



PATNA SMART CITY LTD.



Volume 1 of 2

**DETAIL PROJECT REPORT
OF
OPEN SPACES AT BHAGALPUR**
Under Smart City Mission


SR. MANAGER TECH. 2
BHAGALPUR SMART CITY LTD.
BHAGALPUR

PATNA
November, 2019



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Preamble

Proposal for Assistance / handholding for the preparation of DPR/RFPs of major projects of Bhagalpur Smart City Limited (BSCL) was considered by the UD&HD Department, Government of Bihar and subsequent correspondence on this are narrated hereunder. Ultimately, it was decided that Patna Smart City Limited will extend that support to the Bhagalpur Smart City Limited through the existing PMC under their existing condition of contract with PSCL. The references are-

- I Review meeting of Principal Secretary, UD&HD, and Government of Bihar on 02.04.2019 as his advice in the matter.
- II Letter no 147/BSCL of MD,BSCL dated 02.04.2019 addressed to MD, PSCL, forwarded by CEO, PSCL to PMC, PSCL dated 06.04.2019 and Letter no 154/BSCL dated 06.04.2019, of BSCL.
- III Order No. 768 dt 11-04-2019 of MD, PSCL
- IV This office letter No. EPTISA/PMC/PATNA/557/2019 dated:- 8th April 2019 addressed to the MD, Patna Smart City Ltd.
- V Reports on PMC visit to Bhagalpur during 9-10 April 2019 vide PMC letter No. EPTISA/PMC/PATNA/562/2019 dated 11.04.2019
- VI Order No. 831 dt 27-04-2019 of MD, PSCL
- VII Agreement dated 21st December 2017 between PSCL and EPTISA.
- VIII Letter No. 1127 dt 21-06-2019 of CGM, PSCL
- IX Letter No. 1194 dt 03-07-2019 of CGM, PSCL
 1. M/S Eptisa Servicios de Ingenieria S.L. has been engaged as Project Management Consultant for providing assistance to Patna Smart City Limited (PSCL) to design, develop, manage and implement Smart City Projects. PSCL has entrusted PMC (Eptisa) for additional support for Bhagalpur Smart City Limited (BSCL) vide letter no. Letter No. 1127 dt 21-06-2019 of CGM, PSCL.
 2. The scope of Project Management Consultancy services under the proposed additional assignment is "Preparation and Submission of deliverables" in reference to BSCL for the following 6 projects:

Sl. No.	Projects
1	ICCC - Data Centre
2	Solid Waste Management
3	River Front Development
4	ICCC Building
5	Open spaces
6	Smart Road Network

3. Tentative cost of the project is be Rs. 932.00 cr. Eptisa will prepare the SAR, FR, DPR, RFP up to the issuance of the LOA for procurement of agency/ agencies of the above mentioned project as per the existing terms with PSCL within the time lines as mentioned in the letter no. 1127 dt 21.06.2019.
4. All deliverables will be presented and submitted to PSCL at Patna and the Eptisa team will interact with the Nodal officer (Md Shahid - Sr. Manager, Technical, PSCL) in this respect to coordinate with Bhagalpur Smart City Limited for necessary activities and feedback. (Reference- Letter No. 1194 dt 03-07-2019 of CGM, PSCL)
5. PMC (Eptisa) made the survey investigation of all the sites and made several site visits at Bhagalpur by the different experts from time to time.
6. The SAR for all the 6 (six) projects are submitted in one vol. for convenience and for approval.


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Project Management Consultant
Patna Smart City Limited



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REVISION INDEX

Ver No	Date	Revisions Details	Document Description	Pre by	App by
1.0	27-Sept-2019	-----	Detailed Project Report	PMC	PSCL
2.0	21-Nov-2019	R1	Detailed Project Report	PMC	PSCL



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**ABBREVIATIONS**

ABD	Area-Based Development
BPR	Business Process Re-Engineering
BSRTC	Bihar State Road Transport Corporation
CBD	Central Business District
DPR	Detailed Project Report
EBP	Early Bird Project
GIS	Geographical Information System
Gol	Government of India
GPS	Global Positioning System
LPCD	Litre Per Capita Day
MoPNG	Ministry of Petroleum & Natural Gas
MoUD	Ministry of Urban Development
NRW	Non-Revenue Water
PCP	Pan City Proposal
PMC	Project Management Consultant
BMC	Bhagalpur Municipal Corporation
PMKVY	Prime Minister Kaushal Vikas Yojana
PPP	Public Private Partnership
BSCL	Bhagalpur Smart City Limited
PSU	Public Sector Undertaking
RFP	Request for Proposal
SCADA	Supervisory Control and Data Acquisition
SCM	Smart City Mission
SCP	Smart City Proposal
SLA	Service Level Agreement
SPV	Special Purpose Vehicle
ToR	Terms of Reference


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1. Background

Government of India (GoI) through Ministry of Housing & Urban Affairs (MoHUA) launched 'Smart Cities Mission' in the year 2015 with an objective to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of smart solutions. The focus is on sustainable and inclusive development and the idea is to look at compact areas, create a replicable model which will act like a light house to other aspiring cities. The Smart Cities Mission is a bold, new initiative. It is meant to set examples that can be replicated both within and outside the Smart City, catalyzing the creation of similar Smart Cities in various regions and parts of the country.

Accordingly, the purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to smart outcomes. Area-based development will transform existing areas (retrofit and redevelop), including slums, into better planned ones, thereby improving livability of the whole City. New areas (Greenfield) will be developed around cities in order to accommodate the expanding population in urban areas. Application of Smart Solutions will enable cities to use technology, information and data to improve infrastructure and services. Comprehensive development in this way will improve quality of life, create employment and enhance incomes for all, especially the poor and the disadvantaged, leading to inclusive Cities.

The Smart City Mission envisages interventions in across 100 cities in the country over a period of 5 years i.e. Mission Period 2015-2020. Government of India will give a Grant of Rs 100 Crore per city for 5 years. Smart cities Selection is through competition after evaluation of the Smart City Proposals (SCP) prepared through Intense Citizen Consultation by the cities by a Panel of Experts put in place by MoUD, GoI. The strategic components of Area-based Development (ABD) in the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (Greenfield development) plus a Pan-city initiative in which Smart Solutions are applied covering larger parts of the city. The Mission aims to development, design, build and operationalize smart and innovative solutions across core city infrastructures including:

The core infrastructure elements in a Smart City would include:

- Adequate water supply,
- Assured electricity supply,
- Sanitation, including solid waste management,
- Efficient urban mobility and public transport,



- Affordable housing, especially for the poor,
- Robust IT connectivity and digitalization,
- Good governance, especially e-Governance and citizen participation,
- Sustainable environment,
- Safety and security of citizens, particularly women, children and the elderly, and
- Health and education.

To bridge the gap and provide a society in line with the vision of inclusive growth the smart city mission has been launched in India. The purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to Smart outcomes. Bhagalpur Smart City as part of its vision to provide Good Governance to its citizens, initiated steps to harness the potential of IT to provide integrated services to the citizens by deploying the tools of Information and Communication Technology (ICT) so as to enhance Quality, Transparency, Convenience, Certainty and Accountability in providing such services.

1.1 About Bhagalpur Smart City Project

The city of Bhagalpur has been selected among 100 potential Indian cities to be developed as smart cities under the Smart City Mission. It was selected in the first round. The Bhagalpur Municipal Corporation has formed a Special Purpose Vehicle (SPV) called 'Bhagalpur Smart City Limited' (BSCL) as per mission guidelines for implementation of projects identified in the proposal.

Implementing Agency	Bhagalpur Smart City Limited (BSCL) - Special Purpose Vehicle
Funding Agency	Government of India/Government of Bihar/Bhagalpur Nagar Nigam (BNN)

Citizens of Bhagalpur have collectively envisioned a progressive city, dedicated towards promoting its unique identity, good governance, enhanced quality of life, sustainable utilization of its distinctive historical, cultural and ecological assets to attract tourism, investments and business. Goals of Bhagalpur Smart City Project are:

- Sushaasit Bhagalpur: a city with smart and quality governance
- Samrudh Bhagalpur: city of eco-tourism, progressive economy, employment
- Gatimaan Bhagapur: a well-connected city with enhanced public transport
- Sudrid Bhagalpur: a well-functioning, smart and efficient city
- Sarvabhoomik Vikas: socially inclusive city



The entire project is divided into many sub-projects under two main category; ABD projects and Pan City Projects. The projects under ABD are limited within a specific area of the city and mostly include projects of retrofitting and re-development nature. Whereas PAN city projects are mostly based on use of ICT technology systems and solid waste management component. Other important part of the project is the technology based Smart solution which will help to extend the different need-based services to be provided to the citizen (G2C, B2C and many more) including e-governance through digital services.

1.2 About Bhagalpur City

Bhagalpur, the 3rd largest city in Bihar state is a divisional town with historical importance situated on the southern bank of the Ganga river. Distorted but derived from Bhagdatpura, meaning City of Good Luck, Bhagalpur City is situated in the plains of the Ganga basin, at about 141 feet above sea level. Bhagalpur is located 220 km east of Patna and 410 km North West of Kolkata. Geographically, it is located at 25° 15' 0" North latitude and 87° 0' 0" East longitude on the southern alluvial plains of River Ganga. The Gangetic plains surrounding the city are very fertile. The city is a district headquarters serving multiple functions of an administrative, trade and commerce, service and distribution centre. Vikramshila Dolphin Sanctuary established near the town is the only sanctuary in Asia for conservation of Gangetic Dolphins. World's second largest rescue and rehabilitation area for Garuda is located in Bhagalpur. The city is well connected through rail and road networks. NH-80 runs through the city and connects with Patna. SH-19 and 25 are the main arterial roads. Bhagalpur has been associated with silk industry for hundreds of years and is also known as Silk City and ranks 2nd after Karnataka in silk fabric production and exports. The city is also famous for its Manjusha paintings, a unique art found only in Bihar.

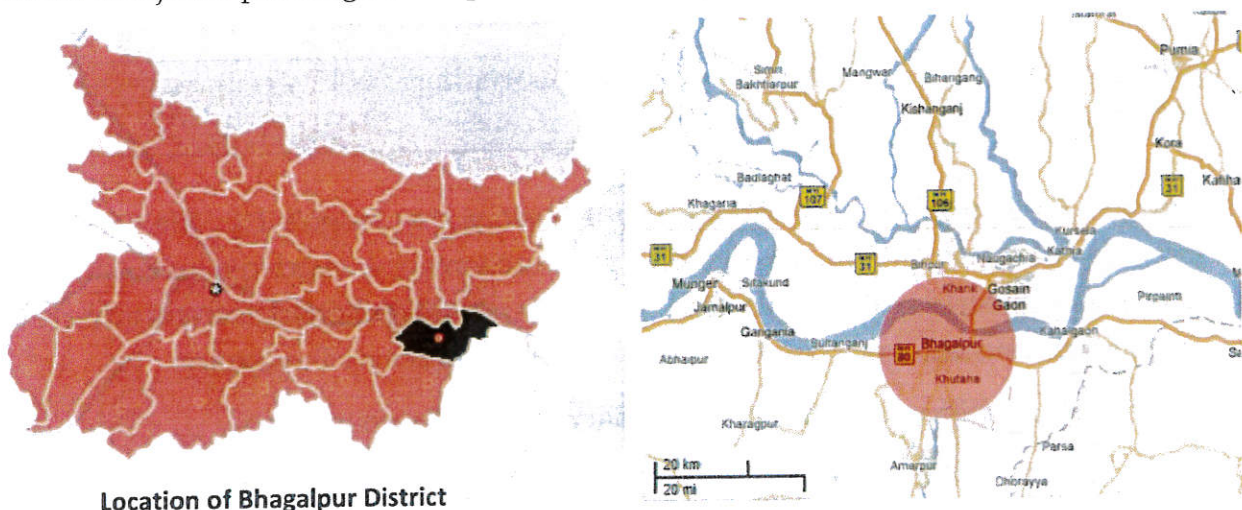


Figure 1 Location Map of Bhagalpur City in Bihar State



Bhagalpur Nagar Nigam covering 30.17 sq.km. area is divided into 51 wards. As of 2011 census, Bhagalpur town has a population of more than 4 lakhs with average literacy rate of 81%. The competitive advantage of Bhagalpur lies in its tradition as a silk weaving centre, the potential for river front development, the potential to develop it as a logistics hub to promote trade and commerce and development of open spaces. The city development plan prepared for Bhagalpur envisions its development as premier silk production centre and hub for agriculture produce with higher order infrastructure facilities. Maximum Summer Temp. & Minimum Winter temp. are 44°C and 10°C.

Demography of Bhagalpur

Area	30.17 Sq .Km.
Geographical location	25°15' 0" N ; 87°0' 0"E
No of wards	51
Population (2011) T (M+F)	4,00,146 (212813 M + 187333 F)
Sex ratio (F / 1000 M)	878
Children population (0-6)	54,818
No of households	85,784
Average household size	5.72
Density (persons/sqkm)	13,263
Literacy (% of total)	81.16%
BPL (% of total)	10.74
No of slums	165
Slum population	8136
Sc/St population (% of total)	8.4
Workforce participation	25.95 %

Land use pattern

Bhagalpur is growing and emerging as trade, business and education centre in last decade and witnessing increase in migration from immediate hinterland and different part of the state of Bihar. It resulted in to rapid urbanization in neighbouring areas of Bhagalpur Municipal Area become outgrowths of Bhagalpur City. In the absence of planning interventions, rapid growth led to haphazard development which resulted into deterioration of open space and green area, uncontrolled and unregulated construction activities, formation of slum and unregulated construction within core city. Mixed land use is prevalent along major roads. Road frontage are dominated by commercial activities and retail shops. The city has about 86,000 households with average density of 13,263 persons per sq.km. There are about 165 slums spread within city with population of about 9,000 persons.

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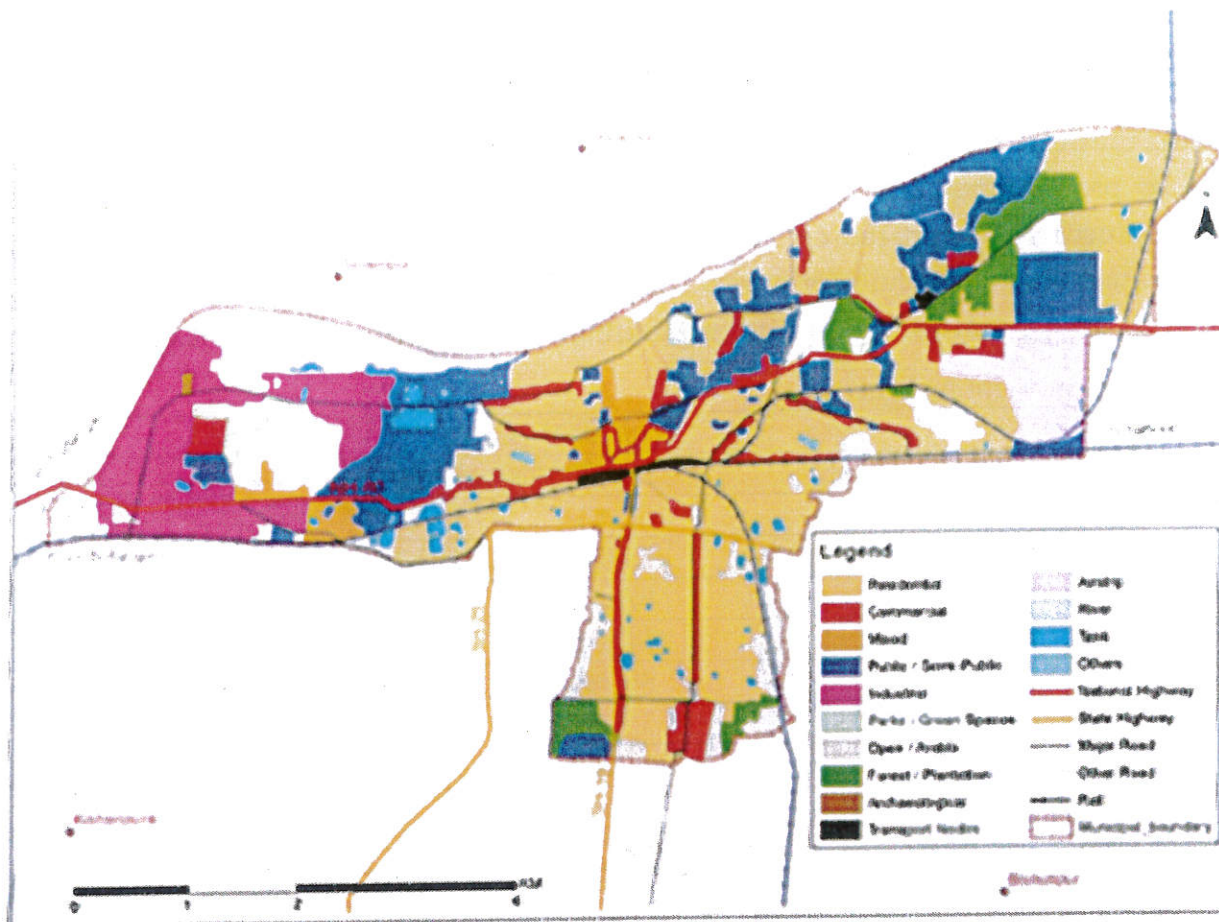


Figure 2 Land Use Map of Bhagalpur City (source: CDP)

Climate

In general a warm and humid climate prevails in the district. Winter starts from November and extends up to February. Temperature usually does not drop below 15°C but during the coldest months (late December to early January) temperature even comes down to 8°C. During this period, wind blows from northwest and west. The summer period begins from March with the peak temperature of 40 – 45°C in May. The month of March and April are the driest months of the year with the relative humidity of 50 – 55 % in the morning and 35 – 40 % in the afternoon. The humidity increases in May and June to 80 % or more. About 80 % of the rainfall is under the influence of southwest monsoon, which normally breaks in the second fortnight of June. The monsoon lasts till the later part of the September. Generally the eastern and north-eastern part of the district receives higher amount of rainfall. The annual normal rainfall in the district remains above 1148 mm.



Table 1.1: Climate Data for Bhagalpur

Climate data for Bhagalpur City (Avg. High-Low - 2000-2012) (Record High-Low - 2015)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C	25	32	38	40	42	44	37	37	37	37	33	30	44
Average high °C	17	18	23	20	27	24	25	27	19	20	18	17	21
Average low °C	10	11	16	16	23	23	22	24	21	24	17	14	18
Record low °C	8	8	12	20	23	24	24	24	24	17	16	6	6
Average precipitation mm	9	15	45	0	66	72	147	150	243	111	0	27	885

Social Infrastructure

Bhagalpur, being a district headquarters has good quality social infrastructure facilities including higher level education and health facilities. However, recreational and community facilities are insufficient. Jawaharlal Nehru Medical College & Hospital is the largest hospital in the city as well as district with more than 700 beds and modern equipment's. Recreational facilities include Jayaprakash Udyan (city level park), Lajpat Park, Forest and Railway Park, Town Hall and Vivah Bhawan. The city has more than 160 slums housing about 30% of city population. About more than 40% of households are below poverty line. Basic facilities are practically absent in slums. Situation is aggravated by poor coverage of poverty and slum upgradation schemes. 90% of road length in slums is kutchha without any drainage network. Handpump is the primary source of water and one pump serves more than 70 households. 90% of slums are of kutchha or semi-kutchha in nature with inadequate access to health facilities. Annual tourist inflow of tourist is estimated at 6% with highest inflow recorded during July-August at time of regional festivals. Tourist infrastructure is inadequate, heritage structures are poorly maintained.

Institutions

The city is a hub of educational activities for surrounding towns and villages. There are more than 400 government schools comprising more than 300 primary school, more than 70 middle schools and more than 20 high schools, including about 6 degree colleges, 1 engineering college, 1 medical college, agriculture university, ITI and polytechnic for higher and technical education facilities. There are both, private and government schools. Some famous institutions are Tilakamanjhi Bhagalpur university, Bhagalpur college of engineering, Bihar agricultural university, Indian Institute of Information Technology, St. Joseph's school, Delhi Public School, TNB college etc.



Civic Amenities

Water supply in Bhagalpur is based on surface water and ground water. Town receives about 17 MLD of piped water from river Ganga. Tube wells account for 18 MLD of supply and hand pumps account for 2.25 MLD. It is estimated that 38 MLD water is supplied covering 19% of the town. Current installed storage capacity is 67% of supply, there are 7 over head tanks. Ground water is high in nitrate and arsenic. Per capita water supply is estimated at 33 lpcd and supply is for 7 hours a day. The city is implementing an integrated water supply scheme from state funds. Bhagalpur has minimal sewerage system. The estimated generation is 44 MLD waste water. Town has one treatment plant with installed capacity of 11 MLD. Only 4 MLD of waste water is collected and treated (primary) with remaining waste water being discharged into river Ganga with no treatment. 75% households have individual toilets with septic tanks and soak pits. Town has 26 community toilets but all are poorly maintained. Only 20% of town has sewage network services. The total drainage network in Bhagalpur municipal area covers 162 km. of which 112 km. drains are pucca open and 50 km. are kutchha open drains. Drains are normally seen on one side of the road. Natural drainage is from south to north. Existing drainage system is highly choked by indiscriminate garbage dumping and silting. All discharge from drains is disposed directly into river Ganga. Storm water drains carry waste water from households. Bhagalpur generates about 225 tonnes of waste per day of which 87% is collected. Door to door collection and transportation system was introduced last year with road sweeping and drain cleaning through a private operator in 10 wards of the town. Nagar Nigam has limited equipment's for solid waste management. There is no treatment of garbage prior to disposal. At present, garbage is dumped on available open spaces. There are more than 2000 street light poles in the city.

Economy

Workforce participation in the town is about 26%. Main workers account for 84%. Bhagalpur's economic base depends on silk production, trade and commerce. Annual silk production is estimated 2 million meters per year of tussar silk. The town is district level wholesale market for agriculture produce. Barari industrial area is the largest industrial belt in the district covering 51 acres and Bahadurpur is about 15 acres both dedicated to cottage industries. kahalgaon industrial area also being equally important. Government of India has established a handloom park and food park has been established by private entrepreneurs. The town has a strong presence of informal sector- about 6800 units contributing to 30-40% of city economy. Bhagalpur has significant potential to develop as a 'silk city' of India. About 50% of silk produced is exported.

Bhagalpur is a major distribution centre for agricultural produces. Grains like rice (paddy), wheat, maize, pulses and oilseeds are under the main food crops and mango, banana, litchi, citrus, guava and tomato are under horticulture crops.



The major cash crops are banana, potatoes and chilies. Based on location major market of the city can be classified in four zones. a) Nath Nagar Bazar b) Muzahidpur, Ali Ganj and Mirjan Hat Bazar c) Tilka Manjhi and d) Main City.

- Nath Nagar Bazar: It covers the area of west Bhagalpur, Nath Nagar and Champa Nagar.
- Muzahidpur, Ali Ganj and Mirjan Hat Bazaar: It covers the area of south Bhagalpur.
- Tilka Manjhi: It covers the area of east Bhagalpur, Tilka Manjhi and Barari
- Main City: It covers the area of Suja Ganj Bazar, Khalifa Bagh, Variety Chowk, Station Chowk, Kotwali Chowk, Mal Godam, Koyla Dipo chowk etc.

The Old Mandi at Mirzan Hat Bazar had been found in dilapidated condition. A huge campus (40-50 Acre) of this Mandi is used unofficially by beverage industry. The shops, warehouse, godown and cold storage are losing their attraction because of poor administrative support from district and state government.

The mentioned Old Mandi at Mirzan Hat Bazar requires immediate renovation. It can be also developed as logistic hub for trade as well as Silk Park to encourage trade and commerce and silk industry in the city. The relocation of commercial activities in the mentioned locations of the city is required for future growth of the city. The development of each location as Central Business District (CBD) can meet the future requirement of the city.

Informal shops are integral part of economy of the city. It contributes significantly (30-40%) to the economy of the city. The station road, stretch of NH- 80 from station to Bheropatti Chowk, Ultapul to Ghantaghar Chowk, Ghurni Peerbaba Chowk to Adampur Chowk, Tilka Manjhi Chowk, Suja Ganj Bazar, Khalifa Bagh, Variety Chowk, Kotwali Chowk, Mal Godam and Koyla Dipo chowk has been identified as the major locations of informal shops. As mentioned thousands of street vendors are involved in trading of fruits, vegetables, garment, leather goods, food items, toys and grocery items in the city. Based on structure permanent and mobile both types of informal shops contribute to the economy of the city.

Transport and Connectivity

Bhagalpur is situated roughly at a distance of 220 km east of state capital Patna and 410 km North West of Kolkata. NH 80 runs through the city and connects it directly to Patna. A branch railway line connects Bhagalpur to Mandar Hills (51 kms). The city is railway connected by broad gauge loop line of Eastern Railway from Kiul to Bardwan. In terms of air connectivity, Bhagalpur has an airport with a single air strip that is not used now. Patna airport and Malda Airport (West Bengal) are 220 km and 120 km from Bhagalpur respectively.

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Air Connectivity

At present there is an air strip at Bhagalpur. The Airport Authority of India (AAI) is considering to develop a civil airport at Bhagalpur.

Rail Connectivity

Bhagalpur Junction railway station is connected to most of the major cities in India by the railway network. It lies in the Sahibganj loop-line which serves Bhagalpur with numerous trains. It is the third busiest line in Bihar. About 100 pairs of Express and 44 pairs of passenger train pass through this line. Bhagalpur Junction is an A1 grade railway station.

It is the highest revenue generator in the Malda Rail Division. It is the third major railway station in Eastern Railway after Howrah and Sealdah. Bhagalpur is well connected to Delhi, Mumbai, Kolkata, Bangalore, Ajmer, Kanpur, Patna, Guwahati, Surat, Jammu, Munger, Gaya and other cities.

Road Network Connectivity, Transport and Traffic Characteristics

Bhagalpur town has 175km of roads with a density of 5.8 (ratio of total road length to city area). The main roads in the town include NH80, SH25 and SH19. The overall traffic characteristics are heterogeneous and the town has 21810 registered vehicles. The road network is largely undivided with no footpaths, high levels of encroachment, lack of road over-bridges that contribute to traffic jams. Intra city transport is mainly by way of cycles and auto rickshaws while, for inter-city transport, there are State Transport buses.

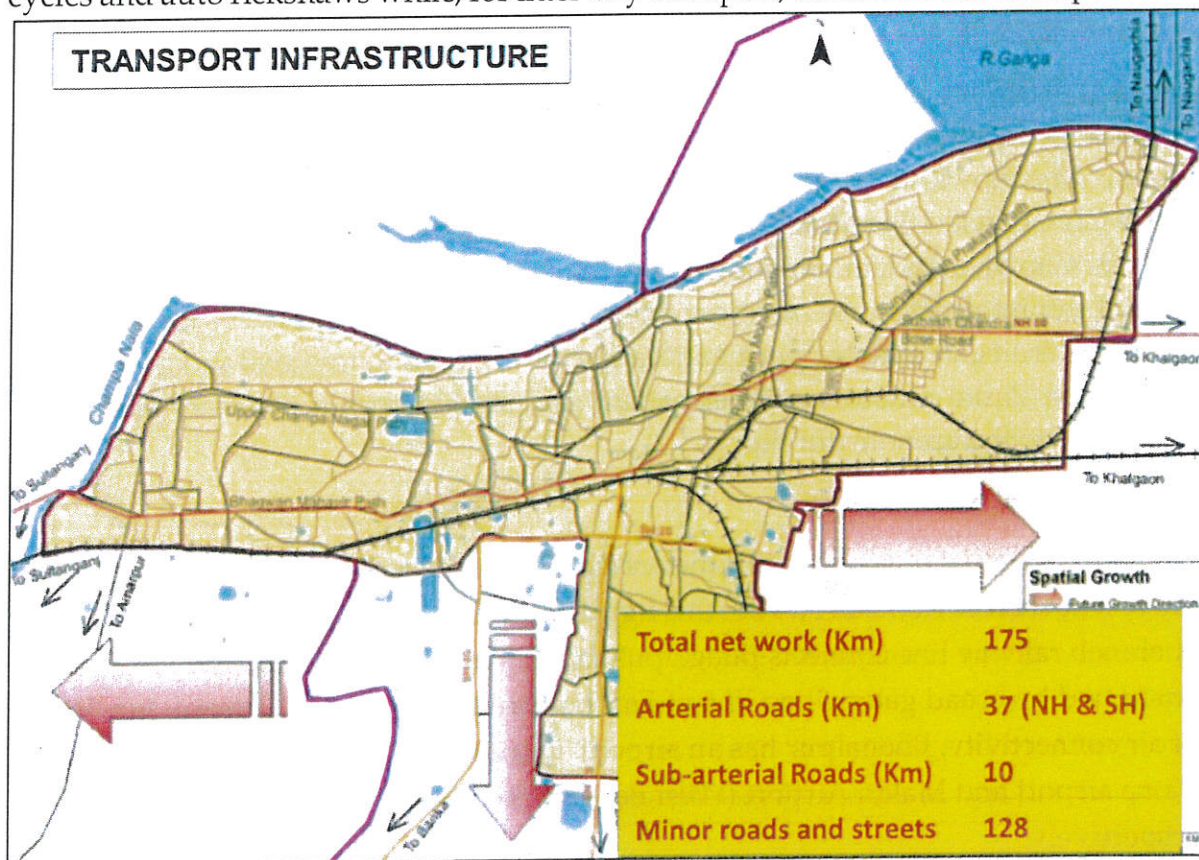


Figure 3 Map showing Road Network of Bhagalpur



2. Introduction

The Smart Cities Mission is an innovative and new initiative by the Government of India to drive economic growth and improve the quality of life of people by enabling local development and harnessing technology as a means to create smart outcomes for citizens.

In the approach to the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. The focus is on sustainable and inclusive. The Smart Cities Mission is meant to set examples that can be replicated both within and outside the Smart City, catalysing the creation of similar Smart Cities in various regions and parts of the country.

The core infrastructure elements in a Smart City would include:

- I. Adequate water supply,
- II. Assured electricity supply,
- III. Sanitation, including solid waste management
- IV. Efficient urban mobility and public transport
- V. Affordable housing, especially for the poor
- VI. Robust IT connectivity and digitalization
- VII. Good governance, especially e-Governance and citizen participation
- VIII. Sustainable environment
- IX. Safety and security of citizens, particularly women, children and the elderly
- X. Health and education.

One major component under Bhagalpur Smart City Project is to develop open and green spaces. Under this, two parks are proposed to be developed viz. Sandy's Compound along with Cleveland Memorial and Lajpat Complex which includes Lajpat Park, Children's Park, Kala Kendra, Town Hall and Sharda Sangeet Sadan.


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3. Scope of Work

The scope of this study is preparation of Detailed Project Report for open spaces. The scope of work is to survey and analyse the existing situation and propose the development for the following two project:

1. Sandy's Compound: To design and develop Sandy's Compound into a multi-Utility Public place for every age group. On the basis of approved plan, consideration and the needs of society, the cost for the development of the park is to be estimated as a part of Detailed Project Report. The scope is to develop and achieve standards of core infrastructure such that a clean & sustainable environment and a decent quality of life can be provided to its citizens. The focus is on sustainable and inclusive development.
2. Lajpat Complex: Lajpat complex includes Lajpat Park, Children's Park, Kala Kendra, Town Hall and Sharda Sangeet Sadan. The aim is to propose a complex with multi-utility space which can be amalgamated within one space.



4. Project Location

4.1 Sandy's Compound

Sandy's Compound is a 30-year-old park complex, opposite of police line Bhagalpur and is included in Smart City Project. It is bounded in the North-By Cleveland Road, South-By Central Jail Road, East-By Central Jail Road, West-By Beatson Road. The site has easy accesses through public transport modes such as city bus, auto rickshaw and private vehicles.

Sandy's compound is originally named after a Briton who was the Mayor of Bhagalpur and the District Judge during the British Era. The piece of land is approximately 123.34 Acres. Post fragmentation of this land, an area of 83 Acres persists with 34.25 Acres more or less in open space and the remaining covered under urban forest reserve. By the area cover, it has the potential of being a District Level Park and to serve a population of about 5 Lakhs.

4.2 Lajpath Complex

The Lala Lajpat Park which is a major part of proposed Lajpat Complex is one of the visited public place of Bhagalpur located at Adampur. This site is easily accessible through bus, auto-rickshaw and private vehicles.

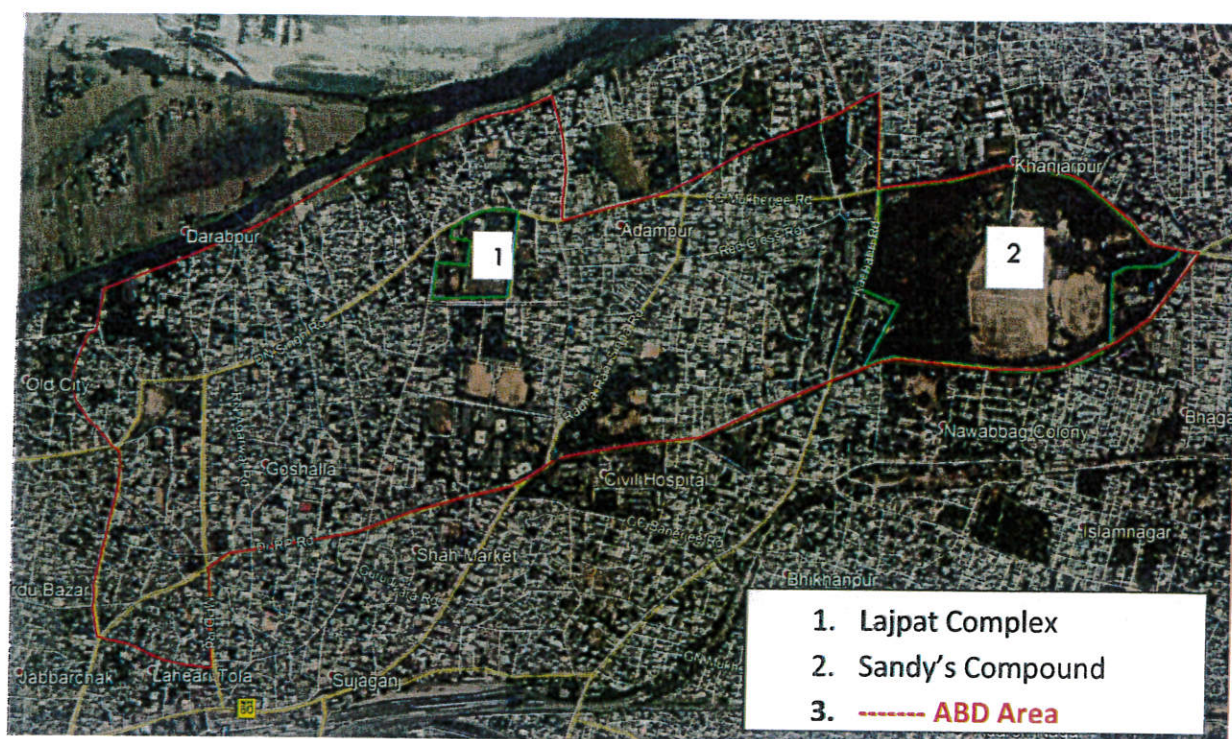


Figure 4: Location of Lajpat Complex and Sandy's Compound

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5. Existing Situation

5.1 Sandy's Compound

The total site area is 81.6 acres. It is a 30-year-old park and besides zoo which is located in Khanjarpur, opposite of police line Bhagalpur. It contains a Station Club, Doordarshan TV Centre, volleyball court, gym, forest area, pond, children play area and a small open stadium. It also provides state level matches and is one of the best fields in Bhagalpur.



Figure 5: Sandy's Compound



Figure 6: Mound Sandy's Compound



Figure 7: Entrance Gate, Sandy's Compound



Figure 8: Volleyball Court, Sandy's Compound



Sandy's Compound is presently consisting of Green lawns, Children's Playground, Ponds, Toilet block, Concrete pathways, Full grown mature trees, Inbuilt benches, Cleveland Memorial, Park Fair Area, Open Amphitheatre, Cricket Stadium, Multipurpose ground, Parking area, Volleyball Court, Indoor Badminton Stadium, Yoga Center and Indoor Gym. It also contains one heritage mound from where the first PM of Independent India addressed Bhagalpur.

The existing site is mostly having large green patches where no activity is being done. Large part of the compound is covered with forest area that create a beautiful environment for morning walkers and evening gatherings. The cricket stadium, multipurpose ground and gym are placed in the south side of the park and devoid of appropriate environment. The Children Park does not have children friendly environment. There are few dilapidated cage structures which were used to keep herbivorous animals.

It has a General Ground which serves the political gathering, fun fair, shopping sales, music events, New Year events and Independence Day, Republic day function, Rawan and Kumbhkaran effigy burning during Dussehra organized. The compound is having boundary wall from all sides of which major portion is in good condition however the remaining portion needs to be repaired or reconstructed. The ht. of boundary wall also is an issue that needs to be catered.

5.2 Lajpat Complex

Lajpat complex contains Lajpat Park, Children's Park, Kala Kendra, Town Hall and Sharda Sangeet Sadan. The Lala Lajpat Park which is a major part of proposed Lajpat Complex is one of the visited public place of Bhagalpur. The total area of the complex is 10.7 acres. It is surrounded by many kinds of flowers and trees. Baby toys, play area and Open gym are also available.



Figure 9: Lajpat Park



Figure 10: Open Gym, Lajpat Park

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Figure 11: Children's Park



Figure 12: Pavement Pathways, Children's Park



Figure 13: Kala Kendra, Bhagalpur



Figure 14: Sculpture in Kala Kendra



Figure 15: Town Hall



Figure 16: Town Hall Building

Lajpat Children's Park is a functional playground for children. It has different types for play equipment's, seating area, pavement pathways, cafeteria, trees and water body. Kala Kendra is having old buildings for the art classes and the area is surrounded by sculptures. Town Hall is an indoor amphitheatre in which different types of cultural programs are conducted.



6. Proposals of Work

Development of open spaces is proposed in two phases. The first phase will focus on the development of Sandy's Compound. The development of Lajpath Complex will be taken up in third phase. Development of Sandy's Compound includes development and retrofitting of existing Sandy's Compound. It carries a glory of Bhagalpur city, through old mature existing trees which will be retained in its own condition. Sandy's Compound has become a place for citizens of all age group to relax. Enhancing the character of the same environment, the design intervention will be giving city dwellers a planned space for the same purpose with segregation of activities.

The proposal envisages recreating the lost glory of Sandy's Compound through developing it as a smart urban landscape form. Sandy's Compound, the huge compound look like large patches of unused monotonous spaces that are lying underutilised. The concept would be converting the compound into different spaces with multiple activities linking through diverse medium of circulation thus creating hierarchy of open spaces. The existing public area, sports complex are to be rejuvenated to make them an integral part of the park, linking with other activities of the compound through design interventions. The other side of the park which is currently unused with deep water body to be converted into water sports and adventure zone.

The two parts of the site will be integrated with pathways and lake along with sports facilities. The sports complex, existing gym, will be developed in an exclusive environment conducive to their functional uses without intervening the compound's environment. There would be miniature/ sculpture garden with brief write up so that visitors could have better understanding about history of Bhagalpur. The proposal also takes into account the development of Station Club.

The vision for Sandy's Compound is to maintain its historic character and flourish it for future generations; to be an oasis of beauty, providing all visitors with positive and memorable experiences.


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6.1 Rejuvenation of Existing Large Open Space

The rejuvenation of existing large open space is proposed which will include redesign of stage, providing drain, laying of natural grass turf with temporary goal post and LED screen. The ground will act as an event ground for different cultural events and rallies. The ground is proposed to be encircled by hedges to mark distinction.

6.1.1 Redesign of Stage

A new stage is proposed in place of existing stage. The new stage will be 1500mm high with truss for providing shading sheet above it and fixing of light fixtures and sound boxes. The proposed stage is 20M wide and 12M deep. The finish of stage will be Kota Stone.



Figure 17 Truss for Stage

6.1.2 Landscaping and Drainage

Laying of natural grass turf is proposed in the open ground. The laying is proposed after proper surface levelling and dressing. Drainage channels is proposed on the periphery of the field which will channelize all the storm water to the water retention pond.

6.2 Development of Badminton Stadium

The development existing Badminton stadium is proposed in Sandy's Compound. The size of campus of badminton stadium is proposed to be expanded. The existing boundary wall will be broken and new wall will be made increasing the size of campus of Badminton Stadium. To link Badminton Stadium with Sandy's Compound, a new

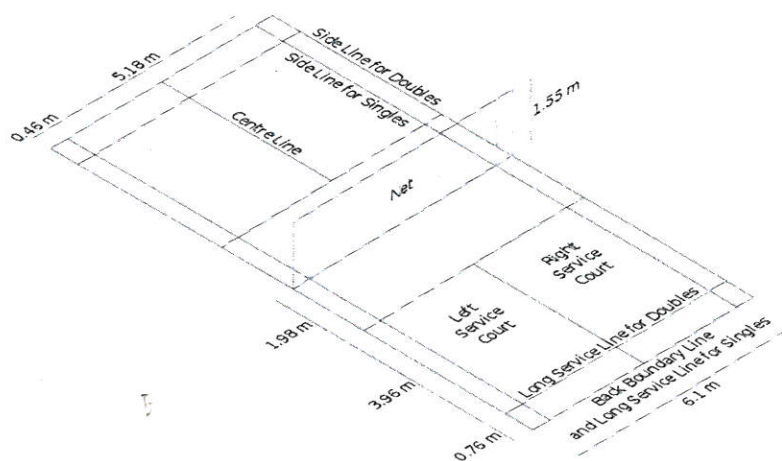


Figure 18: Badminton Court

entrance is proposed from Sandy's Compound side, however the existing entrance which is directly accessible from Road will be closed and new Secondary Entrance will be made. As the current Badminton stadium is lacking basic facility and sitting spaces so a completely new badminton Stadium is proposed in place of existing Indoor Badminton Stadium. The new court will have additional 3 new Courts apart from current 4 courts, totalling 7 courts (as per requirement of BSCL). The entrance to play area will be smart entrance with card access.



The proposal for new Indoor Stadium Includes:

New Indoor Stadium is proposed with seven Badminton courts with wooden floor. It will have seating space for spectators along with office spaces, storage rooms and toilet with change rooms. A small cafeteria and gym is also proposed inside the new Stadium.

The stadium will have Courts with markings for both singles and doubles play, although badminton rules permit a court to be marked for singles only. The doubles court is wider than the singles court, but both are of the same length. The exception, which often causes confusion to newer players, is that the doubles court has a shorter serve-length dimension.

The full width of the court is 6.1 metres (20 ft), and in singles this width is reduced to 5.18 metres (17 ft). The full length of the court is 13.4 metres (44 ft). The service courts are marked by a centre line dividing the width of the court, by a short service line at a distance of 1.98 metres (6 ft 6 inch) from the net, and by the outer side and back boundaries. In doubles, the service court is also marked by a long service line, which is 0.76 metres (2 ft 6 inch) from the back boundary.

The net is 1.55 metres (5 ft 1 inch) high at the edges and 1.524 metres (5 ft) high in the centre. The net posts are placed over the doubles sidelines, even when singles is played.


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6.3 Development of Sports Complex

Existing sports area will be redeveloped into a full-fledged sports complex. The sports complex will act as singular entity with sports area only accessible to players and sports authority. The sports complex will comprise of the following

6.3.1 Entrance and Parking

Separate entrances is proposed for Sports Complex. An Entrance Plaza of 18m X 20m is proposed as common entrance for bigger events which is accessible from Main ground of Sandy's. One direct entrance from NH 33 is proposed for sports persons with separate parking area. While 2 more general entrance is proposed for public and sports person for regular movement. One entrance is accessible from proposed food plaza which will have external access for common public.

6.3.2 Stadium

The current stadium is proposed to be developed into Cricket cum Football Stadium with drainage network. The size of playing area in the proposed stadium is 120m X 170m. The stadium is proposed to have pavilion with total capacity of around 2500 seating (covered and open seating tiers). Extension of sitting capacity can be done horizontally in future in the peripheral area of Stadium. It is also proposed to have Pavilion with all amenities comprising of rooms for administration, players, referee/ umpires, dormitory, broadcasting, commentary box, security, VIP Box, Cafeteria, first aid, Anti-Doping center, toilet facility etc. The pavilion is also proposed to house spaces for different sports federation (Cricket, Basketball, Volleyball, Lawn Tennis, Badminton, Swimming and others). The pavilion is also proposed to have space for administration who will maintain the overall working of Sports' Complex.



Figure 19: Stadium

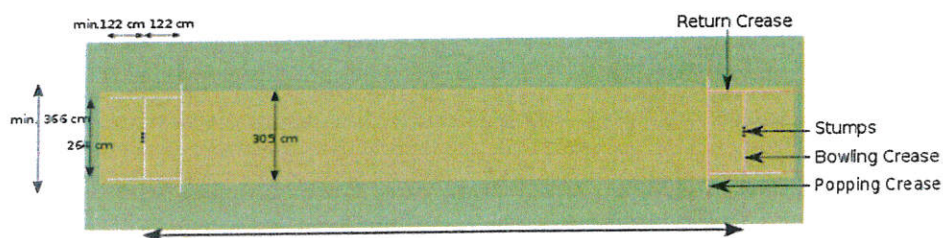


Figure 20: Cricket Pitch



6.3.3 Basketball Court

One outdoor Basketball court is proposed inside Sports Complex but outside Stadium. In basketball, the basketball court is the playing surface, consisting of a rectangular floor, with baskets at each end. Outdoor surfaces are generally made from standard paving materials such as concrete or asphalt. Under International Basketball Federation (FIBA) rules, the court is 28 by 15 meters (91.9 by 49.2 ft). The baskets are always 10 feet (3.05 m) above the floor (except possibly in youth competition). Basketball courts have a three-point arc at both baskets. The FIBA three-point line is 2.95 m (9.68 ft) from the sideline in a zone starting at the baseline and ending when it crosses the 22.1 ft (6.75 m) arc. The 21.65 ft (6.60 m) distance exists only at the points on the three-point line that are directly to the left and right of the basket center.

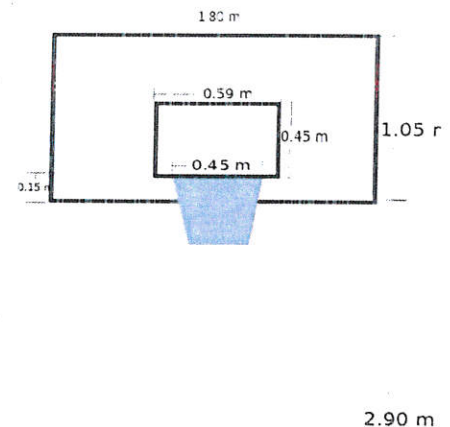


Figure 21: Basket Dimension

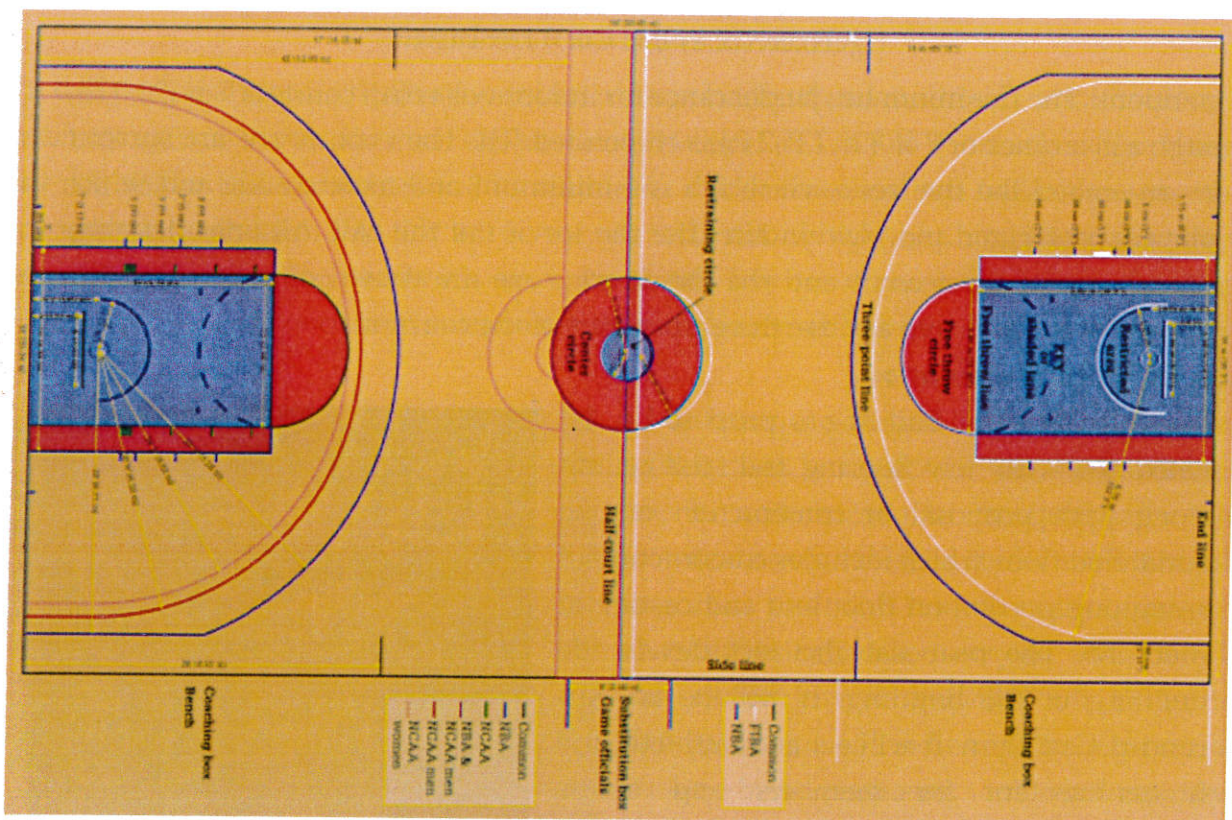


Figure 22: Basketball Court Dimension

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6.3.4 Volley Ball Court Renovation

Renovation of two existing Volley Ball Courts along with seating area is proposed in the proposed sports complex. A proposed volleyball court is 9 m × 18 m (29.5 ft × 59.1 ft), divided into equal square halves by a net with a width of one meter (39.4 in). The top of the net is 2.43 m (7 ft 11 11/16 in) above the center of the court for men's competition, and 2.24 m (7 ft 4 3/16 in) for women's competition, varied for veterans and junior

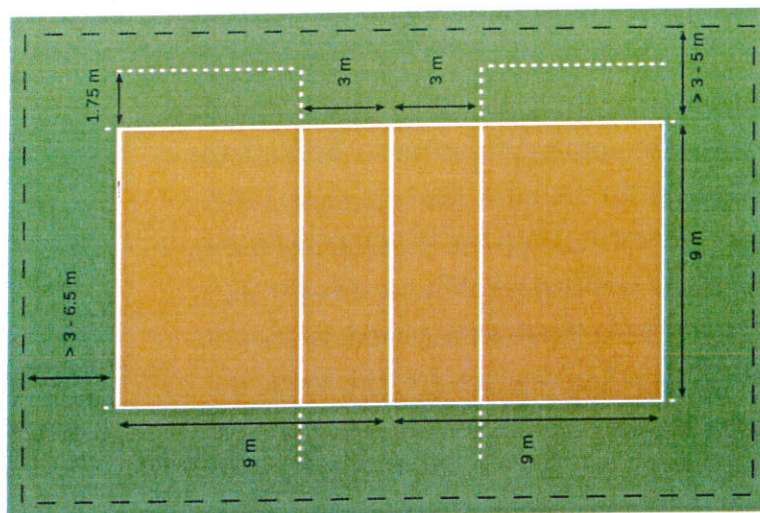


Figure 23: Volley Ball Court Dimension

competitions. The minimum height clearance for indoor volleyball courts is 7 m (23.0 ft), although a clearance of 8 m (26.2 ft) is recommended. The team courts are surrounded by an area called the free zone which is a minimum of 3 meters wide and which the players may enter and play within after the service of the ball. All lines denoting the boundaries of the team court and the attack zone are drawn or painted within the dimensions of the area and are therefore a part of the court or zone.

6.3.5 Gym Renovation

The existing Gym Building is proposed to be renovated with new flooring and false ceiling along with proposal of construction of one additional floor which includes construction of remaining portion on first floor and casting of roof slab. The proposal also includes façade uplifting of the building. It will be an Air-conditioned Gym. It will act as an athletic and fitness centers for members and sports personnel of the sports Complex as well as other members. Toilet, change room, locker and drinking water facilities is proposed in the Gym with facilities of Locker. Gym is proposed with new gym equipment.



Figure 24: Indicative Gym Interior



Table 2: List of Proposed Gym Equipment for each Floor

Gym Equipment		
S.No.	Equipment/Machine	Nos
1	Commercial Motorised Trade Mill	7
2	Commercial Cross Trainer	7
3	Commercial Cycle	10
4	Commercial Smith Machine	2
5	Commercial Cable Cross over	2
6	Commercial Lattice Set	2
7	Big Gym Ball	10
8	Medicine Ball 1 to 10 Kg	10
9	Bench Press-Inclined and declined - Both	2
10	Flat Bench (Adjustable)	3
11	Small Tools	6
12	Orbit Elliptical Machine	6
13	Generator Recumbent Bike	6
14	Vibration Plate (Crazy Massager)	6
15	Multi Gyms- Abdominal Crunch	6
16	45 Degree Leg Press	2
17	Leg Extension/Leg Curl	2
18	Rowing Machine	5
19	Foam roller	6
20	Ab Wheel	6
21	Dumple 5 Kg, 7.5 Kg, 10 Kg, 15 Kg, 20 Kg, 25 Kg, 30 Kg, 35Kg & 40 Kg	2 Pairs Each
22	Butterfly	2
23	Arm Curl	2
24	Mirror (3mX 2m)	5
25	Locker	50
26	Steam Bath (Sauna Bath)	2
27	Rubber Mat	50 sqm


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6.3.6 Lawn Tennis

Two outdoor Lawn Tennis court is proposed inside Sports Complex but outside Stadium. Although Tennis is played on a variety of surfaces however grass court is proposed for Sandy's Sports Complex. Tennis is played on a rectangular, flat surface. The court is 78 feet (23.77 m) long, and 27 feet (8.2 m) wide for singles matches and 36 ft (11 m) for doubles matches. Additional clear space around the court is required in order for players to reach overrun balls. A net is stretched across the full width of the court, parallel with the baselines, dividing it into two equal ends. It is held up by either a cord or metal cable of diameter no greater than 0.8 cm (1/3 in). The net is 3 feet 6 inches (1.07 m) high at the posts and 3 feet (0.91 m) high in the center. The net posts are 3 feet (0.91 m) outside the doubles court on each side or, for a singles net, 3 feet (0.91 m) outside the singles court on each side.

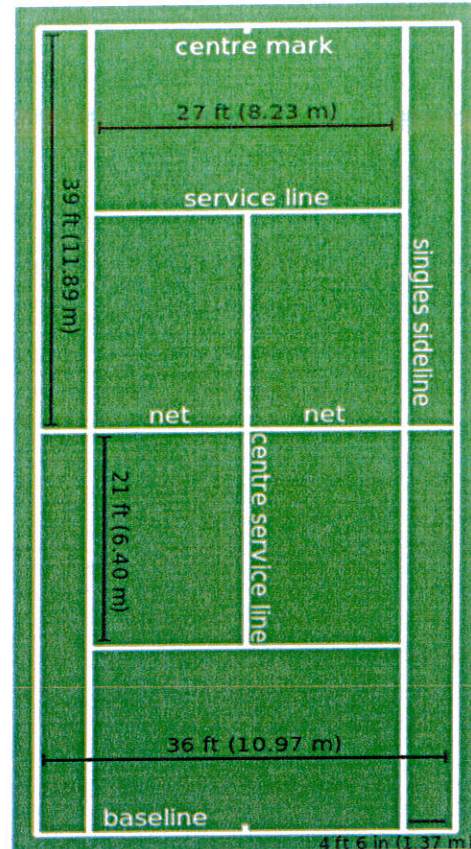


Figure 25: Lawn Tennis Size

6.3.7 Swimming Pool

An open swimming Pool of International size (25m X 50m) is proposed in Sports Complex.

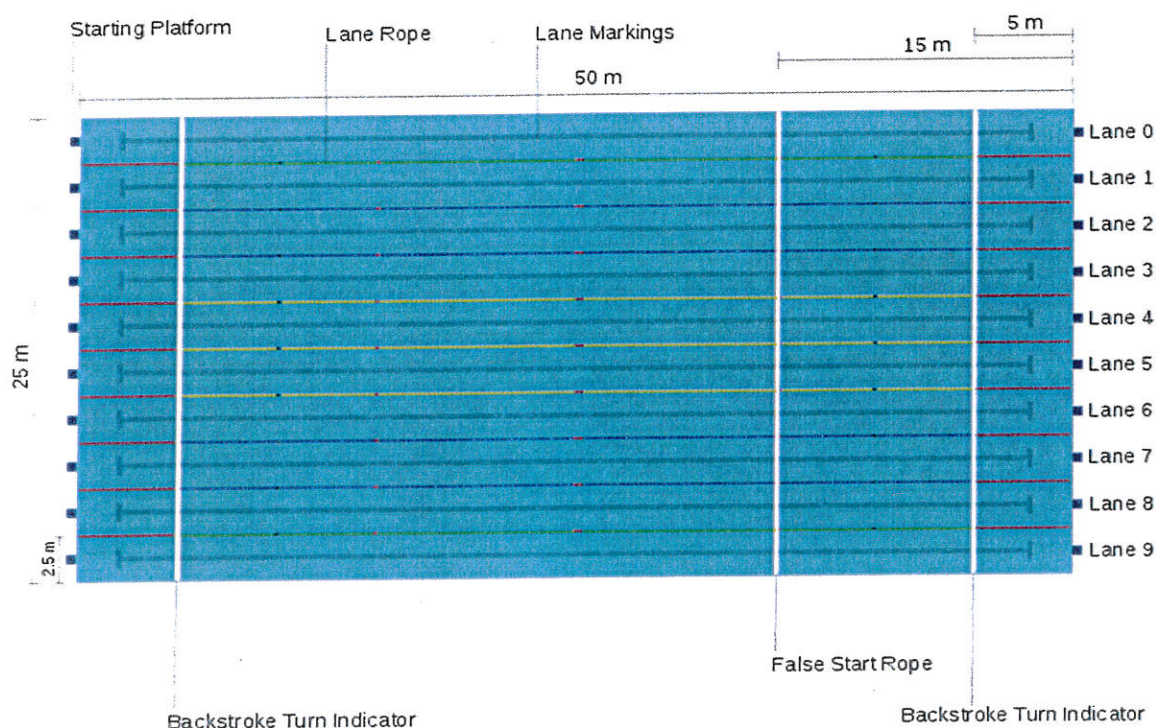


Figure 26: Swimming Pool Dimension



The swimming pool is proposed with allied services; toilets, change rooms, store room, lockers, balancing tank, pump room and other administrative facility required for operation of the sports. World Championship pools must be 50 meters (160 ft) (long course) long and 25 meters (82 ft) wide, with ten lanes labelled zero to nine (or one to ten in some pools; zero and nine (or one and ten) are usually left empty in semi-finals and finals); the lanes must be at least 2.5 meters (8.2 ft) wide.

They will be equipped with starting blocks at both ends of the pool and most will have Automatic Officiating Equipment, including touch pads to record times and sensors to ensure the legality of relay takeovers. The pool must have a minimum depth of two meters.

6.3.8 Cafeteria and Food Plaza

One Cafeteria with open to sky food plaza is proposed inside Sports Complex. The food plaza will have access from common ground for general public. It will also have access from rear side from sports complex so that people from sports complex can have direct access to cafeteria. The food plaza is proposed to have permanent furniture made up of bricks and concrete with patio umbrellas.



Figure 27: Indicative Cafeteria with Food Plaza



Figure 28: Indicative Food Plaza


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6.4 Development of Theme Based Parks

Small theme based park and play areas are proposed inside Sandy's Compound to cater the need of people of different age groups. It will also encourage people participation in different interest/activity based events in the proposed park.

6.4.1 Kids Play Area

A Kids play area is proposed inside Sandy's Compound. This area will basically cater to Kids and teenagers. It will also have sand bed for kids to play with sitting stone benches where one can sit and enjoy the surroundings, toilet facility with feeding rooms for women and drinking water facility.



Figure 29: Representative Kids Play Area

The proposed park will have the following play equipment:

Table 3: Kids Play Equipment

Kids Play Equipment		
Sl.No.	Equipment	No
1	Swings	4
2	Slides	4
3	Double Seesaw	4
4	Trampoline with Safety Net	4
5	Wave Slide	3
6	Spiral Slide	3
7	Outdoor Play Station	2
8	Marry Go Round	2
10	Circular Swing	4

The area will be enclosed with wooden fencing of with single entrance. A Gazebo is also proposed in the play area.



6.4.2 Sculpture Court cum Open Art Gallery

A small sculpture court is proposed where the history of Bhagalpur will be depicted through sculpture. It will also have other theme based sculptures like modern, historic, etc. The court will have sitting benches along the pathway for people to sit. The sculpture will be acquired by BSCL through public participation without incurring any cost.

It will also have open art gallery space where people can come and display (themed temporary art exhibitions) their creativity through models and paintings. The area will be enclosed with wooden fencing of 900mm height with single entrance.



Figure 30: Art Exhibition Area



Figure 31: Modern Sculpture Representation


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6.4.3 Outdoor Gymnasium

An outdoor gym is proposed in a Sandy's Compound. The gym will have following outdoor equipment:

- Air walker
- Sit up station
- Air Swing
- Stair Stepper/Twister
- Air Swing/Horse rider Station
- Pull Chair
- Leg Press/ Exercising bars
- Sit up/ Twister/ Arm wheel
- Dips/Chin Ups/ Pull Ups equipment
- Rowing Machine
- Double Cross Walker
- Elliptical Exerciser



Figure 32: Representation of Open Zoo

Beside gym equipment, seating benches are proposed inside outdoor Gymnasium. A Gazebo is also proposed inside it as all-weather seating. It will also have a toilet block with drinking water facility. The area will be enclosed with wooden fencing of 900mm height with single entrance.

6.4.4 Yoga Park

Currently Sandy's compound is having one shaded Yoga Platform. There is proposal to develop 3 additional Yoga Platform in the proposed Yoga Park along with remodelling of existing one Yoga Platform. It will have a separate entry with access by alley having hedges on both side which will be further connected to Walkway to give it a quite environment. The area will be enclosed with wooden fencing of 900mm height with single entrance.



Figure 33: Representation of Yoga Platform

6.4.5 Nursery

To promote habit of gardening in the people of Bhagalpur a nursery is proposed inside Sandy's Compound. It will act as interpretation center for peoples. The nursery will be responsible for maintaining the flower beds which is proposed inside Sandy's Compound at different locations. The nursery will also have retail arm which will sell seeds/plants to the general public, commercial gardeners, and private nurseries. It will also supply the needs of institutions or private estates.



Figure 34: Representation of Nursery



6.4.6 Open Zoo

Earlier there was a zoo inside Sandy's Compound. Herbivorous animals were kept inside small cages for public display. However over the period of time it became redundant. Revival of the same an open Zoo is proposed inside Sandy's Compound where Herbivorous animals like Deer, Ducks, Peacock, rabbit and others. The zoo will be wire fenced from all side to restrict the movement of kept animals in the whole compound. The zoo should work under an expert zoologist so that animals gets proper care.



Figure 35: Representation of Open Zoo

6.5 Development of Linkage

Several linkages are proposed inside Sandy's Compound to connect the whole compound. The linkages will work as artery of the Sandy's compound. Based on usage following linkages are proposed inside the compound:

6.5.1 Vehicular cum Cycle Track:

A vehicular cum cycle track of 2.55km km is proposed inside Sandy's compound. It is mostly proposed on the periphery of the compound so it will also work as a maintenance road. The proposed finish of the track is Paver Block. The width of the proposed cycle track is 4.5m.

6.5.2 Joggers Track

For morning runners, a jogging track of 1.95 km is proposed. The jogging track will have shaded seating benches at 400 m interval. The track is proposed to be 2.4m wide having rammed Murram at top with concrete edging.

6.5.3 Walkways and Natural Trail

The cycle track and joggers track are proposed to be interconnected to each via. Walkways and Natural Trail. The walkways are proposed to be 3.6 m wide having Sandstone finish while the natural trials are proposed to be 1.2 m wide with rammed Murram finish. The overall length of Walkway and natural Trail are 3.98 km and 1.58 km respectively. The existing pathway on the periphery of main ground, currently of concrete, is proposed to be developed as Walkway. The walkway will have shaded seating benches at 400 m interval.

6.5.4 Drive Way

There is a proposal of revamping the existing drive way up to Station Club. A layer of Bitumen is proposed to be laid over existing concrete driveway with kerb stone and markings on both sides.

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6.5.5 Battery Operated Vehicle

No vehicular movement is to be allowed inside Sandy's Compound. However Sandy's Compound will have its own Battery Operated Vehicle which will cater to demand generated by Old age people, PH people, Ladies, Kids and others. It is proposed to be operated in PPP mode.



Figure 36: Representation of Battery Operated Car

6.6 Development of Water Bodies and Retention Pond

It is proposed to preserve every drop of rain water falling inside the Sandy's Compound. It will be done by developing 3 water bodies. Two existing water body will be developed as water retention pond and one additional retention pond will be developed in the N-E side of the compound.

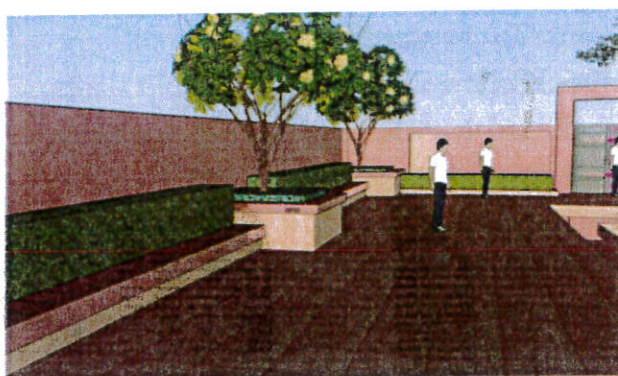


Figure 37: Representative Plaza

Storm water will be channeled to a retention basin through a system of storm drains/swale, and a network of drain channels and underground pipes. The basins are designed to allow relatively large flows of water to enter, but discharges to receiving waters are limited by outlet structures that function only during very large storm events. Depth of retention ponds is of critical importance, for removal of pollutants and the volume of water it needs to retain during the peak.

Retention pond will be landscaped with a variety of grasses, shrubs and/or wetland plants to provide bank stability and aesthetic benefits. Vegetation provides water quality benefits by removing soluble nutrients through uptake.

Out of three water retention pond, one pond is proposed to be developed for recreational purpose. The proposal includes development of Plaza, Cafeteria, Viewing deck, stepped Ghat, Toilet block along with boating facilities.

6.7 Rehabilitation of Station Club

Station Club is currently in dilapidated condition. However looking at its importance it is proposed to be rehabilitated. The current Doordarshan Kendra is proposed to be removed so that after rehabilitation the Station Club can maintain its character. There is proposal of removing the whole roof slab and casting it again as the condition of existing slab is dilapidated. The dance floor which is again in broken state is proposed to be removed as original. The proposal includes renovating interiors including plastering,



painting, wall paneling, false ceiling, tiling, providing fixture in toilet, lighting and electrical works.

The proposal also includes development of water fountain outside the Station Club, External Lighting and Path development. The finish of proposed path is Granite Cubes.



Figure 39: Water Fountain



Figure 38: Cobble Stone



Figure 42: Existing Station Club Building



Figure 41: Roof Condition



Figure 43: Billiard Board



Figure 40: Broken Dance Floor

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6.8 Entrance

There are total 27 proposed Entrance inside Sandy's Compound, out of which 3 main entrances are proposed with parking facility, guard room along with small water fountain. Existing entrance are proposed to be demolished and new grand entrance will be made in place of that. Following is the list of entrance proposed inside Sandy's Compound.

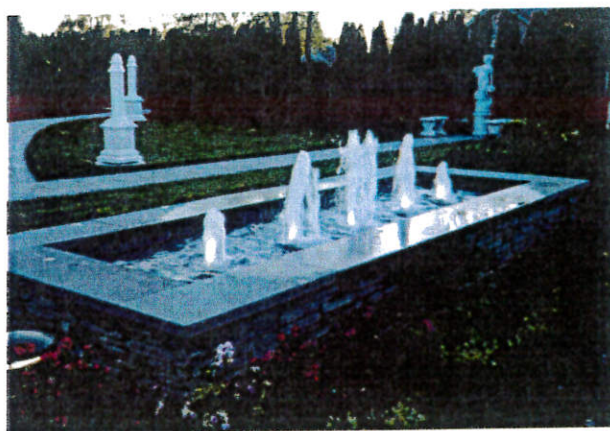


Figure 44: Representative Fountain at Entrance

Table 4: Entrance

Main Entrance	
Main Entrance from NH33 side	1
Main Entrance from Tilkamajhi-Manali Road	1
Sports Entrance	1
Secondary Entrance	
From Tilkamajhi-Manali Road (Fair Ground Side)	1
Near Kacheri Chowk (From NH33 side)	1
Internal Entrance	
Link Badminton Stadium to Sandy's Compound	1
Link Cleveland Memorial to Sandy's Compound	1
Link Stadium to Sandy's Compound	1 Primary + 3 Secondary
Separate Entrance	
Cleveland Memorial	1
Badminton Stadium Entrance	1
Other Entrance	
Entrance to Parks and Open Gym	10
Emergency Exit	3

6.9 Renovation of open-air theatre

The existing Open Air Theatre which is in degraded condition is proposed to be developed into a fine place for hosting different activities including drama, musicals and others. The proposal includes landscaping, surface treatment and extension of facilities like drinking water and toilet.



Figure 45: Representation of OAT



6.10 Rehabilitation of Cleveland Memorial

The existing Cleveland Memorial which is of historic importance is proposed to be developed as a separate space with all amenities. It will be developed as an open area with basic facilities like Toilet block and drinking water facility. The proposal includes:

1. Building renovation
2. Retrofitting of Boundary Wall
3. Special Lighting for Memorial (Indoor and Outdoor)
4. Ticket cum Guard Room
5. Cafeteria
6. Water Fountain

6.11 Development of Fair Ground/ Event Space

The existing Fair Ground will be developed as open landscape area. It will be developed as an open area with separate secondary entry so that it can cater any ongoing event. It will be developed for hosting events (fairs, exhibitions, etc).

6.12 Renovation of campus compound wall

The overall length of campus boundary wall around 3.5 Km of which external boundary wall is 2.5 Km and internal boundary wall is 1.0 Km. The proposal includes demolition of existing boundary wall and construction of high end boundary wall.



Figure 46: Boundary Wall



6.13 Development of Adventure Zone

An Adventure zone is proposed to be developed under PPP. The proposed activity in the adventure zone include Wall Climbing, Rope Climbing, Zip line, Camping, Tunnel and Swings.

6.13.1 Zip Line

A zip line is made up of a pulley appended to a stainless-steel cable extended between fixed points of different elevations. Also known as 'zip wire', 'flying fox' and 'Tyrolean Crossing', it allows a person, fastened to the moving pulley, to 'zip' from the top to the bottom of a cable, propelled by gravity. For gravity alone to propel the user, the zip line must be inclined to a certain degree.

Besides their obvious functional value, zip lines have become a popular outdoors activity, located in adventure camps and resorts. In a professionally run recreational set-up, the user is attached to the cable by a harness, which is attached to a trolley.

The height of cables varies from 30ft (9m) to as high as 200ft (61m), and can cover distances of over 1500ft (457m). The average speed on a zip line is around 50 km/h and 60 km/h.



Figure 47: Zip Line

6.13.2 Rappelling

Rappelling also known as Abseiling, 'to recall' or 'to pull through', is a controlled descent off a vertical drop, such as a rock face, using a rope.

This technique is used by climbers, mountaineers, cavers, canyons, search and rescue and rope access technicians to descend cliffs or slopes when they are too steep.

To descend safely, abseilers use a variety of techniques to increase the friction on the rope to the point where it can be controlled comfortably. These techniques range from wrapping the rope around their body (e.g. The Dülfersitz) to using a custom built device like a rack. Practitioners choose a technique based on speed, safety, weight and other circumstantial concerns.



Figure 48: Rappelling



6.13.3 Wall Climbing

A climbing wall is an artificially constructed wall with grips for hands and feet, usually used for indoor climbing, but sometimes located outdoors. Some are brick or wooden constructions, but on most modern walls, the material most often used is a thick multiplex board with holes drilled into it. Recently, manufactured steel and aluminium have also been used. The wall may have places to attach belay ropes, but may also be used to practise lead climbing or bouldering.



Figure 49: Wall Climbing

Each hole contains a specially formed t-nut to allow modular climbing holds to be screwed onto the wall. With manufactured steel or aluminium walls, an engineered industrial fastener is used to secure climbing holds. The face of the multiplex board climbing surface is covered with textured products including concrete and paint or polyurethane loaded with sand. In addition to the textured surface and hand holds, the wall may contain surface structures such as indentions (incuts) and protrusions (bulges), or take the form of an overhang, underhang or crack.

Some grips are formed to mimic the conditions of outdoor rock, including some that are oversized and can have other grips bolted onto them.

6.13.4 Rope climbing

Rope climbing is a sport in which competitors attempt to climb up a suspended vertical rope using only their hands. Rope climbing is practiced regularly in different Games, and is enjoying a resurgence in most countries.



Figure 50: Rope Climbing

6.13.5 Paintball

Paintball is a competitive team shooting sport in which players eliminate opponents from play by hitting them with spherical dye-filled gelatine capsules ("paintballs") that break upon impact. Paintballs are usually shot using a low-energy air weapon called a paintball marker that is powered by compressed air (nitrogen) or carbon dioxide.



The game was initially developed in May 1981 for recreation, but now is frequently played at a formal sporting level with organized competition that involves major tournaments, professional teams, and players. Paintball technology is also used by military forces, law enforcement, paramilitary and security organizations to supplement military or other training. Paintball markers can play a role in riot response and nonlethal suppression of dangerous suspects.



Figure 51: Paintball

Games can be played on indoor or outdoor fields of varying sizes. A game field is scattered with natural or artificial terrain, which players use for tactical cover. Game types and goals vary, but may include capture the flag, elimination, defending or attacking a particular point or area, or capturing objects of interest hidden in the playing area. Depending on the variant played, games can last from minutes to hours, or even days in "scenario play".

6.13.6 Zorbing

Zorbing (globe-riding, sphereing, orbing) is the recreation or sport of rolling downhill inside an orb, generally made of transparent plastic. Zorbing is generally performed on a gentle slope, but can also be done on a level surface, permitting more rider control. In the absence of hills some operators have constructed inflatable, wooden, or metal ramps. Due to the buoyant nature of the orbs, Zorbing can also be carried out on water, provided the orb is inflated properly and sealed once the rider is inside. "Water walking" using such orbs has become popular in theme parks across the UK. There are two types of orbs, harnessed and non-harnessed. Non-harness orbs carry up to three riders, while the harness orbs are constructed for one to two riders. Double-harness spheres have different slope requirements, and must only be operated in specific locations. The longer runs are approximately half a mile.



Figure 52: Zorbing



6.13.7 Archery

Archery is the art, sport, practice, or skill of using a bow to shoot arrows. Historically, archery has been used for hunting and combat. In modern times, it is mainly a competitive sport and recreational activity. A person who participates in archery is typically called an archer or a Bowman, and a person who is fond of or an expert at archery is sometimes called a toxophilite.



Figure 53: Archery

6.13.8 Mechanical Bull Ride

A mechanical bull, also known as a bucking machine, is a device that replicates the sensation of riding a bucking animal, such as a rodeo bull or horse invented and popularized by Sherwood Cryer. It is usually powered by a variable-speed electric motor. Padded flooring is often installed around the equipment in order to reduce the likelihood of injury to those thrown off it.



Figure 54: Mech. Bull ride

A "quick stop" motor allows the operator to safely control the ride and ensure safety for the rider; this feature allows the operator to stop the ride prior to a rider being thrown. The trained operator at the variable speed control box regulates the unit's Buck-and-Spin speed, as well as spin direction. The equipment has the capability of starting rides very slowly and speeds can be advanced according to a rider's ability.

6.13.9 Human Foosball

It's the same thing as regular foosball, but life-sized! Human foosball is played with a large group, so make sure you bring enough friends or family to get the full experience. The field is about 32 feet long and 16 feet wide, with rods stretching across the field. The players (us humans) hold on to the rods in set positions. The customization of how many people can play varies, especially if you're building your own, but it generally follows the table game pretty closely. For a fun game you probably need at least 10 people, and at maximum, around 14.

Human chess is a form of chess in which people take the place of pieces. Human chess is typically played outdoors, either on a large chessboard or on the ground.



Figure 55: Human Foosball



Figure 56: Human Chess

6.14 Camping Area

A camping area is also proposed inside Sandy's Compound for schools and other institutions. It will be a source revenue generation also. Camping is an outdoor activity involving overnight stays away from home in a shelter, such as a tent or a recreational vehicle. Typically participants leave developed areas to spend time outdoors in more natural ones in pursuit of activities providing them enjoyment.

To be regarded as "camping" a minimum of one night is spent outdoors, distinguishing it from day-tripping, picnicking, and other similarly short-term recreational activities. Camping can be enjoyed through all four seasons.



Figure 57: Representation of Camping Area

6.15 Drainage

It is proposed to preserve every drop of rain water falling inside the Sandy's Compound. Storm water will be channelled to a retention basin proposed inside Sandy's Compound at different places through a system of open storm drains/swale, and a network of drain channels and underground pipes (in case of stadium and multipurpose ground).

A swale is a shady spot, or a sunken. In particular, it is a shallow channel with gently sloping sides. Such a swale may be either natural or man-made.

Artificial swales are often infiltration basins, designed to manage water runoff, filter pollutants, and increase rainwater infiltration.

Swales as used in permaculture are designed to slow

and capture runoff by spreading it horizontally across the landscape (along



Figure 58: Swale Landform




an elevation contour line), facilitating runoff infiltration into the soil. This type of swale is created by digging a ditch on contour and piling the dirt on the downhill side of the ditch to create a berm.

6.16 Compost and Gray water Treatment

Two vermicomposts are proposed inside Sandy's Compound to treat organic waste which will be generated by large number of trees, shrubs, grasses and food waste. It will also be used for the treatment of Sewage generating from toilets.

Vermicomposting can also be applied for treatment of sewage. A variation of the process is vermifiltration (or vermidigestion) which is used to remove organic matter, pathogens and oxygen demand from wastewater or directly from blackwater of flush toilets.


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6.17 CCTV Surveillance

The whole compound is proposed to have an added security of CCTV. The CCTV are proposed to be put up under MSI-ICCC project. However there will be one security video surveillance room inside the compound, which will be further connected to the Command Control Center, to monitor Sandy's Compound continuously.

6.18 Audio System

The compound is proposed to have an Audio system which can come under MSI-ICCC. Audio Bollards are proposed for the same. It can be used as an announcement system, or can be utilised to create theme by playing theme based songs. A big speaker system is also proposed for the whole compound.

6.19 Solar Roof

Solar Panels are proposed to be installed on the roof of the proposed building inside campus. However the provision of the same is to be given under Solar roof top proposal under BREDA. They will be analysing the electrical requirement of the building as well as areas where solar panels can be installed along with its support system and will give proposal based on that. The roof top solar system can be off-grid or on-grid system based on the proposal by BREDA.

6.20 Shared Bicycle System

Cycle track is proposed inside Sandy's Compound. To make it work shared bicycle system is proposed inside Sandy's Compound. 3 parking spots are proposed for bicycle stand at near general parking area at two different main entrance and one secondary entrance. An app or RFID card based bicycle sharing system is proposed. It is proposed to be developed into PPP mode.



Figure 59: App based bicycle sharing System

6.21 Kiosks

11 nos. of kiosks are proposed inside Sandy's Compound at 2 different location. These kiosks will be utilised as food and art and craft selling center.

6.22 Landscape Feature and Furniture

Although the whole compound is proposed to be landscaped. However certain landscape elements are proposed in Sandy's Compound like Gazebo, Mounds, Trellis Walkway, Walk and bridges. The furniture includes Sitting Benches and Dustbins. The compound is also equipped with Toilets along with Drinking water facility.



Figure 60: Mounds



Figure 61: Metallic Dustbin



Figure 62: Bridge



Figure 63: Gazebo



Figure 64: Trellis Walkway

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7. Scope of work & Specifications

7.1 Scope of Work

Scope of work includes applying the design principles, Objective and expected outcomes illustrated in drawings. The Implementing Agency shall review the design and details for betterments or improvements if any which may be incorporated to better achieve the Employer's goals and objectives. These betterments, if any, shall be submitted by the Implementing Agency to the Employer for review and for the approval before the commencement of on ground working stage.

The scope of work which shall be adhered during construction activities would include:

- The cleaning, drenching and revival of the compound, water body and surrounding.
- Civil Construction of buildings, kiosks, entrance plaza, Open Air Theater, Ghats, walkways, viewing deck, drainage and toilets.
- Installation and commissioning of light fixtures, transformers and support systems.
- Landscaping and beautification work on site.
- Installation and commissioning of aeration fountain and small fountains at entrance plaza.
- The Implementing Agency would submit a complete timeline for scope of work to be carried out.
- The Employer will supervise and monitor the progress and Implementing Agency shall provide necessary coordination.
- The details of the man power deployment for the project are to be monitored on regular basis.
- Implementing agency should ensure that there is least disturbance to the existing ecology of compound and also ensure safety of the workers while working.
- The Implementing Agency shall also prepare GFC for the project works in accordance with the design developed in DPR.

Scope of Civil, Electrical, Landscape Works and various Construction Works:

- LANDSCAPE WORK INCLUDING IRRIGATION AND PLUMBING:**
Design, construct & develop Landscape for Sandy's Compound comprising execution of Architectural, Landscape work (including Softscape / Horticulture and Hardscape) complete in all respect.

The softscape works consist of works such as restoring top soil, excavation, site cleaning, Grading & drainages, mound & slope preparation, designing and




planting shrub, trees & ground covers, designing and planting of lawn, Garden furniture's, dustbins, etc. as per the approved drawings by Employer.

The hardscape works consist of Site leveling of entire pathway, demolition of Peripheral railing around the pond, construction of new wall with light post all around pond, Construction of new boundary wall with light posts, Realignment of pond retaining wall, Entry gates, creating space for toilets, kiosks, new construction of steps in pond, Hardscape, pathways and sit-out spaces, dustbin, Parking areas, Painting of all the structures works etc. as per the approved drawings by Employer. Item complete in all respect to the satisfaction of engineer in charge. The work also includes plumbing and irrigation for the garden, toilets etc. as per the drawings approved by the Engineer-in-charge.

- b. **CIVIL WORKS:** Design, Detailed Engineering & Preparation of construction drawing for civil construction items in Sandy's Compound comprising of Architectural, Civil & Structural work complete in all respect. The civil works consist of works such as excavation, site cleaning, Plain Cement and Reinforced cement concrete works, Reinforcement steel works, centering and finishing works etc. as per the approved drawings by the Engineer-in-charge.
- c. **ELECTRICAL WORKS:** Design, detailed engineering, preparation of construction drawing, manufacture, acceptance testing at manufacturer's works or at any accredited agency, supply, packing, forwarding and delivery from manufacturer's works/ place of storage to erection site including transit insurance, unloading, storage at site, assembly, erection, testing, installation, commissioning & performance demonstration and handing over of electrical works as per the direction of the engineer, new wiring and illumination of entire area (Landscape Lighting) related to the landscape development within the project area as of original ratings & specifications.
- d. **O&M:** Comprehensive Operation and Maintenance of the above work including repair works, provision of manpower & original spares, replacement with original or better component in case one turns faulty/ damaged/ defective during the course of entire contract period in order to maintain the upkeep intact.

The Implementing Agency must be aware of general and specific site conditions, topography and any existing landscape prior to commencement of any landscape works on site.


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7.2 Construction Scope

The on-site execution scope of work comprises of full, final and entire installation and completion of landscape and civil works to a 'best practise standard' for such works, (inclusive of buildings, hardscape, soft-scape, site furniture, exterior signage and lighting) and associated landscape services (levelling, drainage etc.) based on the design developed by the Employer and Implementing Agency's good for construction drawings and handing over of the same in full accordance with the Employer's requirements.

Key tasks include

- The Implementing Agency should submit a complete implementation timeline along with working drawings for aspects covered in DPR.
- The Employer and/or Employer's representative will supervise and monitor the progress of the implementation of the work and solution.
- All materials/samples to be submitted to the Employer for comments and approval prior to commencement of works;
- The Implementing Agency shall prepare As-Built drawings and certify on these drawings that the drawings reflect the actual works installed.

The Implementing Agency shall ensure that this submission of As-Built drawings will not delay subsequent inspections and tests by the relevant authorities; otherwise he shall be fully responsible for any consequence due to his delay.

7.3 General Specifications

The Bihar Building construction Department (BCD) specifications must be adhered to as laid down in the schedule of rates.

Proper care must be adopted while execution to adhere to the specifications and details to preserve the ecological and historical values of the compound. Following design standards and codes shall be adhered for development of compound.

DESIGN STANDARDS & CODES

- (i) National Building Code 2016
- (ii) CPWD Specifications 2009 vol. I & II.
- (iii) Relevant IS Codes
- (iv) SP 35 – Plumbing Standard
- (v) WHO standard for water quality
- (vi) TERI GRIHA

**APPLICABLE CODES AND STANDARDS**

- IS 383 Coarse and fine aggregates from natural sources for concrete
- IS 456 Code of practice for plain and reinforced concrete
- IS 516 Methods of testing for strength of concrete
- IS 1199 Methods of sampling and analysis of concrete
- IS 1838 Performed fillers for expansion joints in concrete non-extruding and resilient type
- IS 1946 Code of practice for use of fixing devices in walls, ceiling and floors of solid Construction
- IS 2389 Methods of testing of aggregate for concrete's
- IS 2505 Concrete vibrators, immersion type
- IS 2645 Integral cement water proofing compounds
- IS 3414 Code of practice for design and installation of joints in buildings
- IS 3558 Code of practice for use for immersion vibrators for consolidating concrete
- IS 4082 Recommendation on stacking and storage of construction materials at
- IS 7861 Code of practice for extreme weather concretizing
- IS 7861 Recommended practice for hot weather (part I) concretizing
- IS 8112 Ordinary Portland Cement grade 43
- IS 12269 Ordinary Portland Cement grade 53

7.4 Civil Works specifications

The materials have been selected strategically with considerations of climate, design requirement and aesthetical value of Bhagalpur and surrounding region. The following table will explain the different types of materials used in the proposal. The specifications and approved make shall be as per latest Bihar SOR.

The list of approved makes/agency of materials will be as per latest Bihar SOR.

The general specification for building work will be as follows:

Table 7.4.1: Specifications for building works

Item No.	Description	Specification
1.0	Foundation	(i) RCC foundation
2.0	Super Structure	
2.1	Structure	RCC framed construction with beams & slabs with external walls in brick masonry.
2.2	Internal Partition	The internal partitions will be in half brick masonry. The internal partitions in toilets and storage areas will be of light weight wooden panels.
3.0	Doors & Windows	
3.1	Frames	The opening will be provided with sub-base of granite stone to form a box and to support the frames.



DETAIL PROJECT REPORT

Open Spaces



Item No.	Description	Specification
3.1.1	Doors	(i) Door frames of UPVC or polyester powder coated aluminium or 2 nd Class Teakwood
3.1.2	Windows	Polyester powder coated aluminium frames or UPVC or 2 nd Class Teakwood
3.1.3	Toilet & Wet Areas (Doors)	Polyester powder coated aluminium frames or UPVC
3.2	Shutters	
3.2.1	Doors/Cupboards	(i). Flush door shutters 35mm thick with decorative teak ply veneering on both faces with French spirit polishing on both faces in meditation hall. (ii). Flush door shutters 35mm thick with commercial ply veneering with decorative lamination on both sides in library block and cupboards.
3.2.2	Toilet & Wet Areas	Shutters of compact laminated 12mm thick.
3.3	Window Shutters	(i) Factory made / Polyester powder coated 'Z' section aluminium shutters for windows. (ii). Double glazed hermetically sealed as per green norms for windows where there is Air Conditioning facility.
3.4	Fittings	Stainless steel or equivalent
3.5	Fire check door	As per fire safety specification with GI sheet frame & shutter.
4.0	Flooring	
4.1	General areas	Pre polished granite flooring/Italian marble stone flooring in pattern or Kota stone
4.2	Special areas	Granite Flooring/Vitrified Tiles
5.0	Ramps	Precast terrazzo tiles.
6.0	Railing	Stainless steel railings with ramps.
7.0	Toilets	Rectified glazed ceramic non-skid floor tiles, ceramic glazed tiles in dado, granite counters, stainless steel sink, Mirrors with moulded PVC frame.
8.0	Roofing	
8.1	Roof Treatment	(i). APP membrane sheet of STP on RCC surface and integral cement based water proofing treatment (with coba). (ii). Heat resistance tiles with SRI (Solar Reflective Index) > 78 & Solar reflection > 0.70 as per CPWD specification to meet green building norms over roof of building.
9.0	Finishing	
9.1	External	Texture paints, ACP cladding conforming to Energy Conservation Building code.
9.2	Internal	Oil bound distemper/Acrylic emulsion paint/Textured paint (low VOC)



DETAIL PROJECT REPORT

Open Spaces



Item No.	Description	Specification
9.3	Polishing	French spirit Polishing on wood works.
10.0	Provision for Barrier free	Ramps & Toilets for physically challenged chequered terrazzo tiles in ramp.

Table 7.4.2: Details of materials and specifications for outdoor works

S. No.	Materials	Specifications
1.	Entrance plaza	
	Brickwork structure	Class 1 Brick as /availability
	Paving: Red sandstone Dholpur pink sandstone Brick pavers PCC Kerbstone Parking tiles	36 mm thick rough cut as per desired size 36 mm thick rough cut as per desired size As per Design As per Design Grass Pavers / As per Design
	Cladding: Red sandstone Pink sandstone Beige granite Cladding tile Coping: Granite Sandstone PCC	20 mm thick as /design 20 mm thick as/design 12 mm thick As/ market 20 mm thick 50 mm thick 75mm thick as/availability
2.	Food court, craft plaza and Walkway	
	Walkway1: Vehicular cum Cycle Track (4.5m wide) Paving: Concrete Paver Block/ Red sandstone Dholpur pink sandstone Kerb Stone at edges Walkway2: Joggers Track (2.4m wide) Rammed Murram Finish Kerb Stone at edges Walkway3: Walkways (3.6 m wide) Sandstone finish Kerb Stone at edges Walkway 4: Natural Trail (1.2 m wide)	36 mm thick rough cut as per desired size 36 mm thick rough cut as per desired size As per availability of market As per Design As per Design As per Design



DETAIL PROJECT REPORT

Open Spaces



S. No.	Materials	Specifications
	Rammed Murram Finish Kerb Stone at edges	
	Seats and planter walls: Cast in situ seats: Structure of brickwork Natural stone boulders Coping: Granite Sandstone Brick pavers Cladding: Red sandstone Dholpur Pink sandstone Texture paint Cladding tile	1 st class brickwork 20 mm thick 50 mm thick 75mm thick as/availability 20 mm thick as /design 20 mm thick as/design 12 mm thick As/ market
	Shelter and food and craft kiosks: Structure with brick and concrete Flooring Flooring tiles Coping: Granite Sandstone Cladding: Red sandstone Dholpur Pink sandstone Texture paint	The structure will be brick and concrete frame structure as/structural design. The flooring will be available tiles in the market as per detail 12 mm thick Granite coping in counters and wall. 20 mm thick Sandstone cladding as per design. 20 mm thick as specific places and bands along with other stones and texture paints colour as per design.
3.	Ghat Area	
	The ghat area has steps of 1000 mm wide with 300 mm high at places. Surface finish: Red Sandstone Cladding: Dholpur pink sandstone:	The finish of the steps will be with 20 mm thick red sandstone blocks with 10 mm thick groves The finish of the steps will be with 20 mm thick rough sandstone blocks with 10 mm thick groves cut as/design
	Seats and planter walls: Cast in situ seats: Structure of brickwork Coping: Sandstone Brick pavers Cladding: Red sandstone	Raised planter wall with height of 600 and 450 at places. Structure will be of brick and coping with 30-50 mm sandstone block or brick pavers.



DETAIL PROJECT REPORT

Open Spaces



S. No.	Materials	Specifications
	Dholpur Pink sandstone Texture paint	The cladding will be of 20 mm thick sandstone with texture paint partly.
4.	Other linear seating areas	
	Seats and planter walls: Cast in situ seats: Structure of brickwork Coping: Sandstone Brick pavers Cladding: Red sandstone Dholpur Pink sandstone Texture paint	Raised planter wall with height of 600 and 450 at places. Structure will be of brick and coping with 30-50 mm sandstone block or brick pavers.
5.	Open air theatre area	
	Amphitheatre steps Coping with Thick brick pavers. Cladding with sandstone Stage: Finished with sandstone and sandstone cladding with edges of brick pavers. Amphitheatre Frames Concrete Sandstone Outdoor wood O.A.T. Backdrop wall RCC Sandstone Mosaic tiles	Portals cast in Concrete finished with Sandstone and wood cladding Stage Background wall with RCC wall finished with stone rubble work in one side and mural mosaic on lake side
6.	Other walkways	
	Sandstone Granite Brick pavers	Finished in 20 mm thick sandstone partly with bands of brick pavers as per design
7.	Railings and Gates	
	Iron Mild steel Stainless steel	Hot dip galvanized iron gates and Mild steel railings along the walkway on lake side SS 316 Grade
8.	Boundary walls	Partly brick and concrete structure with plaster finish and texture paint finish.
9.	Fountains inside water body	Aeration fountain inside water body

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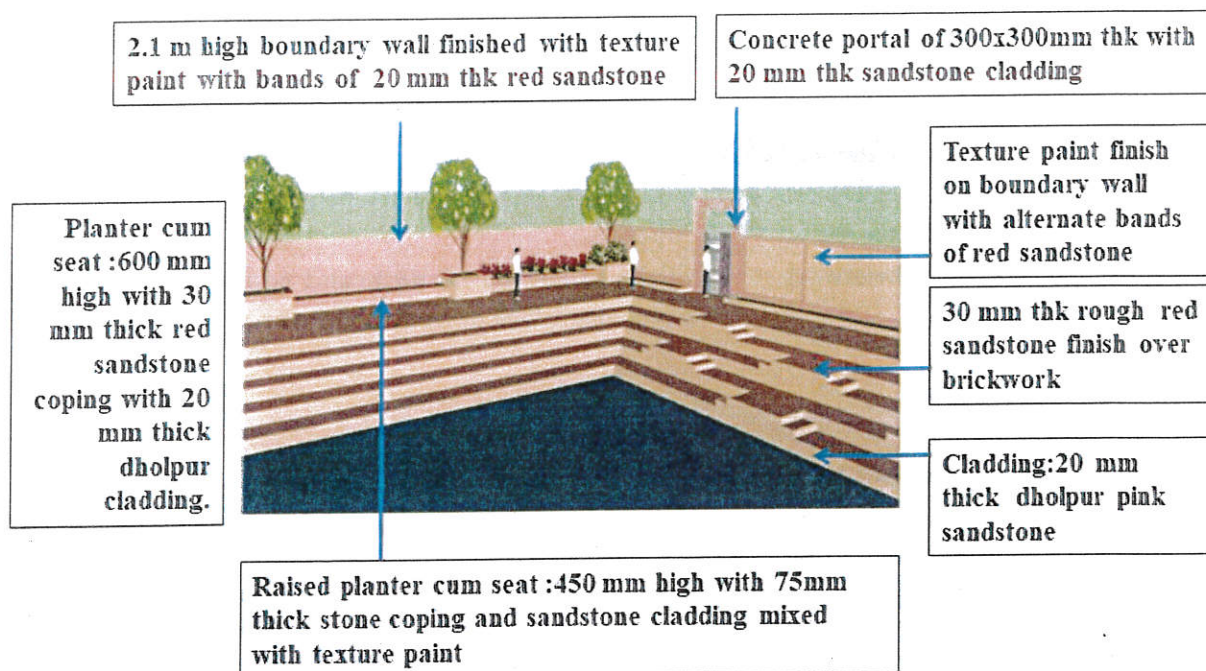


Figure 65: Typical construction specifications

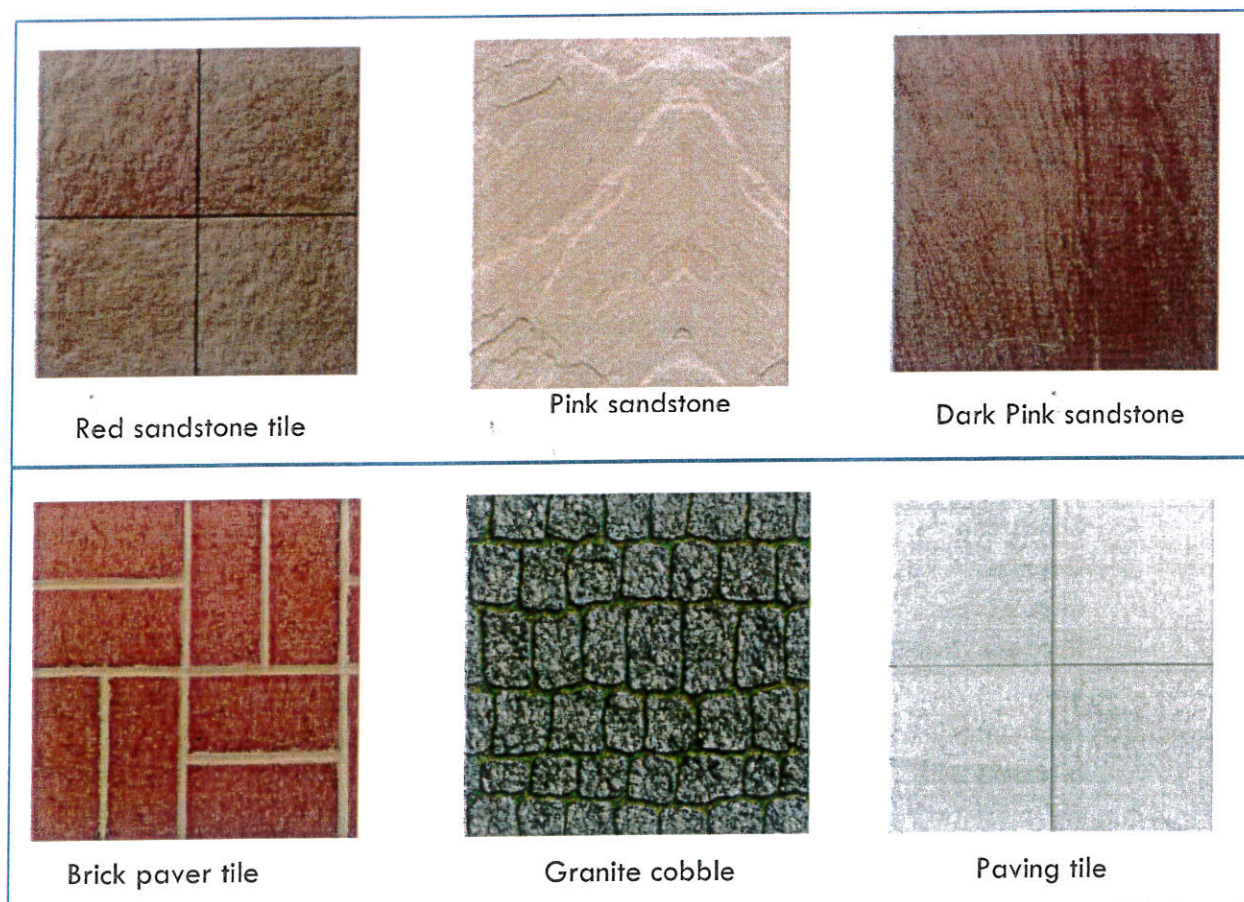


Figure 66: Paving area details



7.5 Details of Electrical items with specifications

The scheme covers the complete Electrification of the proposed development. All Electrical work shall be done as per code of practice for Electrical installations and meeting the requirements of Indian Electricity Rules/ Act, applicable I.S. Codes/Rules and relevant I.S. Specifications as below.

- a) Indian Electricity act
- b) Indian Electricity Rules
- c) IS:732 Code of practice for Electrical Wiring Installations
- d) IS:4648 Guide for Electrical Layout in residential building
- e) CPWD Specifications for Internal Electrical Installation Works
- f) Special requirements of Bihar State Electricity board.

Outdoor Lighting:

From parks and plazas to walkways and waterfronts, open spaces are essential to city life, and the right lighting can turn them into unique visual experiences. A good Lighting scheme can clarify the layout of outdoor spaces by emphasizing walkways, focal points, gathering places and open spaces. Ample lighting also boosts safety.

The Lighting design intends to perception of safety as important criteria for park's actual safety ratings. Lighting has been used to enhance the perceptions of safety and increase park as a waterfront usage. Lighting as a strategy to ensure children and families are safe from violence in the park and waterfront.

Modern lighting technology and fixtures will be used by maximizing park resources and making it easier to adopt energy-efficient, cost-saving strategies.

Outdoor solar lights use solar cells to light areas such pathways, and they are both easy to install and almost maintenance free. Wall mounted lamps, free standing lamp posts, and security lights can be used as outdoor solar lighting. Use of LED lights and energy star rated lighting fixtures are to be used for saving energy in these criteria. Necessary indoor and outdoor lighting arrangements should be covered as per the prevailing rules within the project area.

Electric supply for the compound shall be received from Bihar on 11 KV from the nearest Grid Sub-Station through overhead line / Underground Cable upto the 11 KV HT meter room from the existing substation as decided by BSEB. 2 MLDB Substation are proposed to be installed. All Lighting, Switches, Cabling, Installation are kept under scope of Electrical Works.

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The types of lights proposed in the project are as below:

Table 7.5.1: Types of lights used in project

S. No.	Type	specifications	Areas
1	L1-Post Top lights	LED light above MS post	Along the boundary wall
2	L2-Solar Pole lights	3m high on pole with inbuilt solar panel above Led light with star rated. Lux level-100	Along walkways
3	L3-Bollards	LED Bollard-20 Lux	Along Pathways and Plazas
4	L4-Tree Uplighters	LED lights to uplight tree	Under trees and shrubs Pergolas
5	L5-Step lights	LED recessed lights , LED strips	Amphitheatre steps, Ghats planter and steps, Seat walls
6	L6- Façade Lighting	Decorative pole, Projector light & linear wall washer from architectural LED fixture range.	Buildings- Station Club, Cleveland Memorial
7	L7-Stadium Lights	High Mast Lights	Stadium and open Spaces
8	L8- Indoor Lights	LED lights based, focus lights based on type of Space	Buildings inside the campus



DETAIL PROJECT REPORT

Open Spaces



LOCATION	TECHNICAL SPECIFICATION	PRODUCT	PHOTOGRAPH
STADIUM			
Cricket Pavilion (North South)	Width = 20 M Open Gallery .	50 nos. 4 W LED step light and 20 nos. 18 W FTL (IP 65) for building	
Twin Volleyball court	Two nos. 9 M X 18 M court 3 mtrs apart	14 M Pole with 16 nos. 1000 W LED Flood (4 nos. light per pole)	
Open Spectator stand for volley ball	Setep type gallery	20 nos. 4 w LED step light . Security light - under general area lighting	
Old Gym area	30M X 9M . Illumination level Avg 250 lux for Task lighting .	36 nos. LED indoor decorative lighting 50 nos.	
Twin Tennis court	11 M X 24 M court 5 mtrs apart . Illumination level - Avg 450 lux with uniformity Min/max = 0.4 and Min/Avg = 0.6	14 M Pole with 16 nos. 1000 W LED Flood (4 nos. light per pole)	
basketball Court	15.2 M X 28.7 M . Illumination level - Avg 350 lux with uniformity Min/max = 0.4 and Min/Avg = 0.6	14 M Pole with 12 nos. 1000 W LED Flood (3 nos. light per pole)	
Swimming pool	26 M X 52 M swimming pool with translucent cover & trust . Illumination level - Avg 350 lux with uniformity Min/max = 0.4 and Min/Avg = 0.6	32 nos. 350 W LED Flood on trust	
Changing room	37 M X 5 M Illumination level Avg 150 lux for Task lighting .	30 nos. 36 W LED indoor TL lighting / LED outdoor TL for entrance	
Indoor stadium	60 M X 26 M 7 nos. Badminton court. Avg 350 lux with uniformity Min/max = 0.4 and Min/Avg = 0.6	24 nos. 350 W LED Flood at 12 M High trust above court for each court - 168 nos.	






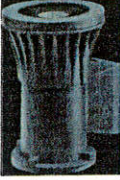


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DETAIL PROJECT REPORT

Open Spaces





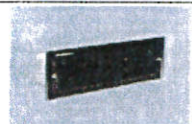




Stadium Cafeteria	Bollards for open area & Tube light for covered area	Decorative 9 W LED bollard (TETRIS - BGBOS 605 9W LED) = 10 nos. 18 W LED Tube light (IP 65) - 6 nos.	
Cleveland memorial & stadium	L = 100 M X W = 3.5 M	Decorative post top lantern ARIAN - BCGT W4 LED WW , 45 W LED post top on 5 mtrs black pole 10 Mtrs apart in one side configuration = 40 nos.	
Event/FAIR GROUND			
	(105 X 50)50 lux average considering safety and security	4 nos. 16 M Umbrala High mast with 8 nos. 350 W LED flood for adjasant area lighting	
OPEN AMPHI THEATER			
Stage		2 nos. Pole with 4 nos. 350 W LED Flood for stage lighting	
Stair & Spectator area	8 nos. stair / Top stair = 70 M ark	32 nos. 4 W step light for stair & 12 nos. 27 W Post top lantern -7 mtrs apart	 
CLEVELAND MEMORIAL			
Tree & Plant area		9 W Focus spike light = 16 nos. / 9W LED ground embeded light BLWUP 9W LED WW for plant = 10 for plant lighting	 
Pathway & Memorial boundary	L = 100 M X W = 3.5 M	Decorative 9 W LED bollard (FLUTE BGBOL 605 9W LED) 10 Mtrs apart in staggered configuration = 20 nos.	
Cafeteria		18 W LED Tube light for indoor and outdoor application with cover to IP 65 protection - 6 nos.	
memorial façade		LED flood for volume light / Strip light for building edge / projection light for pillar & other area for heightling . All lights are	



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Open Spaces



		programmable type RGB dynamic for for architechral lighting application .	
NEHRU MEMORIAL			
Steps	Septs with Max radius 21 M	9 W LED Focus spike light = 20 nos. for plant / 9W LED ground embeded light BLWUP 9W LED WW for plant = 20 for tree	 
Stair	12 nos. stair	4 W step light = 24 nos.	
Memorial block	L = 80 M dia	15 W LED projection light for columns = 16 nos. /Strip light for menorial structure edge = 20 mtrs / 48 W LED Flood for volume light - 1 no. All lights are RGB dynamic for architechral lighting application .	
Walk way 3.5M	L = 700 mtrs / 3.5 M wide road	Decorative post top lantern ARIAN - BCGT W4 LED WW , 45 W LED post top on 3 mtrs black pole 15 Mtrs apart in one side configuration = 50 nos.	
Open Cafeteria	Bollards for open area & Tube light for covered area	Decorative 9 W LED bollard (TETRIS - BGBOS 605 9W LED) = 10 nos. 18 W LED Tube light (IP 65) - 6 nos.	
Pathway	2.5 M road around memorial (280 M) & connection (220 M)	Decorative post top lantern 25 W LED fittings 10 Mtrs apart in one side configuration = 50 nos.	
MUITI PURPOSE GROUND			
National Falg Mast		100 ft Flag mast with narrow beam archi range of Natural white LED flood	
Pathway around ground	1.2 km long 3.5 mtrs wide pathway	5 M PU painted GI Octagonal pole with 45	


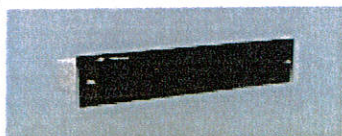
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DETAIL PROJECT REPORT

Open Spaces *




	Illumination level Avg 10 lux , min/avg = 0.3	W LED Street light in 15 M distance = 80 nos. .	
Station club inside area	L = 32 M , W = 32 M Illumination level Avg 150 lux for Task lighting .	Decorative indoor lighting of different wattage	
Pathway around building	L = 150 M , W = 3.5 M	Decorative 3.4 Mtrs post top lantern IMAGICA ASYM with 40 W LED fittings 20 Mtrs apart in one side configuration = 6 nos.	
Main entrance walk way	L = 180 M and W = 5 M	Decorative post top lantern 25 or 40 W LED fittings 30 Mtrs apart in staggered configuration = 14 nos.	
Building Façade		15 W RGB LED projection light for pillar - 12 nos. and 48 W RGB LED Volume light for varanda - 2 nos. . Light are for architechrall lighting application	
Stage		2 nos. Pole with 4 nos. 350 W LED Flood for stage lighting	
Stair		12 nos. 4 W step light for stair	

RETENTION POND

Near OAT	120 mtrs long	Decorative post top lantern ARIAN - BCGT W4 LED WW , 45 W LED post top on 5 mtrs black pole 15 Mtrs apart in one side configuration = 25 nos.	
Near Zoo	140 M X 75 M (420 Mtrs)		
Near Indoor stadium	56 M X 54 M (220 Mtrs)		

PARKING LOT


Beside main entrance		5 nos. 16 M Umbrala High mast with 8 nos. 350 W LED flood for adjasant area lighting	
Near stadium			
Multipurpose ground			
Secondary entrance			



DETAIL PROJECT REPORT

Open Spaces






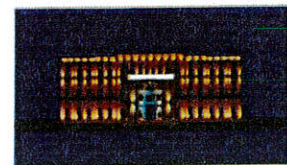
TOILET BLOCK			
stadium		10 nos. 18 LED TL indoor and outdoor application	
Retention pond		10 nos. 18 LED TL indoor and outdoor application	
Multipurpose ground		10 nos. 18 LED TL indoor and outdoor application	
Kid's playing area		10 nos. 18 LED TL indoor and outdoor application	
Zoo cage		12 nos. 18 LED TL indoor and outdoor application	
ENTRANCE			
Main entrance		Façade lighting for entrance gate	
Secondary entry		Façade lighting for entrance gate	
Parking lot entry		Façade lighting for entrance gate	
ROAD SURFACE			
Jogger's track 2.5 M	L = 2 km , 2.5 M wide track	Will be closed at night	Lighting for Security Purpose. Decorative 3.4 Mtrs post top lantern IMAGICA ASYM with 40 W
Cycle track 5 M	L = 2.5 km 5 M wide road	Will be closed at night	
Running track 2.5 M	L = 1.5 km / 2 .5M wide road	Will be closed at night	
Pathway 3.5M	L = 3 km / 3.5 M wide road	Will be closed at night	
Sculpture Garden	Projector lighting for exhibition object	SITC of 40 nos. 15 W to 25 W Warm White / White LED Narrow beam Round Projector with accessories and connection cable & foundation	
	General lighting for Exhibition ground	SITC of 4 nos. 16 M Umbrella mast with raising lowering Head frame .350 W LED Flood including High mast lighting DB, power cable and all accessories & foundation.	



DETAIL PROJECT REPORT

Open Spaces



Others			
Open Gym, Children Play Area, General garden lighting & Furniture	Tree lighting	SITC of 30 nos. 54 W Warm White / White LED Narrow / medium / wide beam Flood light with accessories and connection cable & foundation	
	Bush lighting	100 nos. SITC 9W Spike light	
	Garden area lighting	SITC of 50 nos. 1.2 M Cast Iron decorative bollard with decorative LED fixture with DB and connection cable & foundation	
	Gazebo	sitting / meditation with indirect illumination	
FAÇADE LIGHTING	Station Club	Decorative pole, Projector light & linear wall washer from architectural LED fixture range.	

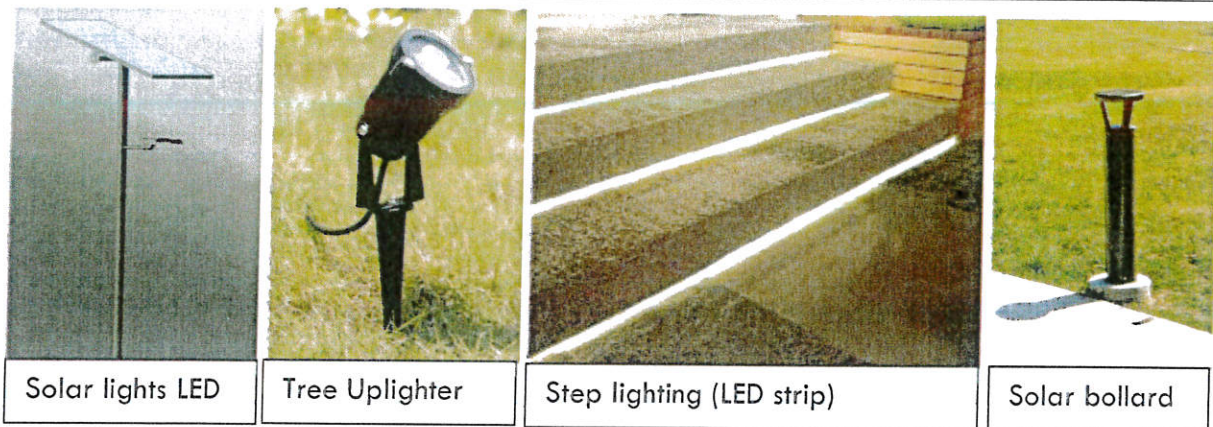


Figure 67: Lighting Fixtures reference images

Indoor lighting:

Indoor lighting which would be used inside Sports Building, Station Club, Cleveland Memorial, Guard house, Toilets, Pump room, Craft kiosks and food stalls would have similar specifications as above and will be of LED type. It will comprise of LED tube lights (T5 batten), LED fans, LED bulbs, LED down lights etc.

STADIUM FLOOD LIGHTING:



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REQUIREMENTS:

For lighting of a sports facility, design attitude should meet both visual performance & Visual comfort parameters of all groups of users, viz. Players, Officials, Spectators and the Media.

Players and Officials

They must be able to see clearly all the activities in the field to perform their best.

Spectators

The spectators should be able to follow the performances of the players and the action of the game with the minimum effort. Also the viewing should be agreeable and appealing i.e. not only the playing area, the immediate surrounding should also be visible in a rhythm with the game. Also the safety criteria of the spectators while entering or exiting the stadium or in case of any unwanted emergency should also be taken care of.

Media

Colour television broadcasting has become an indispensable part of any sports activity of National or International standard. The Lighting should provide conditions that guarantee of good colour picture quality because that is related to lots of commercial interest of the concerned authority. Also the lighting should be adequate for taking close-ups for both the players and spectators.

The following parameters are vital for the right lighting ambience:

- a. **Quantitative:** Adequate Horizontal Lighting level to create a good Visual field for Players, Spectators Good vertical lighting to meet CTV transmission requirement
- b. **Qualitative**
- c. **Uniform lighting**
- d. **Glare control**
- e. **Horizontal Illuminance:** As the illuminated playground itself forms a major part of the field of view of players and spectators it is the horizontal illumination level [Lux level] that mainly serves all the important adaptation state of the eyes. It is the basic backgrounds of the playing area satisfying which the other critical visual parameters are met.
- f. **Illuminance uniformity:** Good illuminance uniformity in both the horizontal and vertical planes is important as it ensures freedom of adaptability of eyes over the field by both the players and spectators. It is important to have good uniformity along with gradient, to minimize camera adjustments.



U1 - Ratio of lowest to the highest illuminance.

U2 - Ratio of lowest to the average illuminance.

Even when the uniformity as defined above is acceptable for a particular design, changes in illuminance can be disturbing if they occur over too short a distance. This problem is most likely to arise when panning a television camera. Where TV/Film coverage is concerned, the illuminance uniformity at a given grid point has to be expressed as a percentage change from the average illuminance in the eight adjacent grid points. This is commonly called the uniformity gradient.

g. **Glare restriction:** Glare, brightness nears or enters the field of view, has a disturbing effect on the visual comfort of both the players and spectators. Glare can be minimized by paying careful attention to the choice floodlights and by ensuring that they are properly sited and aimed bearing in mind the main directions of viewing. Glare should not only been considered for the players and spectators or who have been very close to the illuminated ground, but for also the people outside the facility who might be disturbed by the stray light from the installation. For example traffic adjacent to the playground or people living in the vicinity. A straightforward parameter to quantify the degree of such disturbances is directly related to the optical qualities of the floodlights employed and proper aiming and site of them.

h. **Modelling and shadows:** Modelling is the ability of lighting to reveal form and texture and is particularly important in providing a pleasant overall impression of the players, ball and spectators all around the area. The effectiveness of modelling is dependent upon the directions from which the light comes and the number and type of light sources used. Good quality television pictures demand good modelling from the lighting.

i. **Colour Appearance and Colour Rendering**

- Good colour perception is important in most sports. Two most important aspects of colour have to be distinguished:
- The colour appearance of the light. This is the colour impression of the total environment as created by the lamp.
- The colour rendering of the light, this is the ability of the light to reproduce the colours of an object faithfully.

Both the Colour appearance and Colour Rendering is achieved by proper spectral distribution of the lamp.



Design Philosophy

Basic Considerations are:

Lighting equipment- Use appropriate Lamp and Luminaire combination

Standard: Follow standards, Specifications for Lighting Level, Ballast -wattage delivery, etc.

Application: Use appropriate lighting design tools, and ensure that accurate data is used Usage of L: Light Regulation by selective switching for different levels of sports.

Design Requirements

The design requirements are clearly spelt out in the tender. The illumination parameters for various class of play are well defined. The quantitative as well as qualitative lighting parameters are spelt in the tender and lighting is to be designed to achieve these results at optimum Total Cost of Ownership.

Lighting should provide is visual comfort and good visibility to the players, spectators and TV crew for international event broadcasting.

BASIS OF DESIGN:

The design has been done on basis of the technical specification mentioned in the standard for cricket ground. Additionally, we have recommended two other switching steps for flexibility of usage of the venue i.e. for football & hockey ground.

Cricket ground lighting Specifications: -

Parameters	Requirement
Average Horizontal Illumination (Lux)	750 Lux & 500 lux
Uniformity (U1)-Min/Max	≥ 0.7
Uniformity (U2)-Min/ Avg	≥ 0.6
Glare Rating	< 50
Light Source Type	≤ 1350 W LED luminaire
Colour Temperature	5700K
Colour Rendering Index	> 70
Project Maintenance Factor	0.8

Football ground lighting Specifications: -

Parameters	Requirement
Average Horizontal Illumination (Lux)	500 Lux
Uniformity (U1)-Min/Max	≥ 0.7
Uniformity (U2)-Min/ Avg	≥ 0.6
Glare Rating	< 50
Light Source Type	≤ 1350 W LED luminaire



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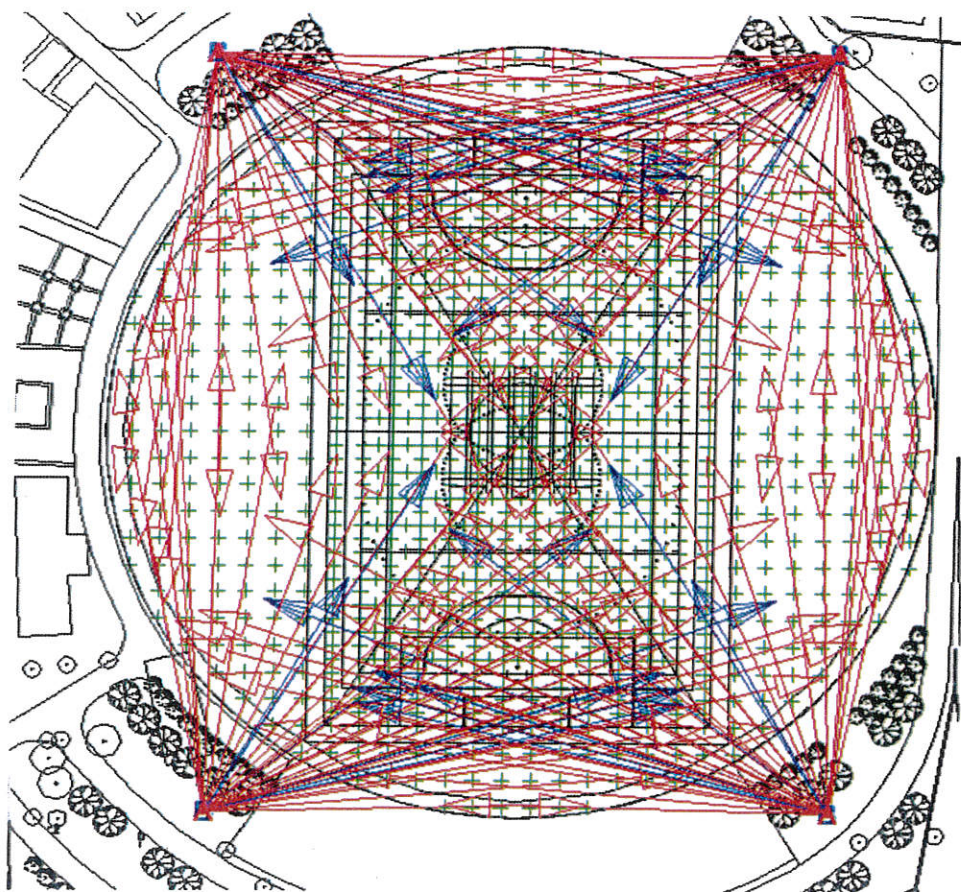


Colour Temperature	5700K
Colour Rendering Index	>70
Project Maintenance Factor	0.8

Hockey ground lighting Specifications: -

Parameters	Requirement
Average Horizontal Illumination (Lux)	500 Lux
Uniformity (U1)-Min/Max	≥ 0.7
Uniformity (U2)-Min/ Avg	≥ 0.6
Glare Rating	< 50
Light Source Type	≤ 1350 W LED luminaire
Colour Temperature	5700K
Colour Rendering Index	> 70
Project Maintenance Factor	0.8

Typical Layout of the Stadium:



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Calculation Grid:

The lighting calculations are done at 5m x 5m grid as per CIE 169:2005.

Glare Calculations:

The glare calculation done for critical observer positions as per stated in CIE 169. The maximum glare rating achieved for the above points are less than 50.

Design Results:-

(II) Luminance Calculations:

Calculation	Switching Mode	Type	Unit	Ave	Min/Ave	Min/Max
Football	2	Surface Illuminance	lux	537	0.70	0.60
Hockey	1	Surface Illuminance	lux	508	0.72	0.60
Cricket	3	Surface Illuminance	lux	592	0.77	0.60
Cricket Pitch	3	Surface Illuminance	lux	764	0.98	0.97

Summary of Lighting Design:-

- 4 nos. 35m stadium masts at top of headframe.
- Total Lighting Load Max 213 kW

TECHNICAL SPECIFICATIONS:

Luminaires:

- The floodlight luminaires shall be of special design for sports lighting application and suitable for LED light source. Each single LED Light should have maximum 1350W system with lumen output of minimum 1,57,000 lumen.
- The Luminaire and driver unit housing, floodlight's electrical connection box and mounting bracket should be made of PDC moulded aluminium. The end caps should be made of pressure die cast aluminium. All the plastic and cables in the luminaire should be UV protected.
- Luminaire should have polycarbonate lens for dedicated rotational/symmetrical optic with reduced glare properties. Various optics should be available to meet the design criteria & optimize the design for an efficient system. (Minimum 7 symmetrical optics for optimum/efficient design from extra-narrow to extra wide (2x6° to 2x19°)) with zero ULOR (Upward Light Output Ratio). These flood lights should be suitable for operating temperature range of -40°C up to +45°C.
- The floodlight shall be a state-of-the-art design allowing easy mounting. Luminaire should have a sturdy U-shaped mounting bracket with foot-print suitable for 3-point fixation by means of M20 bolts, there should be a possibility of vertical aiming from the horizontal: -90° / +90° and standing-up or hanging-down mounting. It should be supplied with electrical connection box pre-fixed enabling wiring between floodlight and driver box.
- The Floodlight fixture shall be minimum IP66 suitable for all weather outdoor application with an impact resistance of IK 08.



- Luminaire should have a Class A serviceability, luminaire is equipped with serviceable parts (when applicable) be it LED board, driver, control units, surge protection device, optics, front cover and mechanical parts from serviceability of the products in future.
- The LED Light Fixture shall have UL/ENEC & CE certification and must also be certified as stated in IEC60598 for outdoor luminaires. Maintenance of lumen output L80B50 shall be 50000 Hrs at released outdoor / indoor ambient. SDCM (Standard Deviation Colour Matching) shall be maximum 5 or better. Luminaire surge protection should be 10kV standard. The power factor should be >0.95 at full power.
- The luminaire should have CRI 70, TLCI (Television lighting consistency indices) per color code should be 49. The luminaire should have percent flicker factor <1%. The corresponding luminaire should have also ranges in CRI 80 in CRI 90.

MEASUREMENT & VERIFICATION:

One time post installation measurement and verification will be carried out as per the followings:-

- The measurement will be done after 5 burning hours of the luminaire and the power for the same needs to be provided by the customer.
- The measurement will be carried out as per 5m x5m grid as shown in our lighting design.
- Voltage and current should be measured along with lighting levels as lighting levels is dependent on the available voltage.
- Rated supply voltage should be made available during the time of measurement.
- The measurement should be carried out on a clear night sky without dust/fog and smog as all these influences the lighting levels.

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7.6 Details of signages, Furniture's with specifications

An identity and a sense of place are created, if landscape furniture is properly integrated in the design of a public space. The furnishings of urban outdoor spaces have been designed by keeping in mind the different users like the needs of differently abled, children, and the elderly and also to enable triangulation. The furniture's has been so designed that everybody in the park can utilise well to enjoy or to relax or to gossip. A different type of "cast in situ" benches has been uses to give a natural feel of the place. This has another benefit of designing benches and seats which are robust and maintenance free.

- **Signage's:** The signage's will be embedded and camouflaged with surrounding materials. The signage's will be integrated into its structures like benches, pillars of kiosks or boundary walls.
- **Dustbins:** Dustbins are to be provided at places as required which will be harmonised with design of the areas. These will be provided more in nowhere there is more concentration of visitors such as ghat area, food and craft area.



Stepped planter and seat



Dust bin



Signage

Figure 68: Garden Furniture

Detail of dustbins:

The dustbins would be of Bamboo or timber made as cast in situ to be as per the landscape of the site. The samples and design shall be approved by BSCL before execution.



Figure 69: Details of Dustbin and Signage

The modern signage would be metal finish cast in situ to be as per the landscape of the site. The samples and design shall be approved by BSCL before execution.

7.7 Details for fountains and specification

The aeration fountain proposed for lake shall have following specifications:

- The manufacturer of Aeration fountain will furnish a floating fountain system capable of pumping water from below the surface of water body.
- A submersible motor will have to draw water into an impeller chamber where it shall be pumped into the atmosphere in the form of a decorative fountain.
- The water droplets will become oxygen enriched and return to the surface, therefore transferring oxygen from the atmosphere into the water body. This repeated action shall effectively mix the body of the water and distribute the dissolved oxygen continuously.
- LED light fixtures of 86W would be totally enclosed with weatherproof fittings and control gear.
- Lighting system will include stainless steel lamp housings, ready to be installed in the float, sealed with clear tempered glass lenses in a stainless steel clamp ring. All lights will remain water-cooled and out of sight below the surface.
- All necessary electrical controls, including digital timer shall be pre-wired into the fountain aerator's existing UL Listed control panel.
- Glass colored lenses (amber, blue, red, green or turquoise), with optional sequencer shall be used for dramatic aquatic display.



7.8 Details of Plants

The palette of plants chosen and displayed help create a sense of place, they evoke feelings, capture a mood, as well as beautifying and enhancing the outdoors. Among all of these hardscape work, one of the most important elements in successful public urban green space is PLANTS. Plants have the power to soften and civilize public urban space.

The proportions of structural plants including trees, evergreens, shrubs and grasses against the softer perennial plants need to be correct to give shape to the garden all year round. A focus on year-round colour and interest is a focus of all our schemes, with typical favourites in shades of Purples, Blues and Whites, or specific colour-themed planting.

Planting is designed such a way that can perform as a function of shading in hot summer, adding fragrance into the space, adding colour to the space. Different plants have been used to create sense of enclosure in some places, define boundaries and create canopies for other shade loving plants.

Hedges been created to have a soft material for dividing internal spaces within a garden. Tree and shrubs along boundary wall are proposed to create visual barrier for the surrounding settlements and chaotic areas.

The Big structured canopied trees are used to provide shade for sitting areas as no hard structures has been propped as a shading structure. Plants along the water body is very useful in maintaining dense beneficial vegetation around water which is extremely important for improving water quality, preventing erosion and controlling nuisance geese. Establishing buffer zones takes minimal effort and requires little maintenance. In the long run, it will also reduce the likelihood of excessive pond algae and other water quality issues that come from nutrient loading, thereby reducing the need for constant herbicide treatments, and lowering long-term costs associated with managing your water body.

These specific plants are proposed to have a self-maintenance and also for aesthetic purpose.










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Table 2: List of Proposed Plants

Trees					
S. No.	Ref. Pic	Botanical Name	Common Name	Height	Remarks
1		Ailanthus excelsa	Maharukh	8'-10'	
2		Azadirachta indica	Neem	8'-10'	
3		Dalbergia sissoo	Shisham	8'-10'	
4		Peltophorum pterocarpum	Copper Pod	8'-10'	
5		Tamarindus indica	Imli	8'-10'	
Ornamental Tree					
1		Lagerstroemia speciosa	Crape Myrtle	8'-10'	
2		Cassia fistula	Amaltas	8'-10'	







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3		Jacaranda mimosifolia	Neeli Gulmohar	8'-10'	
4		Bauhinia variegata	Kachnar	8'-10'	

Trees for Internal Pathways

1		Plumeria alba	Safed Champa	8'-10'	
2		Ficus elastica	Rubber Tree	8'-10'	
3		Ficus rumphii 'variegata'	Pakur Tree	8'-10'	
4		Pseudobombax ellipticum (Bombax ellipticum)	Shaving brush tree	8'-10'	

Palm




1		Wodeytia bifurcate	Fox Tail Palm	10'	
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2		Caryota urens	Fish Tail Palm	10'	
3		Washingtonia filifera	Desert Fan Palm	8'-10'	
4		Bismarckia nobilis	Silver Bismarck Palm	5'-6"	

Shrub





		Calliandra haematocephala	Powder Puff	3'-4'	
1		Agave variety (tequilana, Americana)	blue agave, American aloe etc		5 years old
2		Cactus Variety			5 years old
3		Sansevieria (different varieties)	Snake Plant		5 years old
4		Adenium varieties	Desert Rose		5 years old



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5		Euphorbia milii	Euphorbia		5"x7" polybag
6		Cycus variety	Cycus	6 leaves	24-inch trunk height
7		Clerodendrum inerme		3'-4'	small polybag 5"x6"
8		Ficus panda		3'	



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Table 7.8.3: List of other Trees that can be considered

S. No.	Common Name	Botanical Name	Height (mm)	Girth (mm)
Trees				
1	Fig tree	Ficus benjamina	1500	150
2	Amaltas	Cassia fistula	1500	150
3	Yellow trumpet tree	Tabebuia Argentea	1500	100
4	Indian willow	Salix tetrasperma	1500	100
5	Rosy trumpet tree	Tabebuia impetiginosa	1500	100
6	Madagascar almond	Terminalia mentaly	1500	100
7	Pride of India	Lagerstroemia speciosa	1500	100
8	Umbrella tree	Brassia actionophyla	1500	100
9	Neeli gulmohar	Jacaranda mimosfolia	1500	100
10	Sita Ashok	Saraca indica	1500	100
11	Kachnar	Bauhinia variegata	1500	100
12	Java ki Rani	Cassia javanica	1500	100
Shrubs				
1	Schefflera	Schefflera arboricola	300	-
2	caliandra		300	-
3	Techoma	Techoma capensis	300	-
4	Lantana	Lantana camara	300	-
5	Plumbago	Plumbago capensis	300	-
6	Crape myrtle	Lagrestroemia indica	300	-
7	Poinciana	Poinciana pulcherima	300	-
8	Draceana	Draceana colorama	300	-
9	Japanese bamboo	Pseudosasa japonica	300	-
10	Areca palm	Dypsis lutescense	300	-
11	Ixora	Ixora coccinia	300	-
12	Firebush	Hamelia patens	300	-
13	Golden shrim plant	Pachystachys lutea	300	-
14	Firecracker	Russelia equisetiformis	300	-
15	Fountain grass	Pennisetum setacium	300	-
16	Bird of paradise	Strelizia reginae	300	-
17	Lobster-claws	Heliconia	300	-

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S. No.	Common Name	Botanical Name	Height (mm)	Girth (mm)
18	Umbrella papyrus	Cyperus alternifolius	300	-
19	Adam's needle	Yucca	300	-
20	Sago palm	Cycus revoluta	300	-
21	Canna lily	Canna indica	300	-
22	Lily	Hymenocalis littoralis	300	-
23	Ipomea	Ipomea alba	300	-
24	Alpinia	Alpinia zerumbet	300	-
25	Lily	Lily amhyrilis	300	-
26	Lily	Hymenocalis littoralis	300	-
27	Sider lily	Crinum lily		
1	Alpinia	Setcresia purpurea	200	-
2	Ruellea	Ruellea rosea	200	-
3	Rhoheo	Rheo	200	-
4	Iresene	Iresene herbstii	200	-
5	Alternenthra	Alternenthra red	100	-
6	peace lilies	Spathyphylum	200	-
7	Blue flax-lily	Dianella tasmanica	200	-
8	Mondo grass	Ophiopogon japonicus	200	-
9	Fern	Nephrolepis exaltata	200	-
10	Liriope	Liriope mascari	200	-
11	Elephant ear	Caladium	200	-
12	Philodendron	Philodendron	200	-
13	Syngonium	Syngonium	200	-
List of creepers				
1	Madhumalti	Quisqualis indica	300	-
2	flamevine	Bignonia venusta	300	-
3	Rakhi creeper	Passiflora violacia	300	-
4	Sehra bel	Thunbergia mysorensis	300	-
5	Garlic creeper	Adenocalyma	300	-
6	glory tree	Clerodendron splendens	300	-



Tabebuia impetiginosa



Tabebuia argentea



Terminalia mentalis



Jacaranda mimosifolia

Figure 70: Proposed trees on site



8. Financial Viability

The financial viability of the project was ascertained with the intention of understanding the sustainability of the project in terms of meeting the O&M expenses. A critical requirement of this approach is estimation of the revenues generated from user charges, which is assumed to be the case (i.e. levying of user charges) for the project. Accordingly, the financial viability of the project has to be ascertained.

In order to determine the financial viability of the project, the following approach needs to be adopted

- Estimation of capital cost (CAPEX) of the project
- Identification of operation and maintenance (O&M) expenses that would be incurred under the project and estimation of the same.
- Identification of revenue streams for the project and estimation of the same, in the event that BSCL decides to generate revenues from the project.
- Financial analysis i.e. O&M expenses v/s revenues analysis

8.1 Estimated Project Cost:

A detailed cost estimate has been prepared at this DPR stage for the proposed project of Sandy's Compound which includes all the components for bringing project into reality. The purpose is to provide a detailed cost breakup and estimate which will be guiding factor during project execution.

This detailed estimate will give an insight into the cost of the project before working can start on site and it will form as a base for RFP for the developer. This is based on the specifications of materials, Lighting, planting as proposed in DPR. The item rates and specifications are mostly based on Bihar SOR. The rates which are not available in SOR have been taken from market through quotation from reputed vendors and GEM portal and rate analysis has been done to arrive at the cost for estimate purpose. The total cost of project for comprehensive development comes to Rs. 93.36 Crore. Abstract cost of same is provided below. The detailed cost estimate is provided in VOL II.

ABSTRACT OF COST OF SANDYS PARK AT BHAGALPUR						
SL.NO.	DESCRIPTION OF WORK	UNIT	ITEM RATE	QUANTITY	AMOUNT	REFERENCE
1	Cycle Track	No.	₹ 2,65,72,008	1.00	₹ 2,65,72,008	Appendix 1
2	Jogging Track	No.	₹ 33,84,554	1.00	₹ 33,84,554	Appendix 2
3	Walk Way	No.	₹ 3,36,25,605	1.00	₹ 3,36,25,605	Appendix 3
4	Toilet (SMALL)	No.	₹ 7,55,291	10.00	₹ 75,52,914	Appendix 4



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5	Guard Room Cum Ticket Counter	No.	₹ 3,37,391	8.00	₹ 26,99,126	Appendix 5
6	Electrification of Guard Romm	No.	₹ 75,731	8.00	₹ 6,05,848	Appendix 5 A
7	Cafeteria (PROPOSED)	No.	₹ 1,18,16,245	4.00	₹ 4,72,64,978	Appendix 6, 6A, 6B & 6C
8	Drain 0.5 x 0.75	No.	₹ 9,69,83,413	1.00	₹ 9,69,83,413	Appendix 7
9	Drain 0.75 x 0.9	No.	₹ 8,40,97,919	1.00	₹ 8,40,97,919	Appendix 8
10	RCC NP 3 Pipe for SWD	No.	₹ 13,85,177	1.00	₹ 13,85,177	Appendix 9
11	Landscaping	No.	₹ 1,41,65,726	1.00	₹ 1,41,65,726	Appendix 11
12	Kiosk	No.	₹ 3,54,579	11.00	₹ 39,00,364	Appendix 12
13	Kids Play Area	No.	₹ 24,43,883	1.00	₹ 24,43,883	Appendix 13
14	Outdoor Gym	No.	₹ 19,69,225	1.00	₹ 19,69,225	Appendix 14
15	New Yoga Platform	No.	₹ 40,94,652	1.00	₹ 40,94,652	Appendix 16
16	Renovation of Existing Yoga Platform	No.	₹ 8,45,625	1.00	₹ 8,45,625	Appendix 17
17	New Stage	No.	₹ 13,84,542	1.00	₹ 13,84,542	Appendix 18
18	Nehru Memorial	No.	₹ 6,90,760	1.00	₹ 6,90,760	Appendix 19
19	Station Club	No.	₹ 1,32,87,508	1.00	₹ 1,32,87,508	Appendix 20
20	Specific/ Emergency Entry/ Exit Gate	No.	₹ 7,28,670	13.00	₹ 94,72,712	Appendix 21
21	Entrance gate	No.	₹ 85,01,469	3.00	₹ 2,55,04,408	Appendix 22
22	Swimming Pool	No.	₹ 1,56,28,608	1.00	₹ 1,56,28,608	Appendix 23 A
23	Swimming Pool Mech and Other	No.	₹ 2,33,75,713	1.00	₹ 2,33,75,713	Appendix 23 B
24	Cricket Pavillion	No.	₹ 1,96,43,511	1.00	₹ 1,96,43,511	Appendix 24
25	Pavillion Longe	No.	₹ 1,63,20,985	1.00	₹ 1,63,20,985	Appendix 25
26	Parking	No.	₹ 87,61,104	3.00	₹ 2,62,83,313	Appendix 26
27	Open Air Theatre	No.	₹ 33,37,764	1.00	₹ 33,37,764	Appendix 27
28	Pond 1	No.	₹ 69,55,448	1.00	₹ 69,55,448	Appendix 28
29	Pond 2	No.	₹ 3,79,58,574	1.00	₹ 3,79,58,574	Appendix 29
30	Pond 3	No.	₹ 57,59,855	1.00	₹ 57,59,855	Appendix 30
31	Basket Ball Court	No.	₹ 15,46,828	1.00	₹ 15,46,828	Appendix 32
32	Trellis walkwWay	No.	₹ 11,27,421	1.00	₹ 11,27,421	Appendix 33
33	Renovation of Existing Badminton court	No.	₹ 78,48,161	1.00	₹ 78,48,161	Appendix 34 A
34	New Badminton Court Building	No.	₹ 1,18,31,450	1.00	₹ 1,18,31,450	Appendix 34 B
35	Gym Building renovation	No.	₹ 2,47,39,515	1.00	₹ 2,47,39,515	Appendix 35
36	Lawn Tennis Court	No.	₹ 23,18,576	1.00	₹ 23,18,576	Appendix 36
37	Cricket Field and its Drainage	No.	₹ 1,68,60,937	1.00	₹ 1,68,60,937	Appendix 37
38	Water Fountain	No.	₹ 14,01,500	5.00	₹ 70,07,500	Appendix 38
39	Cleaveland Memorial	No.	₹ 75,25,256	1.00	₹ 75,25,256	Appendix 39
40	Toilet (BIG)	No.	₹ 19,97,553	1.00	₹ 19,97,553	Appendix 40
41	Multipurpose ground	No.	₹ 3,59,75,314	1.00	₹ 3,59,75,314	Appendix 41
42	Open Zoo	No.	₹ 3,05,79,017	1.00	₹ 3,05,79,017	Appendix 42



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43	Adventure Zone	No.	₹ 63,04,918	1.00	₹ 63,04,918	Appendix 43
44	Sculpture court	No.	₹ 28,39,915	1.00	₹ 28,39,915	Appendix 44
45	Open Art Gallery	No.	₹ 19,31,459	1.00	₹ 19,31,459	Appendix 45
46	Dismantelling of Boundary Wall	No.	₹ 19,60,462	1.00	₹ 19,60,462	Appendix 46
47	Boundary wall EXTERNAL	No.	₹ 11,792	2,550.00	₹ 3,00,69,600	Appendix 47
48	Boundary Wall Internal	No.	₹ 6,039	1,010.00	₹ 60,99,791	Appendix 48
49	Compost Pit Plant Nursery	No.	₹ 20,00,000	2.00	₹ 40,00,000	Appendix 49
50	Estimate Sports Complex Electrical	No.	₹ 6,67,48,241	1.00	₹ 6,67,48,241	Additional Sheet
51	Estimate of General Lighting Electrical	No.	₹ 3,27,94,472	1.00	₹ 3,27,94,472	Additional Sheet
52	SUB TOTAL				₹ 83,93,01,104	
53	Operation and Maintenance costs for three year (Included in RFP)			6%	5,03,58,066	
54	Centage (7%- 0 to 10 Cr & 5%-10 to 100 cr)				4,39,65,055	
55	Total Project Cost				₹ 93,36,24,226	

* O&M expenses have been estimated over an O&M period of 3 years. This O&M is apart from DLP of 1 Year.

An approach similar to life-time costs is adopted over the construction period and 3 year O&M period, in arriving at the project cost.

Note: O&M expenses can be recovered from the revenue streams envisaged for the project.

The total project cost including O&M expenses over a 3 year maintenance period is estimated as Rs. 93.36 Crore /- which includes all the project components as stated in DPR and shall be used as base for tender purpose. The funding would be from funds of smart city proposal. The detailed cost estimates with BOQ of all the items are attached with the report as Volume 2.

8.2 Funding

The proposed cost for Open Space as per SCM is Rs. 37.8 Crore, out of which SCM fund is Rs. 30.2 Crore. The breakup is provided below:

1. Rejuvenation of existing Large open spaces with added activities: Rs. 25.2 Crore
2. Recreation & Entertainment: Rs. 12.6 Crore

Table 8.2.1 : Funding Availability as per SCM



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Activity	Project Precinct	Indicative Cost (in lacs)	GoI Funding	GoB Funding	ULB-Own Source	PPP Funding	GoI Amrut
Activity group 5	Rejuvenation of existing Large open spaces with	2520	880.00	880.00	360.00	300.00	100.00
Activity group 6	Recreation & Entertainment	1260	630.00	630.00			

The Scm fund consisting of GoI and GoB funds sums up to Rs. 30.2 Crore. Additional Rs. 3.6 Crore funding is by ULB. So the total available fund for this project equals Rs. 33.8 Crore. However in the review meeting with Chairperson BSCL on 18th October 2019, it was directed to phase the project according to the availability of funds. The items for development under Phase 1 was taken based on direction given by BSCL.

BSCL has directed us not to take up drainage works in the whole campus under Phase 1 but as per best engineering practice its requirement in landscape related project is must. However in reference to the available funds and after discussions from BSCL, in line to their suggestions drain development is not taken in Phase 1 of the project.

The total cost of Project along with O&M and Centage comes to Rs. 35.88 Crore under Phase1 of development. Under phase 1 of the development following activities are proposed by BSCL:

Table 8.2.2: Abstract of Detailed Cost estimate of the project (Phase I)

ABSTRACT OF COST OF SANDYS PARK AT BHAGALPUR (PHASE 1)					
SL.NO.	DESCRIPTION OF WORK	UNIT	ITEM RATE	QUANTITY	AMOUNT
1	Walk Way	No.	3,24,32,853	1.00	₹ 3,24,32,853
2	Guard Room Cum Ticket Counter	No.	3,33,619	4.00	₹ 13,34,475
3	Electrification of Guard Room	No.	75,731	4.00	₹ 3,02,924
4	Cafeteria (PROPOSED)	No.	1,18,16,245	1.00	₹ 1,18,16,245
5	Landscaping	No.	1,41,65,726	1.00	₹ 1,41,65,726
6	Kids Play Area	No.	24,43,883	1.00	₹ 24,43,883
7	Nehru Memorial	No.	6,90,760	1.00	₹ 6,90,760
8	Station Club	No.	1,50,24,091	1.00	₹ 1,50,24,091
9	Specific/Emergency Gate	No.	7,28,670	13.00	₹ 94,72,712
10	Entrance gate	No.	85,01,469	1.00	₹ 85,01,469
11	Swimming Pool	No.	1,56,28,608	1.00	₹ 1,56,28,608
12	Swimming Pool Mech and Other	No.	2,33,75,713	1.00	₹ 2,33,75,713
13	Parking	No.	87,61,104	1.00	₹ 87,61,104
14	Open Air Theatre	No.	33,37,764	1.00	₹ 33,37,764

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15	Basket Ball Court	No.	15,46,828	1.00	₹ 15,46,828
16	Trellis walkway	No.	11,27,421	1.00	₹ 11,27,421
17	Renovation of Existing Badminton court	No.	78,48,161	1.00	₹ 78,48,161
18	New Badminton Court Building	No.	1,18,31,450	1.00	₹ 1,18,31,450
19	Gym Building renovation	No.	1,76,52,741	1.00	₹ 1,76,52,741
20	Lawn Tennis Court	No.	12,16,407	1.00	₹ 12,16,407
21	Cricket Field and its Drainage	No.	1,68,60,937	1.00	₹ 1,68,60,937
22	Cleveland Memorial	No.	24,70,690	1.00	₹ 24,70,690
23	Toilet (BIG)	No.	19,97,553	1.00	₹ 19,97,553
24	Multipurpose ground	No.	3,59,75,314	1.00	₹ 3,59,75,314
25	Sculpture court	No.	28,39,915	1.00	₹ 28,39,915
26	Dismantling of Boundary Wall	No.	19,60,462	1.00	₹ 19,60,462
27	Boundary wall EXTERNAL	No.	11,792	2,550.00	₹ 3,00,69,600
28	Boundary Wall Internal	No.	6,039	1,010.00	₹ 60,99,791
29	ESTIMATE of SPORTS COMPLEX LIGHTING (Proposed Item only)	No.	1,57,93,523	1.00	₹ 1,57,93,523
30	ESTIMATE of GENERAL LIGHTING (Proposed Item only)	No.	1,88,42,125	1.00	₹ 1,88,42,125
31	SUB TOTAL				₹ 32,14,21,245
32	Operation and Maintenance costs for three year (Include this in RFP)			6%	1,92,85,275
33	Centage (7%- 0 to 10 Cr & 5%-10 to 100 cr)				1,80,71,062
34	Total Project Cost				₹ 35,87,77,581

Under in Phase 1, change in quantity in following proposed items are done.

1. Under Phase 1 four Guard Rooms are proposed instead of 8.
2. One Cafeteria is proposed instead of 3.
3. 4 Specific/Emergency gates are proposed instead of 11.
4. 1 Main Entrance is proposed instead of 3.
5. 1 Parking development is proposed instead of 3.
6. Under Phase 1 in Cleveland Memorial, drain development is excluded due to constrain of fund however it is kept for under comprehensive development of compound and can be taken up in further phase of development.
7. Under Phase 1 in Lawn Tennis Court, drain development is excluded due to constrain of fund however it is kept for under comprehensive development of compound and can be taken up in further phase of development.

Note: Additional fund requirement can be procured from savings of SCM fund from other projects after approval from Board and other competent body for fund mobilization.



8.3 Operation and maintenance:

During the design stage and stakeholder discussions, various components of operation and maintenance aspects were set in place for the design proposal. Following aspects are identified and provided for smooth operation and maintenance of the project.

1. Urban facilities and on street parking
2. Regular maintenance Finishes of the pathway.
3. Public safety & water front activities
4. Lighting adequacy and maintenance.
5. Replacement of dilapidated structure
6. Maintaining of public Toilets.
7. Maintenance of water body.
8. Maintenance of Open air theatre.
9. Lake aeration & lake illumination for which a pump house will be provided with Toilet blocks.
10. Maintenance of Parks, Cafeteria and Landscape
11. Maintenance of Sports Complex.
12. Maintenance of Open Zoo.

In order to facilitate the project with above mentioned aspects, regular manpower and equipment cost has to be taken into consideration for maintenance purpose. For the first three year this work has to be carried by Contractor and BSCL will only look after its administrative part.

8.4 Institutional Arrangements:

In order to run the activities in the proposed project, institutional arrangements would be essential which will include the human resources, funding, equipment and supplies, effectiveness, and the communication links between and among them. The tables below describe the institutional arrangements required to efficiently run the project.

Manpower requirement:

Table 8.4.1: Manpower requirement

Sl. No.	Manpower	No
1	Park Manager	1
2	Accountant	1
3	Maintenance Manager	1
4	Zoologist	1
5	Botanist	1

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6	Security Officer	1
7	Computer Operator	5
8	Security guard	20
9	Curator	1
10	Gardner	5
11	Ticket Collector	4
12	Technician (Electrical, Lighting, Pump operator)	5
13	Sweeper/Cleaner	10
14	Life guard	2
15	Office Boy	3
16	Doctor	1
17	Compounder/Nurse	1
18	Game Experts/ Trainer	6
19	Support Staff	18
	Total	87

A total of 87 persons are estimated to be required for all the operation and maintenance activities under the project. Based on requirement BSCL can increase or decrease the no. of employees.

Equipment required:

Table 8.4.2: Equipment requirement

Sl. No.	Equipment	Nos.
1	Lawnmower	5
2	Forks	20
3	Powered edger	5
4	Leaf blower	10
5	Pressure washer	10
6	Powered chainsaw	10
7	Shears	20
8	Wheel barrow (double)	10
9	Garden spade	20
10	Shovel	20
11	Pickaxe	10
12	Hoe	10
13	Pond Pliers	5
14	Pond Scissors	5
15	Pond Cleaning Clearing/Catching Landing Net	10

The equipment cost and manpower cost to be included in O&M expenses. A separate agency can be hired for O&M of the whole compound. However for the first three year



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contractor will be solely responsible for the maintenance of the compound. The equipment and manpower shall be deployed as per requirement and may change as direction of BSCL/engineer in charge.

8.5 Project Revenue

Projected revenue refers to the estimated money a project will generate during a specific period. The projections often refer to monthly, quarterly or annual accounting periods. For financial sustainability of the project there must be revenue sources through which finance can be generated on a regular basis. In case of this project as per the design intent the revenue sources available in this project as described below:

Table 8.5.1: Revenue Estimation

Revenue Head	Charges per person (Rs)/ Bulk Charges	Users/ Nos.	Total (monthly)*	Total (Rs. p.a.)
Entry Ticket Cost	₹ 20/day	5000/day	₹ 30,00,000.00	₹ 3,60,00,000.00
Monthly Pass (morning walkers)	₹ 150/month	3000/month	₹ 4,50,000.00	₹ 54,00,000.00
Membership (Gym)	₹ 500/month	100	₹ 50,000.00	₹ 6,00,000.00
Membership (Sports)	₹ 500/month	100	₹ 50,000.00	₹ 6,00,000.00
Membership (Club)	₹ 1000/month	100	₹ 1,00,000.00	₹ 12,00,000.00
Water Front/ Boating	₹ 20/15mins	500/day	₹ 3,00,000.00	₹ 36,00,000.00
Art and Craft Kiosk	₹10,000/month/ kiosk	5 Kiosk	₹ 50,000.00	₹ 6,00,000.00
Food Kiosks	₹15,000/month/ kiosk	5 Kiosk	₹ 75,000.00	₹ 9,00,000.00
Cafeteria	₹ 50,000/ Cafeteria	3	₹ 1,50,000.00	₹ 18,00,000.00
Events	₹ 50,000/month	-	₹ 50,000.00	₹ 6,00,000.00
Advertising revenues**	₹1,00,000/month	-	₹ 1,00,000.00	₹ 12,00,000.00
Total			₹ 43,75,000.00	₹ 525,00,000.00

* assuming 30 days per month

** In arriving at advertising revenues, the following sources are made: (1) Around 400 Nos. of light poles, each with two faces for Backlit advertising. (2) Cafeteria Ads (3) Plaza and Parks

The total revenue from ticketing, rentals and advertising, under the project is thus estimated as Rs.5.25 Crore p.a. Table below illustrates the revenues from the project over a 5 year period, with an annual escalation of 5%.

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Table 8.5.2: Annual Revenues (Rs.)

Year 1	Year 2	Year 3	Year 4	Year 5	Total
525,00,000.00	551,25,000.00	578,81,250.00	607,75,312.50	638,14,078.13	2900,95,640.63

The EBITDA (Earnings before Interest, Tax, Depreciation and Amortization) is observed to be positive in all the operating years, clearly indicating that revenues estimated for the project, in the event BSCL decides to charge user fees for the project, is sufficient to cover the operating and maintenance (O&M) expenses of the project.

Further, the IRR (internal rate of return) for the project was calculated and found to be negative, indicating that the capital cost incurred under the project cannot be recovered from its cash inflows.

Socio-Economic Benefits

The project once developed would be a place for public realm and would give a much needed green recreational zone to the city of Bhagalpur. The economic benefits of the project has to be looked upon in terms of environmental and social aspects rather than in financial terms as the project would emerge as a model for open space development. Benefits are also expected to accrue with the rejuvenation of an old waterbody in the heart of ABD area in the form of a green space for social gatherings and thereby contributing to the enhancement of the liveability of citizens.

The project would directly impact 4 lacks person living in the ABD area as well as the city (source: census 2011). The project is also expected to generate employment opportunities, especially 87 manpower directly employed under the project and 44 persons expected to find employment through the commercial activities proposed in the project. Therefore, it is estimated that the project is expected to impact lives of 131 person directly and indirectly which in turn would affect 655 families altogether.

The socio-economic benefit of the project in terms of health benefits to the users of the project is of high value and thus increases the overall economic benefit of the project. At least 10,000 persons are estimated to use the project facility on a daily basis for recreational and physical activities such as walking, jogging etc.



8.6 Risks and Allocation of Risks

Identification of Risks

For the purpose of identification and analysis, risks can be categorized into

- Risks encountered during the pre-operative stage of the project
- Risks prevailing during the construction stage of the project
- Risks arising during the Operations Stage of the project
- Risks faced during the Handing-Back Stage of the project and
- Risks prevalent throughout the project.

Table below describes the typical risks associated with an infrastructure project

Table 8.6.1: Typical Risks

Risk type	Description
Risks During Pre-Operative Stage	
Delays in land acquisition	Refers to the risk that the project site (or sites) will be unavailable or unable to be used within the required time, or in the manner or the cost anticipated or the site will generate unanticipated liabilities due to existing encumbrances and native claims being made on the site. This risk is most relevant to greenfield projects.
External linkages	Refers to the risk that adequate and timely connectivity to the project site is not available, which may impact the commencement of construction and overall pace of development of the project. An example of connectivity could be approach roads.
Financing risks	Refers to the risk that sufficient finance will not be available for the project at reasonable cost (e.g. because of changes in market conditions or credit availability) resulting in delays in the financial closure for a project.
Planning risks	Refers to the risk that the pre-development studies (technical, legal, financial and others) conducted are inadequate or not robust enough resulting in possible deviations from the outcomes that were planned or expected.
Approvals risks (other than for construction)	The risk is that the needed approvals will either be delayed or will not be granted, resulting in additional cost or threat to the project. Such approvals may include transport permits, relevant environmental permits etc.
Risks During Construction Stage	

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Risk type	Description
Design risk	Refers to the risk that the proposed design will be unable to meet the performance and service requirements in the output specification. It can result in additional costs for modification and redesign.
Construction risk	Refers to the risk that the construction of the assets required for the project will not be completed on time, on budget or to specification. It may lead to additional raw materials and labour costs, additional financing costs, increase in the cost of maintaining existing infrastructure or providing a temporary alternative solution due to a delay in the provision of the service.
Approvals risk	Refers to the risk that delays in approvals to be obtained during the construction phase will result in a delay in the construction of the assets as per the construction schedule. Such delays in obtaining approvals may lead to cost overruns.
Risks During Operations Stage	
Operations and maintenance risk	Refers to the risks associated with the need for increased maintenance of assets or machinery over the term of the project in order to meet performance requirements.
Volume risk	Refers to the risk that demand for a service will vary from the initial forecast, such that the total revenue derived from the project over the project life will vary from initial expectations.
Payment risk	Refers to the risk that fees for services are not collected in full or are not set at a level that allows recovery of costs. Who bears the payment risk depends on whether the fees for services are paid directly by users.
Financial risk	Refers to the risk related to high financial stress on a project due to an inappropriate financial structure planned for the project. It can result in additional funding costs for increased margins or unexpected refinancing costs. Currency risk can also impact on financial risk if the project includes funding denominated in foreign currency.
Environmental health and safety risk	Refers to the risk of environmental damage in excess of what is planned for in the environmental impact mitigation plan and the risk to employee health and safety from operations.



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Risk type	Description
Risks During Hand-Over Stage	
Handover risk / Terminal value risk	Refers to the risk that the operator will default in the handover of the asset at the end of the project life, or that it will fail to meet the minimum quality standard or realisable value of the asset that needs to be handed back to the public entity.
Risks Arising Throughout the Project	
Change in law	Refers to the risk that the current legal / regulatory regime will change, having a material adverse impact on the project.
Force Majeure	Refers to the risk that events beyond the control of either entity may occur, resulting in a material adverse impact on either party's ability to perform its obligations under the PPP contract. These events are sometimes also called "Acts of God", to indicate that they are beyond the control of either contracted party.
Contractor/operator risk	Refers to the risk that the contractor/operator will prove to be inappropriate or unsuitable for delivery of the project, for example due to failure of their company.
Sponsor risk	Refers to the risk that the Sponsor will prove to be an unsuitable partner for the project, for example due to poor project management or a failure to fully recognise the agreed terms of the contract agreement.
Government event of default	Refers to the risk that the public Sponsor will not fulfil its contractual obligations and that the contractor/operator will be unable to either enforce those obligations against the Sponsor, or recover some form of compensation or remedy from the Sponsor for any loss sustained by it as a result of the breach.

Risk Allocation

For the purpose of analysis and association of risks, the project is divided into

1. Construction phase that includes planning and
2. Operations phase that includes hand-over of the project

The project is structured such that it may be tendered on EPC basis, with and O&M contract of 5 years, during which revenue may be collected by BSCL/ Authority.

Tables below provide the details of risk allocation, during each Phase of the project.


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Table 8.6.2: Risk Allocation during Construction Phase

Risk Type	Construction Phase
Pre-operative Task Risks	
Delays in Land Acquisition	Public Sector
External Linkages	Public Sector
Financing Risks	Public Sector
Planning Risks	Public Sector
Approval Risks	Public Sector
Construction Phase Risks	
Design Risk	Public Sector
Construction Risk	Private Sector
Approvals	Public Sector
Additional Site Risk	Public Sector

Table 8.6.3: Risk Allocation during Operating Phase

Risk Type	O&M Phase
Operations Phase Risks	
Technology Risk	Not Relevant
Operations & Maintenance Risk	Private Sector
Volume Risk	Public Sector
Payment Risk	Public Sector
Financial Risk	Public Sector
Handover Risk Events	
Handover Risk	Private Sector

Table 8.6.4: Risk Allocation of Other Risks

Risk Type	Construction Phase	O&M Phase
Change in Law	Public Sector	Public Sector
Force Majeure	Public Sector	Public Sector
Sponsor Risk	Private Sector	Private Sector
Operator Event of Default	Not Relevant	Not Relevant
Government's Event of Default	Not Relevant	Not Relevant



8.7 Project Phasing

Financing Milestones are drawn in alignment with the project milestones during construction, prescribed for the project. Table below illustrates the milestones.

Table 8.7.1: Milestones

Sl. No.	Project Milestone (Phase I)
1	Demolishing Dilapidated Structure, Cleaning of site
2	Construction of Boundary Wall
3	Pathways and Links along-with site drainage
4	OAT and other civil works (construction of toilets, kiosk, entrance, guard room, parking)
5	Play Courts development, Cafeteria
6	Development of Theme Parks, City Gym, Nehru memorial
7	Renovation of Station Club, Gym, Cleveland Memorial and other remaining Structures
8	Multipurpose Ground, Plumbing work, Mechanical works, and drainage works.
9	Electrical works (high-mast, bollards, street lights etc.)
10	Landscaping work, signage


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9. Environmental Proposals

9.1 Environmental considerations:

The main intent of providing open spaces is to have a healthy living for the city dwellers. The main purpose of this development is to upgrade the existing condition of Sandy's Compound with establishing natural ecosystem with all types of flora and fauna. There is a cultural ecosystem in urban areas which can be seen through the park, playground, water body and others in an urban context. The purpose of development is to create a sustainable urban open space with creating microclimate for the locality of Sandy's Compound area which has a scope to become an important landmark of smart city. Proposal of growing plants in the compound is an important environmental action. Cleaning and desalting of water body is important for establishing a balanced ecosystem.

Proposal of aeration fountain:

Oxygen serves as the most essential component to the health of a body of water. Pond aeration is the simple, yet effective, process of increasing oxygen levels in a pond and can not only greatly enhance the aesthetic beauty of a pond, but can also improve the natural systems taking place beneath the water's surface. Aeration creates desertification of the water column, as lakes and ponds typically consist of stratified layers separated mainly by different temperature and oxygen levels. Natural resource and environmental managers are often challenged by problems caused by lake and pond stratification. The main purpose of aeration is to increase and stabilize the amount of dissolved oxygen in the entire water column and this has a widespread effect on many different aspects of pond and lake health.

Planting of Native trees:

Planting native species of trees and shrubs helps to re-establish the original eco-system of the region. Native species create natural corridors or islands in the urban landscape for migrating wildlife. Many species of wildlife do not recognize non-native species and cannot use them for food or shelter. The native trees are adapted to the region's soil, hydrology, and climate and have evolved defences to many diseases and insect pests. It also creates deep and extensive root systems, which help to stabilize the soil column and create an environment favourable to building fertile soils rich in organic matter. It is beneficial because it absorbs excess nutrients from runoff, enhancing infiltration during periods of heavy rain as well as drought and also provide habitat for butterflies, birds, songbirds, and beneficial insects.



Also the site is full of Eucalyptus Trees. The plantations, mainly of *E. globulus* and sometimes its clones, are also controversial. They are accused of a gamut of sins: depleting groundwater, fostering fires, encouraging erosion, vitiating watersheds, deterring native flora with voracious roots and allelopathy, etc.

Eucalyptus depletes the nutrients and moisture reserves of the soil and inhibits the undergrowth due to allopathic properties. Furthermore the decomposition of the dead plant parts is very slow which adversely affects the nutrient cycling. Owing to these adverse effects, Eucalyptus is often referred as "Ecological Terrorist". Taking this into consideration these trees can be removed from site after taking approval from Forest and Environmental Departments.

City microclimate:

Water bodies creates a microclimate for the area by decreasing the temperature by 0.5 to 2 degrees. Water bodies affect the overall microclimate of an area by increasing the humidity in the area. The water body has its own micro watershed. Selection of trees and shrubs has been done in such a manner that the carbon sequestration is high and it becomes an absorbent for pollution thus reducing the chances of Urban Heat Island.

Anticipated Environmental Impacts and Mitigation Measures:

CONSTRUCTION PHASE

Table 2: Anticipated Environmental Impacts and Mitigation Measures

SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
1	AMBIENT AIR QUALITY	The location is close to the river Ganges. The river has receded from the existing location creating a large area of sedimentation and due to that there is presence of large amount of particulate matter in the surrounding ambient air quality and may cause to be a threat in maintaining the prescribed standards.	<ul style="list-style-type: none">• Suppression of these may be made by spraying and sprinkling of water regularly• Restriction on vehicular movement as well as control on vehicle speed	
2	SOCIO ECONOMIC	The following points are considered under socio-economic condition:	<ul style="list-style-type: none">• Optimal water conservation measures to be adopted along	



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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
		<ul style="list-style-type: none">• pressure on local water resources• Problem of disposal of solid and liquid waste• Contamination of surface and groundwater• Sediment runoff	<ul style="list-style-type: none">• with adequate awareness programs for the people of the area• Restriction on random disposal of wastewater• Adequate drains and collection sumps need to be provided• Sufficient nos. of slopes and drainage channels are to be provided for disposal of liquid wastes• All waste to be handled as per applicable regulations• Waste to be segregated in biodegradable and non-biodegradable parts and to be handled and disposed off in accordance with the regulatory requirements	
3	Landscape and Topography	Construction of pathways and landscape area.	<ul style="list-style-type: none">• Land surface contours to be made in an aesthetic manner• Greenbelt and green buffers may be developed to improve the landscape and beautification	
4	Water Resources and Quality	<ul style="list-style-type: none">• Change in topography and alteration of drainage pattern• Additional pressure on local water resources	<ul style="list-style-type: none">• Water for construction phase to be sourced from existing sources allocated to project Proponent	



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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
		<p>due to water requirement for construction work and labour camps</p> <ul style="list-style-type: none">• Sediment run off from construction area• Disposal of sewage from construction camps• Contamination of surface and groundwater	<p>supplemented from authorized sources</p> <ul style="list-style-type: none">• Optimal water conservation measures at camp sites along with adequate awareness programmes to be organized for the workers• Adequate number of toilets (at least 8-10 toilets per 100 labours) with septic tanks and soak pit arrangements to be provided onsite.• Random disposal of wastewater from labour colonies to be restricted• Adequate drains and collection sumps to be provided around campsites• Sludge from waste water treatment systems to be disposed off properly.• Regular removal of debris from construction site to be practiced• Storage area to be kept away from the storm water drain.• Oil and grease containing effluents to	

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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
			<ul style="list-style-type: none">be pre-treated before discharge.Silt traps and bunds to be set up around construction sites.Adequate slopes and drainage channels to be provided across the project site.	
5	Soil Resources	<ul style="list-style-type: none">Soil Erosion and compactionSoil contamination	<ul style="list-style-type: none">Top soil to be preserved and relocated after construction activities.Clearance of vegetative cover to be minimized to the extent possible and redeveloped later on.Site grading and excavation to be undertaken during dry season.Dikes, berms, drainage swales or ditches to be provided to divert surface run-off.A retention wall or bund to be provided around the storage areas for excavated soil and other construction material.Completed earth work to be sealed and/or re-vegetated at the earliest with the help of landscape expert.	



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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
			<ul style="list-style-type: none">• Stacking of excavated soil material will be made only in earmarked areas.• Excavated soil to be used/transported at the earliest for filling low lying areas.• Proper routing and adequate capacity of the storm water run-offs drains to be provided.• Movement and parking of heavy machinery and vehicles to be restricted to identified areas.• Area used for parking purposes to be restored immediately after completion of each project activity.• All storage facilities to be designed with paved surface, provided with covered shed and adequate containment facility at the construction.• All waste to be handled as per applicable regulations.• Hazardous waste to be handled and disposed off in accordance with the requirements of Hazardous Waste	

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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
			<p>Management Rules 2016.</p> <ul style="list-style-type: none">• Portable spill containment and cleanup equipment to be made available at construction site and training for use of such equipment to be imparted.• Provision of covered bins at camp sites.• Waste to be segregated in biodegradable and non-biodegradable fraction.• Biodegradable waste to be used for animal feed/vermin-compost/manure.• Contaminated sand/soil shall be prevented during construction activities.• Trainings to be imparted to all workers and subcontractors regarding hazardous waste storage and disposal procedures.• On completion of construction activities, septic tanks for camp sites to be abandoned and filled with earth.	



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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
6	Traffic and Transport	<ul style="list-style-type: none">• Increased traffic volume• Damage to existing urban roads• Disruption of traffic and increased cases of road related hazards	<ul style="list-style-type: none">• Temporary widening at required locations to be undertaken.• Traffic and heavy machinery movement schedule to be communicated clearly to the local inhabitant's .Prior consultation with local authorities to be undertaken.• Movement of heavy vehicles to be taken up only during day time in the construction site near habitation areas.• Providing dedicated path within the site for entry and exit of the construction vehicles.• Roads damaged due to project vehicles will be continuously repaired.• Provision of adequate training to drivers.• Dedicated parking area to be provided area for project vehicles.• Parking along footpaths, single lane roads shall be prohibited.• Detailed plan for signage around the construction areas to be prepared to facilitate traffic movement.	

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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
			<ul style="list-style-type: none">Inventory of the vehicles used in project and construction equipment along with their PUC's to be maintained.	
7	Ambient Noise quality	<ul style="list-style-type: none">Noise due to construction activities(such as excavation, grading, erecting equipment, piling, etc)Noise due to operation of heavy equipment and machineryMovement of vehicles	<ul style="list-style-type: none">Adequate planning to avoid high noise activities to be undertaken.Acoustic enclosures, noise barriers to be provided in areas of high noise generating sources.Movement of vehicles during night time to be limited.Construction workers to use ear muffs/ear plugs in the areas with potential for high noise generation.Regular maintenance of vehicles and repair of equipment.Noise barriers will be provided between the activities and the receptors.Restriction on use of equipment generating high noise during night time.Working hours and construction activities	




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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
			to be aligned and works to be prohibited during night.	
8	Labour camp management	<ul style="list-style-type: none">• Location of labour camps• Domestic solid waste generation• Firewood for cooking and burning of garbage• Indoor air quality issues• Waste water generation• Health and hygiene issue	<ul style="list-style-type: none">• Optimal water conservation measures at camp sites along with adequate awareness programmes to be organized for the workers• Adequate number of toilets (at least 8-10 toilets per 100 labours) with septic tanks and soak pit arrangements to be provided onsite.• Random disposal of wastewater from labour colonies to be restricted• Adequate drains and collection sumps to be provided around campsites• Regular removal of debris from construction site to be practiced• Integrated solid waste management plan will be developed for collection, transportation, treatment and disposal of waste.	


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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
			<ul style="list-style-type: none">Workers to be provided with health and safety training.Safety measures, including use of temporary fall protection and out edges of elevated work surfaces, such as hand rails and to be boards to prevent materials from being dislodged shall be done for workers while working at heights.First aid and essential medical services to be provided at site.	
9	Occupational Health and Safety	<ul style="list-style-type: none">Injury due to improper handling, operation and executionTrip and fall, inadequate fall safe arrangementsExposure to hazardous substances	<ul style="list-style-type: none">Manual transfer of heavy loads to be minimized by proper work site lay out.Good housekeeping practices to be exercised.Measures such as job rotations and stretch breaks to be adopted.Proper signage to be provided around construction site.Use of personal protection Equipment (PPEs) to be mandated at worksite.Workers to be provided with health and safety training.	



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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
			<ul style="list-style-type: none">• Use of temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as hand rails and toe boards to prevent materials from being dislodged shall be done.• Safety harness to be ensured for workers while working at heights.• First aid and essential medical services to be provided at site.	
10	Employment and local Economy	<ul style="list-style-type: none">• Increased employment opportunities• Contracting opportunities for locals• Better avenues for small scale service providers	<ul style="list-style-type: none">• Project to utilize the facilities available from the local market to support the local economy to the extent possible• Wherever possible , labour from local community will be employed for project	
11	Ecology	<ul style="list-style-type: none">• Loss of trees and ground vegetation	<ul style="list-style-type: none">• Original soil profile shall be retained by storing each excavated layers separately and restoring it later.• Tree felling to be minimized to the extent possible. Contractors shall be instructed to practice the same.	

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SL. NO.	COMPONENT	IMPACTS IDENTIFIED	SUGGESTED MEASURES	MITIGATION
			<ul style="list-style-type: none">• Raw materials and debris to be stored away from water bodies , streams and run off areas.• Standard noise levels to be maintained during construction activities.	

9.2 Resettlement proposals

Legislations applicable

As the construction has been proposed mostly along the existing government land, the extent of potential impact in terms of land and structure is expected to be minimal. Notwithstanding, the necessity of a framework to ensure mitigation of any negative impacts, as well as compliance with the state and national legal policy cannot be overstated.

The Legislations of State / National acts, policies and rules applicable for Sandy's Compound Development Project regarding land acquisition (if required) and Resettlement and Rehabilitation (R&R) are summarized in the following sections.

In case of Land acquisition (if applicable/Required)


- Bihar Raiyati Land Lease policy 2014.
- Bihar Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and resettlement rules 2014.
- The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (LARR act 2013)



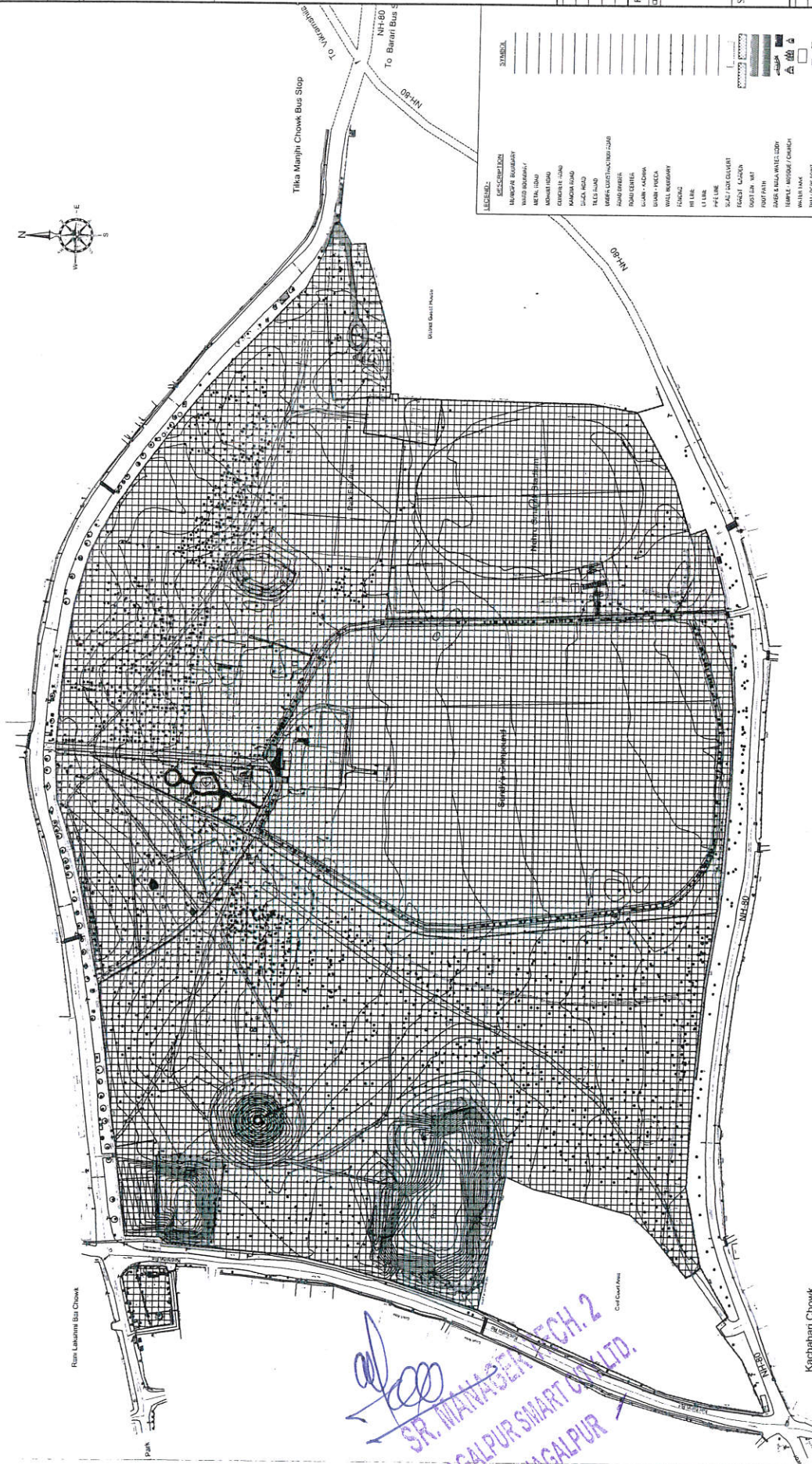
10. Conclusions and recommendations

- i. The park is designed with the purview of the cultural context of the city.
- ii. The proposal has been modified and designed in order to cater the local population of Bhagalpur along with emphasis on local tourism sector.
- iii. The design has focus on sustainable use of existing Landscape while keeping in view the surrounding areas and their relation with their users.
- iv. For development of Play courts permission with related sports authority should be taken beforehand.
- v. Water bodies and Landscape will have to be periodically checked and cleaned for a sustainable ecosystem.

As per direction we will submit RFP and after the approval of this DPR, then tender shall be floated. The work will be executed by the successful bidder under the supervision of implementing agency. The smart city proposals are to be completed in 3 years, but for this project the contractor will complete all works within 24 months only. The same contractor will operate and maintain this park for 3 year under the direction of BSCL/Bhagalpur Nagar Nigam.


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Topographical Drawing of Sandy's Park

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DRAWING TITLE:
SURVEY MAP
OF SANDY'S COMPOUND

SHEET NO.:

SP/LA/MP-0A

DRAWN	CIRCELL	
REVIEW	APPROVED	
DATE	REMARKS	
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SCALE		
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NOTES:-

Project code : 00
DEVELOPMENT OF
SANDY'S PARK

CLIENT
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PROJECT MANAGEMENT CONSULTANT

NOTES
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LEGEND:

- Cycle Track
- Jogging Track
- Walkway
- Nature Trail

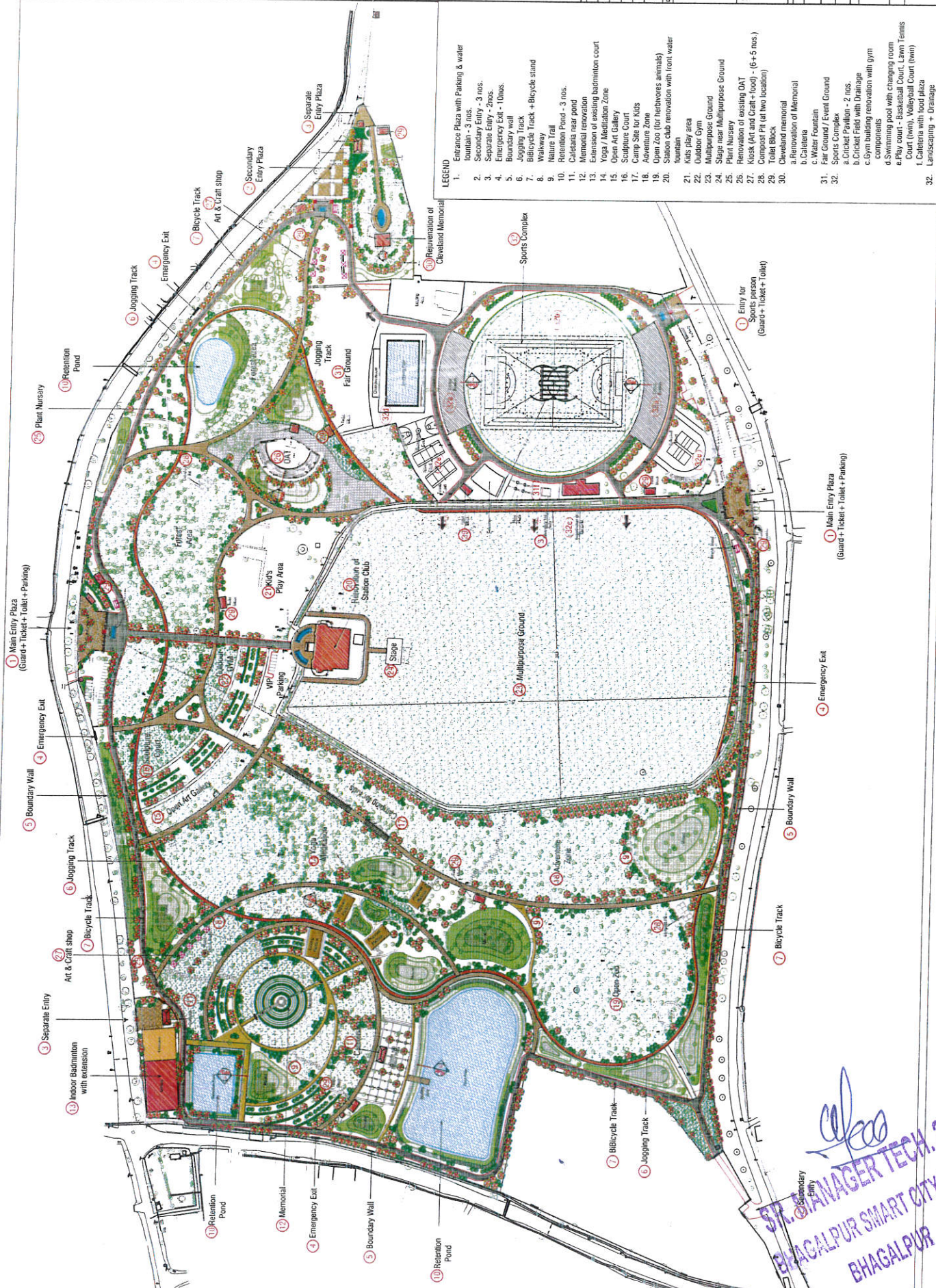
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DRAWING TITLE:
LANDSCAPE MASTER PLAN
OF SANDY'S COMPOUND

SHEET NO.:

SP/LA/MP-01

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PA	
REVIEW	APPROVED
DATE	REMARKS
15.11.23	
SCALE	NORTH
1:200	



- LEGEND
- Entrance Plaza with Parking & water fountain - 3 nos.
 - Secondary Entry - 3 nos.
 - Separate Entry - 2nos.
 - Emergency Exit - 1nos.
 - Boundary wall
 - Jogging Track
 - Bicycle Track + Bicycle stand
 - Walkway
 - Nature Trail
 - Retention Pond - 3 nos.
 - Caletera near pond
 - Memorial renovation
 - Extension of existing admininon court
 - Open Art Gallery
 - Open Art Court
 - Camp Site for Kids
 - Adventure Zone
 - Open Zoo (for herbivores animals)
 - Open club renovation with front water fountain
 - Kids play area
 - Outdoor Gym
 - Multipurpose Ground
 - Stage near Multipurpose Ground
 - Plant Nursery
 - Renovation of existing OAT
 - Kiosk (Art and Craft+food) - (6+5 nos.)
 - Compost Pit (at two location)
 - Toilet Block
 - Cleveland memorial
 - a. Renovation of Memorial
 - b. Caletera
 - c. Water Fountain
 - d. Far Ground / Event Ground
 - e. Sports Complex
 - a. Cricket Pavilion - 2 nos.
 - b. Cricket Field with Drainage
 - c. Gym building renovation with gym components
 - d. Swimming pool with changing room
 - e. Play court - Basketball Court, Lawn Tennis Court (lawn), Volleyball Court (lawn)
 - f. Caletera with board plaza
 - Landscaping + Drainage

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NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
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LEGEND:

- Cycle Track
- Jogging Track
- Walkway
- Nature Trail

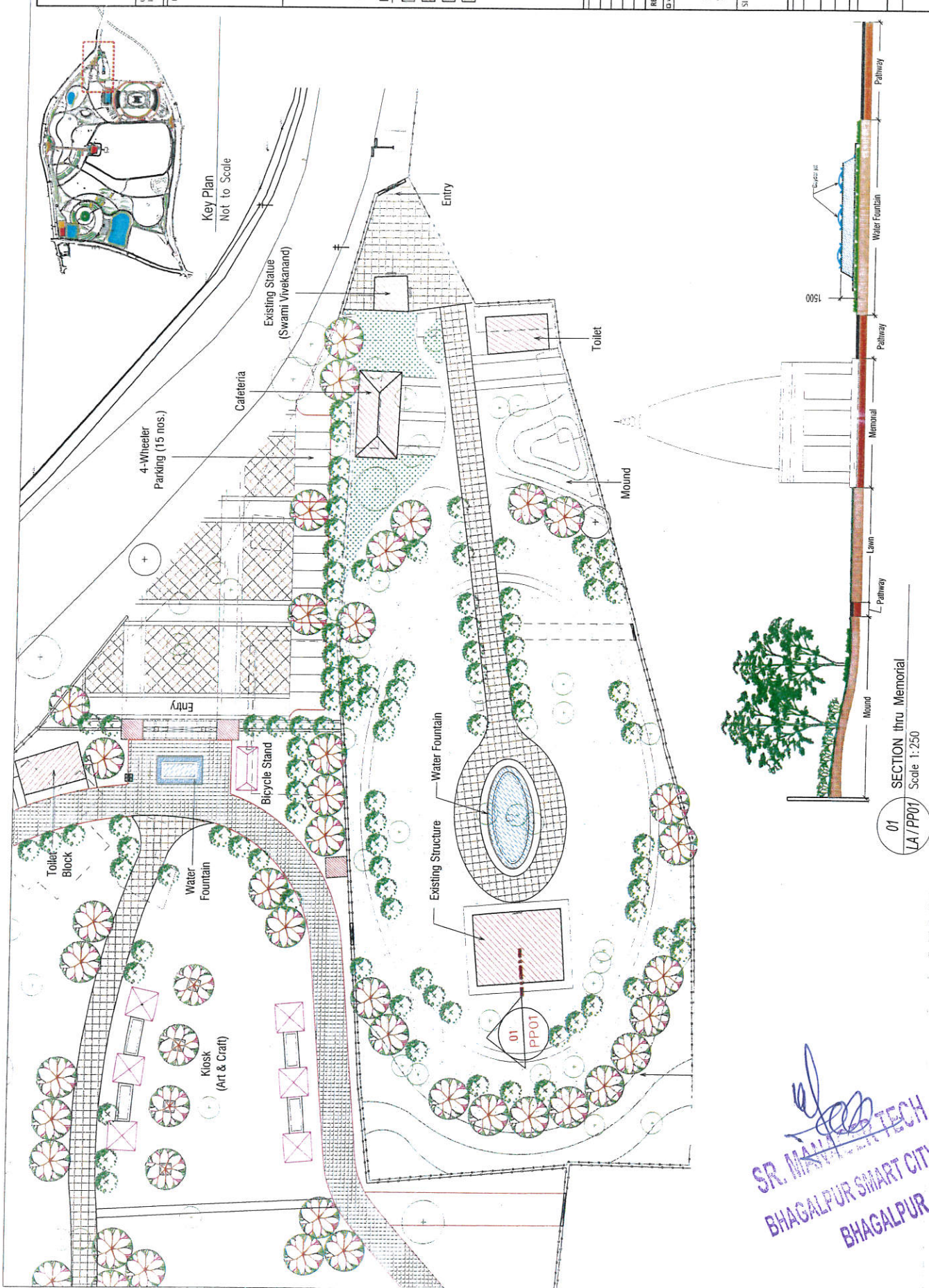
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SANDY'S COMPOUND

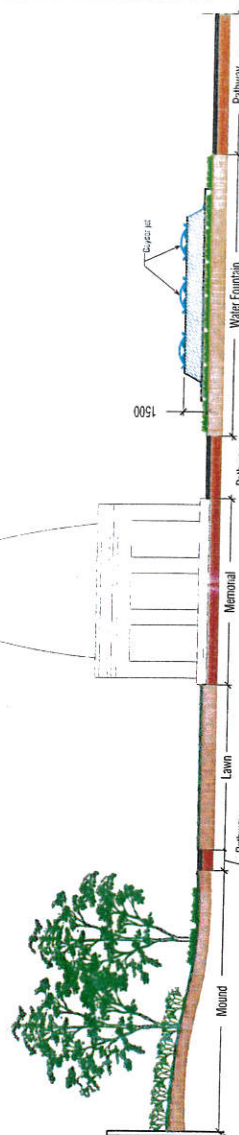
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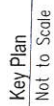
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REVIEWER	DATE	SCALE	NORTH
APPROVED	DATE	SCALE	NORTH
CHECKED	DATE	SCALE	NORTH



01 SECTION thru Memorial
LA/PP01 Scale 1:250



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LEGEND:

- Cycle Track
Jogging Track
Walkway
Nature Trail

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DRAWING TITLE:
Pond's Area
SANDY'S COMPO

HEET NO.

SP/LA/PP-02

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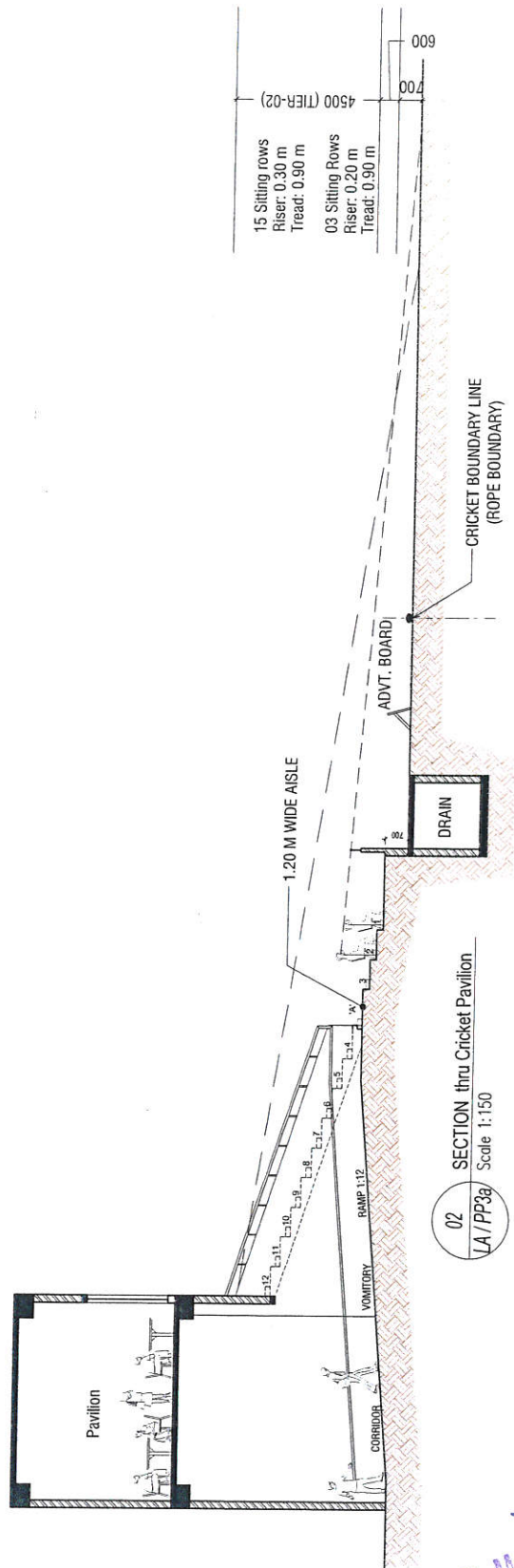
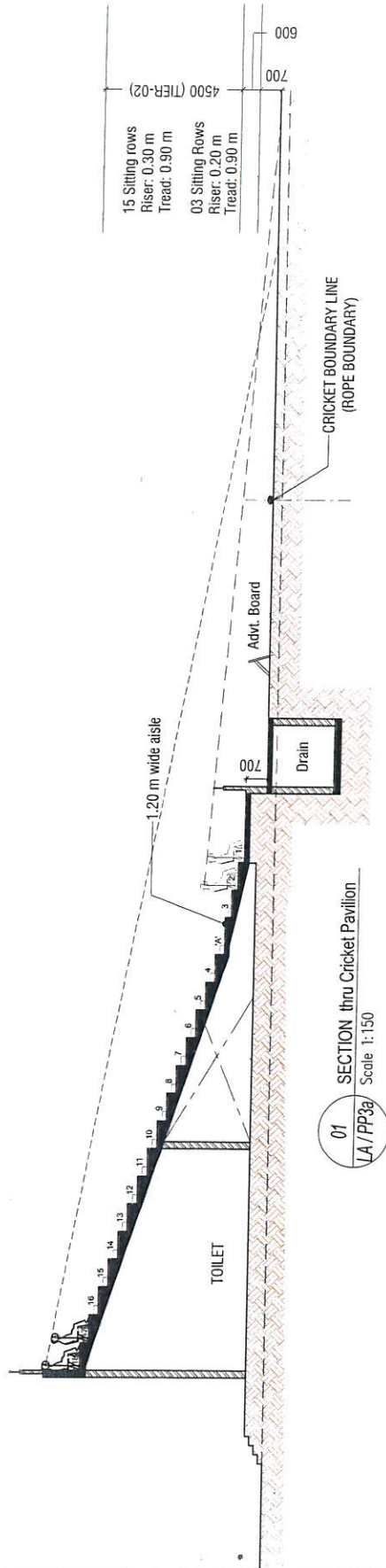
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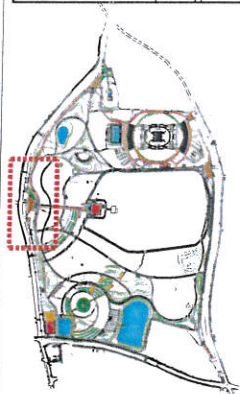
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PROJECT MANAGEMENT CONSULTANT																																																																																																					
<p>NOTE: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED. 2. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 3. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTER LINE OF THE ROAD. 4. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTER LINE OF THE ROAD. 5. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTER LINE OF THE ROAD. 6. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTER LINE OF THE ROAD. 7. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTER LINE OF THE ROAD. 8. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTER LINE OF THE ROAD. 9. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTER LINE OF THE ROAD. 10. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTER LINE OF THE ROAD.</p>																																																																																																					
LEGEND:																																																																																																					
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DRAWING TITLE: Section & Details - Sports Complex SANDY'S COMPOUND SHEET NO.: SP/LA/PP-3a																																																																																																					
RELEASED FOR: DATE: 10/07/2024 BY: 10/07/2024																																																																																																					
DRAWING NO.: SP/LA/PP-3a																																																																																																					
DRAWN: 10/07/2024 CHECKED: 10/07/2024 REVIEW: 10/07/2024 DATE: 10/07/2024 SCALE: 1:300 NORTH																																																																																																					



SR. MANAGER TECH. 2
BHAGALPUR SMART CITY LTD.
BHAGALPUR



Key Plan
Not to Scale



Project code : 00
DEVELOPMENT OF
SANDY'S PARK

CLIMATE
PAINA SMART CITY LTD

PROJECT MANAGEMENT CONSULTANT

NOTES:
1. THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF BHAGALPUR SMART CITY LTD. AND IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN.
2. THE INFORMATION CONTAINED HEREIN IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN.
3. THE INFORMATION CONTAINED HEREIN IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN.
4. THE INFORMATION CONTAINED HEREIN IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN.
5. THE INFORMATION CONTAINED HEREIN IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN.
6. THE INFORMATION CONTAINED HEREIN IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN.
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8. THE INFORMATION CONTAINED HEREIN IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN.
9. THE INFORMATION CONTAINED HEREIN IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN.
10. THE INFORMATION CONTAINED HEREIN IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN.

LEGEND:

- Cycle Track
- Jogging Track
- Walkway
- Nature Trail

RELEASED FOR:

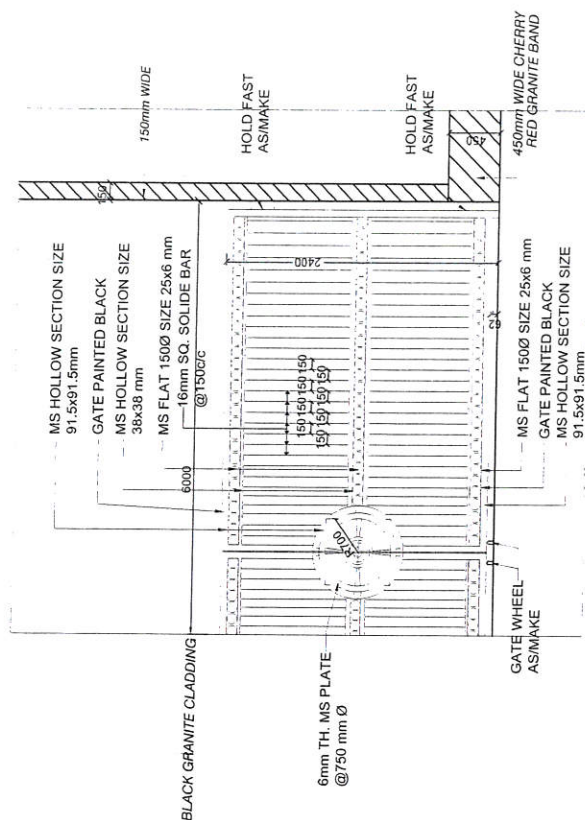
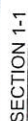
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Entrance Plaza
SANDY'S COMPOUND

SHEET NO.:

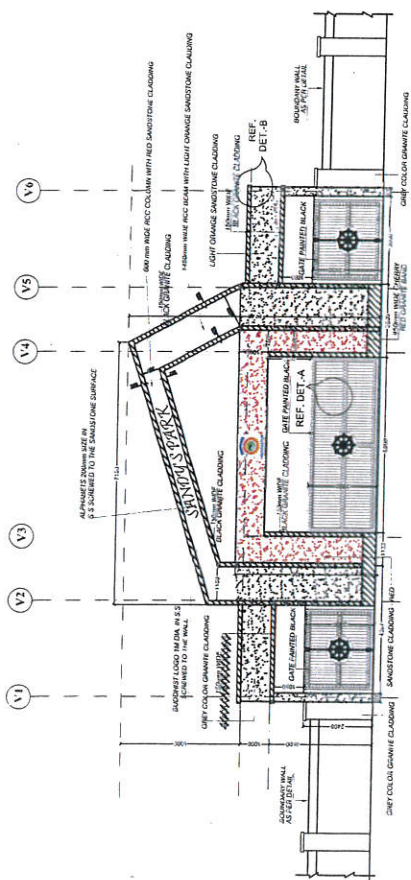
SP/LA/PP-04

DRAWN	CHECKED
BY	BY
REVIEW	APPROVED
DATE	REMARKS
DATE	REMARKS
SCALE	DATE
1:200	DATE

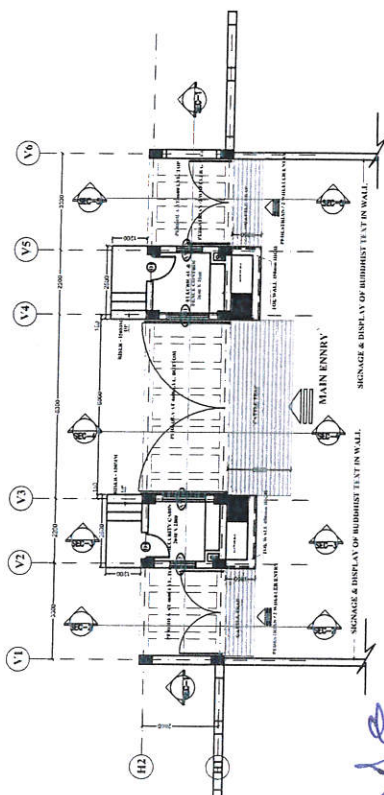
SR. MANAGER
BHAGALPUR SMART CITY LTD.
BHAGALPUR



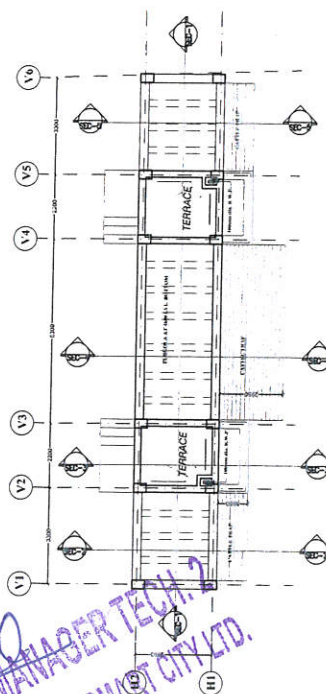
TYP.DET.-A (GATE DETAIL)



FRONT ELEVATION

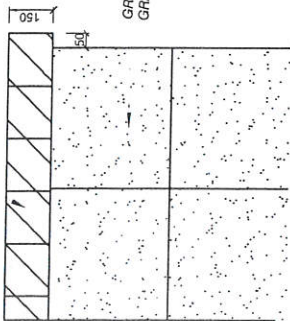


GROUND FLOOR PLAN



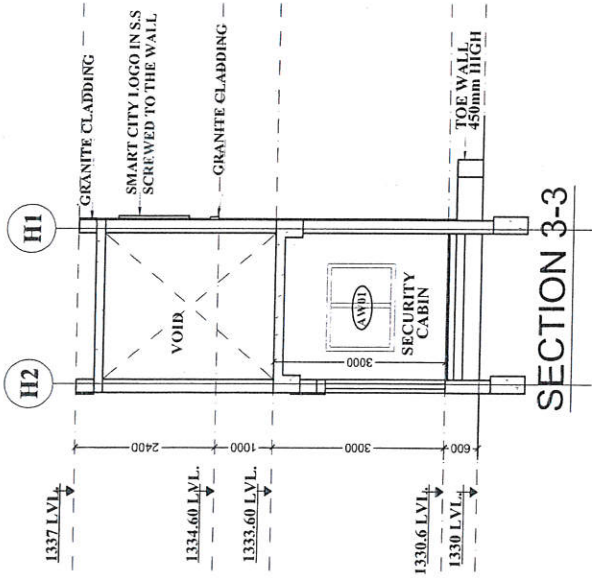
TERRACE FLOOR PLAN

150mm X 900 mm
BLACK GRANITE WET CLADDING

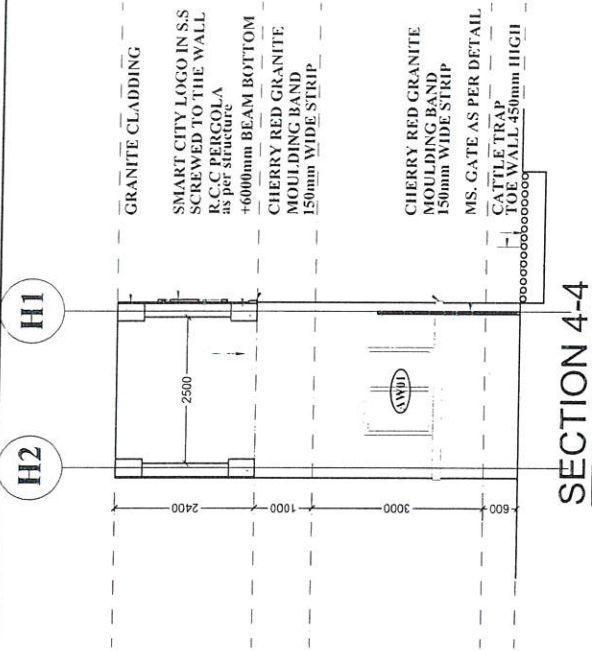


GREY COLOR
GRANITE WET CLADDING

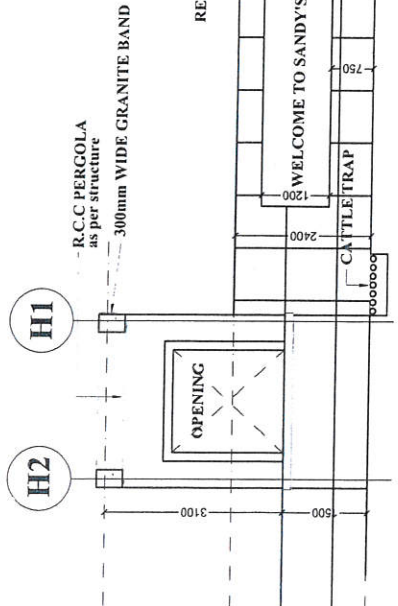
TYP.DET.-B (STONE BAND DET.)



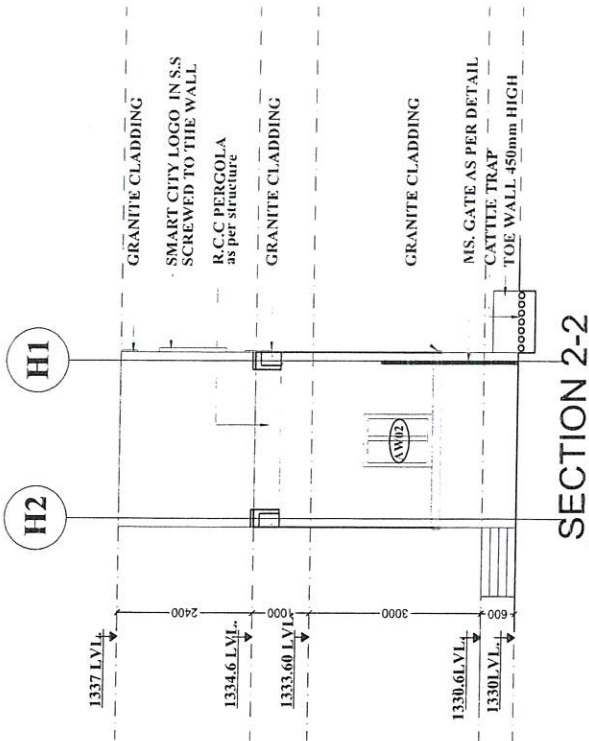
SECTION 3-3



SECTION 4-4



SECTION 5-5



SECTION 2-2

Project code:
DEVELOPMENT OF
SANDY'S PARK

CLIENT:
BHAGALPUR SMART CITY LTD

PROJECT MANAGER/CONSULTANT:

DATE: 10/01/2023

BY: [Signature]

CHECKED: [Signature]

REVIEW: [Signature]

DATE: 10/01/2023

SCALE: 1:100

LEGEND:

1. GRANITE CLADDING

2. SMART CITY LOGO IN S.S. SCREWED TO THE WALL

3. R.C.C PERGOLA +6000mm BEAM BOTTOM

4. CHERRY RED GRANITE MOULDING BAND 150mm WIDE STRIP

5. CHERRY RED GRANITE MOULDING BAND 150mm WIDE STRIP

6. MS. GATE AS PER DETAIL

7. CATTLE TRAP TOE WALL 450mm HIGH

DRAWING TITLE:
Section & Details - ENTRANCE GATE
SANDY'S COMPOUND

SHEET NO.:
SP/LA/PP-4b

RELEASED FOR:

DATE: 10/01/2023

SR. MANAGER TECH. 2
BHAGALPUR SMART CITY LTD.
BHAGALPUR

Project code:
DEVELOPMENT OF
SANDY'S PARK

CLIENT:
BHAGALPUR SMART CITY LTD

PROJECT MANAGER: N. C. GUNDE

NOTES:
1. THE DRAWING IS THE PROPERTY OF BHAGALPUR SMART CITY LTD.
2. THE DRAWING IS TO BE USED ONLY FOR THE PROJECT AND NOT FOR ANY OTHER PURPOSE.
3. THE DRAWING IS TO BE USED ONLY FOR THE PROJECT AND NOT FOR ANY OTHER PURPOSE.
4. THE DRAWING IS TO BE USED ONLY FOR THE PROJECT AND NOT FOR ANY OTHER PURPOSE.
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8. THE DRAWING IS TO BE USED ONLY FOR THE PROJECT AND NOT FOR ANY OTHER PURPOSE.
9. THE DRAWING IS TO BE USED ONLY FOR THE PROJECT AND NOT FOR ANY OTHER PURPOSE.
10. THE DRAWING IS TO BE USED ONLY FOR THE PROJECT AND NOT FOR ANY OTHER PURPOSE.

LEGEND:

RELEASED FOR:

DRAWING TITLE:
Section & Details - TOILET BLOCK
SANDY'S COMPOUND

SHEET NO.

SP/LA/D-02

CHECKED:

REVIEW:

DATE:

SCALE:

NOTES:

PROJECT NO.

SCHEDULE OF OPENINGS			
ITEM	WIDTH	SILL	LINTEL
D1	1.00 M	---	2.1 M
D2	0.75 M	---	2.1 M
V1	0.75 M	2.10 M	2.85 M

ELEVATION ELE 02

ELEVATION ELE 01

ELEVATION ELE 02

ELEVATION ELE 03

PLAN (PUBLIC TOILET)

SECTION S1-S1'

SR. MANAGER TECH. 2
BHAGALPUR SMART CITY LTD.
BHAGALPUR

Project code:
DEVELOPMENT OF
SANDY'S PARK

CLIENT
BHAGALPUR CITY LTD

PROJECT MANAGEMENT CONSULTANT

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. FINISHES TO BE AS PER SPECIFICATION.
3. ALL WORK TO BE DONE IN ACCORDANCE WITH THE LATEST VERSIONS OF IS CODES.
4. ALL MATERIALS TO BE USED SHALL BE OF GOOD QUALITY AND SHALL BE SUPPLIED BY THE CONTRACTOR.
5. ALL WORK TO BE DONE IN ACCORDANCE WITH THE LATEST VERSIONS OF IS CODES.
6. ALL WORK TO BE DONE IN ACCORDANCE WITH THE LATEST VERSIONS OF IS CODES.

LEGEND:

RELEASED FOR:

DRAWING TITLE:
Section & Details - TOILET BLOCK
SANDY'S COMPOUND

SHEET NO.:

SP/LA/D-02

DRAWN BY

CHECKED BY

REVIEW BY

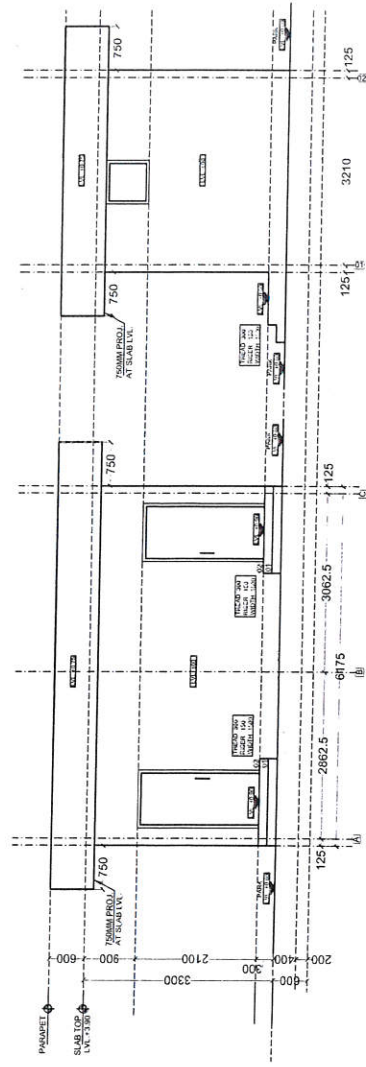
APPROVED BY

DATE

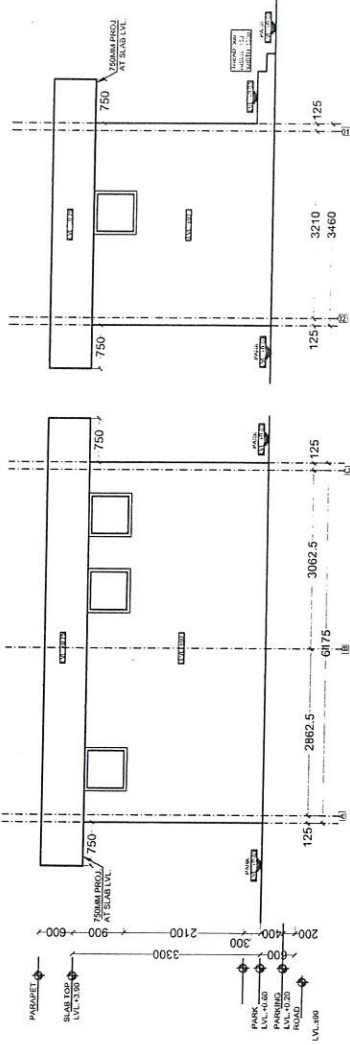
REMARKS

SCALE

NORTH

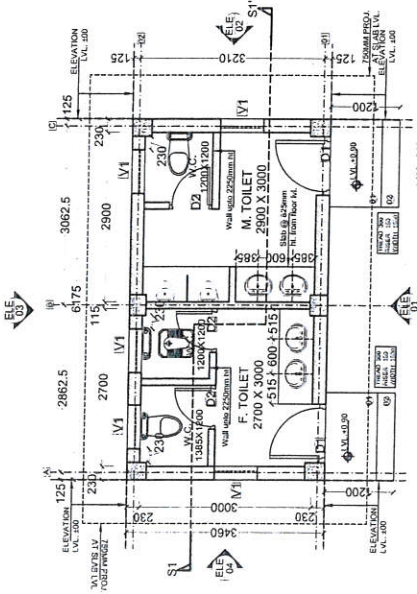


ELEVATION ELE 01

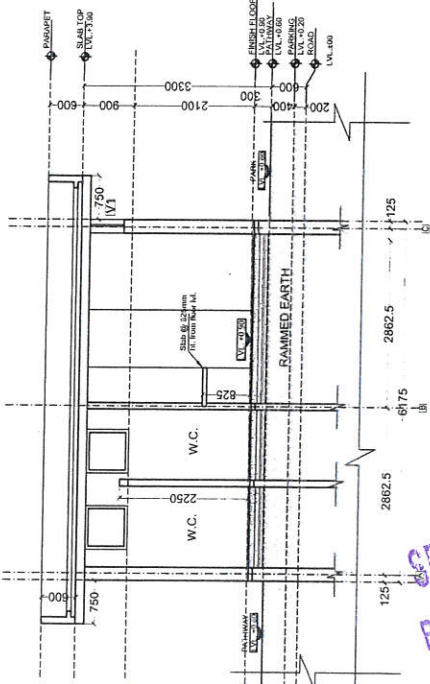


ELEVATION ELE 04

SCHEDULE OF OPENINGS			
ITEM	WIDTH	SILL	LINTEL
D1	1.00 M	2.1 M	
D2	0.75 M	2.1 M	
V1	0.75 M	2.10 M	2.85 M



PLAN (PUBLIC TOILET)



SECTION S1-S1'

SR. MATERIAL TECH. 2
BHAGALPUR SMART CITY LTD.
BHAGALPUR

Project code :
DEVELOPMENT OF
SANDY'S PARK

CLIENT
PATA SMART CITY LTD

PROJECT MANAGEMENT CONSULTANT

NOTES
1. STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING CODE OF INDIA (NBC) AND THE LOCAL BUILDING REGULATIONS.
2. THE FOUNDATION SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING CODE OF INDIA (NBC) AND THE LOCAL BUILDING REGULATIONS.
3. THE ROOF SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING CODE OF INDIA (NBC) AND THE LOCAL BUILDING REGULATIONS.
4. THE ELECTRICAL AND MECHANICAL SERVICES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING CODE OF INDIA (NBC) AND THE LOCAL BUILDING REGULATIONS.
5. THE FINISHES SHALL BE AS PER THE REQUIREMENTS OF THE NATIONAL BUILDING CODE OF INDIA (NBC) AND THE LOCAL BUILDING REGULATIONS.

LEGEND:

DATE	10/01/2024
BY	SR. MANAGER
CHECKED	SR. MANAGER
APPROVED	SR. MANAGER
DATE	10/01/2024
BY	SR. MANAGER
CHECKED	SR. MANAGER
APPROVED	SR. MANAGER

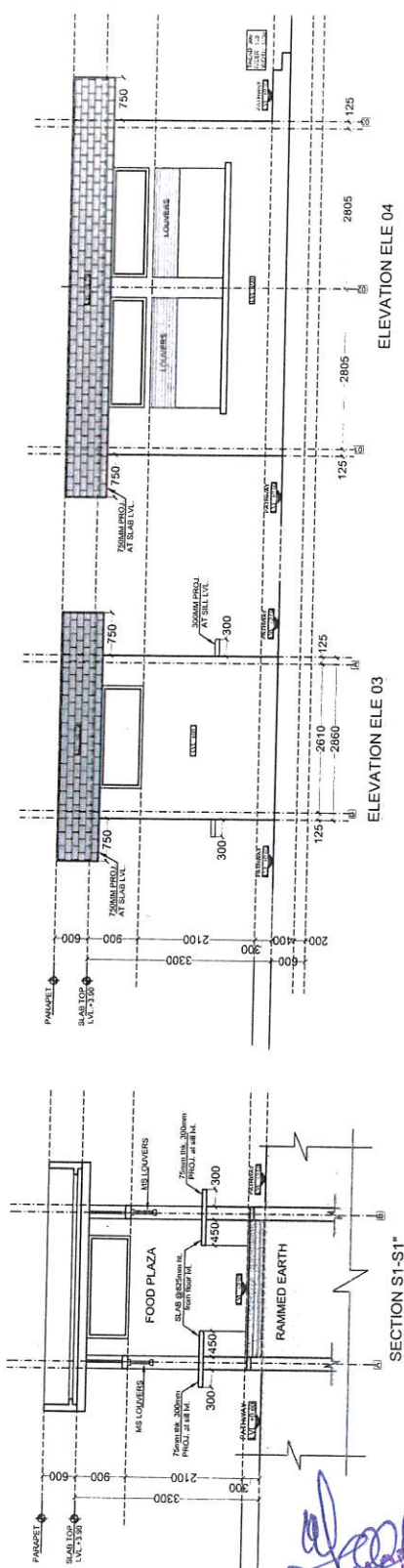
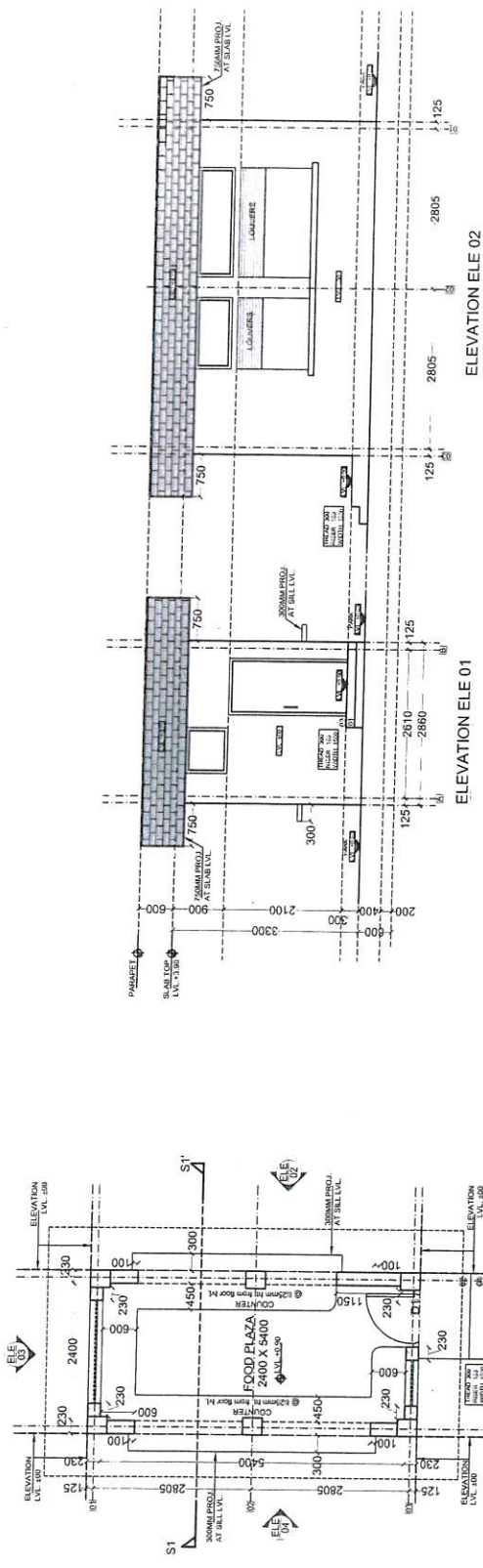
RELEASED FOR:

DRAWING TITLE:
Section & Details - FOOD PLAZA
SANDY'S COMPOUND

SHEET NO.

SP/IA/D-03

DATE	10/01/2024
BY	SR. MANAGER
CHECKED	SR. MANAGER
APPROVED	SR. MANAGER
DATE	10/01/2024
BY	SR. MANAGER
CHECKED	SR. MANAGER
APPROVED	SR. MANAGER



SR. MANAGER
BHAGALPUR SMART CITY LTD.
BHAGALPUR

Project code :
DEVELOPMENT OF
SANDY'S PARK

CLIENT
PAINA SMART CITY LTD

PROJECT MANAGEMENT CONSULTANT

NOTES:
1. THE DRAWING IS THE PROPERTY OF THE PROJECT MANAGEMENT CONSULTANT AND SHALL BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY MENTIONED THEREIN.
2. THE PROJECT MANAGEMENT CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE CONSTRUCTION OF THE PROJECT.
3. THE PROJECT MANAGEMENT CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE PERFORMANCE OF THE PROJECT.
4. THE PROJECT MANAGEMENT CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE MAINTENANCE OF THE PROJECT.
5. THE PROJECT MANAGEMENT CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE OPERATION OF THE PROJECT.
6. THE PROJECT MANAGEMENT CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE REPAIRS OF THE PROJECT.
7. THE PROJECT MANAGEMENT CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE REPLACEMENT OF THE PROJECT.
8. THE PROJECT MANAGEMENT CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE REMOVAL OF THE PROJECT.
9. THE PROJECT MANAGEMENT CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE RECONSTRUCTION OF THE PROJECT.
10. THE PROJECT MANAGEMENT CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE REPAIRS OF THE PROJECT.

LEGEND:

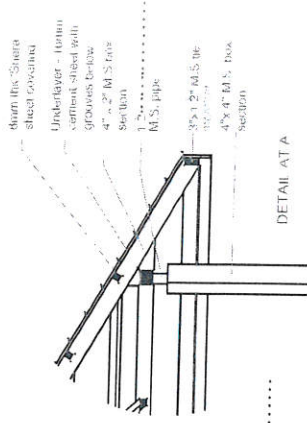
RELEASED FOR:

DRAWING TITLE:
Section & Details - GAZEBOO
SANDY'S COMPOUND

SHEET NO.:

SP/LA/D-04

DRAWN	NO.	CHECKED	NO.
REVIEW	NO.	APPROVED	NO.
DATE	DATE BY	DATE BY	DATE BY
SCALE	NO. OF SETS	NO. OF SETS	NO. OF SETS

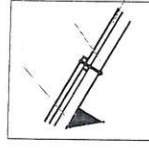


DETAIL AT A

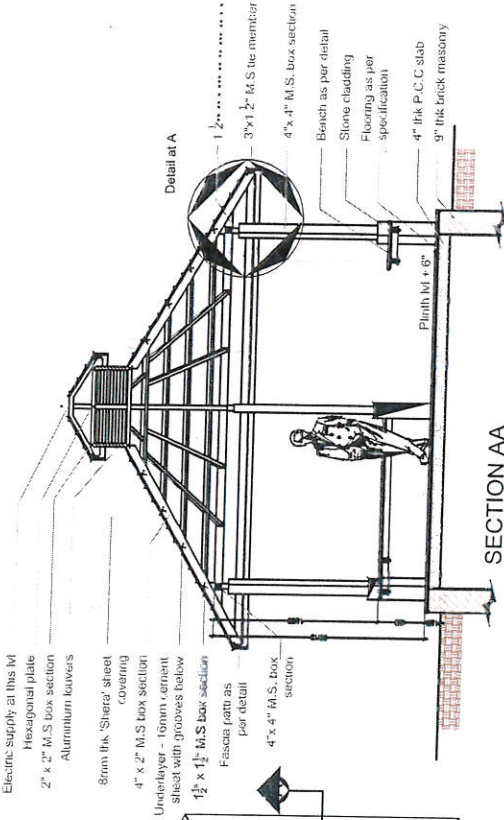
8mm thick 'Shera' sheet covering core of 'Shera' tie member to be polished with 'Shera' grade P.U.



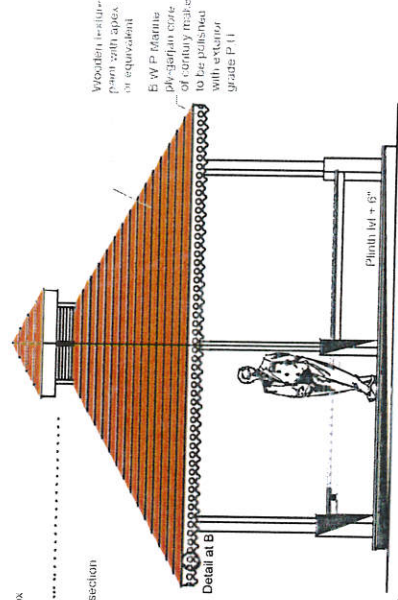
DETAIL AT B



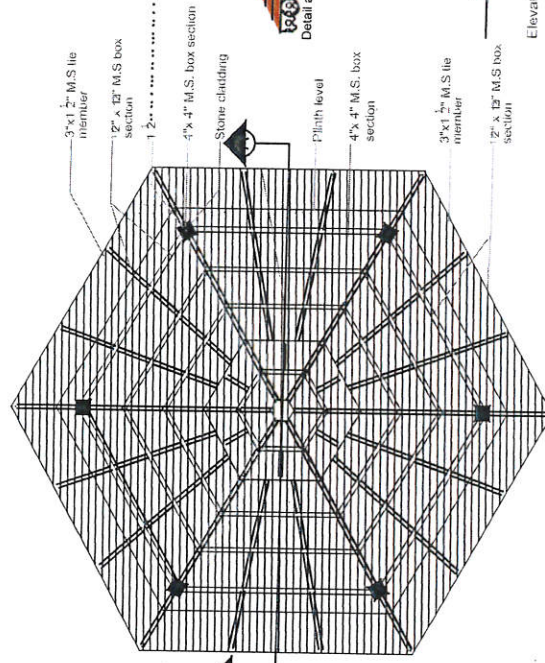
DETAIL AT C



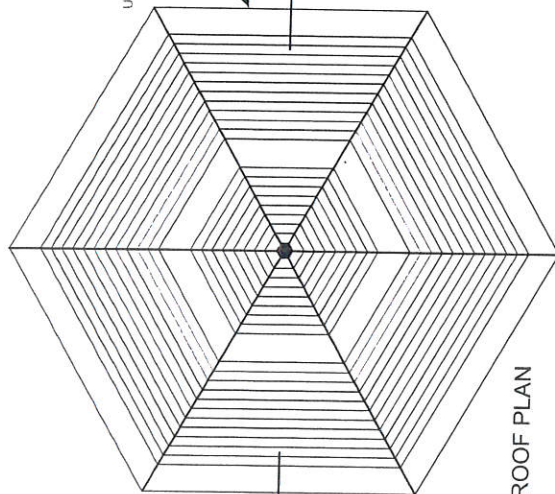
SECTION AA



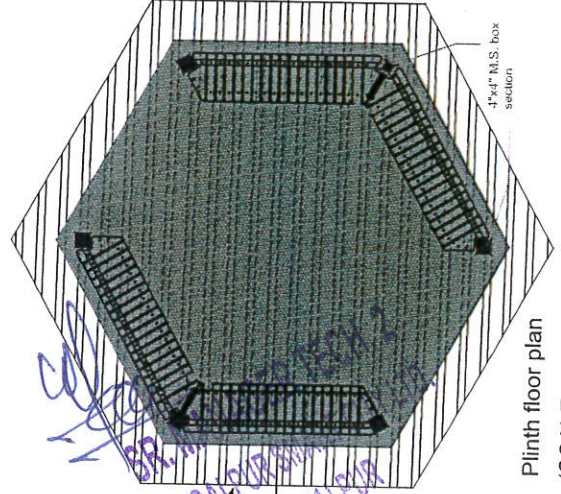
Elevation



Reflected ceiling plan



ROOF PLAN



Plinth floor plan
(SCALE -1:200)

Project code : 00
DEVELOPMENT OF
SANDY'S PARK

CUSTOMER
PUNJAB NAGAR CITY LTD.

PROJECT MANAGEMENT CONSULTANT

NOTES:
1. THE DRAWING IS TO BE USED FOR THE PRELIMINARY DESIGN ONLY.
2. THE DRAWING IS TO BE USED FOR THE PRELIMINARY DESIGN ONLY.
3. THE DRAWING IS TO BE USED FOR THE PRELIMINARY DESIGN ONLY.
4. THE DRAWING IS TO BE USED FOR THE PRELIMINARY DESIGN ONLY.
5. THE DRAWING IS TO BE USED FOR THE PRELIMINARY DESIGN ONLY.

LEGEND:

- Cycle Track
- Jogging Track
- Walkway
- Nature Trail

Toilet
Block

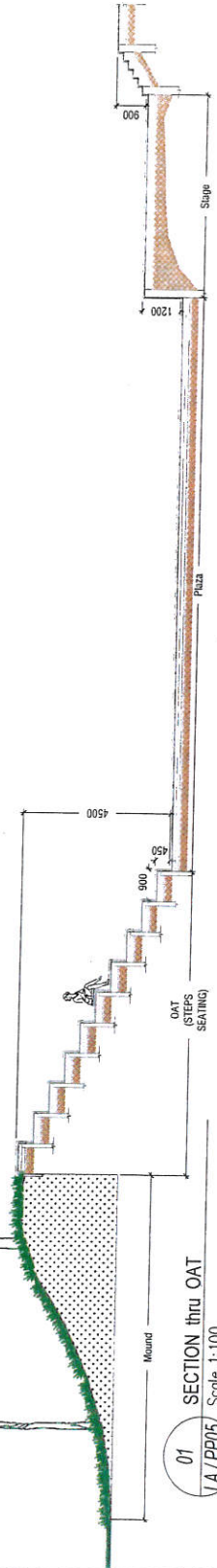
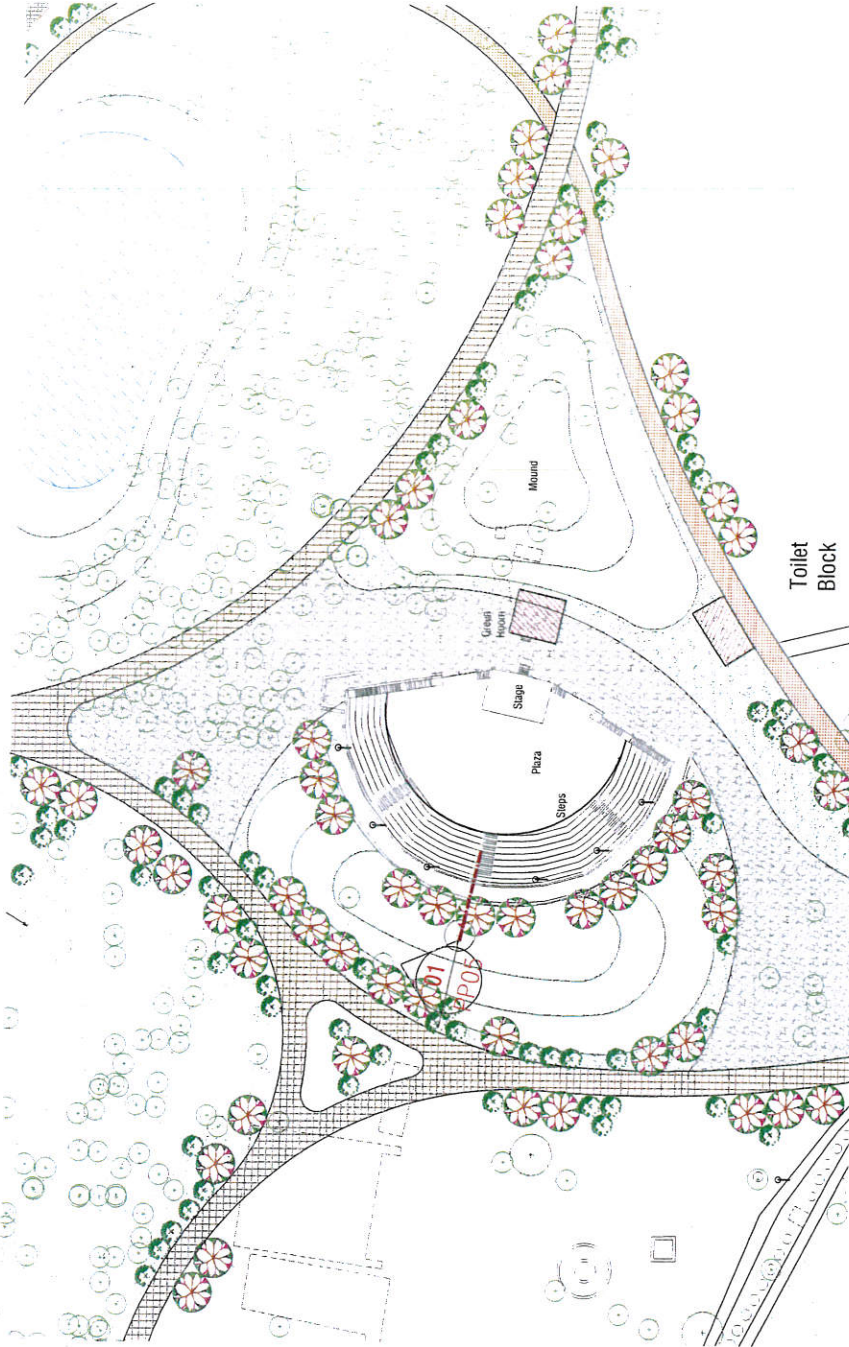
SR. MANAGER
BHAGALPURA
BHAGALPURA

DRAWING TITLE:
Open Air Theatre (OAT)
SANDY'S COMPOUND

SHEET NO.:

SP/LA/PP-05

DRAWN	CHECKED
DESIGNED	APPROVED
DATE	REVISIONS
SCALE	REVISION
1:100	



01 SECTION thru OAT
LA/PP05
Scale 1:100

Project code : 00)
DEVELOPMENT OF
SANDY'S PARK

CLIPART
PATINA SMARTCTY LTD

PROJECT MANAGEMENT CONSULTANT

[illegible]

RELEASED FOR:

DRAWING TITLE:-
Secondary Entry Gate
SANDY'S COMPOUND

SHEET NO.:

SP/LA/D-05

DRAWN	CHOC (FF)
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[illegible]

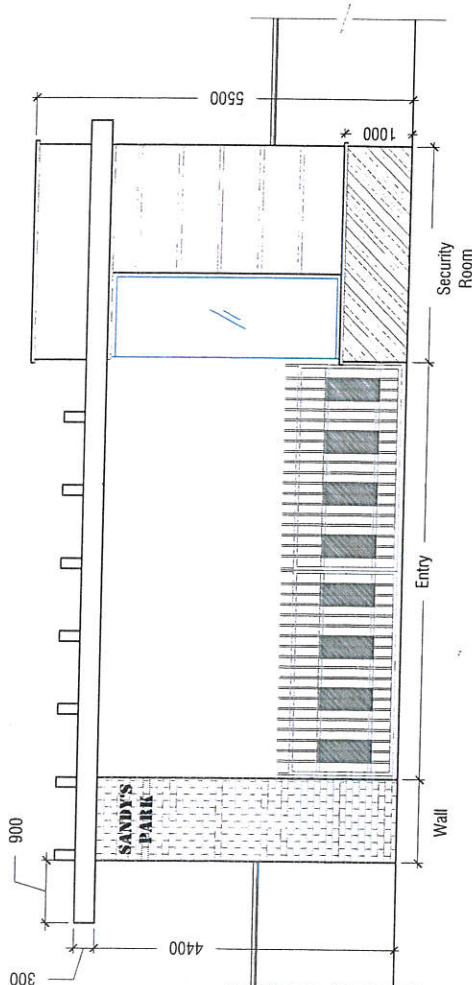
APPROVED	FILED
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DATE	REMARKS
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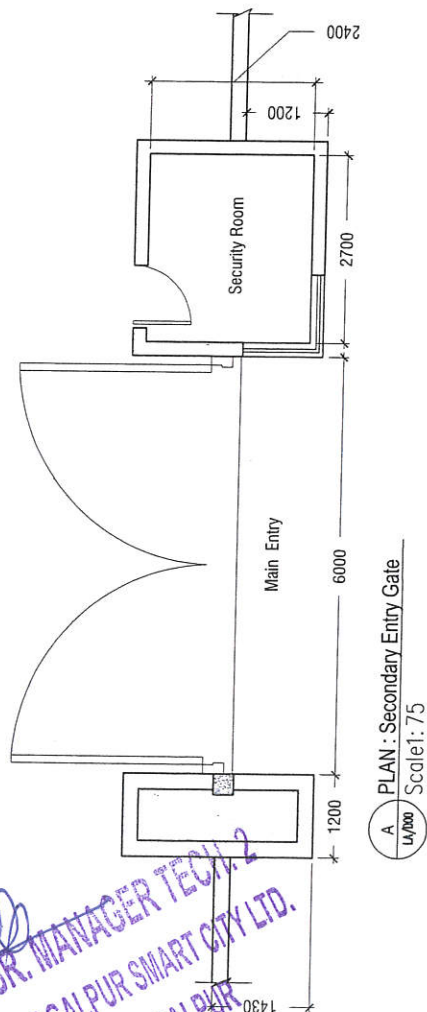
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SCALE	NORTH
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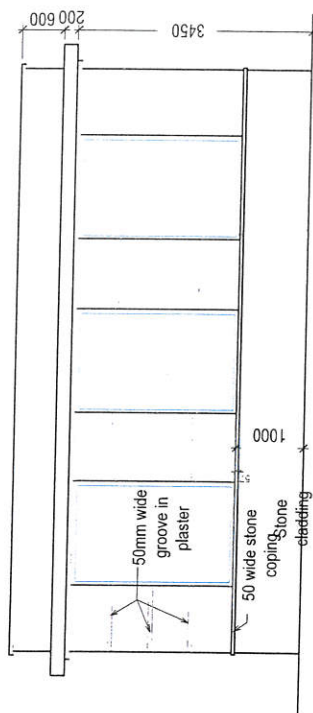
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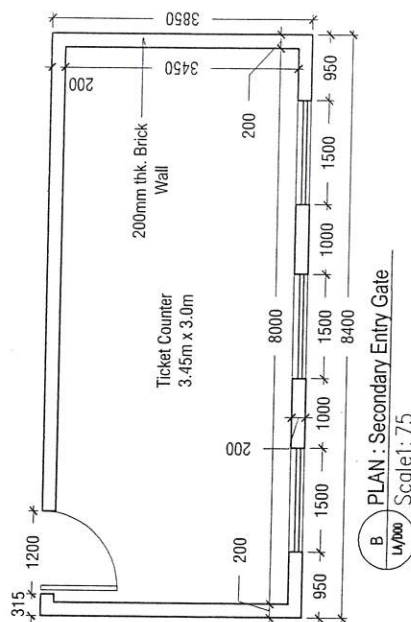
A1 ELEVATION : Secondary Entry Gate
LA/MP01 Scale: 75



A PLAN : Secondary Entry Gate
W/000 Scale 1:75



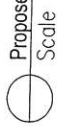
B1 ELEVATION : Secondary Entry Gate
LA/MP01 Scale 1:75



B PLAN : Secondary Entry Gate
14/000 Scale: 1:75

1430

1



Project code : 10
DEVELOPMENT OF
SANDY'S PARK

CUSTOMER
BHAGALPUR SMART CITY LTD

PROJECT TRANSPARENT CONSULTANT

NOTES:
1. THE DRAWING IS THE PROPERTY OF THE CONSULTANT AND SHALL BE USED ONLY FOR THE PROJECT FOR WHICH IT IS PREPARED.
2. ANY MODIFICATION TO THE DRAWING SHALL BE MADE ONLY BY THE CONSULTANT.
3. THE CONSULTANT SHALL BE RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE PROJECT.
4. THE DRAWING SHALL BE USED ONLY FOR THE PROJECT FOR WHICH IT IS PREPARED.
5. THE CONSULTANT SHALL BE RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE PROJECT.
6. THE DRAWING SHALL BE USED ONLY FOR THE PROJECT FOR WHICH IT IS PREPARED.

RELEASED FOR:

DRAWING TITLE:
Water Fountain at Entry Plaza
SANDY'S COMPOUND

SHEET NO.:

SP/LA/D-07

CHECKED:

REVIEW:

DATE:

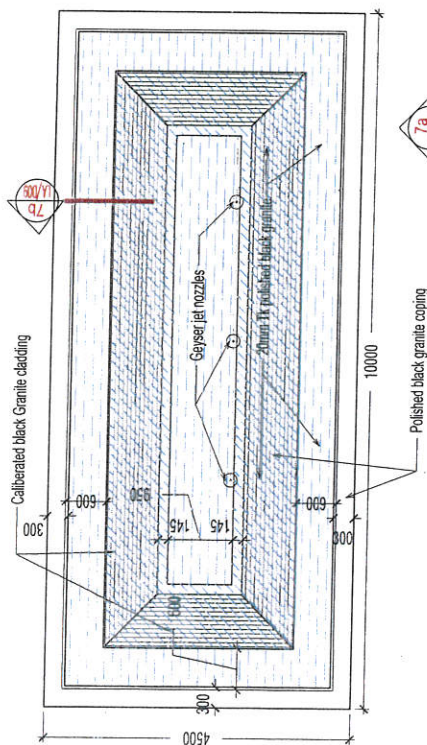
SCALE:

PROJECT NO.:

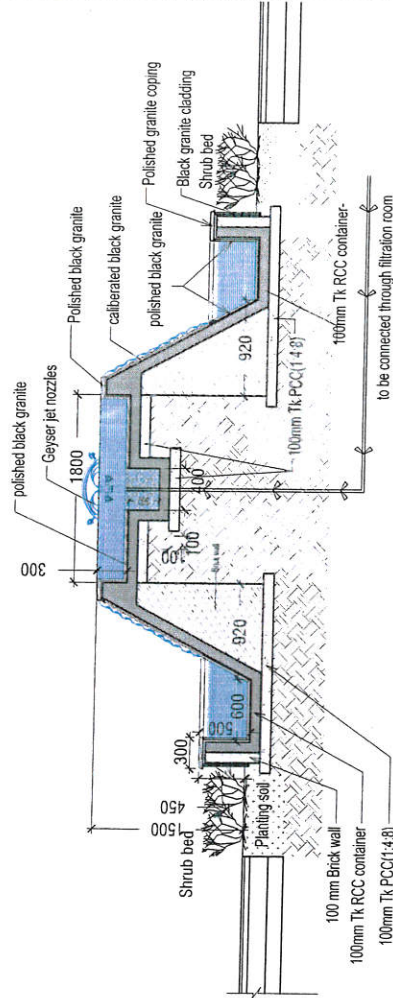
PROJECT NAME:

PROJECT ADDRESS:

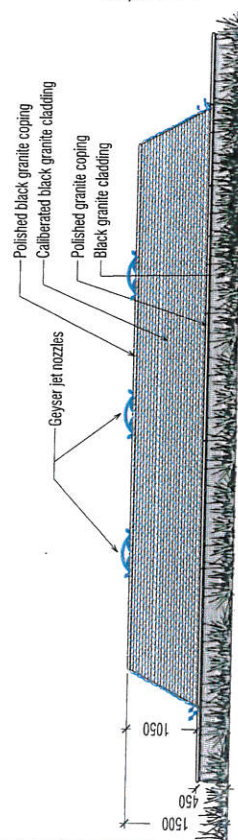
PROJECT LOCATION:



07 PLAN : Water Fountain
LA / MP07 Scale 1:75



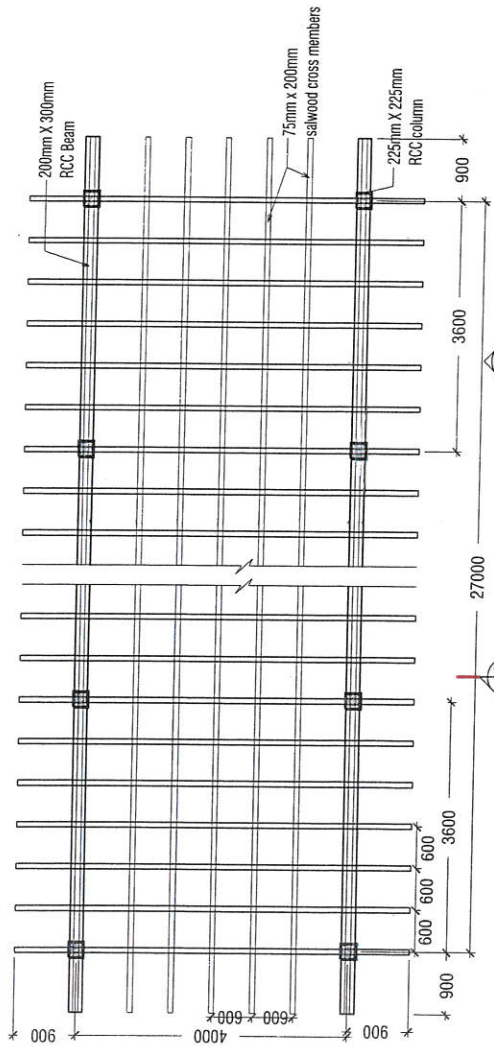
7b SECTIONS : Water Fountain
LA / D09 Scale 1:50



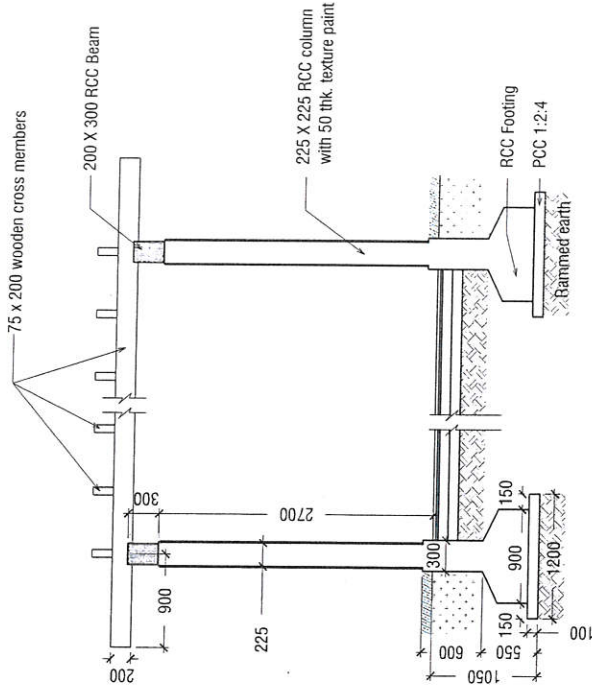
7a PLAN : Water Fountain
LA / D09 Scale 1:75

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BHAGALPUR

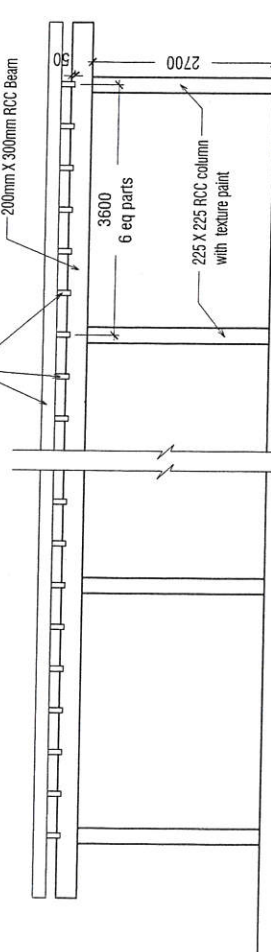
Project code : 00 DEVELOPMENT OF SANDY'S PARK	
CLIENT PARMA SMART CITY LTD	PROJECT MANAGER MUSTUJANSHI
NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED. 2. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 3. ALL DIMENSIONS ARE TO BE MAINTAINED AS SHOWN. 4. ALL DIMENSIONS ARE TO BE MAINTAINED AS SHOWN. 5. ALL DIMENSIONS ARE TO BE MAINTAINED AS SHOWN. 6. ALL DIMENSIONS ARE TO BE MAINTAINED AS SHOWN. 7. ALL DIMENSIONS ARE TO BE MAINTAINED AS SHOWN. 8. ALL DIMENSIONS ARE TO BE MAINTAINED AS SHOWN. 9. ALL DIMENSIONS ARE TO BE MAINTAINED AS SHOWN. 10. ALL DIMENSIONS ARE TO BE MAINTAINED AS SHOWN.	
RELEASED FOR: <input checked="" type="checkbox"/> DESIGN <input type="checkbox"/> MATERIAL <input type="checkbox"/> ESTIMATE	
DRAWING TITLE: Trellis / Pergola SANDY'S COMPOUND	
SHEET NO.:	
SP/LA/D-08	
DRAWN	CHECKED
DESIGN	APPROVED
DATE	RELEASED
SCALE	REVISION



00 PLAN : Pergola
LA/MP/01 Scale: 75



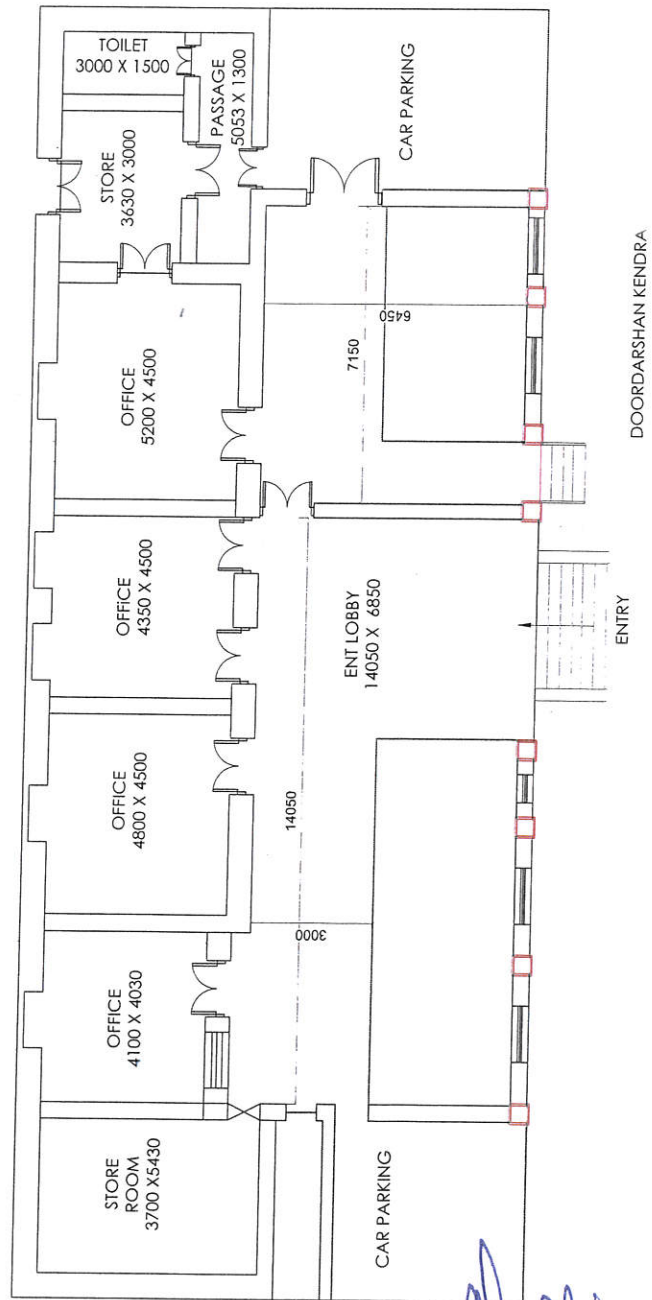
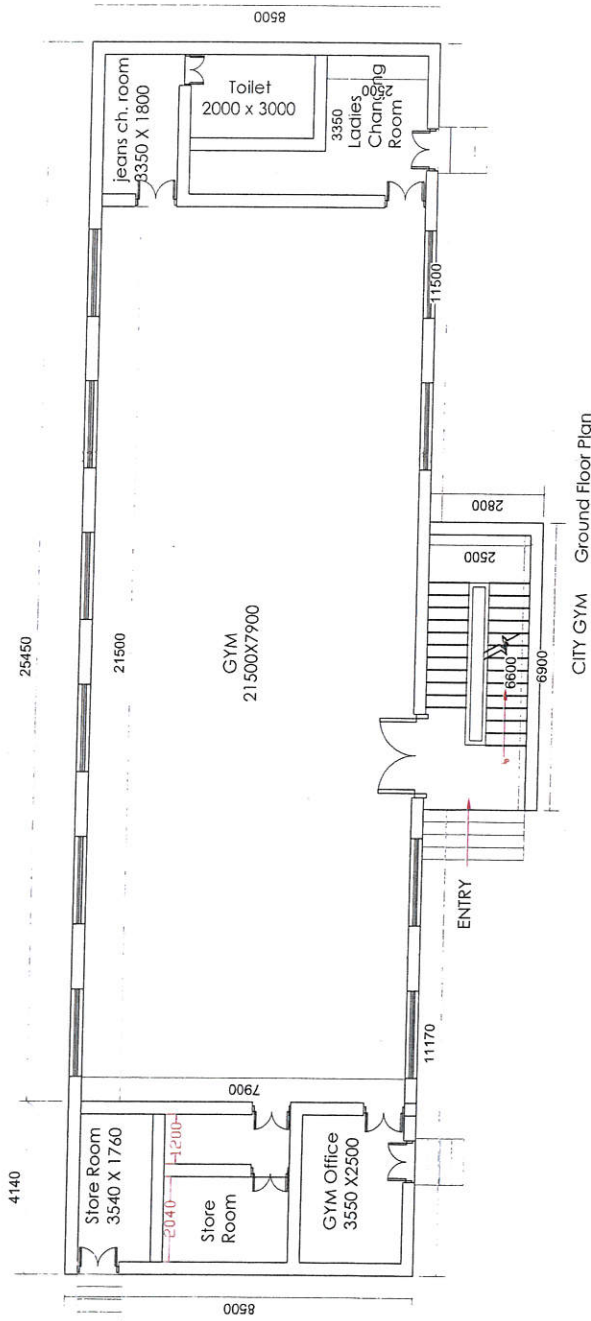
B PLAN : Pergola
LA/MP/02 Scale: 75



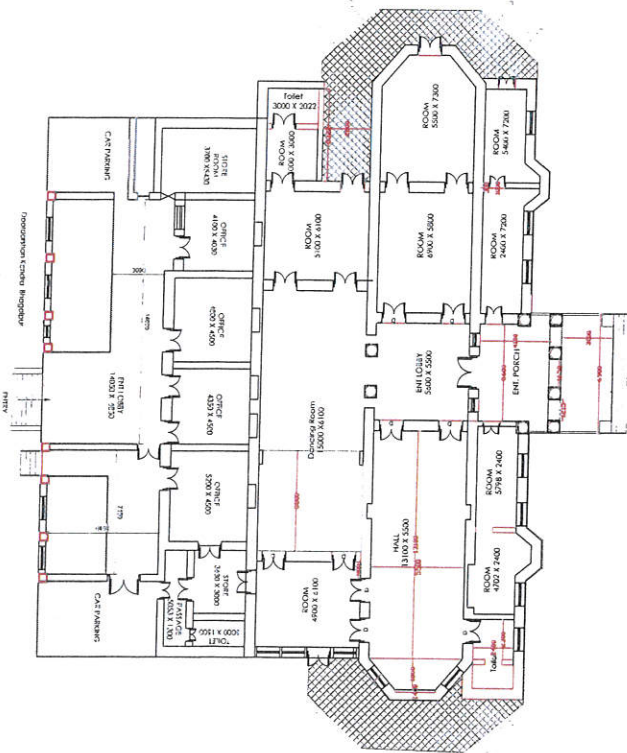
A PLAN : Pergola
LA/MP/03 Scale: 75

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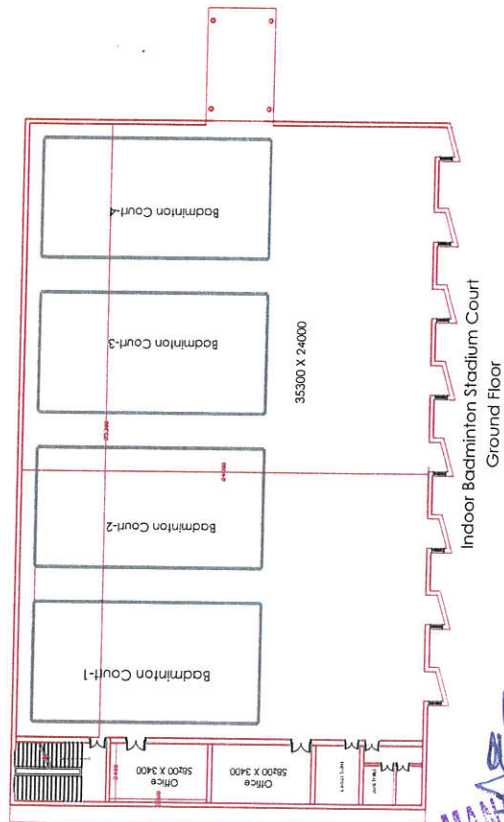
Project code : 00 DEVELOPMENT OF SANDY'S PARK	
CITYSMART PATAKSMART CITY LTD	
PROJECT MANAGEMENT CONSULTANT	
<p>NOTES:</p> <p>1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.</p> <p>2. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p> <p>3. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p> <p>4. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p> <p>5. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p> <p>6. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p> <p>7. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p> <p>8. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p> <p>9. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p> <p>10. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p>	
<p>RELEASED FOR:</p> <p>DATE: 10/01/2024</p> <p>BY: [Signature]</p>	
<p>DRAWING TITLE:</p> <p>CITY GYM & DOORDARSHAN KENDRA SANDY'S COMPOUND</p>	
<p>SHEET NO:</p> <p>SP/LA/AR-01</p>	
<p>DRAWN</p> <p>CHECKED</p> <p>REVIEW</p> <p>DATE</p> <p>SCALE</p>	<p>APPROVED</p> <p>DATE</p> <p>SCALE</p>



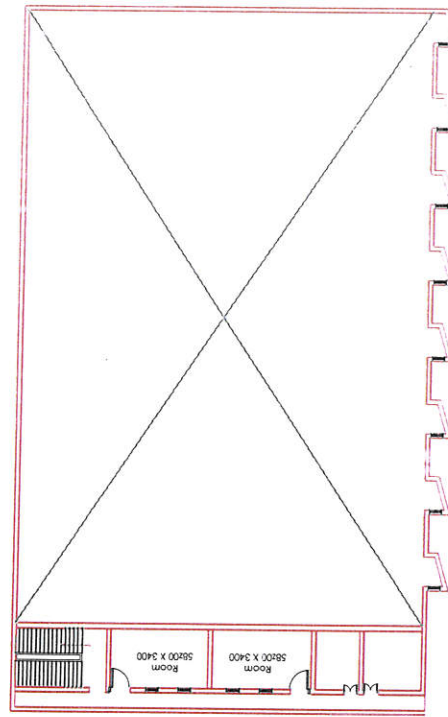
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STATION CLUB LAYOUT DRAWING , BHAGALPUR



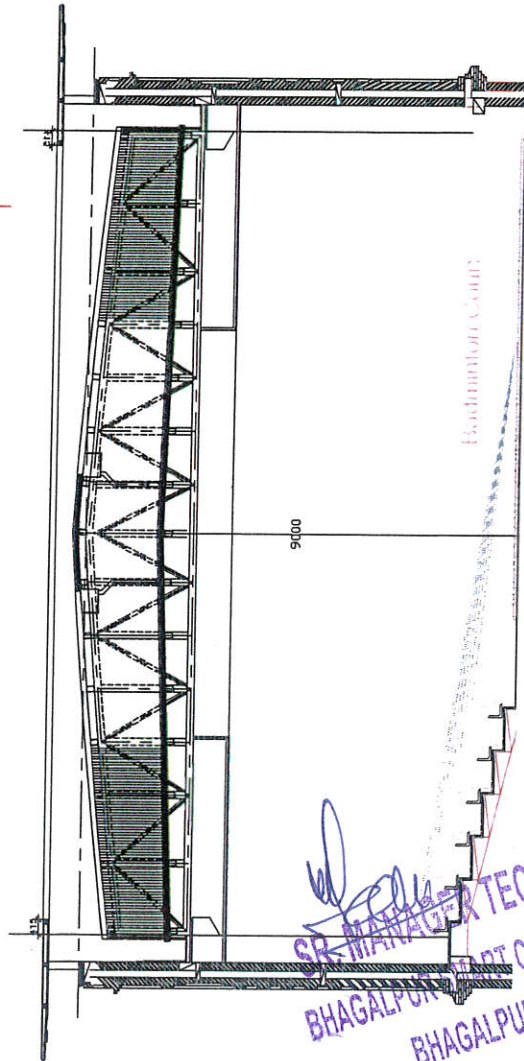
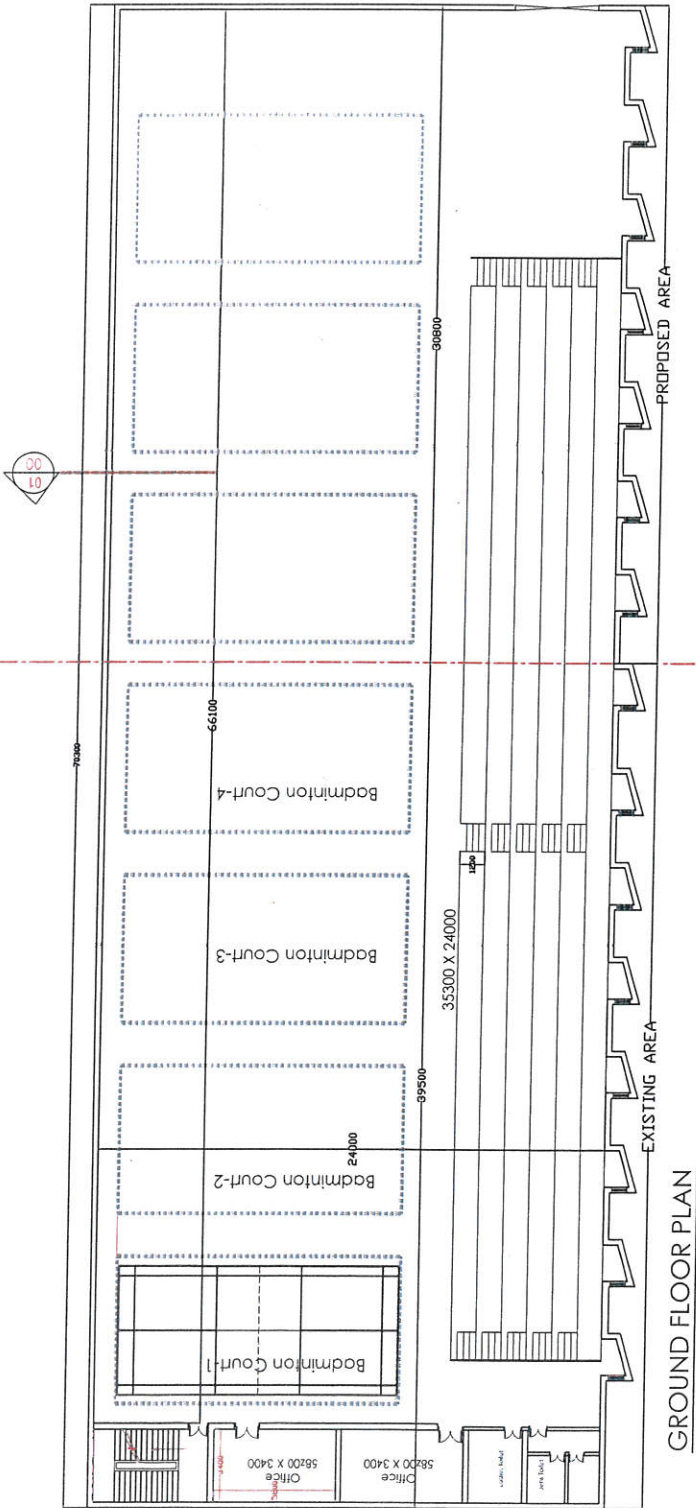
Indoor Badminton Stadium Court
Ground Floor



Indoor Badminton Stadium Court
First Floor

Project code : 00 DEVELOPMENT OF SANDY'S PARK	
CLIENT PANA SMART CITY LTD	
PROJECT MANAGEMENT CONSULTANT	
NOTE: 1. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PROJECT. 2. ANY MODIFICATION TO THIS DRAWING SHALL BE MADE BY THE PROJECT MANAGER. 3. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PROJECT. 4. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED. 5. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 6. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 7. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 8. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 9. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 10. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.	
RELEASED FOR:	DATE: 10/10/2023
DRAWING TITLE: Station & Indoor Stadium SANDY'S COMPOUND	
SHEET NO.: SP/LA/AR-02	
DESIGN	CHECKED
REVIEW	APPROVED
DATE	DATE
SCALE	SCALE

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SR-MANAGER
BHAGALPUR PART CO. LTD.
BHAGALPUR

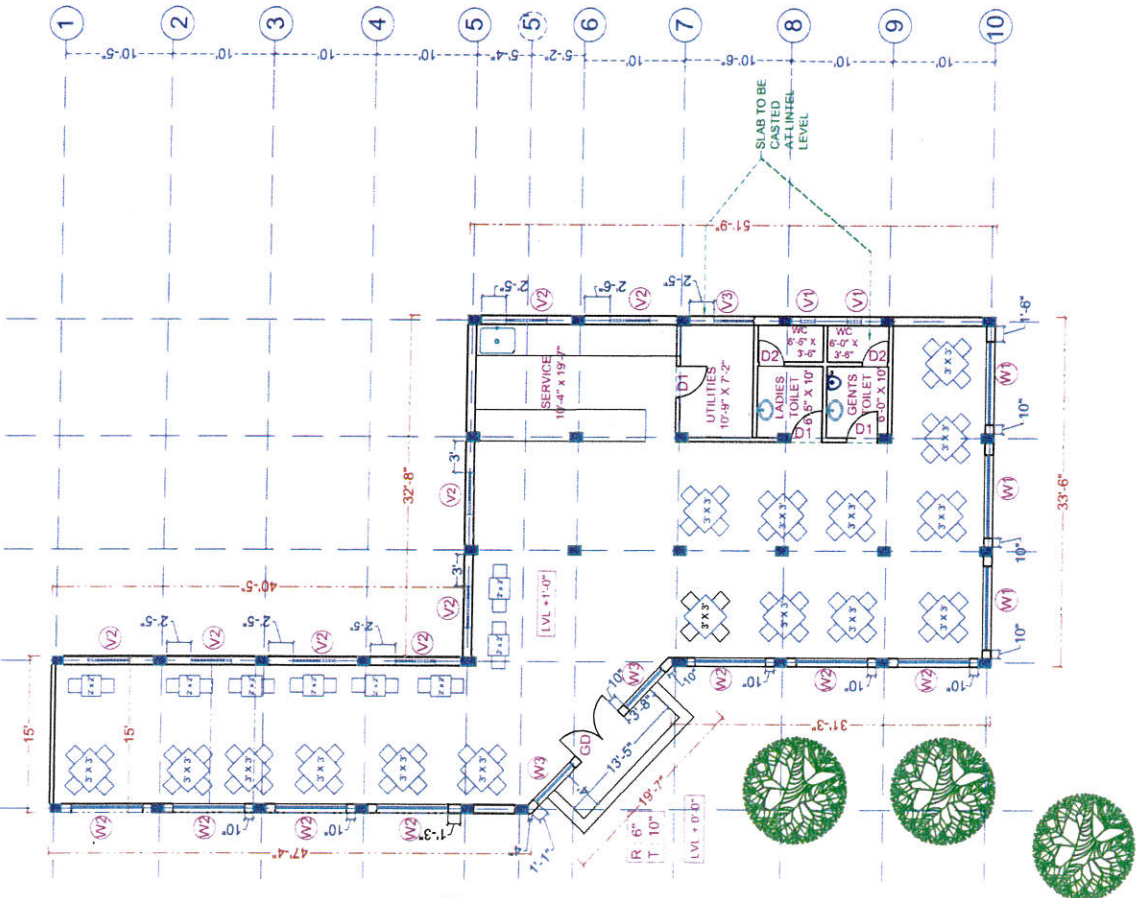
Project code : 00 DEVELOPMENT OF SANDY'S PARK	
UPV PUNJAB STATE CITY LTD	
PROJECT MANAGEMENT CONSULTANT	
<p>NOTES: 1. ALL DIMENSIONS ARE IN METERS. 2. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 3. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 4. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 5. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 6. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 7. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 8. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 9. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. 10. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</p> <p>LEGEND:</p>	
<p>RELEASED FOR:</p> <p>DATE: 10/10/2023</p> <p>BY: 10/10/2023</p>	
<p>DRAWING TITLE:</p> <p>Indoor Badminton Stadium - Proposed SANDY'S COMPOUND</p>	
<p>SHEET NO:</p> <p>SP/LA/AR-03</p>	
DRAWN	CHECKED
REVISED	APPROVED
DATE	REMARKS
10/10/23	
SCALE	NOT TO SCALE
<p>10/10/23</p>	

DEGREE	CHEMISTRY
NAME	AS
REVIEW	APPROVED
DATE	11/16/2015
TO BE BY	
SCALE	NO. 111
DATE	11/16/2015

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Schedule of Doors			
TYPE	WIDTH	HEIGHT	LINTEL
D1	3'-0"	7'-0"	7'-0"
D2	2'-8"	7'-0"	7'-0"
GD	6'-0"	8'-0"	8'-0"
Schedule of Windows			
TYPE	WIDTH	HEIGHT	LINTEL
V1	2'-0"	2'-0"	8'-0"
V2	4'-0"	2'-0"	8'-0"
V3	4'-0"	2'-0"	8'-0"
W1	8'-0"	8'-0"	8'-0"
W2	7'-0"	8'-0"	8'-0"
W3	5'-0"	8'-0"	8'-0"

BUILT UP AREA = 2,384 Sq ft



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Project code :
DEVELOPMENT OF
SANDY'S PARK

CLIENT:
PATNA SMART CITY LTD

PROJECT MANAGEMENT CONSULTANT:

NOTE: 1. ALL DIMENSIONS SHOWN ON THIS DRAWING SHALL BE IN METERS. DIMENSIONS SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE. 2. THE DIMENSIONS OF THE BUILDING SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE. 3. THE DIMENSIONS OF THE BUILDING SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE. 4. THE DIMENSIONS OF THE BUILDING SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE. 5. THE DIMENSIONS OF THE BUILDING SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE. 6. THE DIMENSIONS OF THE BUILDING SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE. 7. THE DIMENSIONS OF THE BUILDING SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE. 8. THE DIMENSIONS OF THE BUILDING SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE. 9. THE DIMENSIONS OF THE BUILDING SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE. 10. THE DIMENSIONS OF THE BUILDING SHALL BE TO FACE UNLESS SPECIFIED OTHERWISE.

LEGEND

REVISION	DATE	BY	REMARKS
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9			
10			

DRAWING TITLE:
Plan - Cafeteria
Sandy's Compound

SHEET NO.:

SP/LA/AR-04-01

REVISION	DATE	BY	REMARKS
1			
2			
3			
4			
5			
6			
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SCALE

NORTH

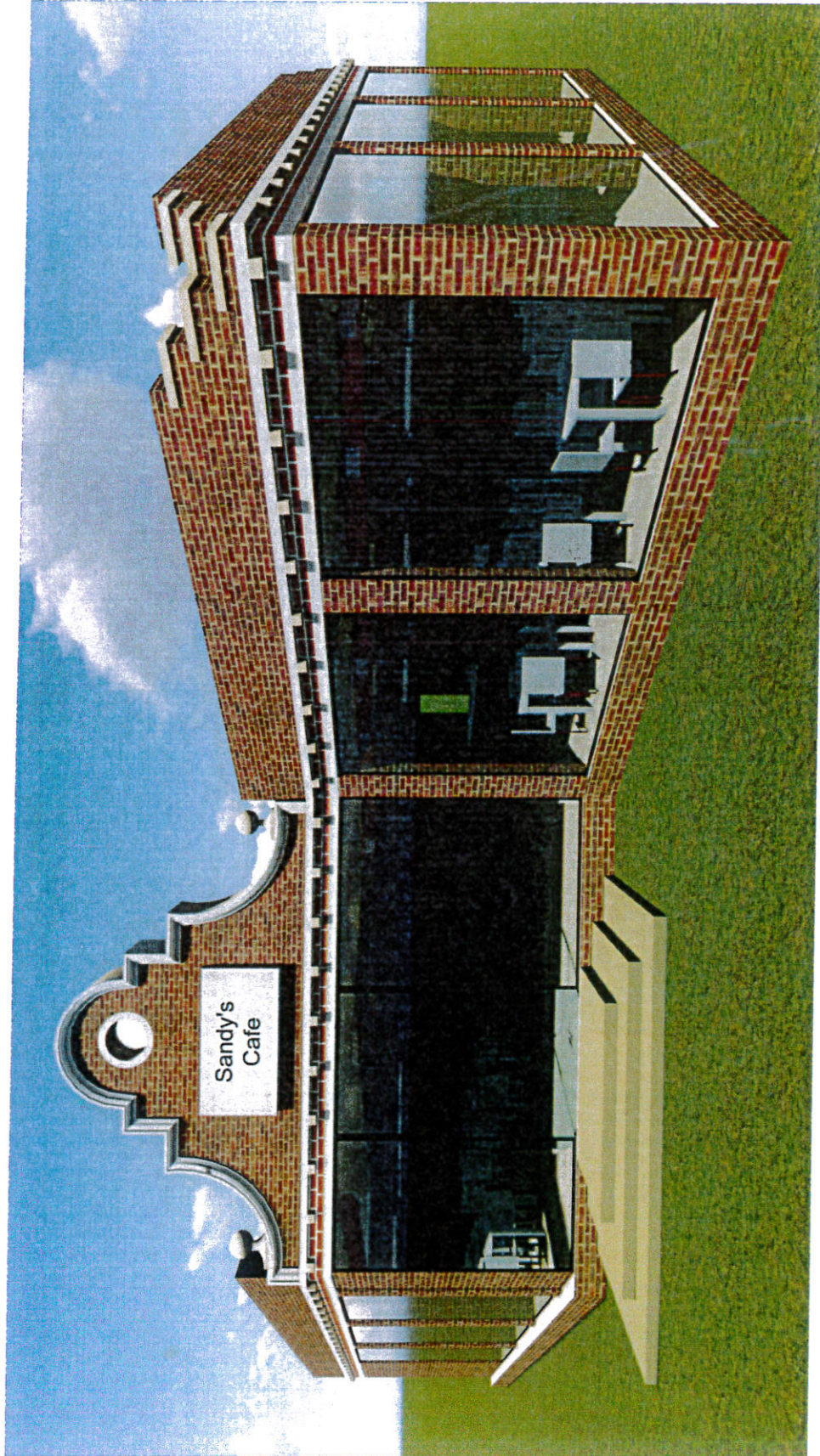
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P2	AS
REVIEW	APPROVED
	PAK
DATE	REMARKS
15-11-12	
SCALE	NORTH
As per B.L. 3	



DRAWN	CHECKED	
PS	AS	
REVIEW	APPROVED	
	AKS	
DATE	REMARKS	
15-11-02		
SCALE	NORTH	
As per detail		




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Project code :
DEVELOPMENT OF
SANDY'S PARK

CLIENT
BHAGALPUR SMART CITY LTD

PROJECT MANAGEMENT CONSULTANT

NOTES:
1. THIS DRAWING IS FOR THE SCALED ONLY. WATER MARK IS NOT TO BE USED.
2. THE DRAWING IS FOR THE SCALED ONLY. WATER MARK IS NOT TO BE USED.
3. THE DRAWING IS FOR THE SCALED ONLY. WATER MARK IS NOT TO BE USED.
4. ALL DIMENSIONS ARE IN METERS (M) UNLESS OTHERWISE SPECIFIED.
5. THE DRAWING IS FOR THE SCALED ONLY. WATER MARK IS NOT TO BE USED.
6. THE DRAWING IS FOR THE SCALED ONLY. WATER MARK IS NOT TO BE USED.

LEGEND

DATE	BY	NO.	REVISION

RELEASED FOR:

DESIGNER	DATE	NO.	REVISION

DRAWING TITLE:
3D - Cafeteria
Sandy's Compound

SHEET NO.:

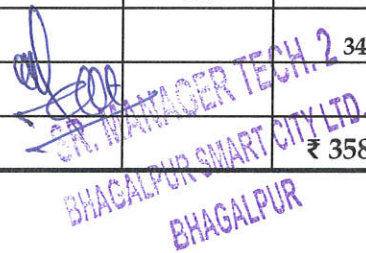
SP/LA/AR-04-04

DRAWN	CHECKED	AS
PC		
REVIEW	APPROVED	AS
DATE	REMARKS	
15/11/22		
SCALE	NORTH	
1:200		

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BHAGALPUR


ABSTRACT OF COST OF SANDYS PARK AT BHAGALPUR (PHASE 1)

SL.NO.	DESCRIPTION OF WORK	UNIT	ITEM RATE	QUANTITY	AMOUNT
1	Walk Way	No.	32,432,853	1.00	₹ 32,432,853
2	Guard Room Cum Ticket Counter	No.	333,619	4.00	₹ 1,334,475
3	Electrification of Guard Romm	No.	75,731	4.00	₹ 302,924
4	Cafeteria (PROPOSED)	No.	11,816,245	1.00	₹ 11,816,245
5	Landscaping	No.	14,165,726	1.00	₹ 14,165,726
6	Kids Play Area	No.	2,443,883	1.00	₹ 2,443,883
7	Nehru Memorial	No.	690,760	1.00	₹ 690,760
8	Station Club	No.	15,024,091	1.00	₹ 15,024,091
9	Specific/Emergency Gate	No.	728,670	13.00	₹ 9,472,712
10	Entrance gate	No.	8,501,469	1.00	₹ 8,501,469
11	Swimming Pool	No.	15,628,608	1.00	₹ 15,628,608
12	Swimming Pool Mech and Other	No.	23,375,713	1.00	₹ 23,375,713
13	Parking	No.	8,761,104	1.00	₹ 8,761,104
14	Open Air Theatre	No.	3,337,764	1.00	₹ 3,337,764
15	Basket Ball Court	No.	1,546,828	1.00	₹ 1,546,828
16	Trellis walkwWay	No.	1,127,421	1.00	₹ 1,127,421
17	Renovation of Existing Badminton court	No.	7,848,161	1.00	₹ 7,848,161
18	New Badminton Court Building	No.	11,831,450	1.00	₹ 11,831,450
19	Gym Building renovation	No.	17,652,741	1.00	₹ 17,652,741
20	Lawn Tennis Court	No.	1,216,407	1.00	₹ 1,216,407
21	Cricket Field and its Drainage	No.	16,860,937	1.00	₹ 16,860,937
22	Cleaveland Memorial	No.	2,470,690	1.00	₹ 2,470,690
23	Toilet (BIG)	No.	1,997,553	1.00	₹ 1,997,553
24	Multipurpose ground	No.	35,975,314	1.00	₹ 35,975,314
25	Sculpture court	No.	2,839,915	1.00	₹ 2,839,915
26	Dismantelling of Boundary Wall	No.	1,960,462	1.00	₹ 1,960,462
27	Boundary wall EXTERNAL	No.	11,792	2,550.00	₹ 30,069,600
28	Boundary Wall Internal	No.	6,039	1,010.00	₹ 6,099,791
29	Estimate of Sports Complex Lighting (Proposed Item only)	No.	15,793,523	1.00	₹ 15,793,523
30	ESTIMATE of GENERAL LIGHTING (Proposed Item only)	No.	18,842,125	1.00	₹ 18,842,125
31	SUB TOTAL				₹ 321,421,245
32	Operation and Maintenance costs for three year (Include this in RFP)			6%	19,285,275
33	Total DPR Cost				₹ 340,706,519.42
34	Centage (7%- 0 to 10 Cr & 5%-10 to 100 cr)				18,071,062
	Total Project Cost				₹ 358,777,582


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Construction of Walk Way

S.No	Code	Description	Unit	No	Length	Width	Height	Quantity	Rate (Rs)	Amount (Rs)
1	RCD 2019 2.1.1	Cutting of Trees, including Cutting of Trunks, Branches and Removal (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.) Girth from 300 mm to 600 mm	Nos.	65	-	-	-	65	250	₹ 16,250.00
2	2.6.1	Earth work in excavation over areas (exceeding 30 cm in depth. 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50 m and lift upto 1.5 m; disposed earth to be levelled and neatly dressed	Cum	1	3980	3.8	0.3	4537.2	279.1	₹ 1,266,332.52
3	2.28	applying and Filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.	Cum	-	3980	3.8	0.075	1134.3	238.6	₹ 270,643.98
4	11.72	Providing designation 100 A one brick flat soling joints filled with local sand including cost of watering, taxes, royalty all complete as per building specification and direction of E/ Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering-all work upto plinth level.	Sqm	-	3980	3.8		15124	277.5	₹ 4,196,910.00
5	4.1.5	1:3:6 (1 Cement: 3 coarse sand : 6 graded stone aggregate 20 mm nominal size)	Cum	1	3980	3.8	0.15	2268.6	3461.4	₹ 7,852,532.04
6	11.29.1	40 mm thick rough chisel dressed stone flooring over 20 mm (average) thick base including pointing with C.M 1:2 (1 cement :2 stone dust) with an admixture of pigment to match the shade of the stone with base 1:1:1 (1 lime : 1surkhi : coarse sand or 1:5 (1 cement : 5 coarse sand) Rend Sand Stone	Sqm	1	3980	3.6		14328	753.1	₹ 10,790,416.80


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Construction of Walk Way

[illegible]

ESTIMATE OF GUARD ROOM Cum Ticket Counter

S.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	QTY.	RATE	AMOUNT (Rs.)
1	2.6	Earth work in excavation over areas (exceeding 30 cm in depth. 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m ; disposed earth to be levelled and neatly dressed.				
	2.6.1	All kinds of soil	cum	22.50	279.10	6280.00
2	2.26	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.	cum	14.46	103.30	1493.00
3	2.28	Supplying and filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.	cum	4.39	238.60	1047.00
4	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work upto plinth level.				
	4.1.6	1:3: 6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size)	cum	2.66	3307.00	8805.00
5	BCD SOR 6.1.12C+6.3C	Providing 125 mm thick brick work in CM (1:4) in superstructure including curing, taxes and royalty all complete as per building specification and direction of E/I (with fly ash Brick).				
	6.1.14A	Cement mortar 1:4 (1 cement : 4 coarse sand)	cum	13.59	4799.20	65231.00
		Reinforced Cement Concrete Works				
7	Item no. 5.33A.1	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centring, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete				
		All work upto plinth level	cum	1.86	4924.00	9164.00
8	5.22	Reinforcement for RCC work including straightening, Cutting, bending, placing in position and binding all complete.				
		Thermo-Mechanically Treated bars				
	5.22.7B	TMTC-500-10 mm dia.	kg	146.09	76.70	11205.00
9	5.90	Centring and shuttering including strutting, propping etc. and removal of form for:				
	5.9.2	Walls (any thickness) including attached pilasters. Butteresses, plinth and string courses etc.	sqm	17.49	321.30	5618.00
10	Item no. 4.1.8	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level. 1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	cum	0.73	2940.80	2150.00
		Flooring Work				
11	11.36	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (Thickness to be specified by the manufacture) 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 (1cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	Sqm	28.50	739.80	21084.00
12	11.27	Kota stone slabs 25 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	1.52	1133.90	1724.00
		Plaster & Finishing Works				
13	13.11	12 mm cement plaster of mix				
	13.11.2	1:4 (1 cement : 4 coarse sand)	sqm	67.99	139.90	9512.00
14	13.12	15 mm cement plaster on rough side of single or half brick wall of mix.				
	13.12.2	1:4(1 cement: 4 coarse sand)	sqm	39.26	161.90	6356.00
15	13.24	6 mm cement plaster to ceiling of mix.				

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CHALPUR

ESTIMATE OF GUARD ROOM Cum Ticket Counter						
S.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	QTY.	RATE	AMOUNT (Rs.)
15	13.24.2	1:4 (1 cement : 4 coarse sand)	sqm	9.99	110.90	1107.00
16	13.79	Finishing Wall with water proofing cement paint of approved brand and manufacture and of required shade to give an even shade				
	13.79.1	New work (three or more coats)	sqm	117.24	68.30	8007.00
17		Waterproofing				
	22.8	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations :				
	22.8.1	With average thickness of 120mm and minimum thickness at Khurra as 65 mm.	sqm	9.99	2553.30	25496.00
18	9.20	Providing and fixing ISI marked flush door shutters decorative type core of block board construction with frame of 1st class hard wood and well matched teak ply veneering with vertical grains or cross or cross bands and face veneers on the both faces veneers on the both face of shutters.				
	9.20.2	30mm thick including stainless steel butt hinges with necessary screws	sqm	3.72	2474.40	9205.00
19	9.1	Providing wood work in frames of doors, windows, clearstory windows and other frames, wrought framed and fixed in position				
	9.1	Second Class teak wood	cum	0.20	95749.10	19389.00
20	9.53	Providing 40 x 5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embeddings in cement concrete block 30x10x15 cm 1:3:6 mix (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size)	each	18.00	106.60	1919.00
21	9.96	Providing and fixing aluminium sliding door bolt anodised (anodiccoating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with nuts and screws etc.				
	9.96.1	300 x 16 mm	each	1.00	220.40	220.00
22	9.100	Providing and fixing aluminium handles anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with necessary screws etc. complete :				
	9.100.1	125 mm	each	6.00	54.00	324.00
23	9.101	Providing and fixing aluminium hanging floor door stopper anodized (anodic coating not less than grade AC 10 as per IS :1868) transparent or dyed to required colour and shade with necessary screws etc. complete.				
	9.101.2	Twin rubber stopper	each	2.00	40.40	81.00
24	9.97	Providing and fixing aluminium sliding tower bolt anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with nuts and screws etc.				
	9.97.1	300 x 10 mm	each	1.00	67.80	68.00
25	9.9	Providing and fixing glazed shutters for doors, windows and clerestory windows using 10kg/square meter (4mm thick) glass panes including black enamelled M.S butt hindege with necessary screws.				
	9.9.2.2	30 mm thick	sqm	0.90	1975.90	1778.00
26	10.18	Providing and fixing circular cast iron box for ceiling fan clamp 140 mm internal dia, 73 mm height, 5 mm thick rim bottom and top lids, 1.5 mm thick M.S sheet with its top surface hacked for proper bonding top lid shall be screwed into the cast iron box by means of 3.3 mm dia round headed screws, one ;pcf at the corners. Clamps shall be made of 12mm dia M.S. bar bent to shape as per standard drawing.	each	2.00	141.30	283.00
27	13.81.1	With ready mixed pink or grey primer of approved brand and manufacture on woodwork (hard and soft wood)	sqm	8.78	32.20	283.00
28	13.93	Painting with synthetic enamel paint of approved brand and manufacture to give an even shed.				
	13.93.1	Two or more coats on new work	sqm	8.78	70.40	618.00

ESTIMATE OF GUARD ROOM Cum Ticket Counter						
S.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	QTY.	RATE	AMOUNT (Rs.)
29	18.48	providing and placing on terrace (at all floor levels) polythelene water storages tank, ISI :12701 marked, with cover and suitable loking arrangment and making necessary holes for inlet , Outlet and over flow pipes but without fittings and the base support for tank.	Litre	1000.00	7.90	7900.00
	17.32	Providing and fixing mirror of superior glass (of approved quality) and of required shapes and size with plastic moulded frame of approved make and said with 6mm thick hard.				
30	17.32.3	Oval shape 450 x 350 mm Mirror	Nos.	4.00	744.60	2978.00
		Sub Total				229,325
		Carriage Cost				28,563
31		Internal electrification				75,731
		GRAND TOTAL				333,619
33	Analysis	Carriage				
	A	Brick	Per Thousand	5832.79	767.08	4474.22
	B	Local Sand	Cum	4.58	262.05	1200.84
	C	Coarse Sand	Cum	8.62	1030.3	8876.35
	D	Stone Chips	Cum	4.10	2701.3	11071.92
	E	Cement	Cum	8.93573496	328.25	2933.16
	F	Steel	Cum	0.02	328.25	6.23
		GRAND TOTAL				28,562.72


 SR. MANAGER TECH. 2
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APPENDIX-5 A

ELECTRIC work Wiring and Light of GUARD ROOM

S.No.	SOR Code	Description	Unit	Qty.	Rate (Rs)	Amount (Rs.)
1	BCD Ele. SOR 2018, Item 1.3.3	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit, with modular switch, modular plate, suitable size G.I. box etc as required. Group C	Nos.	10	724	7,240.00
2	BCD Ele. SOR 2018, Item 1.5	Wiring for light/ power plug with 2X4 sq. mm FR PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit alongwith 1 No 4 sq. mm FR PVC insulated copper conductor single core cable for loop earthing as required.	Meter	50	200	10,000.00
3	BCD Ele. SOR 2018, Item 1.7.2	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required, 2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	Meter	50	161	8,050.00
4	BCD Ele. SOR 2018, Item 1.21.2	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/ recess including cutting the wall and making good the same in case of recessed conduit as required. 25 mm	Meter	20	79	1,580.00
5	BCD Ele. SOR 2018, Item 1.24.1	Supplying and fixing following modular switch/socket on the existing modular plate & switch box including connection but excluding modular plate etc. as required. 5/6 amps switch	Each	2	81	162.00
6	BCD Ele. SOR 2018, Item 1.24.4	Supplying and fixing following modular switch/socket on the existing modular plate & switch box including connection but excluding modular plate etc. as required. 3 pin, 5/6 amps socket outlet	Each	2	122	244.00
7	BCD Ele. SOR 2018, Item 1.24.6	Supplying and fixing following modular switch/socket on the existing modular plate & switch box including connection but excluding modular plate etc. as required. Telephone socket outlet	Each	1	108	108.00
8	BCD Ele. SOR 2018, Item 1.25	Supplying and fixing stepped type electronic fan regulator on the existing modular plate/ switch box including connections but excluding modular plate etc. as required.	Each	1	359	359.00
9	BCD Ele. SOR 2018, Item 1.31	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch, connections, painting etc. as required.	Each	1	362	362.00
10	BCD Ele. SOR 2018, Item 1.32	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 6 pin 5/6 & 15/16 Aamps modular socket outlet and 15/16 amps modular switch, connections, painting etc. as required.	Each	2	413	826.00
11	BCD Ele. SOR 2018, Item 1.33	Supplying and fixing 2 pin, 6 amp ceiling rose on the existing junction box/ wooden block including connection etc as required.	Each	7	42	294.00
12	BCD Ele. SOR 2018, Item 2.8.7	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator), 2+6 wavy Double door	Each	1	1081	1,081.00
13	BCD Ele. SOR 2018, Item 2.12.1	Supplying and fixing following rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required. 6/32 amps. Single pole	Each	5	192	960.00

SR. MANAGER TECH. 2
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14	BCD Ele. SOR 2018, Item 2.30	Supplying and fixing TPN sheet steel enclosure on on surface/ recess along with 63 amps 415 volts, "C" curve TPN MCB complete with connections, testing and commissioning etc. as required.	Each	1	1919	1,919.00
15	BCD Ele. SOR 2018, Item 3.2	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	set	1	5125	5,125.00
16	BCD Ele. SOR 2018, Item 3.15	Providing and fixing 25 mm X 5 mm G.I strip on surface or in recess for connections etc. as required.	Meter	10	150	1,500.00
17	BCD Ele. SOR 2018, Item 5.9.3	Supplying and fixing single wall/ ceiling mounted 20/22 watt LED type batten fitting complete with electronic driver and LED tube etc directly on wall/ ceiling including connection with 1.5 sq. mm FR PVC insulated copper conductor cable and earthing the body etc. as required.	Each	5	684	3,420.00
18	BCD Ele. SOR 2018, Item 5.12.5	Supplying and fixing single 40/45 watt LED type street light with die cast aluminium housing for ingress protection of IP65 and complete with all accessories etc, on pole/building including connection with FR PVC insulated copper conductor cable and earthing the body etc. as required.	Each	1	4056	4,056.00
19	BCD Ele. SOR 2018, Item 7.1.1	Laying of one number PVC insulated and PVC sheathed/ XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required. Upto 35 sq. mm	mtr	70	144	10,080.00
20	BCD Ele. SOR 2018, Item 8.11.2	Supply and installation of Regular/ standard model A.C ceiling fan of 1200 mm sweep including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FR PVC insulated copper conductor etc. as required.	Nos.	1	1618	1,618.00
21	BCD Ele. SOR 2018, Item 2205	3.5 core, 25 sq. mm, XLPE/PVC insulated PVC. sheathed (Heavy duty) Armoured electric cable with aluminium conductor	MTR	70	126	8,820.00
22	DSR Civil SOR 2014, Item 10.17	Providing and fixing M.S. fan clamp type I or II of 16 mm dia M.S. bar bent to shape with hooked ends in R.C.C. slabs, beams during laying including painting the exposed portion of loop, all as per standard design complete.	Each	1	124.45	124.00
23	RUIDP Ele. SOR 2017, Item 67.40.2	Providing and fixing charged ABC type fire extinguisher including the cost of fixing with nut, bolts etc as required. 5 Kg	Nos.	1	2647	2,647.00
24	RUIDP Ele. SOR 2017, Item 48.21.2	P&F of IP51 direct or CT operated, 1x240/ 3x240 volts, 50 Hz static watt-hour meter (kwh) having resolution 0.1/ 0.01 kwh, 1/ 0.5 accuracy class, LED indicators for tamper operation (Reverse &/or earth connection), pulsating LED indicator for meterology, electromechanical counter, cover plate for body and terminal sealing, including making connection, testing etc. as required. up to 60 ampere three phase meter	Each	1	5156	5,156.00
Total Amount						75,731.00

APPENDIX- 6
Cafeteria in Sandys PARK (Civil)

SL. NO		DESCRIPTION	UNIT	QTY.	Rate	AMOUNT	Ref.
1	15.3	Demolishing R.C.C. work including stacking of steel bars and disposal of unserviceable material withing 50 metres lead:	cum	93.80	1172.70	109999.26	SOR Item
2	15.5	Extra for cutting reinforcement bars in R.C.C. or R.B. work (Payment shall be made on the cross sectional area of R.C.C. or R.B. work)	per RCC	40.00	406.20	16248.00	SOR Item
3	15.7	Demolishing brick work including stacking of serviceable material and disposal of unserviceable material within 50 meters lead:					
	15.7.4	In cement mortar	cum	619.724	685.10	424572.91	SOR Item
4	15.60	Disposal of building rubbish / malba / similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge, beyond 50 m initial lead, for all leads including all lifts involved.	cum	713.524	142.50	101677.17	SOR Item
5	2.29	Surface dressing of the ground including removing vegetation and inequalities not exceeding 15 cm deep and disposal of rubbish, lead upto 50 m and lift upto 1.5 m					
	2.29.1	All kinds of soil.	100sqm	3.46	1126.90	3900.31	SOR Item
6	2.8	Earth work in excavation in foundtion trenches or drains (not exceeding 1.5m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.					
	2.8.1	All kinds of soil	Cum	328.56	319.60	105008.93	Quoted Rate
7	2.26	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.	Cum	193.74	103.30	20013.41	SOR Item
8	2.27	Extra for every additional lift of 1.5 m or part thereof in :					
	2.27.1	All kinds of soil	Cum	28.85	41.00	1182.95	SOR Item
9	2.28	Supplying and Filling in plinth with local sand and under floors including watering, ramming consolidating and dressing complete.	cum	252.22	238.60	60180.81	Quoted Rate
10	2.35	Supplying chemical emulsion in sealed containers including delivery as specified.					
	2.35.1	Chlorpyriphos/Lindone emulsifiable concentrate of 20%	litre	485.84	199.40	96876.21	SOR Item
11	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering-All work up to plinth level:					
	4.1.3	1:2:4(1 Cement:3 coarse sand: 6 graded stone aggregate 20mm nominal size)	cum	22.16	4151.40	92009.26	SOR Item
	4.1.8	1:4:8(1 Cement: 4 coarse sand:8 graded stone aggregate 40 mm nominal size)	cum	26.10	2940.80	76766.16	Quoted Rate
12	4.3	Centering and shuttering including strutting, proping etc. and removal of form work for:					
	4.3.1	Foundations, footings, bases for columns	Sqm	74.90	185.90	13923.82	SOR Item
13	4.11	Providing and laying damp-proof course 50mm thick with cement concrete 1:2:4(1 cement: 2 coarse sand: 4 graded stone aggregate 20mm nominal size).	Sqm	22.65	245.50	5560.24	SOR Item

14	4.12	Extra for providing and mixing water proofing material in cement concrete work in the proportion recommended by the manufacturers.	per 50 kg cement	7.25	52.35	379.41	SOR Item
15	4.17	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement:3 coarse sand:6 graded stone aggregate 20mm nominal size) over 75mm bed dry brick ballast 40mm nominal size well rammed and consolidated and grouted with fine sand including finishing the top smooth.	sqm	64.35	417.60	26872.56	Quoted Rate
16	5.33	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 including retard setting of concrete, improve workability without impairing strength and admixtures in recommended proportions as per IS: 9103 to accelerate reinforcement durability as per direction of Engineer-in-charge. Note:- Cement content considered in this item is @ 330 kg/cum. Excess or less cement used as per design mix is payable or recoverable separately.					
	5.33.1	All work up to plinth level	cum	78.20	5192.50	406032.57	SOR Item
	5.33.2	All work from plinth level upto floor V level	cum	83.14	5859.00	487098.10	SOR Item
17	5.35	Add for using extra cement in the items of design mix over and above the specified cement content therein.	quintal	129.07	732.40	94528.06	SOR Item
18	5.9	Centering and shuttering including strutting, propping etc. and removal of form for:					
	5.9.1	Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	114.25	186.30	21285.11	SOR Item
	5.9.2	Walls (any thickness) including attached pilasters, Butteresses, plinth and string courses etc.	sqm	0.00	321.30	0.00	SOR Item
	5.9.3	Suspended floors, roofs, landings, balconies and access platform.	sqm	225.55	362.60	81785.03	SOR Item
	5.9.4	Shelves (Cast in situ)	sqm	12.11	362.60	4390.25	SOR Item
	5.9.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	sqm	388.84	335.30	130376.84	SOR Item
	5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts.	sqm	285.27	425.80	121466.18	SOR Item
	5.9.7	Stairs, (excluding landings) except spiral-staircases.	sqm	0.00	384.70	0.00	SOR Item
	5.9.15	Small lintels not exceeding 1.5m clear span, moulding as in cornices, window sills, string courses, bands, copings, bed plates, anchor blocks and the like.	sqm	102.95	198.50	20435.29	SOR Item
	5.9.16	Edges of slabs and breaks in floors and walls.				0.00	
	5.9.16.1	Under 20cm wide	Metre	45.80	100.90	4621.22	SOR Item
	5.9.17	Cornices and mouldings	sqm	3.34	502.00	1678.44	SOR Item
	5.9.19	Weather shade, Chajjas, corbels, etc. including edges.	sqm	36.06	468.40	16891.54	SOR Item
19	5.11	Extra for additional height in centring, shuttering where ever required with adequate bracing, propping etc. including cost of de-shuttering and de centring at all levels over a height of 3.5 m ,for every additional height of 1 metre or part thereof (Plan area to be measured)					
	5.11.1	Suspended floors, roots, laning, beams and balconies (Plan area to be measured)	sqm	249.50	146.20	36476.75	SOR Item
20	5.22	Reinforcement for R.C.C work including straightening, cutting, bending, placing in position and binding all complete.					
	5.22.1	Mild steel 6.00mm dia	Kg	0.00	86.00	0.00	SOR Item

	5.22.7A	Thermo-Mechanically Treated bars TMTC-500-8mm dia	Kg	7568.94	77.40	585835.77	SOR Item
	5.22.7B	Thermo-Mechanically Treated bars TMTC-500-10mm dia	Kg	1376.17	76.70	105552.28	SOR Item
	5.22.7C	Thermo-Mechanically Treated bars TMTC-500-12mm dia	Kg	3440.43	75.20	258720.05	SOR Item
	5.22.7D	Thermo-Mechanically Treated bars TMTC-500-16mm dia	Kg	5045.96	76.00	383492.84	SOR Item
	5.22.7E	Thermo-Mechanically Treated bars TMTC-500-20mm dia	Kg	5504.68	76.00	418355.82	SOR Item
	5.22.7F	Thermo-Mechanically Treated bars TMTC-500-25mm dia	Kg	0.00	76.00	0.00	SOR Item
21	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in:					
	6.1.14A	Cement mortar 1:6(1 cement:6 coarse sand)	cum	28.86	4799.20	138485.40	SOR Item
22	6.3A	Extra for Brick work in superstructure above plinth level upto floor V Level	cum	0.00	702.20	0.00	SOR Item
23	6.13A	Brick work 7cm thick with F.P.S brick of class designation 100A in cement mortar 1:3(1 cement: 3 coarse sand) in superstructure.	sqm	18.24	471.10	8590.56	SOR Item
24	6.18A	Half brick masonry with bricks of class designation 100A in foundations and plinth in :					
	6.18.4A	Cement mortar 1:4 (1 cement: 4 coarse sand)	sqm	83.37	596.80	49752.60	SOR Item
25	6.19A	Extra for half Brick masonry in superstructure above pinth level upto floor V level.	sqm	83.37	74.70	6227.41	SOR Item
26	6.21A	Extra for providing and placing in position 2 nos. 6mm dia, MS bars at every third course of half brick masonry (with F.P.S bricks)	sqm	83.37	87.70	7311.16	SOR Item
27	6.41A	Brick work with selected bricks of class designation 100A in exposed brick work including making horizontal and vertical irooves 10mm wide 12mm deep complete from ground level up to plinth level in cement mortars 1:6(1 cement: 6 corse sand)	Cum	64.36	4887.00	314519.54	SOR Item
28	6.45A	Extra for explosed brick work in superstructure above plinth level and upto floor level. $0.75 \times 1.5 = 1.13$	Cum	64.36	889.40	57240.37	SOR Item
29	9.1	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position					
	9.1.1	Second class teak Wood	Cum	0.21	95749.10	19954.71	SOR Item
30	9.20	Providing and fixing ISI marked flush door shutters conforming to IS :2202 (Part I) decorative type, core of block board construction with frame of 1 st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.					
	9.20.1	35mm thick including ISI marked Stainless Steel butt hinges with necessary screws.	sqm	7.91	2598.90	20561.85	SOR Item
31	9.23	Extra for providing lipping with 2nd class teak wood battens 25mm minimum depth on all edges of shutters (over all area of door shutter to be measured)	sqm	7.91	392.30	3103.78	SOR Item
32	9.53	providing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bots,nuts and wooden plugs and embeddings in cement concrete block 30x10x15 cm 1:3:6 mix (1 cement :3 coarse sand :6 graded stone aggregate 20 mm nominal size)	each	30.00	106.60	3198.00	SOR Item
33	9.96	Providing and fixing aluminium sliding door bolts ISI Marked anodised (anodic coating not less than grade AC 10 as per IS:1868) transparent or dyed to required colour and shade with nuts and screws etc. complete:					
	9.96.1	300x16mm	Each	0.00	220.40	0.00	SOR Item
	9.96.2	250x16mm	Each	3.00	195.50	586.50	SOR Item

34	9.97	Providing and fixing aluminium tower bolts ISI Marked anodised (anodic coating not less than grade AC 10 as per IS:1868) transparent or dyed to required colour or shade with necessary screws etc. complete:					
	9.97.1	300x10mm	Each	0.00	105.20	0.00	SOR Item
	9.97.4	150x10mm	Each	10.00	67.80	678.00	SOR Item
35	9.100	Providing and fixing aluminium handles anodised ISI Marked (anodic coating not less than grade AC 10 as per IS:1868) transparent or dyed to required colour or shade with necessary screws etc. complete:					
	9.100.1	125mm	Each	10.00	54.00	540.00	SOR Item
36	9.101	Providing and fixing aluminium hanging floor door stopper ISI Marked anodised (anodic coating not less than grade AC 10 as per IS:1868) transparent or dyed to required colour and shade with necessary screws etc. complete.					
	9.101.2	Twin rubber stopper	Each	5.00	40.40	202.00	SOR Item
37	9.103	Providing and fixing bright finished brass 100mm mortice latch and lock with six levers and a pair of anodised (anodic coating not less than grade AC 10 as per IS:1868) aluminium lever handles with necessary screws etc. complete (Best make of approved quality).	Each	3.00	642.90	1928.70	SOR Item
38	21.1	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 / aneling, 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) :					
	21.1.1	For fixed portion					
	21.1.1.1	Anodised aluminium (anodised transparent or dyed to required shade according to IS: 1868, Minimum anodic coating of grade AC 15)	Kg	379.10	369.20	139964.75	SOR Item
	21.1.2	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)					
	21.1.2.1	Anodised aluminium (anodised transparent or dyed to required shade according to IS: 1868, Minimum anodic coating of grade AC 15)	Kg	189.55	423.90	80350.84	SOR Item
39	21.3	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with PVC/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):					
	21.3.1	With glass panes of 4.0mm thickness (weight not less than 10.0 kg/sqm)	Sqm	53.71	735.60	39506.30	SOR Item
	21.3.2	With glass panes of 5.50 mm thickness (weight not less than 13.75 kg/sqm)	Sqm	0.00	1017.30	0.00	SOR Item

40	Analysis as per BCD SOR-18	Extra for using Toughened glass 12 mm thickness instead of glass panes of 4.0mm thickness (weight not less than 10.0 kg/sqm)	Sqm	53.71	2012.89	108104.73	SOR Item with Analysis
41	21.4	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-in-charge.					
	21.4.1	With stainless steel cover plate minimum 1.25 mm thickness	Each	2.00	2163.50	4327.00	SOR Item
42	21.8	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.					
	21.8.1	Upto 5mm depth and 5mm width.	Metre	134.14	72.90	9778.81	SOR Item
43	21.16	Providing and fixing aluminium round shape handle of outer dia 100mm with SS screws etc. complete as per direction of Engineer-in-charge					
	21.16.1	Anodized (AC 15) aluminium	each	4.00	66.20	264.80	SOR Item
44	21.18	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc. to be paid separately).	sqm	4.47	4779.90	21343.21	SOR Item
45	10.5	Providing and fixing in position collapsible steel shutters with vertical channels 20x10x2mm and braced with flat iron diagonals 20x5mm size with top and bottom rail of T-iron 40x40x6mm with 40mm dia, steel pulleys complete with bolts, nuts, locking arrangement, stoppers, handles, including applying a priming coat of approved steel primer.	sqm	0.00	5089.50	0.00	SOR Item
46	10.18	Providing and fixing circular/hexagonal cast iron or M.S sheet box for ceiling fan clamp 140 mm internal dia, 73 mm height, 5 mm thick rim bottom and top lids, 1.5 mm thick M.S sheet with its top surface hacked for proper bonding top lid shall be screwed into the cast iron box by means of 3.3 mm dia round headed screws, one lock at the corners. Clamps shall be made of 12 mm dia M.S. bar bent to shape as per standard drawing.	Each	12.00	141.30	1695.60	SOR Item
47	8.2	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations, of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.					
	8.2.2	Granite of any colour and shade					
	8.2.2.1	Area of slab upto 0.50 sqm	sqm	0.00	3741.20	0.00	SOR Item

	8.2.2.2	Area of slab over 0.50 sqm	sqm	14.99	3699.10	55458.76	SOR Item
48	8.4	Extra for fixing marble/granite stone over and above corresponding basic ite. in facia and drops of width upto 150 mm with expoxy resin based (Araldite or equivalent) adhesive including cleaning etc. complete.	m	17.11	236.30	4043.09	SOR Item
49	8.5	Extra for providing opening of required size & shape for wash basins/kitchen sink in kitchen platform. Vanity counters and similar location in marble/stone work including necessary holes for pillar taps etc. including rubbing and polishing of cut edges etc. complete.	each	2.00	355.80	711.60	SOR Item
50	8.12	Providing and laying flamed finish Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20mm(average) thick base of cement mortar 1:4(1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing , curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge :					
	(a)	Flamed finish granite stone slab Jet Black, Cherry Red, Elite Brown, Cat Eye or equivalent.	sqm	27.497	2979.20	81917.57	SOR Item
51	11.41	Providing and laying vitrified(Unpolished) floor tiles in different sizes {thickness to be specified by the manufactruer} with water absorption's less than 0.08 % and conforming to IS : 15622 of approved make in all colours and shades, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) including grouting the joint with white cement and matching pigments etc., complete.					
	11.41.2	Size of Tile 60x60 cm	sqm	181.99	1520.90	276790.49	SOR Item
52	11.46	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), including grouting the joint with white cement & matching pigments etc. complete.					
	11.46.2	Size of Tile 60x60 cm	sqm	140.75	1141.60	160674.83	SOR Item
53	11.36	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS:15622(thickness to be specified by the manufacture) 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 12mm thick bed of cement Mortar 1:3(1 cement: 3 coarse sand) and jointing with grey cement slurry @ 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	sqm	31.62	739.80	23394.25	SOR Item
54	11.26	Kota stone slab flooring over 20mm (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.					
	11.26.1	20 to 25mm thick	sqm	34.41	1119.60	38527.82	SOR Item
55	11.27	Kota stone slab 20 mm thick in risers of steps skirting, Dado & pillars laid on 12mm (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 slab including rubbing and polishing complete.	sqm	0.00	1133.90	0.00	SOR Item

56	11.72	Providing designation 100A one brick flat soling joints filled with local sand including cost of watering, taxes, royalty all complete as per building specification and direction of E/I.	sqm	430.46	277.50	119454.03	SOR Item
57	12.39	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 20mm nominal size) over P.V.C sheet 1mx1mx400 micron, finished with 12mm cement plaster 1:3 (1 cement: 3 coarse sand) and a coat of neat cement rounding the edge sand making and finishing the outlet complete.	Each	4.00	172.30	689.20	SOR Item
58	13.11	12mm cement plaster of mix:					
	13.11.4	1:6 (1 cement: 6 coarse sand)	sqm	231.35	126.20	29196.91	SOR Item
59	13.12	15mm cement plaster on the rough side of single or half brick wall of mix:					
	13.12.4	1:6 (1 cement: 6 coarse sand)	sqm	231.35	145.50	33662.05	SOR Item
60	13.13	20mm cement plaster of mix:					
	13.13.2	1:4 (1 cement: 4 coarse sand)	sqm	302.46	194.30	58768.02	SOR Item
61	13.24	6mm cement plaster to ceiling of mix:					
	13.24.2	1:4 (1 cement: 4 coarse sand)	sqm	254.00	110.90	28168.70	SOR Item
62	13.36	Extra for providing and mixing water proofing material in proportion recommended by the manufacturers.					
	13.36.6	20mm cement plaster 1:4 (1 cement: 4 sand)	sqm	302.46	9.20	2782.63	SOR Item
63	13.56	Pointing on brick work with cement mortar 1:3 (1 cement: 3 coarse sand):					
	13.56.2	Ruled pointing	sqm	272.25	100.40	27333.52	SOR Item
64	13.51 DSR	Painting with silicon & acrylic emulsion based water thinnable sealer of approved brand and manufacture on wet or patchy portion of plastered surfaces :					
	13.51.2	Two coats	sqm	597.88	129.05	77156.13	SOR Item
65	13.80A.2	Providing and applying white cement based putty of average thickness 2 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete	sqm	900.34	117.60	105879.75	SOR Item
66	13.78	Applying one coat of cement primer of approved brand and manufacture on wall surface:					
	13.78.1	Cement primer	sqm	597.88	31.00	18534.21	SOR Item
67	13.46A	Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade.					
	13.46A.1	New work (Two or more coats applied @ 1.43 ltr/10 sqm over and including base coat of water proofing cement paint applied @ 2.20 kg/10 sqm).	sqm	302.46	90.10	27251.66	SOR Item
68	13.81	Applying priming coat:					
	13.81.1	With ready mixed pink or Grey primer of approved brand and manufacture on wood work (hard and soft wood)	sqm	22.24	32.20	716.04	SOR Item
69	13.101	French spirit polishing:					
	13.101.1	Two or more coats on works including a coat of wood filler.	sqm	141.07	346.90	48936.80	SOR Item
70	13.116	Forming groove of uniform size from 12x12mm and upto 25x15mm in plastered surface as per approved pattern using wooden battens, nailed to the under layer including removal of wooden battens, repairs to the edges of plaster panel and finishing the groove complete as per specifications and direction of the Engineer-in-Charge.	Metre	0.00	40.80	0.00	SOR Item


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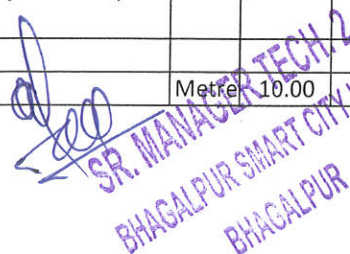
71	22.8	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc. consisting of following operations. (a) Applying and grouting a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with proprietary water -proofing compound cleaning the surface before treatment. (b) Laying cement concrete using broken bricks / brick bats 25 mm to 100 mm size with 50 % of cement mortar 1:5 (1 cement: 5 coarse sand) admixed with proprietary water proofing compound conforming to IS : 2645 over 20 mm thick layer of cement mortar of mix 1:5 (1 cement: 5 coarse sand) admixed with proprietary water proofing compound conforming to IS 2545 to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions, or walls ad slabs.					
		(c) After two days of proper curing applying a second coat of cement slurry admixed with proprietary water proofing compound conforming to IS : 2645. (d) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement: 4 coarse sand) admixed with proprietary water proofing compound conforming to IS : 2645 and finally finishing the surface with trowel with neat cement slurry and making of 300 x 300 mm square. (e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge.					
	22.8.1	With average thickness of 120mm and minimum thickness at khurras point to be 65.	Sqm	242.14	2253.30	545621.91	SOR Item
76		Carriage of Materials with loading & unloading:-					
		Cement		41.25	328.25	13540.31	
		Steel	MT	23.03	328.25	7559.60	
		Bricks 100A(local lead 1K+7P)	% No.	65332	767.08	50115.11	SOR
		Coarse sand 55 km(p) from Koilwar	cum	158.40	1030.30	163195.40	SOR
		Stone chips 185 KM(P) from Koderma	cum	184.16	2701.30	497474.75	SOR
		Local Sand (Lead local 1K+2P)	cum	258.81	262.05	67821.37	SOR
72	2.37.3.1	Diluting and injecting chemical emulsion for Pre-Constructional/Post Constructional Anti-termite treatment and creating a continuous chemical barrier under and around the column pits, wall trenches, basement excavation, top surface of plinth filling, junction of wall and floor along the external perimeter of building, expansion joints, over the top surface of consolidated earth on which apron is to be laid surrounding of pipes and conduits etc. complete as per specifications Chlorpyrifos Emulsifiable concentrate of 20% with 1% concentration.	sqm	242.92	218.50	53077.86	SOR BCD
73	7029	Providing and fixing galvanised chicken wire mesh in 5" wide strip with average width of aperture 1.18mm and nominal dia of wire 0.556mm at junctions of RCC Column-with Brick work before plaster work.	Sqm	85.72	280.71	24062.32	SOR BCD

74	Analysis	Providing & Applying Nitocote SN522 or approved equivalent Colourless silicone water repellent Protective coating on brick work, all complete as per manufacturer's instructions / recommendations.					
			Sqm	272.25	214.29	58339.64	Analysis
		SUB Total of Civil Work				8073267	
		SUB Total of PHE Work				632290	
		SUB Total of Electrical Work				978524	
		SUB Total of AC Work				2132164	
		Grand Total of CAFETERIA				11816245	


SR. MANAGER TECH. 2
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Cafeteria in Sandys PARK (PHE)

L.NO	BCD SOR	DESCRIPTION	UNIT	QTY.	AWARD	
					Rate	AMOUNT
	A	SANITARY INSTALLATION				
1	SOR 17.80	Providing and fixing white vitreous china battery based infrared sensor operated urinal of approx. size 610 x 390 x 370 mm having pre & post flushing with water (250 ml & 500 ml consumption), having water inlet from back side, including fixing to wall with suitable brackets all as per manufacturers specification and direction of Engineer-in-charge.	Each	1.00	5407.30	5407.30
2	SOR 17.10	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS 13983 with C.I brackets and stainless steel plug 40mm including painting of fittings and brackets, cutting and making good the walls wherever required:				
	SOR 17.10.1.	Kitchen sink with drain board				
	SOR 17.10.1.4	510x1040mm bowl depth 178mm	Each	1.00	3781.80	3781.80
3	SOR 17.31	Providing and fixing 600X450mm beveled edge mirror of superior glass complete with 6mm thick hard board ground fixed to wooden cleats with CP brass screws & washers complete.	Each	3.00	741.90	2225.70
4	SOR 17.28	Providing and fixing PVC waste pipe for sink & wash basin including PVC waste fittings complete				
	17.28.1	Semi rigid pipe				
	17.28.1.1	32 mm dia	Each	1.00	86.20	86.20
	B	WATER SUPPLY				
5	SOR 18.7	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.				
		Internal work - Exposed on wall				
	SOR 18.7.2	20 mm Nominal outer dia pipes	Metre	5.00	165.90	829.50
	SOR 18.7.3	25 mm Nominal outer dia pipes	Metre	25.00	204.70	5117.50
	SOR 18.7.4	32 mm Nominal outer dia pipes	Metre	38.00	279.10	10605.80
6	SOR 18.8	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.				
		Concealed work, including cutting chases and making good the				
	SOR 18.8.2	20 mm Nominal outer dia pipes	Metre	13.00	255.70	3324.10
	SOR 18.8.3	25 mm Nominal outer dia pipes	Metre	7.00	308.00	2156.00
7	SOR 18.9	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				
	18.9.4	32 mm Nominal outer dia pipes	Metre	10.00	249.30	2493.00



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8	SOR 18.9	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.				
9	SOR 18.16	Providing and fixing brass stop cock of approved quality				
	SOR 18.16.2	20 mm Nominal bore	Each.	1.00	303.00	303.00
10	SOR 18.17	Providing and fixing gun metal gate valve with C.I. wheel of approved quality.				
	SOR 18.17.1	25 mm Nominal bore	Each.	3.00	461.80	1385.40
	SOR 18.17.2	32 mm Nominal bore	Each.	4.00	540.00	2160.00
11	SOR 18.21	Providing and fixing unplasticised PVC connection pipe with brass unions.				
	18.21.2	45 cm length				
	18.21.2.1	15 mm Nominal bore	Each.	3.00	76.10	228.30
12	SOR 18.46	Providing and fixing G.I. union in G.I. pipe including cutting and threading the pipe and making long screws etc.				
	SOR 18.46.2	20 mm dia. Nominal bore	Each.	1.00	155.20	155.20
	SOR 18.46.3	25 mm dia. Nominal bore	Each.	3.00	192.60	577.80
	SOR 18.46.4	32 mm dia. Nominal bore	Each.	4.00	230.00	920.00
		C.P. BRASS FITTINGS				
13	SOR 18.50	Providing and fixing C.P. brass long nose bib cock of approved quality conforming to IS standards and weighing not less than 810 gms.				
	18.50.1	15 mm Nominal bore	Each	4.00	599.50	2398.00
14	SOR 18.58	Providing and fixing PTMT grating of approved quality and colour.				
	18.58.1	Circular type				
	18.58.1.1	100mm nominal dia.	Each	2.00	36.20	72.40
15	SOR 18.48	Providing and placing on terrace polythethylene water storage tank ISI: 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. (2000x1=2000)	Per litre	2000.00	7.90	15800.00
	D	RAIN WATER SPOUT AND PIPE				
16	SOR 12.78	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 a 10 mm gap for thermal expansion.(i) Single socketed pipes.				
	12.78.2	110 mm diameter	Metre	20.00	238.30	4766.00
17	SOR 12.79	Providing and fixing on wall face unplasticised Rigid 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 a 10 mm gap for thermal expansion.				
	12.79.2	Single pushfit Coupler				
	12.79.2.2	110 mm	Each	5.00	354.90	1774.50
	12.79.5	Bend 87.5°				
	12.79.5.2	110 mm bend	Each	5.00	124.70	623.50
	12.79.6	Shoe (Plain)				
	12.79.6.2	110 mm Shoe	Each	5.00	108.52	542.60

18	SOR 12.80	Providing and fixing unplasticised - PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50 x 50 x 50 mm hard wood plugs, screwed with M.S. screws of required length cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete.				
	12.80.2	110 mm	Each	15.00	157.37	2360.55
19	SOR 12.81	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	Each	5.00	44.90	224.50
	E	DRAINAGE				
20	SOR 2.10	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth up to 1.5m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20cm in depth including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50m:				
	2.10.1	All kinds of soil				
	2.10.1.2	Pipes, cables etc. exceeding 80mm dia but not exceeding 300mm dia	Metre	53.60	326.40	17495.04
21	SOR 19.01	Providing, laying and jointing glazed stoneware pipes class SP-1 'A' with stiff mixture of cement mortar in the proportion of 1:1(1 cement: 1 fine sand) including testing of joints etc. complete.				
	19.1.2	150mm diameter	Metre	3.60	315.40	1135.44
22	SOR 19.02	Providing and laying cement concrete 1:5:10(1 cement: 5 coarse sand:10 graded stone aggregate 40mm nominal size) all-round S.W pipes including bed concrete as per standard design.				
	19.2.2	150mm diameter S.W pipe	Metre	3.60	479.30	1725.48
23	SOR 19.4	Providing and fixing square mouth SW gully trap grade A complete with CI grating brick masonry chamber with water tight CI cover with frame of 300X300mm size(inside) the wt. of cover to be not less than 4.50kg. And frame to not less than 2.70 kg. as/standard design				
	SOR 19.4.3	180x150mm size p type				
	SOR 19.4.3.1	With F.P.S. bricks designation 75	Each	3.00	1639.90	4919.70
24	SOR 19.6	Providing and laying non -pressure NP2 class R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 including testing of joints etc.				
	SOR 19.6.2	150 mm dia R.C.C. pipe	Metre	50.00	359.30	17965.00
25	SOR 19.7	Constructing brick masonry manhole in cement mortar 1:4(1 cement: 4 coarse sand) R.C.C top slab with 1:2:4 mix (1 cement:2 coarse sand: 4 graded stone aggregate 20mm nominal size), foundation concrete 1:4:8 mix (1 cement: 4 coarse sand:8 graded stone aggregate 40mm nominal size) inside plastering 12mm thick with cement mortar 1:3(1 cement: 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement: 2 coarse sand:4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement complete as per standard design:				
	19.7.1	Inside size 90x80cm and 45cm deep including C.I cover with frame (light duty) 455x610mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg)				
	19.7.1.1	With common burnt clay F.P.S (non modular) bricks of class designation 75	Each	2.00	7660.80	15321.60

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26	SOR 19.8	Extra for depth for manholes				
	19.8.1	Size 90x80cm				
	19.8.1.1	With F.P.S bricks class designation 75	Metre	0.40	5635.50	2254.20
27	SOR 19.30	Constructing brick masonry chamber for underground C.I inspection chamber and bends with 75 class designation bricks in cement mortr 1:4(1 cement: 4 coarse sand) C.I cover with frame (light duty) 455x610mm 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 ith 1:2:4 mix (1 cement: 2 coarse sand:4 graded stone aggregate 20mm nominal size) foundtion concrete 1:5:10(1 cement: 5 fine sand:10 graded stone aggregate 40mm nominal size), inside plastering 12mm 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:				
	19.30.1	Inside dimensions 455x610mm and 45cm deep for single pipe line:				
	19.30.1.1	With F.P.S bricks	Each	4.00	4194.20	16776.80
28	SOR 19.31	Extra for depth beyond 45cm of brick masonry chamber:				
	19.31.1	For 455x610mm size				
	19.31.1.1	With F.P.S bricks	Metre	0.60	3932.40	2359.44
29	SOR 19.32	Making soak pit 2.5 m diameter 3.0 meter deep with 45x45 cm dry brick honey comb shaft with brick of class designation 75 and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design.				
	19.32.1	With F.P.S. bricks	Each	1.00	32412.70	32412.70
	F	SEPTIC TANK (Size: 5.0 m x 1.4m x1.8m)				
30	SOR 2.8	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
	SOR 2.8.1	All kinds of soil	Cum	32.88	319.60	10508.45
31	SOR, 2.28	Supplying and Filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.	Cum	1.68	238.60	400.85
32	SOR 4.1	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level.				
	4.1.3	1:2:4 (1 Cement : 2 coarse sand: 4 graded stone aggregate 20 mm nominal size)	Cum	2.32	4151.40	9631.25
33	SOR' 11.72	Providing designation 100 A one brick flat soling joints filled with local sand including cost of watering, taxes royalty all complete as per specification and direction of E/I.	Per M ²	13.44	277.50	3729.60
34	SOR 6.1A	Brick work with bricks of class designation 100A in foundations and plinth in :				
	6.1.14A	Cement mortar 1:6 (1 cement: 6 coarse sand)	Cum	7.56	4799.20	36281.95
35	SOR 6.18A	Half brick masonry with bricks of class designation 100A in foundations and plinth in :				
	6.18.4A	Cement mortar 1:4 (1 cement: 4 coarse sand)	Sqm	2.66	596.80	1587.49
36	SOR 13.18	15 mm cement plaster 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement on the rough side of single or half brick wall.	Sqm	44.41	215.50	9570.36

37	SOR 5.2	Reinforced cement concrete work in wall (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts, etc. upto floor five level excluding cost of centring, shuttering, finishing and reinforcement.				
	5.2.3	1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size)	Cum	0.23	5166.40	1188.27
38	SOR 5.3	Reinforced cement concrete work in beams, suspended floors, roofs having slope upto 15, landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases upto floor five level excluding the cost of centring, shuttering, finishing and reinforcement with 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size).	Cum	1.82	5258.20	9569.92
39	SOR 5.9	Centring and shuttering including strutting, propping etc. and removal of form for.				
	5.9.1	Foundations, footings, bases of columns etc. for mass concrete.	Sqm	2.40	186.30	447.12
	5.9.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	Sqm	2.38	335.30	798.01
	5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm	1.40	425.80	596.12
	5.9.3	Suspended floors, roofs, landings, balconies and access platform.	Sqm	8.44	362.60	3060.34
40	SOR 5.22	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete.				
	5.22.7A	Thermo-Mechanically Treated bars TMTC-500-8mm dia.	Kg	180.00	77.40	13932.00
	5.22.7B	Thermo-Mechanically Treated bars TMTC-500-10mm dia.	Kg	120.00	76.70	9204.00
41	SOR 19.18	Supplying and fixing C.I. cover without frame for manholes				
	19.18.2	500 mm diameter C.I. cover (medium duty) the weight of the cover to be not less than 58 kg.	Each	4.00	2937.30	11749.20
42	SOR 19.15	Providing M.S. foot rests including fixing in manholes with 20x20x10 cm cement concrete blocks 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) as per standard design				
	19.15.1	With 20x20mm square bar	Each	10.00	240.90	2409.00
	F	TUBEWELL				
43	SOR 24.1	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.				
	24.1.1	All types of soil				
	24.1.1.1	300 mm dia	Mtrs.	90.00	388.70	34983.00
44	SOR 24.2					
	24.2.1					
44	24.2.1.1	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, beyond 90 metre & upto 150 metre depth below ground level All types of soil 300 mm dia	Mtrs.	30.00	453.50	13605.00


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45	SOR 24.3	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.				
	24.3.1	100 mm nominal size dia	Mtrs.	45.00	309.90	13945.50
	24.3.2	150 mm nominal size dia	Mtrs.	30.00	612.80	18384.00
46	SOR 24.4.1	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge. 100 mm nominal size dia	Metre	30.00	479.50	14385.00
47	SOR 24.8	Gravels 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.	cu_m	7.08	1225.10	8673.71
48	SOR 24.12	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	36.00	594.60	21405.60
49	SOR 24.13.2	Providing & fixing suitable size threaded mild steel cap or spot welded plate to the top of borewell housing/ casing pipe ,removable as per requirement,all complete for borewell of, 150 mm dia	each	1.00	196.10	196.10
50	SOR 24.14	Providing & fixing MS clamp of required dia to the top of housing/casing pipe of,removable as per tubewell as per IS;2800(part-I), including necessary bolts & nuts of required size complete				
	24.14.2	150 mm dia	each	1.00	1190.00	1190.00
51	SOR 24.15	Providing & fixing Bail plug/ bottom plug of required dia to the bottom of pipe assembly as per IS;2800(part-I),				
	24.15.1	100mm dia	each	1.00	198.80	198.80
52		Add Carriage of Materials with Loading & Unloading				
		Bricks lead of (1K+7P)	% No.	4441.00	767.08	3406.60
		Stone chips (200KM P) from Koderma	cum	3.89	2701.30	10508.06
		Coarse sand 50KM (1K+49P)) from Koilwar	cum	4.78	1030.30	4924.83
		Local sand(1K+2P)	cum	1.89	262.05	495.27
		Cement (5kmP)	Tone	2.09	328.25	686.04
		Steel (5kmP)	Tone	0.30	328.25	98.48
		Sub TOTAL				454433.98
1	GeM	Providing & fixing wall wall hung w.c with UF soft close set over hinges assecerries set size 360x500x380 mm,Jaquar ,cat.no -LYS - WHT -38951. & Concealed Single piece slim concealed cistern cat.no -JCS - WHT - 2400WS.with Flusing Control plate cat.no -JCP -CHR -372415.all complete. specification and direction of Engineer-in-charge. Product ID - 511 6877 - 5920 65766 18	Each	2.00	17400.00	34800.00
2	GeM	Urinal partitions Jaquar cat.no- JSE-CHR-810US450X SIZE- H: 900 W: 450 Product ID - 511 6877 - 32280 746 868	Each	1.00	4060.00	4060.00

3	GeM	Providing & fixing under counter basin (Jaquar, FLS-WHT-5701), CP brass angular stop cock with wall flange(kubix-f) 15mm(jaguar KUP- 35053PM) CP brass Pillar cock with base flange(jaguar-KUP-35001PM) CP bottle trap,32 mm size-300X190 long wall connection pipe(jaguar - ald -769)etc. all complete. Product ID - 511 6877 - 6672 8291 253	Each	3.00	21457.68	64373.04
4	12.78	Providing and fixing PVC Soil ,Waste & vent pipes all complete				
	12.78.1	110 mm dia	metre	28.00	238.30	6672.40
	12.78.2	40 mm dia	metre	8.00	147.40	1179.20
	12.79	Providing and fixing fittings all complete as/specification & direction of E/I				
5	BCD.1896	110 mm vent cowel	Each	1.00	293.18	293.18
	4.2	110 mm plain bend	Each	7.00	183.10	1281.70
	4.2	110 mm door bend	Each	6.00	183.10	1098.60
	5.20	110 X 110 mm dia plain tee	Each	2.00	124.70	249.40
	12.78.2	110 mm pipe clip	Each	3.00	238.30	714.90
	1900	110 X110 mm dia p-trap	Each	6.00	97.17	583.04
	18.90.5	40 mm elbow	Each	10.00	144.40	1444.00
	18.92.50	40 mm plain tee	Each	8.00	850.50	6804.00
6	17.34.1	Providing Paper holder	Each	2.00	363.00	726.00
7	17.73.2	Providing Towel Ring	Each	2.00	402.40	804.80
5	18.65	Soap dispenser	Each	3.00	122.10	366.30
9	18.50.1	CP brass 2-way bib cock with wall flange(Kubix-F) 15mm	Each	2.00	599.50	1199.00
10	5.18.1	110 mm dia cp jali	Each	4.00	730.40	2921.60
11	MR	Establishment of -2HP of submersible pump set of approved brand and make, all complete as per specification and satisfactory of e/i	each	1.00	48285.00	48285.00
		Sub TOTAL (Gem Portal + SOR)				177856.16
		TOTAL				632290.14


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APPENDIX- 6 B
Cafeteria in Sandys PARK (ELE)

AR ELECTRICAL SOR'18

					AWARD		
Sl. No		Item of work	Unit	Quantity	Rate	AMOUNT	Ref.
		WIRING					
1	1.7.2	Wiring for Light plug and circuit with 2x2.5 sq.mm FR PVC insulated copper conductor single core cable insurface/ recessed PVC conduit/casing capping along with 1 No.2.5 sq mm FR PVC insulated copper conductor single core cable for loop earthing as required	Meter	410	161.00	66010.00	SOR Item
2	1.6	Wiring for power plug with 4x4 sq.mm FR PVC insulated copper conductor single core cable in surface/ recessed PVC conduit along with 2 No.4 sq mm FR PVC insulated copper conductor single core cable for loop earthing as required	Meter	40	335.00	13400.00	SOR Item
3	1.5	Wiring for power plug with 2x4 sq.mm FR PVC insulated copper conductor single core cable in surface/ recessed PVC conduit along with 1 No.4 sq mm FR PVC insulated copper conductor single core cable for loop earthing as required	Meter	280	200.00	56000.00	SOR Item
4	1.7.11	Wiring for submain with 4x6 sq.mm +1X6 sq mm earth wire FR PVC insulated copper conductor single core cable in recessed PVC conduit as required.	Meter	80	410.00	32800.00	SOR Item
5	1.7.12	Wiring for submain with 4x10 sq.mm +1X10 sq mm earth wire FR PVC insulated copper conductor single core cable in recessed PVC conduit as required.	Meter	120	593.00	71160.00	SOR Item
6		Supplying & fixing following size ISI marked PVC conduit with accessories in recess including cutting of wall and making good the same as required.					
	1.21.1	(a) 20 mm dia	Meter	20	68.00	1360.00	SOR Item
	1.21.2	(b) 25 mm dia	Meter	40	79.00	3160.00	SOR Item
7		Supplying and fixing metal box of following size in recess with suitable size of phenolic laminated sheet cover in the front including painting etc. as required.					
	1.22.1	(a)75mmX75mmX50mm	Each	2	93.00	186.00	SOR Item
	1.22.6	(b)200mmX150mmX60mm	Each	2	193.00	386.00	SOR Item
8		Supplying and fixing following size/modules, GI box along with modular base & cover plate for modular fitting in recess etc. as required.					
	1.27.1	(a)75mmX75mm	Each	31	180.00	5580.00	SOR Item
9	1.3.3	Wiring for light point/ fan point/ exhaust fan point / call bell point with 1.5 Sq.mm FR PVC insulated copper conductor cable in recessed PVC conduit with modular switch modular plate suitable GI box earthing the point with 1.5 sq mm FR PVC insulated copper conductor single core cable etc as required.	Point	137	724.00	99188.00	SOR Item
10	1.31	Supplying and fixing suitable size GI box with modular plate and cover in recess including providing and fixing modular type 3 pin 5/6 amps socket outlet & 6A switch connection etc. as required.	Point	20	362.00	7240.00	SOR Item
11	1.32	Supplying and fixing of suitable size GI box with modular plate and cover in recess including providing and fixing modular 6 pin 15/16 amp socket outlet & 15/16 amp modular switch including connection, painting etc as required	Set	9	413.00	3717.00	SOR Item
12	1.24.4	Supplying and fixing modular type 5/6 amp, 5 pin socket outlet on the existing modular plate & box including making connection but excluding modular plate etc. as required. (For Bracket fan only)	Each	28	122.00	3416.00	SOR Item

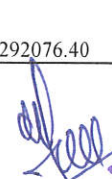
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13	2.30	Supplying and fixing TPN sheet steel enclosure on surface or in recess along ,with 63 amp 415 volts 'C' series, TPN, MCB , complete with connections testing and commissioning etc. as required.(For ODU)	Each	3	1919.00	5757.00	SOR Item
14	2.29	Supplying and fixing TPN sheet steel enclosure on surface or in recess along ,with 32 amp 415 volts 'C' series, TPN, MCB , complete with connections testing and commissioning etc. as required.(For ODU)	Each	1	1392.00	1392.00	SOR Item
15	1.24.6	Supplying and fixing modular type telephone socket outlet on the existing modular plate & box including connections,excluding modular plate etc. as required.	Each	1	108.00	108.00	SOR Item
16	1.16.2	Supplying and drawing 2 pair 0.5 sq mm. FR PVC insulated annealed copper conductor unarmoured telephone cable in the existing surface / recessed PVC conduit etc. as required.	Meter	25	18.00	450.00	SOR Item
17	1.17	Supplying and drawing co-axial T.V cable RJ-6 grade copper conductor PE insulated with PVC sheath in the existing PVC conduit etc. as required.	Meter	40	29.00	1160.00	SOR Item
18	1.24.7	Supplying and fixing modular T.V socket on the existing modular plate and metal box including making connection, etc. as required.	Each	2	102.00	204.00	SOR Item
19	1.26	Supplying and fixing modular blanking plate on the existing modular plate & box excluding modular plate etc. as required.	Each	10	26.00	260.00	SOR Item
		MAIN PANEL & D.B.s					
20	2.9.5	Supplying and fixing 6 way(4+12) double door horizontal type Three pole and Neutral sheet steel M.C.B. D.B, 415 Volts in surface/ recess, complete with tinned copper busbar, neutral bus bar, earth bar, din bar , detachable gland plate, interconnection phosphatised and powder painted including , earthing etc. as required(But without MCB/RCCB/ Isolator)	Each	2	2905.00	5810.00	SOR Item
21		Supplying and fixing following ways TPN vertical Loadline distribution board suitable for upto 160 Amp four pole MCCB as incomer and MCBs as outgoing in surface/ recess, inclusive of tinned copper busbar, common neutral link , earth bar, din bar , for mounting MCB's etc. as required, (but without MCCB & MCB's)					
	2.31.6	6 way Double door	Each	1	10538.00	10538.00	SOR Item
22	2.32.7.	Supplying and fixing cable end box (Loose wire box , IP 43) suitable for TPN sheet steel vertical M.C.B. Distribution board, on surface/ recess, complete with testing commissioning etc. as required	Each	1	861.00	861.00	SOR Item
23		Supplying and fixing of following rating electrical items in the existing Verticle DB as incomer including drilling holes in cubicle panel making connections etc. as required .					
	2.4.3	(i)125 Amp 16 KA FP 415 volt MCCB.	Each	1	4004.00	4004.00	SOR Item
24		Supplying and fixing of following rating C series MCB suitable for inductive and other loads of following poles in the existing Verticle/ MCB DB complete with connections ,testing and commissioning etc. as required .					
	2.12.1	6 Amp. To 32 Amp. SP MCB 240 Volt	Each	36	192.00	6912.00	SOR Item
	2.12.5	32 Amp TPN MCB 415 Volt	Each	4	1108.00	4432.00	SOR Item
	2.12.5	63 Amp TPN MCB 415 Volt	Each	4	1108.00	4432.00	SOR Item
25		Supplying and fixing cable end box (Loose wire box , IP 43) suitable for following three pole and Neutral sheet steel M.C.B. Distribution board, on surface/ recess, complete with testing commissioning etc. as required					
	2.32.5	(i) For 6 way Double door TPN MCB DB	Each	2	1034.00	2068.00	SOR Item
26	8.10.2	Supplying and fixing of wall/floor mounted cubicle panel board fabricated with 16 guage iron sheet suitable for panel mounted switch disconnecter, including busbar chamber, insulator, nut-bolt painting etc as required. (But without busbar copper strip)	Sft	20	1382.00	27640.00	SOR Item

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27		Supplying and fixing of following rating electrical items in the existing cubical panel board including drilling holes in cubicle panel making connections etc. as required .					
	2.4.4	(i) 160 Amp 35 KA FP 415 volt MCCB.	Each	1	9787.00	9787.00	SOR Item
	2.7.5	(ii) 160 Amp, 4 pole changeover switch .	Each	1	7903.00	7903.00	SOR Item
	2.4.3	(iii) 125 Amp 16 KA FP 415 volt MCCB.	Each	1	4004.00	4004.00	SOR Item
	2.12.5	(iv) 32 Amp TPN MCB 415 Volt	Each	5	1108.00	5540.00	SOR Item
	2.12.2	(v) 32 Amp SPN MCB 240 Volt	Each	4	511.00	2044.00	SOR Item
	8.10.6	(vii) Digital ammeter three phase	Each	1	1643.00	1643.00	SOR Item
	8.10.4	(viii) Digital Voltmeter three phase	Each	1	1337.00	1337.00	SOR Item
28	2.20	Providing and fixing MV danger notice plate of 200mmX150mm made of mild steel at least 2mm thick, and vitreous enamelled white on both sides, and with inscription in single red colour on front side etc as required.	Each	1	178.00	178.00	SOR Item
		SUPPLY & INSTALLATION OF FIXTURES					
29	8.11.2	Supply and Installation of regular / standard model A.C. ceiling fan of 1200 mm sweep including wiring the down rod of standard length (upto 30cm) with 1.5 sq.mm FR PVC insulated copper conductor, single core cable etc. as required.	Each	1	1618.00	1618.00	SOR Item
30	1.25	Supplying and fixing stepped type electronic fan regulator on the existing switch box including connections excluding modular plate etc. as required.	Each	1	359.00	359.00	SOR Item
31	8.11.4	Supply and Installation of 300mm sweep 230 A.C. exhaust fan in the existing opening including making good the damage connection testing commissioning etc. as required.	Each	2	1483.00	2966.00	SOR Item
32	8.11.7	Supply and installation of 400 mm, 230 V AC wall / cabin fan including fixing the bracket, making connection, testing, commissioning etc as required.	Each	26	2427.00	63102.00	SOR Item
34	5.14	Supplying and fixing 40 watt LED surface mounting luminaire provides soft light and glare free symmetrical illumination fitting and all accessories including ball and socket arrangement , 2 no down rods of 20 mm dia x1.6 mm thick G.I. pipe upto 30 cm length painting and wiring the down rods and connections with 1.5 sq.mm FR PVC insulated, copper conductor single core cable and earthing etc. as required.	Each	4	4949.00	19796.00	SOR Item
35	5.9.3	Supplying and fixing single wall mounted 20/22watt LED type batten fitting complete with electronic driver and LED tube etc. directly on ceiling / wall including connections with 1.5 sq.mm FR PVC insulated, copper conductor single core cable and earthing the body etc. as required.	Each	3	684.00	2052.00	SOR Item
36	1.33	Supplying and fixing 2 pin 5 Amp ceiling rose on the existing junction box/ PVC box including connection etc as required.	Each	3	42.00	126.00	SOR Item
37	1.34	Supplying and fixing batten / angle holder including connections with 1.5 sq.mm FR PVC insulated, copper conductor single core cable etc. as required.	Each	5	46.00	230.00	SOR Item
38		Supplying and fixing following types lamp in existing electrical fitting/ fixture etc as required.					
	6.1.33	(i) 12 watt LED lamp	Each	5	178.00	890.00	SOR Item
39	5.15	Supplying and fixing surface mounted 10/12 watt LED type bulkhead fitting comprising of pressure die cast housing with acrylic diffuser(IP 65)and complete with integrated electronic driver etc directly on wall/ ceiling including connections with 1.5 sq.mm FR PVC insulated, copper conductor single core cable and earthing the body etc. as required.	Each	7	1293.00	9051.00	SOR Item
40	5.16.2	Supplying and fixing decorative wall bracket fixture in chrome finish with glass diffuser suitable for 2x15 watt CFL/ LED lamp directly on wall including connections with 1.5 sq.mm FR PVC insulated, copper conductor single core cable and earthing the body etc. as required.	Each	18	1100.00	19800.00	SOR Item

		SUPPLY & LAYING OF UNDER GROUND CABLE					
42		Laying of one number PVC insulated and PVC sheathed/ XLE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required.					
	7.1.2	(a) Above 35 sq. mm. and upto 95 sq.mm	Meter	95	151.00	14345.00	SOR Item
43		Laying and fixing of one number PVC insulated and PVC sheathed aluminium conductor cable of 1.1 KV grade of following size on surface etc. as required.					
	7.4.2	(a) Above 35 sq. mm. and upto 95 sq.mm (Clamped with 25/3 mm MS flat clamp)	Meter	15	68.00	1020.00	SOR Item
44	9.2	Excavating for cable trenches of depth upto 1.2M in soft soil including getting out the excavated soil and disposal of surplus excavated soil directed within lead of 50 metres.	Cum	12	155.00	1860.00	SOR Item
45	9.3	Filling available excavated earth (excluding rock) in trenches, sides of foundations etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead upto 50 metres.	Cum	6	99.00	594.00	SOR Item
46		Providing and laying following size NP2 (Non pressure) RCC pipe complete with RCC collar etc. as required .					
	9.14.2	(a) 150 mm dia	Meter	10	369.00	3690.00	SOR Item
47	DSR 2018	Laying of one number PVC insulated and PVC sheathed aluminium conductor cable of 1.1 KV grade of following size in the existing RCC/ HUME/METAL pipe etc. as required.					
	7.5.2	(a) Above 35 sq. mm. and upto 95 sq.mm	M	10	47.00	470.00	SOR Item
48		Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed/XLPE aluminium conductor cable of 1.1 KV grade as required.					
	9.1.22	(a) 3.5 Core 50 sq mm	Set	2	329.00	658.00	SOR Item
	9.1.24	(b) 3.5 Core 95 sq mm	Set	2	473.00	946.00	SOR Item
		EARTHING					
49	3.2	Earthing with G.I earth pipe 4.5 mt. long 40mm dia including accessories and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with Charcoal/coke and salt as required.	Set	2	5125.00	10250.00	SOR Item
50	3.12	Providing and laying earth connections from earth electrode with 6 SWG dia G.I. wire in 15 mm. Dia G.I. pipe from earth electrode including connection with G.I. thimble excavation and refilling etc. as required.	Meter	40	192.00	7680.00	SOR Item
51	3.16	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc as required.	Meter	30	38.00	1140.00	SOR Item
		SUB TOTAL A (Schedule Item)				634710.00	
27		Supplying and fixing of following rating electrical items in the existing cubical panel board including drilling holes in cubicle panel making connections etc. as required .					
	MR	vi) Copper strip of all sizes.	Kg	10	788.80	7888.00	Quotation
	MR	(ix) Pilot lamp for indicator	Each	3	40.60	121.80	Quotation
33	MR	Supplying and fixing of Model JNL-CHR-SL800WPAGE 27 glass & wood pendant with alabaster finish E-27 9W x 1 LED light of Jaquar Make including all accessories and connection with 1.5 sq mm FR PVC insulated copper conductor single core cable and earthing the body etc as required.	Each	70	4172.52	292076.40	Quotation
41	MR	Supply of PVC insulated PVC sheathed aluminium conductor armoured under ground cable of graded 1.1 KV for working voltage upto 1100 volts conforming to ISI 1554 (Part-I) of 1964 with upto date amendment as detailed below.					Quotation
		(a) 3.5 Core 95 sq mm	Meter	100	389.76	38976.00	Quotation


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		(b) 3.5 Core 50 sq mm	Meter	20	237.57	4751.36	Quotation
		SUB TOTAL B				343813.56	
		TOTAL for ELECTRICAL				978523.56	


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APPENDIX-6 C

Cafeteria in Sandys PARK (AC)

Sl.No	Description	Unit	Qty.	Submitted		Ref.
				Rate (incl. Taxes)	Amount	
A	SUPPLY PART (HIGH SIDE WORK)					
NS-1.0	Air-conditioning System					
1	Supply of Ductable air conditioners with Single Indoor & Single/Twin Outdoor Unit of minimum 12000 BTU/Hr. cooling capacity per Tr. fitted with 3 Ph. scroll compressor, Hi & LO Pressure switch, Microprocessor control with Hi & LO voltage cutout, single phase protection and programmable handset & with factory charged R-22 Refrigerant.					
	AC should be fitted with Microprocessors based control includes features of Hi/Lo voltage protection, single phase protection, Phase reversal protection, Compressor On/Off delay for compressor protection, Auto restart function, Fault detection LP/HP/Sensor fail. LED handset, Filter clean time setting, Fault logger to view 100 fault, Total run time viewing, password protected menu and parameter setting, 6 prog timer with 24 Hrs. time mode for different event setting in a day, weekly off. (2 days), etc. Make: Carrier, Mitsubishi Heavy, Midea					
a	4.0 Tr. (1:1) Ductable air conditioners.	Nos.	1.00	113557.90	113557.90	
b	11 Tr. (1:2) Ductable air conditioners.	Nos.	3.00	248615.05	745845.15	
B	INSTALLATION PART:					
NS-2.0	Installation, Testing and commissioning of ductable/cassette air conditioners. The rates shall be inclusive of the following:					
	a) Indoor unit mounting with all items.					
	b) Minor Civil work like opening in the walls for piping & cables & finishing the same. Pipes & cables between through wall shall be taken through sleeves & plugged to avoid leakages.					
	c) Outdoor unit mounting with all accessories vibration mounting pads etc..					
	d) Pressure Testing & Commissioning.					
a	4.0 Tr. Carrier Make Ductable air conditioners.	Nos.	1.00	7475.00	7475.00	
b	11 Tr. Carrier Make Ductable air conditioners.	Nos.	3.00	20700.00	62100.00	
NS-3	Supply & fixing of Copper cable laying in 2.0 MM thick PVC conduit suitable for:					
NS-3.1	4.0 Tr. Ductable air conditioners	Rmt.	18.00	862.50	15525.00	
NS-3.2	11.0 Tr. Ductable air conditioners	Rmt.	55.00	1380.00	75900.00	
NS-4	Supply, fabrication and fixing of painted MS plateform with all required materials & labour to be fixing of outdoor units.	Kgs.	200.00	103.50	20700.00	
NS-5	Supply, installation & testing of Factory fabricated Round/Oval GSS ducts with flanges, joints etc. in accordance with the approved drawings and as per specifications.					
NS-5.1	24 gauge galvanized sheet steel (0.63mm)	Sqmt.	175.00	1437.50	251562.50	
NS-5.2	22 gauge galvanized sheet steel (0.80mm)	Sqmt.	75.00	1638.75	122906.25	
NS-6	Supply, installation, testing & balancing of fixed bar extruded aluminium powder coated round supply air Diffusers with all sides flange.	Nos.	32.00	4600.00	147200.00	
NS-7	Supply, installation, testing & balancing of fixed bar extruded aluminium powder coated Louvered return air Grills with all sides flange.	Sqmt.	8.00	9749.70	77997.60	
NS-8	Supply & installation of thermal insulation with 9 mm thick closed cell elastomeric nitrile rubber insulation pasted from inside of the duct with self adhesives.	Sqmt.	150.00	690.00	103500.00	
NS-9	Supplying & fixing of 12 mm acoustic lining of duct with open cell Nitrile Rubber density 140-180 Kg/Cu.Mtr. Applied by adhesive confirming to standard specification.	Sqmt.	100.00	1138.50	113850.00	
NS-10	Supply & fixing of fire volume control damper for IDU supply air outlet.	Nos.	4.00	8625.00	34500.00	
NS-11	Supply & fixing of double flexible canvass Connections for each units	Nos.	7.00	2300.00	16100.00	

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S-12	Pressure flushing of all refrigerant piping System with Dry nitrogen & leak testing.	Nos.	7.00	2070.00	14490.00	
S-13	Supply, Installation, testing & commissioning of 32 mm/25 mm PVC medium class pipes for the water drainage from IDU duly insulated with 6 mm thick close cell elastometric nitrile rubber.	Rmt.	50.00	276.00	13800.00	
S-14	Supplying & Installation of interconnecting of Refrigerant Copper Piping work of required outer diaMeter, insulated with 19/13 mm thick closed cell electrometric nitrile rubber tubular insulation (or as per manufacturer's standard) between Each set of indoor & outdoor units shall be properly fixed/supported with suitable size of clamp/ M.S. hanger.Refrigerant Copper Pipe Makes: Rajco/Mandev Tubes/Mehta Tubes/Totaline/Camipro etc. Protective coating over insulation Make:Paramount Polytreat/K-Flex/A-Flex/Armacell etc. suitable for:					
NS-14.1	4.0 Tr. Ductable air conditioners	Rmt.	15.00	1380.00	20700.00	
NS-14.2	11.0 Tr. Ductable air conditioners	Rmt.	45.00	2530.00	113850.00	
NS-15	Vaccumisation of the system and charging of Refrigerant in the system as required.	Kgs.	14.00	1207.50	16905.00	
NS-16	Supply, Installation & commissioning of 200 mm x 75 mm x 1.6 MM thick GI Cable tray with Cover for the laying of Copper pipes outside of the building.	Rmt.	40.00	1092.50	43700.00	
	TOTAL				2132164.4	


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APPENDIX 11: LANDSCAPING

S.No.	Ref	Description of Work	Unit	Qty	Rate (Rs.)	Amount (Rs.)
	A	SOIL AND SITE PREPARATION				
1	23.1	Making up the trenched area upto proper levels by filling with earth or earth mixed with manure before and after flooding trench with water (including cpst of imported earth, sludge or manure.	cum	3600.00	37.20	1,33,920.00
2	23.2	Supplying and stacking of good earth at site including royalty but excluding carriage (earth measured in stacks will be reduced by 20 % for payment)	cum	3600.00	119.40	4,29,840.00
3	23.4.3	Supplying and stacking at site dump manure from approved source, excluding carriage (manure measured in stacks will be reduced by 8% for payment)				
		Screened through sieve of I.S. designation 4.75 mm	cum	900.00	64.30	57,870.00
4	23.9	Mixing earth and sludge or manure in proportion specified or directed.	cum	4500.00	17.40	78,300.00
5	23.8	Spreading of sludge, dump manure or/and good earth in required thickness (Cost of sludge, dump manure or/and good earth to be paid separately)	cum	4500.00	25.00	1,12,500.00
6	23.6	Uprooting rank vegetation and weeds by digging the area to a depth of 60 cm removing all weeds and other growth with roots by forking repeatedly, breaking clods, rough dressing, flooding with water, uprooting fresh growths after 10 to 15 days and then fine dressing for planting new grass, including disposal of all rubbish with all leads and lifts.	100 sqm	40	235.7	9,428.00
7	23.7	Fine dressing the ground	100 sqm	40.00	173.40	6,936.00
8	23.1	Grassing with 'Doob' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed.				
9	23.10.3	In rows 5 cm apart in either direction.	100 sqm	34.21	855.40	29,263.23
	B	TREE, SHRUB, CREEPER PLANTATION				
10	23.14	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 20 % 1 part of stacked volume of manure after reduction by 8 %) flooding with water, dressing including removal of rubbish and surplus earth, if any with all leads and lifts (cost of manure sludge or extra good earth if needed to be paid for separately)				
		Holes 60 cm dia. and 60 cm deep.	each	1000.00	57.80	57,800.00


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S.No.	Ref	Description of Work	Unit	Qty	Rate (Rs.)	Amount (Rs.)
11	23.13	Preparation of beds for hedging and shrubbery by excavating 60 cm deep and trenching the excavated base to a further depth of 30 cm refilling the excavated earth after breaking clods and mixing with sludge or manure in the ratio of 8 :1 (8 parts of stacked volume of earth after reduction by 8%) flooding with water, filling with earth if necessary, watering and finally fine dressing, leveling etc. including stacking and disposal of materials declared unserviceable and surplus earth by spreading and levelling as directed, within a lead of 50 m lift upto 1.5 m complete (cost of sludge, manure or extra earth to be paid for separately)	cum	1944.00	105.50	2,05,092.00
12		Supplying and Plantation as per the direction of engineer incharge inc. carriage cost of				
	A	EVERGEN TREES for Boundary wall (Ht- 3000mm)				
		Ailanthus Excelsa / Maharukh	Nos.	190.00	500	95,000.00
		Azadirachata indica	Nos.	110.00	500	55,000.00
		Azadirachta indica	Nos.	500.00	500	2,50,000.00
		Dalbergia sissoo	Nos.	200.00	500	1,00,000.00
		Peltophorum pterocarpum	Nos.	300.00	500	1,50,000.00
		Tamarindus indica	Nos.	300	500	1,50,000.00
		Lagerstroemia speciosa	Nos.	150	750	1,12,500.00
		Cassia fistula	Nos.	150	750	1,12,500.00
		Jacaranda mimosifolia	Nos.	150	500	75,000.00
		Bauhinia variegata	Nos.	150	600	90,000.00
	B	Tree for Internal Pathway				
		Plumeria alba	Nos.	500	750	3,75,000.00
		Ficus elastica	Nos.	100	600	60,000.00
		Ficus rumphii 'variegata'	Nos.	50	500	25,000.00
		Pseudobombax ellipticum (Bombax ellipticum)	Nos.	50	2500	1,25,000.00
	C	Palm				
		Wodeytia bifurcate	Nos.	75	800	60,000.00
		Caryota urens	Nos.	75	750	56,250.00
		Washingtonia filifera	Nos.	50	2500	1,25,000.00
		Bismarckia nobilis	Nos.	50	2500	1,25,000.00
	C	SHRUBS (Ht- 300 to 1000 mm)				
		Calliandra haematocephala	Nos.	200	250.00	50,000.00
		Agave variety (tequilana, Americana)	Nos.	5000	600.00	30,00,000.00
		Cactus Variety	Nos.	100	750.00	75,000.00
		Sansevieria (different varieties)	Nos.	400	600.00	2,40,000.00
		Adenium varieties	Nos.	500	300.00	1,50,000.00
		Euphorbia milii	Nos.	500	150.00	75,000.00
		Cycus variety	Nos.	100	2500.00	2,50,000.00
		Clerodendrum inerme	Nos.	100	15.00	1,500.00
		Ficus panda	Nos.	100	60.00	6,000.00
	D	GROUND COVERS (Ht-200mm)				
		Iresene herbstii	sqm	25.00	50.00	1,250.00
		Alternanthera red	sqm	50.00	50.00	2,500.00
		Dianella tasmanica	sqm	75.00	20.00	1,500.00


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S.No.	Ref	Description of Work	Unit	Qty	Rate (Rs.)	Amount (Rs.)
13		Carriage of Materials				
	A	Earth (1 km kutcha + 2 km pucca)	cum	3600.00	262.05	9,43,380.00
	B	Manure (1km kutcha + 5 km pucca)	cum	900.00	301.36	2,71,221.75
14		Supplying and installation of precast cc dustbins as per approval of PSCL.	no.	65.00	1500.00	97,500.00
15		Supplying and installation of precast cc bollards - provision of bollards at minor junctions, plot entry points and pedestrian crossing with a minimum spacing of 1.2m c/c or as directed by engineer incharge, pv and fixing of concrete bollards of m30 grade and size 1000 mm (ht-1000mm dia 150mm complete inclusive of all consumables, t&p and labours as/ requirement	no.	200.00	2000.00	4,00,000.00
16		Supplying and installation of FRP seating benches of 3 person capacity with cast iron side support as per approval of PSCL.	no.	110.00	12000.00	13,20,000.00
17	RCD SOR, 8.19	Fencing with welded steel wire Fabric 75 mm x 50 mm (Suggestive) (Providing 1.20 metre high fencing with angle iron posts 50 mm x 50 mm x 6 mm at 3 metre center to center with 0.40 metre embedded in M15 grade cement concrete, corner, end and every 10th post to be strutted, provided with welded steel wire fabric of 75 mm x 50 mm mesh or 75 mm x 25 mm mesh and fixed to iron posts by flat iron 50 x 5 mm and bolts etc. complete in all respects.)	m	1800.00	557.00	10,02,600.00
		Provision of Water Supply for the Park				
18	UD HD MEWS 250 M	Cost for construction of 150mm x 100mm x 120 m deep high yeild tube well. All complete as per specification, site condition and as per direction of e/I UD & HD Approved Estimate	Set	1.00	224670.00	2,24,670.00
19	UD HD MEWS 250 M	5 HP Pump motor with Starter pannel, all complete as per specification and direction of E/I UD & HD Approved Estimate	Set	1.00	104000.00	1,04,000.00
20	UD HD MEWS 250 M	110 mm to 63 mm HDPE Pipe distribution of 2020 Mtr for Hrticulture and Irrigation purposeall complete. UD & HD Approved Estimate	Set	1.00	1294025.00	12,94,025.00
22	LS	Stone sculptures	Nos.	9.00	50000.00	4,50,000.00
		Cost of landscaping				1,32,22,346
		Carriage of Materials				9,43,380.00
		Total Cost of landscaping				1,41,65,726


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Appendix 13 : Kids Play Area

S.No	Code	Description	Unit	No	Length	Width	Height	Quantity	Rate (Rs)	Amount (Rs)
1	RCD 2019 2.1.1	Cutting of Trees, including Cutting of Trunks, Branches and Removal (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.) Girth from 300 mm to 600 mm	Nos.	12				12	250	₹ 3,000.00
2	2.6.1	Earth work in excavation over areas (exceeding 30 cm in depth. 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50 m and lift upto 1.5 m; disposed earth to be levelled and neatly dressed	Cum		70	60	0.3	1260	279.1	₹ 3,51,666.00
3	2.28	applying and Filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.	Cum		70	60	0.15	630	238.6	₹ 1,50,318.00
4	11.72	Providing designation 100 A one brick flat soling joints filled with local sand including cost of watering, taxes, royalty all complete as per building specification and direction of E/L.	Sqm		70	6		420	277.5	₹ 1,16,550.00
5	RCD M - 010	Granular Material or hard murrum for GSB works at Quarry	Cum		70	5.8	0.15	60.9	131.53	₹ 8,010.18
6	4.1.3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering-all work upto plinth level. 1:2:4 (1 Cement: 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	Cum					17.5	4151.4	₹ 72,649.50
7	Gem Portal	Sitting Arrangements Product id: 5116877-58242510321	Nos.	11				11	13500	₹ 1,48,500.00
8	Gem Portal	Wide Slide :Product id: 5116877-53479918813	Nos.	4				4	12000	₹ 48,000.00

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Appendix 13 : Kids Play Area

S.No	Code	Description	Unit	No	Length	Width	Height	Quantity	Rate (Rs)	Amount (Rs)
9	Gem Portal	Wave Slide , Product id: 5116877-76117636819	Nos.	3				3	24700	₹ 74,100.00
10	Gem Portal	Spiral Slide, Product id: 5116877-42863169742	Nos.	3				3	99840	₹ 2,99,520.00
11	Gem Portal	Double see saw, Product id: 5116877-14551277238	Nos.	4				4	25000	₹ 1,00,000.00
12	Gem Portal	Merry go Round, Product id: 5116877-30759744505	Nos.	2				2	24000	₹ 48,000.00
13	Gem Portal	Swing for Children Gem Portal Product id: 5116877-14066115194	Nos.	4				4	38000	₹ 1,52,000.00
14	Gem Portal	Children Round Swing Gem Product id: 5116877-8698111099	Nos.	4				4	13899	₹ 55,596.00
15	Gem Portal	Artificial Grass (Artificial Grass) GeM Product id: 5116877-36166393221	Sqm		15	15		225	1592.48	₹ 3,58,308.00
16	Gem Portal	TRAMPOLINE FOR PARK Product id: 5116877-44763654489	Nos.	4				4	7670	₹ 30,680.00
17	Gem Portal	Advance Multi Play Station (SHUBHAM) (MULTI COMBO MODULED) Product id: 5116877-18391069021	Nos.	2				2	87000	₹ 1,74,000.00
A		Sub Total								₹ 21,90,898
B		Carriage Cost								₹ 2,52,986
C		Total Cost of Kids Play Area								₹ 24,43,883


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Appendix 19 : Estimate of Nehru Memorial Renovation

S.No	BCD SOR 2018	Description	Unit	No	Quantity	Rate (Rs)	Amount (Rs)
1	2.1.1	Cutting of Trees, including Cutting of Trunks, Branches and Removal (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.)					
		Girth from 300 mm to 600 mm	Nos.	10	10	248	2,480.00
2	2.33	Clearing grass and removal of the rubbish upto a distance of 50 m outside the periphery of the area cleared.	Sqm	1	1390	2.96	4,114.40
3	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work upto plinth level.					
	4.1.6	1:3: 6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size)	cum	1.00	4.17	3307.00	13,791.84
4	11.29	40 mm thick rough chisel dressed stone flooring over 20 mm (average) thick base including pointing with C.M 1:2 (1 cement :2 stone dust) with an admixture of pigment to match the shade of the stone with base 1:1:1 (1 lime : 1surkhi : coarse sand or 1:5 (1 cement : 5 coarse sand)					
	11.29.1	Red sand stone	Sqm	1	109.56	753.1	82,509.64
5	10.32	Steel work welded in built up sections/framed work including cutting hoisting, rixing in position and applying a priming coat of approved steel primer using structural steel, etc. as required.					
	10.32.2	In gratings, frames, guard bar, ladders, railings, brackts. Gates & similar works.	Kg	1	100	88.8	8,880.00
6	13.48.3	Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/ 10 sqm over an under coat of primer applied @ 0.80 ltr/ 10 sqm of approved brand and manufacture.					
		Steel Struture	Sqm	1.00	10	37.8	378
7	10.36	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes,channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts,fasteners etc.).	Kg	1	1093.20	496.00	5,42,227.20
8	13.79	Finishing Wall with water proofing cement paint of approved brand and manufacture and of required shade to give an even shade					
	13.79.1	New work (three or more coats)	Sqm	1.00	300	68.3	20,490.00
9	13.80	Removing dry or oil bound distemper by scrapping, sand paper and preparing the surface smooth including necessary repari scratches tec.Gmplete	Sqm	1	300.00	8.10	2,430.00
10	CARRIAGE						
	A	Coarse Sand	Cum		1.98	1030.3	2041.05
	B	Stone Chips	Cum		3.92	2701.25	10578.36
	C	Cement	MT		0.95	472.68	447.63
	D	Steel	MT		1.19	328.25	391.67
TOTAL							690760

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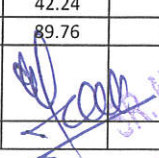
STATION CLUB						
S.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	QTY.	RATE	AMOUNT (Rs.)
		Desmantiling				
1	15.7	Demolishing brick work including stacking of serviceable material and disposal of unserviceable material within 50 meters lead:				
	15.7.2	In lime mortar with old mugnal bricks	Cum	888.6	587	521608.2
	15.7.4	In cement mortar	Cum	2692.00	685.10	1844289.2
2	15.12	Desmantiling doors windows and clerestory windows (steel or wood) shutters including chowkhats, architrage, holdfasts etc. complete and stacking within 50 metres lead:				
	15.12.1	Of area 3 sqm and below	Each	21	125.8	2641.8
	15.12.2	Of area beyond 3 sqm	Each	33	173.1	5712.3
3	15.14	Dismantling wood work in frames, trusses, purlins and rafters upto 10 metres span and 5 metres height including stacking the material within 50 metres lead:				
	15.14.1	Of sectional area 40 cm* and above	Cum	5.6	1528.1	8576
		Brick work				
4	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in :				
	6.1.12 / 1	Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	30.25	5037.20	152375.30
		Reinforced Cement Concrete Works				
5	5.33A	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centring, shuttering, finishing and reinforcement. M-20 grade reinforced cement concrete				
	5.33A.2.2	Beams, planth beams, girders, bressumers, contilevers, Suspended floors lintels roofs and staircases including spiral staircases, shelves etc.	cum	244.59	5689.80	1391668.18
6	5.22	Reinforcement for RCC work including straightening. Cutting, bending, placing in position and binding all complete.				
	5.22.7B	Thermo-Mechanically Treated bars				
7	5.9	Centring and shuttering including strutting, propping etc. and removal of form for:				
	5.9.3	Suspended floors, roots, landings, balconies and access platform.	sqm	985.20	362.60	357,233.52
8	9.48	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all				
	9.48.2	Fixed to openings/ wooden frames with rawl plugs	Kg	1680.00	122.9	206,472.00
		Flooring Work				
9	11.36	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (Thickness to be specified by the manufacture) 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 Motar 1:3 (1cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	Sqm	26.25	739.80	19,419.75
	11.47	Providing and laying Vitrified 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 brand & manufacturer, in all colours and shade, in skirting, riser of steps, laid with cement based high polymer modified quick set tile adhesive (water based) conforming to IS: 15477, in average 6 mm thickness, including grouting of joints (Payment for grouting of joints to be made separately).				
10	11.47.3	Size of Tile 800 x 800 mm.	Sqm	839.65	1568.50	1316983.97
	11.29	40 mm thick rough chisel dressed stone flooring over 20 mm (average) thick base including pointing with C.M 1:2 (1 cement :2 stone dust) with an admixture of pigment to match the shade of the stone with base 1:1:1 (1 lime : 1surkhi : coarse sand or 1:5 (1 cement : 5 coarse sand)				
11	11.29.1	Red sand stone	Sqm	51.00	753.10	38408.10
		Plaster & Finishing Works				
12	13.11	12 mm cement plaster of mix				
	13.11.2	1:4 (1 cement : 4 coarse sand)	Sqm	1950.00	139.90	272805.00
13	13.12	15 mm cement plaster on rough side of single or half brick wall of mix.				
	13.12.2	1:4(1 cement: 4 coarse sand)	Sqm	742.00	161.90	120129.80
14	13.24	6 mm cement plaster to ceiling of mix.				
	13.24.1	1:3(1 cement: 3 coarse sand)	Sqm	663.65	117.80	78177.44
15	13.79	Finishing Wall with water proofing cement paint of approved brand and manufacture and of required shade to give an even shade				
	13.79.1	New work (three or more coats)	sqm	742.00	68.30	50,678.60
		Waterproofing				
16	22.8	preparation of surface as required for treatment of roofs, balconies , terraces etc, consisting of following operations. Applying and grouting a slurry coat of neat				
	22.8.1	With average thickness of 120mm and minimum thickness at Khurra as 65 mm.	sqm	985.20	2253.30	2,219,951.16
17	9.1	Providing wood work in frames of doors, windows, clearstory windows and other frames, wrought framed and fixed in position				
	9.1.	Second Class teak wood	Cum	8.36	95749.10	800,653.97
18	9.53	Providing 40 x 5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bots, nuts and wooden plugs and embeddings in cement concrete block 30x10x15 cm 1:3:6 mix (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size)	Each	164.00	106.60	17,482.40

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19	9.10	Providing and fixing aluminium handles anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with necessary screws etc. complete :				
	9.100.1	125 mm	Each	174.00	54.00	9,396.00
20	9.10	Providing and fixing aluminium hanging floor door stopper anodized (anodic coating not less than grade AC 10 as per IS :1868) transparent or dyed to required colour and shade with necessary screws etc. complete.				
	9.101.2	Twin rubber stopper	Each	66.00	40.40	2,666.40
21	10.18	Providing and fixing circular cast iron box for ceiling fan clamp 140 mm internal dia, 73 mm height, 5 mm thick rim bottom and top lids, 1.5 mm thick M.S sheet with its top surface hacked for proper bonding top lid shall be screwed into the cast iron box by means of 3.3 mm dia round headed screws, one ;pcf at the corners. Clamps shall be made of 12mm dia M.S. bar bent to shape as per standard drawing.	Each	40.00	141.30	5,652.00
22	13.81.1	With ready mixed pink or grey primer of approved brand and manufacture on woodwork (hard and soft wood)	Sqm	196.00	32.20	6,311.20
23	13.82	Painting with ready mixed paint of approved brand and manufacture in all shades to give an even shade:				
	13.82.1	New steel work (two or more coats)	Sqm	20.79	74.50	1,548.86
	13.82.2	New wood work (two or more coats)	Sqm	196.00	74.50	14,602.00
24	13.93	Painting with synthetic enamel paint of approved brand and manufacture to give an even shed.				
	13.93.1	Two or more coats on new work	Sqm	1,950.00	70.40	137,280.00
25	17.1	Providing and fixing water closet squatting pan (Indian Type WC pan) with 100mm sand cast iron P or S trap, 10 liter low fixture complete, including cutting and making good the wall and level white PVC flushing cistern, including flush pipe, manually control device(handle lever) conforming to IS :7231, with all fittings and floors where ever required.				
	17.1.1	white Vitreous china, Orissa, Pattern WC pan of size 580x440 mm with integral type footrest.	Nos.	1.00	3390.90	3,390.90
26	17.3	Providing and fixing white vitreous china pedestal type water closet.(European type) with seat and lid, 10 ltr flow level white vitreous china flushing cistren and C P flush bend with fitting and CI bracket, 40mm flush bend, over flow arrangement with special of standreds make and mosquitoes proof coupling of approved municipal complete design complete, including painting of fittings and brackets, cutting and making good the walls.				
	17.3.1	W.C. Pan with ISI marked white solid plastic seat.	Nos.	1.00	4554.00	4,554.00
27	17.4	Providing and fixing white vitreous china flat back or wall corner type leaped urinal basin of 430x260x350 mm and 340x410x265 mm size repectively with automatic flushing cistren with standred flush pipe and CPP brass spreaders with brass union and GI claim complte, including painting of fittings and brackets , cutting and making good the wall and floor whenever required.				
	17.4.2	Range of Two Urinal Basin with 5 ltr white PVC automatic flushing cistren.	Nos.	2.00	5121.70	10,243.40
28	17.7	Providing and fixing wash basin with CI Bracket, 15mm CP brass pillar taps, 32mm CP brass waste of standred pattren including painting of fittings and brackets, cutting and making good the wall whereever required.				
	17.7.1	White virterous China wash basin size 630x450mm with a pair of 15mm CP brass pillar taps	Nos.	4.00	2307.10	9,228.40
	17.7.7	White virterous Chaina flat back wash basin size 450x300mm with single 15mm CP brass pilar taps.	Nos.	4.00	1520.00	6,080.00
29	18.53	Providing and fixing Cp brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931. a 15mm nominal bore.				
	18.53.1	15 mm Nominal Bore	Nos.	9.00	512.90	4,616.10
30	18.51	Providing and fixing CP Brass long body bib cock of approved quality conforming to IS: standreds and weighinf not less than 690 grams				
	18.51.1	15 mm Nominal Bore	Nos.	3.00	531.60	1,594.80
31	18.48	providing and placing on terrace (at all floor levels) polytheline water storges tank, ISI :12701 marked, with cover and sutable loking arrangement and making necessary holes for inlet , Outlet and over flow pipes but without fittings and the base support for tank.	Litre	1000.00	7.90	7,900.00
32	17.32	Providing and fixing mirror of superior glass (of approved quality) and of required shapes and size with plastic moulded frame of approved make and said with 6mm thick hard.				
	17.32.3	Oval shape 450 x 350 mm Mirror	Nos.	4.00	744.60	2,978.40
33	Analysis	Septic tank as per Specification and dorection of E/I. all complete as per the Specification,Note: 1) Effluent from septic tank to be taken to nearby manhole/ sump/ STP through shallow sewers. If this option is not available then it is to be disposed off	Nos.	1.00	188113.00	188,113.00
34	Analysis	Internal plumbing and electrification			7%	13,154,916.21
						920,844.13
						14,075,760.34
35	Analysis	Carriage				
	A	Brick	Per Thousand	13849.01	767.08	10623.30
	B	Coarse Sand	Cum	193.68	1030.3	199545.45
	C	Stone Chips	Cum	248.49	2701.25	671224.27
	D	Cement	MT	110.45	472.68	52205.37
	E	Steel	MT	44.88	328.25	14732.09
					TOTAL	15,024,091

APPENDIX 21: ESTIMATE OF SECONDARY/EMERGENCY ENTRANCE GATE

SL. NO.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	No.	Length	Width	Depth	QTY.	RATE (Rs.)	AMOUNT
1	20.3A.1	Making 25cm (10") dia bore up to 5 M depth below ground with hand auger of approved quality in ordinary soil (vide classification of soil item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50 M lead including all lifts, all complete as per approved design and direction of E/L./	Rmt	6	5			30	148.6	4458
2	20.3A.2	Making 63 cm (25") dia under-ream at required depth with hand auger of approved quality in ordinary soil (vide classification of soil item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50M lead including all lifts, all complete as per approved design and direction of E/L.	Each	12					158.60	1903.2
3	2.8.1	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 M in width 10 sqm on plan)including dressing of sides and ramming of bottoms lift upto 1.5 m including getting out the excavated soil and disposal of surplus excavated soil as directed,within a lead of 50.0m	cum							
				1	16.2	1.5	0.75	18.225		
								18.225	319.6	5824.71
4	2.28	Supply and filling in plinth with local sand and under floors including watering,ramming,consolidating and dressing complete	cum							
				1	16.2	1.5	0.075	1.8225		
								1.8225	238.60	434.85
5	4.1.8	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level.1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	cum							
		beam		1	16.2	0.5	0.1	0.81		
		gate path in slope		1	6	5	0.15	4.5		
				2	1.2	5	0.15	1.8		
								7.11	2940.8	20,909.09
		R.C.C WORKS								
6	BCD SOR, 5.1.1	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering, finishing and reinforcement- All work up to plinth level.1:1:2 (1 cement:1 coarse sand:2 graded stone aggregate 20mm nominal size)	cum							
		Beam		1	16.2	0.8	0.6	7.776		
		pile @ .250 mm radiuds		6		0.25	2.2	0.65		
		colum		6	4.4	0.8	0.6	12.672		
		pergola top		1	9.9	0.3	0.45	1.3365		
				8	0.9	0.4	0.3	0.864		
		Security Room		1	2.7	2.4	0.15	0.972		
				1	10.2	0.25	0.15	0.3825		
								22.43	6434.4	1,44,337.27
7	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in :	cum							
	6.1.12 A	Cement mortar 1:4 (1 cement : 4 coarse sand)								
				2	2.7	4.4	0.25	5.94		
				2	2.4	4.4	0.25	5.28		
								11.22	5037.2	56,517.38
8	13.13.4	Providing 20mm thick cement plaster 1:6(1cement:6 coarse sand)	Sqm							
				4	2.7	4.4		47.52		
				4	2.4	4.4		42.24		
								89.76	173.00	15,528.48
9	13.79.1	Finishing walls with water proofing cement paint of approved brand and manufacture and of required shade to give an even shade New work(three or more coats)	Sqm							


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		Plaster area		1				89.76	68.3	6,130.61
10	7.30	Providing and laying Red Sand Stone as per approved sample 30 mm thk (only cladding)	sqm							
				1	2.7	1		2.7		
								2.7	949	2,562.30
12	5.22.7B	Reinforcement for R.C.C work including straightening, cutting, bending, placing in position and binding all complete	kg	4,262.10				4,262.10	76.7	3,26,903.36
13	10.32.2	Steel work welded in built up sections/framed work including cutting hoisting, rixing in position and applying a priming coat of approved steel primer using structural steel, etc. as required..								
		In gratings, frames, guard bar, ladders, railings, brackts. gates & similar works.								
		@ 40 kg /Sqm(Gate grill)	Kg	1	1.2	2.4		2.88		
				1	6	2.4		14.4		
								17.28		
14		Carriage of Materials						864	88.8	76,723.20
		Steel	MT.					4.26	290.27	1,237.16
		bricks	per thousand					5.542	767.08	4,251.16
		stone	cum.					25.4	1576.82	40,051.23
		cement	Mt.					16.3	290.27	4,731.40
		Sand	cum.					18.03	896.66	16,166.78
									Total Cost	7,28,670


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Appendix 22: ESTIMATE OF ENTRANCE GATE


SL. NO.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	No.	Length	Width	Depth	QTY.	RATE (Rs.)	AMOUNT
1	20.3A.1	Making 25cm (10") dia bore up to 5 M depth below ground with hand auger of approved quality in ordinary soil (vide classification of soil item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50 M lead including all lifts, all complete as per approved design and direction of E/L/	Rmt	12	5			60	148.6	8916
2	20.3A.2	Making 63 cm (25") dia under-ream at required depth with hand auger of approved quality in ordinary soil (vide classification of soil item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50M lead including all lifts, all complete as per approved design and direction of E/L/	Each	24					158.60	3806.4
3	2.8.1	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 M in width 10 sqm on plan)including dressing of sides and ramming of bottoms lift upto 1.5 m including getting out the excavated soil and disposal of surplus excavated soil as directed,within a lead of 50.0m	cum							
				2	17.3	1.5	0.75	38.925		
				6	3	1.5	0.75	20.25		
								59.175	319.6	18912.33
4	2.28	Supply and filling in plinth with local sand and under floors including watering,ramming,consolidating and dressing complete	cum							
				2	17.3	1.5	0.075	3.8925		
				6	3	1.5	0.075	2.025		
								5.9175	238.6	1,411.92
5	4.1.8	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level.1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	cum							
		beam		2	17.3	0.5	0.1	1.73		
				6	3	0.5	0.1	0.9		
		gate path in slope		1	6.3	6	0.15	5.67		
				2	3.3	6	0.15	5.94		
								14.24	2940.8	41,876.99
		R.C.C WORKS								
6	BCD SOR, 5.1.1	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering, finishing and reinforcement-All work up to plinth level.1:1:2 (1 cement:1 coarse sand:2 graded stone aggregate 20mm nominal size)	cum							
		Beam		2	17.3	0.8	0.6	16.608		
		Beam		6	3	0.8	0.6	8.64		
				2	17.3	0.8	0.6	16.608		
				6	3	0.8	0.6	8.64		
		pile @ .250 mm radiuds		12		0.25	2.2	1.30		
		colum		10	4	0.8	0.6	19.2		
		colum pedestal main gate		2	0.75	1	0.5	0.75		
		security cabin		1	2.2	2.2	0.125	0.605		
		electrical control room		1	2.2	2.2	0.125	0.605		
		pergola		1	17.3	0.45	0.6	4.671		
		main gate beam & colum		2	9	1.45	0.5	13.05		
				2	17.3	1	0.5	17.30		
								107.97	6434.4	6,94,736.65
7	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in :	cum							
	6.1.12 A	Cement mortar 1:4 (1 cement : 4 coarse sand)								
				4	2.6	3	0.25	7.8		
				2	2.5	3	0.25	3.75		
				2	1.15	3	0.25	1.725		
								13.28	5037.2	66,868.83
8	13.13.4	Providing 20mm thick cement plaster 1:6(1cement:6 coarse sand)	Sqm							
				4	2.6	3		31.2		
				2	2.5	3		15		
				2	1.15	3		6.9		
								53.1	175.00	9,186.30

9	13.79.1	Finishing walls with water proofing cement paint of approved brand and manufacture and of required shade to give an even shade New work(three or more coats)	Sqm							
		Plaster area		1				53.1	68.3	3,626.73
10	7.30	Providing and laying Red Sand Stone as per approved sample 30 mm thk (only cladding)	sqm							
				2	1.45	9		26.1		
				2	3.3	1		6.6		
				1	6	0.6		3.6		
								36.3	949	34,448.70
11	7.37	Stone work for wall lining etc.(Veneer work) over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand) and jointing with grey cement slurry 3.30 kg/sqm including rubbing and polishing complete.(to be secured to the backing by means of cramps which shall be paid seperately)								
	7.37.1 A	Dressing of sandstone in veneer work	sqm							
				2	1.15	6		13.8		
				1	1	6		6		
								19.8	2236.8	44,288.64
12	5.22.7B	Reinforement for R.C.C work including straightening, cutting, bending, placing in position and binding all complete	kg	20,514.73				20,514.73	76.7	15,73,479.60
13	10.32.2	Steel work welded in built up sections/framed work including cutting hoisting, rixing in position and applying a priming coat of approved steel primer using structural steel, etc. as required..								
		In gratings, frames, guard bar, ladders, railings, brackts. gates & similar works. @ 40 kg /Sqm(Gate grill)	Kg	2	3	2		12		
				1	6	2.4		14.4		
				2	1.25	2		5		
								31.4		
								1256	88.8	1,11,532.80
14		Carriage of Materials								
		Steel	MT.					20.51	290.27	5,954.81
		bricks	per thousand					6.56	767.08	5,032.04
		stone	cum.					91.77	1576.82	1,44,704.77
		cement	Mt.					67.42	290.27	19,570.00
		Sand	cum.					50.71	896.66	45,469.63
									Total Cost	28,33,823.14
									Total Cost of 3nos gate.	85,01,469.42


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Appendix 23A: Estimate of Swimming Pool

SL.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	RATE	QTY.	AMOUNT (Rs.)
1	2	3	4	5	6	7
1	2.6	Earth work in excavation over areas (exceeding 30 cm in depth. 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m ; disposed earth to be levelled and neatly dressed.				
	2.6.1	All kinds of soil	cum	279.1	1787.26	498824.266
2	2.26	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.	cum	103.30	442.68	45728.844
3	11.41	Providing and laying vitrified floor tiles in different sizes {thickness to be specified by the manufactruer) with water absorption's less than 0.08 % and conforming to IS : 15622 of approved make in all colours and shades, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) including grouting the joint with white cement and matching pigments etc., complete.	SQM			
	11.41.1	Size of Tile 50x50 cm.		1377.1	1338.35	1843041.785
4	2.28	Supplying and filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.	cum	238.6	267.67	63866.062
		CONCRETE WORK				
5	4.1.8	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level.1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	cum	2940.8	136.85	402448.48
6	BCD SOR, 5.1.2	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering, finishing and reinforcement-All work up to plinth level. 1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size)	cum	4902.3	488.08	2392714.584
		REINFORCEMENT				
7	5.22.7B	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete.	KG	76.7	47471.56	3641068.652
		Shuttering				


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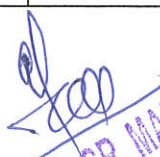
8	BCD SOR, 5.9.2	Walls (any thickness) including attached plas	Sqm	321.3	92.52	29726.676
9	4.3.1	Foundations, footings, bases Columns	SQM	185.9	639.32	118849.588
		Masonry work				
10	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in :				
	6.1.12 A	Cement mortar 1:4 (1 cement : 4 coarse sand)	cum	5037.2	33.96	171063.312
		Finishing				
11	13.11	12 mm cement plaster of mix				
	13.11.2	1:4 (1 cement : 4 coarse sand)	sqm	139.9	290.47	40636.753
12	13.26	Neat cement punning	sqm	38.60	290.47	11212.142
		Flooring				
13	11.36	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (Thickness to be specified by the manufacture) 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 Motar 1:3 (1cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	Sqm	739.8	220	162756
14	11.37	Providing and laying Ceramic glazed floor tiles 300x300 mm (thickness to be specified by the manufacturer) of ist quality conforming to IS : 15622 of approved make in colours such as white , Ivory , Grey , Fume Red , Brown , laid on 20 mm thick Cement motar 1:4 (1 cement: 4 coarse sand) including pointing the joints with white cement and matching pigment etc., complete	SQM	671	1250	838750
15	11.26	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 . Base with 1:1:1 (1 lime : 1 surkhi: 1 coarse sand) / 1:4				
	11.26.1	20 to 25 mm thick -	SQM	1119.6	181.98	203744.808


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16	8.2	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations, of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.	SQM			
	8.2.2	Granite of any colour and shade				
	8.2.2.1	Area of slab upto 0.50 sqm	SQM	3741.2	181.98	680823.576
17	22.1	Providing and laying integral cement based treatment for water . proofing on horizontal surfaces at all levels as directed by Engineer-in-charge and consisting of: 1) 1st layer of 20 mm thick approved and specified rough stone slab over a 25 mm thick base of cement mortar 1:3 (1 cement:3 coarse sand) mixed with water proofing compound conforming to IS: 12645 in the recommended proportion. Joints sealed and grouted with cement slurry mixed with water proofing compound conforming to IS: 12645 in proportions recommended by the manufacturer. II) 2nd class layer of mm thick cement mortar 1:3 (1 cement:3 coarse sand) mixed water proofing compound in recommended proportions. III) Finishing top with stone aggregate of 10 mm to 12 mm nominal size spreading @ 8 cum/sqm thoroughly embedded in the 2nd layer.				
	22.1.1	using rough kota stone	SQM	1304.3	1377.26	1796360.218


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18	22.2	Providing and laying integral cement based treatment for water proofing on the vertical surface by fixing sspecified stone slab 20 mm thick with cemm slurry mixed with water proofing compound conforming to IS: 2645 in recommended proportion with a gap of 20 mm (minimum) between stone slabs and the receiving surfaces and filling the gaps with neat cement slurry mixed with water proofing compound and finishing the exterior of stone slab with cement mortar 1:4 (1 cement:4 coarse sand) 20 mm thick with neat cement punning mixed with water proofing compound in recommended proportion complete at all levels and as directed by Engineer-in-charge.				
	22.2.1	using rough kota stone	SQM	1627.8	358.28	583208.184
19	11.43	Fixing glazed/ Ceramic/ Vitrified floor tiles with cement based high polymer modified quick-set tile adhesive (Water based) conforming to IS: 15477, in average 3 mm thickness.	SQM	380.6	1470	559482
20	9.48	complete. Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all				
	9.48.2	welding Fixed to openings/ wooden frames with rawl plugs	kg	122.9	2373.7	291727.73
21	MR	providing and suppling lane ropes with anchor brackets	each	1680	9	15120
22		Carriage of Materials				
		Steel	MT.	47.471	290.27	13779.40717
		Bricks	per thousand	16.776	767.08	12868.53408
		Stone	cum.	535	1576.82	843598.7
		Cement	Mt.	242.27	290.27	70323.7129
		Sand	cum.	331.1	896.66	296884.126
					Total Cost	1,56,28,608


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Appendix 23B - Electro-Mechanical BOQ for Swimming Pool

Type of Swimming Pool	: Over Flow Type
Surface Area for Main Pool Approx	: 1250.0 M2
Depth for Main Pool Approx	: 2.0 M
Volume for Main Pool Approx	: 2500.0 M3
Volume for Balancing Tank	: 125.0 M3
Total Volume for Main Pool + Balancing tank Approx	: 2625.0 M3
Turnover Period	: 5.0 Hrs.
Flow Rate	: 525.0 M ³ /Hr.
Nos. of Pump Provided	: 5 Working + 1 Standby
Flow of Each Pump Approx	: 105.0 M3/hr.
Filtration Velocity	: 35.0 M ³ /Hr/M ²
Filter Offered	: 5.0 Nos.
Cross Sectional Area Required for Each Filter	: 3.00 M ²
Suggested Filter Dia	: 2000 mm
Provided Cross Sectional Area per Filter	: 3.140 M ²

Sl. No.	Description	Qty.	Unit	Unit Rate (In Rs.)	Total
EQUIPMENT PART					
1(a)	Supply of Bobbin Wound Side Mount Sand Filter manufactured with fiber glass and polyester resin, UV resistance surface, fitted with collector arms and diffuser made from unplasticised PVC and Polypropylene with lid in polyester resin and fibre glass, manual air purge and 6" PVC flanged connection for inlet and outlet, Pressure gauge, water drain/empty drain for filter etc. Complete in all respects.				
	Capacity 105000 ltrs/hr				
	Design @ 35000 ltrs/sqm/hr.				
	Diameter 2000 mm	5	Nos.	9,50,000.00	47,50,000.00
	Working Pressure 2.5 kg/cm ²				
	Model: GD-301925				
(b)	Valve Battery				
	Supply of Valve Battery Manifold made in PVC with flanges for connecting to filters Consists of set of 5 - butterfly valves for carrying out filtration, back-washing, rinsing and shut down of the filters. Size : 160mm	5	Nos.	1,50,000.00	7,50,000.00
	Model: GD-301935				
(c)	Coarse & Fine Sand media for filter	22500	Kg	15.00	3,37,500.00
2	Supply of Self Priming pumps with plastic body, in built strainer basket, Impeller in PPO, Motor shaft in stainless steel AISI-420, Mechanical seal in SIC/graphite and steatite, Motor housing in aluminium, with motor -2800rpm, F class insulation, protection IP-55. (5W+1S)				
	Capacity 105000 ltrs/hr				
	Head 16 mtr				
	Hp 10.0, Three Phase	6	Nos.	2,25,000.00	13,50,000.00
	Model: GSP-3020-7.5				

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3	Swimming Pool U.V. Sterlizer				
	Supply of U.V. Sterlizer with S.S. Housing outside, U.V. Lamp, glass tube and all other accessories with cleaning arrangement, supports, inlet outlet connection with bypass arrangement including S.S. Cabinet with glass door of suitable size to house the U.V. Sterlizer complete with required accessories.				
	Flow rate = 100000 Ltr/Hr				
	working Pressure = 2.5 Kg/Sqm	6	Nos.	6,50,000.00	39,00,000.00
	Model: UV-3010240W				
4	Dosing Pump	3	Nos.	48,000.00	1,44,000.00
	Supply of Chemical dosing Pump for Chlorination with 200 Ltrs. Sintex tank and Accessories				
	Capacity 0-20 litres/hr.				
	Head 35 M				
	Model: DP-301004				
5	Stainless Steel Drain				
	Supply of Stainless steel drain grating plate made out of 316 quality S S plates with suitable supporting frame and of following sizes and having holes of required size for drainout chamber.				
	Size 500X500 MM	2	Nos.	32,000.00	64,000.00
	Model: DG-SS-316-04				
6	Inlet Nozzle	100	Nos.	714.00	71,400.00
	Supply of Flow adjustable ABS inlet nozzles UV treated with S.S. screws to fit in the 2" PVC pipes				
	Model: IN-301201				
7	Suction Inlets (Vacuum points)	6	Nos.	485.00	2,910.00
	Supply of ABS white plastic suction port / Vacuum nozzle with 2 inch solvent cement connection				
	Model: VC-301301				
8	Ladder				
	Supply of Stainless Steel 316 ladders , width: 500mm wide, handrails dia 43mm stainless steel , non-slip steps provided with anchoring Socket.				
a	6 Step Standard Ladder with Anti-skid Steps	4	Nos.	48,000.00	1,92,000.00
	Model: LD-ST-316-6				

9	Underwater LED Lights				
	Supply of 24Volt 54 W under water stainless steel 316L LED light fixture (IP 68) including all required assessories & making connection as required. with 2 Mtr power cord. Model: UWL-301615	20	Nos.	45,000.00	9,00,000.00
10	Power Supply	2	Nos.	15,000.00	30,000.00
	Supply of Transformer for LED Lights 24V DC, 30 amp Model: PS24-301605				
11	Deck Box	20	Nos.	1,071.00	21,420.00
	Supply of ABS white plastic deckbox. Model: JB-301101				
12	Cleaning Accessories				
a	Extensive telescopic Handle, (2.4 - 4.8) metres long & 1.1mm thick for cleaning attachment in anodized almunium. Model: GD-TP224A	1	Nos.	3,648.00	3,648.00
b	Transparent Blue Polyethylene hose 40mm(1-1/2") dia 30 m length. Model: GD-H3815PE	1	Nos.	10,580.00	10,580.00
c	Surface net skimmer made in polypropylne Model: GD-LS301	1	Nos.	884.00	884.00
d	Deep bag net Skimmer made in polypropylne Model: GD-LS201	1	Nos.	702.00	702.00
e	Curved polybristle wall brush 450 mm Model: GD-BR401	1	Nos.	642.00	642.00
f	Test kit for PH and chlorine. Model: GD-TK907	1	Nos.	618.00	618.00
g	Hi-grade Stainless Steel Algae Brush - 10" Model: GD-BR404	1	Nos.	1,067.00	1,067.00
h	Vacuum head with SS-body, 1 1/2" connection size 900 mm long Model: GD-SS-VH01	1	Nos.	58,000.00	58,000.00
i	Deluxe large Vacuum head with 4 wheels, alu-body, plastic handle, 1 1/2" connection size 445x130 mm	1	Nos.	6,100.00	6,100.00
j	Polybristle wall brush 10" (26cm) Model: GD-BR402	1	Nos.	375.00	375.00
k	Chemical TCCA 90 (50 kg.) & ALUM (30 kg.) Model: GD-301921	1	Set	18,000.00	18,000.00
l	nylon rope	100	Mtr	85.00	8,500.00


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13	Competition Equipment				
i	Starting Blocks	10	Nos.	1,86,125.00	18,61,250.00
	Supply of Fixed Diving Starting Block 700mm height				
	Make: GADS/DGM				
ii	Float Lines	11	Nos.	1,76,420.00	19,40,620.00
	Supply of Roma model lane separator 50mt complete				
	Make: GADS/DGM				
iii	Anchoring Sockets	22	Nos.	14,230.00	3,13,060.00
	Supply of Stainless steel separator anchor.				
	Make: GADS/DGM				
iv	Float Line Roller	2	Nos.	1,81,500.00	3,63,000.00
	Supply of Separator collection wheel 1.8m				
	Make: GADS/DGM				
v	Backstroke turn indicators	2	Nos.	90,430.00	1,80,860.00
	Supply of backstroke indicator for pools up to 25m wide (posts are complete with cords with floats)/ pair				
	Make: GADS/DGM				
vi	Anchoring Sockets	4	Nos.	14,230.00	56,920.00
	Supply of Stainless steel separator anchor.				
	Make: GADS/DGM				
vii	False start post indicator	1	Nos.	95,940.00	95,940.00
	Supply of false indicator for pools up to 25m wide (posts are complete with cords with floats)/ pair				
	Make: GADS/DGM				
viii	Anchoring Sockets	2	Nos.	14,230.00	28,460.00
	Supply, of Stainless steel separator anchor.				
	Make: GADS/DGM				
ix	Supply of Lifeguard chair with wheels made in S/S AISI 304 , dia 43mm tube . Treads , platform , chair including parasol holder made of polypropylene fibre - glass . Complete with wheeled base	2	Set	85,000.00	1,70,000.00
	Make: GADS/DGM				
14	Life Saving Equipment				
i	J Hook / Safety Hook	2	Nos.	6,000.00	12,000.00
	Make: GADS/DGM				
ii	Life jacket	6	Nos.	5,500.00	33,000.00
	Make: GADS/DGM				
iii	Oxygen Cylinder with trolley	1	Nos.	45,000.00	45,000.00
	Make: GADS/DGM				
iv	Single fold Stretcher	1	Nos.	8,500.00	8,500.00
	Make: GADS/DGM				
v	First Aid Kit	1	Nos.	3,500.00	3,500.00

	Make: GADS/DGM				
vi	Artificial Respirator / Ambu bag	1	Nos.	6,500.00	6,500.00
	Make: GADS/DGM				
vii	Life buoy ring	6	Nos.	8,550.00	51,300.00
	Make: GADS/DGM				
Total Price in Rupees					1,77,92,256.00


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PLUMBING & ELECTRICAL PART					
15	uPVC pipes				
	Providing and fixing uPVC pressure Pipes (10kg/cm ²) with plain socket suitable for solvent cement jointing conforming to IS:4985/2000 & fittings conforming to IS 7834/87. Cut to required lengths including all necessary fittings and specials such as bends, tees, unions, reducers, flanges and plugs etc. The pipes & fittings shall be tested to a pressure of 10 Kg/Sq.cm.				
i)	32 mm dia	30	RM	130.00	3,900.00
ii)	50 mm dia	RO	RM	198.00	
iii)	63 mm dia	78	RM	295.00	23,010.00
iv)	75 mm dia	6	RM	415.00	2,490.00
v)	90 mm dia	132	RM	582.00	76,824.00
vi)	110 mm dia	6	RM	865.00	5,190.00
vii)	160 mm dia	312	RM	1,826.00	5,69,712.00
viii)	200 mm dia	270	RM	2,817.00	7,60,590.00
vii)	250 mm dia	282	RM	4,810.00	13,56,420.00
viii)	315 mm dia	12	RM	7,858.00	94,296.00
16	Ball Valve				
	Providing and fixing Pvc lever operated ball valve of full flow with setting and gland of superior quality having minimum working pressure of 10 kg/cm ² with union, flanges where as required.				
i)	32mm dia	10	Nos.	567.00	5,670.00
ii)	40mm dia	RO	Nos.	848.00	
iii)	50mm dia	RO	Nos.	1,426.00	
iv)	63mm dia	RO	Nos.	2,084.00	
v)	75mm dia	1	Nos.	5,503.00	5,503.00
vi)	90mm dia	RO	Nos.	8,047.00	
17	Butterfly Valve				
	Providing and fixing uPVC butterfly valves. Tested to a pressure not less than 10 Kg/Sq.cm. Including rubber gasket, flanges, nuts, bolts, washers complete as required.				
i)	90 mm dia	12	Nos.	9,132.00	1,09,584.00
ii)	110 mm dia	1	Nos.	11,168.00	11,168.00
iii)	160 mm dia	7	Nos.	17,617.00	1,23,319.00
iv)	200 mm dia	10	Nos.	28,360.00	2,83,600.00
iv)	250 mm dia	3	Nos.	66,994.00	2,00,982.00
18	Non return valve				
a	Providing and fixing Pvc ball Type Or Spring Loaded Non Return valve with setting and gland of superior quality having minimum working pressure of 10 kg/cm ² with union, flanges where as required.				
i)	50mm dia	RO	Nos.	2,703.00	
ii)	63mm dia	RO	Nos.	3,910.00	
iii)	75mm dia	RO	Nos.	6,900.00	

b	Providing and fixing of uPVC Wafer Check Valve non-return valves (PN 10) complete with matching flanges, rubber insertion, nuts, bolts and washer etc. of following sizes.				
i)	75mm dia	RO	Nos.	4,280.00	
ii)	90 mm dia	RO	Nos.	5,168.00	
iii)	110 mm dia	RO	Nos.	6,009.00	
iv)	160 mm dia	6	Nos.	11,034.00	66,204.00
v)	200 mm dia	2	Nos.	16,421.00	32,842.00
vi)	250 mm dia	3	Nos.	24,641.00	73,923.00
19	Puddles Sleeve				
	Supply & fixing of following sizes of heavy duty PVC puddle flanges (uPVC pipe(10 kg/cm ²) fixed with flanges, length 400 to 600 mm length) on the wall of plantroom, balancing tank and the water body walls & Slab (As required). To be laid in between the steel reinforcement before RCC. Does not include any civil work.				
i)	32 mm dia	2	Nos.	300.00	600.00
ii)	50 mm dia	RO	Nos.	405.00	
iii)	63 mm dia	RO	Nos.	675.00	
iv)	75 mm dia	1	Nos.	900.00	900.00
v)	90 mm dia	RO	Nos.	1,080.00	
vi)	110 mm dia	1	Nos.	1,530.00	1,530.00
vii)	160 mm dia	1	Nos.	3,150.00	3,150.00
viii)	200 mm dia	2	Nos.	3,800.00	7,600.00
ix)	250 mm dia	7	Nos.	4,800.00	33,600.00
20	Supply, laying, testing and commissioning of SS 304 Grade 400MM DIA Pump Suction Header with 2 Nos 250mm Dia Flange Connection For Balancing Tank to Pump Suction Header, 1 No. 90 mm Dia Flange Connection For Vacuum Pipe & 1 No. 250 mm Dia Flange Connection For Pool Drain Pipe & 6 No. 200mm Dia Flange Connection For Pump Suction.	1	Nos.	2,65,000.00	2,65,000.00
21	Supply, laying, testing and commissioning of SS 304 Grade 300MM DIA Pump Delivery Header with 2 Nos 200mm Dia Flange Connection For Filter Inlet Header, 1 No. 160 mm Dia Flange Connection For Drain Pipe & 6 No. 160mm Dia Flange Connection For Pump Delivery.	1	Nos.	2,10,000.00	2,10,000.00
22	Supply, laying, testing and commissioning of following size PVC insulated sheathed copper conductor 1100 V grade unarmoured cable with required size of sleeves complete as required.				
i	4 x 16 sq.mm	RO	RM	745.00	
ii	4 x 6 sq.mm	100	RM	292.50	29,250.00
iii	4 x 4 sq.mm	RO	RM	149.00	
vi	4 x 2.5 sq.mm	RO	RM	130.00	
v	4 x 1.5 sq.mm	RO	RM	108.00	
vi	3 x 6 sq.mm	RO	RM	267.00	
vii	3 x 4 sq.mm	RO	RM	133.00	
iii	3 x 2.5 sq.mm	RO	RM	125.00	
ix	3 x 1.5 sq.mm	RO	RM	98.00	
x	2 x 6 sq.mm	200	RM	157.00	31,400.00


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xi	2 x 4 sq.mm	RO	RM	105.00	
xii	2 x 2.5 sq.mm	100	RM	70.00	7,000.00
xiii	2 x 1.5 sq.mm	100	RM	55.00	5,500.00
23	Supply, laying, testing and commissioning of following size PVC insulated sheathed copper conductor flexible multistand wire complete as required.				
i	1.5 sqmm	RO	RM	28.00	
ii	2.5 sqmm	RO	RM	40.00	
iii	4 sqmm	RO	RM	50.00	
24	Supply, laying, testing and commissioning of following size PVC electrical conduit complete as required.				
i	20 m	RO	RM	55.00	
ii	25 m	720	RM	60.00	43,200.00
25	G.I. earthing wire 8 gauge from all motor and M.C.C panel to be connected in as approved manner to the general earthing system complete.				
i	8 Gauge GI Wire	100	RM	115.00	11,500.00
26	Providing and fixing M.S. slotted cable tray supported from ceiling at intervals of 60 cms on both ends including cable clips with nuts and bolts welding of support rods with ceiling inserts or through dash fasteners cutting and making good complete.				
i	300mm wide	30	RM	650.00	19,500.00
ii	150mm wide	50	RM	450.00	22,500.00
27	Providing and fixing M.S.support with nuts and bolts welding of support rods with ceiling inserts or wall through dash fasteners cutting and making good complete	300	kg	170.00	51,000.00
28	ELECTRICAL CONTROL PANEL				
	Supply, installation, testing and commissioning of following swimming pool panel 415 V, 1 / 3 Phase and 50 Hz power distribution system. The panel shall be free standing floor mounting sheet metal enclosed dust and vermin proof confirming to IP-54, compartmentalized design fabricated out of 16 SWG sheet Steel, painting earthing numbering, danger plate as per specifications and drawings. Flush front with aluminium busbars, seperate earth bus bars to be provided throughout the length of the panel the incoming and outgoing feeder breakers, fuses, indicating lamps etc shall be accomadated in a modular multilier arrangement. The panel shall be powder coated through 9 tank process. Adequate size cable alley shall be provided forcable termination.The outgoing feeders inside shall be connected through bus bars/ flexible cable links.	1	Set	3,85,000.00	3,85,000.00
	Bus bars shall be provided with heat shrinkable sleeves and shall be colour coded. The panels shall be suitable for cable entry from top to bottom. The panels shall be fabricated after the approval of drawings.				

	Starter shall be provided with MCB/MCCB. Suitable for the specified Kw of motor AC 3 power contractors. Single phasing preventer, on-off indication Lamps, start stop push buttons. Auto manual selector switch, ammeter with suitable auxillary contact remote control, interlocking etc starter shall be Type 2 coordinated. "c" curve MCB's 10 KA shall be used wherever required.				
a	Incoming:				
	One (1) no. 200A TP 25 KA MCCB with thermomagnetic based overload and short circuit release.				
	Digital flush mounted 0-200A ammeter with 3 way and OFF selection switch with 3 Nos. 200/5 Amp CT.				
	1 set (3 Nos.) of phase indication lamps				
	200A 25 KA TPN Aluminium bus bar. It shall be insulated with heat shrinkable sleeves and shall be color coded.				
b	Outgoing:				
	Recirculation pump				
	Six (6) Nos. DOL starter complete with separate single phasing protection feature. ON/OFF indicating lamps, relay, contractors, start/stop push button, auto/manual selector switch, sufficient nos of potential free spare contacts, etc for suitable HP				
	3 Nos. 6AMP DP MCB of suitable rating with correct thermal range suitable for chemical dosing				
	3 Nos. Toggle switch for LED Pool Lights				
	6 Nos. 6AMP DP MCB of suitable rating with correct thermal range suitable for UV				
	6 Nos. Toggle switch for LED Pool Lights				
	1 Nos. 16AMP DP MCB of suitable rating with correct thermal range suitable for Underwater Lights				
	1 Nos. Toggle switch for LED Pool Lights				
28	Designing, Installation, testing & commissioning of Equipments	1	Job	6,50,000.00	6,50,000.00
Total Price in Rupees					55,83,457.00
Civil Item					1,45,28,117.91
GRAND TOTAL IN INDIAN RUPEES					2,33,75,713.00

Terms & Conditions

Taxes and freight shall be claimed extra as actual.

Payment Terms : 50 % advance along with the LOI / PO

10% Submission Of Shop Drawing

30% Before Dispatch of material

10% Against the commissioning

Contract Validity : 6 Month

Exclusions List:

- 1 Water Supply at the Plant room with adequate pressure.
- 2 Backwash connection from the Filter to the Storm water drain.
- 3 Water and Electricity for Construction, Testing and Commissioning.
- 4 All Civil Work.
- 5 Plant room construction along with pump base, balancing tank, drains, lighting etc.
- 6 Suitable Power supply at Plant room for running all electrical equipments.
- 7 All Civil works, waterproofing, finishes.


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Appendix 26 : Estimate of Parking

Sl.No.	Ref. SOR 2018	Description Of work	Unit	No	Length	Breadth	Depth	Qty	Rate (Rs.)	Amount (Rs.)
1	2.28	Supply and filling in plinth with local sand and under floors including watering, ramming, consolidating and dressing complete	Cum							
				1	125	30	0.075	281.25		
				1	45	5	0.075	16.875		
				1	59	22	0.075	97.35		
								395.48	238.60	94,360.34
	RCD 4.12	Providing and laying Wet Mix macadam in layers with all leads and lifts etc. Complete as per drawings, Technical Specification 406 and as directed by the Engineer, With Vibratory Roller	cum							
		50% of total area		0.5	125	30	0.25	468.75		
				0.5	45	5	0.25	28.125		
				0.5	59	22	0.25	162.25		
								659.13	1005.00	6,62,420.63
2	4.1.8	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level. 1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	Cum							
		20% of total area		0.2	125	30	0.15	112.5		
				0.2	45	5	0.15	6.75		
				0.2	59	22	0.15	38.94		
								158.19	2940.8	4,65,205.15
3	11.79.1	Providing and laying factory made chamfered edge Cement Concrete paver blocks of required strength, thickness & size/shape, made by table vibratory method, to attain superior smooth finish using PU or equivalent moulds, laid in required Grey colour & pattern over 50mm thick compacted bed of coarse sand, compacting and proper embedding / laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with jamuna sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand In footpath, parks, lawns, drive ways or light traffic parking etc. all complete as per manufacturer's specifications & direction of Engineer-in Charge (a) 80 mm thick c.c. paver block of M-35 grade with approved colour design and pattern.	Sqm							
		30% of total area	Sqm	0.3	125	30		1125		
				0.3	45	5		67.5		
				0.3	59	22		389.4		
								1581.9	812.70	12,85,610.13
4	11.45	Providing and laying 500x500x40 mm thick Turf paver (Turf pave XD) on 150 mm thick sub grade of compacted bed of 20 mm thick nominal size stone aggregate and base course and filling with 150 mm thick jamuna sand, including spreading, well ramming, consolidating and finishing smooth etc. all complete as per direction of Engineer-in-charge.	Sqm							
		50% of total area on the top of wmm area	Sqm	0.5	125	30		1875		
				0.5	45	5		112.5		
				0.5	59	22		649		
								2636.5	894.8	23,59,140.20
5	16.69	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3 coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	Cum	1	230	2.5	0.2	115	5180.8	5,95,792.00
	RCD 8.4.2	Retro- reflectorised Traffic signs (Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of encapsulated lens type reflective sheeting vide clause 801.3, fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing.) 60 cm equilateral triangle	each	12						37,224.00

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7		Carriage of Materials								
		Steel	MT.					0	328.28	-
		Paver block	per thousand					51.02	767.08	39,133.56
		stone	cum.					1010.67	2701	27,29,819.67
		cement	Mt.					26.89	328.28	8,827.45
		Sand	cum.					469.35	1030.3	4,83,571.31
									Total Estimated cost	87,61,104


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Appendix 27 : Open Air Theater (OAT)

No.	Ref.No.	Description	Numbers	Measurement			Unit	Total Quantity	Rate		Amount
				Length	Breadth	Height			Agreement	SoR	
1	15.2	Demolishing cement concrete including disposal of material within 50 metre lead of seating and boundary									
2	15.2.1	1:3:6 or richer mix		2531.25		0.05	cum	126.5625		807.2	102161.25
3		Carriage upto 5km						0			
4											
5		Staircase and steps seating									
6	13.11	12 mm thick cement plaster of mix:									
7	13.11.1	1:3 (1 cement:3 coarse sand)		585			sqm	585		153.6	89856
8	11.28	Supplying sand stone 40 mm thick for flooring ,carriage to site and rough chisel dressing on Open Air theater (STEPS SEATING) under engineer incharge									0
9	11.28.1.1	Red sand stone		491.4			sqm	491.4		373.7	183636.18
10	11.28A	40 mm thick rough chisel dressed stone flooring over 20 mm (average)thick base with joint base 1:1:1 (1lime :1surkhi:1coarse sand) or 1:5 (1:cement :5coare sand) finished flush.all the work going under the supervision of engineer incharge									
11	11.28A.1	Red sand stone		491.4			sqm	491.4		659.3	323980.02
12		Staircase									
13	16.92	Providing and fixing 10x10x7.50 cm Granite stone block hand cut and chisel dressed on top, for paving in floors, drains etc. laid over 20mm thick base mortar 1:4 (1 cement : 4 coarse sand) with joints 10mm wide filled with same mortar including ruled pointing etc. complete as per direction of engineer-in-charge.		93.5			sqm	93.5		1309.1	122400.85
14		platform area									
15	4.4	Providing and faying cement concrete in platform area .									
16	4.4.1	1:2:4 (1 Cement :2 coarse sand :4 grade stone aggregate 20 mm nominal size)		508.68		0.15	cum	76.302		4151.4	316760.1228
17	13.11	12 mm thick cement plaster of mix:									
18	13.11.1	1:3 (1 cement:3 coarse sand)		508.68			sqm	508.68		153.6	78133.248
19	11.28	Supplying sand stone 40 mm thick for flooring ,carriage to site and rough chisel dressing on Open Air theater (STEPS SEATING) under engineer incharge									
20	11.28.1.1	Red sand stone		508.68			sqm	508.68		373.7	190093.716
21	11.28A	40 mm thick rough chisel dressed stone flooring over 20 mm (average)thick base with joint base 1:1:1(1lime :1surkhi:1coarse sand)or 1:5(1:cement:5coare sand) finished flush.all the work going under the supervision of engineer incharge									
22	11.28A.1	Red sand stone		508.68			sqm	508.68		659.3	335372.724
23		Stage									
24	4.4.1	Providing Cement concrete on tap face 1:2:4(1cement :2coarse sand :4grade stone aggregate 20mm nominal size)		10	6	0.15	cum	9		4151.4	37362.6
25	16.92	Providing and fixing 10x10x7.50 cm Granite stone block hand cut and chisel dressed on top, for paving in floors, drains etc. laid over 20mm thick base mortar 1:4 (1 cement : 4 coarse sand) with joints 10mm wide filled with same mortar including ruled pointing etc. complete as per direction of engineer-in-charge.		86			sqm	86		1309.1	112582.6
26		Boundary Wall									
27	13.13.2	20 mm cement plaster of mix 1: 4(1 cement: 4 coarse sand)	2	151.2		5	sqm	1512		194.3	293781.6
28	13.48	Finishing with Deluxe Multi surface paint system for interiors and exteriors wall of boundary using Primer as per manufacturers specifications.									
29	13.48.1	Two or more coats applied on walls @ 1.25 ltr/10 sqm over and including one coat of special primer applied @ 0.75 ltr /10	2	151.2		5	sqm	1512		92.2	139406.4
30	9.48	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all									
31	9.48.1	Fixed to steel windows by					Kg	6000		114.2	685200
32	13.82	Painting with ready mixed paint of approved brand and manufacture in all shades to give an even shade:									
33	13.82.1	New steel work (two or more coats)					Sqm	250		74.5	18625
34	Analysis	Carriage									
35	A	Brick	Per Thousand							767.08	0
36	B	Local Sand	Cum							262.05	0
37	C	Coarse Sand	Cum					79.023326		1030.3	81417.73226
38	D	Stone Chips	Cum					76.76327		2701.25	207356.7825
39	E	Cement	MT					37.377478		472.68	17667.58642
40	F	Steel	MT					6		328.25	1969.5
41		TOTAL									3337763.912


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Appendix 32 - Estimate of Basketball Court

SL.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	RATE	QTY.	AMOUNT (Rs.)
1	2	3	4	5	6	7
1.0	2.6	Earth work in excavation over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m ; disposed earth to be levelled and neatly dressed.				
	2.6.1	All kinds of soil	cum	279.1	94.00	26235.4
2.0	2.26	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.	cum	103.3	30.00	3099
		CONCRETE WORK				
3.0	4.1.8	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level.1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	cum	2940.8	33.00	97046.4
4.0	5.1.2	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering, finishing and reinforcement-All work up to plinth level. 1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size)	cum	4902.3	61.00	299040.3
5.0	5.22.7B	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete.	KG	76.7	4880	374296
6.0	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in :				
	6.1.12 A	Cement mortar 1:4 (1 cement : 4 coarse sand)	cum	5037.2	35.00	176302
7.0	11.40	52 mm thick cement concrete flooring with metallic concrete hardener topping under layer 40 mm thick cement concrete 1:2:4(1 cement:2 coarse sand:4 graded stone aggregate 20 mm nominal size) and top layer 12 mm thick metallic concrete hardener consisting of mix 1:2 (1 cement hardener mix:2 stone aggregate 6 mm nominal size) by volume @ 2 liter per 50 kg of cement or as per manufacture specification. This includes cost of cement slurry, etc. but excluding the cost of nosing of steps etc. complete.	SQM	450.8	608.00	274086.40
8.0	11.13.1	Providing and fixing glass strips in joints of terrazo/cement concrete floors, 40mm wide and 4mm thick	Meter	49.60	300.00	14880.00
9.0	Gem	Providing and Fixing One pair of Basketball Pole (made of minimum 5.0 mm thick 8" round pipe), Acrylic Backboard with angle iron frame (180mm x 105mm x x25mm), Ring (20mm solid Rod) and Net (regulation size) Movable type as per standards. Contractor shall get approved the make and design of the pole and accessories from the engineer-in charge. Approved make - STAG, RIDO, ESSKAY, KHALSA SPORTS, VINEX or equivalent.	Pair	240000.00	1.00	240000.00



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10.0	BCD 13.98.1	Floor painting with floor enamel paint of approved brand and manufacture of required colour to give an even shade, Providing and laying 50mm wide x 52 mm thick White Cemnet Border line(Boundary Luine, Base Line, Side line and internal lines) including the cost of centering and shittering required to create Curves, D's, Circles etc. complete as per drawing.	SQM	140.40	162.00	22744.80
10.0	BCD 13.82B.2	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacture's specifications including appropriate priming coat, preparation of surface, etc. complete. On Concrete work	SQM	106.10	180.00	19098.00
		Total				₹ 15,46,828


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Appendix 33 - Trellis Walkway

Sr. No.	Ref. No.	Description	Unit	Quantity	Rate As.	Amount
1	2.8	Earth Work Excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
	2.8.1	All Kinds of Soil	Cum	85.6	319.6	27357.76
2	4.19.1	All Work Up To Plinth Level				
	4.19.1.1	Provide PCC Layer of M-15 grade plain cement concrete (cement content considered @ 240 kg/cum)	Cum	2.304	4719.1	10872.8064
3	5.1	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring,shuttering,finishing and reinforcement-All work upto plinth level				
	5.1.2	1:1:5:3(1 cement: 1.5 coarse sand:3 graded stone aggregate 20 mm nominal size)	Cum	12.1	4902.3	59317.83
4	5.9	Centring and shuttering including strutting, propping etc. and removal of from for				
	5.9.1	Foundations, footings, bases of columns	Sqm	81.12	186.3	15112.656
	5.9.5	Lintels, beams, plinth bams, grids, bressumers and contilevers.	Sqm	57	335.3	19112.1
5	13.11	12 mm cement plaster of mix:				
	13.11.2	1:4(1 cement :4 coarse sand)	Sqm	70	139.9	9793
6	5.22	Reinforcement for R.C.C. work including straightening, cutting, bending,placing in position and binding all complete				
	5.22.7B	Thermo-Mechanically Treated bars TMTC-500-10mm dia.	Kg	1900	76.7	145730
	5.22.7A	Thermo-Mechanically Treated bars TMTC-500-8mm dia.	Kg	215	77.4	16641
7	9.1	Providing wood work in frames of doors, windows,clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of equired dia & length (hold fast lugs ordash fastener shall be paid for separately).				
	9.1.2	Sal Wood	Cum	7.92	87862.5	695871

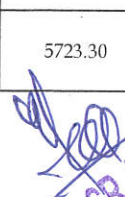

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8	7.42	Providing and Fixing,adjustable with stainless steel nuts, bolts and asher (total weight not less than 260 gms), for dry stone cladding fixed on rame work at suitable location, including making necessary recesses in stone slab,drilling required holes etc complete as per direction of the Engineer-in-charge.	Each	112	204.4	22892.8
9	13.48.2	Painting wood work with Deluxe Multi Surface Paint of required shade. Two or more coat applied @ 0.90 ltr/ 10 sqm over an under coat of primer applied @ 0.75 ltr/ 10 sqm of approved brand and manufacture.	Sqm	290.4	81.9	23783.76
10	13.46A	Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade :				
	13.46A.1	New work (Two or more coat applied @ 1.43 ltr/ 10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/ 10 sqm)	Sqm	70	90.1	6307
11	13.80 A .2	Providing and applying white cement based putty of average thickness 2 sqm 117.60 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	Sqm	70	117.6	8232
12	13.82	Painting with ready mixed paint of approved brand and manufacture in all shades to give an even shade:				
	13.82.2	New wood work (two or more coats)	Sqm	290.40	74.50	21,634.80
13	Analysis	Carriage				
	B	Coarse Sand	Cum	7.22	1030.3	7436.88
	C	Stone Chips	Cum	12.48	2701.25	33709.90
	D	Cement	MT	6.18	472.68	2921.51
	E	Steel	MT	2.12	328.25	694.25
TOTAL						11,27,421



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Appendix 34A : Renovation of Existing Indoor Badminton Stadium Stadium

Sl.No.	Ref.BCD SOR 2018	Description Of work	Unit	No	Length	Breadth	Depth	Qty	Rate (Rs.)	Amount (Rs.)
1		DISMANTLING AND DEMOLISHING								
	15.2	Demolishing cement concrete including disposal of material within 50 metre lead:								
	15.2.1	1:3:6 or richer mix	Cum	1	35.3	8	0.1	28.24	807.20	22795
	15.12	Dismantling doors windows and clerestory windows (steel or wood) shutters including chowkhats, architrage, holdfasts etc. complete and stacking within 50 metres lead:								
	15.12.1	Of area 3 sqm and below	Each	50				50	125.80	6290
	15.7	Demolishing brick work including stacking of serviceable material and disposal of unserviceable material within 50 meters lead:								
	15.7.4	In cement mortar	Cum	1	24	8	0.25	48	685.10	32884.8
	15.14	Dismantling wood work in frames, trusses, purlins and rafters upto 10 metres span and 5 metres height including stacking the material within 50 metres lead:								
	15.14.1	Of sectional area 40 cm* and above	Cum	1	35.3	16	0.025	14.12	1528.10	21576.8
	15.28	Dismantling roofing including ridges, hips valleys and gutters etc. and stacking the material within 50 metres lead of:								
	15.28.1	G.I. Sheet	Sqm	1	35.55	24		853.2	56.00	47779.2
2		CONCRETE WORK								
	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level.								
	4.1.5	1:3:6 (1 Cement: 3 coarse sand : 6 graded stone aggregate 20 mm nominal size)	Cum	1	8	35.55	0.15	42.66	3461.4	1,47,663.32
3		BRICK WORK								
	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in :								
	6.1.12.1	Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	1	45.28	0.25	3	33.96	5037.2	1,71,063.31
4		Plaster								
	13.11	12 mm cement plaster of mix								
	13.11.2	1:4 (1 cement : 4 coarse sand)	Sqm	1	18.34	4.9		89.87		
			Sqm	2	45.28	3		271.68		
							Total	361.55	139.9	50580.29
5		REINFORCED CEMENT CONCRETE WORK								
	5.2	Reinforced cement concrete in walls (any thickness) including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts, etc. up to floor five level, excluding the cost of centring, shuttering, finishing and reinforcement.								
	5.2.2	1:1.5:3 (1 Cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size)	Cum	1	18.34	4.9	0.15	13.48	5723.30	77150


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Sl.No.	Ref.BCD SOR 2018	Description Of work	Unit	No	Length	Breadth	Depth	Qty	Rate (Rs.)	Amount (Rs.)
6		SHUTTERING								
		Centring and Shuttering including strutting, propping etc. and removal of form for								
	5.9.1	Suspended floors, roofs, landings, balconies and access platform.	Sqm	1	18.34	4.9		89.87	362.60	32,585.41
7		REINFORCEMENT								
		Reinforcement for R.C.C work including straightening, cutting, bending, placing in position and binding all complete.								
	5.22.7 B	Thermo - Mechanically Treated bars TMTC - 500-10mm dia	Kg	1				1058.2	76.70	81162
8		ROOF SHEET								
	12.1	Providing corrugated G.S. sheet roofing fixed with G.I.J. or hooks, bolts and nuts 8 mm diameter with bitumen and G. I. limpet washers or with G.I. limpet washers filled with white lead and including a coat of approved steel primer and two coats of approved paint on over lapping of sheets complete (upto a pitch of 60°) excluding the cost of purlins, rafters and trusses.								
	12.1.3	1.00 mm thick with zinc coating not less than 275 gm/m z	Sqm	1	36	27		972.0	1121.40	1090000.8
9		FLOOR								
	26.1	Providing & fixing in position Phenol bonded Bamboowood flooring with planks of sizes 14mm thick, 1800mm length (minimum) and 130 mm wide(minimum), in approved colour, texture and finish, having Performance Appraisal Certificate (PAC) issued by Building Materials & Technology Promotion Council (BMTPC). The flooring shall be fixed with tongue and groove interlocking system, with underlayment of 4mm thick expanded poly ethylene foam sheets having density 40kg/cum, over prepared surface with necessary quarter round planks of size 1900mm x 18mm and door reducer of size 1900mm x 44mm, wherever required. The bamboo wood planks shall have minimum density of 1000 Kg/cum & minimum Hardness 1000 Kgf. with Eco friendly UV coating, all complete as per direction of the Engineer in-charge.	Sqm	1.00	35.55	16		568.8	5314.30	30,22,773.84
	11.37	Providing and laying Ceramic glazed floor tiles 300x300 mm (thickness to be specified by the manufacturer) of ist 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) including pointing the joints with white cement and matching pigment etc., complete	Sqm	1.00	8	35.55		284.4	671.00	1,90,832.40
10		PAINT								


SR. MANAGER TECH.
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Sl.No.	Ref.BCD SOR 2018	Description Of work	Unit	No	Length	Breadth	Depth	Qty	Rate (Rs.)	Amount (Rs.)
	13.93	Painting with synthetic enamel paint of approved brand and manufacture to give an even shed.								
	13.93.1	Two or more coats on new work	Sqm	1.00				2741.28	70.40	1,92,986.11
	13.40A	Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete.	Sqm					2741.28	105.20	2,88,382.66
	13.74	Removing white or colour wash by scrapping and sand paper in and preparing the surface smooth including necessary repair scratches etc. complete	Sqm	1.00				2469.6	6.40	15,805.44
	13.48.3	Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/ 10 sqm over an under coat of primer applied @ 0.80 ltr/ 10 sqm of approved brand and manufacture.	Sqm	1.00				384	37.80	14,515.20
11		DOORS AND WINDOWS								
	10.12.1	Providing and fixing steel glazed doors, windows and ventilators of standard rolled steel sections, joints mitered and welded with 15x3 mm lugs 10 cm long with steel lugs embedded in cement concrete blocks 15x10x10 cm of 1:3:6(1 cement: 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as required, including providing and fixing of glass panes with glazing clips and special metal-sash putty of approved make complete including applying a priming coat of approved steel primer; excluding the cost of metal beading and other fitting except necessary hinges or pivots as required.	Sqm	65.00	1.5	1		97.5	2,973.30	2,89,896.75
	A	SANITARY INSTALLATION								
2	SOR 17.80	Providing and fixing white vitreous china battery based infrared sensor operated urinal of approx. size 610 x 390 x 370 mm	Each	1.00					5407.30	5,407.30


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Sl.No.	Ref.BCD SOR 2018	Description Of work	Unit	No	Length	Breadth	Depth	Qty	Rate (Rs.)	Amount (Rs.)
5	SOR 17.10	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS 13983 with C.I brackets and stainless steel plug 40mm including painting of fittings and brackets, cutting and making good the walls wherever required:								-
	SOR 17.10.1	Kitchen sink with drain board								-
	SOR 17.10.1.4	510x1040mm bowl depth 178mm	Each	1.00					3781.80	3,781.80
6	SOR 17.31	Providing and fixing 600X450mm beveled edge mirror of superior glass complete with 6mm thick hard board	Each	3.00					741.90	2,225.70
7	SOR 17.28	Providing and fixing PVC waste pipe for sink & wash basin including PVC waste fittings complete								-
	17.28.1	Semi rigid pipe								-
	17.28.1.1	32 mm dia	Each	1.00					86.20	86.20
	B	WATER SUPPLY								-
10	SOR 18.7	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply Internal work - Exposed on wall								-
	SOR 18.7.2	20 mm Nominal outer dia pipes	Metre	5.00					165.90	829.50
	SOR 18.7.3	25 mm Nominal outer dia pipes	Metre	25.00					204.70	5,117.50
	SOR 18.7.4	32 mm Nominal outer dia pipes	Metre	38.00					279.10	10,605.80
11	SOR 18.8	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply Concealed work, including cutting chases and making good the								-
12	SOR 18.8.2	20 mm Nominal outer dia pipes	Metre	13.00					255.70	3,324.10
	SOR 18.8.3	25 mm Nominal outer dia pipes	Metre	7.00					308.00	2,156.00
13	SOR 18.9	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply External work								-
D	18.9.4	32 mm Nominal outer dia pipes	Metre	10.00					249.30	2,493.00
14	SOR 18.9	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.								-
15	SOR 18.16	Providing and fixing brass stop cock of approved quality								-
	SOR 18.16.2	20 mm Nominal bore	Each.	1.00					303.00	303.00
16	SOR 18.17	Providing and fixing gun metal gate valve with C.I. wheel of approved quality.								-
	SOR 18.17.1	25 mm Nominal bore	Each.	3.00					461.80	1,385.40
	SOR 18.17.2	32 mm Nominal bore	Each.	4.00					540.00	2,160.00
17	SOR 18.21	Providing and fixing uplasticised PVC connection pipe with brass unions.								-
	18.21.2	45 cm length								-

Sl.No.	Ref.BCD SOR 2018	Description Of work	Unit	No	Length	Breadth	Depth	Qty	Rate (Rs.)	Amount (Rs.)
	18.21.2.1	15 mm Nominal bore	Each.	3.00					76.10	228.30
18	SOR 18.46	Providing and fixing G.I. union in G.I. pipe including cutting and threading the pipe and making long screws etc.								-
	SOR 18.46.2	20 mm dia. Nominal bore	Each.	1.00					155.20	155.20
	SOR 18.46.3	25 mm dia. Nominal bore	Each.	3.00					192.60	577.80
	SOR 18.46.4	32 mm dia. Nominal bore	Each.	4.00					230.00	920.00
		C.P. BRASS FITTINGS								-
24	SOR 18.50	Providing and fixing C.P. brass long nose bib cock of approved quality conforming to IS standards and weighing not less than 810 gms.								-
	18.50.1	15 mm Nominal bore	Each	4.00					599.50	2,398.00
25	SOR 18.58	Providing and fixing PTMT grating of approved quality and colour.								-
	18.58.1	Circular type								-
	18.58.1.1	100mm nominal dia.	Each	2.00					36.20	72.40
26	SOR 18.48	Providing and placing on terrace polythene water storage tank ISI	Per litre	2000.00					7.90	15,800.00
	D	RAIN WATER SPOUT AND PIPE								-
27	SOR 12.78	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 a 10 mm gap for thermal expansion.(i) Single socketed pipes.								-
	12.78.2	110 mm diameter	Metre	20.00					238.30	4,766.00
28	SOR 12.79	Providing and fixing on wall face unplasticised Rigid PVC moulded fittings/								-
	12.79.2	Single pushfit Coupler								-
	12.79.2.2	110 mm	Each	5.00					354.90	1,774.50
	12.79.5	Bend 87.5°								-
	12.79.5.2	110 mm bend	Each	5.00					124.70	623.50
	12.79.6	Shoe (Plain)								-
	12.79.6.2	110 mm Shoe	Each	5.00					108.52	542.60
29	SOR 12.80	Providing and fixing unplasticised - PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50 x 50 x 50 mm hard wood plugs, screwed with M.S. screws of required length cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand)and making good the wall etc. complete.								-
	12.80.2	110 mm	Each	15.00					157.37	2,360.55
30	SOR 12.81	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	Each	5.00					44.90	224.50
12		GYM EQUIPMENTS								
	Gem Portal	Commercial Motorised Trade Mill Product id: 5116877-20575903247	No.	2.00					229000.00	4,58,000.00
	Gem Portal	Commercial Elliptical Cross Trainer	No.	2.00					175000.00	3,50,000.00
	Gem Portal	Commercial Gym S R Electronic Cycle	No.	2.00					24500.00	49,000.00
	Gem Portal	Commercial Smith Machine for Gym	No.	2.00					24900.00	49,800.00
	Gem Portal	Commercial Cable Cross over for Gym	No.	2.00					99996.00	1,99,992.00
	Gem Portal	Big Gym Ball 95 CM	No.	5.00					1399.97	6,999.85
	Gem Portal	Medicine Ball for 1 to 10 Kg. for the Gym	No.	5.00					599.00	2,995.00
	Gem Portal	5 Kg	No.	5.00					1580.00	7,900.00

Sl.No.	Ref.BCD SOR 2018	Description Of work	Unit	No	Length	Breadth	Depth	Qty	Rate (Rs.)	Amount (Rs.)
	Gem Portal	3 Kg Product id: 5116877-60249516699	No.	5.00					865.00	4,325.00
	Gem Portal	Bench press inclined MULTIPURPOSE ADJUSTABLE BENCH PRESS Product id: 5116877-80463679018	No.	2.00					22500.00	45,000.00
	Gem Portal	Flat Bench (Adjustable) Olympic Flat Bench Product id: 5116877-27292292784	No.	2.00					24993.00	49,986.00
	Gem Portal	Orbit Elliptical machine/ELLIPTICAL EXERCISE MACHINE Product id: 5116877-62699339198	No.	1.00					24990.00	24,990.00
	Gem Portal	Generator Recumbent Byke (Fitness World) Product id: 5116877-89056790453	No.	0.00					175000.00	-
	Gem Portal	Multi Gyms - Abdominal Crunch VIVA FITNESS Multi Abdominal Bench, DFT-637 Product id: 5116877-45115314272	No.	2.00					34425.00	68,850.00
	Gem Portal	45 Degree leg Press LEG PRESS (PREMIER) Product id: 5116877-49383134578	No.	2.00					24990.00	49,980.00
	Gem Portal	Leg Extention / Leg Curl - LEG SHAPER / LEG PRESS Product id: 5116877-78800892782	No.	1.00					37000.00	37,000.00
	Gem Portal	Rowing Machine - ROWING MACHINE OUTDOOR Product id: 5116877-49654170141	No.	0.00					16300.00	-
	Gem Portal	Foam Roller for Gym IRIS Interlocking Gym EVA Foam Floor Mat Tiles (80 sqft) (Off white) Product id: 5116877-12475246144	No.	2.00					3999.00	7,998.00
	Gem Portal	AB wheel for zym AB 75LTR MS WITH WHEEL HAND CART Product id: 5116877-66621574466	No.	2.00					11190.00	22,380.00
	Gem Portal	Dumbles Set of 2 5kg Product id: 5116877-79020905998	No.	2.00					1139.00	2,278.00
	Gem Portal	2.5 Kg Product id: 5116877-77263178090	No.	2.00					610.00	1,220.00
	Gem Portal	10 Kg,	No.	2.00					1870.00	3,740.00
	Gem Portal	7.5 Kg Product id: 5116877-2865259899	No.	2.00					2900.00	5,800.00
	Gem Portal	17.5 Kg Product id: 5116877-25743480835	No.	2.00					4375.00	8,750.00
	Gem Portal	Product id: 5116877-43525639692 8 Station Multi Gym (NA) (Fitness World Multi Station Gym 8)	No.	2.00					124900.00	2,49,800.00
	Gem Portal	Mirror (3 m x 2 m) Product id: 5116877-10155089109	No.	2.00					5050.00	10,100.00
	Gem Portal	Locker for gym (GODREJ 6 DOOR PLU BASE UNIT LOCKER WITHOUT STAND / PERSONAL LOCKER UNIT / COLLEGE / GYM) Product id: 5116877-51600775039	No.	1.00					15109.00	15,109.00
	Gem Portal	Steam Bath	No.	0.00					100000.00	-
	Gem Portal	Rubber Mat for Gym Product id: 5116877-55066733872 Per Piece of 1.53 Sqm	No.	10.00					145.00	1,450.00
									Total	76,00,485
									Carriage Cost	2,47,676

Appendix 34B : Estimate of New Extension of Indoor Badminton Court Building

S.No	Code	Description	Unit	No	Length	Width	Height	Quantity	Rate (Rs)	Amount (Rs)
1	2.6	Earth work in excavation over areas (exceeding 30 cm in depth. 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m ; disposed earth to be levelled and neatly dressed.	cum	1	95	1.5	0.5	71.25	279.1	19885.875
	2.6.1	All kinds of soil								
	2.26	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.	cum	1	95	1	0.2	19	103.30	1962.7
3	2.28	Supplying and filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.	cum	1	95	1.5	0.075	10.69	238.60	2550.0375
4	11.72	Providing designation 100 A one brick flat soling joints filled with local sand including cost of watering, taxes, royalty all complete as per building specification and direction of E/	Sqm	1	31	24.25		751.75	277.5	208610.625
5	4.1.5	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level. 1:3:6 (1 Cement: 3 coarse sand : 6 graded stone aggregate 20 mm nominal size)	Cum	1	31	24.25	0.15	112.76	3461.4	390316.1175
6	20.3A.1	Making 25cm (10") dia bore up to 5 M depth below ground with hand auger of approved quality in ordinary soil (vide classification of sol item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50 M lead including all lifts, all complete as per approved design and direction of E/I./	Rmt	20	5			100.00	148.6	14860
7	20.3A.2	Making 63 cm (25") dia under-ream at required depth with hand auger of approved quality in ordinary soil (vide classification of soil item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50M lead including all lifts, all complete as per approved design and direction of E/I.	Each	40				40.00	158.6	6344
		brick work.								
8	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in:	cum							
	6.1.12.1	Cement mortar 1:4 (1 cement : 4 coarse sand) wall		1	95	0.3	6.5	185.25		
								185.25	5037.2	933141.3
		RCC Works								
	BCD SOR, 5.1.2	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering, finishing and reinforcement-All work up to plinth level. 1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size)	cum							
		beam		1	95	0.3	0.3	8.55		
		Lintel		1	95	0.3	0.2	5.7		
		column @5m interval		20	11	0.25	0.25	13.75		
		Gate ramp		1	4	0.2	2	1.6		
								29.60	4902.3	145108.08
		Shuttering								
10	BCD SOR, 5.9.2	Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	Sqm							
		beam		3	95		0.3	85.5		
		lintel		2	95		0.2	38		
		column		80	6		0.25	120		
		ramp path		4	2		0.15	1.2		
								244.7	321.3	78622.11
		REINFORCEMENT								
		Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete.								

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11	BOD SOR, 23.26	Thermo - Mechanically Treated bars TMTC - 500-10mm dia	kg	5920					76.7	454064
		Plaster								
	13.11	12 mm cement plaster of mix								
	13.11.2	1:4 (1 cement : 4 coarse sand)	sqm	2	95	6	1140			
				2	6	0.3	3.6			
							1143.6	139.9	159989.64	
		Flooring								
13	26.10	Providing & fixing in position Phenol bonded Bamboowood flooring with planks of sizes 14mm thick, 1800mm length (minimum) and 130 mm wide(minimum), in approved colour, texture and finish, having Performance Appraisal Certificate (PAC) issued by Building Materials & Technology Promotion Council (BMTPC). The flooring shall be fixed with tongue and groove interlocking system, with underlayment of 4mm thick expanded poly ethylene foam sheets having density 40kg/cum, over prepared surface with necessary quarter round planks of size 1900mm x 18mm and door reducer of size 1900mm x 44mm, wherever required. The bamboo wood planks shall have minimum density of 1000 Kg/cum & minimum Hardness 1000 Kgf. with Eco friendly UV coating, all complete as per direction of the Engineer in-charge.	sqm	1	31	15	465	5314.30	2471149.5	
14	11.37	Providing and laying Ceramic glazed floor tiles 300x300 mm (thickness to be specified by the manufacturer) of ist quality conforming to IS : 15622 of approved make in colours such as white , Ivory , Grey , Fume Red , Brown , laid on 20 mm thick Cement motar 1:4 (1 cement: 4 coarse sand) including pointing the joints with white cement and matching pigment etc., complete	SQM	1	31	10	310	671.00	208010	
		Roofing								
15	Dharwad SOR page no 300 Item no- 38.30	Providing and installing of pre painted Galvanized Trapezoidal profiled sheet of approved make 1060mm width (1000mm cover width), 28-30 mm crest height with crest distance of 200mm c/c with 2 ribs at the center for stifening. The total coated thickness (TCT) of the sheet will be 0.47mm +/- 0.02mm tolerance zinc-alu alloy coating AZ150 gsm as per ASTM 1397/A755-550 mpa steel grade,5-7 microns epoxy primer on both sides of the sheet and polyester top coat 20-22 microns using self drilling/self tapping screws of of 25mm length, to be fixed over the existing purlins, rafters, channels and trusses	sqm	1	32	26	832	770	640640	


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6	Dharwad SOR page no 300 Item no- 38.31	Providing and installing of approved make pre painted galvalume Iron Accessories, like, plain, ridges, plain gutter, plain flashing, corner trim, etc., The total coated thickness (TCT) of the sheet shall be 0.47mm +/- 0.02 tolerancemm Zinc-Alu Alloy coating AZ 150gms as per ASTM 1397/755-550 mpa steel grade, 5-7 microns epoxy primer on both sides of the sheet and polyester top coat 20-22 microns using self drilling/ self tapping screws of 25mm length. (width upto 500-600 mm only), to be fixed over the existing purlins, rafters, channels and trusses.							
	Ridges	sqm	2	32	0.3		19.2		
	Gutters	sqm	1	32	0.3		9.6		
							28.8	740.00	21312
7	10.16.3	Fabrication supplying and erecting M.S Angular trusses for all spans as per approved drawing and design. The entire trusses is anchored Suitably by using 4nos of M.S. anchor bolts at each support with base plate and shoe plate. the work includes cutting, straightening, placing in position of M.S angle and welding whenever necessary and applying one coat of redoxide primer coat to all the members including cost of all materials, welding, grinding and erection equipments, with all lead and lift, transportation etc., complete as per specifications		1					
	Truss @35 kg/Sqm	Kgs	1	31	24.5		26582.5		
	beam @40 kg /Sqm	Kgs	4	31	0.4		1984		
	beam @40 kg /Sqm	Kgs	3	24.5	0.4		1176		
							29742.5	113.10	3363876.75
18	10.19	Providing and fixing M.S. round holding down bolts with nuts and washer plates complete.	Kgs				60	71.50	4290
19	13.93	Painting with synthetic enamel paint of approved brand and manufacture to give an even shed.							
	13.93.1	Two or more coats on new work	sqm				1143.6	70.40	80509.44
20	7.37	Stone work for wall lining etc.(Veneer work) over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand) and jointing with grey cement slurry 3.30 kg/sqm including rubbing and polishing complete.(to be secured to the backing by means of cramps which shall be paid seperately)							
	7.37.1 A	Dressing of sandstone in veneer work (in gate Area)	sqm	2	6	1.5	18	2,236.80	40262.4
	10.32.2	Steel work welded in built up sections/framed work including cutting hoisting, rixing in position and applying a priming coat of approved steel primer using structural steel, etc. as required..							
		In gratings, frames, guard bar, ladders, railings, brackts. gates & similar works.							
		@ 40 kg /Sqm(Gate grill)	Kg	1	4	6	960		
		Iron Steel Sitting Chair @40kg/Sqm	Kg	1	52	11	22880		
							23840	88.8	2116992
		Windows							

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22	10.12	Providing and fixing steel glazed doors, windows and ventilators of standard rolled steel sections, joints mitered and welded with 15x3 mm lugs 10 cm long with steel lugs embedded in cement concrete blocks 15x10x10 cm of 1:3:6(1 cement: 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as required, including providing and fixing of glass panes with glazing clips and special metal-sash putty of approved make complete including applying a priming coat of approved steel primer; excluding the cost of metal beading and other fitting except necessary hinges or pivots as required.	Sqm	7	1.2	0.75		6.3	2,973.30	18731.79
23		Carriage of Materials								
		Cement	Mt.	60.22					290.27	17480.0594
		Steel	Mt.	59.5025					290.27	17271.79068
		Sand	Cum	149					896.66	133602.34
		Stone Chips	Cum	130					1576.82	204986.6
		Bricks	Per thousand	100.225					767.08	76880.593
										11831449.75


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RENOVATION AND EXTENSION OF GYM BUILDING

SL. NO.	BCD SOR-2018	DESCRIPTION OF ITEMS	UNIT	Qty	RATE	AMOUNT
		CIVIL WORKS				
		CONCRETE WORK				
1	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering-all work up to plinth level.				
1.1	4.1.8	1.4.8 (1 Cement :4 coarse sand :8 graded stone aggregate 40 mm nominal size)	cum	29.70	2940.80	87,342.00
1.2	4.1.6	1.3.6 (1 Cement :3 coarse sand :6 graded stone aggregate 40 mm nominal size)	cum	29.70	3307.00	98,218.00
1.3	4.17	Making plinth protection 50 mm thick of cement concrete 1:3:6 (1 cement :3 coarse sand : 6 graded stone aggregate 20 mm nominal size) over 75 mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including finishing the top smooth.	Sqm	85.80	417.60	35,830.00
1.4	4.11	Providing and laying damp-proof Course 50 mm thick with cement concrete 1:2:4(1cement:2:2 coarse sand :4 graded stone aggregate 20mm nominal size)	sqm	271.15	245.50	66,567.33
2	11.79.A	Providing and laying factory made chamfered edge Cement Concrete paver blocks of required strength,thickness & size/shape, made by table vibratory method , to attain superior smooth finish using PU or equivalent moulds, laid in required Grey colour & pattern over 50mm thick compacted bed of coarse sand, compacting and proper embedding / laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with jamuna sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand in footpath, parks,lawns, drive ways or light traffic parking etc. all complete as per manufacturer's specification and direction of E/I. (a) 80 mm thick c.c. paver block of M-35 grade with	Sqm	127.60	812.70	103,701.00
		REINFORCED CEMENT CONCRETE				
3	5.2	Reinforced cement concrete work in wall (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts, etc. upt floor five level excluding cost of centring, shuttering, finishin and reinforcement.				
	5.2.1	1:1:2(1 cement: 1 coarse sand:2 graded stone aggregate 20 mm nominal size) Column	cum	12.994	7255.40	94,275.00
		Beam	cum	35.200	7255.40	255,390.00
		Roof	cum	48.600	7255.40	352,612.00
		Chhajja with Stair	cum	18.113	7255.40	131,413.00
4	5.9	Centring and shuttering including strutting, propping etc. and removal of form for.				
4.1	5.9.1	Foundations, footings, Pile cap, bases of columns etc. for mass concrete.	sqm	172.800	186.30	32,193.00
4.2	5.9.5	Lintels, beams, plinth beams, girders, ressumers and cantilevers.	sqm	457.60	335.30	153,433.00
4.3	5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts	sqm	226.80	425.80	96,571.00
4.4	5.9.7	Stairs,(excluding landings) except spiral stair cases.	sqm	26.40	384.70	10,156.00
4.5	5.9.3	Suspended floors, roots, landings, balconies and access platform.	sqm	324.00	362.60	117,482.00
5		Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level & above plinth level.				
	5.22.7B	Thermo-Mechanically Treated Bars TMT (Fe 500) 6mm to 25 mm as per Approved drawing	KG.	18040	76.70	1,383,690.00

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SL. NO.	BCD SOR-2018	DESCRIPTION OF ITEMS	UNIT	Qty	RATE	AMOUNT
	9.48.2	Providing and fixing M.S. grills of required pattern Providing in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all 20 MM Square Bar	KG.	915	122.9	112,478.00
		BRICK WORK				
6	6.1C	Brick work with fly ash bricks as per IS 12894 (2002) & IS 3495 in foundations and plinth in :				
6.1	6.1.12C	Cement mortar 1:4 (1 cement: 6 coarse sand)	cum	22.8	5129.70	116,957.00
6.2	6.3C + 6.1.12 C	Extra for Brick work in superstructure above plinth level up to floor V cum	cum	79.8	5831.90	465,386.00
		DOOR WINDOW WORK AND STEEL WORK				
7	9.1.1	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fastener shall be paid for separately). Second Class Teak Wood	Cum	2.77	95749.10	264,995.00
8	9.5.1.1	Providing and fixing panelled or panelled and glazed shutters for doors, windows and clerestory windows, including ISI marked M.S.pressed butt hinges bright finished of required size with ecessery screws, excluding panelling which will be paid for separately, all complete as per direction of engineerin-charge. Second Class Teak Wood 35 mm	Sqm	125.66	2547.80	320,167.00
9	9.118.2	30 mm thick factory made Polyvinyl Chloride (PVC) door shutter made of styles and rails of a uPVC hollow section of size 60x30 mm and wall thickness 2 mm (± 0.2 mm), with inbuilt decorative moulding edging on one side. The styles and rails mitred and joint at the corners by means of M.S. galvanised/plastic brackets of size 75x220 mm having wall thickness 1.0 mm and stainless steel screws. The styles of the shutter reinforced by inserting galvanised M.S. tube of size 25x20 mm and 1 mm (± 0.1 mm) wall tickness. The lock rail made up of 'H' section, a uPVC hollow section of size 100x30 mm and 2 mm (± 0.2 mm) wall thickness fixed to the shutter styles by means of plastic/ galvanised M.S. 'U' cleats. The shutter frame filled with a uPVC multichambered single panel of size not less than 620 mm, having over all thickness of 20 mm and 1 mm (± 0.1 mm) wall thickness . The panels filled vertically and tie bar at two places by inserting horizontally 6 mm galvanised M.S. rod and fastened with nuts and washers, complete as per manufacturer's specification and direction	Sqm	8.40	2041.60	17,149.00
10	9.20.1	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board nstruction with frame of 1 st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both face of shuttersRs.Description 35 mm thick including stainless steel butt hinges with necessa	Sqm	15.12	2598.90	39,295.00
		FLOORING WORK				

SL. NO.	BCD SOR-2018	DESCRIPTION OF ITEMS	UNIT	Qty	RATE	AMOUNT
11	11.36	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (Thickness to be specified by the manufacture) 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 @ 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete	sqm	171.600	739.80	126,950.00
12	11.41	Providing and laying vitrified floor tiles in different sizes {thickness to be specified by the manufactruer) with water absorption's less than 0.08 % and conforming to IS : 15622 of approved make in all colours and shades, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) including grouting the joint with white cement and matching pigments etc. complete				
	11.41.2	Size of tile 60x60cm	sqm	542.30	1520.90	824,784.00
13	11.27	Kota stone slabs 20 mm thick in risers of steps skirting. Dado & 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 slab including rubbing and polishing complete	sqm	255.20	1133.90	289,371.00
14	2740	Sheets Rubber tile LP Stud confirming to IS 809 4.0 mm thick	sqm	373.67	2193.74	819,734.00
		ROOFING AND WATERPROOFING				
15	22.5	Providing and laying in situ five course water proofing treatment with glass fibre tissue reinforced bitumen over roof consisting of first coat of bitumen primer @ 0.40 kg. per sqm, 2nd & 4th courses of bonding material@ 1.60 kg. per sqm which shall consist of blown type bitumen of grade 85/25 conforming to IS: 702, third layer of glass fibre tissue course as specified, fifth, the top most layer of stone grit 6 mm and down size or pea-sized gravel sprad @ 6 dm] per sqm including preparation of surface excluding grading for slope etc. complete	sqm	297.0	383.20	113,810.00
		FINISHING WORK				
16	13.11	12 mm thick Cement Plaster of mix Internal and outer				
	13.11.2	1:4 (Cement : Coarse sand)	sqm	1201.200	139.90	168,048.00
17	13.24	6 mm cement plaster to ceiling of mix :				
	13.24.2	1:4 (1 cement: 4 coarse sand)	sqm	574.20	110.90	63,679.00
18	13.80A.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	1775.40	46.50	82,556.00
19	13.77	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade:				
20	13.77.2	New work (two or more coats) over and including water tinnable priming coat with cement primer	sqm	1775.40	83.40	148,068.00
	13.94	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade				
21	13.94.1	Two or more coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacture sqm	sqm	125.664	96.10	12,076.00


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SL. NO.	BCD SOR-2018	DESCRIPTION OF ITEMS	UNIT	Qty	RATE	AMOUNT
		Drain Work				
22	6.48A	Providing 150mm wide brick drain in cement mortar (1:6) with av. 150mm clear depth and 125mm apron concrete (1:4:8), over one brick designation 100-A flat soling in proper grade and slope at the base, the drain duly plastered in CM. (1:3) with punning over exposed surface all complete as per building specification and direction of E/i.	m	78.00	564.50	44,031.00
		GYM Equipments				
23	Gem Portal	Commerciat Motorised Trade Mill Product id: 5116877-20575903247	No.	7.00	229000.00	1,603,000.00
24	Gem Portal	Commerciat Elliptical Cross Trainer Product id: 5116877-83621265430	No.	7.00	175000.00	1,225,000.00
25	Gem Portal	Coomercial Gym S R Electronic Cycle Product id: 5116877-88927229284	No.	10.00	24500.00	245,000.00
26	Gem Portal	Commercial Smith Machine for Gym Product id: 5116877-14487013616	No.	2.00	24900.00	49,800.00
27	Gem Portal	Commercial Cable Cross over for Gym Product id: 5116877-34916229864	No.	2.00	99996.00	199,992.00
28	Gem Portal	Big Gym Ball 95 CM Product id: 5116877-71866501753	No.	10.00	1399.97	13,999.70
29	Gem Portal	Medicine Ball for 1 to 10 Kg. for the Gym MEDICINE BALL 1 KG (HRS) Product id: 5116877-7830289572	No.	10.00	599.00	5,990.00
30	Gem Portal	5 Kg Product id: 5116877-61968411280	No.	5.00	1580.00	7,900.00
31	Gem Portal	3 Kg Product id: 5116877-60249516699	No.	5.00	865.00	4,325.00
32	Gem Portal	Bench press inclined MULTIPURPOSE ADJUSTABLE BENCH PRESS Product id: 5116877-80463679018	No.	2.00	22500.00	45,000.00
33	Gem Portal	Flat Bench (Adjustable) Olympic Flat Bench Product id: 5116877-27292292784	No.	3.00	24993.00	74,979.00
34	Gem Portal	Orbit Elliptical machine/ELLIPTICAL EXERCISE MACHINE Product id: 5116877-62699339198	No.	6.00	24990.00	149,940.00
35	Gem Portal	Generator Recumbent Byke (Fitness World) Product id: 5116877-89056790453	No.	6.00	175000.00	1,050,000.00
37	Gem Portal	Multi Gyms - Abdominal Crunch VIVA FITNESS Multi Abdominal Bench, DFT-637 Product id: 5116877-45115314272	No.	6.00	34425.00	206,550.00
38	Gem Portal	45 Degree leg Press LEG PRESS (PREMIER) Product id: 5116877-49383134578	No.	2.00	24990.00	49,980.00
39	Gem Portal	Leg Extention /Leg Curl - LEG SHAPER / LEG PRESS Product id: 5116877-78800892782	No.	2.00	37000.00	74,000.00
40	Gem Portal	Rowing Machine - ROWING MACHINE OUTDOOR Product id: 5116877-49654170141	No.	5.00	16300.00	81,500.00
41	Gem Portal	Foam Roller for Gym IRIS Interlocking Gym EVA Foam Floor Mat Tiles (80 sqft) (Off white) Product id: 5116877-12475246144	No.	6.00	3999.00	23,994.00
42	Gem Portal	AB wheel for zym AB 75LTR MS WITH WHEEL HAND CART Product id: 5116877-66621574466	No.	6.00	11190.00	67,140.00

SL. NO.	BCD SOR-2018	DESCRIPTION OF ITEMS	UNIT	Qty	RATE	AMOUNT
43	Gem Portal	Dumbles Set of 2 5kg Product id: 5116877-79020905998	No.	2.00	1139.00	2,278.00
44	Gem Portal	2.5 Kg Product id: 5116877-77263178090	No.	2.00	610.00	1,220.00
45	Gem Portal	10 Kg,	No.	2.00	1870.00	3,740.00
46	Gem Portal	7.5 Kg Product id: 5116877-2865259899	No.	2.00	2900.00	5,800.00
47	Gem Portal	17.5 Kg Product id: 5116877-25743480835	No.	2.00	4375.00	8,750.00
48	Gem Portal	Product id: 5116877-43525639692 8 Station Multi Gym (NA) (Fitness World Multi Station Gym 8)	No.	4.00	124900.00	499,600.00
49	Gem Portal	Mirror (3 m x 2 m) Product id: 5116877-10155089109	No.	5.00	5050.00	25,250.00
50	Gem Portal	Locker for gym (GODREJ 6 DOOR PLU BASE UNIT LOCKER WITHOUT STAND / PERSONAL LOCKER UNIT / COLLEGE / GYM) Product id: 5116877-51600775039	No.	10.00	15109.00	151,090.00
51	Gem Portal	Steam Bath	No.	2.00	100000.00	200,000.00
52	Gem Portal	Rubber Mat for Gym Product id: 5116877-55066733872 Per Piece of 1.53 Sqm	No.	50.00	145.00	7,250.00
53	A	Carriage	For Two Floor			
	B	Local Sand	Cum	5.50	262.05	1,441.00
	C	Coarse Sand	Cum	127.74	1030.3	131,607.00
	D	Stone Chips	Cum	102.27	2701.25	276,248.00
	E	Cement	MT	1581.42	472.68	747,505.00
	F	Steel	MT	18.04	328.25	5,922.00
TOTAL						14,294,198
TOTAL COST OF CIVIL and Equipments						14,294,198
54	CPWD PAR 2.1	Internal water supply and sanitary installations	Job	4.00%	571,768	571,768
55	CPWD PAR 2.2.1	Internal Electric Installations	Job	12.50%	1,786,775	1,786,775
56	L/s	Provision for Air conditioning	Each	1.00	1,000,000	1,000,000
57	Total cost					17,652,741


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APPENDIX 36: Estimate of Tennis Court - 2 courts

SL.No.	BCD SOR 2018/ RCD SOR 2019	DESCRIPTION OF ITEM	UNIT	RATE	QTY.	AMOUNT (Rs.)
1	2	3	4	5	6	7
1.0	2.3	Clearing jungle including uprooting of rank vegetation ,grass, brush wood, trees and saplings of girth upto 30 cm measured at a height of 1 m above ground level and removal of rubbish upto a distance of 50 m outside the periphery of the area cleared.	100 sqm	579.8	1.70	985.66
4.0	2.28	Supplying and Filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.	cum	238.60	70.00	16702
2.0	5.2 RCD	Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.	SQM	11.20	670.00	7504
		CONCRETE WORK				
6.0	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in :				
	6.1.12 A	Cement mortar 1:4 (1 cement : 4 coarse sand)	cum	5037.2	8.00	40297.6
7.0	Gem	Providing and laying of ITF Classified imported material (Acry Coat Made In Europe) 8 layers System Synthetic Acrylic for Tennis Court :- (1 Layer) Concrete Primer, (2 layers) Resurface, (3 layer) Cushion Rubber, (2 layers) Top Coat, making provision for fixing of fittings wherever required making it good, all complete, As per the direction of Engineer-in-charge	SQM	1614.00	670.00	1081380.00
13.0	16.20	Welded steel wire fabric fencing with posts of specified material and of standard design placed and embedded in cement concrete blocks 45x45x 60 cm of mix 1:5:10 (1 cement:5 fine sand : 10 graded stone aggregate 40 mm nominal size), every 15th post, last but one end post and corner post shall be struttred on both sides and end post on one side only and struts embedded in cement concrete blocks 70x45x50 cm of the same mix, provided with welded steel wire fabric fixed between the posts fitted and fixed with G.I. staples on wooden plugs or tied to 6 mm bar nibs with G.I. binding wire (cost of posts, welded steel wire fabric, painting, earth work in excavation and concrete to be paid for separately).	SQM	26.80	330.00	8844.00
8.0	Gem	Providing and fixing tennis net and post socket system Length and width specified by the ITF, making provision for fixing of fittings wherever required making it good, all complete, As per the direction of Engineer-in-charge. Product id: 5116877-52973885830	Pair	2450.00	2.00	4900.00
9.0	13.13.2	Providing 20mm thick cement plaster 1:4 (1cement:4 coarse sand)	Sqm	194.30	65.00	12629.50
10.0	13.45.1	Finishing walls with texture exterior paint of required shade New work(two or more coats)	Sqm	233.16	65.00	15155.40
		Carriage Cost				28008.51
		Total				₹ 12,16,407


SR. MANAGER TECHNICAL
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APPENDIX 37: Cricket Stadium Ground : Estimate of RCC Drain 0.5 x 0.75 M, Chainage 2.75 KM with Grassing & Barricadding

Sr. No.	Description	Unit	Quantity	Rate (Rs)	Amount in (Rs)	SOR Reference
1	Earth Work					
1.1	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)					RCD SOR 12.1 v B
a	Depth upto 1.5 m	cum	656.25	177.00	1,16,156.25	
1.2	Timbering			-	-	
1.2.1	Open timbering in trenches including strutting and shoring complete (Measurement to be taken of the face area timbered):			-	-	
a	Depth exceeding 1.5 m but not exceeding 3 m	Sqm	656.25	60.10	39,440.63	BCD SOR - Item No. 2.20.2
	Dewatering and pumping out water in trenches			-	-	
				-	-	
1.3	Pumping out water caused by springs, tidal or river seepage, broken water mains or drains and the like.	KL	1,312.50	92.20	1,21,012.50	BCD Item no 2.25
	Refilling the Excavated Trenches (Backfilling)			-	-	
1.4	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification	cum	328.13	593.00	1,94,578.13	RCD 13.9 B (i)
1.5	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (Below Raft)	cum	437.50	593.00	2,59,437.50	RCD 13.9 B (i)
1.6	Clearing and Grubbing Road Land (Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.)	Hectare	0.11	47,489.00	5,194.11	RCD 2.3 i (a)
				-	-	
	DISPOSAL OF EARTH			-	-	
1.7	Removal of unserviceable soil and disposal upto 1000 meters (Removal of unserviceable soil including excavation, loading and disposal upto 1000 meters lead but excluding replacement by suitable soil which shall be paid separately)	Cum	328.13	93.70	30,745.31	RCD SOR - 2018/Item No. 3.11
1.8	Labour for filling anti cement bags with local sand, stitching the bag and placing including supply of sutri etc. all complete job as per direction of Engineer in charge with carriage of local sand and cost of anti cement bag for different type of work at site.	Per 100 bags	1,320.00	2,622.87	34,62,188.40	WRD SOR 2018 5.7.40.1
2	CONCRETE WORK			-	-	
2.1	PCC 1:3:6 in foundation: Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.			-	-	
a	1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size)	Cum	61.25	3,364.00	2,06,045.00	RCD 12.4
2.2	Centring and shuttering including strutting, proping etc. and removal or form work for			-	-	
a	Foundations, footings, bases of columns etc. for mass concrete	Sqm	525.00	186.30	97,807.50	BCD 5.9.1
				-	-	
3	REINFORCED CEMENT CONCRETE WORK			-	-	
	RCC SLAB			-	-	
3.1	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications RCC grade M30 - with batching plant, transit mixer and concrete pump	Cum	122.50	4,878.00	5,97,555.00	RCD 13.5G (p) i
A	Centring and shuttering including strutting, proping etc. and removal or form work for			-	-	
	Foundations, footings, bases of columns etc. for mass concrete	Sqm	656.25	362.60	2,37,956.25	BCD 5.9.3
3.2	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications RCC grade M30 - with batching plant, transit mixer and concrete pump					
		Cum	153.13	4,878.00	7,46,943.75	RCD 13.5G (p) i
3.2 A	Centring and shuttering including strutting, proping etc. and removal or form work for			-	-	
a	Walls (any thickness) including attached pilasters. Butteresses, plinth and string courses etc.	Sqm	2,975.00	321.30	9,55,867.50	BCD 5.9.2
3.3	REINFORCEMENT			-	-	

3.1	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications					
		MT	43.27	63,203.00	27,34,991.32	RCD 13.6
5	Constructing brick masonry circular manhole 1.52 m internal dia at bottom and 0.56 m dia at top in cement mortar 1:4 (1 cement : 4 coarse sand) inside cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement, foundation concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement, all complete as per standard design :	each	10.00	31,068.40	3,10,684.00	BCD SOR 19.13.1
6	Constructing brick masonry road gully chamber 110x50x77.5 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) with precast R.C.C. vertical grating complete as per standard design : (@ 1 per 20 m)	each	7.00	4,115.30	28,807.10	BCD,Item 19.28.1
7	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete. (For silt traps for box drain)	kg	125.00	114.20	14,275.00	BCD SOR 9.48.1
8	Surface dressing of the ground including removing vegetation and inequalities not exceeding 15cm deep and disposal of rubbish, lead upto 50m and lift upto 1.5m	100 Sqm	225.00	1,126.90	2,53,552.50	2.29.1
9	Supplying and Filling in plinth with local Earth/sand and under floors including, watering, ramming consolidating and dressing complete.	cum	6,750.00	238.60	16,10,550.00	2.28
10	Grassing with 'Doobs' Grass (Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed.) In rows 7.5 cm apart in either direction	Sqm	22,500.00	19.30	4,34,250.00	11.2.ii
11	Construction of a permanent type barricade made of steel components, 1.5 m high from road level, fitted with 3 horizontal rails 200 mm wide and 4 m long on 50 x 50 x 5 mm angle iron vertical support, painted with yellow and white strips, 150 mm in width at an angle of 45° C, complete as per IRC:SP:55-2001	each	150.00	4,163.00	6,24,450.00	8.44 A
12	Providing and fixing 1.2 metres high GI barbed wire fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be struttred on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807	Running Meter	875.00	248.00	2,17,000.00	8.17
	Sub Total				1,32,99,488	
	CARRIAGE OF MATERIALS					
	Brick	3803.80	Thousand	767.08	2917.82	
	Local Sand	7187.50	Cum	262.05	1883484.38	
	Coarse Sand	153.99	Cum	1030.3	158656.49	
	Stone Chips	299.82	Cum	2701.3	809900.39	
	Cement	2109.02	MT	328.25	692284.65	
	Steel	43.27	MT	328.28	14205.70	
	Carriage Cost				3561449	
	Total Cost for the construction of drain with grassing and Barricadding of Cricket Stadium Ground				₹ 1,68,60,937	


 SR. MANAGER TECH. 2
 BHAGALPUR SMART CITY LTD.
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Appendix 39: Development of Cleaveland Memorial

Sr. No.	Description	Unit	Quantity	Rate (Rs)	Amount in (Rs)	SOR Reference
1	Earth Work					
2	Surface dressing of the ground including removing vegetation and inequalities not exceeding 15cm deep and disposal of rubbish, lead upto 50m and lift upto 1.5m	100 Sqm	70.00	1,126.90	78,883.00	2.29.1
3	Supplying and Filling in plinth with local Earth/sand and under floors including, watering, ramming consolidating and dressing complete.	cum	1,750.00	238.60	4,17,550.00	2.28
4	Grassing with ' Doobs' Grass (Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed.) In rows 7.5 cm apart in either direction	Sqm	7,000.00	19.30	1,35,100.00	11.2.ii
5	Pathway at entry and along Water Fountain Supplying and Filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.	cum	72.00	238.60	17,179.20	2.28
6	Paver Block for Pathway Providing and laying factory made chamfered edge Cement Concrete paver blocks of required strength,thickness & size/shape, made by table vibratory method , to attain superior smooth finish using PU or equivalent moulds, laid in required Grey colour & pattern over 50mm thick compacted bed of coarse sand, compacting and proper embedding / laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with jamuna sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand in footpath, parks,lawns, drive ways or light traffic parking etc. all complete as per (a) 80 mm thick c.c. paver block of M-35 grade with approved colour design and pattern.	Sqm	480.00	812.70	3,90,096.00	11.79.1
7	Water Fountain complete package in all respect (Excavation, RCC round wall, Lighting, Water motor, Cleaning and its drainage pattern etc.) as per Existing Condition and as per direction of E/I	each	2,00,000.00	1.00	2,00,000.00	Lump Sump
8	Muroom Pathway Supplying and Filling in plinth with moorum under floors including, watering, ramming consolidating and dressing complete.	cum	23.44	176.90	4,146.09	16.3.10
9	Renovation of Old Structure Plastering - 12 mm cement plaster of mix: 1 : 4	Sqm	1,008.00	139.90	1,41,019.20	13.11.2
10	Applying one coat of cement primer of approved brand and manufacture on wall surface: Distemper primer	Sqm	1,008.00	31.70	31,953.60	13.78.2
11	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade . Two or more coats on new work	Sqm	1,008.00	46.50	46,872.00	13.77.A . 1
12	RCC at Entry Providing and laying in position specified grade of reinforced cement concrete excluding the cost of ring,shuttering,finishing and reinforcement-All work upto plinth level 1:1:5:3(1 cement: 1.5 coarse sand:3 graded stone aggregate 20 mm nominal size)	cum	27.00	4,902.30	1,32,362.10	5.1.2
13	Granite at Platform Providing and fixing 18 mm thick gang saw cut, mirror polished,	Sqm	20.25	3,699.10	74,906.78	8.2.2.2
14	Cost of Toilet 1 No. (Amount taken from estimate of Toilet)				7,55,117	
15	U-PVC pipes (working pressure 4 kg/cm ²) Rubber (Seal) Ring 110 mm dia .	per Meter	100.00	13.52	1,352	7191
	Sub Total				24,26,536	
	CARRIAGE OF MATERIALS					
	Brick	0.00	Thousand	767.08	0.00	
	Local Sand	72.00	Cum	262.05	18867.60	
	Coarse Sand	15.92	Cum	1030.3	16398.73	
	Stone Chips	0.00	Cum	2701.3	0.00	
	Cement	5.31	MT	328.25	1741.53	
	Steel	0.00	MT	328.28	0.00	
	Moorum	23.44	Cum	304.88	7145.63	
	Carriage Cost				44153	
	Total Cost for the construction of cleaveland Memorial with drain, grassing, Pathway, Toilets, Fountainwith Grassing etc.				₹ 24,70,690	

APPENDIX - 40
ESTIMATE OF TOILET BLOCK (BIG)

S.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	QTY.	RATE	AMOUNT (Rs.)
1	2.6	Earth work in excavation over areas (exceeding 30 cm in depth. 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m ; disposed earth to be levelled and neatly dressed.				
	2.6.1	All kinds of soil	Cum	4.55	279.10	1268.51
2	2.26	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.	Cum	2.27	103.30	234.75
3	2.28	Supplying and filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete. Below Grade Beam	Cum	1.26	238.60	300.64
		Sand Filling (Up to plinth)	Cum	61.75	238.60	14733.55
4	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work upto plinth level.				
	4.1.6	1:3: 6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size)	Cum	3.94	3307.00	13029.58
5	6.1A	Brick work with bricks of class designation 100A in foundation and plinth in :	Cum			
	6.1.12 A	Cement mortar 1:4 (1 cement : 4 coarse sand)	cum	7.00	5037.20	35260.40
6	6.18A	Half brick masonry with bricks of class designation 100A in foundation and plinth in :				
	6.18.4A	Cement mortar 1:4 (1 cement : 4 coarse sand)	sqm	100.80	596.80	60157.44
7		Reinforced Cement Concrete Works				
	5.1.2	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of Centring,shuttering,finishing and reinforcement-All work upto plinth level - 1:1:5:3(1 cement: 1.5 coarse sand:3 graded stone aggregate 20 mm nominal size) Column	Cum	3.28		
		Gread Beam	Cum	2.10		
		Tie Beam	Cum	1.40		
		Roof Beam	Cum	1.75		
		Roof	Cum	6.36		
		Chhajja	Cum	1.62		
		Total RCC Quantity	Cum	16.51	4902.30	80940.04
8	5.22	Reinforcement for RCC work including straightening, Cutting, bending, placing in position and binding all complete.				
	5.22.7B	Thermo-Mechanically Treated bars				
		TMTC-500-10 mm dia.	kg	2592.17	76.70	198819.30
9	5.9	Centring and shuttering including strutting, propping etc. and removal of form for:				
	5.9.6	Walls (any thickness) including attached pilasters. Butteresses, plinth and string courses etc. Column	Sqm	63.00	425.80	26,825.40
	5.9.5	Gread Beam	Sqm	30.80	335.30	10,327.24
	5.9.5	Tie Beam	Sqm	28.00	335.30	9,388.40
	5.9.5	Roof Beam	Sqm	30.80	335.30	10,327.24
	5.9.2	Roof	Sqm	50.88	321.30	16,346.14
	5.9.2	Chhajja	Sqm	13.50	321.30	4,337.55
10	11.72	Providing designation 100 A one brick flat soling joints filled with local sand including cost of watering taxes, royalty all complete as per building specification and direction of E/I.	sqm	7.00	277.50	1942.50

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BHAGALPUR SMART CITY LTD.
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APPENDIX - 40
ESTIMATE OF TOILET BLOCK (BIG)

S.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	QTY.	RATE	AMOUNT (Rs.)
11	11.36	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (Thickness to be specified by the manufacture) 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 Motar 1:3 (1cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	Sqm	246.40	739.80	1,82,286.72
12	11.38	Providing and laying Ceramic glazed floor tiles 300x300 mm (thickness to be specified by the manufacturer) of ist quality conforming to IS : 15622 of approved make in colours such shades except white , Ivory , Grey , Fume Red , Brown , laid on 20 mm thick Cement motar 1:4 (1 cement: 4 coarse sand) including pointing the joints with white cement and matching pigment etc., complete.	Sqm	61.75	736.40	45,472.70
13	11.27	Kota stone slabs 25 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	23.40	1133.90	26533.26
14		Plaster & Finishing Works				
	13.11	12 mm cement plaster of mix				
	13.11.2	1:4 (1 cement : 4 coarse sand)	sqm	1008.00	139.90	141019.20
15	13.24	6 mm cement plaster to ceiling of mix.				
	13.24.2	1:4 (1 cement : 4 coarse sand)	sqm	65.55	110.90	7269.50
16	13.78.2	Applying one coat of cement primer of approved brand and manufacture on wall surface: Distemper primer	Sqm	1,073.55	31.70	34031.54
17	13.77.A. 1	Distemping with oil bound washa ble distemper of approved brand and manufacture to give an even shade . Two or more coats on new work Inner Part	Sqm	536.78	46.50	24960.04
18	13.79	Finishing Wall with water proofing cement paint of approved brand and manufacture and of required shade to give an even shade Outer Face				
	13.79.1	New work (three or more coats)	sqm	536.78	68.30	36,661.73
		Waterproofing				
19	22.8	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations :				
	22.8.1	With average thickness of 120mm and minimum thickness at Khurra as 65 mm.	sqm	61.75	2553.30	1,57,666.28
20	9.20	Providing and fixing ISI marked flush door shutters decorative type core of block board construction with frame of 1st class hard wood and well matched teak ply veneering with vertical grains or cross or cross bands and face veneers on the both faces veneers on the both face of shutters.				
	9.20.2	30mm thick including stainless steel butt hinges with necessary screws	sqm	26.40	2474.40	65,324.16
19	9.1	Providing wood work in frames of doors, windows, clearstory windows and other frames, wrought framed and fixed in position				
	9.1.	Second Class teak wood	cum	2.64	95749.10	2,52,777.62

APPENDIX - 40
ESTIMATE OF TOILET BLOCK (BIG)

S.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	QTY.	RATE	AMOUNT (Rs.)
20	9.53	Providing 40 x 5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embeddings in cement concrete block 30x10x15 cm 1:3:6 mix (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size)	each	60.00	106.60	6,396.00
21	9.96	Providing and fixing aluminium sliding door bolt anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with nuts and screws etc.				
	9.96.1	300 x 16 mm	each	10.00	220.40	2,204.00
	9.96.2	250 x 16 mm	each	10.00	195.50	1,955.00
22	9.100	Providing and fixing aluminium handles anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with necessary screws etc. complete :				
	9.100.1	125 mm	each	20.00	54.00	1,080.00
23	9.101	Providing and fixing aluminium hanging floor door stopper anodized (anodic coating not less than grade AC 10 as per IS :1868) transparent or dyed to required colour and shade with necessary screws etc. complete.				
	9.101.2	Twin rubber stopper	each	10.00	40.40	404.00
24	9.97	Providing and fixing aluminium sliding tower bolt anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with nuts and screws etc.				
	9.97.1	300 x 10 mm	each	10.00	105.20	1,052.00
	9.97.4	150 x 10 mm	each	10.00	67.80	678.00
25	9.9	Providing and fixing glazed shutters for doors, windows and clerestory windows using 10kg/square meter (4mm thick) glass panes including black enamelled M.S butt hinge with necessary screws.				
	9.9.2.2	30 mm thick	sqm	26.40	1975.90	52,163.76
26	10.18	Providing and fixing circular cast iron box for ceiling fan clamp 140 mm internal dia, 73 mm height, 5 mm thick rim bottom and top lids, 1.5 mm thick M.S sheet with its top surface hacked for proper bonding top lid shall be screwed into the cast iron box by means of 3.3 mm dia round headed screws, one pcf at the corners. Clamps shall be made of 12mm dia M.S. bar bent to shape as per standard drawing.	each	10.00	141.30	1,413.00
27	13.81.1	Applying priming coat With ready mixed pink or grey primer of approved brand and manufacture on woodwork (hard and soft wood)	sqm	116.16	32.20	3,740.35
28	13.93	Painting with synthetic enamel paint of approved brand and manufacture to give an even shed.				
	13.93.1	Two or more coats on new work	sqm	116.16	70.40	8,177.66
	17.1	Providing and fixing water closet squatting pan (Indian Type WC pan) with 100mm sand cast iron P or S trap, 10 liter low fixture complete, including cutting and making good the wall and level white PVC flushing cistern, including flush pipe, manually control device(handle lever) conforming to IS :7231, with all fittings and floors where ever required.				
	17.1.1	white Vitreous china, Orissa, Pattern WC pan of size 580x440 mm with integral type footrest.	Nos.	2.00	3390.90	6,781.80

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APPENDIX - 40
ESTIMATE OF TOILET BLOCK (BIG)

S.No.	BCD SOR 2018	DESCRIPTION OF ITEM	UNIT	QTY.	RATE	AMOUNT (Rs.)
29	17.3	Providing and fixing white vitreous china pedestal type water closet.(European type) with seat and lid, 10 ltr flow level white vitreous china flushing cistren and C P flush bend with fitting and CI brackest, 40mm flush bend, over flow arrangment with special of standreds make and mosquoues proof coupling of approved municipal complete design complete, including painting of fittings and brackets, cutting and making good the walls.				
	17.3.1	W.C. Pan with ISI marked white solid plastic seat.	Nos.	5.00	4554.00	22,770.00
30	17.4	Providing and fixing white vitreous china flat back or wall corner type leaped urinal basin of 430x260x350 mm and 340x410x265 mm size repectively with automatic flushing cistren with standred flush pipe and CPP brass spreaders with brass union and GI claim complte, including painting of fittings and brackets , cutting and making good the wall and floor whenever required.				
	17.4.2	Range of Two Urinal Basin with 5 ltr white PVC automatic flushing cistren.	Nos.	6.00	5121.70	30,730.20
31	17.7	Providing and fixing wash basin with CI Brackest, 15mm CP brass pillar taps, 32mm CP brass waste of standred pattren including painting of fittings and brackets, cutting and making good the wall whereever required.				
32	17.7.1	White virterous China wash basin size 630x450mm with a pair of 15mm CP brass pillar taps	Nos.	6.00	2307.10	13,842.60
33	17.7.7	White virterous Chaina flat back wash basin size 450x300mm with single 15mm CP brass pilar taps.	Nos.	4.00	1520.00	6,080.00
34	18.53	Providing and fixing Cp brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931. a 15mm nominal bore.				
	18.53.1	15 mm Nominal Bore	Nos.	18.00	512.90	9,232.20
35	18.51	Providing and fixing CP Brass long body bib cock of approved quality conforming to IS: standreds and weighinf not less than 690 grams				
	18.51.1	15 mm Nominal Bore	Nos.	6.00	531.60	3,189.60
36	18.48	providing and placing on terrace (at all floor levels) polytheline water storges tank, ISI :12701 marked, with cover and sutaible loking arrangment and making necessary holes for inlet , Outlet and over flow pipes but without fittings and the base support for tank.	Litre	1000.00	7.90	7,900.00
37	17.32	Providing and fixing mirror of superior glass (of approved quality) and of required shapes and size with plastic moulded frame of approved make and said with 6mm thick hard.				
	17.32.3	Oval shape 450 x 350 mm Mirror	Nos.	8.00	744.60	5,956.80
38	LS	Septic Tank (2.3 mt x 1.1 mt)	Nos.	2.00	77700.00	1,55,400.00
						17,99,388.38
39	LS	Internal plumbing and electrification			5%	89,969.42
						18,89,357.80
40	Analysis	Carriage				
	A	Brick	Per Thousand	5359.90	767.08	4111.47
	B	Local Sand	Cum	63.01	262.05	16511.77
	C	Coarse Sand	Cum	30.85	1030.3	31784.54
	D	Stone Chips	Cum	18.20	2701.3	49166.51
	E	Cement	MT	17.58	328.25	5770.00
	F	Steel	MT	2.59	328.25	850.88
					TOTAL for 1 Toilet	19,97,553

Appendix 41: Multipurpose Ground : Estimate of RCC Drain 0.5 x 0.75 M, Chainage 2.75 KM with Grassing & Landscaping

Sr. No.	Description	Unit	Quantity	Rate (Rs)	Amount in (Rs)	SOR Reference
1	Earth Work					
1.1	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)					RCD SOR 12.1 v B
a	Depth upto 1.5 m	cum	1,687.50	177.00	2,98,687.50	
1.2	Timbering					
1.2.1	Open timbering in trenches including strutting and shoring complete (Measurement to be taken of the face area timbered);			-	-	
a	Depth exceeding 1.5 m but not exceeding 3 m	Sqm	1,687.50	60.10	1,01,418.75	BCD SOR - Item No. 2.20.2
	Dewatering and pumping out water in trenches					
				-	-	
1.3	Pumping out water caused by springs, tidal or river seepage, broken water mains or drains and the like.					
	Refilling the Excavated Trenches (Backfilling)					
1.4	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification	KL	3,375.00	92.20	3,11,175.00	BCD Item no 2.25
				-	-	
1.5	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (Below Raft)	cum	843.75	593.00	5,00,343.75	RCD 13.9 B (i)
		cum	1,125.00	593.00	6,67,125.00	RCD 13.9 B (i)
1.6	Clearing and Grubbing Road Land (Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.)	Hectare	0.28	47,489.00	13,356.28	RCD 2.3 i (a)


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Sr. No.	Description	Unit	Quantity	Rate (Rs)	Amount in (Rs)	SOR Reference
	DISPOSAL OF EARTH			-	-	
1.7	Removal of unservicable soil and disposal upto 1000 meters (Removal of unservicable soil including excavation, loading and disposal upto 1000 meters lead but excluding replacement by suitable soil which shall be paid separately)	Cum	843.75	93.70	79,059.38	RCD SOR - 2018/Item No. 3.11
1.8	Labour for filling anti cement bags with local sand, stitching the bag and placing including supply of sutri etc. all complete job as per direction of Engineer in charge with carriage of local sand and cost of anti cement bag for different type of work at site.	Per 100 bags	1,320.00	2,622.87	34,62,188.40	WRD SOR 2018 5.7.40.1
2	CONCRETE WORK			-	-	
2.1	PCC 1:3:6 in foundation: Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.			-	-	
a	1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size)	Cum	157.50	3,364.00	5,29,830.00	RCD 12.4
2.2	Centring and shuttering including strutting, propping etc. and removal or form work for			-	-	
a	Foundations, footings, bases of columns etc. for mass concrete	Sqm	825.00	186.30	1,53,697.50	BCD 5.9.1


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Sr. No.	Description	Unit	Quantity	Rate (Rs)	Amount in (Rs)	SOR Reference
3	REINFORCED CEMENT CONCRETE WORK			-	-	
	RCC SLAB			-	-	
3.1	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications RCC grade M30 - with batching plant, transit mixer and concrete pump	Cum	315.00	4,878.00	15,36,570.00	RCD 13.5G (p) i
3.1 A	Centring and shuttering including strutting, proping etc. and removal or form work for			-	-	
a	Foundations, footings, bases of columns etc. for mass concrete	Sqm	1,687.50	362.60	6,11,887.50	BCD 5.9.3
3.2	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications RCC grade M30 - with batching plant, transit mixer and concrete pump				-	
3.2 A	Centring and shuttering including strutting, proping etc. and removal or form work for	Cum	393.75	4,878.00	19,20,712.50	RCD 13.5G (p) i
a	Foundations, footings, bases of columns etc. for mass concrete	Sqm	7,650.00	321.30	24,57,945.00	BCD 5.9.2
3.3	REINFORCEMENT			-	-	
3.3.1	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications			-	-	
		MT	111.27	63,203.00	70,32,834.82	RCD 13.6
5	Constructing brick masonry circular manhole 1.52 m internal dia at bottom and 0.56 m dia at top in cement mortar 1:4 (1 cement : 4 coarse sand) inside cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement, foundation concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement, all complete as per standard design :	each	20.00	31,068.40	6,21,368.00	BCD SOR 19.13.1


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Sr. No.	Description	Unit	Quantity	Rate (Rs)	Amount in (Rs)	SOR Reference
6	Constructing brick masonry road gully chamber 110x50x77.5 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) with precast R.C.C. vertical grating complete as per standard design : (@ 1 per 20 m)	each	15.00	4,115.30	61,729.50	BCD,Item 19.28.1
7	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete. (For silt traps for box drain)	kg	200.00	114.20	22,840.00	BCD SOR 9.48.1
8	Surface dressing of the ground including removing vegetation and inequalities not exceeding 15cm deep and disposal of rubbish, lead upto 50m and lift upto 1.5m	100 Sqm	664.00	1,126.90	7,48,261.60	2.29.1
9	Supplying and Filling in plinth with local Earth/sand and under floors including, watering, ramming consolidating and dressing complete.	cum	19,920.00	238.60	47,52,912.00	2.28
10	Grassing with ' Doobs' Grass (Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed.) In rows 7.5 cm apart in either direction	Sqm	66,400.00	19.30	12,81,520.00	11.2.ii
11					-	
12					-	
					-	
	Sub Total				2,71,65,462	
	CARRIAGE OF MATERIALS					
	Brick	8151.00	Thousand	767.08	6252.47	
	Local Sand	21045.00	Cum	262.05	5514842.25	
	Coarse Sand	393.79	Cum	1030.3	405718.18	
	Stone Chips	770.96	Cum	2701.3	2082601.00	
	Cement	2327.22	MT	328.25	763908.78	
	Steel	111.27	MT	328.28	36528.95	
	Carriage Cost				8809852	
	Total Cost for the construction of drain with grassing and Landscaping of Multi Purpose Ground				₹ 3,59,75,314	

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Appendix 44 : Sculpture Court

S.No.	Ref.BCD SOR 2018	Description Of work	Unit	No	Length	Breadth	Depth	Qty	Rate (Rs.)	Amount (Rs.)
1		EARTH WORK								
	2.8.1	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.								
		All kinds of soil	Cum	1	40	34	0.3	408	319.60	130397
2		BACKFILLING								
	2.28	Supply and filling in plinth with local sand and under floor including watering ,ramming consolidating and dressing complete	Cum	1	40	34	0.5	680	238.60	162248
	2.29	Surface dressing of the ground including removing vegetation and in-equalities not exceeding 15cm deep and disposal of rubbish, lead upto 50m and lift upto 1.5m								
	2.29.1	All kinds of soil	100 SQM	1	40	34		1360	1126.90	15325.84
	2.32	Clearing jungle including uprooting of Rank vegetation ,grass, brush wood, trees and saplings of girth upto 30 cm measured at a height of 1 m above ground level and removal of rubbish upto a distance of 50 m outside the periphery of the area cleared.	100 SQM	1	40	34		1360	579.80	7885.28
3		CONCRETE WORK								
	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level.								
	4.1.8	1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	Cum	1				15.54	2940.80	45700
	4.3	Centring and shuttering including strutting,propping etc. and removal or form work for								
	4.3.1	Foundations, footings, bases, columns	Sqm	1				1.05	185.90	196
4		REINFORCED CEMENT CONCRETE WORK								
	5.2	Reinforced cement concrete in walls (any thickness) including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts, etc. up to floor five level, excluding the cost of centring, shuttering, finishing and reinforcement.								
	5.2.2	1:1.5:3 (1 Cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size)	Cum	1				66.40	5723.30	380027
5		SHUTTERING								
		Centring and Shuttering including strutting, propping etc. and removal of form for								
	5.9.1	Foundations, footings, bases of columns etc. for mass concrete.	Sqm	1				105.40	186.30	19636
6		REINFORCEMENT								


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Appendix 47 : Estimate of Dismantling for Boundary Wall

Appendix 47: Estimate of Dismantling for Boundary Wall										
S.No	BCD SOR 2018	Description	Unit	No	Length	Width	Height	Quantity	Rate (Rs)	Amount (Rs)
1	15.7	Demolishing brick work including stacking of serviceable material and disposal of unserviceable material within 50 meters lead:								
	15.7.4	Wall	Cum	1	3910	0.125	1.8	879.75		
		Wall	Cum	1	3910	0.25	1.1	1075.25		
		Sub - Total							1955	685.1
2	15.3	Demolishing R.C.C. work including stacking of steel bars and disposal of unserviceable material withing 50 metres lead:								
		Coloumn	Cum	1304	0.25	0.25	3.5	285.25		
		Beam	Cum	1	3910	0.25	0.25	244.38		
	Sub - Total							529.63	1172.7	621091.238
Total										1960462



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Appendix 48: Bondary Wall External
ESTIMATE OF BOUNDARY WALL (30 M Length)

S.NO.	BCD SOR 2018	DESCRIPTION OF ITEM	QTY.	UNIT	RATE (Rs.)	AMOUNT (Rs.)
1	Item no. 20.3A.1	Making 25cm (10") dia bore up to 1.5 depth below ground with hand auger of approved quality in ordinary soil (vide classification of soil item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50 M lead including all lifts, all complete as per approved design and direction of E/L.	35	Meter	148.6	5,201.00
2	Item no. 20.3A.2	Making 63 cm (25") dia under-ream at required depth with hand auger of approved quality in ordinary soil (vide classification of soil item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50M lead including all lifts, all complete as per approved design and direction of E/L.	8	Each	158.6	1,268.80
3	Item no. 2.8.1	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 M in width 10 sqm on plan)including dressing of sides and ramming of bottoms lift upto 1.5 m including getting out the excavated soil and disposal of surplus excavated soil as directed,within a lead of 50.0m	19.2	Cum	319.6	6,136.32
4	Item no. 2.28	Supply and filling in plinth with local sand and under floors including watering,ramming,consolidating and dressing complete	9.6	Cum	238.6	2,290.56
5	Item no. 4.1.8	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level.1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	3	Cum	2940.8	8,822.40
6	Item no. 5.1.2	Providing and laying in position reinforced cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level.1:1.5:3 (1 Cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size)	12.00	Cum	4902.3	58,827.60
7	Item no. 5.9.5	Centering and Shuttering including strutting,propping etc. and removal of from for lintel, beams, plinth beam, girdes,ressumers and cantilevers.	50.00	Sqm	335.3	16,765.00
8	6.1C	Brick work with fly ash bricks as per IS 12894(2002) & IS 3495 in foundations and plinth in :				
	6.1.12C	Cement mortar 1:4 (1 cement: 4 coarse sand)	2.00	Cum	5129.7	10,259.40
9	Item no. 13.13.4	Providing 20mm thick cement plaster 1:6 (1cement:6 coarse sand)	83.50	Sqm	173	14,445.93
10	Item no. 5.22	Reinforcement for RCC work including straighting,cutting,bending,placing in position and binding all complete - Thermo -Mechnically Treated bars (FE-500).				
	5.22.7B	Thermo-Mechanically Treated bars TMTC-500-10mm dia.	942.00	Kg	76.7	72,251.40
11	Item no. 13.45.1	Finishing walls with texture exterior paint of required shade				
		New work(two or more coats)	83.50	Sqm	143.6	11,990.96
12	Item no. 10.32.2	Steel work welded in built up sections/framed work including cutting hoisting, rixing in position and applying a priming coat of approved steel primer using structural steel, etc. as required.	554.6	Kg	88.8	49,248.48
13	BCD Ele. SOR 2018, Item 1.21.1	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/ recess including cutting the wall and making good the same in case of recessed conduit as required. 20 mm	600	Meter	68	40,800.00
						2,98,307.85
		CARRIAGE				
14	A	Brick	988.00	Per Thousand	767.08	758
	B	Local Sand	9.60	Cum	262.05	2,516
	C	Coarse Sand	8.93	Cum	1030.3	9,204
	D	Stone Chips	13.38	Cum	2701.25	36,135
	E	Cement	13.40	MT	472.72	6,336
	F	Steel	1.50	MT	328.25	491
		TOTAL COST PER 30 RMT				3,53,747
		TOTAL COST PER RMT				11,792
		TOTAL COST PER 2.55 KM of Boundary wall				3,00,69,600

Appendix 49: BOUNDARY WALL Internal (30 M LENGTH)

S.No.	Reference	Item Description	Quantity	Unit	Rate (Rs.)	Total amount (Rs.)
1	BCD SOR 20.3A.1	Making 25cm (10") dia bore up to 4 M depth below ground with hand auger of approved quality in ordinary soil (vide classification of soil item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50 M lead including all lifts, all complete as per approved design and direction of E/I.	35	Rmt	148.6	5201.00
2	BCD SOR 20.3A.2	Making 63 cm (25") dia under-ream at required depth with hand auger of approved quality in ordinary soil (vide classification of soil item-A) true to plumb and without eccentricity in any stage of operation and disposal of the excavated earth up to 50M lead including all lifts, all complete as per approved design and direction of E/I.	8	Each	158.6	1269.00
3	BCD SOR 2.8.1	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 M in width 10 sqm on plan)including dressing of sides and ramming of bottoms lift upto 1.5 m including getting out the excavated soil and disposal of surplus excavated soil as directed,within a lead of 50.0m	1.75	Cum	319.6	559.00
4	BCD SOR 2.28	Supply and filling in plinth with local sand and under floors including watering,ramming,consolidating and dressing complete	0.53	Cum	238.6	126.00
5	BCD SOR 4.1.8	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering-all work up to plinth level (1:4:8)	0.53	Cum	2940.8	1559.00


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6	BCD SOR 5.1.2	Reinforced cement concrete work in beams,suspended floors,roofs having slope up to 15 degree, landings, balconies, shelves, chajjas, lintels, bands, plain window sill, stair cases and spiral stair cases up to floor five level excluding the cost of centering,shuttering,finishing and reinforcement with ratio 1:1.5:3 (1 cement:1.5 coarse sand:3 graded stone aggregate 20 mm nominal size)	4.90	Cum	4902.3	24041.00
7	BCD SOR 5.9.5	Centring and Shuttering including strutting,propping etc. and removal of from for lintel, beams, plinth beam, girdes,ressumers and cantilevers.	49.96	Sqm	335.3	16752.00
8	BCD SOR 6.1.14C+6.3 C	Brick work with fly ash bricks as per IS 12894 (2002) & IS 3495 in foundations and plinth in : Cement mortar 1:6 (1 cement: 6 coarse sand)	5.36	Cum	5597.9	29977.00
9	BCD SOR 13.13.4	Providing 12 mm thick cement plaster 1:6 (1cement:6 coarse sand)	147.70	Sqm	173.00	25552.00
10	BCD SOR 5.22.7B	Reinforcement for RCC work including straighting,cutting,bending,placing in position and binding all complete - Thermo -Mechnically Treated bars (FE-500) 10 mm dia	441.00	Kg	76.7	33825.00
11	BCD SOR 13.45.1	Finishing walls with texture exterior paint of required shade				
		New work(two or more coats)	147.70	Sqm	143.6	21210.00
TOTAL COST						160071.00
Carriage cost						21110.91
COST PER RUNNING METRE						6039
TOTAL COST FOR 1010 METRE						6099791


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SUMMARY OF PROJECT COST FOR ELECTRICAL OF SPORTS AREA IN SANDY'S COMPOUND (PHASE 1)

Sl	DESCRIPTION OF WORK AREA	AMOUNT (Rs.) (Phase 1)
1	City Gym	₹ 3,13,711.00
2	Basketball Court	₹ 24,53,602.00
3	Cleveland Memorial	₹ 7,18,472.38
4	Tennis Court	₹ 28,03,052.00
5	Power Station	₹ 95,04,685.53
	TOTAL COST	₹ 1,57,93,523


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SUMMARY OF PROJECT COST FOR ELECTRICAL OF SPORTS AREA IN SANDY'S COMPOUND						
Sl.No.	DESCRIPTION OF WORK AREA	AMOUNT				
1	City Gym	₹ 3,13,711.00				
2	Basketball Court	₹ 24,53,602.00				
3	Cleveland Memorial	₹ 7,18,472.38				
4	Tennis Court	₹ 28,03,052.00				
5	Power Station	₹ 95,04,685.53				
	TOTAL COST	₹ 1,57,93,522.91				
Sl.No.	DESCRIPTION	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supplying and fixing 4' X 40 watt suspended type LED luminaire provides soft-light and glare free symmetrical illumination complete with all accessories etc. including ball and socket arrangement, 2 no. down rods of 20mm dia X 1.6 mm thick G.I. pipe upto 30 cm. length, painting and wiring the down rods and connection with 1.5 sq mm FR PVC insulated copper conductor, single core cable and earthing etc. as required. Make: Bajaj/Philips/Havells/C&S or equivalent	Nos.	60	1380.00	BCD Ele. SOR 2018, Item 5.14	82800.00
2	Wiring for light point/ fan point/ exhaust fan point/call bell point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface/recessed medium class PVC conduit, with modular switch, suitable size G.I. box etc as required. Group C	Nos.	60	724.00	BCD Ele. SOR 2018, Item 1.3.1	43440.00
3	Wiring for light/ power plug with 2X4 sq. mm FR PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit alongwith 1 No 4 sq. mm FR PVC insulated copper conductor single core cable for loop earthing as required.	nos	10	200.00	BCD Ele. SOR 2018, Item 1.5	2,000.00
4	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required, 2 x 2.5 sq. mm+ 1 x 2.5 sq. mm earth wire	mtr	200	161.00	BCD Ele. SOR 2018, Item 1.7.1	32,200.00
5	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required, 2 X 4 sq. mm + 1 X 4 sq. mm earth wire	mtr	200	200.00	BCD Ele. SOR 2018, Item 1.7.3	40,000.00
6	Supplying and drawing following sizes of FR PVC insulated copper conductor single core cable in the existing surface/ recessed PVC conduit as required 3x1.5 sq. mm	mtr	100	62.00	BCD Ele. SOR 2018, Item 1.15.3	6,200.00
7	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch, connections etc. as required.	Each	10	401.00	DSR Ele. SOR 2018, Item 1.31	4,010.00
8	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	Each	10	495.00	DSR Ele. SOR 2018, Item 1.32	4,950.00
9	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 guage iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	Nos	1	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	6174.00
10	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	Each	1	1,200.00	BCD Ele. SOR 2018, Item 1710	1200.00


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11	Supplying and fixing following rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required. 6/32 amps, Single pole	Each	6	192.00	BCD Ele. SOR 2018, Item 2.12.1	1152.00
12	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	50	105.70	BCD Ele. SOR 2018, Item 2204	5285.00
13	3.5 core, 70 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	281.00	BCD Ele. SOR 2018, Item 2208	84300.00
				Amount		313711.00

Basketball Court

Sl.No.	DESCRIPTION	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	SITC of 14 M Octagonal Pole with ISMC channel to mount 4 nos. 500 W LED flood light fittings with junction box and other accessories . Pole will be supplied with step ladder to access the top of the pole. Price is inclusive of suitable Foundation, bolt and Junction box . Make: Bajaj/Philips/Havells/Transrail/Valmont	Nos.	8	162780.00	MR	1302240.00
2	SITC of 500 W LED Flood light with driver and all accessories for mounting on ISMC Channel . Flood light is made up of Powder coated aluminium die-cast housing With availability of lens for Narrow / medium / wide beam angle to achieve desired illumination level . Flood light should deliver minimum of 155000 lumen output with life of 50000 burning hrs at L70. Correlated Color Temperature 5700K±300k. Luminaire efficacy >= 155 lm/W. Protection class of luminaire is IP 66 . Option of 15° beam angle. Driver is inbuilt with minimum 4.5KV internal surge protection and External Surge protection 20KV. Make: Bajaj/Philips/Havells/C&S or equivalent	Nos.	24	42360.00	MR	1016640.00
3	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 guage iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	Nos	1	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	6174.00
4	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	Each	1	1,200.00	BCD Ele. SOR 2018, Item 1710	1200.00
5	Supplying and fixing following rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required. 6/32 amps, Single pole	Each	4	192.00	BCD Ele. SOR 2018, Item 2.12.1	768.00
6	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	400	105.70	BCD Ele. SOR 2018, Item 2204	42280.00
7	3.5 core, 70 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	281.00	BCD Ele. SOR 2018, Item 2208	84300.00
				Amount		2453602.00

Cleveland Memorial

Sl.No.	DESCRIPTION	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supply and fixing of decorative 40 to 45 Watt LED Post top indirect light luminaire having Pressure die cast aluminium body and clear glass with driver set confirming to IP 65 and above protection complete in all respect. CAT-AAA CAT-AA	nos.	27	18300.00	UP SOR 2018, Chapter 14 - LED LUMINAIRES, Item 1443	494100.00
2	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	105.70	BCD Ele. SOR 2018, Item 2204	31710.00

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3	P & F of IP65 IK10 protected LED Bollard fixture. Light Fixture made of powder coated aluminium/Steel housing with diffuser for uniform distribution. The System level Luminous efficacy > 85 Lumen/W. SMD LEDs . CRI>70, CCT: 3000/4000/6000 K. The integral SMPS based electronic driver must be constant current and inbuilt surge protection of min. 4KV(L-N) and efficiency > 85%, PF>0.9 and input Voltage range of 90- 270V AC at 50Hz. System life of 50000 burning hours with 70% of Initial Lumens maintained. Light should include quick connecting cable coupled with various mounting accessories. Light output in Cool white or Warm White Colour as per engineers choice. Fixture must be in compliance with IS/CE Standards. 0.8 mtr high bollard Make: Bajaj/Philips/Havells/C&S or equivalent	each	20	4055.32	SOR RUIDP 2017, Item 58.34.2	81106.38
4	4 core, 25 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	126.00	BCD Ele. SOR 2018, Item 2205	37800.00
5	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required but excluding sand cushioning and protective covering. Upto 35 sq. mm	mtr	600	77.00	DSR Ele. SOR 2018, Item 7.3.1	46200.00
6	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	mtr	1	5125.00	BCD Ele. SOR 2018, Item 3.2	5125.00
7	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	set	300	38.00	BCD Ele. SOR 2018, Item 3.16	11400.00
8	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 guage iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (each panel 3 Sq. ft)	nos.	1	6174.00	BCD Ele. SOR 2018, Item 8.10.3	6174.00
9	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	each	1	1200.00	BCD Ele. SOR 2018, Item 1710	1200.00
10	Supplying, installation, testing and commissioning of Astronomical time switch of following configuration to be mounted in feeder pillars / Lighting DBs for automatic switching On & OFF of street lights at sun set & sun rise or twilight(Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required. 3 output (1output per phase) and suitable for three phase supply	each	1	3657.00	DSR Ele. SOR 2018, Item 15.4.3	3657.00
Total Amount						718472.38
Tennis Court						
Sl.No.	DESCRIPTION	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs)
1	SITC of 14 M Octagonal Pole with ISMC channel to mount 4 nos. 500 W LED flood light fittings with junction box and other accessories . Pole will be supplied with step ladder to access the top of the pole. Price is inclusive of suitable Foundation bolt and Junction box. Make: Bajaj/Philips/Havells/Transrail/Valmont	Nos.	8	162780.00	MR	1302240.00
2	SITC of 500W LED Floodlight having Pressure die-cast aluminum LED housing designed to act as heat sink for efficient dissipation of heat. Electrochemically brightened and anodized aluminum reflector. Heat resistant toughened glass provided with gasket and SS clips. LED Colour Temp.: 5700K ±300K Luminaires provided with a mounting bracket for aiming adjustment. Power Factor >= 0.95 Driver provided with built-in 5kV input voltage surge, open and short circuit protection. Ingress protection : IP66. Powder coated Finish: Make: Bajaj/Philips/Havells/C&S or equivalent	Nos.	32	42360.00	MR	1355520.00


PROJECT MANAGER TECH-2
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3	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 gauge iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	Nos	1	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	6174.00
4	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	Each	1	1,200.00	BCD Ele. SOR 2018, Item 1710	1200.00
5	Supplying and fixing following rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required. 6/32 amps, Single pole	Each	4	192.00	BCD Ele. SOR 2018, Item 2.12.1	768.00
6	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	500	105.70	BCD Ele. SOR 2018, Item 2204	52850.00
7	3.5 core, 70 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	281.00	BCD Ele. SOR 2018, Item 2208	84300.00
Power Station						
Sl.No.	Description	Unit	Qty	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supply of 11KV grade, 3C x 300 Sq. mm Aluminium conductor, XLPE insulated, PVC sheathed, armoured screened cable. The cable should conform to IS: 7098 Part-2, 2011 with up to date amendment. APPROVED BRAND : Polycab/ Havells/ KEI/ RR / RPG	Mtrs	3000	1,311.36	SPDCL 2016, Material Rate	39,34,090.91
2	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing RCC/ HUMIE/ METAL/ DWC HDPE pipe as required. Above 120 sq. mm and upto 400 sq. mm	Mtrs	3000	112.00	DSR SoR 2018, Item Code 8.3.2	3,36,000.00
3	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc.direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required. 200 mm dia (OD-200 mm & ID-175 mm nominal), approved make	Mtrs	6000	598.00	DSR SoR 2018, Item Code 14.16.5	35,88,000.00
4	Supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required : 300 sq. mm	each	12	17,166.00	DSR Ele. SOR 2018, Item 10.5.4	2,05,992.00
5	Supplying and making straight through cable jointing with heat shrinkable jointing kit complete with all accessories including ferrules suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required : 300 sq. mm	each	6	19,314.00	DSR Ele. SOR 2018, Item 10.6.4	1,15,884.00
6	Supply, installation, testing and commissioning of new double pole structure for 11KV/433V upto including Rail Pole 2 Nos, Top channel set, A.B. Switches base channel set, Horn gap fuse base channel, Transformer base channel, Tanformer fastening angle, Support clamp for transformer base channel, support clamp for AB switch base channel, Back clamp for transformer fastening angle, back clamp for horn gap fuse set, cable holding clamp, 11 kV 200 Amp. AB Switch 3 pole, 11 kV Horn Gap Fuse set with insulator, nut bolt, danger board making HT/LT busbar System, 315 kva DT star rated etc complete with all respect as per Local Discom Specification as required.	set	2	5,34,932.95	SPDCL 2016, DSS	10,69,865.91
7	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	set	12	5,125.00	BCD Ele. SOR 2018, Item 3.2	61,500.00
8	Providing and fixing 6.SWG dia G.I.wire on surface or in recess for loop earthing etc. as required.	Mtrs	200	38.00	BCD Ele. SOR 2018, Item 3.16	7,600.00



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16	<p>SITC of DG Set complete with 1500 RPM Diesel Engine of suitable BHP & AC Brush less SPDP Alternator mounted on a common base Frame & coupled through a flexible coupling or close coupled. Alternator shall be self regulated with standard Alternator Protection(Over voltage, over speed & under voltage). Engine shall have residential silencer, up to 10 M exhaust piping, electronic / Mechanical governor, Manual & electric/Auto Start, Batteries, Fuel tank (with Stand) & piping, control panel (16 G) with MCCB (4P; 25 KA), Ammeter, Voltmeter, Frequency Meter, Energy Meter & Hour Meter, Engine instruments panel, AVM and with Weatherproof, powder coated Acoustic enclosure for DG set for sound attenuation fabricated from 1.6 mm CRCA sheet steel (structure) with side wall fabricated from 1.6 mm CRCA sheet and filled with foam as per CPCB norms latest amendments & IS 8183. The doors are fabricated from 1.6 mm CRCA sheet packed with acoustic material, floor of MS chequered plate 5.0 mm thick. All doors/ opening are sealed with neoprene/ EPDM gaskets. The enclosure has built in fuel tank, residential silencer (isolated from main DG chamber) with protection and tripping of DG set against temperature of more than 50 °C. All controls for operation of DG set are from outside the enclosure with DG control panel having microprocessor based genset monitoring and control system mccb Ammeter, voltmeter, Pf meter, frequency meter, KWH meter, Ind. Lamps etc. mounted inside enclosure, visible and accessible from outside. The enclosure should be suitable for following capacity DG sets and alternator. Noise level is less than 75 db (A) at a distance of 1 Mtrs. duly certified by authorized agency. Complete in all respect of following capacity : Radiator cooled and turbo charged, 500 KVA at 0.8 pf 415V 50Hz 3-Ø, with AMF Panel fitted inside the enclosure, with the following meters/indicators:(Incoming and outgoing voltage, Current in all phases, Frequency, KVA and power factor, Time indication for hours/ minutes of operation, Fuel Level in field tank, low fuel indication, Emergency Stop button, Auto/Manual/Test selector switch, MCCB/Circuit breaker for short-circuit and overload protection, Control Fuses, Earth Terminal, Any other switch, instrument, relay etc. essential for Automatic functioning of DG set with AMF panel</p> <p>Make:-for Engine-Cummins, Caterpillar, KOEL, for Alternator:- Stampford, Kirlosker-Green,CG</p>	each	1	41,19,843.62	RUIDP SOR 2017, Item-66.18.2.23	41,19,843.62
					Amount	95,04,685.53


SR. MANAGER TECH. 2
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SUMMARY OF PROJECT COST FOR ELECTRICAL OF GENERAL LIGHTING OF SANDY'S COMPOUND (Phase 1)		
SI. NO.	DESCRIPTION OF WORK AREA	AMOUNT Phase 1 (Rs.)
1	Entrance plaza and Parking (ONE NO.)	₹ 5,04,226.00
2	Walkway	₹ 32,40,114.00
3	Cafeteria	₹ 2,89,666.00
4	Memorial renovation	₹ 5,47,563.00
5	Sculpture court	₹ 4,95,766.00
6	Station club renovation	₹ 10,92,035.00
7	Kid's play area	₹ 3,05,361.00
8	High Mast & Solar Light	₹ 85,39,052.73
9	Renovation of existing OAT	₹ 9,65,805.00
10	Power Station	₹ 28,62,536.00
11	TOTAL COST	₹ 1,88,42,124.73


 SR. MANAGER TECH. 2
 BHAGALPUR SMART CITY LTD.
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Bill of Quantities (Electrical) for Entrance Plaza with parking & water fountain of Sandish Park in Bhagalpur

Sl.No.	Description	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supply, Installation, Testing and Commissioning of LED RGB/RGBW Linear Wall Washer luminaire for Facade lighting with aluminium extruded housing, of following wattage. Luminaire shall be capable of producing dynamic color changing light with 16 million colors by DMX/Ethernet based control. The beam angle of the fitting shall be narrow, medium, wide or asymmetric as per the requirement. Luminaire shall be complete with driver and capable of operating at line voltage without any separate power supply from 100 to 270 VAC, 50Hz, power factor > 0.9. Fixture shall be suitable to operate at ambient temperature range of -10° C to +50° C and shall be IP65 and IK 06 rated. Life time should be at least L70 : 50000 burning hours at 50° C. Luminaire shall be conforming to BIS and shall be complete with all necessary accessories required for proper working of fixture including weather proof connection cables, water proof connectors etc. as required. 25 watt	each	8	23,130.00	DSR E&M Facade 2018, Item 2.5	185,040.00
2	Supply and fixing of decorative 40 to 45 Watt LED Post top indirect light luminaire having Pressure die cast aluminium body and Clear glass with driver set conforming to IP 65 and above protection complete in all respect. CAT-AAA CAT-AA	nos	10	18,300.00	UP SOR 2018 Chapter 14 - LED LUMINAIRES, Item 1443	183,000.00
3	4 core, 6 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	nos	200	75.00	BCD Ele. SOR 2018, Item 2216	15,000.00
4	4 core, 10 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	200	95.20	BCD Ele. SOR 2018, Item 2217	19,040.00
5	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	105.70	BCD Ele. SOR 2018, Item 2204	31,710.00
6	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required but excluding sand cushioning and protective covering. Upto 35 sq. mm	mtr	700	77.00	DSR Ele. SOR 2018, Item 7.3.1	53,900.00
7	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	mtr	1	5,125.00	BCD Ele. SOR 2018, Item 3.2	5,125.00
8	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	set	10	38.00	BCD Ele. SOR 2018, Item 3.16	380.00


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9	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 guage iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (each panel 3 Sq. ft)	nos	1	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	6,174.00
10	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	each	1	1,200.00	BCD Ele. SOR 2018, Item 1710	1,200.00
11	Supplying, installation, testing and commissioning of Astronomical time switch of following configuration to be mounted in feeder pillars / Lighting DBs for automatic switching On & OFF of street lights at sun set & sun rise or twilight (Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required. 3 output (1output per phase) and suitable for three phase supply	each	1	3,657.00	DSR Ele. SOR 2018, Item 15.4.3	3,657.00
					Amount Rs.	504,226.00

Bill of Quantities (Electrical) for Walkway of Sandi Park In Bhagalpur under Smart City Mission.						
Sl	Description	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supply and fixing of decorative 40 to 45 Watt LED Post top indirect light luminaire having Pressure die cast aluminium body and Clear glass with driver set confirming to IP 65 and above protection complete in all respect. CAT-AAA CAT-AA	nos	133	18,300.00	UP SOR 2018 Chapter 14 - LED LUMINAIRES, Item 1443	2,433,900.00
2	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	2700	105.70	BCD Ele. SOR 2018, Item 2204	285,390.00
3	4 core, 25 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	700	126.00	BCD Ele. SOR 2018, Item 2205	88,200.00
4	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required but excluding sand cushioning and protective covering. Upto 35 sq. mm	mtr	3200	77.00	DSR Ele. SOR 2018, Item 7.3.1	246,400.00
5	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	mtr	4	5,125.00	BCD Ele. SOR 2018, Item 3.2	20,500.00
6	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	set	3200	38.00	BCD Ele. SOR 2018, Item 3.16	121,600.00

7	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 gauge iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	nos	4	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	24,696.00
8	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	each	4	1,200.00	BCD Ele. SOR 2018, Item 1710	4,800.00
9	Supplying, installation, testing and commissioning of Astronomical time switch of following configuration to be mounted in feeder pillars / Lighting DBs for automatic switching On & OFF of street lights at sun set & sun rise or twilight (Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required. 3 output (1 output per phase) and suitable for three phase supply	each	4	3,657.00	DSR Ele. SOR 2018, Item 15.4.3	14,628.00
					Amount	3,240,114.00

Bill of Quantities (Electrical) for Cafeteria of Sandish Park In Bhagalpur under Smart City Mission.

SL	Description	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supply and fixing of decorative 40 to 45 Watt LED Post top indirect light luminaire having Pressure die cast aluminium body and Clear glass with driver set conforming to IP 65 and above protection complete in all respect. CAT-AAA CAT-AA	nos	8	18,300.00	UP SOR 2018 Chapter 14 - LED LUMINAIRES, Item 1443	146,400.00
2	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	105.70	BCD Ele. SOR 2018, Item 2204	31,710.00
3	4 core, 25 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	126.00	BCD Ele. SOR 2018, Item 2205	37,800.00
4	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required but excluding sand cushioning and protective covering. Upto 35 sq. mm	mtr	600	77.00	DSR Ele. SOR 2018, Item 7.3.1	46,200.00
5	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	mtr	1	5,125.00	BCD Ele. SOR 2018, Item 3.2	5,125.00
6	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	set	300	38.00	BCD Ele. SOR 2018, Item 3.16	11,400.00


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7	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 guage iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	nos	1	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	6,174.00
8	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	each	1	1,200.00	BCD Ele. SOR 2018, Item 1710	1,200.00
9	Supplying, installation, testing and commissioning of Astronomical time switch of following configuration to be mounted in feeder pillars / Lighting DBs for automatic switching On & Off of street lights at sun set & sun rise or twilight (Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required. 3 output (1 output per phase) and suitable for three phase supply	each	1	3,657.00	DSR Ele. SOR 2018, Item 15.4.3	3,657.00
					Total Amount	289,666.00

Bill of Quantities (Electrical) for Memorial of Sandish Park In Bhagalpur under Smart City Mission.						
SL	Description	Unit	Qty.	Rate (Rs.)	Ref. Rate	Amount (Rs.)
1	Supply and fixing of decorative 40 to 45 Watt LED Post top indirect light luminaire having Pressure die cast aluminium body and Clear glass with driver set confirming to IP 65 and above protection complete in all respect. CAT-AAA CAT-AA	nos	12	18,300.00	UP SOR 2018 Chapter 14 - LED LUMINAIRES Item 1443	219,600.00
2	P & F of IP68, IK10 protected LED Buried marker light / Step Light Fixture. Fixture made of powder coated die cast aluminium with Toughened Glass cover and appropriate beam angle lens to be used as per requirement. The System level Luminous efficacy must be >90 Lumen/W. High Power LEDs at 1W/2W per LED. The driving current should be Minimum 350 mA per LED. CRI>70, CCT: 3000/6500 K. The integral SMPS based electronic driver must be constant current and surge protection of min. 4KV(L-N) and efficiency > 85%, PF>0.9 and input Voltage range of 90-270V AC at 50Hz. System life of 50000 Burning hours with 70% of Initial Lumens maintained. Light should include quick connecting cable coupled with various mounting accessories. Light output in Cool white or Warm White Colour as per engineers choice. Fixture must be in compliance with IS/CE Standards. Step Light - 5W	nos	50	1,662.00	SOR RUIDP 2017, Item 58.33.4	83,100.00
3	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required. 2 x 1.5 sq. mm	mtr	200	41.00	DSR Ele. SOR 2018, Item 1.17.2	8,200.00
4	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	600	105.70	BCD Ele. SOR 2018, Item 2204	63,420.00

5	4 core, 25 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	126.00	BCD Ele. SOR 2018, Item 2205	37,800.00
6	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required but excluding sand cushioning and protective covering. Upto 35 sq. mm	mtr	900	77.00	DSR Ele. SOR 2018, Item 7.3.1	69,300.00
7	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	mtr	2	5,125.00	BCD Ele. SOR 2018, Item 3.2	10,250.00
8	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	set	600	38.00	BCD Ele. SOR 2018, Item 3.16	22,800.00
9	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 gauge iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	nos	3	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	18,522.00
10	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	each	3	1,200.00	BCD Ele. SOR 2018, Item 1710	3,600.00
11	Supplying, installation, testing and commissioning of Astronomical time switch of following configuration to be mounted in feeder pillars / Lighting DBs for automatic switching On & OFF of street lights at sun set & sun rise or twilight (Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required. 3 output (1 output per phase) and suitable for three phase supply	each	3	3,657.00	DSR Ele. SOR 2018, Item 15.4.3	10,971.00
					Total Amount	547,563.00

Bill of Quantities (Electrical) for Sculpture Court in Sandish Park In Bhagalpur under Smart City Mission.

SL	Description	Unit	Qty.	Rate (Rs.)	Ref. Rate	Amount (Rs.)
1	Supply and fixing of decorative 40 to 45 Watt LED Post top indirect light luminaire having Pressure die cast aluminium body and Clear glass with driver set conforming to IP 65 and above protection complete in all respect. CAT-AAA CAT-AA	nos	18	18,300.00	UP SOR 2018 Chapter 14 - LED LUMINAIRES, Item 1443	329,400.00
2	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	105.70	BCD Ele. SOR 2018, Item 2204	31,710.00
3	4 core, 25 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	126.00	BCD Ele. SOR 2018, Item 2205	37,800.00


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4	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required but excluding sand cushioning and protective covering. Upto 35 sq. mm	mtr	900	77.00	DSR Ele. SOR 2018, Item 7.3.1	69,300.00
5	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	mtr	1	5,125.00	BCD Ele. SOR 2018, Item 3.2	5,125.00
6	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	set	300	38.00	BCD Ele. SOR 2018, Item 3.16	11,400.00
7	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 gauge iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	nos	1	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	6,174.00
8	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	each	1	1,200.00	BCD Ele. SOR 2018, Item 1710	1,200.00
9	Supplying, installation, testing and commissioning of Astronomical time switch of following configuration to be mounted in feeder pillars / Lighting DBs for automatic switching On & OFF of street lights at sun set & sun rise or twilight (Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required. 3 output (1 output per phase) and suitable for three phase supply	each	1	3,657.00	DSR Ele. SOR 2018, Item 15.4.3	3,657.00
					Total Amount	495,766.00

Bill of Quantities (Electrical): for Station ClubSandy's Park In BHAGALPUR under Smart City Mission.

Sl	Description	Unit	Qty.	Rate (Rs)	Ref: Rate	Amount (Rs.)
1	Wiring for light point/ fan point/ exhaust fan point/call bell point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface/recessed medium class PVC conduit, with modular switch, modular plate, suitable size G.I. box etc as required. Group C	nos	300	724.00	BCD Ele. SOR 2018, Item 1.3.1	217,200.00
2	Wiring for light/ power plug with 2X4 sq. mm FR PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit alongwith 1 No 4 sq. mm FR PVC insulated copper conductor single core cable for loop earthing as required.	nos	50	200.00	BCD Ele. SOR 2018, Item 1.5	10,000.00
3	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required, 2 x 2.5 sq. mm + 1 x 2.5 sq. mm earth wire	mtr	400	161.00	BCD Ele. SOR 2018, Item 1.7.1	64,400.00
4	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required, 2 X 4 sq. mm + 1 X 4 sq. mm earth wire	mtr	300	200.00	BCD Ele. SOR 2018, Item 1.7.3	60,000.00

5	Supplying and drawing following sizes of FR PVC insulated copper conductor single core cable in the existing surface/ recessed PVC conduit as required 3x1.5 sq. mm	mtr	300	62.00	BCD Ele. SOR 2018, Item 1.15.3	18,600.00
6	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch, connections etc. as required.	each	50	401.00	DSR Ele. SOR 2018, Item 1.31	20,050.00
7	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	each	50	495.00	DSR Ele. SOR 2018, Item 1.32	24,750.00
8	Supplying and fixing stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	each	20	359.00	BCD Ele. SOR 2018, Item 1.25	7,180.00
9	Supplying and fixing 2 pin, 6 amp ceiling rose on the existing junction box/ wooden block including connection etc as required.	each	70	42.00	BCD Ele. SOR 2018, Item 1.33	2,940.00
10	Installation of exhaust fan in the existing opening, including making good the damage connection, testing, commissioning etc as required. Upto 450 mm sweep	each	10	198.00	BCD Ele. SOR 2018, Item 1.50.1	1,980.00
11	P & F following capacity busbar chamber with 4 strps of suitable size made of copper, heavy duty complete with all accessories including connections, earthing the body etc. as required. 200 Amps	each	2	7,742.00	BCD Ele. SOR 2018, Item 2.5.3	15,484.00
12	Providing and fixing following capacity four pole ONload/panel mounted changeover switches inside the existing cubical panel board including drilling holes in cubicle panel, making connections etc. as required. 125 Amp, four pole	each	2	7,252.00	BCD Ele. SOR 2018, Item 2.7.4	14,504.00
13	Supplying and fixing following way, horizontal type three pole & neutral, sheet steel, MCB distribution board, 415 volts, on surface/ recess, complete with tinned copper bus - bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator), 4 way (4 + 12), double door, horizontal type	each	4	2,388.00	BCD Ele. SOR 2018, Item 2.9.4	9,552.00
14	Supplying and fixing following rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required. 6/32 amps, Single pole	each	60	192.00	BCD Ele. SOR 2018, Item 2.12.1	11,520.00
15	Supplying and fixing following rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following load of single poles in the existing MCB DB complete with connections, testing and commissioning etc. as required. 50/63 amps, Tripole & neutral	each	4	1,635.00	BCD Ele. SOR 2018, Item 2.12.7	6,540.00
16	Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current Upto 300 mill amperes in the existing MCB DB complete with connection, testing and commissioning etc. as required. 63 Amp	each	4	2,941.00	BCD Ele. SOR 2018, Item 2.18.3	11,764.00


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17	Supplying and fixing 20 amps, 240 volts, SPN industrial type, socket outlet, with 2 pole and earth, metal enclosed plug top along with 20 amp "C" curve, SP MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket outlet and complete with connection, testing and commissioning etc. as required.	each	5	996.00	BCD Ele. SOR 2018, Item 2.19	4,980.00
18	Supplying and fixing 30 amps, 415 volts, TPN industrial type, socket outlet, with 4 pole and earth, metal enclosed plug top along with 30 amps "C" curve, TP MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket outlet and complete with connections, testing and commissioning etc. as required.	each	10	3,157.00	BCD Ele. SOR 2018, Item 2.25	31,570.00
19	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	set	3	5,125.00	BCD Ele. SOR 2018, Item 3.2	15,375.00
20	Providing and fixing 25 mm X 5 mm G.I strip on surface or in recess for connections etc. as required.	mtr	200	150.00	BCD Ele. SOR 2018, Item 3.15	30,000.00
21	Supplying and fixing single wall mounted 20/22 watt LED type batten fitting complete with electronic driver and LED tube etc directly on wall/ ceiling including connection with 1.5 sq. mm FR PVC insulated copper conductor and earthing the body etc. as required.	each	10	684.00	BCD Ele. SOR 2018, Item 5.9.3	6,840.00
22	Supplying and fixing indoor recess mounting 36 watt LED flat panel luminaire suitable for armstrong / grid ceiling and complete with electronic driver etc. directly on false ceiling including connection with 1.5 sq. mm FR PVC insulated copper conductor cable and earthing the body etc. as required.	each	30	4,023.00	BCD Ele. SOR 2018, Item 5.10.3	120,690.00
23	Supplying and fixing 90 watt LED type FLOOD light with die cast aluminium housing for ingress protection of IP65 and complete with all accessories etc and connection with FR PVC insulated copper conductor cable and earthing the body etc. as required.	each	4	8,501.00	BCD Ele. SOR 2018, Item 5.13.10	34,004.00
24	Fixing for Laying of one number PVC insulated and PVC sheathed/ XLPE power cable of 1.1 KV grade of following size on wall surface as required. Above 35 sq. mm and upto 95 sq. mm Upto 35 sq. mm (Clamped with 1 mm thick saddle)	mtr	300	29.00	BCD Ele. SOR 2018, Item 7.4.1	8,700.00
25	Fixing for Laying of one number PVC insulated and PVC sheathed/ XLPE power cable of 1.1 KV grade of following size on wall surface as required. Above 35 sq. mm and upto 95 sq. mm (Clamped with 25 x 3 mm NS flat clamp)	mtr	300	68.00	BCD Ele. SOR 2018, Item 7.4.2	20,400.00
26	Supply and installation of Regular/ standard model A.C ceiling fan of 1200 mm sweep including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FR PVC insulated copper conductor etc. as required.	nos	4	1,618.00	BCD Ele. SOR 2018, Item 8.11.2	6,472.00
27	4 core, 6 sq. mm, XLPE/PVC insulated PVC. sheathed (Heavy duty) Armoured electric cable with aluminium conductor	mtr	300	75.00	BCD Ele. SOR 2018, Item 2216	22,500.00
28	4 core, 10 sq. mm, XLPE/PVC insulated PVC. sheathed (Heavy duty) Armoured electric cable with aluminium conductor	mtr	200	95.20	BCD Ele. SOR 2018, Item 2217	19,040.00

29	4 core, 16 sq. mm, XLPE/PVC insulated PVC. sheathed (Heavy duty) Armoured electric cable with aluminium conductor	mtr	200	105.70	BCD Ele. SOR 2018, Item 2204	21,140.00
30	3.5 core, 25 sq. mm, XLPE/PVC insulated PVC. sheathed (Heavy duty) Armoured electric cable with aluminium conductor	mtr	100	126.00	BCD Ele. SOR 2018, Item 2205	12,600.00
31	3.5 core, 35 sq. mm, XLPE/PVC insulated PVC. sheathed (Heavy duty) Armoured electric cable with aluminium conductor	mtr	200	159.00	BCD Ele. SOR 2018, Item 2206	31,800.00
32	3.5 core, 50 sq. mm, XLPE/PVC insulated PVC. sheathed (Heavy duty) Armoured electric cable with aluminium conductor	mtr	300	207.00	BCD Ele. SOR 2018, Item 2207	62,100.00
33	3.5 core, 95 sq. mm, XLPE/PVC insulated PVC. sheathed (Heavy duty) Armoured electric cable with aluminium conductor	mtr	300	340.20	BCD Ele. SOR 2018, Item 2209	102,060.00
34	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required. Above 35 sq. mm and upto 95 sq. mm	mtr	300	151.00	BCD Ele. SOR 2018, Item 7.1.2	45,300.00
35	Supply, Installation, Testing and Commissioning of LED RGB/RGBW Linear Wall Washer luminaire for Facade lighting with aluminium extruded housing, of following wattage. Luminaire shall be capable of producing dynamic color changing light with 16 million colors by DMX/Ethernet based control. The beam angle of the fitting shall be narrow, medium, wide or asymmetric as per the requirement. Luminaire shall be complete with driver and capable of operating at line voltage without any separate power supply from 100 to 270 VAC, 50Hz, power factor > 0.9. Fixture shall be suitable to operate at ambient temperature range of -10° C to +50° C and shall be IP65 and IK 06 rated. Life time should be at least L70 : 50000 burning hours at 50° C. Luminaire shall be conforming to BIS and shall be complete with all necessary accessories required for proper working of fixture including weather proof connection cables, water proof connectors etc. as required. 25 watt	each	16	23,130.00	DSR E&M Facade 2018, Item 2.5	370,080.00
Total Amount						1,092,035.00

Bill of Quantities (Electrical) for Kid's Play Area in Sandish Park In Bhagalpur under Smart City Mission.

SL	Description	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supply and fixing of decorative 40 to 45 Watt LED Post top indirect light luminaire having Pressure die cast aluminium body and Clear glass with driver set conforming to IP 65 and above protection complete in all respect. CAT-AAA CAT-AA CAT-AAA	Nos	8	18,300.00	UP SOR 2018 Chapter 14 - LED LUMINAIRES, Item 1443	146,400.00
2	4 core, 16 sq. mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	400	105.70	BCD Ele. SOR 2018, Item 2204	42,280.00


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3	4 core, 25 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	126.00	BCD Ele. SOR 2018, Item 2205	37,800.00
4	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required but excluding sand cushioning and protective covering. Upto 35 sq. mm	mtr	600	77.00	DSR Ele. SOR 2018, Item 7.3.1	46,200.00
5	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	mtr	2	5,125.00	BCD Ele. SOR 2018, Item 3.2	10,250.00
6	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	set	300	38.00	BCD Ele. SOR 2018, Item 3.16	11,400.00
7	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 gauge iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	Nos	1	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	6,174.00
8	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	Each	1	1,200.00	BCD Ele. SOR 2018, Item 1710	1,200.00
9	Supplying, installation, testing and commissioning of Astronomical time switch of following configuration to be mounted in feeder pillars / Lighting DBs for automatic switching On & OFF of street lights at sun set & sun rise or twilight (Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required. 3 output (1 output per phase) and suitable for three phase supply	Each	1	3,657.00	DSR Ele. SOR 2018, Item 15.4.3	3,657.00
Total Amount						305,361.00
Bill of Quantities (Electrical) for Multipurpose Ground in Sandish Park In Bhagalpur under Smart City Mission.						
SL	Description	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supply and fixing of 20 mtr High mast Pole of approved make with rising system, hot dip Galvanized inside & outside , having pole sheet thickness 4mm, top dia minimum 150mm, bottom dia minimum 410mm, base plate 32mm thick, suitable for wind velocity as per IS 875 part 3 & having no circumferential weld, with accessories for high mast such as head frame suitable for 6 to 12 luminaries & its control gear boxes, 1.5 HP Power tool motor, 3 point suspension system with steel wire rope 8 mm dia , double drum winch. Including making suitable Foundation as per manufacture drawing & site requirement along with foundation bolts, nuts, washers , anchor plates etc Complete in all respect as per direction and satisfaction to the Engineer-in-charge.	Nos	8	403,409.09	UP SOR 2018 Chapter 6 - High Mast, Item 653	3,227,272.73

2	Supplying and fixing following LED street/ Flood light with die cast aluminium housing for ingress protection of IP65 and complete with all accessories etc on pole/ building including connection and earthing the body etc. as required. 200/220 watt FLOOD light	Nos	64	26,964.00	BCD Ele. SOR 2018, Item 5.13.15	1,725,696.00
3	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	105.70	BCD Ele. SOR 2018, Item 2204	31,710.00
4	4 core, 25 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	2000	126.00	BCD Ele. SOR 2018, Item 2205	252,000.00
5	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required but excluding sand cushioning and protective covering. Upto 35 sq. mm	mtr	2000	77.00	DSR Ele. SOR 2018, Item 7.3.1	154,000.00
6	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	mtr	10	5,125.00	BCD Ele. SOR 2018, Item 3.2	51,250.00
7	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	set	100	38.00	BCD Ele. SOR 2018, Item 3.16	3,800.00
8	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 gauge iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	Nos	4	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	24,696.00
9	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	Each	4	1,200.00	BCD Ele. SOR 2018, Item 1710	4,800.00
10	Supplying, installation, testing and commissioning of Astronomical time switch of following configuration to be mounted in feeder pillars / Lighting DBs for automatic switching On & OFF of street lights at sun set & sun rise or twilight (Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required. 3 output (1 output per phase) and suitable for three phase supply	Each	4	3,657.00	DSR Ele. SOR 2018, Item 15.4.3	14,628.00


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11	S & F of all in one solar LED street light fixture with Integrated high efficient Monocrystalline panel with Lithium (LiFePO4) Ferro Phosphate battery with BIS approved make .luminaire should be secondary optic lenses for better distribution with delivered efficacy of > 100 Lumen per watt. Bidder shall have in house R&D Laboratory which is recognised by ministry of Science & Technology department, Govt. Of India/NABL. Bidder shall have inhouse pole & luminaire manufacturing facility. Luminaire can be supplied with Hybrid switch along with indicator to understand the source of power (either from solar or AC supply). shall have certificate tested from MNRE approved Lab. Guarantee for total system is two years .Note: All the above should be integrated and should be 1 system. Compact Solar LED Street Light - 90W(MONO) 18V/12.8V 42Ah/60W	Each	50	60,984.00	RUIDP Ele. SOR 2017, Item 15.4.3	3,049,200.00
Total Amount						8,539,052.73
Bill of Quantities (Electrical) for OAT in Sandish Park In Bhagalpur under Smart City Mission.						
Sl	Description	Unit	Qty.	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supply and fixing of decorative 40 to 45 Watt LED Post top indirect light luminaire having Pressure die cast aluminium body and Clear glass with driver set confirming to IP 65 and above protection complete in all respect. CAT-AAA CAT-AA	nos	8	18,300.00	UP SOR 2018 Chapter 14 - LED LUMINAIRES, Item 1443	146,400.00
2	P & F of IP68, IK10 protected LED Buried marker light / Step Light Fixture. Fixture made of powder coated die cast aluminium with Toughened Glass cover and appropriate beam angle lens to be used as per requirement. The System level Luminous efficacy must be >90 Lumen/W. High Power LEDs at 1W/2W per LED. The driving current should be Minimum 350 mA per LED. CRI>70, CCT: 3000/6500 K. The integral SMPS based electronic driver must be constant current and surge protection of min. 4KV(L-N) and efficiency > 85%, PF>0.9 and input Voltage range of 90-270V AC at 50Hz. System life of 50000 Burning hours with 70% of Initial Lumens maintained. Light should include quick connecting cable coupled with various mounting accessories. Light output in Cool white or Warm White Colour as per engineers choice. Fixture must be in compliance with IS/CE Standards. Step Light - 5W	nos	50	1,662.00	SOR RUIDP 2017, Item 58.33.4	83,100.00
3	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required. 2 x 1.5 sq. mm	mtr	200	41.00	DSR Ele. SOR 2018, Item 1.17.2	8,200.00
4	Supply and fixing of 12.5 mtr High mast Pole of approved make with rising system, hot dip Galvanized inside & outside , having pole sheet thickness 3mm, top minimum 100mm, bottom dia minimum 310mm, base plate 25mm thick, suitable for wind velocity as per IS 875 part 3. & having no circumferential weld, with accessories for high mast such as head frame suitable for 6 luminaries & its control gear boxes, 0.75 HP Power tool motor, 3 point suspension system with steel wire rope 6mm dia , double drum winch Including making suitable Foundation as per manufacture drawing & site requirement along with foundation bolts, nuts, washers , anchor plates etc Complete in all respect. as per direction and satisfaction to the Engineer-in-charge.	nos	2	220000.00	UP SOR 2018 Chapter 6 (Supplementary) - Mast, Item 651	440000.00

5	Supplying and fixing following LED street/ Flood light with die cast aluminium housing for ingress protection of IP65 and complete with all accessories etc on pole/ building including connection and earthing the body etc. as required. 200/220 watt FLOOD light	nos	6	26,964.00	BCD Ele. SOR 2018, Item 5.13.15	161,784.00
6	4 core, 16 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	200	105.70	BCD Ele. SOR 2018, Item 2204	21,140.00
7	4 core, 25 sq mm XLPE/PVC insulated PVC sheathed (heavy duty) armoured electric cable with aluminium conductor	mtr	300	126.00	BCD Ele. SOR 2018, Item 2205	37,800.00
8	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required but excluding sand cushioning and protective covering. Upto 35 sq. mm	mtr	500	77.00	DSR Ele. SOR 2018, Item 7.3.1	38,500.00
9	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	mtr	2	5,125.00	BCD Ele. SOR 2018, Item 3.2	10,250.00
10	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	set	200	38.00	BCD Ele. SOR 2018, Item 3.16	7,600.00
11	Supplying and fixing Floor mounted outdoor feeder pillar cubical type panel board, fabricated with 14 guage iron sheet suitable for panel mounted SFU/MCCB and complete with bus-bar chamber, insulator, nut-bolt with MS 40 X 40 X 5 mm angle stand and complete with powder painting etc as required. (But without busbar copper strip, MCCB, & PCC work) (Each panel 3 Sq. ft)	nos	1	6,174.00	BCD Ele. SOR 2018, Item 8.10.3	6,174.00
12	50/63 amps ratings, TPN MCB, "C" curve 10 KA breaking capacity	each	1	1,200.00	BCD Ele. SOR 2018, Item 1710	1,200.00
13	Supplying, installation, testing and commissioning of Astronomical time switch of following configuration to be mounted in feeder pillars / Lighting DBs for automatic switching On & OFF of street lights at sun set & sun rise or twilight(Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required. 3 output (1output per phase) and suitable for three phase supply	each	1	3,657.00	DSR Ele. SOR 2018, Item 15.4.3	3,657.00
					Total Amount	965,805.00
Bill of Quantities (Electrical) for Sandish Park Project (11 kv and LT Line, Power Transformer, RMU), in Bhagalpur under Smart City Mission.						
Sl	Description	Unit	Qty	Rate (Rs.)	Ref: Rate	Amount (Rs.)
1	Supply of 11KV grade, 3C x 300 Sq. mm Aluminium conductor, XLPE insulated, PVC sheathed, armoured screened cable. The cable should conform to IS: 7098 Part-2, 2011 with up to date amendment. APPROVED BRAND : Polycab/ Havells/ KEI/ RR / RPG	mtr	1000	1,311.36	SPDCL 2016, Material Rate	1,311,363.64


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2	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing RCC/ HUME/ METAL/ DWC HDPE pipe as required. Above 120 sq. mm and upto 400 sq. mm	mtr	1000	112.00	DSR SoR 2018, Item Code 8.3.2	112,000.00
3	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc.direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required. 200 mm dia (OD-200 mm & ID-175 mm nominal), approved make	mtr	2000	598.00	DSR SoR 2018, Item Code 14.16.5	1,196,000.00
4	Supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required : 300 sq. mm	each	4	17,166.00	DSR Ele. SOR 2018, Item 10.5.4	68,664.00
5	Supplying and making straight through cable jointing with heat shrinkable jointing kit complete with all accessories including ferrules suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required : 300 sq. mm	each	6	19,314.00	DSR Ele. SOR 2018, Item 10.6.4	115,884.00
6	Supply, installation, testing and commissioning of new double pole structure for 11KV/433V upto including PSC Pole 400 kg 2 Nos, Top channel set, A.B. Switches base channel set, Horn gap fuse base channel, Transformer base channel, Tanformer fastening angle, Support clamp for transformer base channel, support clamp for AB switch base channel, Back clamp for transformer fastening angle, back clamp for horn gap fuse set, cable holding clamp, 11 KV 200 Amp. AB Switch 3 pole, 11 KV Horn Gap Fuse set with insulator, nut bolt, danger board making HT/LT busbar System, 200 kva DT star rated etc complete with all respect as per Local Discom Specification as required.	set	1	428,484.00	SPDCL 2016, DSS	428,484.00
7	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	set	4	5,125.00	BCD Ele. SOR 2018, Item 3.2	20,500.00
8	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing etc. as required.	mtr	100	38.00	BCD Ele. SOR 2018, Item 3.16	3,800.00

9	<p>SITC of DG Set complete with 1500 RPM Diesel Engine of suitable BHP & AC Brush less SPDP Alternator mounted on a common base Frame & coupled through a flexible coupling or close coupled. Alternator shall be self regulated with standard Alternator Protection(Over voltage, over speed & under voltage). Engine shall have residential silencer, up to 10 M exhaust piping , electronic / Mechanical governor, Manual & electric/Auto Start, Batteries, Fuel tank (with Stand) & piping, control panel (16 G) with MCCB (4P; 25 KA), Ammeter, Voltmeter, Frequency Meter, Energy Meter & Hour Meter, Engine instruments panel, AVM and with Weatherproof, powder coated Accoustic enclosure for DG set for sound attenuation fabricated from 1.6 mm CRCA sheet steel (structure) with side wall fabricated from 1.6 mm CRCA sheet and filled with foam as per CPCB norms latest amendments & IS 8183. The doors are fabricated from 1.6 mm CRCA sheet packed with accoustic material, floor of MS chequered plate 5.0 mmthick, All doors/ opening are sealed with neoprene/ EPDN gaskets. The enclosure has built in fuel tank, residential silencer (isolated from main DG chamber) with protection and tripping of DG set against temperature of more than 50 °C. All controls for operation of DG set are from outside the enclosure with DG control panel having microprocessor based genset monitoring and control system mccb Ammeter, voltmeter, Pf meter, frequency meter, KWH meter, Ind. Lamps etc. mounted inside enclosure , visible and accessible from outside. The enclosure should be suitable for following capacity DG sets and alternator. Noise level is less than 75 db (A) at a distance of 1 mtr. duly certified by authorized agency. Complete in all respect of following capacity : Radiator cooled and turbo charged, 100 KVA at 0.8 pf 415V 50Hz 3-Ø, with AMF Panel fitted inside the enclosure, with the following meters/indicators:(Incoming and outgoing voltage, Current in all phases, Frequency, KVA and power factor, Time indication for hours/ minutes of operation, Fuel Level in field tank, low fuel indication, Emergency Stop button, Auto/Manual/Test selector switch, MCCB/Circuit breaker for short-circuit and overload protection, Control Fuses, Earth Terminal, Any other switch, instrument, relay etc. essential for Automatic functioning of DG set with AMF panel Make:-for Engine-Cummins, Caterpillar, KOEL, for Alternator:- Stamford, Kirlosker-Green,CG</p>	1	917,204.00	RUIDP SOR 2017, Item- 66.18.2.9	917,204.00	
					Amount	2,862,536.00

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