cold works reinforcing bars and bars other than mild steel.

11.4 For the purpose of payment, the bar shall be measured correct up to 10 mm length and weight payable worked out as per the rate specified below:

i)	6 mm	0.22 Kg/Rmt.	viii)	20 mm	2.47 Kg/Rmt.
ii)	8 mm	0.39 Kg/Rmt	ix)	22mm	2.98 Kg/Rmt.
iii)	10mm	0.62 Kg/Rmt.	x)	25 mm	3.85 Kg/Rmt.
iv)	12 mm	0.89 Kg/Rmt.	xi)	28 mm	4.83 Kg/Rmt.
v)	14 mm	1.21 Kg/Rmt.	xii)	32 mm	6.31 Kg/Rmt.
vi)	16 mm	1.58 Kg/Rmt.	xiii)	36 mm	7.31 Kg/Rmt
vii)	18 mm	2.00 Kg/Rmt.	xiv)	40 mm	9.86 Kg/Rmt

M-12 High Yield Strength Steel Deformed Bars [CRS - Fe 500]:

12.1 High yield strength steel deformed bars shall be either cold twisted or hot rolled and shall conform to I.S. 1786-1985. CRS - Fe 500 conforming the test as described for ultimate tensile strength, bend tests and elongation tests. Steel shall be tested in approved laboratories. To samples should be taken by the engineer in charge in presence of contractor or his authorized representative. One sample shall be got tested and other sample shall be retained by making clear identification in the sample by the engineer in charge so as to identify at a later date. Cost of testing shall be borne by the contractor.

12.2 Other provision and requirements shall conform to specification No. M-11 for Mild Steel bars.

M-13 High Tensile Steel Wires:

13.1 The high tensile wires for use in pre-stressed concrete shall conform to I.S. 2090- 1962.

13.2 The tensile strength of the high tensile steel bars shall be as specified in the item. In absence of the given strength, minimum strength shall be taken as per Para. 6-1 or the I.S. 1785-1962. Testing shall be done as per I.S. requirements.

13.3 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.

- 13.4 The high tensile wire shall be obtained from manufacturers in coils having diameter not less than 350 times the diameter of wire itself so that wire springs back straight on being uncoiled.

M-14 MILD STEEL BINDING WIRE:

- 14.1 The mild steel wire shall be of 1.63 mm or 1.22 mm (16 or 18 gauge) diameter and shall conform to I.S. 280-1972.
- 14.2 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 the adhesion of cement mortar.

M-15 STRUCTURE STEEL :

- 15.1 All structural steel conform to I.S. 226 - 1965. 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. 1148-1973.
- 15.2 When the steel is supplied by the contractor test certificate of the manufacturers shall be obtained according to I.S. 226-1975 and other relevant Indian Standards.

M-16 SHUTTERING :

- 16.1 The shuttering shall be either of wooden planking of 30 mm. 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 bulgies properly cross braced together so as to make the centering rigid. In places of bulgie props, brick pillar of adequate section built in mud mortar may be used.
- 16.2 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 live load of men working over 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.
- 16.3 If at any stage of work during or after placing concrete in the structure, the form 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 got approved from the Engineer-in-charge, before the reinforcement bars are placed in position.
- 16.4 The props shall consist of bulgies having 100 mm minimum diameter measured at mid length and 80 mm 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.

- 16.5 Double wedges shall further be provided between the sole plate and the wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.
- 16.6 The timber used in shuttering shall not be so dry as to absorb water from concrete and swell or bulge nor so wet to shrink after erection. The timber shall be properly sawn and planned on the sides and the surface coming in contract with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.
- 16.7 As far as practicable, clamps shall be used to hold the forms together and use of nails and spikes avoided.
- 16.8 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.
- 16.9 The shuttering for beams and slabs shall have camber of 4 mm per meter (1 in 250) or as directed by the Engineer-in-charge so as to offset of 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 C.I. Steps or Poly propylene heavy duty steps

Providing and fixing in concrete or brick wall C.I. steps of required length & width as per specifications etc. complete.

C.I.Steps forMH shall be as per IS:5455. It shall be clean, well cast and shall be free from oil and sand holes wrapping etc. The C.I.steps shall be heavy duty type having size 300 x 150 x 25 mm portion of the step which projects from the wall of the wall/ wet well shall have a raised Chequered design to provide an adequate non-slip grip. Minimum weight of each step be as per I.S. The step shall be coated with approved bituminous paint.**Poly propylene heavy duty steps should be provided with permission of engineer in charge.**

EXECUTIVE ENGINEER,
BHAVNAGAR MUNICIPAL CORPORATION,
BHAVNAGAR.

SIGNATURE OF THE CONTRACTOR :

NAME AND ADDRESS :

14.0 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 referred 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 practical 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 Original Ground 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 prefix '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-loading 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 satisfactory 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 relevant 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.
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24. Approval to any or the executed items for the work does not in any way relieve the contractor of his responsibility for the correctness, soundness and strength of the structure as per the drawings and specifications.

SIGNATURE OF THE CONTRACTOR

EXECUTIVE ENGINEER,
BHAVNAGARMUNICIPAL
CORPORATION, BHAVNAGAR.

15.0 DETAILED TECHNICAL SPECIFICATIONS

DRAIN WATER PIPELINE

SCHEDULE- B

NO.01

➤ **Brick masonry work in class - 2 clay kiln burn bricks, 1:6 cement mortar , good workmanship line level plum including scaffolding , racking of joints, curing etc complete**

Brick masonry work in class - 2 clay kiln burn bricks, 1:6 cement mortar , good workmanship line level plum including scaffolding , racking of joints, curing etc complete.

Before masonry 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 one foundation, bed, before foundation masonry is started.

Wetting of Bricks: The brick required for masonry 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.

Brick shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete to bond. Closers in such case shall be cut to required size and used near the ends of 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 tamping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar then the next brick is laid and pressed against it. On completion of course, the vertical joints shall be fully sealed from the top with mortar.

The wall shall be taken up truly in plumb. All corners shall be laid truly horizontal and all vertical joints shall be truly vertical. Vertical joints in alternate courses shall generally be directly one over the other. The thickness of brick courses shall be kept uniform.

The brick shall be laid with frog upwards. A set of tools comprising of wooden straight edges, monsoon spirit level, square half meter 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 of 23 cms. shall be kept in proper plumb. All the connected brickwork shall be kept not more than one meter over the rest of the work. Where this is not possible the work shall be raked back according to bond (and not left too thin) at an angle not steeper than 45 degrees.

All fixtures like pipe inlet and outlet of water C.I. steps, manhole cover and frame etc. which are required to be built in wall shall be embedded in cement mortar.

Brick shall be so laid that all joints shall not be 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 be done.

For the face of brickwork, plastering is to be done joints shall be raked out to a depth not less than thickness of joints. The face of brickwork shall be cleaned and mortar droppings removed on very same day that brickwork is laid.

NO.02

➤ **Single coat 10 to 12 mm thick single coat plastering in 1: 3 cement mortar with good workmanship line level plum including scaffolding , racking of joints, curing etc complete**

Single coat 10 to 12 mm thick single coat plastering in 1: 3 cement mortar with good workmanship line level plum including scaffolding , racking of joints, curing etc complete.

PLASTERWORK:

The surface shall be cleaned of all dust, loose mortar droppings, traces of algae efflorescence and other foreign matter by water or by brushing. Smooth surfaces shall be roughened by wire brushing or hard by racking if it is hard. In case of concrete surface, if a chemical retarder has been applied to the formwork 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 surface where necessary shall be carried out to get an even surface.

The work shall be soaked but only damped evenly before applying the plaster. If the surface becomes dry, such areas shall be moistened again.

The plaster about 15 x 15 cms. shall be first applied horizontally and vertically at not more than 2 meters interval over the entire surface to serve as gauge. The surface of these gauges shall be truly in plane 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 float accordingly excess trowelling or over working the float shall be avoided. All corners, rises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, rises, junctions etc. shall be carried out with proper templates the size required.

Cement mortar for plaster shall be used within half an hour after addition of water. And mortar for 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 edge of the old work shall be scraped clear and wetted with cement putty before plaster is applied to the adjacent area so enable the two to properly get together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15 cm. to any corners or arises. It shall not be closed on the body of features such as plaster bends and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on walls and copings these invariably lead to leakage. No portion of the surfaces shall be depth out initially to be packed up later on.

NO. 4

C.C. work in 1:1.5:3 for wall and bottom-top slab of box drain using 10-20 mm size hard black metal machine crushed stone, clean sand and cement (53 grade) etc material, shuttering, vibrating and curing etc complete work and additionally instructed that, RCC work in 1:1.5:3 mix proportion for bottom raft of storm water inlet structure with boring hole of 0.3mt dia and 3.0 mt depth and filling it with coarse sand for recharge of rain water as per EIC design

C.C. work in 1:1.5:3 for wall and bottom-top slab of existing box drain using 10-20 mm size hard black metal machine crushed stone, clean sand and cement (53 grade) , shuttering, vibrating and curing etc complete work. Additionally, with boring hole of 0.3mt dia and 3.0 mt depth and filling it with coarse sand for recharge of rain water as per EIC design. Detail specification as per detail material specification

MODE OF MEASUREMENTS & PAYMENT

per cubic meter of work done.

NO. 5

Steel for box drain TMT Fe 500 : confirming to relevant IS : Providing, supplying, cutting, bending, binding and placing steel bars with required binding wires , work up to 6.0 mt above or below GL as per design provided by department etc complete

Steel for box drain TMT Fe 500 : confirming to relevant IS : Providing, supplying, cutting, bending,

binding and placing steel bars with required binding wires , work up to 6.0 mt above or below GL as per design provided by department etc complete.

MODE OF MEASUREMENTS & PAYMENT

per Kg of steel used.

NO. 6

Water line connection repairing work : including labour and material within 12 hrse

Water line connection repairing work : including labour and material within 12 hr.

MODE OF MEASUREMENTS & PAYMENT

per rmt of pipe reinstated for repairing of the connections.

NO.7

➤ **Excavation for Drainage water Collecting pipe line system and machineholes(MH), inlet chambers including all safety provision using site rails and removing and spreading the excavated stuffs directed with lead up to 90M. for 0 to 1.5 mts. and strata as specified**

(a) In all sorts of soil and soft murrum, including Rocks, C.C., R.C.C., W.B.M., Lime Concrete and Lime Stone etc.

1.0 GENERAL

1.1 Any soil which generally yields to the application of pickaxes and shovels or jumpers or scarifies phawaras rakes or any such excavation implement or organic soil, gravel, silt, sand turf loam, clay, peat etc. fall under this category.

2.0 CLEARING THE SITE

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.

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.

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 labor, materials etc. required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

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 Municipal Engineer or his Consultant. The payment for such precautionary measures shall be included in this work. The bottom of the excavated area shall be levelled both longitudinally and 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.

5.0 DISPOSAL OF EXCAVATED MATERIALS

5.1 No materials excavated from the foundation trenches, of whatever kind they may be, are to be placed even temporarily up to 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.

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 of 50 Mts. as directed. Useful materials obtained from clearing site and 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.

6. MODE OF MEASUREMENT AND PAYMENT

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 sections given by the Engineer-in-charge. 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.

6.2 No extra payment shall be made for temporary pumping of water/sewage due to abnormal adverse conditions/climate.

6.3 The rate shall be for a unit of one cubic meter.

NO.8

➤ **Refilling trenches incl. ramming, watering, consolidating disposal of surplus stuff as directed within a radius of 8 km.**

1. WORKMANSHIP

- 1.1 The earth to be used for filling shall be free from salts, organic or other foreign matter. All clods of earth shall be broken.
- 1.2 As soon as the work in foundation has been completed and measured the site of foundation shall be cleared of all debris, brick bats, mortar dropping etc. and filled with earth in layers not exceeding 20 Cms. Each layer shall be adequately watered, rammed and consolidated before the succeeding layer is laid. The earth shall be rammed with iron rammers where feasible and with the butt ends of crowbars, where rammer cannot be used.
- 1.3 The plinth shall be similarly filled with earth in layers not exceeding 20 Cms. adequately watered and consolidated by ramming with iron or wooden rammers. When filling reaches finishing level, the surface shall be flooded with water for at least 24 hours and allowed to dry and then rammed and consolidated.
- 1.4 The finished level of filling shall be kept to shape intended to be given to floor.
- 1.5 In cases of large heavy duty flooring like factory flooring, the consolidation may be done by power rollers, where so specified. The extent of consolidation required shall also be as specified.
- 1.6 The excavated stuff of the selected type shall be allowed to be used in filling the trenches and plinth. Under no circumstances black cotton soil be used for filling the plinth.

2. MODE OF MEASUREMENTS & PAYMENTS

- 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.

NO.9

➤ **Excavation for Sewage Collecting system and sewer manholes including all safety provision using site rails and removing and spreading the excavated stuffs directed with lead up to 90M. for 1.5 to 3.0 mts. and strata as specified**

(a) In all sorts of soil and soft murrum, including Rocks, C.C., R.C.C., W.B.M., Lime Concrete and Lime Stone etc.

1.9 WORKMANSHIP

1.1 The relevant specification of schedule B1, item No.8 shall be followed except that the excavation work shall be carried out in all sorts of soil with lift 1.5 Mts. to 3.0 Mts.

2.0 MODE OF PAYMENT

2.1 The relevant specifications of schedule B1, item No.8 shall be followed.

2.2 The excavation work of lift 1.5 Mts. to 3.0 Mts. shall be measured under this item.

2.3 The rate shall be for a unit of one cubic metre.

NO.10

➤ **Excavation for Sewage Collecting system and sewer manholes including all safety provision using site rails and removing and spreading the excavated stuffs directed with lead up to 90M. for 3.0 to 4.5 mts. and strata as specified**

(a) In all sorts of soil and soft murrum, including Rocks, C.C., R.C.C., W.B.M., Lime Concrete and Lime Stone etc.

1.0 WORKMANSHIP

1.1 The relevant specifications of schedule B1, item No.8 shall be followed except that the excavation work shall be carried out from 3.0 Mts. to 4.5 Mts. lift in all sorts of soil.

2.0 MODE OF MEASUREMENTS & PAYMENT

2.1 The relevant specifications of schedule B1, item No.8 shall be followed.

2.2 The excavation work from 3.0 Mts. to 4.5 Mts. lift shall be measured under this item.

2.3 The rate shall be for a unit of one cubic metre.

NO.11

➤ **Excavation for Sewage Collecting system and sewer manholes including all safety provision using site rails and removing and spreading the excavated stuffs directed with lead up to 90M. for lifts up to 4.5 to 6.0 mts. and strata as specified**

(a) In all sorts of soil and soft murrum, including Rocks, C.C., R.C.C., W.B.M., Lime Concrete and Lime Stone etc.

1.0 WORKMANSHIP

1.1 The relevant specifications of schedule B1, item No. 8 shall be followed except that the excavation work shall be carried out from 4.5 Mts. to 6.0 Mts. lift in all sorts of soil.

2.0 MODE OF MEASUREMENTS & PAYMENT

2.1 The relevant specifications of item No. 8 shall be followed.

2.2 The rate shall be paid for carrying out excavation work for depth from 4.5 Mts. to 6.0 Mts. under this category.

2.3 The rate shall be for a unit of one cubic metre.

ITEM NO. Deleted

Dismantling of partly decrepitude box drain wall , slab etc portion of existing structure by engaging required labour or machinery and disposal of stuff as directed by engineer in charge

Providing and engaging required labour and machinery for the dismantling of partly decrepitude box drain wall , slab etc portion of existing structure and disposal of stuff as directed by engineer in charge up to 3.0 km lead .

MODE OF MEASUREMENTS & PAYMENT

per cubic meter of work done.

No.12

➤ R.C.C. Pipe (Horizontal Cast)

Providing, supplying, lowering and laying ISI Standard R.C.C. pipes (of Sulphate Resisting Cement) in standard lengths of following class and diameter suitable for either collar joints or rubber ring joints including all taxes, insurance, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to departmental stores, stacking etc. complete. (IS - 458/ 1989).

Class NP3 Test Pressure, 0.7 Kg / Sq.m.**➤ 450 mm Dia.****SCOPE**

This specification covers the requirements for manufacturing, testing, supplying, jointing and testing at work sites of Reinforced Cement Concrete (RCC) pipes, of both pressure and non-pressure varieties used for pumping mains and gravity, sewers and stormwater drains. Laying of pipes and fittings/specials are covered in Technical Specifications: Item no. 5. The two parts are complementary and are to be read together for a correct interpretation of the provisions of this specification.

APPLICABLE CODES

The manufacturing, testing, supplying, jointing and testing at work sites of RCC pipes shall comply with all currently applicable statutes, regulations, standards and codes. In particular, the following standards, unless otherwise specified herein, shall be referred. In all cases, the latest revision of the codes shall be referred to. If requirements of this specification conflict with the requirements of the codes and standards, this specification shall govern.

MATERIALS

- a) IS:458-Specification for precast concrete pipes (with and without reinf.)-2003
- b) IS:3597-Method of tests for concrete pipes.
- c) IS:5382-Specification for rubber sealing rings for gas mains, water mains and sewers.
- d) IS:516-Method of test for strength of concrete.

CODE OF PRACTICE

- a) IS:456-Code of practice for plain and reinforced concrete
- b) IS:783-Code of practice for laying of concrete pipes

DESIGN

Design of RCC pipes including reinforcement details and the ends of pipes shall be in accordance with the relevant clauses of IS:458-2003.

MANUFACTURING GENERAL:

All Pipes must have BIS mark of IS-458-1998/latest.

RCC NP3/4 Pipe manufactured with horizontal spinning method with BIS mark of IS-458-1998/latest can also be permitted to used.

The method of manufacture shall be such that the form and the dimension of the finished pipes are accurate within the limit specified in relevant clause of IS:458.

The surfaces and edges of the pipes shall be well defined and true, and their ends shall be square with the longitudinal axis. The ends of the pipes shall be further reinforced by an extra ring of reinforcement to avoid breakage during transportation.

The RCC pipes and rubber rings shall be systematically checked for any manufacturing defects by experienced supervisors so as to maintain a high standard of quality.

Owner/Engineers shall at all reasonable times have free access to the place where the pipes and collars/rubber rings are manufactured for the purpose of examining and testing the pipes and collars/rubber rings and of witnessing the test and manufacturing.

All tests specified either in this specification or in the relevant Indian Standards shall be performed by the supplier/contractor at his own cost and in presence of Owner/Engineer if desired. For this, sufficient notice before testing of the pipes and fittings shall be given to Owner/Engineer.

If the test is found unsatisfactory, Owner/Engineer may reject any or all pipes of that lot. The decision of Owner/Engineer in this matter shall be final and binding on Contractor and not subject to any arbitration or appeal.

MATERIALS Cement

Cement used for the manufacture of RCC pipes should be Sulphate Resisting Cement (SRC) or **OPC** shall conform to relevant IS codes.

Aggregates

Aggregates used for the manufacture of RCC pipes shall conform to IS: 383. The maximum size of aggregates should not exceed one-third the thickness of the pipe or 20mm, whichever is smaller.

Mixing and Curing Water

Water shall be clean, colorless and free from objectionable quantities of organic matter, alkali, acid, salts or other impurities that might reduce the strength, durability or other desirable qualities of concrete and mortar.

Reinforcement

Reinforcement used for the manufacture of the RCC pipes shall be mild steel Grade I or medium tensile steel bars conforming to IS: 432 (Part-I) or hard drawn steel wire conforming to IS: 421 (Part-2). Reinforcement cages for pipes shall be as per relevant requirements of IS: 458.

Concrete

Concrete used for the manufacture of RCC pipes shall conform to IS: 456. The minimum cement content and minimum compressive strength of concrete shall be as per relevant requirements of IS: 458 (Latest Edition). Compressive strength tests shall be conducted on 15 cm cubes in accordance with the relevant requirements of IS: 456 and IS: 516.

Rubber Ring

Rubber ring chords used in pipe joints for diameter less than 300 mm dia pipe shall be EPDM rubber ring as per IS 5382: 1985. 300 mm and above dia pipe

shall be spigot and socket joint only.

EPDM RUBBER GASKET:

Rubber Gasket shall be suitable for Push-on-Joint.

The spigot ends shall be suitably chamfered or rounded off to facilitate smooth entry of pipe in the socket fitted with the rubber gasket

Rubber Gasket shall conform to IS 5382-1985 and ISO: 4633-1996 its latest revision or amendments if any

CURING

Pipes manufactured in compliance with IS:458 (Latest Edition) shall be either water cured or steam cured for minimum stipulated curing period in accordance with relevant requirements of the latest revised IS:458 (Latest Edition).

DIMENSIONS

The internal diameter, wall thickness and length of barrel and collar of pipes, reinforcement (longitudinal and spiral), type of ends and minimum clear cover to reinforcement and strength test requirements shall be as per the relevant clauses/tables of IS:458 for different classes of pipes.

Table– 1

Design and Strength Test Requirements of Concrete Pipes of Class NP2 Reinforced Concrete, Medium Duty, Non-Pressure Pipes

(Clauses 6.1.1, 6.1.2.1, 6.1.3, 6.2.2, 7.3.2 and 8.1 and Table 20)

Internal Diameter of Pipes in mm	Barrel Wall Thickness	Reinforcements			Strength Requirements for Bearing Test	Test Three Edge
		Longitudinal, Mild Steel or Hard Drawn Steel	Spirals, Hard Draws Steel			
		Minimum	Kg/linear metre	Kg/linear metre	Load to Produce 0.25mm Crack kN/linear metre	Ultimate Load kN/linear metre
(1)	(2)	(3)	(4)	(5)	(6)	(7)
80	25	6	0.59	0.16	10.05	15.08
100	25	6	0.59	0.18	10.05	15.08
150	25	6	0.59	0.24	10.79	16.19
200	25	6	0.59	0.38	11.77	17.66
225	25	6	0.59	0.46	12.26	18.39
250	25	6	0.59	0.58	12.55	18.83
300	30	8	0.78	0.79	13.48	20.22

350	32	8	0.78	1.13	14.46	21.69
400	32	8	0.78	1.49	15.45	23.18
450	35	8	0.78	1.97	16.18	24.27
500	35	8	0.78	2.46	17.16	25.74
600	45	8	0.78	3.47	18.88	28.32
700	50	8	1.22	4.60	20.35	30.53
800	50	8	1.22	6.71	21.57	32.36
900	55	8	1.22	9.25	22.80	34.20
1000	60	8	1.76	10.69	24.27	36.41
1100	65	8	1.76	12.74	25.50	38.25
1200	70	8	1.76	15.47	26.97	40.46
1400	75	12	2.64	20.57	29.42	44.13
1600	80	12or8+	3.52	25.40	32.12	48.18
1800	90	12or8+	3.52	32.74	35.06	52.59
2000	100	12+12	5.28	45.14	37.76	56.64
2200	110	12+12	5.28	56.37	40.41	60.32

Note:

1. If mild steel is used for spiral reinforcement, the weights specified under col.5 shall be increased to 140/125.
2. Soft grade mild steel wire for spirals may be used for pipes of internal diameters 80 mm, 100 mm and 150 mm only, by increasing weight to 140/84.
3. The longitudinal reinforcement given in this table is valid for pipes up to 2.5 m. effective length for internal diameter of pipe up to 250 mm and up to 3 m. effective length for higher diameter pipes.
4. Total mass of longitudinal reinforcement shall be calculated by multiplying the values given in col.4 by the length of the pipe and then deducting for the cover length provided at the two ends.

Table-2
Design and Strength Test Requirements of Concrete Pipes of Class NP3
Reinforced Concrete, Medium Duty, Non-Pressure Pipes

(Clauses 6.1.1, 6.1.2.1, 6.1.3, 6.2.2, 7.3.2 and 8.1 and Table 20)

Internal Diameter of Pipes in mm	Barrel Wall Thickness	Reinforcements			Strength Test Requirements for Three Edge Bearing Test	
		Longitudinal, Mild Steel or Hard Drawn Steel	Spirals, Hard Draws Steel	Load to Produce 0.25mm Crack kN/linear metre	Ultimate Load	
						Minimum
(1)	(2)	(3)	(4)	(5)	(6)	(7)
200	30	6	0.59	0.81	14.5	21.75
250	30	6	0.59	1.24	15.00	22.50

300	40	8	0.78	1.80	15.50	23.25
400	75	8	0.78	3.30	19.16	28.74
600	85	8 or 6+6	1.18	7.01	28.74	43.11
800	95	8 or 6+6	2.66	13.04	38.32	57.48
900	100	6+6	2.66	18.30	43.11	64.67
1000	115	6+6	2.66	21.52	47.90	71.85
1200	120	8+8	3.55	33.57	57.48	86.22
1400	135	8+8	3.55	46.21	67.06	100.60
1600	140	8+8	3.55	65.40	76.64	114.96
1800	150	12+12	9.36	87.10	86.22	129.33
2000	170	12+12	9.36	97.90	95.80	143.70
2200	185	12+12	9.36	133.30	105.38	158.07

Note:

1. If mild steel is used for spiral reinforcement, the weights specified under col. 5 shall be increased to 140/125.
2. The longitudinal reinforcement given in this table is valid for pipes up to 2.5 m. effective length for internal diameter of pipe up to 250 mm and up to 3 m. effective length for higher diameter pipes.
3. Total mass of longitudinal reinforcements shall be calculated by multiplying the values given in col. 4 by the length of the pipe and then deducting for the cover length provided at the two ends.
4. Concrete for pipe shall have a minimum compressive strength of 35 N/mm² at 28 days.

Table- 3

**Design and Strength Test Requirements of Concrete Pipes of Class NP3
Reinforced Concrete, Medium Duty, Non-Pressure Pipes Made by Vibrated Casting
Process
(Clauses 5.5.1, 6.1.1, 6.1.2.1, 6.1.3, 6.2.2, 7.3, 2 and 8.1; and Table 20)**

Internal Diameter of Pipes in mm	Barrel Wall Thickness	Reinforcements			Strength Requirements for Three Edge Bearing Test	
		Longitudinal, Mild Steel or Hard Drawn Steel	Spirals, Hard Draws Steel	Load to Produce 0.25mm Crack kN/linear metre	Ultimate Load	
		Minimum number	Kg/linear metre	Kg/linear metre	kN/linear	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
300	50	8	0.78	1.53	15.5	23.25
400	60	8	0.78	1.6	19.16	28.74
600	75	8 or 6+6	1.18	2.2	28.74	43.11
800	95	8 or 6+6	2.66	6.87	38.32	57.48
900	100	6+6	2.66	11.55	43.11	64.67
1000	115	6+6	2.66	15.7	47.90	71.85
1200	125	8+8	3.55	21.25	57.48	86.22

1400	140	8+8	3.55	30	67.06	100.60
1600	165	8+8	3.55	50.63	76.64	114.96
1800	180	12+12	9.36	64.19	86.22	129.33
2000	190	12+12	9.36	83.12	95.8	143.7
2200	210	12+12	9.36	105.53	105.4	158.07

Note: Concrete for pipes shall have a minimum compressive strength of 35N/mm² at 28 Days

Table- 4
Design and Strength Test Requirements of Concrete Pipes of Class NP4
Reinforced Concrete, Heavy Duty, Non-Pressure Pipes

(Clauses 6.1.1, 6.1.2.1, 6.1.3, 6.2.2, 7.3.2 and 8.1; and Table 20)

Internal Diameter of Pipes in	Barrel Wall Thickness	Reinforcements			Strength Requirements for Three Edge Bearing Test	
		Longitudinal, Mild Steel or Hard Drawn Steel		Spirals, Hard Draws Steel	Load to Produce 0.25mm Crack kN/linear metre	Ultimate Load
		Minimum number	Kg/linear metre	Kg/linear metre		kN/linear
(1)	(2)	(3)	(4)	(5)	(6)	(7)
200	30	6	0.59	1.30	24.6	36.9
250	30	6	0.59	1.98	25.5	38.25
300	40	8	0.78	2.71	26.4	39.6
400	75	8	0.78	3.52	33.9	50.9
600	85	8 or 6+6	2.34	9.63	46.3	69.4
800	95	8 or 6+6	3.44	21.2	59.3	89.1
900	100	6+6	3.44	27.13	66.3	99.4
1000	115	8+8	6.04	35.48	72.6	108.9
1200	120	8+8	6.	53.07	88.3	132.4
1400	135	8+8	9.36	77.62	104.2	156.4
1600	140	12+12	9.36	108.97	119.6	179.5
1800	150	12+12	14.88	150.22	135.3	203
2000	170	12+12	14.88	151.79	135.3	203
2200	185	12+12	14.88	160.90	142.2	213.3

Note:

1. If mild steel is used for spiral reinforcement, the weights specified under col. 5 shall be increased to 140/125.
2. The longitudinal reinforcement given in this table is valid for pipes up to 2.5m. effective length for internal diameter of pipe up to 250mm and 3m. effective length for higher diameter pipes.
3. Total mass of longitudinal reinforcements shall be calculated by multiplying the

values given in col. 4 by the length of the pipe and then deducting for the cover length provided at the two ends.

4. Concrete for pipes shall have a minimum compressive strength of 35 N/mm² at 28 days.

Table– 5

**Design and Strength Test Requirements of Concrete Pipes of Class NP4
Reinforced Concrete, Heavy Duty, Non-Pressure Pipes made by Vibrated casting process**

(Clauses 5.5.1, 6.1.1, 6.1.2.1, 6.1.3, 6.2.2, 7.3.2 and 8.1; and Table 20)

Internal Diameter of Pipes in mm	Barrel Wall Thickness	Reinforcements			Strength Requirements for Three Edge Bearing Test	
		Longitudinal, Mild Steel or Hard Drawn Steel		Spirals, Hard Draws Steel	Load to Produce 0.25mm Crack kN/linear metre	Ultimate Load
		Minimum number	Kg/linear metre	Kg/linear metre		kN/linear r
(1)	(2)	(3)	(4)	(5)	(6)	(7)
300	50	8	0.78	1.53	26.4	38.6
400	60	8	0.78	1.97	33.9	50.9
600	75	8 or 6+6	2.34	8.50	46.3	69.4
800	95	8 or 6+6	3.44	19.72	59.3	89.1
900	100	6+6	3.44	20.92	66.3	99.4
1000	115	8+8	6.04	26.70	72.6	108.9
1200	125	8+8	6.04	42.42	88.3	132.4
1400	140	8+8	9.36	53.39	104.2	156.4
1600	165	12+12	9.36	79.92	119.6	179.5
1800	180	12+12	14.88	85.75	135.3	203
2000	190	12+12	14.88	108	135.3	203

Note: Concrete for pipes shall have a minimum compressive strength of 35 N/mm² at 28 days.

The tolerances regarding overall length, internal diameter of pipes or sockets and barrel wall thickness shall be as per relevant clause of IS:458.

WORKMANSHIP AND FINISH

Pipes shall be straight and free from cracks except that craze cracks may be permitted.

The ends of the pipes shall be square with their longitudinal axis so that when placed in a straight line in the trench no opening between ends in contact shall exceed 3mm in pipes up to 600mm diameter (inclusive), and 6mm in pipes larger than 600mm diameter.

The outside and inside surfaces of the pipes shall be smooth, dense and hard, and shall not be

coated with cement wash or other preparation unless otherwise agreed to between Owner/Engineer and the manufacturer or supplier.

The pipe shall be free from defects resulting from imperfect grading of the aggregate, mixing or moulding.

The pipe shall be free from local dents or bulges greater than 3 mm in depth and extending over a length in any direction greater than twice the thickness of barrel.

The deviation from straight in any pipe throughout its effective length, tested by means of a rigid straight edge parallel to the longitudinal axis of the pipe shall not exceed, for all diameters 3 mm for every meter run.

TESTING

All pipes for testing purposes shall be selected at random from the stock of the manufacturer and shall be such as would not otherwise be rejected under the criteria of tolerances as mentioned in IS:458 (Latest Edition).

During manufacture, tests on concrete shall be carried out as per IS:456. The manufacturer shall supply, when required to do so by Owner/Engineer the results of compressive tests of concrete cubes and split tensile tests of concrete cylinders made from the concrete used for the pipes. The manufacturer shall supply cylinders or cubes for test purposes required by the Owner/Engineer and such cylinders or cubes shall withstand the tests prescribed by the manufacturer for the hydrostatic test pressure. For non-pressure pipes, 2 percent of the pipe shall be tested for hydrostatic test pressure.

The specimen of pipes for the following tests shall be selected in accordance with relevant Clause of IS:458 (Latest Edition) and tests in accordance with the methods described in IS:3597.

- i) Hydrostatic test
- ii) Three edge bearing test
- iii) Absorption test

Note: Three edge bearing strength to produce 0.25 mm crack in case of special design of pipe shall be as per IS:458:2003.

For inspection at manufacturing site 24 hrs. Access shall be provided to Client's Engineers as well as engineer appointed by PMC/TP Agency.

SAMPLING AND INSPECTION

In any consignment, all the pipes of same class and size and manufactured under similar conditions of production shall be grouped together to constitute a lot. The conformity of a lot to the requirements of this specification shall be ascertained on the basis of tests on pipes selected from it.

The number of pipes to be selected from the lot for testing shall be in accordance with Table 15 of IS:458 (Latest Edition).

Pipes shall be selected at random. In order to ensure randomness, all the pipes in the lot may be arranged in a serial order and starting from any pipe, every 'n' th pipe shall be selected till the requisite number is obtained, n being the integral part of $\frac{N}{n}$, where N is the total number of pipes in the lot.

isthelotsizeandnisthesamplesize.

Allpipesselected asperIS:458shallbeinspected fordimensionalrequirements, finishanddeviationfromstraight.Apipefailingtosatisfy oneormoreofthese requirementsshallbeconsideredasdefective.

ThenumberofpipetobetestedfortestsunderIS:458shallbeinaccordancewith column4ofTable15ofIS:458(LatestEdition).Thesepipesshallbeselectedfrom pipethathavesatisfiedtherequirementsmentionedinClauseabove.

AlotshallbeconsideredasconformingtotherequirementsofIS:458(LatestEdition) ofthefollowingconditionsaresatisfied.

- (a)Thenumberofdefectivepipesshallnotbemorethanthepermissibleumbergivenin column3ofTable15ofIS:458(LatestEdition).
- (b)Allthepipe testedforvarious testsasperIS-458shall satisfy corresponding requirementsofthetests.
- (c)Incasethenumberofpipesnotsatisfyingrequirementsofanyoneormoretests,one Ortwofuthersamplesofsamesizeshallbeselectedandtestedfor thetestortests in whichfailurehasoccurred.Allthesepipesshall satisfythecorresponding requirementsof thetest.

MARKING

Thefollowinginformationsshallbeclearlymarkedoneachpipe:

- a)Internaldiameterofpipe
- b)Classofpipe
- c)Dateofmanufacture,and
- d)Nameofmanufacturerorhisregisteredtrademarkorboth.
- e)OwnerandProjectname

LAYING OF PIPES

ThelayingofRCCpipesshallconformtoTechnicalSpecifications:Itemno.5

JOINTING GENERAL

Jointing of RCC pipes shall be done with SRC cement only and as per the requirementsoffollowingspecificationsandaspertherelevantIS.Thetypeofjoints shallbeasbelow.Afterjointing,extraneousmaterial,ifany,shallberemovedfrom theinsideofthepipeandthenewlymadejointsshallbethoroughlycured.Incase, rubber-sealingringsareusedforjointing,theseshallconformtoIS5382andshallbe ofsuchtypeasmentionedinIS-458:2003.

FLUSH JOINT (INTERNAL)

Thisjointshall begenerallyusedfor culvert pipesof 900-mm diameterandover.The endsofthepipesarespeciallyshapedtoformaself-centeringjointwithaninternal

jointingspace13-mmwide.Thefinishedjointisflushwithbothinsideandoutside withthepipewall.Thejointingspaceis filledwithcementmortarin theproportionas specifiedinIS-458-2003, mixedufficientlydrytoremaininpositionwhenforced withatrowelorramped.

FLUSHJOINT(EXTERNAL)

Thisjointissuitableforpipeswhicharetoosmallforjointingfrominside.Thisjoint iscomposed of speciallyshaped pipeends.Eachendshallbebuttedagainsteach otherandadjusted incorrecposition. Thejointingspaceshallthenbefilledwith cementmortarasspecified inIS-458-2003, sufficientlydryandfinished offflush. Greatcareshallbetakentoensurethattheprojectingendsarenotdamagedasno repairscanbereadilyaffectedfrominsidethepipe.

SPIGOTANDSOCKETJOINT(FLEXIBLE)

TheRCCpipewiththerubberringaccuratelypositionedonthespigotshallbepushed wellhomeintothesocketofthepreviouslylaidpipebymeansofuniformlyapplied pressurewiththeaidofajackorsimilarappliance.TheRCCpipesshallbeofspigot andsockettypeformorethan300mmdia.pipeasspecifiedinIS-458-2003,shallbe used,andthemanufacturer'sinstructionsshallbe deemedtoforma partofthese specifications.

Socket&SpigotNP2,NP3&NP4pipewithrubberringrollonjointfordiameterup to900mmshouldbeprovidedasperTable14 pflS458:2003.

Socket&spigotNP2,NP3&NP4pipewithrubberringofconfinedjointfordiameter 1000mmto2200mmshouldbeprovidedasperTable-17ofIS458:2003.

CLEANINGOFPIPES

Assoonasa stretchofRCCpipeshasbeenlaidcompletefrommanholetomanhole orforastretchasdirectedby Owner/Engineer,contractorshallrunthroughthepipes bothbackwardsandforwardsadoublediscorsolidorclosedcylinder75mmlessin diameterthantheinternaldiameterofpipes.Theopenendoftheincompletestretch ofpipelineshallbesecurelyclosedasmaybedirectedby Owner/Engineertoprevent entry ofmudorsiltetc.

If as a result of the removal of anyobstructions Owner/Engineer considers that damages mayhavebeencaused tothepipelines, heshallbeentitled toorderthe stretchtobetested immediately. Should suchtestproveunsatisfactory, contractor shall amend the work and carry out such further tests as are required by Owner/Engineer.

Itshall alsobeascertainedbycontractorthateachstretchfrommanholetomanholeor thestretchasdirectedbyEngineerisabsolutelyclearandwithoutanyobstructionby meansof visualexaminationof theinteriorofthepipelinesuitablyenlightenedby projectedsunlightorotherwise.

TESTINGATWORKSITE

AfterlayingandjointingofRCCpipesiscompletedthepipelineshallbetestedat worksiteasperthefollowingspecificationsandasdirectedbyOwner/Engineer.All equipmentfortestingatworksiteshallbesuppliedanderectedbycontractor.Water for testing

of pipes shall be arranged by him. Damage during testing shall be contractor's responsibility and shall be rectified by him to the full satisfaction of Owner/Engineer. Water used for test shall be removed from pipes and not released to the excavated trenches.

After the joints have thoroughly set and have been checked by Owner/Engineer and before backfilling the trenches, the entire section of these sewer or storm water drain shall be proved by contractor to be watertight by filling in pipes with water to the level of 1.50 m above the top of the highest pipe in the stretch and heading the water up for the period of one hour. The apparatus used for the purpose of testing shall be approved by Owner/Engineer. Contractor if required by Owner/Engineer shall dewater the excavated pit and keep it dry during the period of testing. The loss of water over a period of 30 minutes should be measured by adding water from a measuring vessel at regular 10 minutes intervals and noting the quantity required to maintain the original water level. For the approval of this test the average quantity added should not exceed 1 liter/hour/100 linear meters/10 mm of nominal internal diameter. Any leakage including excessive sweating which causes a drop in the test water level will be visible and the defective part of the work should be removed and made good.

In case of pressure pipeline the completed stretch of pipelines shall be tested for site test pressure as specified in IS-458-2003. The site test pressure should not be less than the maximum operating pressure plus the calculated surge pressure, but in no case should it exceed the hydrostatic test pressure as specified in IS:458 (Latest Edition).

TESTING OF GRAVITY FLOW CONDUITS

The pipe line shall be subjected to be performing test of flow test.

MEASUREMENT

All RCC pipes shall be measured according to the work actually done and no allowance will be made for any waste in cutting to the exact length required. The measurement for pipe shall be in running meter nearest to a cm. of length along the center line of pipe as actually laid at work sites.

The rate for providing, laying and jointing of RCC pipes shall be deemed to include the cost of rubber rings, jointing material, testing and extra excavation required for ordinary bedding of pipes and also for pipe sockets, if any.

NOTES

- If any damage is caused to the pipeline during the execution of work or while cleaning/testing the pipeline as specified. Contractor shall be held responsible for the same and shall replace the damaged pipeline and retest the same at his own cost to the full satisfaction of Engineer.
- Water for testing of pipelines shall be arranged by Contractor at his own cost.
- Pipes shall be brought on site proportionate to the required progress for Thirty days only.
- RCC pipes shall be with ISI marking only.

MODE OF MEASUREMENT & PAYMENT

All RCC pipes shall be measured according to the work actually done and no allowance will be made for any waste in cutting to the exact length required. The measurement for pipes shall be in running meter nearest to a cm. of length along the center line of pipe as actually laid at work sites.

The rate for providing of RCC pipes shall be deemed to include the cost of rubber rings, jointing material.

Payment release of this item is as under:

- (A) On supply of Material at store/site.....80% (max. 2000 mt. unlaidd length is payable for this item)
- (B) On execution of laying, joining etc.....15%
- (C) On **hydraulic Flow** testing completion at field.....05%

NOTES

- If any damage is caused to the pipeline during the execution of work or while cleaning/testing the pipeline as specified. Contractor shall be held responsible for the same and shall replace the damaged pipeline and retest the same at his own cost to the full satisfaction of Engineer.
- Water for testing of pipelines shall be arranged by Contractor at his own cost.
- Pipes shall be brought on site proportionate to the required progress for Thirty days only.

NO.13

➤ **Providing and constructing Sewer manholes as per the type design in brick masonry in C. M. 1:5 and inside and outside 20mm thick plastering in C. M. 1:3 necessary 100 mm coping with reinforcement in R.C.C.M. 200 fixing C. I. steps and fixing manhole frame and covers (But excluding supply of manhole frame and covers) over manholes and house connection chambers/ **drainage water chamber** and fixing Manhole covers (but excluding supplying of manhole covers) over scraper manhole etc. complete, providing and fixing safety chain wherever necessary as per the stipulations in the type design complete as per latest CPHEEO manual. (excl. excavation).**

- a) **Manhole type "A" Circular type having inside diameter of 1200 mm for depth upto 1.5 m depth (for 150 mm to 500 mm dia sewer)**
Manhole type "A" as above but up to 1.0 M depth.
Extra depth beyond 1 .0 M but up to 1 .5 M depth for "A" type manhole above.
- b) **Manhole type "B" circular type having inside diameter of minimum 1500 mm and for depth from 1.5 M to 4.0 M (for 150 mm to 600 mm dia sewers)**
Manhole type "B" as above but up to 1.5 M depth.
Extra depth beyond 1 .5 M but up to 4.0 M depth for type B manhole above.

- c) **Manhole type "C" circular type having inside diameter of minimum 1500 mm and for depth beyond 4.0 m to 6.0 m (for 150 mm to 1800 mm dia sewers)**
Manhole type "C" as above but up to 4.0 M depth.
Extra depth beyond 4.0 M and up to 6.0 M depth for type "C" manhole above.
- d) **Manhole type "D" circular type having inside diameter of minimum 1500 mm and for depth beyond 6.0 m to 10 m (for 150 mm to 500 mm dia sewers)**
Manhole type "D1" as above but up to 6.0 M depth.

MATERIALS:

Water shall conform to M-1, Cement conform to M-3, Stone coarse aggregate of 20 mm nominal size shall conform to M-9, Grit shall conform to M-6, Steel reinforcement shall conform to M-14-15-16-17-18. Flyash brick shall conform to M-12A, Cement mortar of specified proportions shall conform to M-11, The cast iron step shall conform to M-52."

Manhole cover with frame of required size and weight shall be procured by the contractor. Supply of manhole frame and cover shall be paid separately under respective item.

WORKMANSHIP:

The manhole of different types and sizes as specified shall be constructed in sewer line at such place and to such levels and dimension as shown in drawing or as directed.

Excavation :- The excavation for construction of manhole including dismantling of all types of roads surface guarding, barricading, lightening the trenches, baling out water if required, removing and replacing, shifting of telephone/electric cables, pipeline etc. and all other safety provisions like shoring and strutting etc. till refilling of trenches and completion of manhole construction, stacking of excavated stuff within the specified lead, back filling of selected excavated earth, watering and consolidation etc. complete shall be carried out as per relevant specification, including disposal of surplus soil as directed.

Concrete work :- The bed concrete in C.C. 1:3:6, Copping in C.C. 1:1.5:3 and benching concrete in proportion C.C. 1:2:4 (1 Cement : 2 coarse sand : stone aggregate of 20 mm nominal size) by volume with necessary centering and shuttering work shall be provided. It shall be placed, deemed and/or vibrated and cured as directed by Engineer-in-charge.

REINFORCEMENT:

All the reinforcement bars shall be accurately placed in exact position shown on the drawings and shall be securely held in position during placing of concrete by annealed No. 1 binding wire not less than 1 mm size and by using stay block or metal chair spacers, metal hangers, supporting wires or other approved devices at sufficiently close intervals. Bars shall not be allowed to lag between supports nor displaced during concrete or any other operation of the work. Reinforcement after being placed

in positions 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 covers shall be provided as indicated on drawings.

Bars shall be bent to specified shape and dimensions or as directed, attain proper radius of bends, Bars shall not be bent or straightened in a manner that will injure the materials. Bars bend during transport or handling shall be straightened before being used on the work. Unless otherwise specified for mild steel a 'U' type hook at the end of each bar shall invariably be provided to maintain reinforcement.

In case bars which are not round and in case of deformed bars, the diameter shall be taken as the diameter of circle having an equivalent effective area. The cold twisted steel bars shall be used without hooks at the ends. Deformed bars without hooks shall however, comply with relevant anchorage requirements.

Bars crossing each other where required shall be secured by binding wires (annealed) of size not less than 1mm in such a manner that they do not slip over each other at the time of fixing and concreting.

As far as possible bars of full length shall be used. In case this not possible overlapping of bars shall be done as directed. The overlap shall be staggered for different bars and located at points along the span where neither shear nor bending moment is maximum.

When permitted or specified on the drawings joints of reinforcement bars shall be butt welded so as to transmit their full stresses. Welded joints shall preferably be located at points where steel will not be subject to more than 75 percent of the maximum permissible stresses and welds shall be staggered so that in any one section not more than 20 percent of the rods are welded. 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.

BRICK MASONRY WORK:

Before masonry is laid on concrete footing the top of concrete shall be cleaned and moistened. The contractor shall obtain the Engineer's approval for one foundation bed, before foundation masonry is started.

Wetting of Bricks: The brick required for masonry 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.

Brick shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete to bond. Closers in such case shall be cut to required size and used near the ends of 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 tamping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar then the next brick is

laid and pressed against it. On completion of course, the vertical joint shall be fully sealed from the top with mortar.

The wall shall be taken up truly in plumb. All corners shall be laid truly horizontal and all vertical joint shall be truly vertical. Vertical joints in alternate courses shall generally be directly one over the other. The thickness of brick courses shall be kept uniform.

The brick shall be laid with frog upwards. A set of tools comprising of wooden straight edges, monsoon spirit level, square half meter 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 of 23 cms. shall be kept in proper plain. All the connected brickwork shall be kept not more than one meter over the rest of the work. Where this is not possible the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

All fixtures like pipe inlet and outlet of water C.I. steps, manhole cover and frame etc. which are required to be built in wall shall be embedded in cement mortar.

Brick shall be so laid that all joint shall not be exposed 12 mm. The face joint 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 be done.

For the face of brickwork, plastering is to be done joint shall be raked out to a depth not less than thickness of joints. The face of brickwork shall be cleaned and mortar dropping removed on very same day that brickwork is laid.

PLASTER WORK:

The surface shall be cleaned of all dust, loose mortar droppings, traces of algae efflorescence and other foreign matter by water or by brushing. Smooth surfaces shall be roughened by wire brushing or hard by racking if it is hard. In case of concrete surface, if a chemical retarder has been applied to the formwork 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 surface where necessary shall be carried out to get an even surface.

The work shall be soaked but only damped evenly before applying the plaster. If the surface becomes dry, such areas shall be moistened again.

The plaster about 15 x 15 cms. shall be first applied horizontally and vertically at not more than 2 meters interval over the entire surface to serve as gauge. The surface of these gauges shall be truly in plane 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 float accordingly excessive trowelling or over working the float shall be avoided. All corners, rises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, rises, junctions etc. shall be carried out with proper template of the size required.

Cement mortar for plasters shall be used within half an hour after addition of water. And mortar for 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 plasters shall be left out clean to the line both horizontally and vertically, when recommending the plaster the edge of the old work shall be scraped clear and wetted with cement putty before plaster is applied to the adjacent area so as to enable the two to properly get together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15 cm. to any corners or arises. It shall not be closed on the body of features such as plaster bends and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on walls and copings these invariably lead to leakage. No portion of the surfaces shall be depth out initially to be packed up later on.

POINTING:

The flush pointing work shall be carried out with cement mortar of required proportion by volume. Before pointing to be started the joints shall be raked to such depth that the average of new mortar measured from the sunk surface of the finished pointing or from the edge of the brick shall be average 10mm.

The mortar shall be pressed into the raked out joints with a pointing trowel according to the type of pointing specified in item or as directed. The mortar shall not spread over the corners of finished work i.e. at fixing of C.I. Steps and M.H. cover.

FIXING OF POLYPROPYLENE STEPS AND MANHOLE COVER:

During the construction of masonry wall of the manhole the cement mortar of required proportions shall be used for embedding the Polypropylene steps in the wall masonry. The spacing of steps in the masonry shall be 300mm center to center in the staggered position in the vertical direction with two staggered rows at 385 mm center to center in the horizontal direction. The top of the manhole shall not be more than 300 mm above the first step from top of manhole frame and cover and the center line of two staggered rows shall be the center line of the shorter side of manhole frame in the roof of chamber.

The detailed specifications for the "Polypropylene steps" as below:

The Polypropylene conforming to an ASTM D-4101, injection molded around a 12 mm dia. IS 1786 grade Fe-415 steel reinforcing bar and should meet the load required 225 Kg. as per IS-5455. The measurement should be as per attached drawing. The tolerance in the length and width is +/- 5 mm and +/- 1 mm in thickness. The weight of the steps should not be less than 0.900 Kg.

Unchequered portion of the steps shall be inserted with the rich cement mortar during the course of masonry work so constructed around the steps as to keep the step on its right position. Thenon-slip grip chequered portion of the steps shall be well kept outside the masonry.

During fixing of the steps, the wall should not be damaged and shall not vibrate or shall not shake during ascents and descents otherwise they shall have to be refixed correctly as per the drawings or as mentioned above.

Manhole frames shall be firmly and securely laid on top of shafts of conical tops in 25mm thick cement mortar and shall be embedded in 150mm thick cement concrete of proportion 1:2:4 (1 Cement: 2 coarse sand: 4 Kapchias aggregate of 20 mm nominal size) in such a way that the top of M.H. frame shall be flush with concrete surface and top surface neatly finished 25 mm thick with cement mortar 1:3 in conformity with ground or road levels.

OTHER REQUIREMENTS:

As per line and level and size of the manhole pit shall be excavated as per drawing or as ordered by the Engineer.

The foundation concrete 1:3:6 with required thickness as per drawing or as directed shall be laid after compacting the bottom of the pit. The cement concrete shall conform to specified specification of Cement Concrete.

The clear inside chamber size of openings shall be as per the drawing or as directed by the Engineer-in-charge.

The masonry wall shall be plastered inside and outside with 15mm thick 1:3 cement mortar. The offset for the concrete foundations shall be 100mm on all sides beyond walls of chamber.

Whenever pipes enter or leave the masonry chamber bricks on edge must be so laid around the upper half of the pipe so as to form the arch to prevent the weight of the masonry chamber over it.

On the top of masonry walls RCC coping 1:1.5:3 150mm thick or as directed shall be laid and then 1:1 cement mortar shall be laid and then R.C.C. slab of grade 1:2:4 necessary and as directed by the Engineer with coarse aggregate of trap metal of 20 mm nominal shall be laid necessary from work and centering shall have to be provided by the contractor at his own cost as per relevant specification of cement concrete.

In the bottom of manhole the channel and benching shall be done in C.C. 1:2:4 (1 Cement: 2 Coarse sand : 4 graded stone aggregate of 20mm nominal size) The channel at the bottom of the chamber shall be plastered 15mm thick in c.m. 1:3 (1 Cement: 3 fine sand) and steel trowels smooth.

Channels shall be in semicircular in the bottom half and a diameter equal to the sewer. Above the horizontal diameter, the sides shall be extended vertically to the same level as the crown of the outgoing pipe and the top edges shall be suitably rounded off. The branch channels shall also be similarly constructed with respect to the benching but at their junctions with the main channel an appropriate fall suitably rounded off in the direction of flow in the main channel shall be given.

For conical shaft of manhole necessary conical portions shall be treated from 750 mm below the bottom of concrete of slab for fixing of manhole cover and frame.

The item includes curing of all the cement work for 14 days.

If dewatering is required by installing pumping sets the same shall be paid separately Under respective item.

MODEOFMEASUREMENTS&PAYMENTS:

Payment shall be made on the basis as per number of masonry manholes chambers constructed with all constructing materials labors, refilling curing, finishing providing and fixing C.I.steps, constructing laying half round gutter fixing R.C.C.manhole cover etc. complete in all respect for incomplete item. Payment will be made on partrate basis.

The item will be paid per No. of construction of complete masonry manhole chamber as shown in the drawing upto the depth specified and shown in the type design drawing. For every increase or decrease in the minimum specified depth of masonry manhole chamber increase or decrease in rates shown in schedule B will be paid taking in consideration every 10 CM increase or decrease depth of masonry chambers. For the purpose of payment of masonry chamber every increase or decrease of the 10 cm depth than the specified minimum depth of masonry manhole chambers as shown in drawing or in Schedule-B will be paid more or less for every 10 cm depth.

The measurements shall be made for number of chamber constructed and for additional depth plus or minus the rates shall be paid for meter length correct upto 10 cm depth plus or minus. The surplus excavated stuff shall be disposed of within municipal limits as directed by Engineer-in-charge without any extra claim.

The depth of manholes shall be the distance between the top manhole cover and the invert level of the main drain. The rate includes all labors, materials, tools and plant etc. required for satisfactory completion of this item as directed above.

The item include:-

- (i) Bed concrete slab concrete and coping with necessary reinforcement.
- (ii) Necessary brick work with cement plaster inside and outside completely.
- (iii) Providing and fixing polypropylene steps.
- (iv) Carting, conveying and fixing of manhole frame cover with necessary concrete and finishing.
- (v) Refilling with necessary watering and consolidation.
- (vi) Excavation with shoring is required.
- (vii) Leveling coarse concrete
- (viii) Disposal of surplus soil
- (ix) Curing for 14 days.

NO. 14

RCC precast M.H. Frame & Cover Manufacture, supply & Delivery at store or at site of work precast RCC M.30 Frame & cover suitable to drainage M.H. and as per type design & Drawing including cost of reinforcement M.S. Angles or Flate, curring mold work etc.

Heavy Duty - HD - 20 : Circular (0.56 dia) suitable for circular MH or perforated (0.6x0.6)

Shape, size and thickness of the manhole covers shall be as shown in drawing.

It is of precast RCC in M-200 manhole cover having 10 mm dia. TMT bars at 10 cm c/c both ways in centers shall be provided. In manhole frame also at least 4 Nos. of 10 mm bars shall be provided. Precast manhole covers and frames shall be cured at least for 21 days. The thickness of cover minimum 100 mm. **However, contractor shall cast the manhole frame and cover as per Type design provided by detailed design as directed by the Engineer-in-charge.**

Heavy duty precast RCC manhole frame and covers shall be required to be used on scraper manholes. The general requirements for the material, manufacture and workmanship, sampling, testing key holes shall be as directed.

Each manhole cover and frames shall have cast on if the following information

- (a) Manufacturer name or trademark
- (b) Grade namely heavy duty (HD)
- (c) The work "BMC SEWER" or as decided by the Engineer-in-charge.
- (d) An identification mark as required by Engineer-in-charge.

All the additional requirement and dimensions shall be decided by Engineers.

The rates shall be paid per number of manhole and cover manufactured as per above specification and supplied at site of work.

The detail design of heavy duty manhole frame and cover shall be got approved before casting. It shall be casted in M-300 RCC.

NO.15

➤ **Providing and constructing Sewer manholes, scraper manholes, as per the type design in Precast RCC with Top Conical wall in Brick masonry having inside and outside 20mm thick plastering in C. M. 1:3, necessary 100 mm coping with reinforcement in R.C.C. M. 200, C. I. steps and manhole frame and covers etc. complete, providing and fixing safety chain wherever necessary as per the stipulations in the type design complete as per latest CPHEEO manual. (excl. excavation) including transportation, loading, unloading and installation of Precast RCC Block.**

- a) **Manhole type "C" circular type having inside diameter of minimum 1500 mm and for depth beyond 4.0 m to 6.0 m (for 150 mm to 1800 mm dia sewers)**
Manhole type "C" as above but up to 4.0 M depth.
Extra depth beyond 4.0 M and up to 6.0 M depth for type "C" manhole above.

- b) **Scraper manhole type "SI" rectangular type for 600 mm dia to 1200 mm dia sewer pipes and for depth 2.5 m to 9.0 m.**

Scraper manhole type "SI" as above but upto 2.5 m depth.

Extra depth beyond 2.5 m and upto 9.0 m depth for type "SI" scraper manhole above.

This includes Manholes with vertical shaft in RCC and the cone portion in brickwork.

MATERIALS:

Water shall conform to M-1, Cement conform to M-3, Stone coarse aggregate of 20 mm nominal size shall conform to M-5A, Grit shall conform to M-5, Steel reinforcement shall conform to M-11. Brick shall conform to M-9, Cement mortar of specified proportions shall conform to M-7, The cast iron steps shall conform to M-27."

Manhole cover with frame of required size and weight shall be procured by the contractor. Supply of manhole frame and cover shall be paid separately under respective item.

WORKMANSHIP:

The manhole of different types and sizes as specified shall be constructed in sewer line at such place and to such levels and dimension as shown in drawing or as directed.

Excavation :- The excavation for construction of manhole including dismantling of all types of roads surface guarding, barricading, lightening the trenches, baling out water if required, removing and replacing, shifting of telephone/electric cables, pipeline etc. and all other safety provisions like shoring and strutting etc. till refilling of trenches and completion of manhole construction, stacking of excavated stuff within the specified lead, back filling of selected excavated earth, watering and consolidation etc. complete shall be carried out as per relevant specification, including disposal of surplus soil as directed.

Concrete work :- The bed concrete in C.C. 1:3:6, Copping in C.C. 1:1.5:3 and benching concrete in proportion C.C. 1:2:4 (1 Cement : 2 coarse sand : stone aggregate of 20 mm nominal size) by volume with necessary centering and shuttering work shall be provided. It shall be placed, deemed and/or vibrated and cured as directed by Engineer-in-charge.

REINFORCEMENT:

All the reinforcement bars shall be accurately placed in exact position shown on the drawings and shall be securely held in position during placing of concrete by annealed No. 1 binding wire not less than 1 mm size and by using stay block or metal chair spacers, metal hangers, supporting wires or other approved devices at sufficiently close intervals. Bars shall not be allowed to lag between supports nor displaced during concrete or any other operation of the work. 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.

Bars shall be bent cold to specified shape and dimensions or as directed, to attain proper radius of bends. Bars shall not be bent or straightened in a manner that will injure the materials. Bars bent during transport or handling shall be straightened before being used on the work. Unless otherwise specified for mild steel a 'U' type hook at the end of each bar shall invariably be provided to maintain reinforcement.

In case bars which are not round and in case of deformed bars, the diameter shall be taken as the diameter of circle having an equivalent effective area. The cold twisted steel bars shall be used without hooks at the ends. Deformed bars without hooks shall however, comply with relevant anchorage requirements.

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.

As far as possible bars of full length shall be used. In case this not possible overlapping of bars shall be done as directed. The overlap shall be staggered for different bars and located at points along the span where neither shear nor bending moment is maximum.

When permitted or specified on the drawings joints of reinforcement bars shall be butt welded so as to transmit their full stresses. Welded joints shall preferably be located at points where steel will not be subject to more than 75 percent of the maximum permissible stresses and welds shall be staggered so that in any one section not more than 20 percent of the rods are welded. 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.

BRICK MASONRY WORK:

Before masonry to be used for top cone portion of manholes shall be cleaned and moistened. The contractor shall obtain the Engineer's approval for one foundation, bed, before foundation masonry is started.

Wetting of Bricks: The brick required for masonry 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.

Brick shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete to bond. Closers in such case shall be cut to required size and used near the ends of 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 tamping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar then the next brick is laid and pressed against it. On completion of course, the vertical joints shall be fully sealed from the top with mortar.

The wall shall be taken up truly in plumb. All corners shall be laid truly horizontal and all vertical joint

shall be truly vertical. Vertical joints in alternate courses shall generally be directly one over the other. The thickness of brick courses shall be kept uniform.

The brick shall be laid with frog upwards. A set of tools comprising of wooden straightedges, monsoon spirit level, square half meter 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 of 23 cms. shall be kept in proper plain. All the connected brickwork shall be kept not more than one meter over the rest of the work. Where this is not possible the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

All fixtures like pipe inlet and outlet of water C.I. steps, manhole cover and frame etc. which are required to be built in wall shall be embedded in cement mortar.

Brick shall be so laid that all joints shall not be 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 be done.

For the face of brickwork, plastering is to be done joints shall be raked out to a depth not less than thickness of joints. The face of brickwork shall be cleaned and mortar droppings removed on very same day that brickwork is laid.

PLASTERWORK:

The surface shall be cleaned of all dust, loose mortar droppings, traces of algae efflorescence and other foreign matter by water or by brushing. Smooth surfaces shall be roughened by wire brushing or hard by racking if it is hard. In case of concrete surface, if a chemical retarder has been applied to the formwork the surfaces 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 surface where necessary shall be carried out to get an even surface.

The work shall be soaked but only damped evenly before applying the plaster. If the surface becomes dry, such areas shall be moistened again.

The plaster about 15 x 15 cms. shall be first applied horizontally and vertically at not more than 2 meters interval over the entire surface to serve as gauge. The surface of these gauges shall be truly in plane 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 or wooden float accordingly. Excessive trowelling or over working the float shall be avoided. All corners, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, angles and junctions etc. shall be carried out with proper template of the size required.

Cement mortar for plaster shall be used within half an hour after addition of water. And mortar for 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 edge of the old work shall be scraped clear and wetted with cement putty before plaster is applied to the adjacent area so enable the two to properly get together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15 cm. to any corners or arises. It shall not be closed on the body of features such as plaster bends and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on walls and copings these invariably lead to leakage. No portion of the surfaces shall be depth out initially to be packed up later on.

POINTING:

The flush pointing work shall be carried out with cement mortar of required proportion by volume. Before pointing to be started the joints shall be raked to such depth that the average of new mortar measured from the sunk surface of the finished pointing or from the edge of the brick shall be average 10 mm.

The mortar shall be pressed into the raked out joints with a pointing trowel according to the type of pointing specified in item or as directed. The mortar shall not spread over the corners of finished work i.e. at fixing of C.I. Steps and M.H. cover.

RCC WORK:

Vertical shaft of manhole shall be in RCC M-30 pre-cast.

The entries and exits of main sewers as well as house service sewers requires careful detailing because the issue of puncturing the walls for insertions of especially house service sewers later on is impossible. These shall be managed as detailed below.

- The cone portion shall be separately cast and its design standardized with respect to the diameter of its base.
- The vertical shaft is best pre-cast to have a better quality control of raw materials and workmanship, which is otherwise very suspect in local situations of every manhole.
- The shaft itself shall be made of rings with lap joints of the annular rim and duly jointed at site by cement mortar or elasto-polymers. The varying heights of the manhole are obtained by choosing the bottom ring deeper than the fractional height needed there and filling up the bottom floor after placing the ring such that the invert level of the sewer is obtained thereby.
- This ring shall have a vertical inverted U cut out in casting itself to insert the sewer pipes and caulk the annular space using cement concrete with cement-based water proofing admixtures. The dimensions of the U cut out shall be standardized to match the OD of proposed sewers and a clear cover of 50 cm all round for caulking.
- The position of the vertical inverted U cut outs will normally be 180 degrees apart in plan but in cases of junction manholes and drop manholes it may be at differing angles in plan and needs to be precast suitably and shall not be chiseled out in the field.
- For insertion of the house service sewers into the manholes, it is necessary to have a precast ring section below the corbel portion, with holes at 45 degrees to the public sewer line to facilitate insertion of three house service sewers on each side of the public sewer axis. Usually the house service sewers shall be 110 mm or 160 mm UPVC 4 kg/sqcm (as detailed in sewer laying section). Accordingly, the height of the ring shall be 250 mm and 300 mm to permit filling of the annular interspaces between the sewer and the opening with cement concrete of at least 50 mm around the

finished sewer.

Details are to be followed as per drawing.

Trimming of projections on brick / concrete surface where necessary shall be carried out to get an even surface.

FIXING OF POLYPROPYLENE STEPS AND MANHOLE COVER:

During the construction of masonry wall of the manhole the cement mortar of required proportions shall be used for embedding the Polypropylene steps in the wall masonry. The spacing of steps in the masonry shall be 300 mm center to center in the staggered position in the vertical direction with two staggered rows at 385 mm center to center in the horizontal direction. The top of the manhole shall not be more than 300 mm above the first step from top of manhole frame and cover and the center line of two staggered rows shall be the center line of the shorter side of manhole frame in the roof of chamber.

The detailed specifications for the "Polypropylene steps" as below:

The Polypropylene conforming to an ASTM D-4101, injection molded around a 12 mm dia. IS 1786 grade Fe-415 steel reinforcing bar and should meet the load required 225 Kg. as per IS-5455. The measurement should be as per attached drawing. The tolerance in the length and width is ± 5 mm and ± 1 mm in thickness. The weight of the steps should not be less than 0.900 Kg.

Unchequered portion of the steps shall be inserted with the rich cement mortar during the course of masonry work so constructed around the steps to keep the steps on its right position. Then non-slip grip chequered portion of the steps shall be well kept outside the masonry.

During fixing of the steps, the wall should not be damaged and shall not vibrate or shall not shake during ascents and descents otherwise they shall have to be refixed correctly as per the drawings or as mentioned above.

Manhole frames shall be firmly and securely laid on top of shafts of conical tops in 25 mm thick cement mortar and shall be embedded in 150 mm thick cement concrete of proportion 1:2:4 (1 Cement: 2 coarse sand: 4 Kapchias aggregate of 20 mm nominal size) in such a way that the top of M.H. frame shall be flush with concrete surface and top surface neatly finished 25 mm thick with cement mortar 1:3 in conformity with ground or road levels.

OTHER REQUIREMENTS:

As per line and level and size of the manhole pit shall be excavated as per drawing or as ordered by the Engineer.

The foundation concrete 1:3:6 with required thickness as per drawing or as directed shall be laid after compacting the bottom of the pit. The cement concrete shall conform to specified specification of Cement Concrete.

The clear inside chamber size of openings shall be as per the drawing or as directed

by the Engineer-in-charge.

The masonry wall shall be plastered inside and outside with 15mm thick 1:3 cement mortar. The offset for the concrete foundations shall be 100mm on all sides beyond walls of chamber.

Whenever pipes enter or leave the masonry chamber bricks on edge must be solaid around the upper half of the pipe so as to form the arch to prevent the weight of the masonry chamber over it.

On the top of masonry walls RCC coping 1:1.5:3 150mm thick or as directed shall be laid and then 1:1 cement mortar shall be laid and then R.C.C. slab of grade 1:2:4 necessary and as directed by the Engineer with coarse aggregate of trap metal of 20 mm nominal shall be laid necessary from work and centering shall have to be provided by the contractor at his own cost as per relevant specification of cement concrete.

In the bottom of manhole the channel and benchings shall be done in C.C. 1:2:4 (1 Cement: 2 Coarse sand : 4 graded stone aggregate of 20mm nominal size) The channel at the bottom of the chamber shall be plastered 15mm thick in c.m. 1:3 (1 Cement: 3 fine sand) and steel trowels smooth.

Channels shall be in semicircular in the bottom half and a diameter equal to the sewer. Above the horizontal diameter, the sides shall be extended vertically to the same level as the crown of the outgoing pipe and the top edges shall be suitably rounded off. The branch channels shall also be similarly constructed with respect to the benching but at their junctions with the main channel an appropriate fall suitably rounded off in the direction of flow in the main channel shall be given.

For conical shaft of manhole necessary conical portions shall be treated from 750 mm below the bottom of concrete of slab for fixing of manhole cover and frame.

The item includes curing of all the cement work for 14 days.

If dewatering is required by installing pumping set the same shall be paid separately Under respective item.

MODE OF MEASUREMENTS & PAYMENTS:

Payment shall be made on the basis as per number of masonry manholes chambers constructed with all constructing materials labors, refilling curing, finishing providing and fixing C.I. steps, constructing laying half round gutter fixing R.C.C. manhole cover etc. complete in all respect for incomplete item. Payment will be made on par rate basis.

The item will be paid per No. of construction of complete masonry manhole chamber as shown in the drawing up to the depth specified and shown in the type design drawing. For every increase or decrease in the minimum specified depth of masonry manhole chamber increase or decrease in rates shown in schedule B will be paid taking in consideration every 10CM increase or decrease depth of masonry chambers. For the purpose of payment of masonry chamber every increase or decrease of the 10 cm depth than the specified minimum depth of masonry manhole chambers as shown in drawing or in Schedule-B will be paid more or less for every 10cm depth.

The measurements shall be made for number of chamber constructed and for additional depth plus or minus the rates shall be paid for meter length correct up to 10 cm depth plus or minus. The surplus excavated stuff shall be disposed of within municipal limits as directed by Engineer-in-charge without any extra claim.

The depth of manholes shall be the distance between the top manhole cover and the invert level of the main drain. The rate includes all labors, materials, tools and plant etc. required for satisfactory completion of this item as directed above.

The item include:-

- (i) Bed concrete slab concrete and coping with necessary reinforcement.
- (ii) Necessary brick work with cement plaster inside and outside completely.
- (iii) Providing and fixing polypropylene steps.
- (iv) Carting, conveying and fixing of manhole frame cover with necessary concrete and finishing.
- (v) Refilling with necessary watering and consolidation.
- (vi) Excavation with shoring is required.
- (vii) Leveling coarse concrete
- (viii) Disposal of surplus soil
- (ix) Curing for 14 days.

NO. 16

➤ **Providing and constructing Sewer manholes as per the type design in RCC Cast in situ M:30 with reinforcement with Top Conical wall in Brick masonry, inside and outside 20mm thick plastering in C. M. 1:3, 100 mm coping with reinforcement in R.C.C. M: 200, C. I. steps and manhole frame and covers etc. complete, providing and fixing safety chain wherever necessary as per the stipulations in the type design complete as per latest CPHEEO manual. (excl. excavation)**

a) Manhole type "C" circular type having inside diameter of minimum 1500 mm and for depth beyond 4.0 m to 6.0 m (for 150 mm to 1800 mm dia sewers)

Manhole type "C" as above but up to 4.0 M depth.

Extra depth beyond 4.0 M and up to 6.0 M depth for type "C" manhole above.

Specifications to be followed as per above item Item no. 6 except the vertical shaft of manhole shall be in RCC M-30 cast-in-situ instead of pre-cast.

NO.17**➤ Extra for Dewatering**

The Contractor shall ensure that the excavation and the structures are free from water during construction and shall take all necessary precautions and measures to exclude ground/rain water so as to enable the works to be carried out in reasonably dry conditions in accordance with the construction programme. Sumps made for dewatering must be kept clear of the excavations/trenches required for further work. The method of pumping shall be approved by Employer's Representative, but in any case, the pumping arrangement shall be such that there shall be no movement of subsoil or blowing in due to differential head of water during pumping. Pumping arrangements shall be adequate to ensure no delays in construction. The dewatering shall be continued for adequate time so that concrete, Brick work of M.H. & cement mortar used for sewer line jointing shall attain adequate strength. The Contractor shall, however, ensure that no damage to the sewer, M.H. results on stopping of dewatering.

The Contractor shall study the sub-soil conditions carefully and shall conduct any tests necessary at the site with the approval of the Employer's Representative to test the permeability and drainage conditions of the sub-soil for excavation, concreting etc., below ground level.

The scheme for dewatering and disposal of water shall be approved by the Employer's Representative. The Contractor shall suitably divert the water obtained from dewatering from such areas of site where a buildup of water in the opinion of the Employer's Representative obstructs the progress of the work, leads to unsanitary conditions by stagnation, retards the speed of construction and is detrimental to the safety of men, materials, structures and equipment.

Measurement and Payment

Payment shall be made on cubic meter basis of excavation for single time only.

NO.18

**➤ Shoring and strutting with ordinary timber planking for excavation trench with 50 mm thick planks and suitable size struts etc. complete.
(For Excavation trench upto 4.5 mt. depth)**


1.0 GENERAL :

1.1 This item is applicable for excavation of trench up to depth 3.0 mt.

- 1.2 Contractor shall suitably design polling bards, walling and struts to meet different soil conditions that might be encountered in excavating trenches/ pits. The horizontal and vertical spacing of struts shall be such that not only the sides of trenches shall be prevented from collapse but also easy lowering of pipe in trenches shall be ensured without creating undue obstructions for the excavation of the work. Any inconvenience and/or delay that might be caused in lowering pipes in trenches as a result of adopting improper spacing of struts by Contractor shall be his sole responsibility. No part of shoring shall be at any time be removed by Contractor without obtaining permission from Owner/Engineer. While taking out shoring planks the hollows of any form must simultaneously be filled in with soft earth well rammed with rammers and with water.
- 1.3 Owner/Engineer may order portions of shoring to be left in the trenches/pits at such places, where it is found absolutely necessary to do so to avoid any damage, which may be caused to buildings, cables, gas-mains, water mains, sewers etc. in close proximity of the excavation, by pulling out the shoring from the excavations. Contractor shall not claim, on any reason whatsoever, for the shoring which may have been left in by him at his own discretion.
- 2.0 MATERIAL :
- 2.1 Sheathing, planks, wales, struts etc. required for shoring and strutting shall be of approved quality of wood or structural steel as per requirements of IS-3764-1966.
- 3.0 WORKMANSHIP :
- 3.1 The Contractor before execution shall get approval of design of shoring from Engineer-in-charge. The shoring shall be of sufficient strength to resist side pressure and ensure safety from slips and below and to prevent damage to work and to prevent injury to persons. It shall be removed after getting permission of Engineer-in-charge, after all items for which it is required are completed. Shoring and strutting shall conform to IS - 3764 - 1966 or its latest version.
- 3.2 The sheeting shall be placed against the side of trench so that length of each piece of sheeting is vertical. The sheeting shall be held securely in place against the Wales by ensuring that sheeting is kept firmly placed against the wall of the trench. Where the trench is excavated in loose, sandy or soft soil or soil which has been previously excavated or soil which is under hydrostatic pressure, each piece of sheeting shall be driven into the bottom of trench so has to be firmly held in place.
- 3.3 Where two or more pieces of sheeting are used one above another, the sheeting shall be so arranged that the lower piece of sheeting overlap the lowest Wales supporting the pieces of sheeting next above it. These pieces of sheeting shall be firmly driven in to the soil and securely supported by Wales and struts as the trench is made deeper.
- 3.4 The wales shall be supported parallel to the bottom of the proposed bottom of the trench. Each wale shall be supported on cleats spliced to the sheathing or by posts set on the wales next below it and in the case of lowest wale on the bottom of the trench
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- itself. Where necessary, wedges may be provided between a wale and sheathing is supports to that roughly uniform support is given to all individual pieces of sheathing.
- 3.5 Struts shall be horizontal and at right angles to the wales of sheathing supported 6.5thereby. Struts shall be cut to the proper length required to fit in tightly between wales, where necessary, the struts shall be held securely in place by wedges, driven between struts and the wales. Struts shall be placed on cleats spliced or bolted to posts supporting wales.
- 3.6 The sizes and spacing of sheathing, wales struts and wedges used for shoring and timbering for different depth shall conform the requirement of IS-3764-1966 or its latest version.
- 3.7 The extra width of excavation that may be deemed necessary for the purpose of shoring and strutting will be under-stood to be covered in the rate for item of shoring and strutting for pipe trench sides or foundation sides.
- 3.8 The contractor shall have to make all the necessary arrangements while removing shoring strutting. However, if contractor fails to remove the shoring strutting safely, the corporation shall not be responsible for any type of damages and contractor shall have to bear all the cost for the same and the corporation shall not pay any extra payment for the same.
- 3.9 Shoring and strutting shall be close or open depending on the nature of soil and the depth of trench. The type of shoring and strutting shall be determined by the Engineer in charge. It shall be the responsibility of the contractor to take all necessary steps to prevent the sides of trenches from collapse. Engineer in charge should take guidance from IS: 3764-1966 for designing the shoring and strutting arrangements and specifying the profile of excavation.
- 4.0 MODE OF MEASUREMENTS AND PAYMENT :
- 4.1 The item includes all labors, materials, equipment, tools etc. complete for whole the period for satisfactory completion of the item.
- 4.2 No extra payment shall be paid for extra excavation that required to shoring the strutting.
- 4.3 The rate shall be for a unit of one square meter.
- 4.4 No payment shall be made to any wood which has been left out by the contractor while removing the shoring, strutting etc.

NO.19

 **Shoring and strutting with sheathing steel sheets for Excavation trench
(For Excavation trench beyond 4.5 mt. depth)**

This item is applicable for excavation of trench beyond depth 3.0 mt.
Specifications to be followed as per above item no. 10.

NO.20

➤ **Providing laying and spreading granual material in required proportion so as to have mix material gradation of GSB grade II, including sprenging in uniform thickness, rolling with vibratory roller 80-100 kn static wt. to proper grade and camber including watering etc. complete.**

1.0 GENERAL :

1.1 This item provides for supplying crushed stone aggregates of hard stone 10 to 40 mm size at site of work for providing soling below concrete bedding below pipe line in the pipe trenches. The concrete bedding to be paid separately. The aggregates shall be placed and spread in the pipe trenches in a layer of thickness which on consolidation shall remain 300 mm. The layer so laid shall be uniformly spread in the trench along length, watered and then well consolidated with hand rammers to the satisfaction of the engineer in charge.

1.2 The rate shall be paid per cum of completed work including all labor, tools tackles, watering ramming consolidation etc. complete.

NO: 21

Providing, laying, spreading and compacting graded stone aggregate to Wet Mix Macadam (as per Table 400-10 and 400-11) specification including premixing the material with water at OMC in machanical mix plant as per approved design mix, carriage of mixed material by tipper to site, laying in uniform layers with motor grade/front end loader/ paver finisher in sub base/base course on a well prepared under base and compacting with vibratory roller to achieve the desired density including lighting, gauriding barrication and maintenance of diversion etc. (MoRTH specification: clause 406) By mechanical means.

Mode of measurement : in Cu mtr.

NO: 22

Providing and fixing pre-cast Rubber Dye/steel Dye inter locking concrete block 100 mm thick with grade of concrete M450 pneumatic compressed/vibrated mechanically and as per approved design Confirming to IS 15658: 2006 including 35 mm Sand layer for levelling and filling the joint with sand in proper line and level as per guidlines of IRC SP 63 2018 etc. Complete. IS code 14033/p-171

Mode of measurement : in Sq mtr.

NO.23

➤ **Providing and laying cement concrete 1:3:6(1-Cement: 3 Coarse sand: 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formworking (A) Foundation and Plinth.**

1.0 GENERAL :

- 1.1 This item provides for laying 100 mm thick plain CC 1:3:6 bedding below pipes. The layer shall be provided on the crushed stone aggregate of 300 mm thick in pipe trenches. Soling shall be paid separately under respective item.
- 1.2 Aggregate shall be of inert materials and shall be clean, dense, hard, sound durable, non-absorbent and capable of developing good bond with mortar. Coarse aggregate shall be of hand broken stone or granite or similar stone free from dust dirt and other foreign matters. The stone ballast shall conform to PWD specifications.
- 1.3 Fine aggregate shall be of coarse sand consisting of hard, sharp and angular grains and shall pass through screen of 4.75 mm IS Sieve. Sand shall be of standard specifications, clean and free from dust, dirt and organic matters. Fine aggregate may also be crushed stone.
- 1.4 Ordinary Portland cement of 43 grade as per **IS: 8112** shall be used. It shall have the required tensile and compressive stresses and fineness. Water shall be clean and free from alkaline and acid matters and suitable for drinking purposes.
- 1.5 The proportion of concrete shall be 1:3:6 (Cement: Fine Aggregate: Coarse Aggregate) by volume unless otherwise specified. Minimum compressive strength of concrete of 1:3:6 proportion shall be as per IS: 456 2000 or its latest revision.
- 1.6 Stone aggregate sand and cement shall be mixed as per PWD specifications. All materials shall be dry. If damp sand is used, compensation shall be made by adding additional sand to the extent required for the bulking of damp sand.
- 1.7 Appropriate quantity of water required for cement may be taken 30% by weight of cement plus 5% by weight of total aggregate. For concrete compacted by mechanical vibrations the quantity of water shall be reduced to 20%.

- 2.0 Mixing shall be of machine mixing type. Hand mixing shall not be permitted.
- 2.1 **Machine mixing:** Stone ballast, sand and cement shall be put into the cement concrete mixer to have the required proportion. For concrete of 1:4:8 proportion, first eight boxes of stone ballast, then four boxes of sand and then one bag of cement shall be put into the C.C. Mixer, the machine shall then be resolved to mix materials dry and then water shall be added gradually to the required quantity, 25 to 30 litres per bag of cement to have the required water cement ratio. The volume of measuring box shall be equivalent of volume of one bag of cement The mixing shall be thorough to have a plastic mix of uniform color. It requires 1.5 to 2 minutes rotation for thorough mixing. Mixed concrete shall be unloaded on a masonry platform or on a sheet iron. Output of concrete mixer is 15 to 20 mix per hour.
- 3.0 Regular slump test shall be carried out to control the addition of water and to maintain the required consistency.
- 4.0 Formwork centering and shuttering shall be provided as required, as per standard specifications before laying concrete to continue to support or to keep the concrete in position.
- 5.0 Concrete shall be laid gently (not thrown) in layers not exceeding 15 cm and with mechanical vibrating machine until a dense concrete is obtained. (For important work mechanical vibrating shall be used for thick or mass concrete immersion type vibrators and for thin concrete surface vibrators shall be used for compacting concrete). Over vibration will separate coarse aggregate from concrete and shall be avoided. After removal of the formwork in due time the concrete surface shall be free from honey combing, air holes or any other defect.
- 6.0 Concrete shall be laid continuously, if laying is suspended for rest or for the following day the end shall be shuttered and vibrated to achieve dense concrete and made rough after de-shuttering for further jointing. When the work is resumed, the previous portion shall be roughened, cleaned and watered and a grout of neat cement shall be applied and the fresh concrete shall be laid. For successive layer the upper layer shall be laid before the lower has set.
- 6.1 After about 2 hours laying when concrete has begun to harden, it shall be kept damp by covering with wet gunny bags or wet sand for 24 hours, and then cured by flooding with water, making mud walls 7.5 cm high or by covering with wet sand or earth and kept damp continuously for 15 days. If specified, curing may be done by covering concrete with special type of waterproof paper as to prevent water escaping or evaporating.
- 6.2 Plain cement concrete shall be provided for leveling courses, foundations, plinth and pipe bedding or at other places wherever indicated in the drawings/directed by the Engineer-in-Charge. Grade and thickness of all PCC works shall be as mentioned in the drawings.

- 6.3 The proportion of the concrete, size of the aggregate shall be as specified in the drawings and technical specifications approved by Engineer-in-Charge.
- 6.4 While placing concrete directly on the soil for foundations etc. all the loose material shall be removed. The surfaces shall be trimmed and well consolidated.
- 6.5 The material specifications, mixing, placing of concrete compaction, curing, removal of the form work shall all be done as specified under respective IS The clauses provided therein shall also equally apply for this item of work to the extent relevant.

Note: Code of practice for plain and reinforced concrete with latest amendments (IS: 456-2000) shall be applicable for design and construction of all concrete work.

- 6.6 The rates shall be paid per cum of concrete work including supply of material, labor, tools and plant, water, mixing platforms, curing, supplying, erecting and dismantling of all form works as required.

NO.24

- Providing and casting in situ C.C. in grade M-25 (proportions as per mix design or as per table 9 of IS 456 2000 in masses by weigh batching) using granite, quartzite trap metal of size 6 mm to 20 mm for RCC work, including scaffolding centering, formwork, needle vibrated consolidation, curing complete up to 6 meter depth or height (excluding cost of reinforcement and neat finishing) with centering and shuttering etc. complete for structure other than water retaining (Below G.L)

For RCC road

MATERIALS

- 1.1 Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-5. Grit shall conform to M-6. Graded stone aggregate 20 mm. nominal size shall nearly conform to M-9. Shuttering shall conform to M-19.
- 1.2 The dimensions of scantling and batten of wood shall not be less than assumed in the

design.

2.0 GENERAL

2.1 PROPORTIONING CONCRETE:

2.2 Mix Design [M-30]

The Contractor shall get the concrete mix designed confirming to various design parameters given in these specifications and latest revision of IS:10262 for each grade of concrete mentioned above by a Government approved laboratory. The cost / charge of the MIX DESIGN work shall be borne by the Contractor.

The MIX DESIGN shall be got approved from the Consultant. Volume batching shall be allowed at site. The concrete mix shall be permitted RMC, Digital Mixer Machine. The proportion of cement, sand and coarse aggregates, water and admixtures if any shall be determined by weight. The Contractor shall make arrangements to weigh water by an electronic device at the site.

The Contractor shall follow the following specifications for mix design reinforced cement concrete work.

Proportioning Mix:

The mix of fine and coarse aggregate, cement and water as per the DESIGN MIX shall give the most dense concrete confirming to minimum quantity of cement paste and maximum water cement ratio for binding the materials to give required strength, Water content and the water cement ratio shall give the specified strength with the materials proposed for use in actual work carried out before the work is started, adopting the consistency suitable for the work and method of compaction that will be actually used on site subject to the water cement Ratio as Tabulated separately.

Target strength for M20, M25 and M30 shall be 29.24 N/mm², 35.39 N/mm² and 41.55 N/mm² respectively.

2.3 Test:

Tests shall confirm to the specifications laid down in I.S. 456 – 2000. These tests shall be got done in an approved laboratory at the cost of Contractor.

a) Preliminary tests :

In preliminary test, three separate tests shall be carried out on samples collected from different stacks. Each test shall be carried out with six samples of 15 cm. (About 6") cubes and 3 of these shall be tested at 7 days and 3 at 28 days. In preliminary tests the average crushing strength attained shall be 33 percent higher than that required on work tests.

b) Work test:

For each of the work test, 6 samples shall be prepared from the concrete being used on the site, 3 samples being tested at 7 days and the remaining 3 samples at 28 days. Work tests shall be carried out on each of the first six days and subsequently once in three working days or for every 60 cu.m. of concrete which ever is less and also whenever the quality or grading of the materials is changed. When a relation between the strengths at 7 days and

28 days is established, only 3 samples may be prepared and tested at 7 days only. This number of controlled specimen tests may be increased if the Engineer-in-charge considers it necessary.

2.4 Field Mix :

In the work tests, bulkage of sand due to moisture, if any, should be allowed for different batches according to the moisture actually present at the time of mixing. The moisture will be taken into account in controlling the mixing water also. The proportions once fixed by preliminary tests shall not be changed so long as the materials are the same, subject only to the quantities of fine aggregate and water being adjusted to compensate for bulkage due to the moisture in sand and free water in fine aggregate at the time of use.

No change of materials shall be allowed unless fresh tests with new materials show satisfactory results.

Water and cement content per batch or concrete as determined MIX DESIGN shall be maintained constant except for suitable allowances to be made for surface moisture of the aggregates at the time of actual use. Immediately upon the receipt of the award of the contract, the Contractor shall inform the Engineer-in-charge the exact location of the sources of the acceptable materials which he proposes to use and get approved materials to be used. The CONCRETE MIX shall be got designed in an approved laboratory by the Contractor with minimum water cement ratio to give specified strength in the preliminary tests and the proportions got approved by the Engineer-in-charge in writing. These proportions shall be used so long as the materials contains to be of the same quality and from the same source subject only to slight changes in the relative quantities of fine and coarse aggregates for the purpose of promoting workability provided the works tests require the same. If during the progress of the work, the Contractor wishes to change the materials, the proportion shall be fixed on the basis of fresh MIX DESIGN to give the required strength after the Engineer-in-charge is satisfied that the materials satisfy the specifications. No adjustment of cost shall be made for change of proportions of cement fixed in the original preliminary tests.

2.5 Maximum Water Cement Ratio :

Sr.No	Types of concrete	Mix	Maximum water
		Strength	cement ratio
	Reinforced concrete	(a) M-300	0.45
		(b) M-250	0.5
		(c) M-200	0.55
		(d) M-150	0.60

2.6 Detailed Specifications For Concrete:

[1] Ingredients

1. Cement :

The cement shall be ordinary Portland Cement confirming to IS:269. Under special circumstances other cements may be used with prior approval of Engineer-in-charge. Cement shall conform to M-3

2. Aggregate:

Aggregates shall comply with the requirements of IS:383. Generally aggregates having a nominal size of 20 mm shall be used. Coarse and Fine aggregate shall be weigh batched separately. Sand shall conform to M-5, Grit shall conform to M-6, Graded stone aggregate of design size shall confirm to M-9

3. Water :

Water shall conform to M-1. Water used for mixing and curing shall be as per Clause 5.4 of IS:456-2000.

4. Admixtures:

Admixtures such as plasticizer / super plasticizer shall be used with prior approval of the Engineer-in-charge.

[2] Grades of concrete to be used shall be M10, M15, M20, M25, M30.

Minimum cement content for different grades of concrete shall be as follows :

<u>Grade</u>	<u>Minimum cement content in kg.</u>
M-100	200
M-150	250
M-200	325
M-250	380
M-300	410

[3] All reinforcement shall be free from loose mill scale, loose rust, and coats of paints, oil, mud or other coatings. The Contractor shall get the reinforcement cleaned by using wire brush, rubbing with gunny bags, light acid itching etc. as required.

[4] Workability of concrete shall be as per Clause 6.0 of IS:456.

[5] Durability :

In order to provide / produce durable concrete with low permeability, it must have an adequate cement content and a low water cement ratio. By using strong dense, aggregates, sufficient low water cement ratio, ensuring thorough compaction and sufficient hydration of cement through proper curing methods, a sufficient low permeability is achieved. Therefore cement content shall be sufficient to provide adequate workability with a low water cement ratio so that concrete can be completely compacted with the means available.

The permissible limits of chlorides and sulphate in concrete shall be as per Table 1 of IS-456-2000.

2.7 Concrete Mix Proportioning

The Concrete mix should be so proportioned that when the concrete is hardened it shall be of the required strength, durability and surface finish. For this purpose the Contractor shall establish a well equipped concrete testing laboratory at site. The results of these shall be sent to Consultant for their comments / approval / suggestion for modification of Design Mix.

[1] Strength Requirement of Concrete :

Where ordinary Portland cement conforming to IS:269 or Portland blast furnace cement conforming to IS:455 is used, the compressive strength requirements for various grades of concrete, controlled as well as ordinary shall be as given in Table-1. Where rapid hardening Portland cement is used, the 28 days compressive strength requirement specified in Table-1 shall be met at 7 days. For controlled concrete, the mix shall be so designed as to attain in preliminary tests, a strength at least 33 percent higher than that required on work tests, for concrete mix upto and including M-250 and 25 percent higher for higher strengths. Preliminary tests need not be made in case of "ordinary concrete".

Grade of concrete	TABLE-1 Compressive work strength in Kg/cm ² on 150 mm cubes as per Testing conducted in accordance with IS:516.	
	min.at 7 days	min.at 28 days
M-100	70	100
M-150	100	150
M-200	135	200
M-250	170	250
M-300	200	300
M-350	235	350

Note: In all cases, the 28 days compressive strength specified in Table-1 shall be the criterion for acceptance or rejection of the concrete.

When the strength of a concrete mix as indicated by test, lies in between the strength for any two grades specified in Table-1 such concrete shall be classified for all purpose as concrete belonging to the lower of the two grades between which its strength lies.

Field Test cubes shall be taken as per IS 456 required / or directed by Engineer In Charge. The same shall be tested in approved laboratory & results shall comply with required strength of mix used. The cost of taking cubes and testing shall be included in rates quoted.

[2] Nominal Mix Concrete:

Under special circumstances nominal mix concrete for grades of M20 or lower may be used with prior approval of Engineer-in-charge. Nominal Mix concrete shall be as per Table 9 of IS 456:2000

2.8 Construction Tolerances

(a)	Length	
(i)	Members upto 3 mt length	+ 3mm to -6mm
	3 mt to 4.5 mt length	+ 3mm to -8 mm
	More than 4.5 mt length	+ 3 mm to -10mm
(b)	Cross-Sectional Dimensions	
	Dimensions up to 15 cm	+ 2mm
	Dimensions between 15 cm and 23 cm	+ 3mm
	Dimensions greater than 23 cm	+ 4mm

Straightness : When a straight edge or line is applied to the member it shall not show concavity or convexity exceeding.

For length upto 4.5 mt	4.5 mm
For length between 4.5 mt	6.0 mm
For length exceeding 6 mt	8.0 mm

Shape of Cross Section – No line on the cross section of a member shall deviate from its correct position by an angle exceeding 1 Degree. Vertical members shall not deviate in verticality from its true position by more than 5% of vertical length subject to maximum of 20 mm.

Member which do not confirm to above mentioned constructional tolerances shall be removed and redone or modified / strengthened as per instructions of Engineer-in-charge / Consultant.

2.9 Specifications For Formwork, Centering & Scaffolding

- Materials :
- Formwork shall be in plywood, sawn timber or steel as required for shaft, container walls, stairs, slab, beams, columns, parapets, etc. for all concrete work.
- Workmanship :
- The formwork shall conform to the shape, lines and dimensions as shown on the drawings and shall be so constructed so as to remain sufficiently rigid and water-tight, during placement and compaction of the concrete. Adequate arrangement shall be made by the Contractor to safe guard against any settlements of the formwork during the course of concreting and after concreting.
- Centering :
- The centering, which has been got approved should be sufficiently strong and safe before, during and after pouring concrete and should be so erected that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

- The props of centering shall be provided on firm foundation or base of sufficient strength to carry the loads, without any settlement.
- Scaffolding :
 - All scaffolding, hoisting arrangements and ladders etc, required for facilitating of concrete shall be provided and removed on completion work by Contractor, at his own expense. The scaffolding, hoisting arrangement, ladders etc shall be strong enough to withstand all live, dead and impact loads expected to act. The Contractor shall be solely responsible for the safety of the scaffolding, hoisting arrangement, ladders, work and workmen etc.
- The scaffolding, hoisting arrangement and ladders shall allow easy approach to the work spot and afford easy inspection.
- The rate shall include the grouting of pockets. No extra payment will be made for keeping pockets in R.C.C. and grouting of pockets thereafter.

2.10 MODE OF MEASUREMENT & PAYMENT

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 ---

i] Ends of dis-similar materials such as joints, beams, posts, girders, rafters, purline trusses, corbels and steps etc. up to 500 Sq.Cm. in section.

ii] Opening up to 0.1 Sq.M.

The rate includes cost of all materials labor 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 includes the cost of form work as well as any admixtures added to the concrete.

The rate is applicable to all conditions of working and for all height. The rate shall include the cost of materials and labor for various operations involved such as ---

- a] Splayed edges, notching, allowance for overlaps and passing at angles, battens centering, shuttering, strutting, propping bolting, nailing, wedging, easing striking and removal.
- b] Filleting to form stop chamfered 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 required, removing rubbish etc.

- d] Dressing with oil to prevent adhesion of concrete with shuttering, and
- e] Raking or circular cutting.

The site condition may require R.C.C. work in paints as per schedule. No extra payment will be claimed for this operation schedule.

The rate shall be for a unit of one cubic metre.

IMPORTANT INSTRUCTION TO TENDERER

16.0 IMPORTANT INSTRUCTION TO TENDERER

NAME OF WORK :- **Drainage line Up gradation work at Anjani city society opp. Gyan manjari school to Indraprasthnagar kabir Aashram road, in Kaliyabid ward, Bhavnagar City**

1

Affix latest
passport size
photo of
tenderer

Specimen Signature of the Contractor

2.

1	2	3	4
AFFIX LATEST PASSPORT SIZE PHOTOGRAPH OF ALL PARTNERS IN CASE OF PARTNERSHIP AGENCY			

Specimen signature of all partners incase of partnership agency.

1. _____

Submission of Registered

2. _____

in case of partnership

Agreement is compulsory

3. _____

agency.

4. _____

5. Submission of sale tax certificate, with proof of residence is compulsory for tenderer.
6. In case of Government royalty applicable to tenderer, it is compulsory to submit a receipt of royalty payment with tender.
7. The Photograph and specimen signature of contractor will be cross checked, whenever contractor receives payment in account section of BMC.

8. The specimen signature of contractor will be cross checked by Account Department of BMC, in case of representative of Contractor alongwith letter of authority of a person who signed an agreement, receives payment.
09. In case of octroi applicable to the goods of supplier/tenderer, the tenderer/suppler has to submit an attested copies of Xerox of all octroi receipts.
10. All partners of tenderer should put their specimen signature at the relevant places in the tender. A Passport size photograph of all partners who have signed the tender shall be affixed in the tender. The successful tenderer shall be required to execute necessary agreement where in the same partners shall put on their signatures.

EXECUTIVE ENGINEER,
BHAVNAGAR MUNICIPAL CORPORATION,
BHAVNAGAR.

Signature of the Contractor.

17.0 ADVANCE STAMP RECEIPT

Received with thanks the sum of Rs. _____ (In Words _____) only from the _____ Bhavnagar Municipal Corporation being the refund of Earnest Money Deposit placed by me / us vide BMC's Receipt No. _____ dated _____ alongwith 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 toRs. _____ 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,
BHAVNAGAR MUNICIPAL CORPORATION,
BHAVNAGAR.

F.W.Cs. to EXECUTIVE ENGINEER ,

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 certified 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,
BHAVNAGAR MUNICIPAL CORPORATION,
BHAVNAGAR.

18.0 FORM OF BID SECURITY (BANK GUARANTEE)

WHEREAS, _____ [*Name of Bidder*] (hereinafter called "the Bidder") has submitted his biddated _____ [*Date*] for the construction of _____ [*Name of Contract*] (hereinafter called "the Bid").

KNOW ALL MEN by these presents that We _____ [*Name of Bank*] of _____ [*Name of Country*] having our registered office at _____ (hereinafter called "the Bank") are bound as principal obligator unto _____ [*Name of Employer*] (hereinafter called "the Employer") and unconditionally and irrevocably guarantee the payment to the sum of _____ for which payment well and. truly to be made to the said Employer the Bank binds himself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____ 20____.

THE CONDITIONS of this obligation are:

- (1) If the bidder withdraws his Bid during the period of bid validity specified in the Form of Bid:
or
- (2) If the Bidder refuses to accept the correction of errors in his Bid;
or
- (3) if the Bidder, having been notified of the acceptance of his Bid by the Employer during the period of Bid validity;
 - (a) fails or refuses to execute the Form of Contract Agreement in accordance with the 'Instructions to Bidders, if required; or
 - (b) fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders;

We undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer will note that the amount claimed by it is due to it owing to the occurrence of one or all of the three conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date _____ days after the deadline for submission of bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is

hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE _____

SIGNATURE OF THE BANK

WITNESS _____

SEAL

(Signature, Name, and Address)

19.0 FORM OF CONTRACT AGREEMENT

AGREEMENT

THIS AGREEMENT made the _____ day of _____ 20____
between

of _____ (hereinaft
er called "the Employer") of the one part and _____ of

(hereinafter called "the Contractor" of the other part.

WHEREAS the Employer is desirous that certain Works should be executed by the Contractor,
viz.,

and has accepted a Bid by the Contractor for the execution and completion of such Works and
the remedying of any defects therein at a cost of
Rs. _____
and _____.

NOW THIS AGREEMENT WITNESSETH as follows:

In this Agreement, words and expressions shall have the same meanings as are respectively
assigned to them in the Conditions of Contract hereinafter referred to.

The following documents shall be deemed to form and be read and construed as part of this
Agreement, viz:

- a) The Contract Agreement;
- b) The Letter of Acceptance;
- c) The Employer's Requirements;
- d) The Bid;
- e) The Conditions of Contract - G.C. etc.
- f) The Conditions of Contract - I.T. etc.
- g) Special Conditions of Contract
- h) The Specifications;
- i) The Bid Drawings;
- j) The Schedules; and
- k) The Contractor's Proposal
- l) Standing Committee Resolution
- m) All amendment, Addendum, Errata
- n) Minutes of Pre-bid meeting

In consideration of the payments to be made by the Employer to the Contractor as
hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and
complete the Works and remedy any defects therein in conformity in all respects with the
provisions of the Contract.

The Employer hereby covenants to pay the Contractor in consideration of the execution and
completion of the Work and the remedying of defects therein the Contract Price or such other

sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed the day and year first before written.

The Common Seal of _____
_____ was
hereunto affixed in the presence of:

_____ or _____

Signed, sealed, and delivered by the said _____
in the presence of: _____

Binding Signature of Employer _____

Binding Signature of Contractor _____

20.0 FORM OF PERFORMANCE SECURITY (BANK GUARANTEE)

To: _____ (name of Employer)

_____ (address of Employer)

WHEREAS _____ (name and address of Contractor) (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ (name of Contract and brief description of Works) (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such as Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you as principal obligator, on behalf of the Contractor, un conditionally and irrevocably guarantee the payment of an amount to total of _____ (amount of Guarantee)

_____ (amount in words), such sum being payable in the types and proportions- of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ (amount of Guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the date of issue of the performance certificate.

SIGNATURE AND SEAL OF THE GUARANTOR

Name of Bank _____

Address _____

Date _____