1.3.4.3 Should any Contractor's proposals for the any specialised items differ in entirely or substantially from that of the Engineer's or should it affect another component of the element or item of work beyond permissible variations from it, then the Contractor shall, at his own cost, be responsible for redesign to provide a complete acceptable system before approval of any part thereof. For such works, the Contractor shall furnish, at his own expense, the Engineer with copies of all design calculation, sketches, working drawings and similar information in as much detail as the Engineer may reasonable require for his full information and subsequent approval.

Such approval of the Contractor's design shall not relieve the Contractor from any of his duties, responsibilities or obligations under the Contract.

The above design work to be undertaken by the Contractor or his approved subcontractor shall be in accordance with f current practice generally using accepted design techniques in accordance to international standards or as specified in the relevant Tender Document all to the approval of the Engineer.

1.3.4.4 Contractor shall prepare the working drawings/shop drawings and documents, including diagrams and schedules shall show the details of proposals for the execution of the works and shall include everything necessary for the following purposes :

To illustrate in detail the arrangement of the various section of the works and to identify the various components.

To integrate the various sections of the works.

The shop drawings required shall include but not be limited to the following

General layout drawings for equipment and like items as deemed necessary by the Engineer.

a) Detailed layout drawings all lift stations and pumping stations, showing the connection of mechanical and electrical services, ducting, paper work, conduit, cable tray and trunking together with earthing system

b) Detailed layout drawings showing sections such as through ceiling voids and vertical shafts.

c) System diagrams, circuit diagrams and wiring diagrams for all installations and equipment.

d) The drawings, specifications and technical information for materials and equipment of building components such as doors, windows etc.

1.3.4.5 Working drawings and documents shall be made available in sufficient time in order to maintain the Programme of Work on site.

The Contractor shall liase with the Engineer for the period required for any approval, which shall be a maximum of two weeks.

The Contractor shall ensure that all items to be ordered by him can be accommodated in the positions shown on the drawings and for taking all necessary dimensions on site together with any supporting information which may be necessary for preparing working drawings.

Materials or equipment shall be ordered nor construction of the associated works be commenced until such approval has been obtained from the Engineer.

The Contractor shall be deemed to have obtained a full and proper understanding of the Engineer's design and design intents and to have satisfied himself with their accuracy and suitability. In this respect, the Engineer will meet all reasonable requests made by the Contractor in furnishing design information and the like to he Contractor. No claim in respect of lack of knowledge will be admissible.

1.3.5 Construction Levels

Before commencement of construction, the Contractor shall conduct a detailed topographic survey of each road in the project and submit to the Engineer, for approval, the following:

(a) Tabulated control levels to which the works are to be referred to. Co-ordinates of each salient point shall be determined in metres to 3 decimal places.

(b) Plan of the proposed road showing the location of the asphalt carriageway. The drawing shall clearly indicate the location of the boundary walls wherever available. Where boundary walls are not available the survey should show the extent of the right of way of the road. The existing services, as determined by site excavation, should also be marked up on these plans.

(c) Profile of the existing road as directed by the Engineer

(d) In the dual carriageway, profile shall be drawn for both carriageways.

1.4 SOIL INVESTIGATION AND REPORT

1.4.1 A soil investigation has been undertaken during the Design phase. However in case additional investigations are required during the course of construction the Contractor shall be advised of such requirement and the Contractor shall promptly carry out such investigations as advised by the Engineer.

1.5 PROGRESS PHOTOGRAPHS

1.5.1 The Contractor shall submit to the Engineer each month, throughout the period of the Contract, progress photographs as mentioned in the General conditions of the contract, taken at the direction of the Engineer. The camera used for this purpose shall be such that the date is printed out.

1.5.2 In addition copies of previously selected progress photographs and mounted in three separate and suitable albums shall also be delivered to the Engineer on the Preliminary Handing-over of the works. The arrangements for the progress photographs are subject to the approval of the Engineer and shall be discussed at as early a date as possible so that complete coverage can be assured.

1.6 NOTICE BOARDS

The Contractor shall provide, erect and maintain for the duration of the contract, two steel framed timber notice boards for the works, in location approved by SPV and the Engineer's Representative.

Notice Boards shall have a block board panel size of around 3m as detailed on the Drawings or equally approved. Prior to sign writing, the board shall be painted with two coats of white oil based paint back and front. The board shall be supported above the ground on steel struts painted matt black and fixed into concrete foundations, all to the approval of the Engineer. The sign shall be painted by a skilled sign writer to show the details described in the Contract. The Contractor is responsible for obtaining all necessary approvals for the erection of these notice boards.

Under no circumstances, shall sub-contractor's or supplier's name boards be fixed on hoarding or elsewhere on site.

1.7 ADVERTISING

1.7.1 Neither the Contractor nor any of those in his employment shall give information concerning the works for publication in any form without the written approval of the Engineer.

1.7.2 Neither the Contractor nor any of his sub-contractors shall erect placards or advertisements within the site other than the notice boards permitted under the relevant Clauses.

1.8 SITE SAFETY

1.8.1 Site Safety

In order to improve the general vehicular traffic condition and to guarantee public safety from and around the work the Contractor shall provide all labour, and materials, and construct and maintain temporary traffic diversions through out the construction activities, to the directive and approval of the Engineer. It is therefore recognised that there is a particular responsibility placed upon the Contractor to take special precautions for public safety and to minimise the scale and extent of disruption. Plans for diversion shall always be submitted to the Engineer for prior approval.

1.8.2 Safety on Site

1.8.2.1 The Contractor shall ensure that the works are carried out in a safe manner. According to internationally accepted guidelines on safe working procedures and to the satisfaction of the Engineer.

1.8.2.2 The following requirements shall be complied with by the Contractor:

a) Excavation - All excavations shall be adequately supported to avoid collapses and effective safety barriers shall be erected with warning signs and devises around all open excavations to the satisfaction of the Engineer.

Struts and walling shall not be used as ladders and for the purpose of access to the base of excavation the Contractor shall provide proper ladders which shall be suitably secured.

Reflective wearing shall be worn by all workmen on or close to a highway and, where necessary, temporary road signs and cones shall be provided to ensure a safe working area.

b) Protective Clothing - The Contractor shall ensure that all personnel on site are supplied with the necessary protective clothing such as safety helmets, goggles, face masks, ear muffs, gloves, boots, etc. which are required for the operations being performed.

c) Scaffolding - Suitable and sufficient scaffolds shall be provided and properly maintained for all work that cannot safely be carried out from the ground or from part of the structure or from a ladder.

Every scaffold shall be of good construction, of suitable and sound material and of adequate strength for the purpose for which it is used. Unless designed as an independent structure, every scaffold shall be rigidly connected to a part of the structure which is of sufficient strength to afford safe support. Protective headgear shall always be worn.

d) Lifting Device - Every rope, chain, pulley, bloc, hook, winch, crane or other lifting gear used for raising or lowering loads of as a means of suspending them shall be of good construction, sound material, adequate strength and free from defects. They shall be properly maintained and tested at regular intervals by a competent person, who shall be to the approval of the Engineer.

e) Working in existing manholes etc. , - Checks shall be carried out before entry to ensure that the atmosphere is fir for respiration and no smoking naked lights or flames are to be permitted in any sewer, manhole of chambers or adjacent to them when these are open

The equipment which shall be made available shall include but not limited to:

a) Gas detector lamps with lead acetate papers.

b) Lifting harness with ropes

c) Handlamps with spare batteries

d) First aid kit.

e) Protective head gear.

f) Rubber Gloves.

g) Breathing apparatus.

1.8.2.3 Throughout the period of the Contract, the Contractor shall provide safety helmets and high reflectivity jackets to all Consultant's staff and visitors. Barriers must be provided to all excavations for the safety of the public and flagmen must be used for all items of plant for the safety of the operatives, supervision staff and members of the public.

1.8.3 Vehicular Movement

1.8.3.1 Before commencing the works, the Contractor shall consult with and obtain from the Employer and the Engineer their requirements for temporary safety signs, road markings, lighting and other measures necessary to ensure the safety of the public, and shall comply with these requirements will not relieve the Contractor of his obligations under the Contract. The Contractor shall also take a No Objection Certificate from Consultants supervising other Contracts in the area, get details of newly installed and temporary services and obtain access requirements for other contractors.

1.8.3.2 The Contractor shall deploy, as a full time member of his site staff for the duration of the contract, whose duties shall include the production and implementation of safety management schemes. Qualification and experience of the safety management staff shall be subject to the approval of the Engineer.

1.8.3.3 Throughout the Contract, the Contractor shall maintain vehicular and personnel access to all parts within the site at all time.

Adequate warming and direction signs are to be erected wherever necessary and diversions are to be maintained in good condition to the satisfaction of the Engineer.

1.8.3.4 Temporary diversions shall be constructed and maintained to the standards approved by the Engineer. Upon completion of the Permanent works, the temporary diversions shall be removed and the site restored to the satisfaction of the Engineer.

1.8.3.5 All diversions and safet sign boards must be constructed and maintained to the highest standards with regular washing of cones and daily maintenance of flashing lights. The signs and cones should be self-stabilising, and if extra stability is required only small sandbags should be used.

1.8.3.6 All stockpiles of material to be used in the works must be fenced off and all unsuitable material must be removed from site on a daily basis and not stockpiled on site.

1.8.3.7 Payment for safety management shall be considered as included in the various pay items of B.O.Q. deductions to be made, from moneys due to the Contractor, for failure on the part of the Contractor to provide adequately for safety and for the accommodation of safety management plan.

1.9 SERVICES

1.9.1 Contractor to establish location of Services

Before the Contractor may proceed with the Works in any given area he is required to establish the precise location of all services in that area as executed by other contractors.

1.10 AS BUILT RECORDS

1.10.1 On or before the completion of the works, at the direction of the Engineer, the Contractor shall prepare detailed drawings and other records, as required, of the works executed. The Contractor is required to submit the soft copy as well as two hard copies of the as built records to the scale advised by the Engineer.

1.11 PROGRAMME OF WORKS

1.11.1 In respect of the programme of works required under Clause 17 of the General Conditions of Contract the following specific requirements shall apply: -

- The works shall be programmed in such a way as to minimise disruption to other works
- Works shall not be carried out simultaneously over large areas of the site but shall be sequenced so that all operations likely to cause disruption to other works shall be undertaken and completed in discrete area before commencement of operations in other areas.
- Works, which, by their nature, will create disruption and / or obstructions to other works, shall be programmed to be undertaken in a continuous sequence of events from the initial disruption until the restoration of access without and significant delay between operations.

1.11.2 The Contractor's Programme of Works, submitted in accordance with Clause 17 of the Conditions of Contract, shall be subject to the approval of the Engineer and of Employer, the Contractor has not properly achieved the objectives of the programme, then they may require the Contractor to revise his Programme and the Contractor shall do so forth, for this reason the Contractor is advised to liaise closely with the Engineer during the production of his Programme.

1.11.3 The Contractor should note that when a phase or phases of the works is/are programmed to be completed before commencement of another phase, the Contractor may not commence work on the later phase until the former phase is completed, even if the former phase overruns its allocated construction time, without the specific permission of the Engineer's Representative.

1.11.4 In addition to the Works Programme required under Clause 17 of the Conditions of Contract, the Contractor shall produce individual programmes for each element of the works likely to cause significant disruption to other works, for the approval of the Engineer and prior to commencement of the element of the works, clearly showing the sequencing of construction operations is such a manner as to minimise the duration of the disruption.

1.11.5 The Contractor shall note that different work in various parts of site by other contractors may be in progress or may commence during the Contract Period. It will be the Contractor's responsibility to liase with contractors on adjacent sites in order to ensure the detail progress. The Contractor's Programme will be phased and will make full allowance for the need for a co-operative timing with adjacent contractors.

1.12 CONTRACTOR'S OFFICES, YARD, STORES AND PLANT AREA

1.12.1 The Contractor's main office shall be located in the general vicinity of the Engineer's office, on land to be provided, by the Contractor, for the duration of the project. The Contractor's main office shall be used for the purposes of administering the Project but may not be used for the storage of construction materials nor for storage or maintenance of plant and shall not be allowed to become unsightly.

1.12.2 The Contractor's other offices, yard, stores and plant area shall be provided, by the Contractor, at location(s) to the approval of the Employer. The Contractor shall be responsible for all associated expenses including rents, assessments or temporary occupation license fees, establishment, running and maintenance costs, the supply of all services, as well as the obtaining of any appropriate No Objection Certificates.

1.12.3 Within 7 days of the Commencement date of the Contract, the Contractor shall submit, for the approval of the Engineer, a drawing showing detailed plans for his offices, yard, stores and plant area, together with al sanitary arrangements, and for the supply of water and electricity. Until the Engineer has given his approval in writing, no construction of any of the Contractor's facilities shall commence. The area shall be fenced in accordance with the Engineer's approval.

1.12.4 The Contractor shall not be permitted to erect temporary building or structures elsewhere without the specific permission in writing of the Engineer, including approval of the dimensions and specifications of such buildings or structures and their location.

1.12.5 The Contractor shall take all steps necessary as directed by the Engineer to minimise or eliminate dust, noise or any other nuisance, which may occur. Plant emitting dust, smoke, excessive noise or other nuisance shall not be permitted to be sited at any location which shall cause nuisance to any building or other installation, whether complete or under construction, site offices, camps, or other similar buildings.

1.12.6 Under no circumstances shall overnight accommodation be permitted on site except for Site watchman in carrying out their duties.

1.12.7 Throughout the period of the Contract, the Contractor shall maintain the area of his operation within the limits of the site in a clean, tidy and safe condition by arranging materials and the like in an orderly manner. All rubbish, debris, waste materials and the like shall be systematically cleared from the site as it accumulates.

1.12.8 The Contractor shall satisfy himself as to the means of access to the site and other relative items affecting him, his sub-contractors and suppliers.

1.12.9 Upon completion of the Contract, or, in the case of facilities required by the Contractor during the Period of Maintenance, on completion of the period of maintenance the Contractor shall remove all buildings and other facilities from the site including all foundations and services, clean and level the site and restore the ground to its original condition.

2.1 SITE PREPARATION

2.1.1 General

The Contractor shall maintain close liaison with the Engineer and the Employer and shall obtain their approval prior to removal of any service installation. Where external Service Authority installations are to be removed, they shall be removed after the existing facilities have been

relocated and commissioned or after they have been redundant and after any electrical supply has been made safe by the Authority or the Contractor whichever is appropriate.

"Site clearance" shall include the demolition/removal of all plants, bushes, underground structure, foundations, manholes, chambers, drains, septic tanks, cesspits, soak away, pipelines, undergrowth, trees (of any girth), tree stumps, buildings, services, rubbish and debris which are required to be cleared to construct the Works. Site clearance as directed by the Engineer shall include clearing and grubbing for the road corridor. The rate shall include for backfilling with suitable material all voids created by the removal of above mentioned items.

It is deemed that except for the items mentioned in this bill, costs of all other works in connection with site clearance are included in various pay items of other bills.

2.1.2 Removal of Trees

a) General

1. This item consists of the removal of trees of any girth, their disposal as instructed by the Employer and Engineer and the backfilling of the hole left after uprooting the tree.

2. If any tree is conflicting with the road works then Contractor shall inform the Consultant.

Removal of trees shall be performed only after written approval from the Employer.

b) Measurement and Payment

Payment under this item shall be made per unit of trees removed.

The unit price shall constitute full compensation for the removal, hauling, disposing off of the tree of any girth as described herein and as directed by the Engineer and for all material, labour equipment, supplies and incidentals necessary to complete the Work.

No payment shall be made for the removal of bushes, stumps, roots etc., whose cost is considered as included in other pay items of the bill.

2.1.3 Removal of Fence

a) General

The Contractor shall take down existing fencing and gates within the Contract Right-of-Way as shown on the Drawings or as directed by the Engineer and shall ensure the provision of suitable terminal posts, tensions, tie wires, lengths of fencing or whatever is necessary to ensure the integrity of the remaining lengths of fencing and stop the entry of animals should the remaining fenced area be under cultivation or a plantation.

Prior to removal, the fencing is to be inspected by the Engineer to assess its suitability for re-use.

Sections of fencing designated by the Engineer as suitable for re-use shall be dismantled, removed and stored in a manner approved by the Engineer to leave all parts of the fencing system suitable for re-use and late re-erection as directed by the Engineer.

b) Measurement and Payment

Payment under this Item shall be made per linear metre of fence removed.

The unit price shall constitute full compensation for the works described herein and as directed by the Engineer and for all material, labour, equipment, supplies and incidentals necessary to complete the Works.

2.1.4 Removal of Concrete Structures

a) General

The Contractor shall remove wholly or in part and satisfactorily dispose of all structures (manhole, slabs, walls, building or any other concrete structure) as indicated on the Drawings or directed by the Engineer, and which are not specifically described under a separate Clause of this Specifications.

All material removed and all structures demolished shall be removed from the Work Site, hauled away and disposed off in approved disposal area and as approved by the Engineer.

The voids or depression which are the result of the demolition of structures shall be backfilled with borrow material as approved by the Engineer. Backfilling material shall be placed in horizontal layers of over 15 cm in depth and compacted to not less than 98%.

b) Measurement and Payment

Payment for the removal and disposal of all structures and related obstructions as described above will be at the cubic metre rate included in the Bill of Quantities which shall include all labour and equipment to demolish, remove the obstructions as building materials, concrete, debris etc., loading, hauling irrespective of haulage distance, disposing off all materials removed, and backfilling with borrow material and depression of voids, as indicated on the Drawing, specified herein and as directed by the Engineer.

LIST OF APPROVED MAKES/AGENCIES

FOR WORKS COVERED UNDER THIS CONTRACT

(A) All materials and products used in the work shall conform to the relevant standards/ specifications and shall be of approved make and design. Lists of approved manufacturers/ vendors for Civil works, Plumbing works, Fire fighting & Fire Alarm works, Electrical works etc. is given herein below. The approval of a manufacturer/ vendor shall be given only after review of the sample/specimen by the Engineer-in-charge. The complete system and installation shall also be in conformity with the "Applicable Codes Standards and Publications".

(B) List of Approved makes for Products, Materials and specialist agencies is given below. Other equivalent manufacturers may be considered with prior approval; however the decision of the Engineer-in-charge shall be final.

SL. NO.	ITEM	MAKE
1	GREY CEMENT	ACC, AMBUJA, JK UltraTech, OR OTHER BRAND WITH APPROVAL OF ENGINEER INCHARGE.
2	WHITE CEMENT	JK, BIRLA OR EQUIVALENT
3	REINFORCEMENT/STRUCTURAL STEEL	SAIL, TISCO, RINL, JINDAL
4	ANTI-TERMITE TREATMENT	PEST CONTROL INDIA LTD, PEST CON INDIA, PEST CONTROL INCORPORATED, OR ANY OTHER AGENCY TO BE APPROVED BY THE ENGINEER IN CHARGE
5	CONCRETE ADDITIVE	FOSROC, STP, CICO-TL, SIKA, PIDILITE
6	FLUSH DOORS	GREEN, DURO, CENTURY, MAYUR, JAYNA, ARCHID PLY, ALPRO
7	FIRE CHECK DOORS	GLOBAL FIRE PROTECTION COMPANY, RADIENT SAFE FIRE DOORS, GODREJ
8	PLYWOOD / BLOCK BOARD / SOFT BOARD	ANCHOR, DURO, MAYUR, GREEN LAM, CENTURY, ARCHID PLY, ALPRO
9	PRELAMINATED PARTICLE BOARD	ACTION TESA, NOVAPAN, ANCHOR, MERINO, GREEN LAM, CENTRURY, ARCHID PLY
10	LAMINATES	CENTURY, ROYAL CHALLENGE, MERINO,GREEN LAMP, ARCHID LAM
11	ADHESIVE FOR WOOD WORK	DUNLOP, FEVICOL, VAMICOL, PIDILITE
12 a)	POLYRETHANE SEALANT	MBT, CHOKSEY,PIDILITE
b)	SILICON SEALANT	DOWN CORNING, ALSTONE OR EQUIVALENT
13	POLYETHELENE BOARD	SUPREME OR EQUIVALENT
14 a.	ALUMINIUM EXTRUSIONS	JINDAL, HINDALCO, NARMADA, BHARUKA, INDAL, MAHAVIR OR EQUIVALENT
b.	STAINLESS STEEL	SALEM, JINDAL OR EQUIVALENT
c.	EXPANSION, FASTENERS	FISCHER, HILTI, ANCHORS, AXEL
15	Structural Steel	TATA, Jindal, SAIL

SL. NO.	ITEM	MAKE
15	FLOAT GLASS	MODI GUARD, SAINT GOBAIN, ASAHI, ATUL
16	CERAMIC TILES	NITCO, KAJARIA, SOMANY, JOHNSON, SUNHEART, VARMORA
17	VITRIFIED PORCELINE 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 a)	CEMENT CONCRETE TILES	UNISTONE, ULTRA, DALAL TILES OR EQUIVALENT
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	SAINT 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, Fidder 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

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 PORCELINE 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 a)	CEMENT CONCRETE TILES	UNISTONE, ULTRA, DALAL TILES OR EQUIVALENT
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	SAINT 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, Fidder 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. Date & Time of Concrete
Location Grade of Concrete
Source 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	☐ Alignment Checked	☐ Level of base Checked	☐ Dimensional Check (edges & diagonals)	☐ Starters	☐ Location of cu-outs & services
STAGING/ SCAFFOLDING	☐ Adequacy & rigidity of Props, stays,bracings, Conformity to scheme drawings	☐	☐		
FORMWORK	☐ Qty of forms and support ☐ Props adequate	☐ Vertical form surface in alignment & plumb	☐ Even surface ☐ Oil sprayed	☐ Gaps between shuttering are ☐ Properly closed.	☐ No space for sagging of ☐ Form work
REINFORCEMENT	☐ Cutting & bending as per Bar bending schedule (schedules attached)	☐ Adequate laps Welds	☐ Chair/cover blocks Placed as per scheme	☐ Binding wire not Touching shuttering	☐ Fixtures, inserts Conduits in position
	☐ Dowels & positioning Provided as per drg.	☐ Walkway for Labour provided			
PRE-CONCRETING	☐ Concreting Arrangements	☐ Approval of Construction joint	☐ Mixer/vibrator Condition & mixing	☐ Top level of Concerete marked	☐ Transporting & Placeing arrangement
POST-CONCRETING	☐ Compaction Checked	☐ Removal of laitance	☐ Post concreting Level/dimensions.	☐ Nos of cubes cast	
DESHUTTERING & CLEARING	☐ Curing days------- Water/compound	☐ Surface finish OK	☐ Concrete Test Results OK		

W.O. Item	UNIT	QTY.

SIGNATURE:							
CONTRACTOR	DATE	SITE ENGR	DATE	SITE INCHARGE	DATE	CONSULTANT	DATE

NAME OF PROJECT_____

CONTRACTOR CONTRACT NO.	**CHECK LIST FOR MASONRY WORK** REF DRAWING _____ LOCATIONBLOCK_____FLOOR_____AREA_____	

LAYOUT	☐ Alignment & wall Thickness checked `	☐ Brick on edge (top course)		
SCAFFOLDING	☐ Adequacy of props, Stays, platform	☐ Rigidity of base	☐ Movement space	☐ Approach to height
PRE-LAYING	☐ Working arrangements & service provisions checked	☐ Bricks as per specification	☐ Mortar grade & mix As specified	☐ Bricks moistened
LAYING	☐ Joint thickness & course Ht. As specified	☐ Joint alignment Checked	☐ Vertical joints Properly mortar filled from top	
	☐ Raking of joints Done (if applicable)	☐ Bearing plaster for Concrete		
CURING AND CLEARING	☐ Proper curing of const. Joint.	☐ Scaffolding removed (if required)		

W.O. Item	UNIT	QTY.

SIGNATURE:							
CONTRACTOR	DATE	SITE ENGR	DATE	SITE INCHARGE	DATE	CONSULTANT	DATE

NAME OF PROJECT_____

CONTRACTOR CONTRACT NO.	**CHECK LIST FOR PLASTERING WORK** LOCATION BLOCK _____ FLOOR _____AREA _____	

SCAFFOLDING	☐ Platform	☐ Stability	☐ Movement space	☐ Approach to Height	
SERVICE	☐ All chasing work Complete	☐ Fixing in position Using clamps etc.	☐ Patching Work complete	☐ All door/window frames Fixed in position	☐ Skirting to floors marked
				CLEARANCE FROM AE (E)	
SURFACE PREPARATION	☐ Clearing & raking of Surface	☐ Roughening Hacking done	☐ Fixing metal/lathe Chicken mesh	☐ Mortar level Guides made	☐ Surface moistened/ Cement slurry
PLASTERING	☐ Mix & w/p compound Checked as per specification	☐ Coating/thickness As specified	☐ Groove at joints Provided	☐ Corners & edges sharp & at right Angles lines & levels maintained	☐ Surface leveled with At straight edge
FINISHING	☐ Texture	☐ Curing Days----------	☐ Site cleared	☐	☐

W.O. Item	UNIT	QTY.

SIGNATURE:							
CONTRACTOR	DATE	SITE ENGR	DATE	SITE INCHARGE	DATE	CONSULTANT	DATE

NAME OF PROJECT_____

CONTRACTOR CONTRACT NO.	CHECK LIST FOR LAYING OF EXTERNA SEWER REF DRAWING NO _____ LOCATION	

Excavation	☐ Layout	☐ Slope/cutting as per Specifications	☐ Level
Laying /RCC pipes	☐ Bed concrete as per Specifications	☐ RCC pipes as per Requirement	☐ Jointing of pipes
	☐ Boxing	☐ Strata bore Dewatering (wherever required)	
Manholes	☐ Bricks as per specifications	☐ Mortarasper specifications	☐ Plastering
	☐ End of pipes plugged		
Back fillings	☐ In layers		

W.O. Item	UNIT	QTY.

SIGNATURE:							
CONTRACTOR	DATE	SITE ENGR	DATE	SITE INCHARGE	DATE	CONSULTANT	DATE

NAME OF PROJECT_____

CONTRACTOR **CONTRACT NO.**	**CHECK LIST FOR SUB GRADE** **LOCATION** **FLOOR NO.**_____	

LAYOUT	☐ **Alignment of center line as drawings**	☐ **Marking of carriage way edges as per drawing**		
SUB GRADE PREPARATION	☐ **Initial cross sectional levels recorded**	☐ **Cleaning & grubbing of vegetation and top soil as specified**	☐ **Watering & rolling as specified**	☐ **Cross section levels recorded after rolling**
FORMATION LEVEL (FILLING)	☐ **Depth of filling upto formation Level ----------mtr.**	☐ **Nosof layers upto formation level ----------**	☐ **Fill material**	☐ **Spreading, watering & rolling of layers on layer no.**
	☐ **% compajction of soil (Proctor test)**	☐ **Camber/slope Provided as drawing**	☐ **Formationcrosssectional 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 remark Engineer with S designation**
2	**3**	**4**	**5**	**6**

2. Hindrance Register

Sl. No.	Nature of Hindrance	Date of Occurrence	Date of clearance	Period	Over lapping 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.	Manufacture 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)	Iten wor wh con

6. Sieve Analysis of Stone Aggregate Nominal Size

Sl. No.	Date	Weight of sample in gms	Size of Sieves	Weight retained on each Sieve	%age of weight retained	Cumulative %age of weight Retained	%Age of weight passing	Specified %age of weight Passing	Sign. Of contractor with date	Sign. Of Site Engineer with date	Remarks/action taken
1	2	3	4	5	6	7	8	9	10	11	12

Note: Size of Sieve should be as per CPWD manual/BIS specification

7. Silt Contents of Fine Sand/Coarse Sand

Sl. No.	Date	Source of material	Height of Silt after Setting (V-1)	Height of sand after setting (V-2)	%age Silt Content V1/V2x100	Acceptability as per specification	Sign. Of Site Engineer with date	Sign. Of contractor with date	Location where sand used	Remarks/action taken
1	2	3	4	5	6	7	8	9	10	11

8. Slump Test

Sl. No.	Date of Testing	Item of work and location	Vibrators used Yes / No	Quantity of water added per bag of cement (Liters)	Height of specimen after removal of mould in (mm)	Slump (mm)	Acceptability of result or action taken	Sign. Of Site Engineer with date	Sign. of contractor with date	Remarks
1	2	3	4	5	6	7	8	9	10	11

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……..

Sl. No	Location (C.H.) / Area Represented by the Test	Core Cutter Nos.	Weight of Core Cutter + Weight of Soil (in gram) (W1)	Weight of Empty Core cutter (in gram) (W2)	Weight of Wet Soil (in gram) W= W1-W2	Volume of Core Cutter (in CC) V	Bulk Density (gram/cc) W3= W/V	Moisture Content of compaction layers (M)	Dry Density gram/cc W4 = W3/ (1+M)	Degree of compaction W4/W5	Acceptability limit	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	12	13	14

11. Test for Thickness and Density of the Compacted Layer (By Sand Replacement Method)

for Asphalt Concrete / Bitumen Macadam / CC Pavement

Lab Test Density in gms/CC ……..

Sl. No	Date of Test	Qty. represented by the test	Location of holes	Thickness of Layer		Weight of materials removed from the carpet Hole	Initial weight of sand taken in Cylinder	Weight of sand filling in cone of cylinder	Weight of sand remaining in cylinder	Predetermined bulk density of sand	Density = $\frac{A.d.}{W-(W1+W2)}$	Remarks / Acceptability	Sign. Of Site Engineer	Contractor / contractor's representative Signature with Name & date	Action Taken
				Individual (mm)	Average (mm)	A gm	W gm	WI gm	W2 gm	d gm/CC	gm/CC				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

12. Density Test Register for Soil ---- By Sand Replacement Method

Unit Wt. of Standard Sand in grams/CC (W6) = …….

Lab Test MDD in gms/CC (W10) = …….

Sl. No	Date of Test	Qty. represented by the test	Location of holes	Thickness of Layer (mm)		Wt. of Material from the hole	Moisture Content %age	Initial weight of sand taken in the Cylinder before filling in hole in gms	Wt. of sand after filling in hole in gms	Wt. of sand in hole & cone in gms	Wt. of sand in cone in gms	Wt. of sand in hole in gms	Volume of hole in CC	Bulk Density in gms/CC	Dry Density in gms/CC	Degree of compaction	Remarks / Acceptability	Sign. Of Site Engineer with date	Contractor / contractor's representative Signature with Name & date	Action Taken
				Individual	Average	(W) gms	(Y)	(W1)	(W2)	(W3)= W1-W2	(W4)	W5 = (W3-W4)	(W7)= W5/W6	(W8)=W/W7	(W9)= W8/Y	W9/W10 x100	W9/W10 x100			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

13. Test of the Brick / Brick Tiles for Compressive Strength

Sl. No	Date of collection of sample	Date of testing	Wt. (in Kg)	No. of Specimen	Size in cm/Area in cm2	Compressive Strength obtained for individual bricks in Kg. per Cm2	Average Strength in Kg/Cm2	Specified Compressive Strength in Kg/Cm2	Acceptability	Sign. Of Site Engineer with date	Contractor / contractor's representative Signature with Name & date	Action Taken / Remark
1	2	3	4	5	6	7	8	9	10	11	12	13

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.	Description of Items	Unit	Qty as per Agt.	Rate as per Agt.	Qty as per Pre. Bill	Qty as per this Bill	Cumulative Qty.	Amt. as per Previous Bill	Amt. as per this Bill	Cumulative 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	• 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	• 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	• 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	• 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	• 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	• Review of OEM's Test Certificate • Review of Lab Test Report
4	PUF doors	Physical Inspection at site OEM's Test Report	• To be procured from approved make • Submission of OEM's Test Certificate and technical compliance sheet to the tender technical specifications	• Review of OEM's Test Certificate
5	Overhead sectional door	Physical Inspection at site OEM's Test Report	• To be procured from approved make • Submission of OEM's Test Certificate and technical compliance sheet to the tender technical specifications	• Review of OEM's Test Certificate

6	Dock leveler	Physical Inspection at site OEM's Test Report	• 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.	• Review of OEM's Test Certificate • Review of site test report
7	Dock seals retractable type	Physical Inspection at site OEM's Test Report	• To be procured from approved make • Submission of OEM's Test Certificate and technical compliance sheet to the tender technical specifications	• 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	• 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.	• Review of OEM's Test Certificate • Review of site test report
9	Sorting Grading Machinery and All Refrigeration equipment's, Accessories & Controls	Physical Inspection at site OEM's Test Report	• To be procured from approved make • Submission of OEM's Test Certificate • Commissioning certificate to be submitted as given in Annexure-B	• Review of OEM's Test Certificate • Review of Commissioning Certificate

10	Electrical Panel & Accessories	Physical Inspection at site OEM's Test Report	• To be procured from approved make • Submission of OEM's Test Certificate	• Review of OEM's Test Certificate

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.

FORMATS

SCHEDULE – 1

ELIGIBILITY CRITERIA DOCUMENT

1.	Name of Company/Firm	
	Registered Address	
	Website & Email Address	
	Telephone Number	
	Fax Number	
2.	Description of the company giving detail of activities	
3.	Number of years of experience as a General Contractor	
4.	Number of years of experience as a Sub-Contractor	
5.	Names of members of Board of Directors	
6.	Names of principals who sign documents on behalf of the company	
7.	Attach a Company organization chart	
8.	Previous names of the company with the dates of changes (if any)	
9.	Previous partners with dates of changes(if any)	
10	State if a member of any contractor's association/organization.	
11	In which field of SITC/Engineering do you claim specialization & Interest.	

Encl.:

1) Attach attested copies of original documents:
a) Applicant's legal status.
b) Principal place of business.
c) The place of Incorporation (for applicants who are Corporation), the place of registration and nationality of the owners (for applicants who a rein partnerships or individually owned firms).
2) Power of attorney or authority to sign duly attested by Magistrate 1st Class.
3) Latest brochures and technical literatures.

Authorized Signatory with official seal

SCHEDULE – 2
ELIGIBILITY CRITERIA DOCUMENT

FINACIAL CAPABILITY

a) Summary of assets and liabilities on basis of the audited financial statements of the last three financial years.

ITEM	DESCRIPTION	2016-2017	2017-2018	2018-2020
1.	Total Assets			
2.	Current Assets			
3.	Total Liabilities			
4.	Current liabilities			
5.	Net worth (1-3)			
6.	Working Capital (2-4)			
7.	Annual Turn over			
8.	Services related turn over			
9.	Profit before taxes			
10.	Profit after Taxes			

Note:

a) Attach attested copies of the audited financial statements of the last three financial years.
b) Details of services related turnover

Name and Address of the Bank providing Credit line

c) Specify proposed sources of financing to meet the cash flow demands of the project, net of current commitments:

SOURCE OF FINANCING	AMOUNT
1.	
2.	
3.	

4.	

Firms owned by individuals, partnerships, may submit their balance sheets certified by the registered Chartered Accountant, and supported by copies of tax returns, if audits are not required by the laws of their countries of origin.

NOTE: (The following information is mandatory)

i) The average annual financial turnover during the last 3 years ending 31st March of previous financial year should clearly be indicated.

ii) The applicant should have positive net worth. This will be judged from audited balance sheet of the last financial year ending on a date not prior to 24 months from the due date of submission of this document.

Authorized Signatory with official seal

SCHEDULE - 3

ELIGIBILITY CRITERIA DOCUMENT

Assessed Available Bid capacity

The applicant must fulfil the criteria of...

Working Bid Capacity> Total estimated **cost of work(s) at the time of bidding**. Contractors should calculate the bid capacity as per given formula.

WBC = 2AN – B

A=	Average Annual Turnover of the bidder for last three financial years from similar nature of projects
B=	Value of the existing commitments and ongoing works of the bidder (lead member of the Consortium) to be completed during next 6 months (period of completion of works as per bid)
N=	No. of years prescribed for completion of works for which bids are invited i.e. 0.5 in this case.

Authorized Signatory with official seal

SECHUDLE – 4
ELIGIBILITY CRITERIA DOCUMENT

WORK EXPERIENCE

LIST OF RELEVANT PROJECTS OF VALUE OF PACKAGE (FOR WHICH PREQUALIFICATION IS SOUGHT), COMPLETED/STILL CONTINUING, DURING THE LAST TEN YEARS

Name of Employer / Client	Name, Location, Nature & Description of Work	Contract Price in Indian Rs.	% of Participation of the Company	Contractual Date of Commencement	Contractual Date of completion of Work	Actual Date of Start of Work	Actual Date of Completion of work	Reasons for Delay in Completion, if any	Value of work completed till the last date of submission of bid supported with certificate from employer/ client

Note :-
1. Certificates from the employers are to be attached in respect of the information furnished.
2. Attach photographs of completed Projects.
3. Attach additional photo copied pages, if required.
4. Works to be listed separately as per the similarity.
5. Attach performance certificates as per the value of work as defined in this document. There should not be an unsatisfactory performance of the applicant.

Authorized Signatory with official seal

SCHEDULE – 5
ELIGIBILITY CRITERIA DOCUMENT

LIST OF CURRENT PROJECTS

PROJECT TITLE	WORKS INVOLVED	HAFED	CONTRACT VALUE	DATE OF COMMENCEMENT OF WORKS	DUE DATE OF COMPLETION	%AGEWISE COMPLETION	EXPECTEDDATE OF COMPLETION

Note :- Works to be listed separately as per the similarity.

Authorized Signatory with official seal

SCHEDULE – 6

ELIGIBILITY CRITERIA DOCUMENT

INFORMATION REGARDING CURRENT LITIGATION OR ABANDONMENT OF WORK BY APPLICANT

i)	a) Is the applicant currently involved in any arbitration/litigation to the contract works.	**Yes / No**
	b) If yes, give details	
ii)	a) Has the applicant or any of its constituent partners been debarred/expelled by any agency in India during the last 5 years due to any reason	**Yes / No**
	b) If yes, give details	
iii)	a) Has the applicant or any of its constituent partners failed to complete any contract work in India during the last 5 years due to any reason.	**Yes / No**
	b) If yes, give details	
iv)	Applicant shall submit an affidavit with an undertaking that the applicant / associates have not been blacklisted by any Govt. Agency / State Government/ Central Government offices if any of the State in India.	

Note:- If any information in this schedule is found to be incorrect or concealed, participation of applicant will be summarily rejected at any time. The applicant is supposed to fill-up the correct details of arbitration/litigation during last five years with their outcome.

Details of dispute	Year	Award for or against applicant	Name of HAFED, cause of litigation and matter of dispute	Current value of disputed amount	Actual awarded amount

Signature with Seal of the Company
(Name of the Authorized Signatory)
Title / Designation

SCHEDULE – 7
ELIGIBILITY CRITERIA DOCUMENT
AFFIDAVIT

1. I, the undersigned duly authorized on behalf of company/firm/do hereby certify that all the statements made in the required attachments are true and correct to the best of my knowledge.

2. The undersigned hereby authorize(s) and request(s) any bank, person, firm or Corporation to furnish pertinent information deemed necessary and requested by the HAFED to verify this statement or regarding my(our)competence and general reputation.

3. The undersigned understands and agrees that further qualifying information may be requested and agrees to furnish any such information at the request of the HAFED.

(Signed by an Authorized Officer of the Firm)

Name and Title of Officer

Name of the Firm

Date
Encl.: Requisite Power of Attorney duly attested by Magistrate – 1st Class.

SCHEDULE – 8
ELIGIBILITY CRITERIA DOCUMENT

ADDITIONAL INFORMATION

Following additional information supported with attested copies, may be supplied along with your application:

1. Registration of company, partnership deed, Article of Association, Registration under Labour Law, Registration under GST etc

2. EPF No., PAN No. etc.

3. Details of available site testing equipments.

4. Details of possession of Electrical License from Chief Electrical Inspector of the State for execution of High Tension line network.

Please add any further information, which you consider to be relevant to the evaluation of your application. If you wish to attach other documents please list below, otherwise state "not applicable".

Authorized Signatory with official seal

Format of Bank Guarantee for Bid Security
(BANK GUARANTEE ON NON-JUDICIAL STAMP PAPER OF Rs.100)

BID SECURITY (BANK GUARANTEE)

WHEREAS, _____ *[name of Bidder]* (hereinafter called "the Bidder") has submitted his Bid dated _____ *[date]* for the (**insert the name of the works)** (hereinafter called "the Bid").

KNOW ALL PEOPLE by these presents that We _____ *[name of bank]* of having our registered office at _____ (hereinafter called "the Bank") are bound unto _____(hereinafter called "the Employer") in the sum of Rs._____[1](Rupees _____ _____ ____ _____) for which payment well and truly to be made to the said Employer the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____ 2018.
THE CONDITIONS of this obligation are:

(1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the Form of Bid;
or

(2) 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 Agreement in accordance with the Instructions to Bidders, if required; or

(b) fails or refuses to furnish the Performance Security, in accordance with the Instruction to Bidders; or

(c) does not accept the correction of the Bid Price pursuant;

we undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without any protest or demur or any objection, whatsoever on our part and without any first claim or reference to the Contractor, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any 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]

The Bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Section 1 (II).

Instruction for furnishing Bank Guarantee

- The Bank Guarantee by Bidders will be given on non-judicial stamp paper as per stamp duty applicable at the place where the tender has emanated. The non-judicial stamp paper should be in name of the issuing bank.
- This bank guarantee/ all further communication relating to the bank guarantee should be forwarded to HAFED Office, Panchkula only.
- The full address along with the Telex/Fax No. and email address of the issuing bank to be mentioned.

PERFORMANCE BANK GUARANTEE

To

_____ [name of Employer]
_____ [address of Employer]

WHEREAS _____ [name and address of Contractor] (hereafter 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 obligation in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of _____ [amount of guarantee]* _____ (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 there under 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 waive notice of any such change, addition or modification.
The Bank guarantee for performance security shall remain in force as given in the Bid Document shall be valid up to 3 months beyond the expiry of the Defects Liability Period.

Signature and Seal of the guarantor_____
Name of Bank_____
Address _____
Date_____

* An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract including additional security for unbalanced Bids, if any and denominated in Indian Rupees.

BANK GUARANTEE FOR ADVANCE PAYMENT

To

_____ [name of Employer]
_____ [address of Employer]
_____ [name of Contractor]
_____ [name of Contract]

Gentlemen:

In accordance with the provisions of the Conditions of Contract, sub-clause 51.1 ("Advance Payment") of the above mentioned Contract,_____

[Name and address of Contractor] (Hereinafter called" the Contractor") shall deposit with _____ [name of Employer]a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of _____[amount of Guarantee]*_____[in words].

We, the _____[bank of financial institution], as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____[name of Employer] on his first demand without whatsoever right of obligation on our part and without his first claim to the Contractor, in the amount not exceeding_____[amount of guarantee]*_____[in words].

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 there under or of any of the Contract documents which may be made between_____ [name of Employer]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.

The guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until_____ [name of Employer] receives full repayment of the same amount from the Contractor.

Yours truly,

Signature and Seal: _____
Name of Bank/Financial Institution:_____
Address: _____
Date: _____

---

* An amount shall be inserted by the Bank of Financial Institution the amount of the Advance Payment, and denominated in Indian Rupees.

INDENTURE FOR SECURED ADVANCES
FORM 31

(for use in cases in which the contract is for finished work and the contractor has entered into an agreement for the execution of a certain specified quantity of work in a given time)

This indenture made the _____ day of _____, 20____ BETWEEN _____ (hereinafter called the contractor which expression shall where the context so admits or implies be deemed to include his executors, administrators and assigns) or the one part and the Employer of the other part.

Whereas by an agreement dated _____ (hereinafter called the said agreement) the contractor has agreed.

AND WHEREAS the contractor has applied to the Employer that he may be allowed advanced on the security of materials absolutely belonging to him and brought by him to the site of the works the subject of the said agreement for use in the construction of such of the works as he has undertaken to executive at rates fixed for the finished work (inclusive of the cost of materials and labour and other charges.)

AND WHEREAS the Employer has agreed to advance to the Contractor the sum of Rupees _____ on the security of materials the quantities and other particulars of which are detailed in Accounts of Secured Advances attached to the Running Account bill for the said works signed by the Contractor on _____ and the Employer has reserved to himself the option of making any further advance or advances on the security of other materials brought by the Contractor to the site of the said works.

Now THIS INDENTURE WITNESSETH that in pursuance of the said agreement and in consideration of the sum of Rupees _____ on or before the execution of these presents paid to the Contractor by the Employer (the receipt where of the Contractor doth hereby acknowledge) and of such further advances (if any) as may be made to him as a for said the Contractor doth hereby covenant and agree with the President and declare as follows:

(1) That the said sum of Rupees _____ - so advanced by the Employer to the Contractor as aforesaid and all or any further sum of sums advanced as aforesaid shall be employed by the Contractor in or towards expending the execution of the said works and for no other purpose whatsoever.

(2) That the materials details in the said Account of Secured Advances which have been offered to and accepted by the Employer as security are absolutely the Contractor's own propriety and free from encumbrances of any kind and the contractor will not make any application for or receive a further advance on the security of materials which are not absolutely his own property and free from encumbrances of any kind and the Contractor indemnified the Employer against all claims to any materials in respect of which an advance has be made to him as aforesaid.

(3) That the materials detailed in the said account of Secured Advances and all other materials on the security of which any further advance or advances may hereafter be made as aforesaid (Hereafter called the said materials) shall be used by the Contractor solely in the execution of the said works in accordance with the directions of the Engineer.

(4) That the Contractor shall make at his own cost all necessary and adequate arrangements for the proper watch, safe custody and protection against all risks of the said materials and that until used in construction as aforesaid the said materials shall remain at the site of the said works in the Contractor's custody and on his own officer authorized by him. In the event of the said materials or any part thereof being stolen, being stolen, destroyed of damaged of becoming deteriorated in a greater degree than is due to reasonable use and wear thereof the Contractor will forthwith replace the same with other materials of like quality of repair and make good the same required by the Engineer.

(5) That the said materials shall not be any account be removed from the site of the said works except with the written permission of the Engineer of an officer authorized by him on that behalf.

(6) That the advances shall be repayable in full when of before the Contractor receives payment from the Employer of the price payable to him for the said works under the terms and provisions of the said agreement. Provided that if any intermediate payments are made to the Contractor on account of work done than on the occasion of each such payment the Employer will be at liberty to make a recovery from the contractor's bill for such payment by deducting there form the value of the said materials than actually used in the construction and in respect of which recovery has not been made previously, the value of this purpose being determined in respect of each description of materials at the rates at which the amounts if the advances made under these presents were calculated.

(7) That if the Contractor shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances that may still be owing of the Employer shall immediately on the happening of such default be repayable by the Contractor to be the Employer together with interest thereon at twelve percent per annum from the date or repayment and with all costs, charges, damages and expenses incurred by the **Employer** in or for the recovery thereof or the enforcement of this security or otherwise by reason of the default of the Contractor and the Contractor hereby covenants and agrees with the **Employer** to reply and pay the same respectively to him accordingly.

(8) That the Contractor hereby charges all the said materials with the repayment to the Employer of the said sum of Rupees _____ and any further sum of sums advanced as aforesaid and all costs, charges, damages and payable under these presents

PROVIDED ALWAYS and it is hereby agreed and declared that notwithstanding anything in the said agreement and without prejudice to the power contained therein if and whenever the covenant and the money owing shall not be paid in accordance there with the **Employer** may at any time thereafter adopt all of any of the following courses as he may deem best:

(a) Seize and utilize the said materials or any thereof in the completion of the said works on behalf of the contractor in accordance with the provisions in that behalf contained in the said agreement and the amount due to the contractor with the value of work done as if he had carried it out in accordance with the said agreement and at the rates thereby provided. If the balance is against the contractor, he is to pay same to the **Employer** on demand.

(b) Remove and sell by public auction the sized materials or any part thereof and our of the moneys arising from the sale retain all the sums aforesaid repayable or payable to the **Employer** under these presents and pay over the surplus (if any) to the Contractor.

(9) That except in the event of such default on the part of the contractor as aforesaid interest on the said advance shall not be payable.

(10) That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevail and in the event of any dispute of difference arising over the construction of effect of these presents the settlement of which has not been here-in-before expressly provided for the same shall be referred to the Employer whose decision shall be final and the provision of the Indian Arbitration Act for the time being in force shall apply to any such reference.

FORMAT FOR POWER OF ATTORNEY FOR LEAD MEMBER OF CONSORTIUM POWER OF ATTORNEY

(Only applicable for JV/ Consortium)

Whereas the Awarder of India (AWARDER) has invited applications from interested parties for Whereas, the member of the Consortium are interested in bidding for the Project and implementing the Project in accordance with the terms and conditions of the tender document (DNIT) and other connected documents in respect of the Project.

Whereas, it is necessary under the DNIT Document for the members of the Consortium to designate one of them as the Lead Member with all necessary power and authority to do for and on behalf of the Consortium, all acts, deeds and things as may be necessary in connection with the Consortium's bid for the Project.

NOW THIS POWER OF ATTORNEY WITNESSE THAT:

We, M/s. , M/s. and M/s. (the respective names and addresses of the registered office) do hereby designate M/s.(name and address of the registered office) being one of the members of the Consortium, as the Lead Member of the Consortium (name and address of the registered office) being one of the members of the Consortium, to do on behalf of the Consortium, all or any of the acts, deed or things necessary or incidental to the Consortium's bid for the Project, including submission of application / Proposal, participating in conference, responding to queries, submission of information / documents and generally to represent the Consortium in all its dealings with AWARDER, any other Government Agency or any person, in connection with Project until culmination of the process of bidding and thereafter till the Concession Agreement is entered into with AWARDER.

We hereby agree to ratify all acts, deeds and things lawfully done by Lead Member our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

Dated this the day of[year] (Executants)

(To be executed by all the members of the Consortium) Notes:

• The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executants (s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.

• Also, wherever required, the executants (s) should submit for verification the extract of the charter documents and documents such as a resolution / power of attorney in favor of the Person executing this Power of Attorney for the delegation of power hereunder on behalf of the executants (s)

FORMAT FOR POWER OF ATTORNEY FOR SIGNING OF APPLICATION
(Applicable for all bidders including JV)

(On Stamp paper of relevant value)

POWER OF ATTORNEY Know all men by these presents, we(name and address of the registered office) do hereby constitute, appoint and authorize Mr. / Ms. (name and address of residence) who is presently employed with us and holding the position of as our attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to our bid for the project envisaging Bid for _____.at HAFED Mega Food Park, Rohtak including signing and submission of all documents and providing information / responses to HAFED, representing us in all matters before HAFED, and generally dealing with HAFED in all matters in connection with our bid for the said Project.

We hereby agree to ratify all acts, deeds and things lawfully done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

Dated this the Day of ....., …… For _____

(Signature)
(Name, Title and Address)
Signing on behalf of the Bidder/ Lead Member in case of Consortium

Accepted …… (Signature)
(Name, Title and Address of the Attorney)

Agreement Form

Agreement

This agreement, made the _____ day of _____ between _____ (name and address of Employer) [hereinafter called "the Employer"] and _____ (name and address of Contractor) hereinafter called "the Contractor" of the other part.

Whereas the Employer is desirous that the Contractor execute

_____

(name and identification number of Contract) (Hereinafter called "the Works") and the Employer has accepted the Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein, at a cost of Rs.

_____

NOW THIS AGREEMENT WITNESSTH as follows:

1. In this Agreement, words and expression shall have the same meanings as are respectively assigned to tem in the conditions of contract hereinafter referred to and they shall be deemed to form and be read and construed as part of this Agreement.
2. 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 conformity in all aspects with the provisions of the contract.
3. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying the defects wherein 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.
4. The following documents shall be deemed to form and be ready and construed as part of this Agreement viz.
   - i) Letter of Acceptance
   - ii) Notice to proceed with the works;
   - iii) Contractor's Bid
   - iv) Condition of Contract : General and Special
   - v) Contract Data
   - vi) Additional condition
   - vii) Drawings
   - viii) Bill of Quantities and
   - ix) Any other documents listed in the Contract Data as forming part of the Contract.

In witnessed whereof the parties there to 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:

Signed, Sealed and Delivered by the said _____
_____

in the presence of :

Binding Signature of Employer _____

Binding Signature of Contractor _____

Witnesses of Employer	Witnesses of Contractor
1	1
2	2

Section-7

BILL OF QUANTITIES/DNIT

Sr. No.	Description	Unit	Estimated Lump-sum Cost (Rs. in Crores)
1	Planning, Design, Fabrication, Supply, Erection, Testing, Commissioning and Trial Run (3 Months) including Civil, PEB, MEP, Firefighting Works for COLD STORAGE (500 MT), SORTING GRADING (1.5 TPH), WAREHOUSE (500 MT), Complete In all Respect On Turnkey Basis, with annual maintenance and technical operations of three years , with annual maintenance and technical operations of three years At HAFED Mega Food Park, Primary Processing Center Rewari, Haryana	**JOB**	**Rs. 7.14 Crores**

Note:

1. The item wise price of goods to be supplied shall be on F.O.R. site basis inclusive of GST, applicable taxes, duties, freight etc. The item wise price shall also include the charges for packing and forwarding, transportation, transit insurance and all other local costs incidental to delivery of the goods to their final destination, storage insurance and safe custody at site.

2. The bidder should submit the bill of quantities/ individual price break-up of each item, clearly mentioning the item description, makes, model nos., quantities, rate, amount, GST and all applicable Tax if any and total price in numbers as well as in words. Failing to submit the individual price break-up in the asked format shall not be taken into account for evaluation and shall not be considered for award.

3. Bidders must quote their prices for all the three parts. In case the bidder omits any part(s), their bid will be considered as incomplete and treated as non-responsive.

4. Individual price break-up of each item shall be finalized by Competent Authority of HAFED for billing purpose.

5. The item wise price of goods to be supplied shall be on FOR site basis inclusive of applicable taxes & duties. The item wise price shall also include the charges for packing and forwarding, transportation, transit insurance and all other local costs incidental to delivery of the goods to their final destination, storage insurance and safe custody at site.
6. In case of discrepancy between unit price and total price, unit price shall prevail.

7. The item wise quoted price should inclusive of service cover/incidental services during defect liability period of 2 years.

FORM FOR PRICE BID

I/We hereby tender for the execution of the works for the Haryana State Cooperative Supply and Marketing Federation Limited (here in after referred to as HAFED) specified in the underwritten memorandum within the time specified in such memorandum.

Single percentage rates are to be quoted in the box specified below in figures as well as in words above/below applicable on Lump cost mentioned as Estimated cost in Tender documents.

We quote our rates _____ (in figures) above/below which will be applicable on the LS Amount provided in DNIT	We quote our rates _____ (in words) above/below which will be applicable on the LS Amount provided in DNIT

And in accordance, in all respects, with the specifications drawings and instructions in writing referred to in Section 1 to 8 of this document and with such materials as are provided by the Implementing Agency in all other respect in accordance with such conditions so far as applicable. The contract shall be divided in four part (i. SITC Supply Installation Testing and Commissioning, ii. AMC, iii. Operations separately, iv. Civil & PEB).

Enter both the rates in figures as well as in words, only in the space provided above. In the event of variation of rate in figures and words, the lower value only shall be considered. Only single percentage on all items of DNIT/BOQ is to be entered. In case more than one percentage is entered, the tender will liable to be rejected.

MEMORANDUM

(a)	General Description	Planning, Design, Fabrication, Supply, Erection, Testing, Commissioning and Trial Run (3 Months) including Civil, PEB, MEP, Firefighting Works for COLD STORAGE (500 MT), SORTING GRADING (1.5 TPH), WAREHOUSE (500 MT), Complete In all Respect On Turnkey Basis, with annual maintenance and technical operations of three years , with annual maintenance and technical operations of three years At HAFED Mega Food Park, Primary Processing Center Rewari, Haryana
(b)	Estimated Cost	Rs. 714.82 Lakhs
(c)	Earnest Money	Rs. 7.14 Lakhs
(d)	Security to be deducted	5% of all bills (including earnest money)
(e)	Time allowed for completion of capital work	06 (Six) Months

Signature of Contractor

If, this tender is accepted, I/We hereby agree to abide by and fulfill all the terms and provisions of the said conditions of contract annexed hereto so far as applicable or in default thereof forfeit to and pay to the Federation or its successors in office the sums of money mentioned in the said conditions.

The Bank Guarantee of Rs. _____ lakhs is being submitted as EMD for this Bid, the full value of which is to be absolutely forfeited by the Federation or its successors in office without prejudice to any other rights or remedies of the said Federation or its successors in office, if I/We fail to commence the works specified in the above memorandum or otherwise the Bank Guarantee of Rs. _____ Lakhs shall be retained by the Federation on account of the security deposit. Should I/We withdraw or modify the tender within the period of bid validity, my/our earnest money will stand forfeited to the said Federation.

(Signature of the Contractor)

Price Schedule

(To be filled by the technical qualified bidders and submitted in hard copy in sealed envelope to HAFED on the date of financial bid opening)

Planning, Design, Fabrication, Supply, Erection, Testing, Commissioning and Trial Run (3 Months) including Civil, PEB, MEP, Firefighting Works for COLD STORAGE (500 MT), SORTING GRADING (1.5 TPH), WAREHOUSE (500 MT), Complete In all Respect On Turnkey Basis, with annual maintenance and technical operations of three years , with annual maintenance and technical operations of three years At HAFED Mega Food Park, Primary Processing Center Rewari, Haryana

Part –I: SITC (Supply Installation, Testing & Commissioning) of for COLD STORAGE (500 MT), SORTING GRADING (1.5 TPH), WAREHOUSE (500 MT), Trial Run and Civil, MEP, Freighting works

S. NO.	ITEM DESCRIPTION	MAKE	MODEL NO.	QUANTITY	RATE	AMOUNT	PACKING FORWARDING	INSURANCE	GST	FREIGHT	TOTAL

Part II: Annual Maintenance of three years after completion of Defect Liability Period

S. NO.	Per Month Cost for 36 months	

Part III: Technical Operations of three years

S. NO.	Per Month Cost for 36 months	

Part IV: Civil & PEB Works:

S. NO.	Cost above/ below the estimated cost in the BoQ	

Authorized Signatory with official seal

SECTION – 8

Deviation Statement Forms Technical Deviation Statement

(TO BE SUBMITTED AND ATTACHED IN TECHNICAL BID)

Format A: Technical Deviation Statement

(1) The following are the particulars of deviations from the requirements of the tender specifications:

CLAUSE REFERENCE	DEVIATION	JUSTIFICATION	REMARKS

The technical specifications furnished in the bidding document shall prevail over those of any other document forming a part of our bid, except only to the extent of deviations furnished in this statement.

Dated:

Signature and seal of the Manufacturer / Bidder

NOTE:

- Where there is no deviation, the statement should be returned duly signed with an endorsement indication **"NO DEVIATIONS"**

FORMAT-B: Bidding Terms Deviation Statement Form

(2) The following are the particulars of deviations from the requirements of the bidding conditions / terms:

CLAUSE REFERENCE	DEVIATION	JUSTIFICATION	REMARKS

Dated:

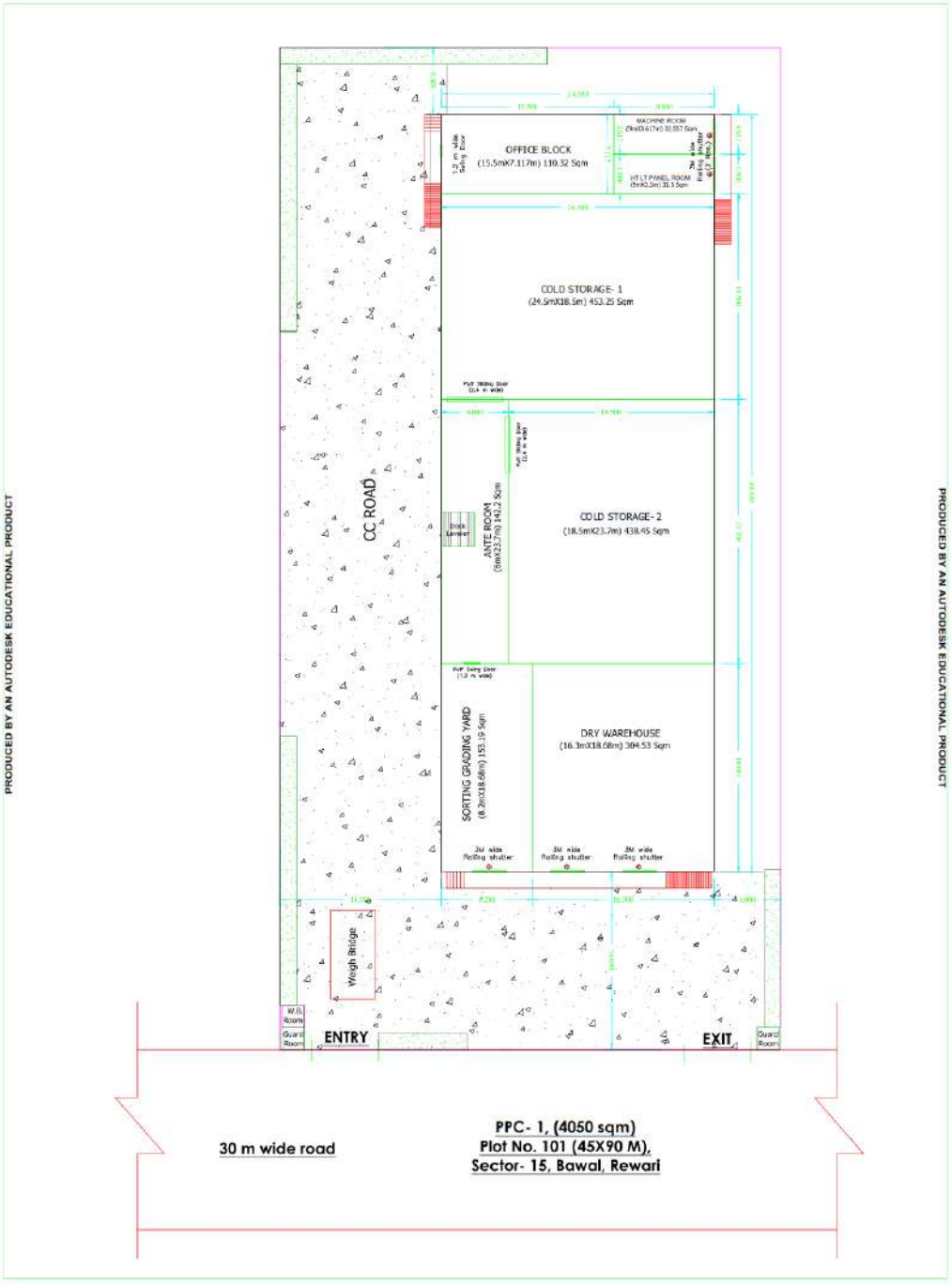
Signature and seal of the

Manufacturer / Bidder

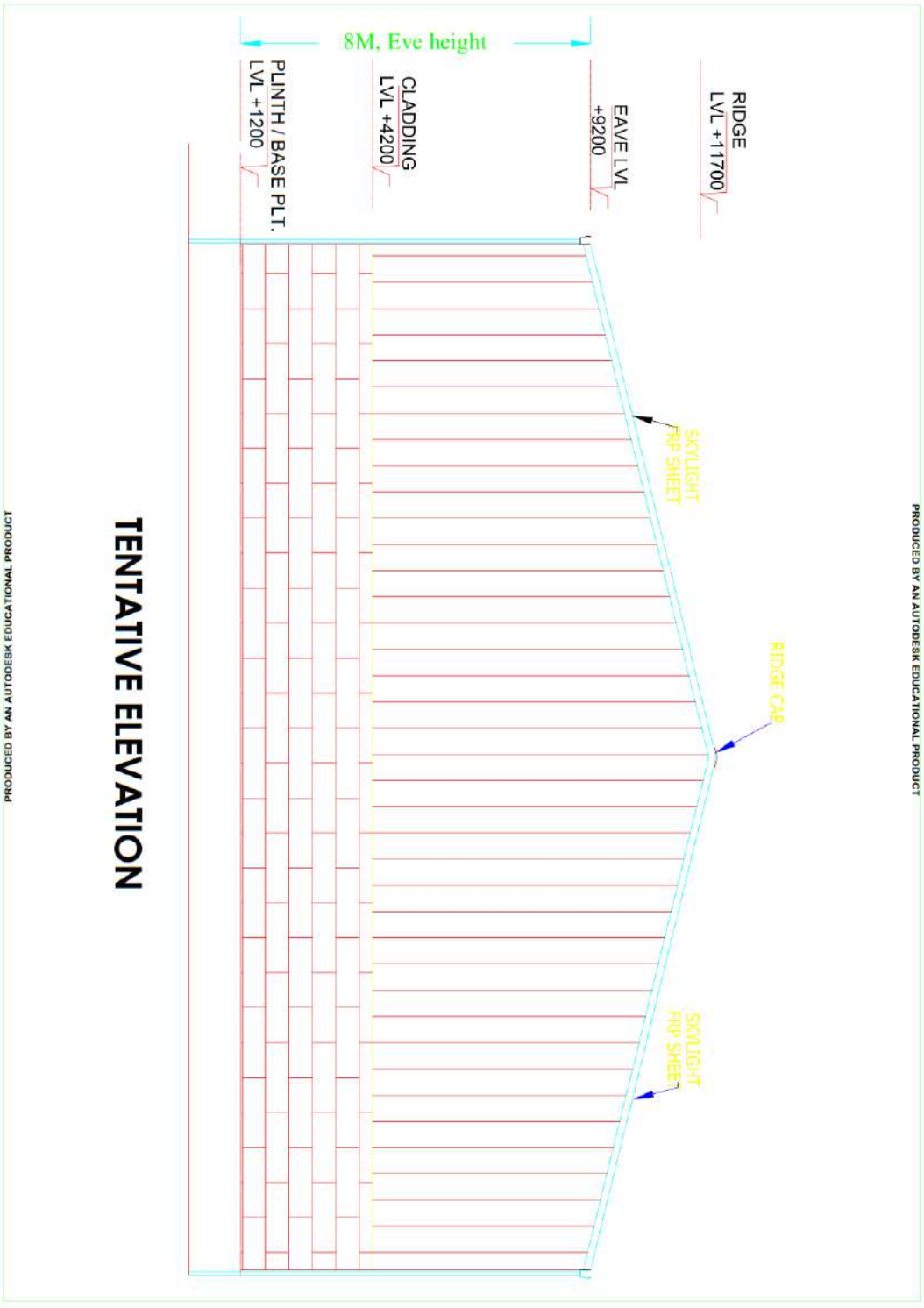
NOTE:

(1) Where there is no deviation, the statement should be returned duly signed with an endorsement indication **"NO DEVIATIONS"**

SECTION- 9 (Layout of Plot and BoQ of Construction Works)



The layout is for indicative purpose. The bidders are advised to propose their own design fulfilling the capacity and government norms.



TENTATIVE ELEVATION

Indicative Cost Summary of Construction Works- Refer Annexure A

PPC at HAFED MFP, Bawal, Rewari.		
Summary of Estimated Cost		
Sr. No.	**Description**	**Amount (Rs.)**
Bill No. 01	Civil Works	3,16,79,564.96
Bill No. 02	Electrical Works	24,24,633.20
Bill No. 03	Plumbing Works	15,57,617.49
Bill No. 04	PEB Works	61,42,035.70
Bill No. 05	Firefighting Works	37,39,535.00
	Total	**4,55,43,386.34**

Estimate for the Civil work of Construction of PPC Building in HAFED MFP, Bawal, Rewari							
Civil Works							
S.No	**Item Source**	**Item Ref.**	**Description**	**Unit**	**Quantity**	**HSR 2021 & DSR-2018 Rate (Rs.)**	**Amount (Rs.) I/C CP**
			CIVIL WORKS				
			EXCAVATION				
1	HSR	4.12.1	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge. All kinds of soil	Cum	1124.0	94.00	1,05,656.00
a	HSR	4.32	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum	569.0	67.00	38,123.00
2	HSR	4.33	Excavating, supplying and filling of local earth (including royalty) by mechanical transport upto a lead of 1 km also including ramming and watering of the earth in layers not exceeding 20 cm in trenches, plinth, sides of foundation etc. complete.	Cum	13299.0	158.00	21,01,242.00
3	NS	NS	Supplying and filling in plinth with Jamuna sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	167.0	852.82	1,42,420.94
4	HSR	4.38.1	Supplying chemical emulsion in sealed containers including delivery as specified.Chlorpyriphos/ Lindane emulsifiable concentrate of 20%	Per ltr	1870.0	194.00	3,62,780.00

a		4.39	Providing and injection chemical emulsion for PRE-CONSTRUCTIONAL antitermite treatment (excluding the cost of chemical emulsion) and creating a chemical barrier under and around the column pits, wall trenches, basement excavation, top surface of plinth filing junction of wall and floor, alongwith the external perimetre of building, expansion joints surrounding of pipes and conduite etc, complete (plinth area of the building at ground floor only shall be measured) using Chlorpyriphos/ Lindane emulsifiable concentrate of 20%	Sq Mt	1870.0	281.00	5,25,470.00
5	HSR	6.1.4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :1:3:6 (1 Cement : 3 coarse sand (zone-III) : 6 graded stone aggregate 20 mm nominal size)	Cum	346.0	3,881.00	13,42,826.00
6	HSR	6.1.2	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1: 2 :4 (1 Cement :2 Coarse sand (zone-III) : 4 graded stone aggregate 20mm nominal size)	Cum	13.0	4,376.00	56,888.00
7	HSR	6.25.1	Providing and laying in position machine batched and machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS: 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. All works upto plinth lvl. (Note :- Cement content considered in this item is @ 330 kg/cum. Less cement used as per design mix is recoverable. However no extra payment shall be made if excess cement is used as per design mix).	Cum	558.0	5,277.00	29,44,566.00

8	HSR	6.25.2	Providing and laying in position machine batched and machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS: 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. All works above plinth level upto floor IV level. (Note :- Cement content considered in this item is @ 330 kg/cum. Less cement used as per design mix is recoverable. However no extra payment shall be made if excess cement is used as per design mix).	Cum	76.0	5,318.00	4,04,168.00
9		6.26.1	Providing M-30 grade concrete instead of M-25 grade BMC/ RMC. (Note:- Cement content considered in M-30 is @	Cum	634.0	60.00	38,040.00
10	HSR	10.115	Two coats of bitumen painting 20/30 penetration @ 1.65 Kg./Sqm.	Sqm	62.0	8.45	523.90
11	HSR	6.29.1	Centering and shuttering including strutting, propping etc. and removal of form work for : **Foundations, footings, bases for columns**	Sqm	1094.0	158.00	1,72,852.00
12	HSR	6.29.3	Centering and shuttering including strutting, propping etc. and removal of form work for : **Columns, piers, abutments, pillars, posts and struts**	Sqm	673.0	384.00	2,58,432.00
13	HSR	6.30.5	Centering and shuttering including strutting, propping etc. and removal of form for : **Lintels, beams, plinth beams, girders, bressumers and cantilevers**	Sqm	2536.0	297.00	7,53,192.00
14	HSR	6.29.2	Centering and shuttering including strutting, propping etc. and removal of form work for : **Retaining walls, return walls, walls (any thickness) including attached pilasters, buttresses, plinth and string courses fillets, kerbs and steps etc.**	Sqm	810.00	319.00	2,58,390.00
15	HSR	6.30.3	Centering and shuttering including strutting, propping etc. and removal of form for : **Suspended floors, roofs, landings, balconies and access platform**	Sqm	82.0	364.00	29,848.00

16	HSR	6.33.6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. : **Thermo-Mechanically Treated bars of grade Fe-500D or more.**	Kg	99803.0	69.00	68,86,407.00
17	HSR		Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level.: **Thermo-Mechanically Treated bars of grade Fe-500D or more.**	Kg	7560.0	69.00	5,21,640.00
			BRICK WORK IN CEMENT MORTAR				
18	HSR	7.21.1	Brick work with common burnt clay non-modular bricks of class designation 7.5 in foundation and plinth in: **Cement mortar 1:4 (1 cement : 4 coarse sand)**	Cum	497.0	5,549.00	27,57,853.00
19	HSR	7.23.1	Brick work with common burnt clay machine moulded perforated bricks of class designation 12.5 conforming to IS: 2222 in superstructure above plinth level up to floor four level in cement mortar 1:6 (1 cement : 6 coarse sand) : **With non-modular bricks**	Cum	215.0	5,579.00	11,99,485.00
20	HSR	7.28.1	Half brick masonry with common burnt clay non-modular bricks of class designation 7.5 in superstructure above plinth level up to floor IV level. : **Cement mortar 1:3 (1 cement :3 coarse sand)**	Sqm	35.0	728.00	25,480.00
			FLOORING AND DADOS				
21	HSR	10.63.2	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3 kg/ sqm including grouting the joints with white cement and matching pigments etc., complete : **Size of Tile 600x600 mm**	Sqm	124.0	985.00	1,22,140.00

22	HSR	10.67.2	Providing and laying Vitrified tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08 % and conforming to I.S. 15622, of approved make, in all colours & shade, in skirting, riser of steps, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), jointing with grey cement slurry @ 3.3 kg/ sqm including grouting the joint with white cement & matching pigments etc. complete : **Size of Tile 600x600 mm**	sqm	8.0	994.00	7,952.00
23	HSR	10.37.1	Providing and fixing of Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) **: 25mm thick**	Sqm	27.0	988.00	26,676.00
24	HSR	10.38	Providing and fixing of Kota stone slabs 20 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.	Sqm	6.0	1,036.00	6,216.00
25	HSR	10.43	Extra for Kota stone/ sand stone in treads of steps and risers using single length up to 1.05 metre. (labour rate only)	Sqm	10.0	14.00	140.00
26	HSR	10.42	Extra for pre finished nosing in treads of steps of Kota stone/ sand stone slab. (labour rate only)	Meter	20.0	78.00	1,560.00
27	HSR	10.57	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), Jointing with grey cement slurry @ 3.3 kg/sqm including pointing the joints with white cement and matching pigment etc., complete.	Sqm	18.0	541.00	9,738.00

28	HSR	11.58	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (thickness to be specified by the manufacturer) of approved make in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge in skirting, risers of steps and dados over 12 mm thick bed of cement Mortar 1:3 (1 cement: 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	Sqm	141.0	537.00	75,717.00
29	HSR	11.39	Washed stone grit plaster on exterior walls height upto 10 metre above ground level, in two layers, under layer 12 mm cement plaster 1:4 (1 cement : 4 coarse sand), furrowing the under layer with scratching tool, applying cement slurry on the under layer @ 2 kg of cement per square metre, top layer 15 mm cement plaster 1:1/ 2:2 (1 cement: 1/2 coarse sand : 2 stone chipping 10 mm nominal size), in panels with groove all around as per approved pattern, including scrubbing and washing the top layer with brushes and water to expose the stone chippings ,complete as per specification and direction of Engineer-in-charge (payment for providing grooves shall be made separately).	sqm	837.0	443.00	3,70,791.00
30	HSR	11.40.0	Forming groove of uniform size in the top layer of washed stone grit plaster as per approved pattern using wooden battens, nailed to the under layer, including removal of wooden battens, repair to the edges of panels and finishing the groove complete as per specifications and direction of the Engineer-in-charge :				
	HSR	11.40.1	15 mm wide and 15 mm deep groove	meter	763.0	23.00	17,549.00
a	HSR	11.44	Extra for using white cement in place of ordinary cement in the top layar of the item of washed stone girt plaster	Sqm	837.0	71.00	59,427.00

b	NS	NS	Extra for using marble stone chips & Marble power instead of stone chips & Coarse sand in top layar 15mm thick washed stone grid plaster 1: 1/4:1/ 4 (1 Cement, 1/4 Marble power :1/4 Coarse snad, 2 marble chips & 2 Stone chipping 10 mm nominal size) complete as per specification and direction of Engineer-in- charge.	Sqm	837.0	54.10	45,281.70
31	HSR	11.1.1	6 mm cement plaster of mix : 1:3 (1 cement : 3 fine sand)	Sqm	36.0	112.00	4,032.00
32	HSR	11.5.2	12 mm thick cement plaster : 1:3 (1 cement: 3 fine sand) on walls.	Sqm	1859.4	151.00	2,80,769.62
33	HSR	11.6.1	15 mm cement plaster on the rough side of single or half brick wall of mix : **1:4 (1 cement: 4 fine sand)**	Sqm	118.0	162.00	19,116.00
34	HSR	9.10	Painting top of roofs with bitumen of approved quality @ 17kg per 10 sqm impregnated with a coat of coarse sand at 60 cudm per 10 sqm, including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete :				
		9.10.1	with residual type petroleum bitumen of grade VG -10	Sqm	34.0	93.00	3,162.00
35	HSR	9.12.1	10cm thick (average) mud phaska of damped brick earth on roofs laid to slope consolidated and plastered with 25 mm thick mud mortar with bhusha @ 35 kg per cum of earth and gobri leaping with mix 1:1 (1 clay : 1 cow-dung) and covered with machine moulded tile bricks, grouted with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% of integral water proofing compound by weight of cement and finished neat : **With machine moulded common burnt clay non-modular brick tiles of class designation 12.5, conforming to IS 2690**	Sqm	34.0	551.00	18,734.00
36	HSR	9.18	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1 m x1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3 coarse sand) and a coat of neat cement, rounding the edges and making and finishing the outlet complete.	nos	6.0	151.00	906.00

37	HSR	9.17.1	Providing gola 75x75 mm in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10 mm and down gauge), including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design : **In 75x75 mm deep chase**	Rmt	24.0	115	2,760.00
38	HSR	9.55.5	Supplying and fixing in position 60 cm long G.I. pipe class 'B' spouts in chajjas and cantilevers : **50 mm internal dia** (Provision only)	Each	2.0	303	606.00
39	HSR	9.57.3	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion, (i) Single socketed pipes.				
a			150mm dia pvc pipe	Mtr	150.0	264.00	39,600.00
40	HSR	9.58.5.3	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.				
a		(b)	150mm dia pvc bend	Each	20.0	128.00	2,560.00
41		11.60.1	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	Sqm	2074.2	58.00	1,20,301.07
42		11.69.2	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content. : **With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre**	Sqm	2074.2	26.00	53,928.07
43	HSR	11.71.1	Wall painting on a cement plaster surface with acrylic emulsion paint of approved brand and manufacture to give an even shade : two or more coats on new work	Sqm	2074.2	64.00	1,32,746.01
44	HSR	11.78	Painting two coats excluding priming coat with synthetic enamel paint in all shades on new wood work or metallic or plastered or concrete surfaces to give an even shade.	Sqm	211.9	36.00	7,630.18

45	HSR	32.47.1	Providing and fixing mineral fibre false ceiling tiles at all heights of size 595X595mm of approved texture, design and pattern. The tiles should have Humidity Resistance (RH) of 99%, Light Reflectance ≥ 85%, Thermal Conductivity k = 0.052 - 0.057 w/m K, Fire Performance as per (BS 476 pt - 6 &7)in true horizontal level suspended on interlocking T-Grid of hot dipped all round galvanized iron section of 0.33 mm thick (galvanized @120 gsm) comprising of main T runners of 15x32 mm of length 3000 mm, cross T of size 15x32mm of length 1200 mm and secondary intermediate cross T of size 15x32 mm of length 600 mm to form grid module of size 600x600 mm suspended from ceiling using galvanized mild steel item (galvanised@80gsm) 50 mm long 8mm outer diameter M-6 dash fasteners, 6 mm diameter fully threaded hanger rod up to 1000 mm length and L-shape level adjuster of size 85x25x2 mm, spaced at 1200 mm centre to centre along main 'T'. The system should rest on periphery walls /partitions with the help of GI perimeter wall angle of size24x24X3000 mm made of 0.40 mm thick sheet, to be fixed to the wall with help of plastic rawl plug at 450 mm centre to centre & 40 mm long dry wall S.S. screws. The exposed bottom portion of all T- sections used in false ceiling support system shall be pre-painted with polyester baked paint, for all heights. The work shall be carried out as per specifications, drawings and as per directions of the engineer-in-charge. : **With 16 mm thick beveled tegular mineral fibre false ceiling tile (NRC 0.55 to 0.6**	Sqm	119.4	1,488.00	1,77,667.20
			JOINERY				

46	HSR	12.157.1.3	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) : **Polyester powder coated aluminium (minimum thickness of polyester powder coating 50 micron)**	Kg	822.0	352.00	2,89,344.00
47		12.157.2.3	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required (Fittings shall be paid for separately) : **Polyester powder coated aluminium (minimum thickness of polyester powder coating 50 micron)**	Kg	822.0	403.00	3,31,266.00
48		12.158.2	Providing and fixing 12 mm thick prelaminated particle board flat pressed three layer or graded wood particle board conforming to IS: 12823 Grade l Type ll, in panelling fixed in aluminum doors, windows shutters and partition frames with C.P. brass / stainless steel screws etc. complete as per architectural drawings and directions of engineer-in-charge. Pre-laminated particle board with decorative lamination on both sides	Sqm	20.0	776.00	15,520.00

49		12.160.1	Providing and fixing double action hydraulic floor spring of approved brand and manufacture conforming to IS : 6315, having brand logo embossed on the body / plate with double spring mechanism and door weight upto 125 kg, for doors, including cost of cutting floors, embedding in floors as required and making good the same matching to the existing floor finishing and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-incharge. With stainless steel cover plate minimum 1.25 mm thickness	Each	4.0	1,871.00	7,484.00
50	HSR	12.159.2	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge . (Cost of aluminium snap beading shall be paid in basic item):				
a		(b)	With float glass panes of 5 mm thickness (weight not less than 12.50 kg/sqm)	Sqm	65.4	907.00	59,317.80
51		12.162.3	Providing and fixing stainless steel (SS 304 grade) adjustable friction windows stays of approved quality with necessary stainless steel screws etc. to the side hung windows as per direction of Engineer-in-charge complete : (355 X 19 mm)	Each	24.0	233.00	5,592.00
52		12.164	Providing and fixing Brass 100mm mortice latch and lock with 6 levers without pair of handles (best make of approved quality) for aluminium doors including necessary cutting and making good etc. complete.	Each	10.0	316.00	3,160.00
53		12.166.2	Providing and fixing aluminium casement windows fastener of required length for aluminium windows with necessary screws etc. complete : **Powder coated minimum thickness 50 micron aluminium**	Each	50.0	58.00	2,900.00
54		12.167.2	Providing and fixing aluminium round shape handle of outer dia 100 mm with SS screws etc. complete as per direction of Engineer-in-charge : **Powder coated minimum thickness 50 micron aluminium**	Each	20.0	68.00	1,360.00

55		12.169.1	Filling the gap in between aluminium frame & adjacent RCC/ Brick/ Stone work by providing weather silicon sealant over backer rod of approved quality as per architectural drawings and direction of Engineer-in-charge complete. : **Upto 5mm depth and 5 mm width**	mete r	200.0	39.00	7,800.00
56		12.173	Providing and fixing bright finished 100 mm mortice lock with 6 levers without pair of handles of approved quality for aluminium door, with necessary screws etc complete as per direction of Engineer- in-charge.	Each	20.0	486.00	9,720.00
57	HSR	12.143	Providing and fixing Fiber Glass Reinforced plastic (FRP) Door Frames of cross-section 90 mm x 45 mm having single rebate of 32 mm x 15 mm to receive shutter of 30 mm thickness. The laminate shall be moulded with fire resistant grade unsaturated polyester resin and chopped mat. Door frame laminate shall be 2mm thick and shall be filled with suitable wooden block in all the three legs. The frame shall be covered with fiber glass from all sides. M.S. stay shall be provided at the bottom to steady the frame.	Mtr	14.9	553	8,212.05
58	HSR	12.144.2	Providing and fixing to existing door frames- 30 mm thick Fiberglass Reinforced Plastic (F.R.P.) flush door shutter in different plain and wood finish made with fire retardant grade unsaturated polyester resin, moulded to 3 mm thick FRP laminate all around, with suitable wooden blocks inside at required places for fixing of fittings and polyurethane foam (PUF)/Polystyrene foam to be used as filler material throughout the hollow panel, casted monolithically with testing parameters of F.R.P. laminate conforming to table - 3 of IS: 14856, complete as per direction of Engineer-in-charge.	Sqm	6.0	3,202.0	19,212.00

59	HSR	13.37.1	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of adequate strength conforming to IS: 4454 - part 1 and M.S. top cover of required thickness for rolling shutters.-				
a			80x1.25 mm M.S. laths with 1.25 mm thick top cover	Sqm	105.0	1,962.00	2,06,010.00
60	HSR	13.38	Providing and fixing ball bearing for rolling shutters.	each	5.0	317.00	1,585.00
61	HSR	13.39.1	Extra for providing mechanical device chain and crank operation for operating rolling shutters- Exceeding 10.00 sqm and upto 16.80 sqm in the area	Sqm	105.0	924.00	97,020.00
62		13.40	Extra for providing grilled rolling shutters manufactured out of 8 mm dia M.S. bar instead of laths as per design approved by Engineer-in- charge, (area of grill to be measured).	Sqm	20.0	571.00	11,420.00
			External Development				
63	**HSR**	6.1.4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : **1:3:6 (1 Cement : 3 coarse sand (zone-III) : 6 graded stone aggregate 20 mm nominal size)**	Cum	365.0	3,881.00	14,16,565.00

64	**HSR**	6.24.1	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying , excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge.:**All works upto plinth level**	Cum	608.0	5,620.00	34,16,960.00
65		6.26.3	Extra for providing richer mixes up to plinth and at all floor levels.: **Providing M-40 grade concrete instead of M-25 grade BMC/ RMC.(Note : Cement content considered in M-40 is @**	Cum	608.0	179.00	1,08,832.00
66	HSR	6.39.1	Providing and fixing at or near ground level precast cement concrete in kerbs, edgings etc. as per approved pattern and setting in position with cement mortar 1:3 (1 Cement : 3 coarse sand), including the cost of required centering, shuttering complete.: 1:1½:3 (1 Cement: 1½ coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size).	cum	71.0	4,958.00	3,52,018.00
67	HSR	13.42.1	Providing and fixing hand rail of approved size by welding etc. to steel ladder railing, balcony railing, staircase railing and similar works, including applying priming coat of approved steel primer. M.S. Tube	kg	400.0	106.00	42,400.00
67	NS	NS	Providing and laying C.C. pavement of mix M-30 with ready mixed concrete from batching plant. The ready mixed concrete shall be laid and finished with screed board vibrator , vacuum dewatering process and finally finished by floating, brooming with wire brush etc. complete as per specifications and directions of Engineer-in-charge. (The panel shuttering work shall be paid for separately). to give an even shade :	cum	255.0	5601.38	14,28,351.29

69	NS	NS	Providing and cuttting groove 10/5mm & to be filled with FIBEAL JSP 700 of Fibrex or equivalent make in a groove. Ensure that the groove or expansion joint to be treated should be free from all contaminants, dirt, dust, debris and unsound material in order to attain proper bonding. Moisture content should be less than 4%-6%. Apply masking tape on both edges of the groove or expansion joint in a straight line fashion.	cum	1100.0	110.00	1,21,000.00
70	HSR	13.28	Structural steel work in girders or stanchions built up one joint or channel sections welded including cutting and fixing all gusset plate bolts nuts welding rods etc complete with flange plates heads sole plates angle connections etc with hoisting and erecting in positition				
		a	With one R.S Joint	Kg	10272.4	74.00	7,60,156.13
71		6.13	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	sqm	52.2	357.00	18,635.40
			AREA DEVELOPMENT				
72	HSR	24.1	Preparation of sub grade, including trenching, rough dressing of spoil final dressing of earth,to given levels and camber, watering, rolling with road roller, and compacting the bed	100 sqm	2430.0	0.92	2,235.60
73		NS	Providing and laying of compacted Granular Sub Base Grading-I, in two layers including preparation and compaction complete as per MORT&H specification Clause 401.	cum	365.0	1,100.00	4,01,500.00
			TOTAL				**3,16,79,564.96**

Estimate for the Electrical work of Construction of PPC Building , Bawal							
Electrical Works							
S.No	**Item Source**	**Item Ref.**	**Description**	**Unit**	**Quantity**	**HSR 2021 & DSR E & M-2018 Rate (Rs.)**	**Amount (Rs.) I/C CP**
1			**MAIN PANEL**				
	Market Rate	MR	Supply with all standard accessories & fixtures including testing at Factory & at Site. Receiving, unloading, Storing, Shifting, installing, commissioning of incoming & outgoing cable at site location	Set	1	76,840.00	76,840.00
			INCOMER				
			1No. 100A TPN MCCB (25KA)				
			METERING & INDICATION				
			1 set of R,Y,B phase indicating lamps with 6Amp SP MCB (3nos)				
			CT Operated Dual resistor Multifunction meter 3 nos				
			BUS-BAR				
			1 Set of 200A, TPN Aluminium Bus Bar with colour coded PVC Sleeves				
			OUTGOINGS				
			8 Nos. 63A 4 pole C Curve				
			Supply of weatherproof 20/32A SPN Metal Clad Socket with DP 16/32 DP MCB				
2			**Industrial Socket Outlets**				

	DSR E & M 2018		Supply, installation, testing & commissioning of weather proof type (IP 65) industrial type plug and socket outlet with MCB's (10 KA motor duty) mounted In a factory fabricated enclosure including termination, earthing etc as required				
		DSR18(E& M) 2.18	20/32A metal clad SPN Socket outlet controlled by 16/20/32A DP MCB.	Set	4	1,232.00	4,928.00
3			**CABLES, SUB MAINS & CABLE TRAYS:**				
			LT Cables:				
		24.2.2	Laying of underground cable 0.75 metre below ground level covered with sand and bricks including excavation and refilling of trenches.:-				
a	HSR	24.2.2.3	50 Sq mm to 150 sqmm 2 to 4 Core	RM	180	215.00	38,700.00
4			**Cable Termination:**				
		24.2.8	Supply and erection of aluminium lugs heavy duty including crimping etc. upto the entire satisfaction of the Engineerin-charge of the work.				
a	HSR	24.2.8.7	50 sqmm	Set	6	15.00	90.00
		20.106	Supply, erection, testing & commissioning in LT cables PVC aluminum armoured / copper cable including cost of thimbles, lugs for making connection underground covered with sand and bricks / in trench / in pipe on steel bridges (detail of cable sizes & length to be provided be clearly mentioned) for making following connection complete as per directions of Engineer-in-charge				

a	HSR	20.106.1	from transformer to LT panel 1100 V grade 3.1/2 core 10 Sq. mm XLPE or for motor side 3 core aluminum 2x6 sq.mm XLPE	RM	180	180.00	32,400.00
5			**Cable Trays:**				
	DSR E & M 2018	DSR18(E& M) 4.1.8	Supplying and installing following size of perforated painted with powder coating M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc as required.				
		a	300 mm wide x 62.5mm depth x 2.0mm thickness	RM	100	599.00	59,900.00
6			**GI Pipe**				
	DSR E & M 2018	DSR2018 (E & M) 14.13.2	Supply and installation of following sizes of `B' class GI pipe for cable sleeves in recess/ on surface/Ground complete with all accessories pull boxes where ever required, G.I. fish wire, fixing hardware etc. including the chasing of wall/floor, and plastering the chased portion, digging the trench and back filling, making good the damages, sealing of pipe entry etc as required.				
			Providing, laying and fixing following dia GI pipe (medium class) in ground complete with GI fittings including trenching (75cm deep) and refelling etc as required - 80 mm dia	RM	75	803.00	60,225.00
7			**WIRING**				

a	DSR 2018(EM)	1.3.3	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required. (GROUP C)				
		(a)	Group C	Each	100	1213	1,21,300.00
b	DSR 2018 (EM)	1.12	Wiring for light/ power plug with 2X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit along with 1 No. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	Mtr	600	200.00	1,20,000.00
c	DSR 2018 (EM	1.13	Wiring for light/ power plug with 4X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit alongwith 2 Nos. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	Mtr	400	308.00	1,23,200.00
d	DSR 2018 (EM)	1.14	Wiring for circuit / submain wiring alongwith earth wire with the following sizes of FR PVC insulated copper conductor single core cables in surface/recessed PVC conduit complete as required				
		1.14.3	2 X 4 sq. mm + 1 X 4 sq. mm earth wire - Ground Floor	mtr	600	200	1,20,000.00
8			SUBMAIN WIRING				
a	DSR 2018(EM)	1.14.9	4 X 6 sq. mm + 2 X 6 sq. mm earth wire	mtr	400	394	1,57,600.00
b	DSR 2018(EM)	1.14.10	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	mtr	600	543	3,25,800.00

9		23.8.10	Providing and fixing GI concealed sheet metal boxes with inner and outer face plate including concealing the box in wall and fixing in position with inner plate and face plate with all labour and material required for the job complete in all respects.				
		23.8.10.1	1 & 2 Modules including combined plate for Telephone and data	Each	10	92	920.00
		23.8.10.2	3 Modules	Each	10	125	1,250.00
		23.8.10.3	4 Modules	Each	20	138	2,760.00
		23.8.10.4	6 Modules	Each	20	182	3,640.00
		23.8.10.5	8 Modules	Each	30	229	6,870.00
		23.8.10.6	12 Modules	Each	20	278	5,560.00
10	HSR	23.8.11	Providing and fixing modular type accessories of approved make in existing box including fixing and making necessary connections, complete in all respect.				
		23.8.11.1	5 amp 1 way switch	Each	50	40	2,000.00
		23.8.11.2	5 amp 2 way switch	Each	40	73	2,920.00
		23.8.11.3	15 amp 1 way switch	Each	50	81	4,050.00
		23.8.11.4	5 amp Socket	Each	50	81	4,050.00
		23.8.11.5	15 amp 6 pin Socket	Each	30	122	3,660.00

		23.8.11.6	Bell Push	Each	2	75	150.00
		23.8.11.7	step type Fan Regulator 2 modules 300 watt	Each	20	253	5,060.00
		23.8.11.10	Blanking plate	Each	50	18	900.00
11			**CONDUITS**				
	HSR	23.7.6	Supply and erection of PVC CONDUIT ISI marked (Medium) recessed in wall/ceiling etc. including the cost of PVC bends, inspection boxes, iron hooks and cement concrete etc. complete in all respect up to the entire satisfaction of Engineer-in-Charge of work				
a		23.7.6.3	PVC pipe of 32 mm dia.	mtr	250	44.00	11,000.00
12			**VERTICAL/MULTITIER DISTRIBUTION BOARD**				
			Supply & Installation, testing & commissioning of following surface/reccesed Distribution Board (I.P-42 Protection), fabricated out of 16SWG, CRCA sheet indoor type, dust & vermin proof, hinged complete with bus bar, Internal connection, numbering,earthing, painting complete as required.				
			Make-ABB/Schneider				
			8W SPN DB				
	DSR E & M 2018	Basic Rate DSR 2018 (E&M) 1737	2+10 way, SPN, double door, MCB DB	Set	4	936.00	3,744.00
i			Incoming :				

-	DSR E & M 2018	Basic Rate DSR 2018 (E&M) 1710	6 amps to 32 amps ratings , TPN MCB "C" curve 10KA breaking capacity	nos	40	776.00	31,040.00
ii			Outgoings :				
-	DSR E & M 2018	Basic Rate DSR 2018 (E&M) 1707	6 amps to 32 amps ratings , SPN MCB "C" curve 10KA breaking capacity	Set	40	362.40	14,496.00
13			**LIGHT FIXTURES**				
			Supply following type of light fixtures with installation arrangement & proper support etc. complete as required. (Light Fixture Hang From the ceiling Height upto 11mtr or as per site requirement)				
a	Market Rate	MR	High bay Led 100W 240 v 0.440 A PF >0.95 THD <10 CT 5700K CRI >70 10000 lm	each	15	11,760.00	1,76,400.00
b	Market Rate	MR	supply and fixing of 1'X1' 24 WAtt LED light of Rossete /philips complete	each	40	7,000.00	2,80,000.00
		MR	72 watt LED with lens S/2 litting with having min. Of 7200 lumens & lumen efficence100 LPW, fitting should be IP/66/65 irrgress protection with interval lurge protection of min 5 KV Make-BAJAJ/Philips/Crompton /Halomix/ Jaquar/Surya Roshni		20	9,395.11	1,87,902.20
13			**EARTHING PITS & LIGHTENING CONDUCTOR**				

		24.1.1	Earthing with GL earth pipe 4.5 m long and 40 mm dia with masonry enclosures on the top etc. (but without charcoal or coke and salt) as required.	Each	4	2,736.00	10,944.00
		24.1.2	Extra for using salt and char coal/coke for pipe earth electrode as required.	Each	4	642.00	2,568.00
a	HSR	24.1.4	Earthing with G.I. earth plate 600 mmx 600 mm x 6 mm thick including accessories and providing masonry enclosures with cover plate having locking arrangement and watering pipe etc. (but without charcoal or coke and salt) complete as required.	each	6	8,202.00	49,212.00
b	HSR	24.1.16	Supply and erection of 25mm dia 1.5 metre long lightning GI. tube rod tapered into a point at the top with 16cm x 16cm x 3mm thick G.I. base plate and necessary nuts and bolts with washers.	Each	6	884.00	5,304.00
c	HSR	24.1.9	Providing and fixing 25 mm x5 mm copper strip in 40 mm dia G.I. pipe from earth electrode as required.	Metr e	40	719.00	28,760.00
14			**External light**				
	HSR	24.4.8	Supply of Hot Dip Galvanized octagonal pole of 3mm thickness, with base plate including cost of nut and bolts , earthing studs, Integral Cable termination arrangement 5 mm thick Bakellite base plate on suitable welded MS/GI bracket 32 A four way connector 2 no 10 A SP MCB , end cover and all accessories as supplied by the manufacture.				
		24.4.8.5	7 Mtr Long pole with top dia 75 0mm and bottom dia 150 mm with base plate of size 300 x 300x 20mm	Each	20	8,487.00	1,69,740.00

		24.4.4.3	Street Light Erection of street light fitting on the pole including the cost of petty material required (irrespective of height/length of bracket) At pole above 7m but upto the height of 9m	Each	20	118.00	2360.00
		24.8.5	Providing RCC foundation of M25 grade (1 Cement:1 Stone aggregate: 2 Coarse sand) i/c excavation, steel reinforcement (Fe 500) @ 70 kg/cum of concrete contents, concrete cover 50mm, anchor bolts etc. over a bed of PCC 1:5:10 of required dimensions for octagonal poles of various heights as per following specifications complete in all respects and as per directions of Engineer-in-charge 7m high pole	per foun datio n	20	5,369.00	1,07,380.00
		24.4.4.3	Street Light Erection of street light fitting on the pole including the cost of petty material required (irrespective of height/length of bracket) At pole above 7m but upto the height of 9m	each	20	118.00	2,360.00
		24.5.2	S/E mark double walled corrugated (DWC) HDPE, pipe 10 Kg/Cm2 ,laid 0.75 Mtr below ground level including diging and refilling of earth including cost of suitable size socket/cuppler for HDPE pipe including the cost of labour and material required to complete the job in all respect up to the entire satisfaction of Engineer in charge of the work				
		24.5.2.3	HDPE pipe 63/50 mm outer dia/ inner dia	Mtr	300	122	36,600.00
			Total Electrical Works				**24,24,633.20**

PEB WORKS

Providing and installing Pre Engineered Building (PEB) comprising of pre-fabricated steel portals with rod / angle bracings as per drawing. 26 G Colored Galvalume 0.5mm thick TCT wall sheeting. 26 G Bare Galvalume 0.5mm thick TCT (Total Coated Thickness) roof sheeting with daylight panel on 2% of Roof Area & turbo vents for ventilation. All primary and secondary members with Red Oxide primer and synthetic enamel paint. And The shed shall be supplied with all necessary fittings, fasteners, EPDM gaskets / washers & flashings & rain water pipes (0.5mm thick colour coated galvalume sheet). The pre-fab shed wok should be carried out by a specialized approved agency having in house manufacturing facility and having ISO : 9001 certification for both manufacturing and contracting. The design and engineering and supply and installation shall be in the scope of the vendor.

S.No.	Description of Item	Qty	Unit	Supply Charges		Erection Charges		
				Rate	Amount	Rate	Amount	Final Cost
1	**Structural Steel -** Primary & Secondary Steel complete with primer & 2 coats of synthetic enamel paint (applied at site)	35900	Kg.	76.00	27,28,400.00	8.50	3,05,150.00	**30,33,550.00**
2	**Roofing** - HI RIB SMP 0.50 Galvalume with screws	1710	Sq.mtr.	405.00	6,92,550.00	50.00	85,500.00	**7,78,050.00**
3	**Insulation - 50**mm thick 16 kg/m3 density Alum Foil	1710	Sq.mtr.	150.00	2,56,500.00	20.00	34,200.00	**2,90,700.00**
4	**Cladding** - HI RIB SMP 0.50 Galvalume with screws	2133	Sq.mtr.	405.00	8,63,865.00	50.00	1,06,650.00	**9,70,515.00**
5	**Day Light Panels** - Polycarbonate 2.00mm	51.3	Sq.mtr.	950.00	48,735.00	50.00	2,565.00	**51,300.00**
6	**Turbo Ventilators 600mm**	18	Nos.	4,000.00	72,000.00	500.00	9,000.00	**81,000.00**
	Total				**46,62,050.00**		**5,43,065.00**	**52,05,115.00**
	ADD 18% GST							**9,36,920.70**
	Total							**61,42,035.70**

Estimate for the plumbing work of Construction of PPC Building in Mega Food Park at Indl. Estate, Bawal							
PLUMBING WORKS							
S.No	**Item Source**	**Item Ref.**	**Description**	**Unit**	**Quantity**	**HSR 2021 & DSR-2018 Rate (Rs.)**	**Amount (Rs.) I/C CP**
1	HSR	22.24	Providing and fixing white vitreous chinaware pedestal type water closet (European type) with seat and lid, 10 litre low level white vitreous chinaware flushing cistern & C.P. flush bend with fittings & C.I. brackets, 40 mm flush bend, overflow arrangement with specials of standard make and mosquito proof coupling of approved municipal design complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required :				
		22.24.1	W.C. pan with ISI marked white solid plastic seat and lid	each	3	4,317.00	12,951.00
2	HSR	22.42	Providing and fixing toilet paper holder :				
		22.42.2	vitreous chinaware- white	each	3	248.00	744.00
3	HSR	22.10	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require:				
	b	22.1.1	White vitreous chinaware Wash basin size 630x450 mm with a pair of 15 mm C.P. brass pillar taps	each	3	1994	5,982.00
4	HSR	22.14.1.1	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete. (semi girid pipe): 32 mm dia	each	3	45	135.00

5	HSR	22.17.1	Providing and fixing 40mm i/d chromium plated trap with chromium plated pipe to wall with walflange completed for use with sinks: With Bottle Trap (Indian make)	each	8	869	6,952.00
6	HSR	22.35	Providing and fixing G.I. inlet connection for flush pipe connecting with W.C. pan.	each	3	79	237.00
7	HSR	22.26.4	Providing and fixing white vitreous chinaware flat back half stall urinal of size 580x380x350 mm with white PVC flushing cistern, with fittings, standard size C.P. brass flush pipe, spreaders with unions and clamps (all in C.P. brass) with waste fitting as per IS : 2556, C.I. trap with outlet grating and other couplings in C.P. brass, including painting of fittings and cutting and making good the walls and floors wherever required :				
a		i	Range of three half stall urinals with 10 litre P.V.C. automatic flushing cistern-white	each	3	9,093.00	27,279.00
8	HSR	30.40	Providing and Fixing 25mm thick marble backs for different type of urinals (b) viterous China Ware partition wall (I) small sze 680x 330mm				
a		b(I)(i)	White	each	3	833.80	2,501.40
9	HSR	22.119.2	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fittings arrangement of approved quality and colour. : 600 mm long towel rail with total length of 645 mm, width 78 mm and effective height of 88 mm, weighing not less than 190 gms.	each	2	353.00	706.00
10	HSR	22.10.1.3	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS:13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required : kitchen				

			shink with drain board				
a		a	510x1040 mm bowl depth 200 mm	each	1	4,026.00	4,026.00
11	HSR	22.210.4	Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with plastic moulded frame of approved make and shade with 6 mm thick hard board backing :				
a		a(ii)	Rectangular shape 1500x450 mm	each	3	1,253.00	3,759.00
12	HSR	22.20.2	Providing and fixing in position super quality 65 mm i/d opening CP brass dome type hinged grating weighing about 750gram fixed in cement mortar 1:2 complete in all respect (as required by engineer in charge) :	each	3	67.50	202.50
13	HSR	22.81.1	Cutting chases in brick walls in cement or in floorfor embedding GI or HCI PIPELINE AND making good the same to its original conditions.:				
a		b	150 mm dia.	metre	3	9.00	27.00
14	HSR	22.20.1	Provinding and fixing in position C.I. plain Nahani Trap conforming to I.S.I. specifications and of self cleaning design with C.P. brass hinged grating with frame complete		3	1,353.00	4,059.00
a		b	Providing and fixing 75 mm outlet plain nahani trap.	each			
15	HSR	22.92.2	Making connection of G.I. distribution branch with G.I. main of following sizes by providing and fixing tee, including cutting andthreading the pipe etc. complete : 50 to 80 mm nominal bore	each	3	834.00	2,502.00

16	HSR	22.105.1	Providing and fixing C.P. brass long nose bib cock of approved quality conforming to IS standards and weighing not less than 810 gms.				
a		c	15 mm nominal bore	each	3	504.00	1,512.00
17	HSR	22.106.1	Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standards and weighing not less than 690 gms.				
a		a	15 mm nominal bore	each	3	440.00	1,320.00
18	HSR	22.38	Providing and fixing 8 mm dia C.P. / S.S. Jet with flexible tube upto 1 metre long with S.S. triangular plate to Eureopean type W.C. of quality and make as approved by Engineer - in - charge.				
a				each	3	238.00	714.00
19	HSR	22.107.1	Providing and fixing C.P. brass stop cock (concealed) of standard design and of approved make conforming to IS:8931.				
a		a	15 mm nominal bore.	each	3	500.00	1,500.00
20	HSR	22.12.1	Providing and fixing CP Brass Single lever telephonic wall mixer of quality & make as approved by Engineer in charge.				
a		b	15 mm nominal dia	each	3	5,164.00	15,492.00
21	HSR	22.51.1.1	Providing and fixing soil, waste and vent pipes :				
a		a	(100 mm dia) Sand cast iron S&S pipe as per IS: 1729	metre	105	816.00	85,680.00

22		22.54.1	Providing and fixing M.S. holder bat clamp of approved design to sand cast iron/ cast iron (spun) pipes comprising of M.S. flat brackets made of 50x5 mm flat of specified shape, projecting 75 mm outside the wall surface and fixed on wall with 4Nos., 6mm dia expansion hold fasteners, including drilling necessary holes in brick wall/ CC/ RCC surface and the cost of bolts etc. The pipes shall be fixed to the already fixed brackets with the help of 30 mm x1.6 mm galvanised M.S. flats of specified shape and of total length 420 mm and shall be fixed with M.S. nuts, bolts, & washers of size 25x6 mm, one bolts on each side of the pipe.	each	20	175.00	3,500.00
		b	Total bracket length 580mm of approved shape and design for single 100 mm dia pipe				
a		22.57.1.1	Providing and fixing heel rest sanitary bend : Sand cast iron S&S as per IS - 1729- 100 mm dia	each	6	407.00	2,442.00
b		22.58.1.1	Providing and fixing double equal junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete : 100x100x100x100 mm- Sand cast iron S&S as per IS - 1729	each	6	847.00	5,082.00
c		22.60.1.1	Providing and fixing single equal plain junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.: 100x100x100x100 mm- Sand cast iron S&S as per IS - 1729	each	6	493.00	2,958.00
d		22.55.1.1	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete. : 100 mm dia : Sand cast iron S&S as per IS - 1729	each	6	373.00	2,238.00
g		22.76.1.1	Providing and fixing collar :: 100 mm dia : Sand cast iron S&S as per IS - 1729	each	12	291.00	3,492.00

23	HSR	22.85	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge.				
a		22.85.6	50mm nominal outer dia pipes	metre	100	637.00	63,700.00
b		22.85.5	40mm nominal outer dia pipes	metre	15	421.00	6,315.00
c		22.85.4	32mm nominal outer dia pipes	metre	15	305.00	4,575.00
d		22.85.3	25mm nominal outer dia pipes	metre	40	228.00	9,120.00
e		22.85.2	20mm nominal outer dia pipes	metre	50	178.00	8,900.00
f		22.85.1	15mm nominal outer dia pipes	metre	50	128.00	6,400.00
24		22.87	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge: External work				
		22.87.1	15 mm nominal outer dia Pipes	metre	10	100.00	1,000.00
		22.87.2	20 mm nominal outer dia Pipes	metre	10	144.00	1,440.00
		22.87.3	25 mm nominal outer dia Pipes	metre	10	198.00	1,980.00
		22.87.4	32 mm nominal outer dia Pipes	metre	30	267.00	8,010.00
		22.87.5	40 mm nominal outer dia Pipes	metre	50	367.00	18,350.00
		22.87.6	50 mm nominal outer dia Pipes	metre	100	582.00	58,200.00
		22.87.7	62.50 mm nominal outer dia Pipes	metre	10	1,209.00	12,090.00
		22.87.8	75 mm nominal outer dia Pipes	metre	10	1,558.00	15,580.00
		22.87.9	100 mm nominal outer dia Pipes	metre	5	2,221.00	11,105.00
		22.87.10	150 mm nominal outer dia Pipes	metre	5	4,633.00	23,165.00
25	HSR	22.78	Providing lead caulked joints to sand cast iron/centrifugally cast (spun) iron pipes and fittings of				

			diameter :				
		22.78.1	100 mm	each	20	238	4,760.00
		22.78.2	75 mm	each	15	205	3,075.00
		22.78.3	50 mm	each	10	171	1,710.00
26	HSR	30.106	Painting GI pipes and specialswith first and second quality synthetic enamel paint in all shades of existing or new work . Two coats of paint including cleanig, rubbing surface etc.				
a		a	10 to 20 mm dia nominal bore	10 metre	30	32.31	969.30
b		b	25 to 32 mm dia nominal bore	10 metre	30	42.11	1,263.30
27	HSR	22.98	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :				
a		22.98.1	25 mm nominal bore	each	6	400.00	2,400.00
b		22.98.2	20 mm nominal bore	each	5	371.00	1,855.00
c		22.98.3	32 mm nominal bore	each	2	477.00	954.00
d		22.98.4	40 mm nominal bore	each	2	558.00	1,116.00
e		22.98.5	50 mm nominal bore	each	2	719.00	1,438.00
f		22.98.6	65 mm nominal bore	each	2	1,246.00	2,492.00
g		22.98.7	80 mm nominal bore	each	1	1,864.00	1,864.00
1		22.99	Providing and fixing gun metal non- return valve of approved quality (screwed end) :				
a		22.99.1.1	25 mm nominal bore – Horizontal	each	1	387.00	387.00
b		22.99.1.2	25 mm nominal bore – Vertical	each	1	410.00	410.00
c		22.99.2.1	32 mm nominal bore – Horizontal	each	1	525.00	525.00
d		22.99.2.2	32 mm nominal bore – Vertical	each	1	582.00	582.00
e		22.99.3.1	40 mm nominal bore – Horizontal	each	1	652.00	652.00
f		22.99.3.2	40 mm nominal bore – Vertical	each	1	812.00	812.00

g		22.99.4.1	50 mm nominal bore – Horizontal	each	1	950.00	950.00
h		22.99.4.2	50 mm nominal bore – Vertical	each	1	1,041.00	1,041.00
28	HSR	22.179.0	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design: **With common burnt clay non-modular bricks of class designation 7.5**				
a		22.179.1.1	Inside dimensions 455x610 mm and 45 cm deep for single pipe line :	each	3	4,384.00	13,152.00
b		22.179.2.1	Inside dimensions 500x700 mm and 45 cm deep for pipe line with one or two inlets :	each	3	5,050.00	15,150.00
c		22.179.3.1	Inside dimensions 600x 850 mm and 45 cm deep for pipe line with three or more inlets :	each	3	5,797.00	17,391.00
1		22.180.0	Extra for depth beyond 45 cm of brick masonry chamber : With common burnt clay non-modular bricks of class designation 7.5				
a		22.180.1.1	For 455x610 mm size	Mtr	3	4,271.00	12,813.00
b		22.180.2.1	For 500x700 mm size	Mtr	3	4,653.00	13,959.00
c		22.180.3.1	For 600x850 mm size	Mtr	3	5,409.00	16,227.00

29	HSR	22.181	Providing and placing on terrace (at all floor levels) polyethylene water storage tank, IS : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	litre	2,000	7.00	14,000.00
30	HSR	30.110b	Providing and fixing in position automatic brass ball valves in tanks. (b) With Plastic Ball (ii) 20 mm internal diameter. [HSR 30.110 (b) (ii)].	each	2	55	110.00
31	HSR	22.164.0	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) all- round S.W. pipes including bed concrete as per standard design :				
a		22.164.1	100 mm diameter S.W. pipe	metre	50	491	24,550.00
b		22.164.2	150 mm diameter S.W. pipe	metre	75	601.00	45,075.00
c		22.164.3	200 mm diameter S.W. pipe	metre	195	700.00	1,36,500.00
d		22.164.4	250 mm diameter S.W. pipe	metre	50	810.00	40,500.00
32	HSR	22.163.0	Providing, laying and jointing glazed stoneware pipes class SP-1 with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete :				
a		22.163.1	100 mm diameter	metre	50	230.00	11,500.00
b		22.163.2	150 mm diameter	metre	75	351.00	26,325.00
c		22.163.3	200 mm diameter	metre	195	443.00	86,385.00
d		22.163.4	250 mm diameter	metre	50	652.00	32,600.00

33	HSR	30.114	Providing and fixing in position gully trap fixed in cement concrete 1:4:8 complete with HCI grating 150mmx 150mm cast Iron weighing approx 7.26kg and frame clear opening 300mmx 300mmand chamber including cost of brick work in cement mortar 1:5 cement concrete1:8:16 in foundations. And cement concrete 1:2:4 in coping around CI frame and cover etc. with three coats of black bitumestic superior paint of approved manufacture of all CI work as per standard design. Minimum depth of water should be 150mm with a minimum seal 50mm.:				
a			100 mm internal diameter.	each	2	166.00	332.00
34	HSR	22.21	Constructing brick masonry road gully chamber 50x45x60 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame complete as per standard design : With common burnt clay non-modular bricks of class designation 7.5				
a		22.205.1	With common burnt clay non-modular bricks of class designation 7.5	each	2	3,723.00	7,446.00
			TOTAL FOR PHE WORKS (PLUMBING)				**991193.50**
			PART-2				
			RCC Pipe				

1	HSR	21.96.1	Providing lowering, cutting jointing and testing RCC pipe class NP3 as per IS-458-2003 which Spigot & socketted joints manufactured with ISI marked sulphate Resistance Cement as per ISI 12330 with rubber rings ISI marked antitermite as required at site, into trenches, for all depths and laying out the same to correct alignment and cutting of concrete bed and sides of trenches, if required, jointing with rubber rings in trenches and jointing with 1:1 1/2 cement sand mortar and with end dowels filled with 1:1 1/2 cement sand mortar and finishing the joints cutting and finishing the cut surface to a uniform finish etc. as fully described in HSR item No. 29.38, 29.44, 29.45 & 29.46 including cartage loading and unloading complete in all respects. the internal diametric of the sewer being				
		21.96.1	350mm	per mtr	50.00	1101	55,050.00
							55,050.00
			Part -3				
			Detailed Estimate- Rain water harvesting pit				
1	HSR	33.6	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer-in-charge, upto 90 metre depth below ground level.				
(a)	HSR	33.6.1	All types of soil				
	HSR	33.6.1.1	300 mm dia	metre	120.0	339.00	40,680.00

2	HSR	33.8	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
(a)	HSR	33.8.3	200 mm nominal size dia	metre	100.0	905.00	90,500.00
3	HSR	33.12	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm, in recharge pit, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	cum	4.8	1023.00	4,941.09
4	HSR	33.13	Supplying, filling, spreading & leveling gravels of size range 5 mm to 10 mm, in the recharge pit, over the existing layer of boulders, in required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	cum	4.8	1023.00	4,941.09
5	HSR	33.14	Supplying, filling, spreading & leveling coarse sand of size range 1.5 mm to 2 mm in recharge pit, in required thickness over gravel layer, for all leads & lifts, all complete as per direction of Engineer -in-charge.	cum	4.8	1326.55	6,407.24
6	HSR	33.15	Gravel packing in tubewell construction in accordance with IS: 4097, including providing gravel fine/ medium/ coarse, in required grading & sizes as per actual requirement, all complete as per direction of Engineer-in-charge.	cum	4.8	1147.00	5,540.01

7	HSR	33.19	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water samples & getting tested in approved laboratory, i/c disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	Hrs	24.00	619.00	14,856.00
8	HSR	33.16.2	Providing and fixing suitable size threaded mild steel cap or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for borewell of:				
(a)		33.16.2	150 mm dia	each	2.0	180.00	360.00
9	HSR	33.17	Providing and fixing M.S. clamp of required dia to the top of casing/ housing pipe of tubewell as per IS: 2800 (part I), including necessary bolts & nuts of required size complete.				
(a)		33.17.2	150 mm clamp	each	2.0	1173.00	2,346.00
10	HSR	33.18	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I).				
(a)	HSR	33.18.2	150 mm dia	each	2.0	232.00	464.00
11	HSR	22.201.3	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of required shape and approved quality: H D - 20				
12	HSR	22.201.3.1	Circular shape 560 mm internal diameter (H D - 20)	each	1.0	1105.00	1,105.00
			SH-1: E A R T H W O R K				

13	HSR	4.12.1	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge. All kinds of soil	Cum	78.45	94.00	7,374.30
14	HSR	6.2 c	Extra for every 7.5 metres additional lead beyond 15 metres, but upto60 metres by manual mean	100 CUM	156.90	22.65	3,553.79
			SH-2: C O N C R E T E W O R K				
		6.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level				
15	HSR	6.1.6	1:4:8 (1 Cement : 4 coarse sand (zone-III) : 8 graded stone aggregate 40 mm nominal size)	Cum	1.58	3,549.00	5,589.68
			SH-3: REINFORCED CEMENT CONCRETE				
16		6.29	Centering and shuttering including strutting, propping etc. and removal of form work for :				
	HSR	6.29.1	Foundations, footings, bases for columns	Sqm	16.47	158.00	2,602.26
17	HSR	6.29.2	Retaining walls, return walls, walls (any thickness) including attached pilasters, buttresses, plinth and string courses fillets, kerbs and steps etc.	Sqm	138.80	319.00	44,277.20
18		6.33	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.				
	HSR	6.33.6	Thermo-Mechanically Treated bars of grade Fe-500D or more.	kg	2,431.1	69.00	1,67,742.80

19		6.2	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor etc., up to floor four level, excluding the cost of centering, shuttering and finishing:				
		6.2.1	1:1½:3 (1 cement : 1½ coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	cum	22.10	4,891.00	1,08,093.55
			GROSS TOTAL				**5,11,373.99**
			TOTAL FOR PHE WORKS (PLUMBING) & drain				**15,57,617.49**

Package - PPC HAFED FIRE FIGHTING		
Summary of Estimated Cost		
Sr. No.	**Description**	**Amount (Rs.)**
Bill No. 01	Tank Civil Works	6,12,233.00
Bill No. 02	FIRE FIGHTING	28,81,572.00
Bill No. 03	Electrical	2,45,730.00

	Grand Total	**37,39,535.00**

NAME OF PROJECT :- PPC HAFED			
SUMMARY OF COST FOR FIRE FIGHTING WORK			
S. No.	**DESCRIPTION**	**MR Amount (Rs.)**	**In Electrical scope**
1	SUB HEAD - I - (PUMPING EQUIPMENTS)	11,27,515.00	
2	SUB HEAD - II - (HYDRANTS SYSTEM)	4,37,403.00	
3	SUB HEAD - III - (PIPING, VALVES AND ACCESSORIES)	6,79,678.00	
4	SUB HEAD - IV - (FIRE EXTINGUISHERS)	46,976.00	
5	SUB HEAD - V - (MOTOR CONTROL PANELS)		2,45,730.00
6	SUB HEAD -VI - (SPRINKLERS ACCESSORIES)	4,90,000.00	
7	APPROVALS	1,00,000.00	
	TOTAL	**28,81,572.00**	**2,45,730.00**

NAME OF PROJECT :- PPC HAFED						
DETAILED ESTIMATE FOR FIRE FIGHTING EQUIPMENT , RING						
Item No		**Description Of Item**	**Qty.**	**Unit**	**Rate (Rs)**	**Amount (Rs)**
		SUB HEAD - I - (PUMPING EQUIPMENTS)				
	DSR_AOR2019	**FIRE FIGHTING SYSTEM**				
1	1	**Fire Pumps and Accessories**				
		Supplying, installation, testing and commissioning of Electric driven Main Fire Pump suitable for automatic operation and consisting of following, complete in all respects, as required :				
	a)	Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical seal conforming to IS 1520.				
	b)	Suitable HP Squirrel cage induction motor, TEFC, synchronous speed 1500 RPM, suitable for operation on 415 volts, 3 phase 50 Hz, AC supply with IP 55 protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS-325.				
	c)	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
	d)	Suitable cement concrete foundation duly plastered with anti vibration pads.				
	1.8	1620 lpm at 70 m Head	1	Set	330204.00	330204.00
		Note: Contractor shall include in his rates for providing pressure switches, pressure guages, wiring, cabling from pressure switch to panel etc. complete as required to operate the system automatic/manual. Pump shall be protected against running dry.				
2	DSR_AOR	Supplying, Installation, Testing and Commissioning of **diesel engine driven main fire pumping set** complete in all respect as required suitable for automatic operation and consisting of				

	2019 / 2	following:				
		Horizontal type, multistage, centrifugal pump of cast of iron body and bronze impeller with stainless steel shaft, mechanical seal conforming to IS 1520.				
		Suitable HP, 1500 RPM water cooled with radiator, diesel engine conforming to relevant IS standard complete with auto starting mechanism, 12 /24 volts electric starting equipment, diesel tank, exhaust pipe extended upto 10 m outside pump house duly insulated with 50 mm thick glass wool with 1.0 mm thick aluminium sheet cladding, residential silencer, instruments and protection as per standard specification, stop solenoid for auto stop in the event of fault with audio indications, painted with post office red colour etc. as required.				
		M.S fabricated, common base plate, coupling, coupling guard, foundation bolts etc. as required				
		Suitable cement concrete foundation duly plastered and with anti vibration pads.				
	2.8	1620 lpm at 70 m Head	1	Set	590426.00	5,90,426.00
		Note: Contractor shall include in his rates for providing pressure switches, pressure guages, wiring, cabling from pressure switch to panel etc. complete as required to operate the system automatic/manual. Pump shall be protected against running dry.				
3	DSR _AOR 2019 / 3	Supplying, installation, testing and commissioning of electric driven pressurisation pump suitable for automatic operation and consisting of following, complete in all respects, as required : (Jockey Pump)				
		Horizontal type, multistage, centrifugal pump of cast iron body and bronze impeller with stainless steel shaft, mechanical seal conforming to IS : 1520.				
		Suitable HP squirell cage induction motor TEFC type suitable for operation on 415 volts, 3 phase 50 Hz AC supply with IP 55 class of protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS : 325.				
		M.S.fabricated Common base plate, coupling, coupling guard,				

		foundation bolts etc. as required.				
		Suitable cement concrete foundation duly plastered and with anti vibration pads.				
	3.2	180 lpm at 70 m Head	1	Set	102391.00	1,02,391.00
		Note: Contractor shall include in his rates for providing pressure switches, pressure guages, wiring, cabling from pressure switch to panel etc. complete as required to operate the system automatic/manual. Pump shall be protected against running dry.				
5	**MR**	Fabricating, Supplying, Installation, Testing and Commissioning **Air Vessel** of continuous welded construction with flanged discharge header on the top of each riser fabricated out of 10 mm thick dished ends and 8 mm thick MS sheet, Air Release Valve complete with suitable drain arrangement with 25 mm dia gun metal wheel valve complete with all accessories etc. as required of the following sizes:				
5.1		1.2 Meter high and 250 mm dia.	1	Each	35875.00	35875.00
6	**MR**	Fabricating, Supplying, Installation, Testing and Commissioning **Air Vessel** of continuous welded construction with flanged discharge header in pump house fabricated out of 10 mm thick dished ends and 8 mm thick MS sheet, Air Release Valve, complete with drain arrangement with 25 mm dia gun metal wheel valve complete with all accessories etc. as required of the following sizes:				
6.1		2 Meter high and 450 mm dia suitable to operate Jockey Pump, Main Fire Pump & Diesel Engine Driven Fire Pump	1	Each	45000.00	45000.00
7	**MR**	Supply, Installation, testing and commissioning of pressure switches for Hydrant / Diesel Engine Driven Pump / Jockey Pumps, diaphragm type, adjustable range from 0-9 bar and a regulation range of 0.1 1.5 bar direct mounted SNAP acting type made from die cast aluminium with epoxy powder coated finish and SS316 diaphragm and other wetted parts, including	3	Each	7873.00	23619.00

		necessary wiring upto control panel & other materials as required as per specifications.				
		TOTAL				**1127515.00**
		SUB HEAD - II - (HYDRANTS SYSTEM)				
1	**MR**	Supplying and fixing **Single Headed Internal Hydrant Valve** oblique patternwith instantaneous Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked, conforming to IS : 5290 (Type A), with 80 mm dia flanged inlet, with ABS cap and chain complete with all accessories etc. as required.	4	Each	4500.00	18000.00
2	**MR**	Supply, Installation, Testing and Commissioning of 100% synthetic **flax canvas** Non-percolating FIRE hose (Type A), I.S.I marked 63mm dia x 15m long with stainless steel male & female couplings (ISI marked) bound & riveted to hose pipes with copper rivets and copper wire as required.	4	Each	5025.00	20100.00
4	**MR**	Supplying and Fixing **First Aid Hose Reel**, wall mounting swinging type complete with drum & bracket of MS construction, spray painted in Post office Red, confirming to IS 884/1995 with upto date amendments, complete with the following as required.				
(a)		36 Meter long 20 mm dia water hose Thermoplastic (Textile reinforced) Type - 2 as per IS : 12585				
(b)		25 mm dia ball valve & nozzle.				
(c)		Drum and brackets for fixing the equipments on wall.				
(d)		Connection from riser with stop valve (gun metal) & M.S. Pipe	4	Each	7481.00	29924.00
5	**MR**	**SITC weather proof M.S cabinet size 1200 mm x 2100 mm x**				

		600mm				
		Supplying, installation, testing and commissioning of weather proof M.S cabinet size 1200 mm x 2100 mm x 600mm deep fabricated from 1.6mm thick M.S. sheets and M.S angle 40mmx40mmx6mm complete with glass, locking arrangements to accommodate the following: -				
a)		Gunmetal single headed Hydrant valve - 1 No.				
b)		Fire Hoses 63mm, 15 M long with accessories - 2 Nos.				
c)		Short branch - 1 No.				
d)		First Aid hose Reel - 1 No.				
e)		Fire Extinguisher - 2 Nos.				
f)		Fireman's Axe - 1 No.				
g)		Pressure Gauge - 1 No.				
		The cabinet shall be painted with one coat of primer and 2 coats of synthetic enamel paint of approved shade.	4	Each	5500.00	22000.00
6	**MR**	Providing and fixing **single gunmetal suction collecting head** as per IS: 904-1983, hose coupling (draw out connection) with female outlet as per 903 complete with 150 mm dia. G.I. Suction pipe (with puddle flange) with a foot valve with strainer complete as per drawings.	1	Each	5251.00	5251.00
9	**MR**	Supplying and fixing vane type water **flow switch** suitable for installation on 50 mm to 150 mm dia line for a service pressure upto 20 kg/sq. cm. of Potter / System sensor /Angus	4	Each	3732.00	14928.00
10	**MR**	Supplying and fixing 4 way 63 mm instantaneous **Fire Brigade Inlet Connection (FBIC)** comprising of gunmetal body and gunmetal instantaneous male inlet coupling confirming to IS:904 with plug and cap with chain as required with nuts & bolts and high pressure rubber gasket, suitable for 150 mm dia MS pipe connection etc. complete as required.	1	Each	8500.00	8500.00

	3.0	Supply, Installation testing & commissioning of Black Mild Steel Class 'C' (Heavy Duty) pipes conforming to IS : 1239 Part-I including cutting, threading, welding & all fittings like flanges, tees, elbows, bends junctions, reducers, ball valves etc. welded or screwed joints, clamps structural steel supports (as per TAC norms) or as required/ directed at site including cutting & making good the walls, floors, RCC work etc cutting chases & filling the same with cement concrete 1:3:6 (1 cement :3 coarse sand :6 graded stone aggregate 20 mm nominal size) (For Internal work).INCLUDING PAINTING				
	a)	25 mm dia (Nominal Bore)	300	RM	300	90000
	b)	32 mm dia (Nominal Bore)	50	RM	345	17250
	c)	40 mm dia (Nominal Bore)	50	RM	410	20500
	d)	50 mm dia (Nominal Bore)	50	RM	600	30000
	e)	65 mm dia (Nominal Bore)	50	RM	750	37500
	f)	80 mm dia (Nominal Bore)	50	RM	900	45000
50	g)	100 mm dia (Nominal Bore)	50	RM	1325	66250
	5.0	Providing and applying two coat of 4 mm thick 'PYPKOTE' antirust protection including primer and lap of 25 mm on M.S. pipe in trenches or complete including surface preparation coating and wrapping shall be confirm to ISI 10221 including conducting required Test.				
	b)	80 mm dia	20	RM	200	4000
	c)	100 mm dia	10	RM	220	2200
	d)	150 mm dia	20	RM	300	6000
		TOTAL				**437403.00**
		SUB HEAD - III - (PIPING, VALVES AND ACCESSORIES)				
		SLTC of M.S. pipe on surface				

1.	**MR**	Supplying, laying, fixing, testing and commissioning of following sizes (NB) of ISI marked heavy class M.S. pipes including cutting, threading, welding etc. and providing all fittings e.g. elbows, reducers, clamps, hangers, flanges, gaskets, nuts, bolts and washers etc. including painting of pipes and fittings with red paint over a coat of ready mixed primer, both of approved quality and shade including cutting holes and chases in brick or RCC walls/ slabs and making good the same etc. complete in all respect as required.				
		Note:-The Pipes of sizes 150 mm & below shall be M.S. 'C' class as per IS : 1239 and pipes size above 150 mm shall be welded black steel pipe heavy class as per IS: 3589, from minimum 6.35 mm thick M.S. Sheet for pipes upto 350 mm dia. and from minimum 7mm thick MS sheet for pipes of 400 mm dia and above.				
1.3		200 mm dia	5	Metre	1800.00	9000.00
1.4		150 mm dia	428	Metre	1250.00	535000.00
1.5		110 mm dia	10	Metre	1100.00	11000.00
3	**MR**	Supplying, Installation, Testing and Commissioning of **Butterfly valves of PN 1.6** rating of following sizes with nitrile Bronze / G.M. seat duly ISI marked and stainless steel stem with lever/gear operation and cast iron body in powder coated finish for fire fighting application complete in all respects confirming to IS: 13095 as required.				
3.1		150 mm dia	1	Each	4500.00	4500.00
3.2		100 mm dia	6	Each	2600.00	15600.00

3.3		80 mm dia	1	Each	2200.00	2200.00
4	**MR**	Providing, Installation, Testing and Commissioning of double flanged cast iron **Non-Return Valve,** PN 1.6of following sizes confirming to IS : 5312 complete with rubber gasket, Gl bolts, nuts, washers etc. as required.				
4.1		100 mm dia	2	Each	3500.00	7000.00
5	**MR**	Providing, Installation, Testing and Commissioning of **Gun Metal / Bronze Ball Valves** with brass body chrome plated of following sizes as required.				
5.1		50 mm dia	2	Each	2085.00	4170.00
5.2		40 mm dia	2	Each	1416.00	2832.00
6	**MR**	Supplying and Fixing **Orifice Plate** made of 6 mm thick, upto 200 mm outer dia. stainless steel with orifice (internal dia.) of required size in between flange & landing valve of external and internal hydrant to reduce pressure to working pressure of 3.5 Kg / cm^2 complete as per specifications as required.	4	Each	659.00	2636.00
7	**MR**	Supply, Installation, Testing and Commissioning of 150 mm dia Bourden type, Stainless Steel dial type **Pressure Gauge** including brass isolation valve and siphon pipe having calibration of 0 - 16 Kg / cm^2	4	Each	471.00	1884.00
8	**MR**	Supplying, Installation, Testing and Commissioning of CI body flanged (both ends) type serviceable suction / **Y strainer** with (stainless steel / brass mesh) conforming to relevant IS specifications amended upto date complete including providing				

		and fixing nuts, bolts, washers, gaskets etc. complete as required.				
8.1		150 mm dia	2	Each	9057.00	18114.00
9	**MR**	Supplying and Fixing of Fire Man's axe with heavy insulated rubber as per standard conforming to IS 926	4	Each	490.00	1960.00
11	**MR**	Providing & fixing double flanged Metallic expansion with M.S. fixed flanges (PN-1.6) joint (suitable for system test pressure) of standard length as per manufacturers specs including rubber gaskets, flanges, nuts, bolts and washers complete as required as per specifications.				
11.1		65 mm dia	1	Each	3326.00	3326.00
11.1		80 mm dia	1	Each	4258.00	4258.00
11.2		150 mm dia	2	Each	6133.00	12266.00
12	**MR**	Providing & fixing controlled percolation fire hose pipe (as per IS:8423) of 63 mm dia and 15 meter length rated for burst pressure of 3.5 Kg/sqcm. The hose shall be tested for flame resistance test in accordance to IS:8423. Hose shall be complete with ISI marked SS male & female coupling (IS:903) bound & riveted to hose pipe with copper rivets & 1.5 mm copper wire as required as per specifications. (Location : External fire hydrant)	4	Each	2803.00	11212.00
13	**MR**	Providing and fixing weather proof lockable cabinet of size not less than 0.9 x 0.6 x 0.5 mtr made out of MS sheet 2mm thick having central opening and 6 mm thick glazed glass doors (Two nos.) suitably marked on the outside with the letters "FIRE HOSE" including necessary locking arrangement and	2	Each	4240.00	8480.00

		shall be painted with one coat of primer and two coats of synthetic enamel paint of approved shade as required as per specifications.				
14	**MR**	Supply, Installation, Testing and Commissioning **External Yard Hydrant Stand Post** comprising of MS pipe 80 mm dia (heavy duty C class) from existing ring main to about 1 meter above ground level and Single Headed Yard Hydrant Valve with 80 mm dia flanged inlet, instantaneous SS coupling of 63 mm dia with cast iron wheel ISI marked, conforming to IS : 5290 (Type A), with ABS cap and chain etc. complete with all accessories as required.	4	Each	6060.00	24240.00
		TOTAL				**679678.00**
		SUB HEAD - IV - (FIRE EXTINGUISHERS)				
1	**MR**	Supply, installation, testing and commissioning of ISI marked (IS:15638) portable chemical fire extinguisher, water (gas pressure) type capacity 9 litres with gun metal cap and nozzle and complete in all respects including initial fill and wall suspension brackets as required as per specifications.	4	Each	2467.00	9868.00
2	**MR**	Providing and fixing fire extinguisher of carbon dioxide type consisting of brand new high pressure steel cylinder bearing IS: 7285 mark and having the approval of controller of explosives Nagpur, wheel type valve bearing IS:3224 mark internal discharge tube, 1 meter long high pressure discharge hose, non conducting horn, suspension bracket, fully charged bearing IS: making fixed to wall as directed.				
2.1		4.5kg capacity cylinder	4	Each	6458.00	25832.00

3	**MR**	ABC type extinguisher with cylinder fully charged with 4 Kg. capacity.	4	Each	2819.00	11276.00
		TOTAL				**46976.00**
E		**SUB HEAD - V - (MOTOR CONTROL PANELS)**				
1		**Control Panel**				
	DSR_ AOR 2019/ 5	Fabrication, Supplying, Installation, Testing and Commissioning of **electrical control panel** of cubical construction, floor mounted type, fabricated out of 2mm. Thick CRCA sheet, compartmentalised with hinged lockable doors, dust and vermin proof, powder coated of approved shade after 7 tank treatment process, cable alley, inter-connection, having switchgears and accessories mounting and internal wiring, earth terminals, numbering etc. complete in all respect, suitable for operation on 415 V, 3 phase, 50 Hz. AC supply with enclosure protection class IP 42 as required.				
	5.6	**COMMON PANEL IN FIRE PUMP HOUSE**				
		250A, 50kA 4 Pole MCCB, Ics=100% Icu rating				
		Digital Voltmeter 0-500V with selector switch				
		Digital Ammeter (0-250 A) with selector swtich & CTs				
		LED type RYB phase indicating lamps, ON, OFF, trip				
		indicating lamps				
		Set of Copper Bus Bar 300A				
i)		**OUTGOING (Note : All outgoing feeders for pumps should have digital Ammeter with selector switches, and LED type ON, OFF, trip indicating lamps)**				
		Main Fire Pump				
ii)		125 A, 50kA TPN MCCB, Ics=100% Icu, with fully automatic Star/Delta starter suitable for 60 HP pump with overload protection, current sensing type single phase preventor complete with all acceessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF				

		operation.				
iii)		**Jockey Pump**				
iv)		63 A, 50kA TPN MCCB, Ics=100% Icu, with suitable HP fully automatic Star/Delta starter with overload protection, current sensing type single phase preventor complete with all acceessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF operation.				
v)		**Diesel Engine Control.**				
vi)		Control for diesel engine comprising - Automatic/Manual selctor switch & 3 attempts starting device, timers and relays as required, push buttons, start/stop in manual mode Indicating lamp for high/ Low Lub. Oil pressure, High Water Temp and Engine on indication Battery charger suitbale for 12V/24 V DC with boost and trickle selector switch, 0-30 V DC volt meter, and 0-20 A DC Ammeter All standard relays and accessories for automatic **operation of diesel engine** **System Controller** Designing, Supply, Installation, Testing and commissioning of system controller to control operation of main electric fire pump, diesel pump, Pressurization pump, Terrace pump in sequence as per specification consisting of relays, timers. Sensors, annunciation window for fault indication, complete as per specification				
		Fire panel as above	1	Set	245730.00	245730.00
		TOTAL				**245730.00**

		SUB HEAD-VI (SPRINKLERS ACCESSORIES)				
	1	Providing and fixing 15 mm gunmetal **sprinkler head** with quartz bulb and set to operate at specified temperature pendent/ upright/ side wall /quick response as per instruction fixed with **loctite.** Temperature of operation 68 deg.C K-80				
	a.	Normal response Pendent type/ upright type	100	Nos	300.00	30,000.00
	a.	Normal response Pendent type	100	Nos	350.00	35,000.00
	b.	Normal response Side wall type	100	Nos	350.00	35,000.00
	c.	Extended throw normal response Side wall type.	40	Nos	750.00	30,000.00
	2	Providing & fixing 25mm dia. UL listed gunmetal inspector test and drain valve with integral sight glass connected to drain line complete in all respects.	20	Nos	450.00	9,000.00
	3	Providing and fixing electrically operated **flow indicating switches** model System Sensor in sprinkler branch line on each floor with necessary junction box installed in accessible place (Wiring from switches to panel and stair case pressurization not included)				0.00
	a.	100/65/50 mm dia.	20	Nos	7000.00	1,40,000.00
	4	Providing and fixing **gunmetal installation valve** with turbine type automatic alarm to be connected with control valve , drain valve, test valve and piping as per manufacturer's specifications complete in all respects.				0.00
	a.	150 mm dia.	4	Nos	45000	1,80,000.00
	5	Providing and fixing UL/Fm listed powder coated finish Escutcheon plate complete including fixing in position on pipe and ceiling complete in all respects. (Size=15NB)	50	Each	200	10,000.00
	6	Providing and fixing UL/Fm listed SS braided flexible pipe with accessories complete with all accessories specified in technical specifications(Size=15B)				0.00
		a. 780mm long	10	Each	900.00	9,000.00
		b. 1000mm long	10	Each	1200.00	12,000.00
		TOTAL				**490000.00**
		APPROVALS				

		Providing NOC/approvals from statutory authorities including preparation of shop drawings, approval drawings, report etc as may be required for approval.	1	LS	100000.00	1,00,000.00

PPC HAFED TANK ESTIMATE						
					CIVIL WORK	
S. No	**HSR**	**Description of Items**	**Unit**	**Rate**	**Qty.**	**Amount**
						In Figure
1		**SH-1: E A R T H W O R K**				
1	4.12.1	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge. All kinds of soil	Cum	94.00	104.72	9,843.68
2		**SH-2: C O N C R E T E W O R K**				
	6.1.4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level				
1		1:3:6 (1 Cement : 3 coarse sand (zone-III) : 6 graded stone aggregate 20 mm nominal size)	Cum	3,881.00	4.28	16,602.92
3		**SH-3: REINFORCED CEMENT CONCRETE**				
		Centering and shuttering including strutting, propping etc. and removal of form for :				

1	6.29.1	Centering and shuttering including strutting, propping etc. and removal of form work for : **Foundations, footings, bases for columns**	sqm	158.00	110.00	17,380.00
2	6.29.2	Centering and shuttering including strutting, propping etc. and removal of form work for : **Retaining walls, return walls, walls (any thickness) including attached pilasters, buttresses, plinth and string courses fillets, kerbs and steps etc.**	Sqm	319.00	220.00	70,180.00
3		Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth & above plinth level.				
(a)	6.33.6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. : **Thermo-Mechanically Treated bars of grade Fe-500D or more.**	QTL	69.00	2,728.00	1,88,232.00
4	6.25.2	Providing and laying in position machine batched and machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS: 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. All works above plinth level upto floor IV level. (Note :- Cement content considered in this item is @ 330 kg/cum. Less cement used as per design mix is recoverable. However no extra payment shall be made if excess cement is used as per design mix).	cum	5,318.00	24.80	1,31,886.40
	6.26.1	Providing M-30 grade concrete instead of M-25 grade BMC/ RMC. (Note:- Cement content considered in M-30 is @	cum	60.00	24.80	1,488.00
4		**SH-4: WATER PROOFING**				

1	22.20.1	Providing and laying APP (Atactic Polypropylene Polymer) modified prefabricated five layer 3 mm thick water proofing membrane, black finished reinforced with non-woven polyester matt consisting of a coat of bitumen primer for bitumen membrane @ 0.40 litre/sqm by the same membrane manufacture of density at 25°C, 0.87-0.89 kg/ litre and viscocity 70-160 cps. Over the primer coat the layer of membrane shall be laid using Butane Torch and sealing all joints etc, and preparing the surface complete. The membrane parameter : Joint strength in longitudinal and transverse direction at 23°C as 650/ 450N/5cm. Tear strength in longitudinal and transverse direction as 300/250N. Softening point of membrane not less than 150°C. Cold flexibility shall be upto -2°C when tested in accordance with ASTM, D - 5147 : 3 mm thick.	sqm	425.35	80.00	34,028.00
5		**SH-8: FINISHING WORK**				
1	11.6.1	15 mm cement plaster on the rough side of single or half brick wall of mix : **1:4 (1 cement: 4 fine sand)**	Sqm	162.00	80.00	12,960.00
	11.58	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (thickness to be specified by the manufacturer) of approved make in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge in skirting, risers of steps and dados over 12 mm thick bed of cement Mortar 1:3 (1 cement: 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	sqm	537.00	220.00	1,18,140.00
	22.200.3	Supplying and fixing C.I. cover without frame for manholes : 560 mm diameter C.I. cover (heavy duty) the weight of the cover to be not less than 108 kg	Nos	5,746.00	2.00	11,492.00
		Total				**6,12,233.00**