

S. No.	Details of Materials / Equipments	Manufacturer's Name
1	G.I./M.S pipes.	Jindal Hissar, Tata or equivalent
2	G.I. pipes fittings.	Unik or equivalent
3	G.M. / Forged brass valves	Zoloto / Leader or equivalent
4	Sluice Valves, Non return valve	Kirloskar , Micon, Weir BDK, Advanced or equivalent
5	Valves	Kartar/Zoloto/Leader /C& R/Advance or equivalent
6	'Y' strainer	Emerald Enterprises / Zoloto or equivalent
7	Level Controller & Indicator (Water)	Technika / Minilec or equivalent
8	Paints	Asian Paints
9	Pressure Gauge	H Guru. Gauges Bourdon, GIC or equivalent
10	Flexible Rubber Expansion Joint	Kanwal Easyflex, Resistoflex or equivalent
11	Pumps	Kirloskar, Sam Turbo, KSB, Kishor, Grundfos, Johnson or equivalent
12	Fire Fighting Equipments	Minimax, Newage or equivalent
13	Welding Rods	Advani/Victor or equivalent
14	GI Hangers	Chilly/GMGR or equivalent
15	Rubber hose pipe	Deep Jyoti or equivalent
16	Underground Pipe Protection	IWC or equivalent
17	UPVC/ PVC Pipes	Supreme, Jindal, Jain Pipes, Ori Plast or as Approved or equivalent
18	HDPE Pipe	Supreme, Jain Pipe, Apollo or equivalent
19	RCC Pipes	Hindusthan Hume Pipe or equivalent
20	Ball Valves	Audco, Zoloto or equivalent
21	Ball Cocks	Audco, Zoloto or equivalent
22	CI Manhole Cover	Necco or equivalent
23	PVC Tanks	Sintex or equivalent
24	Air Valve	Indian, Amatic or equivalent
25	Ductile Iron Pipes	Electrosteel or equivalent
26	CPVC Pipes & fittings	Astral, Fowguard, George Fischer or equivalent

** equivalent makes to be approved by Client/Engineer-in-charge prior to installation*

SL. NO.	ITEM	MAKE
15	FLOAT GLASS	MODI GUARD, SAINT GOBAIN, ASAHI, ATUL
16	CERAMIC TILES	NITCO, KAJARIA, SOMANY, JOHNSON, SUNHEART, VARMORA
17	VITRIFIED PORCELAIN TILES	NAVEEN DIAMOND TILES, NITCO, JOHNSON, MARBITO BRAND, RAK, KAJARIA, VARMORA, CT TILES
18	INTERLOCK TILES/GRASS PAVER BLOCKS/ KERB STONE	DALAL TILES, UNISTONE, MODERN OR EQUIVALENT
19	TERRAZZO TILES	NITCO, MODERN, A-1, NTC, DALAL TILES OR EQUIVALENT AS PER ISI SPECIFICATION
20	CEMENT CONCRETE TILES	UNISTONE, ULTRA, DALAL TILES OR EQUIVALENT
a)		
b)	HANDMADE CERAMIC TILES	RAJA, ARIHANT, JAIN
21	ROOF WATER PROOFING	NINA CONCRETE SYSTEM PVT. LTD, C R S ASSOCIATES AND ENGINEERS PVT.LTD, CREATIONS,PIDILITE
22	PAINT	NEROLAC, JOHNSON & NICHOLSON, BERGER, ASIAN PAINTS, SHALIMAR
23	TEXTURED COATING	UNITILE, SPECTRUM, HERITAGE OR EQUIVALENT
24	DOOR FITTINGS	GODREJ, DOORSET, OZONE, INDOBRASS
25	LOCKS AND HANDLES	EVERITE, GODREJ, HARRISON, INDOBRASS
26	NON METALLIC HARDENER COMPOUND	FOSROC, S TP, PIDILITE, CICO
27	ROLLING SHUTTER	RAMA, PRAKASH, SANJEEV OR EQUIVALENT AS PER CPWD SPECIFICATIONS.
28	DOOR CLOSER	DOORSET, EVERITE, GARNISH, INDOBRASS
29	FLOOR DOOR SPRING	D-LINE,OZONE,DOORSET,EVERITE,INDOBRASS
30	HDF LAMINATED BOARD	ARMSTRONG, BVG, EGO FLOORS, SQUARE FOOT, ACTION TESA
31	EXPANSION FASTENERS	HILTI, FIHSER, GKW, AXEL
32	FASTENERS	HILTI, FIHSER, GKW, AXEL
33	GYPSUM CEILING	INDIA GYPSUM, LAFARGE
34	CALCIUM SILICATE BOARD FALSE CEILING	AEROLITE, HYLUX
35	PATCH FITTING	DORMA, GEZE, OZONE OR AS APPROVED
36	WORK STATION AND MODULAR FURNITURE	GODREJ, BP ERGO, FEATHERLIGHT, WIPRO
37	BLINDS	VISTA, MAX, ARMSTRONG
38	ADHESIVE	FEVICOL, VEMICOL OR EQUIVALENT
39	FURNITURE HARDWARE	UNIQUE, HATTICH INDIA, EBCO, EARL BEHARI.
40	LACQUERED GLASS	SAINTE GOBIN, ASAHI, ATUL
41	MELAMINE POLISH	ASIAN PAINT, BERGER, SHALIMAR

ELECTRICAL WORKS LIST OF APPROVED MAKES		
1	Switch Fuse Unit (HRC Type)	Schnider/GE/L&T/Siemens/C&S/Havells/MDS
2	MCB's, MCCBs, RCCBs, ELCB's & MCB DBs	Legrand / ABB / L&T /Siemens / Havells / C&S / Schneider / GE / Hagger / Anchor / Standard / Action
3	LT XLPE Aluminium Armoured cables upto 1100v	Plaza/Skytone/ National/Ralison/PYTEX/Paragon/KEI
4	HT XLPE Aluminium Armoured cables upto 11000V	Skytone/ National/INCAB/ Nicco
5	Air Circuit Breakers	Schneider/ GE /L & T/Siemens
6	Terminals	Elmex /Technoplast
7	Lugs	Dowells/ Ismal
8	Glands	Gripwell/ Comet
9	Indicating lamps	L &T/ Siemens/Technique
10	Power factor correction relay	Syntron/ Avomec/Sigma
11	Indicating Instruments	Automatic Electric/ Rishab
12	KWH Meters	L&T/HPL SOCOMEC
13	Current Transformers	Automatic Electric/ Kappa
14	Selector Switches	Salzer-L&T/ Kaycee
15	Change over switches	HH Elecon/HPL
16	11 KV VCB/RMU Panel	Crompton/ABB/Siemens/Areva
17	Power Transformers	Crompton/ Kirloskar/ABB/Siemens
18	HT Jointing Kits	Raychem/ Mahindra/Denson/Cabseal
19	DG Sets- Engine.	Kirloskar/Cummins/Caterpillar/Mitsubishi
20	Alternator	Kirloskar /Stamford./Crompton/Mitsubishi
21	LT Panels, Fiddler Pillars etc.	Ambit, Trikolite/KEPL/Madhu elect./SPC/ Amptech/ USHA Power/Precision System Control
22	Power Capacitors	Crompton/Siemens Apcos/Khatou
23	HRC Fuse Base & HRC Fuses	L&T/GE/Schneider/HPL
24	Sound Proof Acoustic Enclosures	DG suppliers
25	Lighting Fittings & Luminaries	Crompton/Philips/Wipro/BAJAJ/Havell's
26	PVC insulated 1.1KV grade copper wires	Plaza/Pytex/National/Ralison/RKG/Finolex/Polycb / Batra-Henlay/Havells
27	Piano/Modular Type Sockets & Switches	Roma(Anchor)/Legrand/MK/Crabtree/ Philips/ Clipsal/North West
28	Steel/PVC Conduit	BEC/AKG/ATUL/STEEL KRAFT/RKG
29	Ceiling/Wall/Exhaust fans	Crompton /Almonard /Bajaj/Usha/Orient
30	External lights	Bajaj/ Philips/ Decon/K-Lite/Metal Coat

QAP for Civil Works, Check Lists & Formats

Pre- Concrete Check List

Structure No.
Location
Source of Concrete

Date & Time of Concrete
Grade of Concrete
Brand of Cement

Sr. No	Description	Approved		Observations & Remarks
		Yes	No	
1	ALIGNMENT / LEVEL CHECK			
2	GENERAL CLEANLINESS			
3	FORM WORK			
	a) Shutters- Smooth & Cleaned Surface			
	b) Application of Mould Oil			
	c) The roads, Supports / Props provided			
4	REINFORCEMENT CHECKING			
	a) Size (as per drawing)			
	b) Spacing (As per drawing)			
	c) Starter Bar			
	d) Lapping of bars			
5	CEMENT			
	a) Weight of cement per cum			
	b) Theoretical cement consumption			
	c) Actual cement consumption			
6	REINFORCEMENT COVER			
7	WEEP HOLES PROVIDED			
	a) Not Required			
	b) Not Provided			
8	CONSTRUCTION JOINT REQUIRED			
9	EQUIPMENT VERIFICATION			
	a) No of needle vibrators deployed			
10	CONCRETE PLACEMENT ARRANGEMENT			
	A) Using Pump			
	a) Joint / Fixing Checked			
	B) Direct			
	a) Platform placed			
	b) clean chute provided			
	c) proper gradient provided			
11	CONCRETE VOLUME REQUIRED			
12	NO. OF CUBES CASTED			
13	RFI SUBMITTED TO QA/ QC			
14	PROPER ACCESS ROAD PROVIDED			
15	LIGHTING ARRANGEMENT FOR NIGHT WORKING			
	a) No of spot lights provided			
16	CURING ARRANGEMENT			
17	SAFETY REQUIREMENTS			

	a) Proper Barricading done			
	b) Cautionary sign boards provided			
	c) Lights & Genset Arrangement for night works			
	d) First Aid Box			
18	MISC			
	a) Supervisors			
	b) Labours			

Contractor Representative

Consultant Representative

NAME OF PROJECT _____

CONTRACTOR _____ CONTRACT NO. _____	CHECK LIST FOR CONCRETING REF DRAWING NO _____ LOCATION BLOCK _____ FLOOR _____ AREA _____											
LAYOUT STAGING/ SCAFFOLDING FORMWORK REINFORCEMENT PRE-CONCRETING POST-CONCRETING DESHUTTERING & CLEARING	<input type="checkbox"/> Alignment Checked <input type="checkbox"/> Adequacy & rigidity of Props, stays, bracings, Conformity to scheme drawings Qty of forms and support Props adequate <input type="checkbox"/> Cutting & bending as per Bar bending schedule (schedules attached) <input type="checkbox"/> Dowels & positioning Provided as per drg. <input type="checkbox"/> Concreting Arrangements <input type="checkbox"/> Compaction Checked <input type="checkbox"/> Curing days----- Water/compound	<input type="checkbox"/> Level of base Checked <input type="checkbox"/> Vertical form surface in alignment & plumb <input type="checkbox"/> Adequate laps Welds <input type="checkbox"/> Walkway for Labour provided <input type="checkbox"/> Approval of Construction joint <input type="checkbox"/> Removal of laitance <input type="checkbox"/> Surface finish OK	<input type="checkbox"/> Dimensional Check (edges & diagonals) <input type="checkbox"/> Even surface Oil sprayed <input type="checkbox"/> Chair/cover blocks Placed as per scheme <input type="checkbox"/> Mixer/vibrator Condition & mixing <input type="checkbox"/> Post concreting Level/dimensions. <input type="checkbox"/> Concrete Test Results OK	<input type="checkbox"/> Starters <input type="checkbox"/> Gaps shuttering are Properly closed. between <input type="checkbox"/> Binding wire not Touching shuttering <input type="checkbox"/> Top level of Concrete marked <input type="checkbox"/> Nos of cubes cast	<input type="checkbox"/> Location of cu-outs & services <input type="checkbox"/> No space for sagging of Form work <input type="checkbox"/> Fixtures, inserts Conduits in position <input type="checkbox"/> Transporting & Placeing arrangement							
						<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:50%;">W.O. Item</th> <th style="width:20%;">UNIT</th> <th style="width:30%;">QTY.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	W.O. Item	UNIT	QTY.			
W.O. Item	UNIT	QTY.										
SIGNATURE: _____		DATE _____	SITE ENGR _____	DATE _____	SITE INCHARGE _____	DATE _____	CONSULTANT _____	DATE _____				

NAME OF PROJECT _____

CONTRACTOR		CHECK LIST FOR MASONRY WORK						
CONTRACT NO.		REF DRAWING _____		LOCATION BLOCK _____		FLOOR _____ AREA _____		
LAYOUT	<input type="checkbox"/> Alignment & wall <input type="checkbox"/> Thickness checked	<input type="checkbox"/> Brick on edge <input type="checkbox"/> (top course)						
SCAFFOLDING	<input type="checkbox"/> Adequacy of props, <input type="checkbox"/> Stays, platform	<input type="checkbox"/> Rigidity of base	<input type="checkbox"/> Movement space	<input type="checkbox"/> Approach to <input type="checkbox"/> height				
PRE-LAYING	<input type="checkbox"/> Working arrangements & service provisions <input type="checkbox"/> checked	<input type="checkbox"/> Bricks as specification	per	<input type="checkbox"/> Mortar grade & mix <input type="checkbox"/> As specified	<input type="checkbox"/> Bricks moistened			
LAYING	<input type="checkbox"/> Joint thickness & course Ht. As specified	<input type="checkbox"/> Joint alignment <input type="checkbox"/> Checked	<input type="checkbox"/> Vertical joints Properly mortar filled from top					
CURING AND CLEARING	<input type="checkbox"/> Raking of joints <input type="checkbox"/> Done (if applicable)	<input type="checkbox"/> Bearing plaster for Concrete						
	<input type="checkbox"/> Proper curing of const. <input type="checkbox"/> Joint.	<input type="checkbox"/> Scaffolding removed <input type="checkbox"/> (if required)						
						W.O. Item	UNIT	QTY.
SIGNATURE:								
CONTRACTOR	DATE	SITE ENGR	DATE	SITE INCHARGE	DATE	CONSULTANT	DATE	

NAME OF PROJECT _____

CONTRACTOR		CHECK LIST FOR PLASTERING WORK						
CONTRACT NO.		LOCATION BLOCK _____		FLOOR _____		AREA _____		
SCAFFOLDING	<input type="checkbox"/> Platform	<input type="checkbox"/> Stability	<input type="checkbox"/> Movement space	<input type="checkbox"/> Approach to <input type="checkbox"/> Height				
SERVICE	<input type="checkbox"/> All chasing work <input type="checkbox"/> Complete	<input type="checkbox"/> Fixing in position <input type="checkbox"/> Using clamps etc.	<input type="checkbox"/> Patching <input type="checkbox"/> Work complete	<input type="checkbox"/> All door/window frames <input type="checkbox"/> Fixed in position	<input type="checkbox"/> Skirting to floors marked			
						CLEARANCE FROM AE (E)		
SURFACE PREPARATION	<input type="checkbox"/> Clearing & raking of <input type="checkbox"/> Surface	<input type="checkbox"/> Roughening <input type="checkbox"/> Hacking done	<input type="checkbox"/> Fixing metal/lathe <input type="checkbox"/> Chicken mesh	<input type="checkbox"/> Mortar level <input type="checkbox"/> Guides made	<input type="checkbox"/> Surface moistened/ <input type="checkbox"/> Cement slurry			
PLASTERING	<input type="checkbox"/> Mix & w/p compound <input type="checkbox"/> Checked as per specification	<input type="checkbox"/> Coating/thickness <input type="checkbox"/> As specified	<input type="checkbox"/> Groove at joints <input type="checkbox"/> Provided	<input type="checkbox"/> Corners & edges sharp & at right Angles lines & levels maintained	<input type="checkbox"/> Surface leveled with <input type="checkbox"/> At straight edge			
FINISHING	<input type="checkbox"/> Texture	<input type="checkbox"/> Curing <input type="checkbox"/> Days-----	<input type="checkbox"/> Site cleared	<input type="checkbox"/>	<input type="checkbox"/>			
						W.O. Item	UNIT	QTY.
SIGNATURE:								
CONTRACTOR	DATE	SITE ENGR	DATE	SITE INCHARGE	DATE	CONSULTANT	DATE	

NAME OF PROJECT _____

CONTRACTOR		CHECK LIST FOR LAYING OF EXTERNA SEWER						
CONTRACT NO.		REF DRAWING NO _____						
		LOCATION _____						
Excavation	<input type="checkbox"/> Layout	<input type="checkbox"/> Slope/cutting as per Specifications	<input type="checkbox"/> Level					
Laying /RCC pipes	<input type="checkbox"/> Bed concrete as per Specifications	<input type="checkbox"/> RCC pipes as per Requirement	<input type="checkbox"/> Jointing of pipes					
	<input type="checkbox"/> Boxing	<input type="checkbox"/> Strata bore Dewatering (wherever required)						
Manholes	<input type="checkbox"/> Bricks as per specifications	<input type="checkbox"/> Mortar as per specifications	<input type="checkbox"/> Plastering					
	<input type="checkbox"/> End of pipes plugged							
Back fillings	<input type="checkbox"/> In layers							
						W.O. Item	UNIT	QTY.
SIGNATURE:								
CONTRACTOR	DATE	SITE ENGR	DATE	SITE INCHARGE	DATE	CONSULTANT	DATE	

NAME OF PROJECT _____

CONTRACTOR		CHECK LIST FOR SUB GRADE						
CONTRACT NO.		LOCATION _____						
		FLOOR NO. _____						
LAYOUT	<input type="checkbox"/> Alignment of center line as drawings	<input type="checkbox"/> Marking of carriage way edges as per drawing						
SUB GRADE PREPARATION	<input type="checkbox"/> Initial cross sectional levels recorded	<input type="checkbox"/> Cleaning & grubbing of vegetation and top soil as specified	<input type="checkbox"/> Watering & rolling as specified	<input type="checkbox"/> Cross section levels recorded after rolling				
	FORMATION LEVEL (FILLING)	<input type="checkbox"/> Depth of filling upto formation Level _____mtr.	<input type="checkbox"/> Nos of layers upto formation level _____	<input type="checkbox"/> Fill material	<input type="checkbox"/> Spreading, watering & rolling of layers on layer no.			
<input type="checkbox"/> % compaction of soil (Proctor test)		<input type="checkbox"/> Camber/slope Provided as drawing	<input type="checkbox"/> Formation cross sectional levels recorded					
						W.O. Item	UNIT	QTY.
SIGNATURE:								
CONTRACTOR	DATE	SITE ENGR	DATE	SITE INCHARGE	DATE	CONSULTANT	DATE	

LIST OF MANDATORY TESTS

S. No.	Description of Material	Test	Reference of IS Code / Specification for testing	Field / Laboratory test	Frequency of testing
1	Cement	Physical & chemical properties	IS : 4031	Lab	Initial Test-01 test for each brand of cement. Subsequently, 01 test for 200 MT or part thereof for each brand. Cement should be of approved brand and each lot should be accompanied by manufacturer's test certificates
2	Reinforcement steel	Physical & chemical properties	IS :1786	Lab	Initial Test-01 test for each brand and each dia of reinforcement steel , Subsequently - One test for every 35 MT or part thereof. Reinforcement Steel should be of approved brand and each lot should be accompanied by manufacturer's test certificates
3	Water	PH value, chlorides, sulphates, alkalinity test, acidity test, suspended matter, organic matter and inorganic matter	IS:3025	Lab	Initial Test- Source approval at commencement of work and Subsequently- every six months or change of source.
4	Coarse Aggregate - Building works	Gradation	IS 2386 – I	Field / Lab	Minimum one test for every 50 cum or part thereof.
		Deleterious material	IS 2386 - II	Field / Lab	
		Specific Gravity	IS 2386 - III	Field / Lab	
		Crushing value	IS 2386 - IV	Field / Lab	
		impact value	IS 2386 - IV	Field / Lab	
		10% fine value	IS 2386 - IV	Field / Lab	
5	Fine Aggregate- Building works	Organic impurities	Appendix 'A 'of chapter 3 ,CPWD Specifications	Field	Minimum one test for every 50 cum or part thereof.
		Silt content	Appendix ' C 'of chapter 3 ,CPWD Specifications	Field	
		Bulking of Sand	Appendix 'D 'of chapter 3 ,CPWD Specifications	Field	
		Gradation	Appendix 'B 'of chapter 3 ,CPWD Specifications	Field / Lab	

6	Coarse Aggregate - Road , Pavement works	Gradation	IS 2386 – I	Field / Lab	One test for everyday's work.
		Flakiness and Elongation Index	IS 2386 – I	Field / Lab	Once for each source of supply and subsequently on monthly basis.
		Deleterious material	IS 2386 - II	Lab	One test for everyday's work.
		Water Absorption	IS 2386 - III	Lab	Regularly as required subject to a minimum one test a day. This data shall be used for correcting the water demand of mix on a daily basis
		Los Angeles Abrasion Value/Aggregate Impact value	IS 2386 - IV	Lab	Once for each source of supply and subsequently on monthly basis
		Soundness	IS 2386 - V	Lab	Before approving the aggregates and every month subsequently.
		Alkali aggregate reactivity	IS 2386 - VII, IS:456	Lab	Before approving the aggregates and every month subsequently.
7	Fine Aggregate - Road , Pavement works	Gradation	IS 2386 – I	Field / Lab	One test for everyday's work.
		Deleterious material	IS 2386 - II	Lab	One test for everyday's work.
		Water Absorption	IS 2386 - III	Lab	Regularly as required subject to minimum two test per day. This data shall be used for correcting the water demand of mix on a daily basis.
		Silt Content	Appendix 'C' of chapter 3 ,CPWD Specifications	Field	Minimum one test for everyday's work.
8	Slump Test - Building Works		Appendix 'D' of Chapter 4, CPWD Specifications	Field	Minimum one test for every 20 cum of concrete or part thereof
9	Slump Test - Pavement Works		IS 1199	Field	One test per each dumper load at both Batching plant site and paving site initially when work starts. Subsequently, sampling may be done from alternate dumper.
10	Cube Test				
(i)	Reinforced Cement Concrete - Building works	7 days and 28 days Compressive strength	IS 516	Lab	One sample of six cubes for every 50 cum or part thereof
(ii)	Dry Lean Concrete (DLC) - Pavement Work	7 days compressive strength	IS 516	Lab	One sample of five cubes for every 150 cum or part thereof
(iii)	Pavement Quality Concrete (PQC) - Pavement Work	Compressive strength, flexure strength	IS 516	Lab	2 cube set samples and 2 beam set samples per 150 cum or part thereof for each day production.
11	Earthwork				
		Gradation/clay & sand content	IS 2720 -IV	Lab	2 tests per 3000 cum or part thereof for each source.
		Atterberg's limit	IS: 2720-V	Lab	
		California Bearing Ratio	IS 2720-XVI	Lab	

		Maximum dry density / OMC	IS 2720-VIII	Lab	
		Deleterious content	IS: 2720-XXVII	Lab	
		Free swelling Index	IS: 2720-XXXX	Lab	As and when required by Engineer
		Field density	IS: 2720-XXVIII	Field	(a) One set of 10 measurements for each layer per 3000 sqm of compacted area for embankment (b) One set of 10 measurements for each layer per 2000 sqm of compacted area of shoulder and sub-grade.
		Moisture content	IS: 2720-II	Field	2 tests per 1000 cum
12	Granular Sub base				
		Gradation	IS 2386- I	Field / Lab	Minimum 01 test per source and additional test after every 1000 cum
		Water absorption	IS 2386- III	Lab	Minimum 01 test per source and additional test as required by Engineer
		Wet Aggregate Impact Value test (if WA >2.0%)	IS 5640	Lab	As required by Engineer
		Aggregate Impact Value	IS 2386- IV	Lab	Minimum 01 test per source and additional test after every 2000 cum
		Atterberg's limit	IS 2720-V	Lab	Minimum 01 test per source and additional test after every 1000 cum
		Maximum dry density /OMC	IS 2720-VIII	Lab	Minimum 01 test per source and additional test as required by Engineer
		Moisture content prior to compaction	IS 2720-II	Field	Minimum 01 test every 400 cum
		Field Density	IS 2720-XXVIII	Field	one test per 2000 Sqm or part thereof
		Deleterious material	IS: 2720-XXVII	Lab	Minimum 01 test per source and additional test as required by Engineer
		CBR	IS 2720-XVI	Lab	Minimum 01 test per source and additional test as required by Engineer
13	Water Bound Macadam				
		Gradation	IS 2386- I	Field / Lab	Minimum 01 test per source and additional test after every 500 cum
		Aggregate Impact Value	IS 2386- IV or IS5640	Lab	Minimum 01 test per source and additional test after every 500 cum
		Combined Flakiness and Elongation Indices	IS 2386- I	Lab	Minimum 01 test per source and additional test after every 500 cum
		Atterberg's Limit (Screening, Binding Material)	IS 2720-V	Lab	Minimum 01 test per source and additional test after every 500 cum or part thereof
		Water absorption	IS 2386-III	Lab	Minimum 01 test per source and additional test as required by Engineer
		Sulphur Content, Water Absorption, Chemical Stability, Density for Crushed Slag (if used)	To comply with requirements of Appendix of BS : 1047	Lab	As required by Engineer
		Soundness test (if WA >2.0%)	IS 2386-V	Lab	As required by Engineer
14	Wet Mix				
		Gradation	IS 2386 – I	Field / Lab	Minimum 01 test per source and

	Macadam				additional test after every 500 cum
		Water Absorption	IS 2386-III	Lab	Minimum 01 test per source and additional test as required by Engineer
		Soundness (if WA > 2.0%)	IS 2386-V	Lab	As required by Engineer
		Atterberg's limit of portion of aggregate passing 425 micron sieve	IS 2720 - V	Lab	Minimum 01 test per source and additional test after every 500 cum or part thereof
		Aggregate Impact value	IS 2386- IV or IS 5640	Lab	Minimum 01 test per source and additional test after every 500 cum
		Maximum Dry Density / OMC	IS 2720 - VIII	Lab	Minimum 01 test per source and additional test as required by Engineer
		Combined Flakiness and Elongation Indices	IS 2386 – I	Lab	Minimum 01 test per source and additional test after every 500 cum
		Moisture content	IS 2720-II	Field	Minimum 03 tests per day
		Field Density	IS 2720 – XXVIII	Field	One set of three test per 2000 sqm or part thereof
15	Prime /Tack Coat				
		Quality of Binder	IS 73, IS 217, IS 8887	Lab	No. of samples per lot and tests as per IS 73, IS 217, IS 8887as applicable
		Binder Temperature for Application	As per MORTH specifications	Field	At regular close interval
		Rate of Spread of Binder	As per MORTH specifications	Field	Minimum 03 tests per day
16	Dense Bituminous Macadam / Bituminous Concrete				
		Mix grading	IS 2386- I	Lab	One set for individual constituent and mixed aggregates from dryer for each 400 tonnes of mix subject to a minimum of two tests per day per plant
		Plasticity Index	IS 2720-V	Lab	One test for each source and whenever there is change in the quality of aggregate.
		water absorption	IS 2386-III	Lab	One test for each source and whenever there is change in the quality of aggregate.
		Soundness (if WA>2%)	IS 2386-V	Lab	One test for each source and whenever there is change in the quality of aggregate
		Impact value / Abrasion value	IS 2386-IV	Lab	One test per 350 cum of aggregates for each source and whenever there is change in the quality of aggregates
		Combined flakiness and elongation Indices	IS 2386- I	Lab	One test per 350 cum of aggregates for each source and whenever there is change in the quality of aggregates
		Stripping value	IS 6241	Lab	Initially one set of 3 aggregate representative specimen and then for each change in quality of aggregate
		Stability and Void Analysis of Mix	ASTM: D-1559	Lab	Three tests for stability, flow value, density and void contents for each 400 tonnes of mix subject to minimum of two tests per day per plant

		Retained Tensile test (if retained Coating <95%) / Moisture Susceptibility Mix	AASHTO T283	Lab	one test for each mix type whenever there is change in quality or source of coarse or fine aggregate
		Binder Content	IRC: SP 11 Appendix 5	Field	Minimum 2 tests per day
		Field Density	IRC: SP 11 Appendix 5	Field	One test per 700 sqm
		Quality of Binder	IS 1201 to IS 1220	Lab	number of samples per lot (as in IS 73) and tests as per IS 73
		Temp Control at the time of laying and compaction		Field	At regular interval
17	Brick work / brick tiles / sewer brick/Burnt clay perforated building Bricks				
		Dimension	Appendix A, B, C & D of Chapter 6 of CPWD Specifications	Lab	Minimum one test for every 50000 bricks or part thereof
		Compressive strength		Lab	
		Water Absorption		Lab	
		Efflorescence		Lab	
18	Stone work				
		Water absorption	IS 1124	Lab	Minimum one test for every 200 sqm / 100 cum or part thereof
		Transverse Strength	IS 1121 - II		
		Resistance to wear	IS 1706		
		Durability	IS 1126		
19	Marble				
		Moisture absorption	IS 1124	Lab	Minimum one test for every 100 sqm or part thereof
		Hardness test	Mho's Scale		
		Specific Gravity	IS 1122		
20	Granite				
		Moisture	IS 1124	Lab	Minimum one test for every 100 sqm or part thereof
		Specific Gravity	IS 1122		
21	Structural Steel (other than PEB)				
		Tensile strength	IS 1599	Lab	Minimum one test for every 20 tonnes or part thereof per source and also manufacturer's test certificates for each consignment should be accompanied.
		Bend Test			
22	Steel Tubular pipes				
		Tensile test	IS 1608	Lab	Minimum one test for every 8 tonne or

		Bend Test	IS 2329		part thereof per source and also manufacturer's test certificates for each consignment should be accompanied.
		Flattening Test	IS 2328		
23	M 50 Grade Cement Concrete Paver Blocks				
(i)	M-50 Grade Pre-Cast Concrete Paving Blocks	Compressive Strength	As per Technical Specifications	Field / Lab	a) 16 paving blocks for everyday production. If, however, the average strength of the first 04 blocks tested is not less than 54 N/sqm, the sample shall be deemed to comply and the remaining 12 blocks from the sample need not be tested. b) If blocks are procured from outside and not manufactured at project site 01(one) test of 16 blocks per 10,000 nos. paving blocks or part thereof
		Dimensions	As per Technical Specifications	Field / Lab	a)16 paving blocks for everyday production b) If blocks are procured from outside and not manufactured at project site 01(one) test of 16 paving blocks per 10,000 nos. paving blocks or part thereof
(ii)	Sand for Bedding Layer				
		Percentage of Deleterious material	IS 2386	Lab	Minimum one test for every 50 cum or part thereof
		Particle Size Distribution	As per Technical specification	Field / Lab	
		Silt Content	As per Appendix 'C' of Chapter 3 of CPWD Specifications	Field	
		Moisture Content	IS 2720	Field	
(iii)	Sand for Joint Filling	Particle Size Distribution	As per Technical specification	Field / Lab	Minimum one test for every 50 cum or part thereof
Note:-	For items not covered above may be dealt with as per the technical specifications in the contract.				

1. Site Order Book

Date	Instructions issued on the Inspection of work with Signature and designation	Contractor / contractor's representative acknowledgement with Signature, Name & Date	Compliance report by contractor / contractor's representative with Signature, Name & date	Final remarks Engineer with S designation
2	3	4	5	6

2. Hindrance Register

Sl. No.	Nature of Hindrance	Date of Occurrence	Date of clearance	Period	Overlapping period if any	Weight age of hindrance	Net effective days of hindrance	Remarks and references	Sign. of Site Engineer with date	Contractor / contractor's representative Signature with Name & date
1	2	3	4	5	6	7	8	9	10	11

3. Drawing Register

Sl. No	Drg. No. and revision no. if any	Date of receipt	Details of DRG	Date of Issue to Contractor	Acknowledgement of contractor	Signature of Site Engineer with date
1	2	3	4	5	6	7

4 Cement Register

Sl. No.	Date of Receipt	Source of Receipt	Bill/Challan no.	Manufacturer Test Certificate reference	Quantity Received (bags)	Progressive Total of Receipts (Bags)	Date of Issue	Qty. Issued (Bags)	Qty. Returned at the end of the Day (Bags)	Net Qty issued (Bags)	Progressive Total of issue (Bags)

5 Steel Register

Sl. No	Date of Receipt	Source of Receipt & Ch. No. /Bill No.	Qty Received (MT)	Cum Qty Received (MT)	Date of Issue	Qty issued (MT)	Cumulative qty issued (MT)	Balance at the end of the Day (MT)	Item work wh con

9. Cube Test

Sl. No.	Date of Collection	Grade of Mix	Mark of Specimen	7 days Test Result				28 days Test Result				Required specified strength	Approx. qty represented by	Item of work from where the	Sign. Of Site Engineer with date	Contractor / contractor's representative Signature with Name & date
				Date of Testing	Load in KN	Compressive strength (KN / mm2)	Average compressive strength (KN / mm2)	Date of Testing	Load in KN	Compressive strength(KN / mm2)	Average compressive strength (KN / mm2)					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

10. Density Test by Core Cutter Method

MDD as per lab test W5.....

14 Inspection Register

Sl. No	Date and time	Officer's Name and designation	Items inspected and specific defects noticed & action to be taken	Signature	Defects taken to Site Order Book/letter written			Final action / result
					Site Order Book Page no. / letter no.	Date	Sign. of Site Engineer / PMC	

Bill Performa

Name of work :

LOI No.

Name of Contractor :

Date of Start :

Date of Preparation of Bill :

S N	Item No.	Descript ion of Items	Unit	Qty as per Agt.	Rate as per Agt.	Qty as per Pre. Bill	Qty as per this Bill	Cumul ative Qty.	Amt. as per Previou s Bill	Amt. as per this Bill	Cumulat ive Amount
1											
2											
3											
4											
5											
						Total of Schedule A					
						Add Enhancement or Rebate @					
						Grand Total of Schedule A					

Quality Assurance Plan				
S.N.	Material	Test to be carried out	Contractor Role	SMFPIL Role
1	100 mm thick Poly urethane foam(PUF) or as per any thickness designed by bidder conforming to industrial standards	Physical & Lab Test	<ul style="list-style-type: none"> To be procured from approved make Submission of OEM's Test Certificate for each Lot One Lab Test for every 2000 Sq. Mtr The tests to be conducted are enlisted in Annexure A 	<ul style="list-style-type: none"> Review of OEM's Test Certificate Review of Lab Test Report
2	100mm Bare PUF Slabs or as per any thickness designed by bidder conforming to industrial standards	Physical & Lab Test	<ul style="list-style-type: none"> To be procured from approved make Submission of OEM's Test Certificate for each Lot One Lab Test for every 2000 Sq. Mtr The tests to be conducted are enlisted in Annexure A 	<ul style="list-style-type: none"> Review of OEM's Test Certificate Review of Lab Test Report
3	All other PUF panels of varied thickness as applicable and design considerations conforming to industrial standards	Physical & Lab Test	<ul style="list-style-type: none"> To be procured from approved make Submission of OEM's Test Certificate for each Lot One Lab Test for every 2000 Sq. Mtr The tests to be conducted are enlisted in Annexure A 	<ul style="list-style-type: none"> Review of OEM's Test Certificate Review of Lab Test Report
4	PUF doors	Physical Inspection at site OEM's Test Report	<ul style="list-style-type: none"> To be procured from approved make Submission of OEM's Test Certificate and technical compliance sheet to the tender technical specifications 	<ul style="list-style-type: none"> Review of OEM's Test Certificate
5	Overhead sectional door	Physical Inspection at site OEM's Test Report	<ul style="list-style-type: none"> To be procured from approved make Submission of OEM's Test Certificate and technical compliance sheet to the tender technical specifications 	<ul style="list-style-type: none"> Review of OEM's Test Certificate

6	Dock leveler	Physical Inspection at site OEM's Test Report	<ul style="list-style-type: none"> • To be procured from approved make • Submission of OEM's Test Certificate and technical compliance sheet to the tender technical specifications • Load testing at site during commissioning confirming to loads as per tender technical specifications. 	<ul style="list-style-type: none"> • Review of OEM's Test Certificate • Review of site test report
7	Dock seals retractable type	Physical Inspection at site OEM's Test Report	<ul style="list-style-type: none"> • To be procured from approved make • Submission of OEM's Test Certificate and technical compliance sheet to the tender technical specifications 	<ul style="list-style-type: none"> • Review of OEM's Test Certificate
8	Racking and material handling equipment and pallets and storage bins/crates etc.	Physical Inspection at site OEM's Test Report	<ul style="list-style-type: none"> • To be procured from approved make • Submission of OEM's Test Certificate • The Reach truck/stackers and racking storage system should be tested for load carrying capacity at the highest level of loading confirming to the loading parameters as per tender specifications during commissioning. • The battery accessories (as applicable) for all material handling equipments and all standbys should be tested as on then in the commissioning. 	<ul style="list-style-type: none"> • Review of OEM's Test Certificate • Review of site test report
9	Milk Chilling, Storage and All Refrigeration equipment's, Accessories & Controls	Physical Inspection at site OEM's Test Report	<ul style="list-style-type: none"> • To be procured from approved make • Submission of OEM's Test Certificate • Commissioning certificate to be submitted as given in Annexure-B 	<ul style="list-style-type: none"> • Review of OEM's Test Certificate • Review of Commissioning Certificate

10	Electrical Panel & Accessories	Physical Inspection at site OEM's Test Report	<ul style="list-style-type: none"> • To be procured from approved make • Submission of OEM's Test Certificate 	<ul style="list-style-type: none"> • Review of OEM's Test Certificate
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Annexure A-

As per tender documents all mentioned below parameters for OEM Test certificate and Lab test are required to confirm all parameters in line for PUF panels:

- 1-Density Test
- 2-Thickness of GI Sheet
- 3-Thickness of PUF
- 4-Epoxy Primer on both sides (thickness)
- 5- Polyester Top Coat (thickness)
- 6- Zinc Coating
- 7- Thermal Conductivity
- 8- Yield Strength of GI sheet
- 9- Tensile Strength of GI sheet

Annexure B-

All refrigeration machinery and equipments shall be tested for COP (Coefficient of performance) at the time of commissioning for 3 times as per the pull down time of chambers or on a shift basis as applicable. These tests shall cover for all compressors, evaporator (all indoor units), condenser, Water chillers etc including all accessories.

Bill of Quantities

Annexure A-Estimation of Construction Works & Pre Engineering Building

FORMATS