



PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY

DETAILED DESIGN OF THE INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING AND RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB (PACKAGE-II)



PC-I IMPROVEMENT AND EXTENSION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Total Cost: Rs. 367.76 Million

March, 2023



Clearance Code	4396/11/M/32B.22	Doc No.	4396-15	Rev No.	March, 2023
----------------	------------------	---------	---------	---------	-------------

IMPROVEMENT AND EXTENSION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

TABLE OF CONTENTS

DESCRIPTION		Page #
PC-I FORM		i – xix
APPENDICES		
APPENDIX-A	Location Plan	1
APPENDIX-B	Cost Estimate & Backup Calculations	4
APPENDIX-C	Rate Analysis & Quotations	70
APPENDIX-D	Economic and Financial Analysis	183
APPENDIX-E	Work Schedule-Construction Plan	200
APPENDIX-F	Drawings	202
APPENDIX-G	Environmental & Social Management Plan	220
APPENDIX-H	Environment, Health and Safety SOPs for Labor/Workers	238
APPENDIX-I	Technical Specification	248
APPENDIX-J	Operation & Maintenance Calculations	280
APPENDIX-K	Design Calculations (2032)	282

PC-I PROFORMA

1. Name of the Project:	Improvement and extension of Water Supply System in Kamoke City											
2. Location:	Kamoke is located on the Grand Trunk Road 21 km from Gujranwala at its south and 46 km from Lahore. Kamoke is located at 31°58'31"N 74°13'23"E (31.9752600, 74.2230400) and at (226 m) above sea-level in central Punjab. Location Map is also attached in Appendix-A.											
3. Authority Responsible for:												
i. Sponsoring	Govt. of the Punjab (through World Bank (WB) funding)											
ii. Execution	Municipal Committee Kamoke under the control of District Council Gujranwala											
iii. Operation & Maintenance	Municipal Committee Kamoke under the control of District Council Gujranwala											
iv. Concerned Federal Ministry	N. A											
4a. Plan Provision:												
i. If the Project is included in the medium term/five-year plan, specify actual allocation.	<p>Punjab Cities Program (PCP) is a World Bank Funded Program with a total cost of 236.00 million USD and comprises of below mentioned components.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Total loan from World Bank</td> <td style="text-align: right;">200.00 million USD</td> </tr> <tr> <td>Component-1 Infrastructure development (PforR)</td> <td style="text-align: right;">180.00 million USD</td> </tr> <tr> <td>Component-2 Technical Assistance</td> <td style="text-align: right;">20.00 million USD</td> </tr> <tr> <td>MCs share (20% of PforR component) equivalent to:</td> <td style="text-align: right;">36.00 million USD</td> </tr> <tr> <td>Total Program cost</td> <td style="text-align: right;">236.00 million USD</td> </tr> </table> <p>Component-2 i.e., Technical Assistance component of Program costing 20.00 million USD is meant for management cost of the Program and capacity building of MCs & Government Departments and is included in the medium term/ five-year plan and has been funded now in ADP 2022-23 - under General Serial No-1769 with allocation of PKR 1329.90 million as foreign component.</p>		Total loan from World Bank	200.00 million USD	Component-1 Infrastructure development (PforR)	180.00 million USD	Component-2 Technical Assistance	20.00 million USD	MCs share (20% of PforR component) equivalent to:	36.00 million USD	Total Program cost	236.00 million USD
Total loan from World Bank	200.00 million USD											
Component-1 Infrastructure development (PforR)	180.00 million USD											
Component-2 Technical Assistance	20.00 million USD											
MCs share (20% of PforR component) equivalent to:	36.00 million USD											
Total Program cost	236.00 million USD											
ii. If not included in the current plan, what warrants its inclusion and how it is now proposed	Included and reflected in ADP 2022-23 at Sr. No. 1769 with allocation of Rs. 1329.90 million (T.A) component.											

to be accommodated?	
iii. If the project is proposed to be financed out of block provision, indicate:	The Project is being financed by World Bank as Donor along with 20% co-financing from the Program Municipal Committees and is not proposed to be financed out of Block Allocation.
4b. Provision in the current year PSDP/ADP	Rs.1329.90 million (TA Component only) under ADP 2022-23 General Serial No 1769 for Component-2 of the Program i-e Technical Assistance as described above.
<p>5. Project objectives and its relationship with sector's objectives:</p>	<p>The Government of Punjab's (GoPb's) vision is to develop cities with improve urban sectors including water, sanitation, solid waste management, urban transport and green spaces (e.g., parks, Lights etc.) in the 16 cities of Punjab. The development objective of the Program is to strengthen the performance of participating Municipal Committees (MCs), focusing on urban management and improvement of urban sectors including water, sanitation, solid waste management, urban transport and green spaces (e.g., parks, Lights etc.) in the cities of Package-II (Hafizabad, Kamoke and Muridke).</p> <p>In order to extend the facilities and service area a Program captioned as Punjab Cities Program (PCP), funded by World Bank through loan of USD 200.00 million with development period of 5 years has been launched in 16 MCs of Punjab. Each MC will contribute 20% of the total cost of the sub-projects being executed in its jurisdiction.</p> <p>This sub project captioned as <i>“Improvement and extension of water supply system in kamoke city”</i> is included in that programme. For improvement of the existing water supply system two areas are selected as need based priority named as, Rasool Nagar and Mandiala Road for installation of new water supply lines and tube wells to cater the demand of the population.</p> <p>Sector Objectives The sector objectives include:</p> <ol style="list-style-type: none"> 1. Provision of efficient and effective municipality services to the cities. 2. Design of priority projects keeping in view the needs and cost effectiveness of the water supply services as per projected population for up to 2032. 3. Community development through improving basic infrastructure. 4. Clean and green environment for better living standards. 5. Effective use of land through sectoral planning of urban areas. 6. Ease in mobility and communication. 7. Cost efficient Solid Waste Management through waste to energy initiatives.

	<p>8. Capacity building of Local Governments.</p> <p>Objectives of the Project The Project aims at improvement of infrastructure and water supply system of the city kamoke.</p> <p>The Project has the following objectives;</p> <ol style="list-style-type: none"> 1. Project’s design objectives are to provide more efficient and cost-effective water supply services targeting the population densities of 2032 in selected area of Kamoke city 2. The proposed water supply network will enable the MC to fulfil the basic water needs of the city. 3. It will improve the supply network and control the losses. 4. Reduce or nullify the gap between demand and supply of this project area in respect of clean drinking water. 5. It will provide safer / improved quality water to the consumers. 6. Provide better or improved terminal pressure. 7. It will reduce the water borne disease and the expenditure on the curative medicine. 8. It will help in improving the local economy. <p>Hence, the objectives of the project are in line with the sector objectives mentioned above and the project forms integral part of the concerned sector.</p>
<p>In case of revised projects, indicate objectives of the project if different from original PC-1</p>	<p>N/A</p>
<p>6. Description, justification and technical parameters:</p>	
<p>i. Present Condition</p>	<p><u>Existing System</u> The groundwater in the city is extracted through tube wells by both the city water supply system (operated by MC) and residents. The coverage of the water supply system in Kamoke is about 40 percent only for existing population. The city has been divided in to two operational zones (eastern and western). Presently, 5 tube wells are installed in the city, out of which 2 are abandoned due to the sand blowing issues. 3 Tube wells are operational at different locations to harness the deep underground water. Water from two tube wells having capacity of 2.0 cusecs each is directly fed to the distribution system and one tube well of 2 cusec capacity near Girls college is pumping water into overhead reservoir. Water from this OHR is being supplied to the filtration plant. Out of five OHRs, only one is operational. 60% of the city area does not have any water supply distribution system. Rest is served with the very old water supply facility constructed by PHED department mor than 30 years ago. In served areas of the city, the estimated total length of network is about 33 km.</p>

Due to the damaged and outlived water supply pipelines, the water contamination issues are found in almost all areas. The possible causes may be the leakages in the distribution system pipelines and underground leaking consumer connections. Due to contamination issues, private boring and extraction of water is very common in the city. Mixing of sewerage water with drinking water being supplied by the supply pipes at several points has resulted in the production of contagious diseases, allergy and other associated problems among the masses of the city.

Details of existing Water supply components in Kamoke;

S. N	Component	Quantity	Remarks
1	Tube wells	5 Nos	Only 3 operational
2	Overhead Tanks / Reservoirs	5 Nos	1 Operational
3	Piped Distribution Network	Approximate 33 km	Old, Deep, Damaged and Outlived
4	Filtration Plants	4 Nos	Need Repair Work

Tube wells

Currently, five deep tube wells are installed at different locations of the city. Out of these five tube wells, two tube wells are not operational. Water is directly pumped into the system or either into the OHRs. Water from two tube wells is directly fed to the distribution system and one tube well of 2 cusec capacity near Girls college GT road is pumping water into overhead storage reservoir. Water from this OHR is being supplied to the filtration plant. The details of the existing operational tube wells are as follows;

Zone	Location	No. of tube wells	Capacity each (cusecs)	Total capacity (cusecs)	No of tube wells	
					Operational	Abandoned
Eastern Zone	Mandiala road Kamoke	1	2.0	2.0	1	0
	Rasool Nagar	1	2.0	2.0	1	0
Western Zone	Girls College GT Road	1	2.0	2.0	1	0
	Sharif pura Kamoke	1	2.0	2.0	0	1
	Dera Gujran	1	2.0	2.0	0	1
Total		5	2	10	3	2

Overhead Tanks / Reservoirs

In Eastern Zone, two OHRs and in Western zone, three OHRs were constructed. In present scenario, there are five overhead reservoirs of varying capacities ranging from 50,000 to 100,000 Gallons are in Kamoke but only one OHR is operational. Remaining four OHRs are

not operational due to their repair and maintenance issues and they are abandoned. The details of the existing OHRs are as follows;

Zone	Location	Nos.	Capacity each (Gallons)	Operational Status
Eastern Zone	Rasool Nagar road	1	50,000	Abandoned
	Mandiala road	1	50,000	Abandoned
Eastern Zone	Mohalla Mubarak pura	1	50,000	Abandoned
	Girls' college	1	100,000	Operational (Supply to Filtration Plant)
	Mohalla Dera Gujran	1	100,000	Abandoned
Total		5	350,000	

4 Nos. water filtration plants are working in the city which require repair of certain important component to supply potable water to the inhabitants of the city. The current working state of these filtration plants however is not optimal. No filtration plants have cartridge expiry or replacement record at site. The condition of water taps is also unsatisfactory. Lack of funds and poor operation & maintenance have left these filtration plants nearly redundant.

MAJOR ISSUES OF THE EXISTING WATER SUPPLY SYSTEM

1. Entire water supply system in the western zone is abandoned due to over aging and installation of sewerage facilities, which damaged the existing water supply lines in the area.
2. Most of the city area is un-served due to lack of water supply distribution system. Water supply facility for these areas needs to be planned & implemented.
3. All the water supply from existing two operational tube wells is through direct pumping in the distribution lines. Existing distribution lines are damaged and sewage is mixing with clean water.
4. None of the consumer connection is metered and it is proposed to meter all the consumer connections to conserve water, reduce O&M cost, address water shortage and supply of adequate quantity of water to every consumer.
5. In Eastern Zone water supply is intermittent and total 10 hours per day. The quantity of water being produced presently is not enough even in these areas because of closure of one tube well.
6. Deteriorating sub soil water quality due to uncontrolled industrial effluent disposals.
7. Large water loss in lieu of leaks and unaccounted for water.
8. No firefighting water storage in case of electricity shutdown.
9. Large number of un-regularized private water pumps.
10. Filtration plants are not timely serviced and filter cartridges are not replaced when fully utilized.

	11. Improper detection of illegal connections due to shortage of staff resulting in less revenue as compared with O&M charges. Poor maintenance of system due to less collection of revenue.																																		
ii. Description of the subproject	<p><u>Project Description</u> The project comprises of improvement and extension of the existing water supply system of Kamoke City as per approved design criteria along with including unserved areas of Rasool Nagar and Mandiala road.</p> <p><u>Population Projection</u> For the analysis of existing population and future projection the census report of Kamoke district 1998 and 2017 is used. According to available census reports, following Available existing data of Kamoke MC is provided in census reports; -</p> <ul style="list-style-type: none"> ➤ Population in 1998= 152,288 Person ➤ Population in 2017= 248,814 Person ➤ Average Annual Growth rate of Kamoke MC (1998-2017) = 2.61% ➤ Average Household size of 2017= 6.68 <table border="1" data-bbox="504 999 1431 1279"> <thead> <tr> <th>Sr. no.</th> <th>Years</th> <th>Population with Increased Growth Rate</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1998-2017</td> <td>248,814</td> </tr> <tr> <td>2</td> <td>2017-2022</td> <td>294,681</td> </tr> <tr> <td>3</td> <td>2022-2032</td> <td>341,160</td> </tr> <tr> <td>4</td> <td>2032-2040</td> <td>399,875</td> </tr> <tr> <td>5</td> <td>2040-2050</td> <td>462,650</td> </tr> </tbody> </table> <p>Design Criteria was established and got approved. Brief summary of design criteria is as follows:</p> <table border="1" data-bbox="496 1379 1437 1697"> <tbody> <tr> <td>Project Horizon:</td> <td>2050</td> </tr> <tr> <td>Population projections:</td> <td>Based on 2017 Census</td> </tr> <tr> <td>Design Per capita Water demand</td> <td>39.6 gpcd</td> </tr> <tr> <td>Maximum Day Demand</td> <td>1.5 * Average Demand</td> </tr> <tr> <td>Peak Hour Demand</td> <td>1.5 of Maximum Demand</td> </tr> <tr> <td>OHR</td> <td>1/10th of Avg. day demand</td> </tr> <tr> <td>Tube wells</td> <td>Maximum day demand</td> </tr> <tr> <td>Distribution network</td> <td>Peak hour demand</td> </tr> </tbody> </table> <p>For PC-I, Rasool Nagar and Mandiala road areas are selected as per First Priority as established in the consultative session with stake holder of Kamoke city. Distribution Network is designed on design horizon of 2050 while the tube well machinery is designed on 2032. In these two areas, new water supply lines have been proposed to be laid. Detailed lengths and other infrastructure components are given below in both of the two areas:</p>	Sr. no.	Years	Population with Increased Growth Rate	1	1998-2017	248,814	2	2017-2022	294,681	3	2022-2032	341,160	4	2032-2040	399,875	5	2040-2050	462,650	Project Horizon:	2050	Population projections:	Based on 2017 Census	Design Per capita Water demand	39.6 gpcd	Maximum Day Demand	1.5 * Average Demand	Peak Hour Demand	1.5 of Maximum Demand	OHR	1/10 th of Avg. day demand	Tube wells	Maximum day demand	Distribution network	Peak hour demand
Sr. no.	Years	Population with Increased Growth Rate																																	
1	1998-2017	248,814																																	
2	2017-2022	294,681																																	
3	2022-2032	341,160																																	
4	2032-2040	399,875																																	
5	2040-2050	462,650																																	
Project Horizon:	2050																																		
Population projections:	Based on 2017 Census																																		
Design Per capita Water demand	39.6 gpcd																																		
Maximum Day Demand	1.5 * Average Demand																																		
Peak Hour Demand	1.5 of Maximum Demand																																		
OHR	1/10 th of Avg. day demand																																		
Tube wells	Maximum day demand																																		
Distribution network	Peak hour demand																																		

Water Supply Design (2032) - Mandiala Road and Rasool Nagar areas					
Area	Pipe dia (inch)	Length (ft)	Others	Parameters	
Rasool Nagar	3	45420	Population	30110	Persons
	4	15265	Avg Water Demand	1.19	MGD
	6	15477	Max Water Demand	1.78	MGD
	8	2551	Peak Water Demand	2.68	MGD
	10	244	Tube well capacity	2	Cusecs
	Total Length	78,957	TW Nos.	1	Nos.
Mandiala Road	3	25627	Population	15368	Persons
	4	5198	Avg Water Demand	0.60	MGD
	6	12978	Max Water Demand	0.91	MGD
	8	1283	Peak Water Demand	1.36	MGD
	10	621	Tube well capacity	2	Cusecs
	Total Length	45,707	Tube Well Nos.	1	Nos.
Note:					
39.6 gpcd or 0.180 m ³ /d per capita					
Pumps Working = 12 hours per day					
Tube wells at Max Day Demand					
Total length of water supply system for these two areas come out to be 38km along with one tube well of 2 cusec capacity in each area. One tube well is already working in Rasool Nagar and whereas one additional tube well will be installed on Mandiala Road.					
iii. Provide details of civil works, equipment, machinery and other physical facilities required for the project.	The scope of the project is given below;				
	Sr #	Details	Quantity		
	1	Tube well	1 No		
	2	Pumping machinery (DWT)	1 No		
	3	Pump house	1 No		
	4	Distribution system			
		Mandiala Road	45,707 Rft		
		Rasool Nagar	78,957 Rft		
iv. Indicate governance issues of the sector relevant to the project and strategy to resolve them	MC is facing acute shortage of the locally appointed staff which is one of the major issues of O&M. Further due to great hike in the prices of electricity and manpower, it is becoming increasingly difficult to operate and maintain these services due to poor financial condition of the Municipal Committees. The Repair and maintenance of the municipal services is not up to the mark. Training will be imparted by PMDFC to the officers as well as the field staff under the Program but practicing the interventions and method/procedures learnt in these training is the actual requirement in which Committees are lacking at present. Hence inculcating the mindset for good Repair and maintenance is the major requirement for improving the service delivery level.				
7. Capital cost estimates:	Capital cost of the project is given below;				

	S #	Detail of works	Cost (million Rs)																				
	1	Replacement of water supply and old lived pipes in Mohalla Rasoolnagar & Mandiala Road	293.253																				
	2	Installation of tubwell, pump house and pumping machinery	30.206																				
		Total work out lay	323.459																				
		Contingencies (2%)	6.469																				
		PST 5%	16.173																				
		Environmental & Social Management Plan	1.247																				
		Price Adjustment @ 6%	19.407																				
		WAPDA Meter Connection	1.000																				
		Total Cost	367.76																				
(Detail attached as Appendix-B)																							
i. Indicate date of estimation of project cost	The project estimates have been framed during the month of January, 2023																						
ii. Basis of determining the capital cost be provided.	<p>The cost estimates have been framed on the basis of bill of quantities actually measured at site and unit rates from the Market Rate System (MRS) issued by the Government of Punjab (District Gujranwala 1st biannual of year 2023).</p> <p>For items not available in the MRS, the same have been analyzed as per prevailing market rates.</p>																						
iii. Provide year wise estimates of physical activities by main components.	<p>The physical and financial requirements, year wise are included in the following table:</p> <table border="1"> <thead> <tr> <th>S. #</th> <th>Name of subproject</th> <th>Total</th> <th>Year 2022-23</th> <th>Year 2023-24</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Replacement of water supply and old lived pipes in Mohalla Rasool Nagar & Mandiala Road</td> <td>100%</td> <td>10%</td> <td>90%</td> </tr> <tr> <td>2</td> <td>Installation of new tube well at Mandiala Water Works</td> <td>100%</td> <td>50%</td> <td>50%</td> </tr> <tr> <td>3</td> <td>ESMP cost, contingencies & PRA Tax</td> <td>100%</td> <td>20%</td> <td>80%</td> </tr> </tbody> </table>			S. #	Name of subproject	Total	Year 2022-23	Year 2023-24	1	Replacement of water supply and old lived pipes in Mohalla Rasool Nagar & Mandiala Road	100%	10%	90%	2	Installation of new tube well at Mandiala Water Works	100%	50%	50%	3	ESMP cost, contingencies & PRA Tax	100%	20%	80%
S. #	Name of subproject	Total	Year 2022-23	Year 2023-24																			
1	Replacement of water supply and old lived pipes in Mohalla Rasool Nagar & Mandiala Road	100%	10%	90%																			
2	Installation of new tube well at Mandiala Water Works	100%	50%	50%																			
3	ESMP cost, contingencies & PRA Tax	100%	20%	80%																			

iv. Phasing of capital cost on the basis of each item of work.	<p>The phasing of capital cost of the project is included in the following table (All figures are in million rupees)</p> <table border="1" data-bbox="491 297 1441 808"> <thead> <tr> <th>S. #</th> <th>Name of subproject</th> <th>Total</th> <th>Year 2022-23</th> <th>Year 2023-24</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Replacement of water supply and old lived pipes in Mohalla Rasool Nagar & Mandiala Road</td> <td>293.253</td> <td>29.325</td> <td>263.927</td> </tr> <tr> <td>2</td> <td>Installation of new Tube well at Mandiala Water Works</td> <td>30.206</td> <td>3.02</td> <td>27.185</td> </tr> <tr> <td></td> <td>Capital Cost</td> <td>323.459</td> <td>32.345</td> <td>291.112</td> </tr> <tr> <td>3</td> <td>ESMP cost, contingencies PST, PA, WAPDA Connection</td> <td>44.296</td> <td>4.429</td> <td>39.866</td> </tr> <tr> <td></td> <td>Grand Total</td> <td>367.76</td> <td>36.774</td> <td>330.978</td> </tr> </tbody> </table>	S. #	Name of subproject	Total	Year 2022-23	Year 2023-24	1	Replacement of water supply and old lived pipes in Mohalla Rasool Nagar & Mandiala Road	293.253	29.325	263.927	2	Installation of new Tube well at Mandiala Water Works	30.206	3.02	27.185		Capital Cost	323.459	32.345	291.112	3	ESMP cost, contingencies PST, PA, WAPDA Connection	44.296	4.429	39.866		Grand Total	367.76	36.774	330.978
S. #	Name of subproject	Total	Year 2022-23	Year 2023-24																											
1	Replacement of water supply and old lived pipes in Mohalla Rasool Nagar & Mandiala Road	293.253	29.325	263.927																											
2	Installation of new Tube well at Mandiala Water Works	30.206	3.02	27.185																											
	Capital Cost	323.459	32.345	291.112																											
3	ESMP cost, contingencies PST, PA, WAPDA Connection	44.296	4.429	39.866																											
	Grand Total	367.76	36.774	330.978																											
8. Annual operating and maintenance after completion of the project:																															
i. Annual recurrent cost after completion of the project and source of financing	<p>RS. 17.32 million/year</p> <p>The detail of the cost has been given in Appendix-J</p>																														
9. Demand and supply:																															
i. Existing capacity of services and its supply/demand.	<ul style="list-style-type: none"> • MC KAMOKE has existing 3 tube wells of 2 cusec capacity operational with a total design discharge of 6 cusec. Although, Mandiala wala road tube well has a design discharge of 2 cusec but in actual it is providing 0.25 cusec flow. • One OHR of 1, 00,000 Gallons is available along GT road and this OHR is supplying water to the nearby filtration plant. • A total of approximately 33 km of water supply distribution network is available in the city. <p>Western zone is totally abandoned while distribution network in east zone is damaged.</p>																														

ii. Project demand for 10 years.	<table border="1"> <thead> <tr> <th colspan="4">Future Water Demands of Sub projects for 10 years</th> </tr> <tr> <th>Areas</th> <th>units</th> <th>Population 2032</th> <th>Avg. Water Demand (MGD)</th> </tr> </thead> <tbody> <tr> <td>Rasool Nagar</td> <td>persons</td> <td>30110</td> <td>1.19</td> </tr> <tr> <td>Mandiala road</td> <td>persons</td> <td>15368</td> <td>0.60</td> </tr> <tr> <td rowspan="2">Per Capita Water Demand</td> <td>lpcd</td> <td colspan="2">180</td> </tr> <tr> <td>gpcd</td> <td colspan="2">39.6</td> </tr> </tbody> </table>	Future Water Demands of Sub projects for 10 years				Areas	units	Population 2032	Avg. Water Demand (MGD)	Rasool Nagar	persons	30110	1.19	Mandiala road	persons	15368	0.60	Per Capita Water Demand	lpcd	180		gpcd	39.6	
Future Water Demands of Sub projects for 10 years																								
Areas	units	Population 2032	Avg. Water Demand (MGD)																					
Rasool Nagar	persons	30110	1.19																					
Mandiala road	persons	15368	0.60																					
Per Capita Water Demand	lpcd	180																						
	gpcd	39.6																						
iii. Capacity of the projects being implemented in public/private sector.	No such projects in public sector (Water & Sanitation) are executed is being executed in Kamoke City.																							
iv. Supply-demand gap.	<p>In Rasool Nagar, New tube well of 2 cusec capacity is installed but due to lines damage and leakage issues, people have installed their own boreholes too in this Mohalla.</p> <p>In Mandiala Road, Tube wells has less discharge (0.25 cusec against designed discharge of 2 cusec). Hence a new tube well is proposed (2 cusec capacity) with direct pumping because of the increase in demand. Water supply pipelines are damaged in this zone</p>																							
v. Designed capacity and output of the project	One tube well of 2 cusec capacity will be installed along with laying of water supply distribution system in muhallah Rasool nagar and Mandiala road. The system will provide average 1.79 MGD of water to the inhabitants of these parts of the city.																							

<p>10. Financial Plan: a) <u>Debt</u></p> <p>Indicate the local and foreign debt loan</p>	<p>Below given loan for the Punjab Cities Program has been funded by World Bank for 16 PCP cities in Punjab.</p> <table border="1" data-bbox="496 293 1441 797"> <tr> <td>Total loan to Government of Pakistan/Punjab</td> <td>200 million USD</td> </tr> <tr> <td>Component-1 for Infrastructure Development</td> <td>180 million USD</td> </tr> <tr> <td>Component-2 for Investment Project Financing For capacity building of MCs & three Govt. organization and program management.</td> <td>20 million USD</td> </tr> <tr> <td>20% share of Municipalities is equivalent to</td> <td>36 million USD</td> </tr> <tr> <td>Total funds available for Infrastructure Development</td> <td>216 million USD</td> </tr> </table> <p>This project will be funded under this financing trickling down to MC Kamoke as grants.</p>	Total loan to Government of Pakistan/Punjab	200 million USD	Component-1 for Infrastructure Development	180 million USD	Component-2 for Investment Project Financing For capacity building of MCs & three Govt. organization and program management.	20 million USD	20% share of Municipalities is equivalent to	36 million USD	Total funds available for Infrastructure Development	216 million USD
Total loan to Government of Pakistan/Punjab	200 million USD										
Component-1 for Infrastructure Development	180 million USD										
Component-2 for Investment Project Financing For capacity building of MCs & three Govt. organization and program management.	20 million USD										
20% share of Municipalities is equivalent to	36 million USD										
Total funds available for Infrastructure Development	216 million USD										
<p>b) <u>Equity</u></p>	<p>a) Loan/grant to MC</p> <p>The amount of loan converted to grant to Kamoke will be Rs. 294.206 million (cost of the PC-I). The financing of the project will be as given below;</p> <table border="1" data-bbox="523 1070 1414 1256"> <tr> <td>Grant to Committee for the year 2022-23(80% of cost of PC-I)</td> <td>PKR 294.206 million</td> </tr> <tr> <td>20% Co-finance by MC (20% of the cost of PC-I)</td> <td>PKR 73.551 million</td> </tr> <tr> <td>Total available funds (Total cost of PC-I)</td> <td>PKR 367.76 million</td> </tr> </table> <p>b) Project Cost Rs. 367.76 million</p> <p>*The loan is from World Bank to Government of Pakistan/Punjab which will trickle down to Kamoke as grant.</p>	Grant to Committee for the year 2022-23(80% of cost of PC-I)	PKR 294.206 million	20% Co-finance by MC (20% of the cost of PC-I)	PKR 73.551 million	Total available funds (Total cost of PC-I)	PKR 367.76 million				
Grant to Committee for the year 2022-23(80% of cost of PC-I)	PKR 294.206 million										
20% Co-finance by MC (20% of the cost of PC-I)	PKR 73.551 million										
Total available funds (Total cost of PC-I)	PKR 367.76 million										
<p>c) <u>Grants</u></p>	<p>No grant is being given by Government of Punjab out of ADP funds. The World Bank loan to Government of Pakistan/Punjab will trickle down as grant to MC from Government of Punjab.</p>										
<p>d) Weighted cost of capital</p>	<p>Nil</p>										
<p>11. Project benefits & analysis:</p>											
<p>i. Financial</p>	<p>The suggested tariff of user charges is given below</p> <ol style="list-style-type: none"> 1. Domestic connections = Rs 300/household/month 2. Commercial connection = Rs 800/commercial/month 3. Industrial connections = Rs 0 <p>Financial Analysis has been conducted for 30 years Financial Internal Rate of Return at 12% discount rate = 12.58% Cost benefit ratio = 1.06 :1</p>										

	Financial has been given in Appendix-D
ii. Social benefits with indicator	<p>The completion of the project will result in:</p> <ul style="list-style-type: none"> • Up gradation of water supply infrastructure. • Supply of potable and clean water to for raising the general health standards • Reduction of water borne diseases • Saving of man-days of the people presently subjected to water borne diseases. • Reduction in expenditure on the curative health • Improvement of local economy • Increase in potential growth index of the city
iii. Environmental impact	<p>Primary and secondary data were collected and used to assess the environmental and social impacts of the proposed water supply schemes (Replacement of water supply old lived pipes, Installation of a new Tube-well along with Distribution lines) in Kamoke. The Environmental & Social Survey was conducted at the project site to assess the baseline in order to evaluate whether any key receptors will need to be considered during the project works to prevent any long-term and irreversible impacts. The activities to be conducted under the project are screened for potential impacts at the design/pre-construction, construction, and operation phases of the proposed project and to identify the required mitigation measures as per the Environmental & Social Management Framework (ESMF) of PCP. However, the impacts are identified as of temporary nature and there will be no negative impacts after the completion of the project. To facilitate the selection of an optimal solution and for the inclusion of Standard Operating Procedures for Construction workers/labor, an assessment indicator, an Environmental & Screening Checklist and Involuntary Resettlement screening checklists are developed and attached in Appendix G of this PC-1. The Checklist focuses on environmental Issues and Social dimensions are adequately considered. Based on the remarks on the screening checklist, an Environmental and Social Management Plan (ESMP) is prepared (as the sub-project is of Category E-2). ESMP will be made part of the bidding documents. Moreover, the necessary Cost for the implementation of ESMP has also been incorporated into the PC-1. The Environment, Health, and Safety SOPs for the Labor/workers are provided as Appendix H and shall be made part of bid documents.</p>

iv. Quantifiable output of the project	<p>The benefits to be accrued to the target group have been quantified in the Economic Analysis given in Annexure-D. The Economic Indicators are given below:</p> <table border="1" data-bbox="483 320 1447 640"> <tr> <td>Time line of Economic Analysis</td> <td>30 years</td> </tr> <tr> <td>EIRR at 12% discount rate</td> <td>25.84 %</td> </tr> <tr> <td>Cost Benefit ratio</td> <td>1.78:1</td> </tr> <tr> <td colspan="2">Sensitivity Analysis</td> </tr> <tr> <td>Benefits decreased by 10%</td> <td>EIRR = 22.76 %</td> </tr> <tr> <td>Cost overrun by 10%</td> <td>EIRR = 23.04</td> </tr> <tr> <td>Benefits reduction and cost overrun occurring simultaneously</td> <td>EIRR = 20.22 %</td> </tr> </table>	Time line of Economic Analysis	30 years	EIRR at 12% discount rate	25.84 %	Cost Benefit ratio	1.78:1	Sensitivity Analysis		Benefits decreased by 10%	EIRR = 22.76 %	Cost overrun by 10%	EIRR = 23.04	Benefits reduction and cost overrun occurring simultaneously	EIRR = 20.22 %
Time line of Economic Analysis	30 years														
EIRR at 12% discount rate	25.84 %														
Cost Benefit ratio	1.78:1														
Sensitivity Analysis															
Benefits decreased by 10%	EIRR = 22.76 %														
Cost overrun by 10%	EIRR = 23.04														
Benefits reduction and cost overrun occurring simultaneously	EIRR = 20.22 %														
v. Unit Cost Analysis	<p>The unit cost analysis is produced below;</p> <table border="1" data-bbox="515 734 1415 958"> <tr> <td>Project capital cost</td> <td>PKR 367.76 million</td> </tr> <tr> <td>Beneficiary population</td> <td>45478</td> </tr> <tr> <td>Capital Unit cost per person</td> <td>PKR 8086</td> </tr> <tr> <td>Annual O&M cost</td> <td>PKR 17.32 million</td> </tr> <tr> <td>Unit cost of O&M</td> <td>PKR 380.84 /year</td> </tr> </table>	Project capital cost	PKR 367.76 million	Beneficiary population	45478	Capital Unit cost per person	PKR 8086	Annual O&M cost	PKR 17.32 million	Unit cost of O&M	PKR 380.84 /year				
Project capital cost	PKR 367.76 million														
Beneficiary population	45478														
Capital Unit cost per person	PKR 8086														
Annual O&M cost	PKR 17.32 million														
Unit cost of O&M	PKR 380.84 /year														
vi. Employment generation (direct and indirect)	<p><u>Employment Analysis</u></p> <p>Direct Employment</p> <p>a) Planning and Design of projects</p> <p>The planning and design of the project has been entrusted to local consultants (NESPAK) who have appointed staff and experts in water supply system along with their support staff. The consultants will also appoint their staff for resident supervision of the project to verify and certify the items of works to be executed under this PC-I.</p> <p>b) Execution of the Project</p> <p>I. PMDFC</p> <p>PMDFC has the project monitoring and supervisory role and the company has enough experts and staff to complete this assignment. PMDFC has already deployed under mentioned staff for these projects:</p> <ul style="list-style-type: none"> • Civil Engineers • Accounts, administration and audit personnel • Urban planners • GIS experts • Support staff like computer operators, vehicle drivers, office boys and guards. • Procurement experts • Communication experts • Environmental and social experts 														

	<ul style="list-style-type: none"> • Contract management experts <p>II. Municipality Kamoke has regular staff like engineers, sub engineers and other administrative & accounts keeping staff which will be responsible for execution of the project and contract management. No additional staff will be needed for execution of this project</p> <p>III. Contractor The contractor responsible for execution of the sub project will employ skilled and un-skilled labor on this work.</p> <p>Indirect Employment Indirect employment for production of material such as cement, steel, stone metal, bitumen, bricks etc. will be generated.</p>
vii. Impacts of delay on projects cost and availability	<p>The impact of delay in project implementation will;</p> <ul style="list-style-type: none"> • Result in increased project cost due to escalation in cost of material and labor. • Delay the benefits to the target group • Result in further deterioration of the infrastructure and the service delivery level. <p>The Sensitivity Analysis for the first two impacts has been carried out and attached at Annexure-D</p>
12. IMPLEMENTATION SCHEDULE	
i. Indicate starting and completion date of the project	The project will start from May, 2023 and will be completed up to January, 2024 with a contract time line of 9 months.
ii. Item-wise/year-wise implementation schedule in line chart correlated with the phasing of physical activities	Attached as Appendix-E
13. Management Structure and Manpower Requirement Including Specialized Skills During Execution & Operational Phases:	
i. Administrative arrangements for	i. Planning & design of the project

<p>implementation of project.</p>	<p>The project has been designed by the consultants (NESPAK) employed by PMDFC and will also carry out the resident supervision of the project.</p> <p>ii. Preparation of cost estimation The cost estimates have been prepared by the design consultants by actual measurements at site. The execution of the items of works included in these estimates /PC-I will be certified by these consultants.</p> <p>iii. Execution of the project</p> <ul style="list-style-type: none"> • The project will be executed by MC, Kamoke and supervised by the Consultants appointed by PMDFC in resident supervision mode. The technical staff & experts in PMDFC will oversee, co-ordinate and collaborate in the project planning, design and implementation through their experts in head office located in Lahore and regional offices. The reporting of progress to LG & CDD & World bank and troubleshooting will also be responsibility of PMDFC. • MO (I&S) of the Municipal Committee Kamoke has been designated as Project Manager /Engineer in Charge of the project. The supervision of the works will also be carried out by these municipal officers along with their support engineering staff. All supervisory staff is available with MC. • The procurement of works and goods will be done by Procurement Committee of Kamoke Municipal Committee as per PPRA Rules. <p>iv. Verification of quantities included in PC-Is and Resident Supervision of the works by consultants</p> <p>The works will be supervised by Supervision Consultants in resident supervision mode by assuring the quantity and quality of works. The consultants will verify the items of work and their quantities contained in the PC-Is and cost estimates initially and then the quantities and quality of works included in the contractor claims at the stage of payments. Payments will be made by the Municipal Committee Kamoke after these contractor claims have been entered in the measurement books by the Project Manager/Engineer in Charge and pre audited as per LG Works Rules.</p>
<p>ii. The manpower requirements by</p>	<p>a) PMDFC experts and staff</p>

skills during execution and operation of the project provided.

The job description, qualification, experience, age and salary of each post be provided.

For rendering assistance in implementation of infrastructure projects in 16 MCs, PMDFC has the experts and staff in the required fields. In order to facilitate the Program Units, three regional offices have been established by PMDFC at Gujranwala, Faisalabad and Multan/Khanewal.

b) Resident Supervision Consultants

The project will be supervised by consultants. The tentative staff to be employed/deployed by the consultants for the certification of quantities of works and resident supervision of the project is given below.

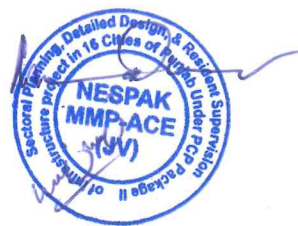
S #	Personnel	Nos	Qualification
1	Chief Resident Engineer/Team Leader	01	BSc;/BE in Civil engineering with minimum 20 years' professional experience or MSC; Civil Engineering/Public Health Engineering/Environmental Engineering with Bachelor in Civil Engineering and minimum 15 years, experience, with 5 years on similar assignments in both cases
2	Senior Engineer	01	BSc;/BE Civil engineering with minimum 08 years' relevant design experience or MSc engineering, with 5 years on similar assignments in both cases
3	Resident Engineer	01	BSc;/BE Civil engineering with minimum 10 years' experience in site supervision and execution for projects of similar nature.
4	Assistant Resident Engineer	01	Bachelor Degree in Civil engineering with minimum 8 years' experience in site supervision and execution for projects of similar nature
5	Site Inspectors	01	DAE in Civil with minimum 10 years' experience in site supervision for projects of similar nature
6	Quantity Surveyor	01	DAE in Civil Technology with minimum 10 years' experience in estimation & costing of projects of similar nature. The person having public sector projects will be preferred.
7	AutoCAD Operator	01	DAE in Civil Technology with minimum 5 years' experience in preparation of drawings for projects of similar nature. (Situating at Lahore office)

c) Contractor's Technical staff, skilled & non skilled labor

The contractors will employ the supervisory technical staff and skilled & non skilled labor for execution of works. The works will be supervised by experienced Engineers and sub engineers and the number of slots for engineers and skilled and non-skilled will depend upon the type and quantity of work and its period of completion.

	<p>d) Repair & maintenance of the project</p> <p>Municipal Committee Kamoke has its own regular staff which has been deployed for repair and maintenance of the municipal services infrastructure. However, it has been observed that the existing staff is not adequate to repair and maintain the services in a manner which can give good service delivery. Hence it is proposed to fill up the presently vacant slots and recruit additional staff as per need of the infrastructure after obtaining sanctions from the competent authority.</p>
<p>14. Additional projects/ decisions required to maximize social – economic benefits from the proposed projects:</p>	<p>1) Shortage & frequent transfers of Provincially appointed staff</p> <p>Municipal Committees are facing frequent transfers in provincially appointed staff. Recently a ban has been imposed by Chief Minister Punjab on the transfer of officers working in the Program Municipal Committees for one year which should be continued till the completion of all PCP subprojects in the Municipal Committees.</p> <p>2) Operation & Maintenance (O&M) staff</p> <p>The O&M staff is also deficient and this is adversely affecting the service delivery level. Number of slots are vacant but the Municipal Committees were not allowed to recruit the staff to fill these slots due to ban on recruitments. Recently this ban has been lifted by the orders of the Chief Minister Punjab and the situation will improve.</p> <p>Further the sanctioned strength of the field staff is much lesser than the actual requirement because with the increase in population and extension of services, additionally required staff has not been sanctioned by the competent authorities.</p> <p>This issue needs to be addressed for optimal utilization of the investments and giving targeted benefits to the resident population of these cities.</p>
<p>15. Certificate</p>	<p>Certified that the project proposal has been prepared on the basis of guidelines provided by the planning commission for the preparation of PC-I for social sectors projects.</p>

Prepared by For and on behalf of
Consultants
(NESPAK, MMP & ACE)
Phone # 0092-42-9090000



Stamp &
Signatures

Checked by Municipal Officer (I&S)
Municipal Committee
Kamoke

Stamp &
Signatures

Checked by Chief Officer Municipal
Committee Kamoke

Stamp &
Signatures

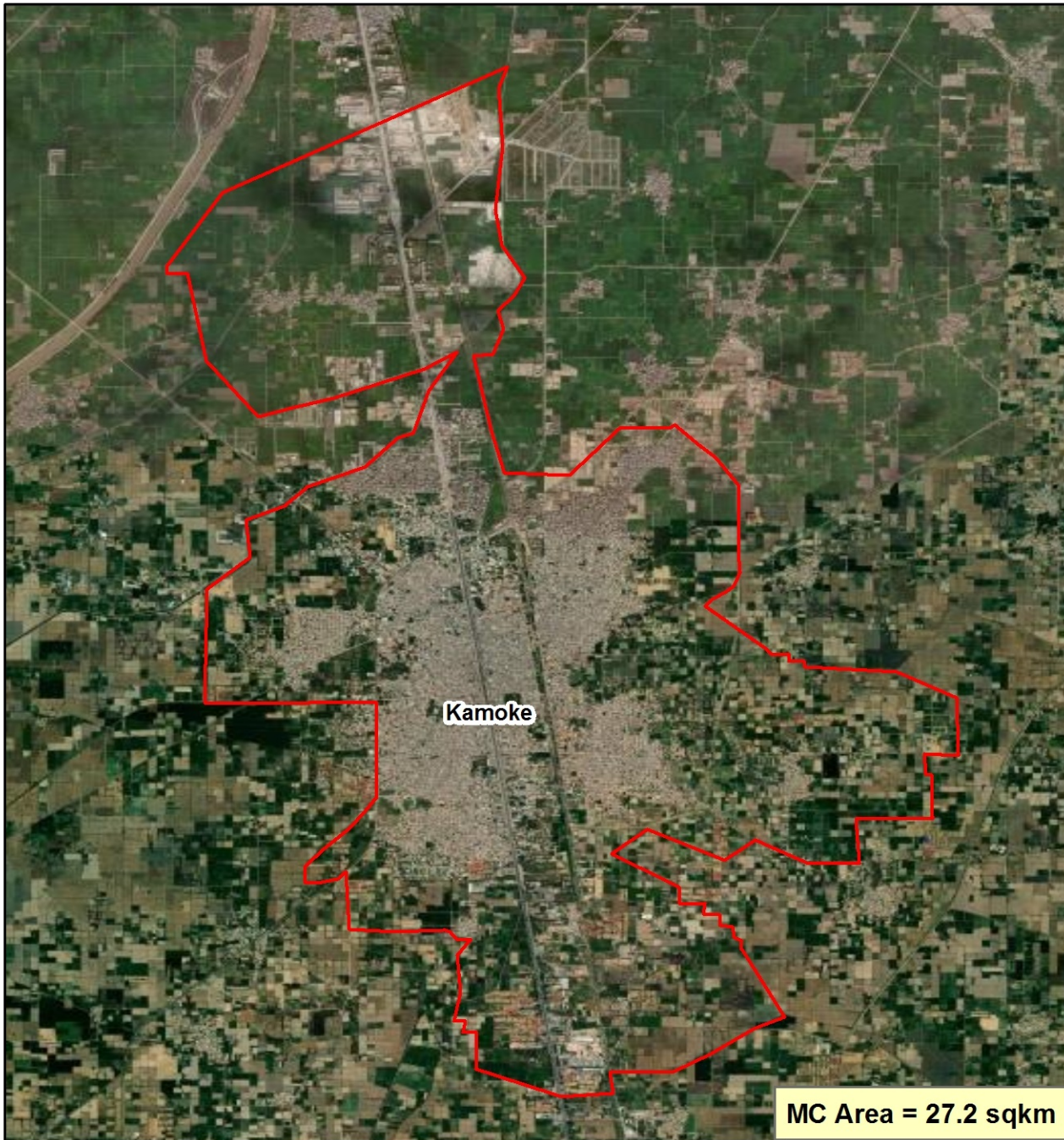
Vetted by Senior Program officer (ID)
PMDFC

Stamp &
Signatures

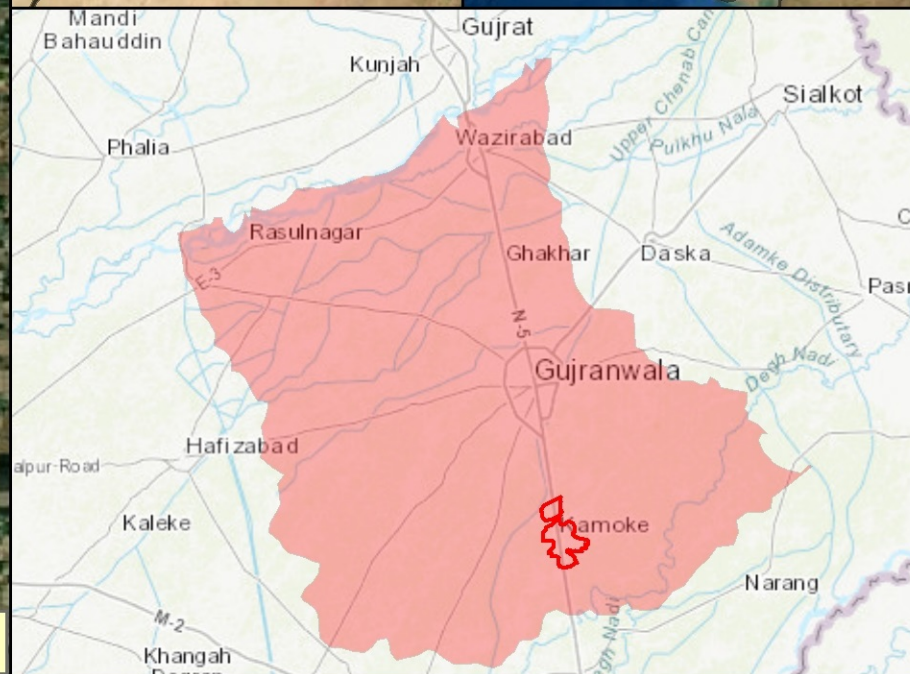
Forwarded by Administrator Municipal
Committee Kamoke

Stamp &
Signatures

ANNEXURE-A LOCATION PLAN



MC Area = 27.2 sqkm



PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDFC)

CONSULTANT

MAP CODE
MAP VERSION

1.0

PROJECT

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT,
SECTORAL PLANNING & RESIDENT
SUPERVISION PACKAGE-II

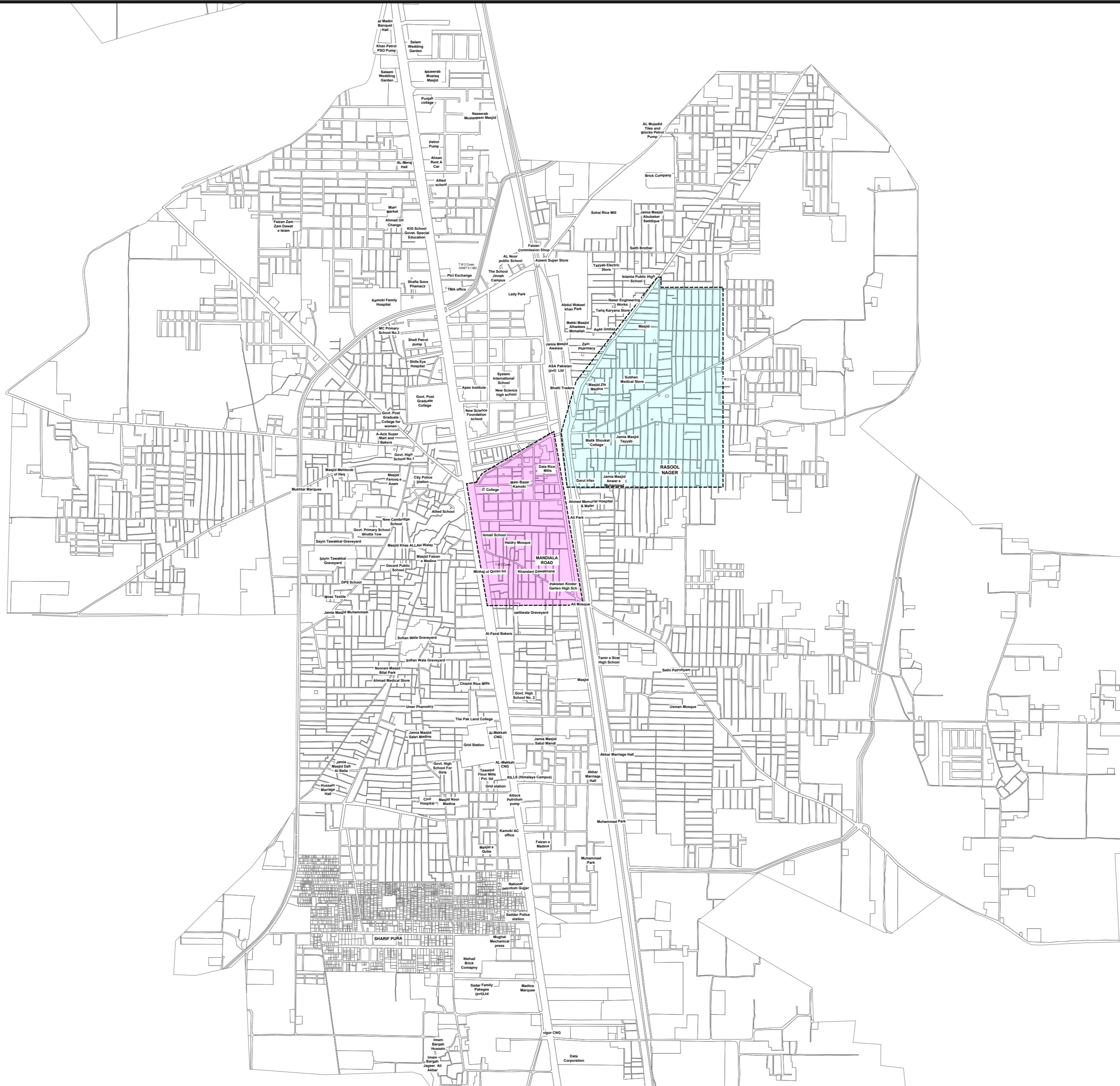
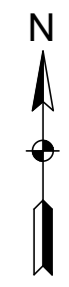
Scale:
1:15,681

Date

August 2, 2022

MAP NO:

REV:



PUNJAB MUNICIPAL DEVELOPMENT
FUND COMPANY (PMDEC)

CONSULTANT

REV.	DATE	DESCRIPTION	APPROVED

DRAWN M QASIM
SUBMITTED
RECOMMENDED
CH.A/VER.
APPROVED

PROJECT
 DETAIL DESIGN OF INFRASTRUCTURE
 SUB-PROJECT, SECTORAL PLANNING &
 RESIDENT SUPERVISION PACKAGE-II

KAMOKI TAJ PURA WATER SUPPLY SYSTEM LENGTH & DIA DESIGN 2032		
DATE	DRAWING NO.	REV.
SEPTEMBER, 2022	4396/11/TD/1J01	

**APPENDIX-B
COST ESTIMATE &
BACK UP
CALCULATIONS**

COST ESTIMATE

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
SUMMARY OF COST**

Bill No.	DESCRIPTION	AMOUNT (Rs.)
1.0	Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road	293,253,860
2.0	Installation of new Tubewell at Mandiala Water Works	30,206,932
TOTAL AMOUNT		323,460,792
	Contingencies @ 2%	6,469,216
	PST @ 5%	16,173,040
	Environmental & Social Management Plan	1,247,000
	Price Adjustment @ 6%	19,407,648
	WAPDA Meter Connection	1,000,000
GRAND TOTAL		367,757,695
GRAND TOTAL (PKR in Millions)		367.76


Team Leader/CRE
(NESPAK, MMP & ACE)

For and on behalf of Consultants

Quantity Surveyor
(NESPAK, MMP & ACE)

Signature



Signature



**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD,
KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

1. SUMMARY OF COST

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

Bill No.	DESCRIPTION	AMOUNT (Rs.)
1.1	DISTRIBUTION (RASULNAGAR)	
	MRS ITEMS	152,249,296
	NON MRS ITEMS	29,388,395
	Total	181,637,691
1.2	DISTRIBUTION (MANDIALA ROAD)	
	MRS ITEMS	96,354,657
	NON MRS ITEMS	15,261,512
	Total	111,616,169
TOTAL AMOUNT		293,253,860

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
1	4/19(c)	Pipe Line Dismantling cement concrete 1:2:4 plain	409.13	100 Cft	12,312.95	5,037,597
2	4/45	Dismantling and removing road metalling.	14.70	100 Cft	2,238.70	32,910
3	4/46	Dismantling and removing road pavement, etc., including screening and stacking of byproducts upto one chain lead (30 metre).	975.89	100 Cft	2,988.70	2,916,643
4	4/20	Dismantling cement concrete reinforced separating reinforcement from concrete, cleaning and straightening the same.	415.33	100 Cft	20,148.50	8,368,254
5	4/29	Dismantling brick or flagged flooring without concrete foundation.	88.56	100 Sft	951.45	84,257
6	3/44	Excavation of trenches in all kinds of soil, except cutting rock, for watersupply pipelines upto 5 ft. (1.5 m) depth from ground level, including trimming, dressing sides, levelling the beds of trenches to correct grade and cutting pits for joints, etc. complete in all respects.	680.66	1000 Cft	8,403.10	5,719,683
7	7/30	Supplying and filling sand under floor or plugging in wells	2,730.65	100 Cft	2,986.40	8,154,810
8	23/43	(Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE-100) working presure pipe, Beta/Dadex/Popular/ILL or equivalent including the cost of specials, in trenches, as approved & directed by the engineer incharge, complete in all respects. a) PN-8 (SDR-21)				
		i) 90mm	47,740.00	Rft	197.35	9,421,489
		ii) 125mm	16,080.00	Rft	376.80	6,058,944
		iii) 180mm	16,405.00	Rft	770.30	12,636,772

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
9	6/5	iv) 225mm	2,790.00	Rft	1,202.15	3,353,999
		v) 315mm	330.00	Rft	2,335.30	770,649
		v) 355 mm	165.00	Rft	2,957.70	488,021
9	6/5	Cement concrete plain including placing, compacting, finishing and curing complete (Thrust blocking and p.c.c restoration) (including screening and washing of stone aggregate): (f) Nominal Ratio 1: 2: 4	34.81	100 Cft	38,880.60	1,353,242
10	3/13	Rehandling of earthwork: a) Lead upto a single throw of Kassi, phaorah or shovel.	395.85	1000 Cft	2,798.40	1,107,753
11	3/25	Compaction of earthwork or any approved mechanical means), including ploughing, mixing, moistening earth to optimum moisture content in layers, etc. complete:				
12	3/17	i) 95% maximum modified AASHO dry density.	395.85	1000 Cft	1,509.00	597,341
		Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m) (Transportation will be paid as per actual lead chart to be approved by the Engineer)				
12	3/17	a) upto ¼ mile (400 m).	965.47	1000 Cft	4,584.60	4,426,316
		b) for every 330 ft. (100 m) additional lead or part thereof, beyond ¼ mile (400 m) upto one mile. (1.6 Km.)	965.47	1000 Cft	351.60	339,461
		c) for every ¼ mile (400 m) additional lead or part thereof, beyond one mile (1.6 Km.) upto 5 mile (8 Km). (for 5 Km)	965.47	1000 Cft	2,758.25	2,663,021
13	21/10	RESTORATION Restoration of brick pavement on edge, over laid service line, with 2" (50 mm) sand cushion under soling.	88.56	100 Sft	6,047.45	535,540

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
14	18/12.	Re-laying as sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate ii) Crushed stone aggregate.	878.30	100 Cft	6,167.25	5,416,701
15	18/4	Providing and laying base course of crush stone aggregate of approved quality and grade, and supply and spreading of stone screening, including placing, mixing, spreading and compaction of base course material to required depth, camber and grade to achieve 100% maximum modified AASHO dry density, including carriage of all materials to site of work except gravel and aggregate.	29.22	100 Cft	14,211.75	415,320
16	18/6	Providing and laying bituminous priming coat, using 10 lbs. kerosene oil and 10 lbs. binder per 100 Sft. or 0.5 Kg kerosene and 0.5 Kg binder per square metre.	88.56	100 Sft	1,984.85	175,771
17	18/10(iv)	Providing and laying plant premixed bituminous carpet, (2" thick) including compaction and finishing to required camber, grade and density. iv) 4.5% Bitumen	88.56	100 Sft	14,103.60	1,248,963

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
18	6/6	Providing and laying reinforced cement concrete (including prestressed concrete), using coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.):- a)(iii) Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and footing beams, other structural members other than those mentioned in 6(a) (i) &(ii) above not requiring form work (i.e. horizontal shuttering) complete in all respects:- (3) Type C (nominal mix 1: 2: 4)	41,532.89	Cft	473.65	19,672,053
19	6/12	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust) (c) Deformed bars (Grade-40)	745.00	100 kg	31,583.05	23,529,372
20	6/5	Cement concrete plain including placing, compacting, finishing and curing complete (Thrust blocking and p.c.c restoration) (including screening and washing of stone aggregate): (f) Nominal Ratio 1: 2: 4	409.13	100Cft	38,880.60	15,907,220

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
21	3/44	Valve Chambers Excavation of trenches in all kinds of soil, except cutting rock, for watersupply pipelines upto 5 ft. (1.5 m) depth from ground level, including trimming, dressing sides, levelling the beds of trenches to correct grade and cutting pits for joints, etc. complete in all respects.	17.31	1000 Cft	8,403.10	145,488
22	3/13	Rehandling of earthwork: a) Lead upto a single throw of Kassi, phaorah or shovel	6.35	1000 Cft	2,798.40	17,768
23	3/24	Compaction of earthwork (soft, ordinary or hard soil) :- c) Ramming earthwork (all types of soil).	6.35	1000 Cft	1,326.30	8,421
24	6/5	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate). (h) Nominal Ratio 1: 4: 8 (f) Nominal Ratio 1: 2: 4	12.86 1.36	100 Cft 100 Cft	29,880.60 38,880.60	384,256 52,932
25	7 /7	Pacca brick work other than building upto 10ft. (3 m) height. i) cement, sand mortar:- Ratio 1:3	49.16	100 Cft	36,080.05	1,773,872
26	21/13.	Providing and fixing 1¼"x1¼"x3/16" (31x31x5 mm) angle iron step, in manhole chambers, including carriage and setting the same in work to correct lines and levels.	272.00	Each	614.65	167,185
27	11 /8	Cement plaster 1:3 upto 20' (6.00 m) height:- b) ½" (13 mm) thick	105.39	100 Sft	3,693.25	389,248

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
28	6/6	Providing and laying reinforced cement concrete (including prestressed concrete), using coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.):- (a) (i) Reinforced cement concrete in roof slab, beams, columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:- (2) Type B (nominal mix 1: 2: 4)	874.89	Cft	638.50	558,617
29	7/30	Supplying and filling sand under floor; or plugging in wells	1.81	100 Cft	2,986.40	5,393
30	10/9	Brick on edge flooring, laid in 1:6 cement mortar, over a bed of ¾" (20 mm) thick cement mortar 1:6.	10.88	100 Sft	14,301.10	155,596
31	21/16	Providing and fixing 6" thick R.C.C. manhole cover with tee shaped C.I. frame of 22" I/d (frame weighing 37.324 Kg. or one maund as per Standard Drawing STD/PD No. 6, of 1977, complete in all respect.	68.00	Each	16,085.30	1,093,800
32	23/31	Providing and fixing sluice valve of B.S.S. quality and weight, Class `B', for cast iron pipe line, and Asbestos cement pipe line (including cost of jointing material):- a) 3" i/d (75 mm) b) 4" i/d (100 mm) c) 6" i/d (150 mm) d) 8" i/d (200 mm) e) 10" i/d (250 mm) f) 12" i/d (300 mm)	15.00 5.00 5.00 3.00 3.00 3.00	Each Each Each Each Each Each	18,272 20,005 34,317 48,560 66,992 96,732	274,085 100,023 171,584 145,680 200,977 290,196

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
33	23/33	Supply, installation, testing, and commissioning of Garden/ fire Hydrants made by Haseen Habib/ Teepu Engineering or equivalent, according to B.S.S. 750 standard double delivery type having 4" dia barrel with 2 Nos. 2-1/2" valve including the cost of jointing material with all fittings and accessories complete in all respect as approved by the Engineer Incharge	12.00	Each	54,383.70	652,604
34	23/34	Providing and fixing, air valve 2½" (65mm) dia of B.S.S. quality and weight (complete with jointing material). b) double	12.00	Each	12,470.75	149,649
35	13/22	c) Painting and lettering Sign posts:- ii) two coats	70.00	Each	633.40	44,338
36	3/17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m) (Transportation will be paid as per actual lead chart to be approved by the Engineer) a) upto ¼ mile (400 m). b) for every 330 ft. (100 m) additional lead or part thereof, beyond ¼ mile (400 m) upto one mile. (1.6 Km.) c) for every ¼ mile (400 m) additional lead or part thereof, beyond one mile (1.6 Km.) upto 5 mile (8 Km). (for 5 Km)	17.13	1000 Cft	4,584.60	78,548
			17.13	1000 Cft	351.60	6,024
			17.13	1000 Cft	2,758.25	47,257
37	1/1	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor (crushed stone aggregate and bajri used in concrete items) Lead From Sargodah quarry up to 185 KM	820.00	100 Cft	10216.65	8,377,653

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

MRS ITEMS

Sr. No.	MRS 1st Bi- Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
	N.S	Recovery for Steel obtained from dismantled RCC.	38,600.00	Kg	-90	-3,474,000
Total Amount MRS Items						152,249,296

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

NON MRS ITEMS

Sr. No.	Ref	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
1	RA-12	Excavation of trenches in all kinds of soil, except cutting rock, for watersupply pipelines upto 5 ft. (1.5 m) depth from ground level, including trimming, dressing sides, levelling the beds of trenches to correct grade and cutting pits for joints, etc. complete in all respects.	1.73	1000cft	8,403	14,549
2	RA-13	Providing, transportation, fixing and Jointing of MS flanges to joint the valves (sluice vlave, air vlave and fire hydrant) with HDPE pipe line complete in all respect and as per approval of The Engineer.				
		90mm o/d	30.00	Each	1,937	58,109
		125mm o/d	10.00	Each	2,297	22,970
		180mm o/d	10.00	Each	2,657	26,570
		225mm o/d	6.00	Each	4,097	24,582
		315mm o/d	6.00	Each	4,697	28,182
		355mm o/d	6.00	Each	7,697	46,182
3	RA-14	Providing, transportation, fixing and Jointing of Flexible Coupling to joint the valves (sluice vlave, air vlave and fire hydrant) with HDPE pipe line complete in all respect and as per approval of The Engineer.				
		90mm o/d	15.00	Each	12,647.00	189,705
		125mm o/d	5.00	Each	14,447.00	72,235
		180mm o/d	5.00	Each	18,047.00	90,235
		225mm o/d	3.00	Each	21,647.00	64,941
		315mm o/d	3.00	Each	30,647.00	91,941
		355mm o/d	3.00	Each	39,647.00	118,941

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar

BILL NO. 1.1: Distribution Network of Rasul Nagar

NON MRS ITEMS

Sr. No.	Ref	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
4	RA-15	Providing, fixing and testing consumer connections of 25 mm dia polyethylene pipe, cost of PE pipe, including the cost of brass ferrule, adapter & PP saddle clamp, ,MTF/FTA ,and End Cap, brass ball valve ,1" dia G.I pipe of B.S.S. 1387-1967 including G.I fitting, uPVC pipe (SDR-41/SN-4) 4" i/d (100 mm), P.C.C (1:2:4) complete in all respects as per drawings specification and instructions of the Engineer incharge.				
		A) CONSUMER CONNECTIONS OF 25 MM O/D AT FOLLOWING PIPE LINE				
		90mm o/d	530	No.	4908	2,599,344
		125mm o/d	530	No.	5124	2,713,737
		180mm o/d	265	No.	5844	1,547,525
5	RA-16	Providing, fixing, testing and commission of multi jet brass body dry water meter of best quality dry-dial, magnetic drive, protected against external magnetic tampering; vacuum-sealed register, frost resistant, comforming to ISO4064 standard Class B as per approved sample complete in all respects or/and as directed by Engineer In Charge.				
		15mm	1,059	No.	15,054	15,944,773
		20mm	132	No.	19,554	2,588,897
		25mm	132	No.	23,754	3,144,977
Total Amount Non MRS Items						29,388,395

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
1	4/19(c)	Pipe Line Dismantling cement concrete 1:2:4 plain	244.72	100 Cft	12,312.95	3,013,172
2	4/45	Dismantling and removing road metalling.	8.79	100 Cft	2,238.70	19,684
3	4/46	Dismantling and removing road pavement, etc., including screening and stacking of byproducts upto one chain lead (30 metre).	583.72	100 Cft	2,988.70	1,744,551
4	4/20	Dismantling cement concrete reinforced separating reinforcement from concrete, cleaning and straightening the same.	248.42	100 Cft	20,148.50	5,005,361
5	4/29	Dismantling brick or flagged flooring without concrete foundation.	52.97	100 Sft	951.45	50,397
6	3/44	Excavation of trenches in all kinds of soil, except cutting rock, for watersupply pipelines upto 5 ft. (1.5 m) depth from ground level, including trimming, dressing sides, levelling the beds of trenches to correct grade and cutting pits for joints, etc. complete in all respects.	404.75	1000 Cft	8,403.10	3,401,139
7	7/30	Supplying and filling sand under floor or plugging in wells	1,627.56	100 Cft	2,986.40	4,860,534
8	23/43	(Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE-100) working presure pipe, Beta/Dadex/Popular/ILL or equivalent including the cost of specials, in trenches, as approved & directed by the engineer incharge, complete in all respects. a) PN-8 (SDR-21)				
		i) 90mm	27,070.00	Rft	197.35	5,342,265
		ii) 125mm	5,580.00	Rft	376.80	2,102,544
		iii) 180mm	13,785.00	Rft	770.30	10,618,586

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
9	6/5	iv) 225mm	1,480.00	Rft	1,202.15	1,779,182
		v) 315mm	660.00	Rft	2,335.30	1,541,298
		v) 355 mm	165.00	Rft	2,957.70	488,021
9	6/5	Cement concrete plain including placing, compacting, finishing and curing complete (Thrust blocking and p.c.c restoration) (including screening and washing of stone aggregate): (f) Nominal Ratio 1: 2: 4	31.29	100 Cft	38,880.60	1,216,382
10	3/13	Rehandling of earthwork: a) Lead upto a single throw of Kassi, phaorah or shovel.	234.18	1000 Cft	2,798.40	655,319
11	3/25	Compaction of earthwork with any approved mechanical means), including ploughing, mixing, moistening earth to optimum moisture content in layers, etc. complete: i) 95% maximum modified AASHO dry density.	234.18	1000 Cft	1,509.00	353,372
12	3/17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m) (Transportation will be paid as per actual lead chart to be approved by the Engineer) a) upto ¼ mile (400 m). b) for every 330 ft. (100 m) additional lead or part thereof, beyond ¼ mile (400 m) upto one mile. (1.6 Km.) c) for every ¼ mile (400 m) additional lead or part thereof, beyond one mile (1.6 Km.) upto 5 mile (8 Km). (for 5 Km)	638.92	1000 Cft	4,584.60	2,929,213
			638.92	1000 Cft	351.60	224,646
			638.92	1000 Cft	2,758.25	1,762,313
13	21/10	RESTORATION Restoration of brick pavement on edge, over laid service line, with 2" (50 mm) sand cushion under soling.	52.97	100 Sft	6,047.45	320,326

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
14	18/12.	Re-laying as sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate				
		ii) Crushed stone aggregate.	525.34	100 Cft	6,167.25	3,239,929
15	18/4	Providing and laying base course of crush stone aggregate of approved quality and grade, and supply and spreading of stone screening, including placing, mixing, spreading and compaction of base course material to required depth, camber and grade to achieve 100% maximum modified AASHO dry density, including carriage of all materials to site of work except gravel and aggregate.	17.48	100 Cft	14,211.75	248,417
16	18/6	Providing and laying bituminous priming coat, using 10 lbs. kerosene oil and 10 lbs. binder per 100 Sft. or 0.5 Kg kerosene and 0.5 Kg binder per square metre.	52.97	100 Sft	1,984.85	105,135
17	18/10(iv)	Providing and laying plant premixed bituminous carpet, (2" thick) including compaction and finishing to required camber, grade and density. iv) 4.5% Bitumen	52.97	100 Sft	14,103.60	747,051
	6/6	Providing and laying reinforced cement concrete (including prestressed concrete), using coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.):-				

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
18		a)(iii) Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and footing beams, other structural members other than those mentioned in 6(a) (i) &(ii) above not requiring form work (i.e. horizontal shuttering) complete in all respects:- (3) Type C (nominal mix 1: 2: 4)	24,842.35	Cft	473.65	11,766,579
19	6/12	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust) (c) Deformed bars (Grade-40)	450.00	100 kg	31,583.05	14,212,373
20	6/5	Cement concrete plain including placing,compacting, finishing and curing complete (Thrust blocking and p.c.c restoration) (including screening and washing of stone aggregate): (f) Nominal Ratio 1: 2: 4	244.72	100Cft	38,880.60	9,514,693

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
21	3/44	Valve Chambers Excavation of trenches in all kinds of soil, except cutting rock, for watersupply pipelines upto 5 ft. (1.5 m) depth from ground level, including trimming, dressing sides, levelling the beds of trenches to correct grade and cutting pits for joints, etc. complete in all respects.	15.18	1000 Cft	8,403.10	127,583
22	3/13	Rehandling of earthwork: a) Lead upto a single throw of Kassi, phaorah or shovel	5.62	1000 Cft	2,798.40	15,716
23	3/24	Compaction of earthwork (soft, ordinary or hard soil) :- c) Ramming earthwork (all types of soil).	5.62	1000 Cft	1,326.30	7,449
24	6/5	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate). (h) Nominal Ratio 1: 4: 8 (f) Nominal Ratio 1: 2: 4	10.40 1.10	100 Cft 100 Cft	29,880.60 38,880.60	310,794 42,636
25	7 /7	Pacca brick work other than building upto 10ft. (3 m) height. i) cement, sand mortar:- Ratio 1:3	39.77	100 Cft	36,080.05	1,434,748
26	21/13.	Providing and fixing 1¼"x1¼"x3/16" (31x31x5 mm) angle iron step, in manhole chambers, including carriage and setting the same in work to correct lines and levels.	220.00	Each	614.65	135,223
27	11 /8	Cement plaster 1:3 upto 20' (6.00 m) height:- b) ½" (13 mm) thick	85.25	100 Sft	3,693.25	314,833

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
28	6/6	Providing and laying reinforced cement concrete (including prestressed concrete), using coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.):- (a) (i) Reinforced cement concrete in roof slab, beams, columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:- (2) Type B (nominal mix 1: 1½: 3)	707.64	Cft	638.50	451,828
29	7/30	Supplying and filling sand under floor; or plugging in wells	1.46	100 Cft	2,986.40	4,363
30	10/9	Brick on edge flooring, laid in 1:6 cement mortar, over a bed of ¾" (20 mm) thick cement mortar 1:6.	8.80	100 Sft	14,301.10	125,850
31	21/16	Providing and fixing 6" thick R.C.C. manhole cover with tee shaped C.I. frame of 22" I/d (frame weighing 37.324 Kg. or one maund as per Standard Drawing STD/PD No. 6, of 1977, complete in all respect.	55.00	Each	16,085.30	884,692
32	23/31	Providing and fixing sluice valve of B.S.S. quality and weight, Class `B', for cast iron pipe line, and Asbestos cement pipe line (including cost of jointing material):- a) 3" i/d (75 mm) b) 4" i/d (100 mm) d) 6" i/d (150 mm) e) 8" i/d (200 mm) f) 10" i/d (250 mm) g) 12" i/d (300 mm)	9.00 2.00 5.00 3.00 3.00 3.00	Each Each Each Each Each Each	18,272 20,005 34,317 48,560 66,992 96,732	164,451 40,009 171,584 145,680 200,977 290,196

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
33	23/33	Supply, installation, testing, and commissioning of Garden/ fire Hydrants made by Haseen Habib/ Teepu Engineering or equivalent, according to B.S.S. 750 standard double delivery type having 4" dia barrel with 2 Nos. 2-1/2" valve including the cost of jointing material with all fittings and accessories complete in all respect as approved by the Engineer Incharge	9.00	Each	54,383.70	489,453
34	23/34	Providing and fixing, air valve 2½" (65mm) dia of B.S.S. quality and weight (complete with jointing material). b) double	9.00	Each	12,470.75	112,237
35	13/22	c) Painting and lettering Sign posts:- ii) two coats	57.00	Each	633.40	36,104
36	3/17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m) (Transportation will be paid as per actual lead chart to be approved by the Engineer) a) upto ¼ mile (400 m). b) for every 330 ft. (100 m) additional lead or part thereof, beyond ¼ mile (400 m) upto one mile. (1.6 Km.) c) for every ¼ mile (400 m) additional lead or part thereof, beyond one mile (1.6 Km.) upto 5 mile (8 Km). (for 5 Km)	20.65	1000 Cft	4,584.60	94,685
			20.65	1000 Cft	351.60	7,262
			20.65	1000 Cft	2,758.25	56,966
37	1/1	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor (crushed stone aggregate and bajri used in concrete items) Lead From Sargodah quarry up to 185 KM	505.00	100 Cft	10216.65	5,159,408

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

MRS ITEMS

Sr. No.	MRS 1st Bi- Annual 2023 Gujranwala Chap#/Item#	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
	N.S	Recovery for Steel obtained from dismantled RCC.	23,250.49	Kg	-90	-2,092,544
Total Amount MRS Items						95,994,665

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

NON MRS ITEMS

Sr. No.	Ref.	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
1	RA-12	Excavation of trenches in all kinds of soil, except cutting rock, for watersupply pipelines upto 5 ft. (1.5 m) depth from ground level, including trimming, dressing sides, levelling the beds of trenches to correct grade and cutting pits for joints, etc. complete in all respects.	1.40	1000cft	8,403	11,767
2	RA-13	Providing, transportation, fixing and Jointing of MS flanges to joint the valves (sluice vlave, air vlave and fire hydrant) with HDPE pipe line complete in all respect and as per approval of The Engineer.				
		90mm o/d	18.00	Each	1,937	34,866
		125mm o/d	4.00	Each	2,297	9,188
		180mm o/d	10.00	Each	2,657	26,570
		225mm o/d	6.00	Each	4,097	24,582
		315mm o/d	6.00	Each	4,697	28,182
		355mm o/d	6.00	Each	7,697	46,182
3	RA-14	Providing, transportation, fixing and Jointing of Flexible Coupling to joint the valves (sluice vlave, air vlave and fire hydrant) with HDPE pipe line complete in all respect and as per approval of The Engineer.				
		90mm o/d	9.00	Each	12,647	113,823
		125mm o/d	2.00	Each	14,447	28,894
		180mm o/d	5.00	Each	18,047	90,235
		225mm o/d	3.00	Each	21,647	64,941
		315mm o/d	3.00	Each	30,647	91,941
		355mm o/d	3.00	Each	39,647	118,941

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

NON MRS ITEMS

Sr. No.	Ref.	Description	Quantity	Unit	Rate (Rs)	Amount (Rs)
4	RA-15	Providing, fixing and testing consumer connections of 25 mm dia polyethylene pipe, cost of PE pipe, including the cost of brass ferrule, adapter & PP saddle clamp, ,MTF/FTA ,and End Cap, brass ball valve ,1" dia G.I pipe of B.S.S. 1387-1967 including G.I fitting, uPVC pipe (SDR-41/SN-4) 4" i/d (100 mm), P.C.C (1:2:4) complete in all respects as per drawings specification and instructions of the Engineer incharge.				
		A) CONSUMER CONNECTIONS OF 25 MM O/D AT FOLLOWING PIPE LINE				
		90mm o/d	270	No.	4908	1,327,157
		125mm o/d	270	No.	5124	1,385,564
		180mm o/d	135	No.	5844	790,126
5	RA-16	Providing, fixing, testing and commission of multi jet brass body dry water meter of best quality dry-dial, magnetic drive, protected against external magnetic tampering; vacuum-sealed register, frost resistant, conforming to ISO4064 standard Class B as per approved sample complete in all respects or/and as directed by Engineer In Charge.				
		15mm	541	No.	15,054	8,140,987
		20mm	68	No.	19,554	1,321,823
		25mm	68	No.	23,754	1,605,743
Total Amount Non MRS Items						15,261,512

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
 SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD,
 KAMOKE & MURIDKE)
 IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
 2. SUMMARY OF COST**

II. Installation of new Tubewell at Mandiala Water Works

Bill No.	DESCRIPTION	AMOUNT (Rs.)
2.1	TUBEWELL	
	MRS ITEMS	2,395,643
	NON MRS ITEMS	7,649,185
	Total	10,044,828
2.2	CIVIL WORKS OF TUBEWELL ROOM	
	MRS ITEMS	1,338,164
	Total	1,338,164
2.3	ELECTRIFICATION OF TUBEWELL	
	MRS ITEMS	10,155,013
	NON MRS ITEMS	8,668,928
	Total	18,823,941
TOTAL AMOUNT		30,206,932

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

Bill No. 2.1: Installation of new Tube Well at Mandiala Water Works

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Unit	Qty	Rate	Amount (Pak Rs.)
1	3/21	Excavation of water storage pit (46'x19'x8'), for main borehole and supply well including leveling and site clearance after completion of job.	%oCft	7.00	9,892.45	69,247
2	23/5	Direct Rotary/Reverse Rotary drilling of bore for tubewells, in all types of soil except shingle, gravel and rock:				
		a) from ground level to 250 ft. below ground level ii) 20" to 26" (500 to 650 mm) i/d	P/Rft	250	1093.10	273,275
		b) Exceeding 250 ft. depth below ground level 15" to 18" i/d. i) 15" to 18" (375 to 450 mm)	P/Rft	355	760.05	269,818
3	23/13A(v)	Providing and installing Fiberglass Reinforced Polypropelene (FRP) bail plug of specified wall thickness inTubewell borehole i/c the cost of male/female coupling with Nylone Strip, studs complete in all respect as approved and directed by the Engineer Incharge. v) 8" inch dia (5mm thickness)	P/Rft	10	2,098.80	20,988
4	23/13(v)	Providing and installing Fiberglass reinforced Polypropelene (FRP) strainer of specified wall thickness having slot size of 0.9mm to1.00mm inTubewell borehole i/c the cost of male/female coupling with Nylone Strip, studs complete inall respect as approved and directed by the Engineer Incharge. v) 8" inch dia (5mm thickness)	P/Rft	140	2,073.20	290,248

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

Bill No. 2.1: Installation of new Tube Well at Mandiala Water Works

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Unit	Qty	Rate	Amount (Pak Rs.)
5	23/13A(v)	Providing and Installing Fiberglass reinforcement polypropylene (FRP) blank of wall thickness having slot size of 0.9mm to1.00mm in Tubewell borehole i/c the cost of male/female coupling with Nylon Strip , studs complete in all respect as approved and directed by the Engineer Incharge. 8" inch dia (5mm thickness)	P.Rft	230	2098.80	482,724
6	23/15	Providing and installing M.S. blind pipe socketed /welded joint, M.S. reducer (where necessary) in tubewells borehole including jointing/welding with strainer, etc. complete. l)18" i/d, 1/4" (450 mm i/d 6 mm) thick	P/Rft	250	3045.65	761,413
7	23/7	Providing strong substantially built box of deodar wood 4'x2½'x9" (1200x750x225 mm), with compartments, lock compl- compland locking arrangement, for preserving samples of strata ete bore ete bore from bore hole.	Job	1.00	37307.45	37,307
8	23/19	Shrouding with graded pea gravel 3/8" to 1/8" (10 to 3 mm), around tubewell in bore hole.	P/cft	621	164.15	102,011
9	23/15	Providing and installing M.S. delivery pipe socketed /welded joint, M.S. reducer (where necessary) including jointing/welding etc. complete. g) 8" i/d, 3/16" (200 mm i/d 5 mm) thick	P/Rft	25	3045.65	76,141
10	23/34	Providing and fixing, air valve 2½" (65mm) dia of B.S.S. quality and weight (complete with jointing material). b) double	Each	1	12,470.75	12,471
Total Rs.						2,395,643
Cost for Nos.1						2,395,643

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

Bill No. 2.1: Installation of new Tube Well at Mandiala Water Works

Non MRS items

Sr. No.	Ref.	Description	Unit	Qty	Rate	Amount (Pak Rs.)
1	RA-1	Taking sample one number at every 5 ft.or from each stratum as per direction of Engineer including submission construction charts etc. and results of strata analysis.	Each	121	158	19,130
2	RA-2	Geophysical logging of bore (self potential resistivity Both short normal and Gama) complete in all respect.	Each	1	60,000	60,000
3	RA-3	Providing /fixing M.S. centerlizers	Each	4	2,001	8,005
4	RA-4	Providing and sealing with puddle clay between shrouding and grouting etc.	Job	1	34,235	34,235
5	RA-5	Cement sand slurry 1:1 Ratio arround betwenn 26' doa botr hole and18" pump housin casing.	P.Rft	250	1,392	347,954
6	RA-6	Testing & development of tube well with turbine pump, capable of pumping water from tube well upto 150% of the designed capacity, including lowering and pulling of turbine, disposal of pumped out water complete in all respect.	Job	1	231,177	231,177
7	RA-7	Collection of water sample from Tubewell, transportation of water sample from site to laboratory and performing chemical, physical and arsenic analysis of water from approved water testing Lab.	Each	2	6,000	12,000
8	RA-8	Providing and fixing of M.S Cap as per drawing complete in all respect.	Each	1	1,355	1,355

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

Bill No. 2.1: Installation of new Tube Well at Mandiala Water Works

Non MRS items

Sr. No.	Ref.	Description	Unit	Qty	Rate	Amount (Pak Rs.)
9	RA-9	Supply and installation of Vertical Shaft Turbine Pump 2.0 Cusec with total pumping head 175 ft (53.35 m), Pump setting depth 90, M.Steel Column pipe size 8 inch, stainless steel pump shaft, Bronze impellers, prime mover (SEM/DE) , 3 phase, 50 Cycles, 400 ± 5 % Volts, rating 60 HP, 1450 RPM with Non- reverse ratchet including Motor control Unit 60 HP, over/under Voltage relay, Phase reversal relay, Volt meter, Ampere meter, Indicating lights for all above relays, On . Off Push Buttons. All contained in a lockable Steel Cabinet. Moreover, Pump and motor efficiency should not be less than 80% and 90% respectively.	Each	1	6,796,000	6,796,000
10	RA-10	Dosing pump to dose sodium hypochlorite with flowrate 08 l/hr max pressure 10 barg, construction material pump head PVDF , diaphragm in PVDF/ PTFE, Lip valve in FPM, sealing in EPDM, suction & delivery turbine in Teflon , Robust potentiometer for flow rate setting, IP 65 ON/OFF switch, with rated power as per manufacture, 220 volt Hz and IP65, including. Chemical storage container with capacity 80 liters, equipped with inlet and outlet connection, Construction material PE or Plastic, for indoor application. complete in all respect as directed by the Engineer Incharge.	Each	1	129,313	129,313
11	RA-11	Providing, installing, testing and commissioning 4" dia Pressure Gauge as per standard of ISO, specification complete in all respect as directed by the Engineer Incharge.	Each	1	10,015	10,015
Total Rs.						7,649,185
Cost for Nos.1						7,649,185

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

ROUGH COST ESTIMATES

Bill No. 2.2 TUBEWELL ROOM

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	A	CIVIL WORKS				
1	3/21b	Excavation in foundation ,bridges and other structures, including dagbelling ,dressing ,refilling around structure with excavated earth ,watering and ramming lead up to one chain (30 m) and lift up to 5 ft.(1.5 m). b) in ordinary soil .	1000Cft	0.452	9,892.45	4,466.44
2		Filling , watering and ramming earth under floors:				
	3/15 i	i) With surplus earth from foundation etc	1000Cft	0.298	5,620.55	1,674.87
	3/15 ii	ii) With new earth from out side ,etc. lead upto 30 m	1000Cft	0.124	12,394.60	1,530.86
3	26/43	Spraying termite proofing by using liquid FMC/ Biflex/ Terminex Exin/ MsHextar or equivalent @specified suspension concentrate (SC), Mixing Ability-HEXTAR with Ratio (1:250) = 540 Sft or equivalent approved liquidapplying withshower and certificate will beprovidedby thecontractor for 10-yearscomplete inall respect .as approved by the Engineer Incharge.	Sft	341.50	9.90	3,380.85
4	6/5	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (i) Ratio 1: 4:8	100 Cft	1.55	29,880.60	46,165.53
5	7/4i	Pacca brick work in foundation and plinth in Cement, sand mortar:- Ratio 1:6	100 Cft	2.45	31,808.90	78,011.33
6	6/36	Providing and laying damp proof course of cement concrete 1:2: 4(using cement, sand and shingle), including bitumen coating :- (a) with one coat bitumen and one coat polythene sheet 500gauge. i) 1½" thick (40 mm)	100 Cft	0.60	9,316.95	5,590.17

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

ROUGH COST ESTIMATES

Bill No. 2.2 TUBEWELL ROOM

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
7	6/38	Providing and laying vertical damp proof course with cement sand plaster and bitumen coating:-(a) with one coat of bitumen and one coat of polythene sheet 500 gauge: ii) Ratio 1:3 (b) ¾ " thick (20 mm)	100 Sft	0.40	6,684.95	2,673.98
8	7/30	Supplying and filling sand under floor; or plugging in wells.	100 Cft	1.56	2,986.40	4,658.78
9	7/5(i)	Pacca brick work in ground floor cement, sand mortar:- Ratio 1:5	100 Cft	4.50	34,955.90	157,257.86
10	6/6ai(3c)	Providing and laying reinforced cement concrete (including prestressed concrete), using coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.):- (a) (i) Reinforced cement concrete in roof slab, beams, columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:- (3) (c) Type C (nominal mix 1: 2: 4)	Per Cft	105.87	583.80	61,804.13

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

ROUGH COST ESTIMATES

Bill No. 2.2 TUBEWELL ROOM

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
11	6/6aii	Providing and laying reinforced cement concrete (including prestressed concrete), using coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.):- (a)(ii) Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and other structural members other than those mentioned in. 5(a) (i) above not requiring form work (i.e. horizontal shuttering) complete in all respects: (3) Type C (nominal mix 1: 2: 4)	Per Cft	16.63	473.65	7,878.39
12	6/12c	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): (c) Deformed bars (Grade-60)	100Kg	16.89	31,972.80	539,937.05
13	10/15	Providing and laying topping of cement concrete 1:2:4, including surface finishing and dividing in panels:- (e) 2"(50 mm) thick	100 Sft	0.96	9,610.85	9,226.42
14	10/22a	1½" (40 mm) thick mosaic flooring, consisting of ½" (13 mm) mosaic topping of one part of cement and marble powder in the ratio of 3:1 and two parts of marble chips, laid over 1"(25 mm) thick floor of 1:2:4 cement concrete,including rubbing and polishing complete with finishing :- (b) using white cement	100 Sft	1.41	22,122.50	31,082.11
15	11/10	Cement plaster 3/8" (10 mm) thick under soffit of R.C.C. roof slabs only, upto 20' height. b) 1:3	100 Sft	1.55	3,933.95	6,097.62

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

ROUGH COST ESTIMATES

Bill No. 2.2 TUBEWELL ROOM

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
16	11/9c	Cement plaster 1:4 upto 20' (6.00 m) height:- c) ¾" (20 mm) thick	100 Sft	4.12	4,720.80	19,449.70
17	11/18a	Cement pointing struck joints, on walls, upto 20' (6.00 m) hieght:- a) ratio 1:2	100Sft	5.76	3,843.70	22,151.24
18	11/23a	Distempering:- a) new surface: i) iii) three coats	100Sft	1.40	1,462.30	2,047.22
19	13/31a	Preparing surface and painting with emulsion paint:- a) first coat	100 Sft	4.12	1,297.25	5,344.67
	13/31b	b) 2nd and each subsequent coat (Two coats)	100 Sft	4.12	2,010.60	8,283.67
20	13/33a	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect: a) new surface: ii) 1st coat 2nd coat	100 Sft	0.996	5,811.55	5,788.30
21	25/42a	Providing and fixing steel windows using M.S. sheet (16 SWG) moulded tubular pipe 1½"x1½" (40x40mm) for frame and 1¼"x1¼" (30x30mm) for leaves including M.S. square bars ¼"x¼" (6x6 mm) welded around each panel of frame, 5 mm thick glass panes fixed with double M.S. square tubular pipe 3/8"x3/8" (10x10mm) (22 SWG) beading with U' shaped rubber lining, brass fitting, holdfast, including painting three coats complete in all respects. For openable panels fixed with wire gauze 24 SWG, 12x12 mesh and glass panes ¼" (6 mm) thick.	Sft	32.00	1,078.35	34,507.20
22	23/62	Providing and fixing Chain Pulley Block of 5 ton capacity with 5 meter length of chain, as per required specifications complete in all respect and as approved by the Engineer Incharge.	Each	1.00	32,599.00	32,599.00

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

ROUGH COST ESTIMATES

Bill No. 2.2 TUBEWELL ROOM

MRS ITEMS

Sr. No.	MRS 1st Bi-Annual 2023 Gujranwala Chap#/Item#	Description	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
23	25/10	Small iron work, such as gusset plates, knees, bends stirrups, straps, rings, etc. including cutting, drilling, riveting, handling, assembling and fixing; but excluding erection in position.	100 Kg	2.67	43,082.25	115,079.38
24	25/30	Providing and fixing single leaf steel door 1-1/2" x1-1/2" and 18 Gauge M.S sheet with 1-1/2" x1-1/2" x1/ 4" square pipe, hold fast, hinges, earl, including paint as per drawing complete in all respect and approved by the Engineer in-charge.	Sft	32.00	2,006.05	64,193.60
25	25/59	Providing and fixing M.S. grill fabricated with MS Square polished Vertical/horizontal Bars of specified size @ 6" c/c ' passed through punched holes in MS Patti of 1-1/4"x1/8" i/c the cost of 1-1/4"x1/8" MS patti for Frame of windows and painting 3 coat complete in all respect as approved and directed by the Engineer Incharge. (i) 3/8" Squar Bars	Sft	32.00	913.10	29,219.20
26	9/35iii	Providing and laying roof insulation, comprising of single layer of tiles 9"x4½" x1½" (225x113x40 mm) grouted with cement sand mortar 1:3 laid over 2" (50 mm) thick earth (including mud plaster) over thermopore sheet, over polythene sheet 300 gauge over a layer of bitumen, complete in all respects: - iii) Thermopore sheet 1" (25 mm) thick	100 Sft	1.24	16,782.35	20,810.11
27	9/15	Khuras on roof 2'x2'x6"	Each	2.00	918.75	1,837.50
28	23/27(b) 23/38(i)(b) 23/39(i)(b)	Providing, laying, cutting, jointing, P.V.C. pipe with 'B' Class working pressure pipe, including Bends, Tee, etc as per drawing complete in all respects and directed by Engineer.	Rft	25.00	616.66	15,417
TOTAL						1,338,164

**DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING AND
RESIDENT SUPERVISION PACKAGE - II
TUBEWELL - MC KAMOKE**

ENGINEER'S COST ESTIMATE FOR ELECTRICAL WORKS (N-MRS ITEMS)

Item No.	Description		Qty.	Unit	Unit Rate (Rs.)	Total Amount (Rs.)
	MRS Items					
1.0	<u>WIRING AND ACCESSORIES</u>					
1.1	Wiring of light or fan point from switch board/dimmer to the point with 3x1.5mm sq (P+N+E) PVC insulated single core stranded cables in 25 mm PVC conduit/pipe concealed in walls, columns and slabs including accessories, PVC box, 10 Amp. gang switch 1 or 2 way as required, one for each light or fan and installed as in specifications complete in all respects.	10(c-ii)/24, 3(iii)/24, 14(i)/24, 32(ii)/24	10	Each	3,560	35,600
1.2	Circuit wiring from DB MCBs to gang switches board and from switch board to switch board with 3x2.5mm sq (P+N+E) PVC insulated single core stranded cables in 25mm PVC pipe/conduit concealed in walls, columns and slabs as required complete in all respects.	10(c-iii) /24, 3(iii)/24	4	Each	7,673	30,692
1.3	The same as item No. 1.1(a) but from one light point to another light point.	10(c-ii)/24, 3(iii)/24	8	Each	2,106	16,848
1.4	10/13 Amp 3 pin universal flush mounting switch socket outlet wired from DB MCBs to first outlet with 4mm sq (P+N+E) single core cable stranded (away from switch board) in 25mm PVC pipe/conduit concealed in walls, columns and slabs as required complete in all respects.	10(c-iv)/24, 14(ii)/24, 36(i)/24, 3(iii)/24	2	Each	8,070	16,140
1.5	The same as item No.1.4 but wiring from one socket outlet to another socket outlet with 3x2.5mm sq (P+N+E) single core stranded cable in 25mm PVC pipe/conduit concealed in walls, columns and slabs as required complete in all respects.	10(c-iii)/24, 3(iii)/24	2	Each	4,267	8,534
1.6	20 Amp 3 pin universal flush mounting switch socket outlet wired from DB MCBs to independent socket outlet with 3x6mm sq (P+N+E) single core stranded cable (away from switchboard) in 25mm PVC pipe/conduit concealed in walls, columns and slabs as required complete in all respects.	10(c-v)/24, 3(iii)/24, 36(ii)/24, 14(ii)/24	4	Each	10,124	40,496
2.0	<u>POWER CABLE</u>					
2.1	Supply and erection of copper conductor cables for service connection, in prelaid pipe/G.I. wire/trenches, etc. (rate for cable only) PVC insulated, PVC sheathed 4 core, 600/1000 volt non armoured cable					
a)	16 mm (7/0.064") (For DB-Tubewell Room)	13(c-viii) /24	500	Rft.	695	347,725
b)	50 mm sq (19/0.072") (For Motor)	13(c-x)/25	660	Rft.	1,966	1,297,824
c)	95 mm sq (37/0.083") (For 50 HP Motor) From Transformer to ATS/AMF, D.G set to ATS/AMF & ATS/AMF to MPB	13(c-x)/25	2,000	Rft.	4,019	8,037,700

**DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING AND
RESIDENT SUPERVISION PACKAGE - II
TUBEWELL - MC KAMOKE**

ENGINEER'S COST ESTIMATE FOR ELECTRICAL WORKS (N-MRS ITEMS)

Item No.	Description		Qty.	Unit	Unit Rate (Rs.)	Total Amount (Rs.)
2.3	Supply and erection of single core PVC insulated copper conductor cables, in prelaid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing an capping/G.I. wire/trenches (rate for cables only) 450/750 volts, PVC insulated:					
a)	16 mm sq (7/0.064")	10(c-vii) /24	500	Rft.	226	113,225
b)	25 mm sq (19/0.052")	10(c-viii) /24	660	Rft.	304	200,607
3.0	<u>ELECTRIC FAN</u>					
3.1	Providing and fixing Copper winded Exhaust fan with louver and shutter made of Pak/Younas/G.F.C. i/c the cost of necessary cable and hardware for connection from ceiling rose complete as approved and directed by Engineer Incharge.					
a)	Steel body (18" Sweep)	102(b-ii) /24	2	Each	4,811	9,622
TOTAL OF MRS ITEMS						10,155,013

**DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING AND
RESIDENT SUPERVISION PACKAGE - II
TUBEWELL - MC KAMOKE**

ENGINEER'S COST ESTIMATE FOR ELECTRICAL WORKS (N-MRS ITEMS)

Item No.	Description	Qty.	Unit	Unit Rate (Rs.)	Total Amount (Rs.)
	N-MRS Items				
	Supply, stroage, installation, testing and commissioning of the following items of work (unless specifically stated otherwise) including all material, labour, tools, accessories, etc. required for proper completion of each item as per specification, drawings and as directed by the Engineer.				
1.0	<u>POWER CABLE</u>				
1.1	PVC insulated 450/750 Volt grade (Green - Yellow) unarmoured copper cable laid direct in ground, pulled in PVC pipe already laid, on surface of wall or cable trays etc. as required or as shown on drawingsas earth continuity conductor (ECC/CPC). (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing)				
a)	1 core 50 mm ²	2,000	Rft.	827	1,654,000
b)	1 core 70 mm ²	500	Rft.	1,141	570,500
2.0	<u>LIGHT FITTINGS AND FANS</u>				
	Following LED Luminaries of suitable wattage make suitable for the project requirements. Contractor to submit lighting design calculation to determine the adequacy of the wattage and should adjust the number of LEDs/wattage as per project lighting requirements. The fitting shall be approved by the Engineer.				
2.1	Light Fixture Type LED Batten Ceiling/surface mounted, 18W complete in all respect with allied accessories . The fitting shall be approved by the Engineer.	4	Each	3,804	15,216
2.2	Light Fixture Type LED Batten Ceiling/surface mounted, 10W above mirror in toilets complete in all respect with allied accessories ma. The fitting shall be approved by the Engineer.	1	Each	2,679	2,679
2.3	Wall bracket Light Fixture Type LED 12W energy saving lamp with holder and complete in all respect with allied accessories. The fitting shall be approved by the Engineer.	2	Each	5,376	10,752
2.4	20W LED Water tight light fixture IP 65 complete in all respect with all allied accessories. The fitting shall be approved by the Engineer.	6	Each	22,368	134,208
2.5	Smart Bright Highbay wide beam LED Luminaries 100W efficient and reliable and all accessories/ components required for the proper operation of the system. The luminaries shall be fully flexible for future upgrades and easy replacements for maintenance purposes.	1	Each	34,140	34,140
2.6	Wall Bracket fan 20" sweep make capacitor type,copper winding complete with all required accessories etc.	2	Each	14,268	28,536
3.0	<u>uPVC PIPE</u>				
3.1	uPVC pipe conduit with accessories suitable for laying single/multi-core cables.				
a)	100 mm dia (Class-B)	660	Rft.	1,001	660,660

**DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING AND
RESIDENT SUPERVISION PACKAGE - II
TUBEWELL - MC KAMOKE
ENGINEER'S COST ESTIMATE FOR ELECTRICAL WORKS (N-MRS ITEMS)**

Item No.	Description	Qty.	Unit	Unit Rate (Rs.)	Total Amount (Rs.)
b) 4.0	100 mm dia (Class-D) CABLE TRAYS Perforated cable tray with cover (14 SWG & 16 SWG) G.I Sheet including installation accessories such as wall support bracket assembly, saddles or straps secured with brass or cadmium nuts, rawal plugs, bolts & washer, cable ladder for horizontal run of cable as and provided specification or as required.	350	Rft.	1,441	504,350
a) 5.0	150 mm x 75 mm LV SWITCHGEAR PANEL/MAIN PANEL BOARD (MPB) LV Switchgear Panel/Main Panel Board of 14 SWG, IP class 54/44 & RAL 7032 including I/C and O/G following electrical items, foundation/base frame with all installation and operational accessories as per site requirements, as per tender specifications and drawings and as directed by the Engineer.	160	Rft.	1,399	223,840
6.1	MPB INCOMING - 01 No. 200 Amps TP (Adj.) MCCB, RC= 36 kA, Icu=100%Ics - 01 No. VSS (07 position) - 01 No. 0-600 Volts AC DIGITAL Voltmeter - 03 Nos. 200/5 Amps Current Transformers - 01 No. ASS (R-Y-B-OFF) - 01 No. 0-200 Amps AC DIGITAL Ammeter - 06 Nos. RYB and ON OFF TRIP LED indication lights 14 SWG steel sheet Panel RAL 7032, IP= 54/44 and all other accessories OUTGOING 01 No. 160 Amp MCCB TP, (Adj.) RC=25KA , Icu=100%Ics - (For Motor) 01 No. 100 Amp MCCB TP, (Adj.) RC=25KA , Icu=100%Ics - (For PFI) - 01 No. 32 Amp MCCB, TP, (Adj.) RC=25KA , Icu=100%Ics - 01 No. 25 Amp MCCB, TP, (Adj.) RC=25KA , Icu=100%Ics - 01 No. Spare 160 Amp MCCB TP, (Adj.) RC=25KA , Icu=100%Ics - 01 No. Spare 40 Amp MCCB TP, (Adj.) RC=25 kA, Icu=100%Ics - 01 No. Space 160 Amp MCCB TP - 01 No. Panel light with limit switch 02 Nos. Exhaust fan 6" (copper) & Louver 8" sweep with thermostat relay and all accessories etc. Electrolytic copper bus bar with electrical grade PVC mountings 3 for each, nuts, bolts and washers, control MCB etc. (400 Amps. R+Y+B N, 50 Hz, 415 V, AC) - All other accessories required for completion of the quality works	1	No.	1,494,616	1,494,616

**DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING AND
RESIDENT SUPERVISION PACKAGE - II
TUBEWELL - MC KAMOKE**

ENGINEER'S COST ESTIMATE FOR ELECTRICAL WORKS (N-MRS ITEMS)

Item No.	Description	Qty.	Unit	Unit Rate (Rs.)	Total Amount (Rs.)
8.0	<p>Contractor shall submit the genuine certificate from the manufacturer/authorized agent clear by indicating the project name make/model/rating of MCCB, MCB, magnetic contactors, terminal blocks and voltmeters/ ammeter alongwith warranties.</p> <p><u>POWER FACTOR IMPROVEMENT PANEL (PFI)</u> 14 SWG steel sheet clad IP 54 colour RAL 7032 powder coated power factor improvement panel (PFI) including Cu busbar, heavy duty incoming and outgoing circuit breaker to capacitor, magnetic contactors, continuous digital p.f controller, on & off pushbuttons etc. complete with all components/ accessories as per specifications and drawings.</p>				
8.1	<p><u>PFI - 40kVAR</u> 06 steps with continuous digital power factor and capacitor controller with all accessories etc.</p> <ul style="list-style-type: none"> - 01 No. Neutral/OFF/Auto selector switch - 04 Nos. 10 kVAR capacitor - 04 Nos. 50A Magnetic contactor (AC-3) - 04 Nos. 32A MCCB, TP (Adj.) RC= 25 kA Circuit breaker - 08 Nos. Indication light - (for magnetic contactor and phase) - 08 Nos. Push Buttons (ON/OFF) - 05 Nos. Auxiliary contractor (NO/NC) - 01 No. Panel light with limit switch - 02 No. Exhaust fan 6" & Louver 8" sweep with thermostae relay and all accessories etc. - 14 SWG steel sheet Panel RAL 7032, IP= 54/44 and all other accessories, - Electrolytic copper bus bar with electrical grade PVC mountings 3 for each, nuts, bolts and washers, control MCB etc. (400 Amps. R+Y+B N, 50 Hz, 415 V, AC) - All other accessories required for completion of the qulaity works <p>Contractor shall submit the genuine certificate from the manufacturer/authorized agent clear by indicating the project name make/model/rating of MCCB, MCB, magnetic contactors, terminal blocks and voltmeters/ ammeter alongwith warranties.</p>	1	No.	627,599	627,599
9.0	<p><u>EARTHING</u></p>				
9.1	<p>Earth point comprising of 10 ft. 5/8" dia. (16 mm dia) copper coated M.S. rods driven in ground near each lighting control panel. The earthing rods shall be completed with fixing clamps etc.</p>	4	No.	25,691	102,764
9.2	<p>Bore type, earthing up to permanent water level/moist soil by arrangement of earth pit/point comprising of concrete/ brickwork housing with lifting cover 50mm perforated GI pipe, appropriate bare copper stranded conductor as per details in drawing. The earthing and bonding shall be complete with fixing clamps etc. & all metal works shall be bonded to the proposed earthing network.</p>	1	No.	189,888	189,888
	<p><u>MATERIAL</u> Drilling of earth bore 3" dia 100 ft. deep or up to permanent water level.</p>				

**DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING AND
RESIDENT SUPERVISION PACKAGE - II
TUBEWELL - MC KAMOKE
ENGINEER'S COST ESTIMATE FOR ELECTRICAL WORKS (N-MRS ITEMS)**

Item No.	Description	Qty.	Unit	Unit Rate (Rs.)	Total Amount (Rs.)
	<ul style="list-style-type: none"> - Supply and installation of G.I pipe 2" dia 14 SWG to be installed in pre-made bore including all accessories like tees, bends, sockets etc. Pipe shall be connected to tinned copper spike as per detail shown on drawing, complete in all respects. - Supply and installation of tinned copper spike to be manufactured as per detail shown on drawing. Spike shall be connected/screwed at bottom of G.I pipe including all accessories like nuts and bolts complete in all respect. - Supply and installation of 70 mm² bare stranded electrolytic copper conductor lead in pre-laid G.I pipe and connected to tinned copper spike as shown on drawing. 2 Nos. of leads to be installed including all accessories like brass nuts, bolts, washers etc complete in all respect. - Supply and installation of tinned earth test link in earthing pit consisting of copper plate (12"x2"x1/2") with fixing arrangement on the wall of man hole including brass nuts, bolts washers lugs etc. complete in all respect. - Construction of earthing pit (manhole) of internal size 18"x18"x24" deep with 9" thick brick wall with cement mortar, internal plaster 1:4, RCC 4" thick cover with lifting hooks including all accessories complete in all respect. - Testing and commissioning of the earthing system alongwith all testing accessories complete in all respect. 				
10.0	<u>TRANSFORMER</u>				
As per WAPDA Specs.	Supply of 100 kVA, 11/0.415 kV Pole mounted transformer, installation material and all required allied accessories, 11kV HT/LT Steel Poles, HT/LT Conductor, platform, Civil Works, allied hardware complete with all respects. etc., as required for proper completion of job as per WAPDA/DISCO standards. as per WAPDA standards and practice.	1	No.	2,415,180	2,415,180
TOTAL OF N-MRS ITEMS					8,668,928
TOTAL COST					8,668,928

Note:

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The cost of security deposit and obtaining of 11 kV electrical connection with installation material from WAPDA/DISCOs shall be finalized as per site requirement and the cost for the same is not included in the Estimate.
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

BACKUP CALCULATIONS

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.1: Distribution Network of Rasul Nagar

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
1	Dismantling								
	(a) p.c.c road dismantling								
	(90mm) o/d	0.250	1	1	26257	2.000	0.420	22,055.88	Cft
	(125mm) o/d	0.330	1	1	8844	2.000	0.420	7,428.96	Cft
	(180mm) o/d	0.500	1	1	9023	2.500	0.420	9,473.89	Cft
	(225mm) o/d	0.670	1	1	1535	2.500	0.420	1,611.23	Cft
	(315mm) o/d	0.830	1	1	182	3.000	0.420	228.69	Cft
	(355mm) o/d	1.000	1	1	91	3.000	0.420	114.35	Cft
							Total	40,913.00	Cft
								409.13	100 Cft
2	(b) Dismantling and removing R.C.C in road								
	(90mm) o/d	0.250	1	1	16709	2.000	0.670	22,390.06	Cft
	(125mm) o/d	0.330	1	1	5628	2.000	0.670	7,541.52	Cft
	(180mm) o/d	0.500	1	1	5742	2.500	0.670	9,617.43	Cft
	(225mm) o/d	0.670	1	1	977	2.500	0.670	1,635.64	Cft
	(315mm) o/d	0.830	1	1	116	3.000	0.670	232.16	Cft
	(355mm) o/d	1.000	1	1	58	3.000	0.670	116.08	Cft
							Total	41,532.89	Cft
								415.33	100 Cft
3	(b) Dismantling and removing road metalling.								
	(90mm) o/d	0.09	1	1	2387	2.000	0.166	792.48	Cft
	(125mm) o/d	0.11	1	1	804	2.000	0.166	266.93	Cft
	(180mm) o/d	0.16	1	1	820	2.500	0.166	340.40	Cft
	(225mm) o/d	0.2	1	1	140	2.500	0.166	57.89	Cft
	(315mm) o/d	0.250	1	1	17	3.000	0.166	8.22	Cft
	(355mm) o/d	0.320	1	1	8	3.000	0.166	4.11	Cft
							Total	1,470.03	Cft
								14.70	100 Cft
4	(c) Dismantling and removing road pavement								
	(90mm) o/d	0.25	1	1	2387	2.000	0.830	3,962.42	Cft
	(125mm) o/d	0.33	1	1	804	2.000	0.830	1,334.64	Cft
	(180mm) o/d	0.5	1	1	820	2.500	0.830	1,702.02	Cft
	(225mm) o/d	0.67	1	1	140	2.500	0.830	289.46	Cft
	(315mm) o/d	0.830	1	1	17	3.000	0.830	41.09	Cft
	(355mm) o/d	1.000	1	1	8	3.000	0.830	20.54	Cft
	Under p.c.c								
	(90mm) o/d	0.250	1	1	26257	2.000	0.500	26,257.00	Cft
	(125mm) o/d	0.330	1	1	8844	2.000	0.500	8,844.00	Cft
	(180mm) o/d	0.500	1	1	9023	2.500	0.500	11,278.44	Cft

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.1: Distribution Network of Rasul Nagar

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
	(225mm) o/d	0.670	1	1	1535	2.500	0.500	1,918.13	Cft
	(315mm) o/d	0.830	1	1	182	3.000	0.500	272.25	Cft
	(355mm) o/d	1.000	1	1	91	3.000	0.500	136.13	Cft
	Under R.c.c								
	(90mm) o/d	0.250	1	1	16709	2.000	0.670	22,390.06	Cft
	(125mm) o/d	0.330	1	1	5628	2.000	0.670	7,541.52	Cft
	(180mm) o/d	0.500	1	1	5742	2.500	0.670	9,617.43	Cft
	(225mm) o/d	0.670	1	1	977	2.500	0.670	1,635.64	Cft
	(315mm) o/d	0.830	1	1	116	3.000	0.670	232.16	Cft
	(355mm) o/d	1.000	1	1	58	3.000	0.670	116.08	Cft
								Total	97,589.01 Cft
									975.89 100 Cft
5 (d)	Brick Dismantling								
	(90mm) o/d	0.25	1	1	2387	2.000		4,774.00	Sft
	(125mm) o/d	0.33	1	1	804	2.000		1,608.00	Sft
	(180mm) o/d	0.5	1	1	820	2.500		2,050.63	Sft
	(225mm) o/d	0.67	1	1	140	2.500		348.75	Sft
	(315mm) o/d	0.830	1	1	17	3.000		49.50	Sft
	(355mm) o/d	1.000	1	1	8	3.000		24.75	Sft
								Total	8,855.63 Sft
									88.56 100 Sft
6	Excavation in foundation								
	0 to 1.5m' depth								
	(90mm) o/d	0.25	1	1	47740	2.000	3.750	358,050.00	Cft
	(125mm) o/d	0.33	1	1	16080	2.000	3.830	123,172.80	Cft
	(180mm) o/d	0.5	1	1	16405	2.500	4.000	164,050.00	Cft
	(225mm) o/d	0.67	1	1	2790	2.500	4.140	28,876.50	Cft
	(315mm) o/d	0.83	1	1	330	3.000	4.330	4,286.70	Cft
	(355mm) o/d	1	1	1	165	3.000	4.500	2,227.50	Cft
								Total	680,663.50 Cft
									680.66 1000 Cft
7	Sand Filling								
	In Bed of pipe								
	(90mm) o/d	0.25	1	1	47740	2.000	0.330	31,508.40	Cft
	(125mm) o/d	0.33	1	1	16080	2.000	0.330	10,612.80	Cft
	(180mm) o/d	0.5	1	1	16405	2.500	0.330	13,534.13	Cft
	(225mm) o/d	0.67	1	1	2790	2.500	0.330	2,301.75	Cft
	(315mm) o/d	0.83	1	1	330	3.000	0.330	326.70	Cft
	(355mm) o/d	1	1	1	165	3.000	0.330	163.35	Cft

Above pipe

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.1: Distribution Network of Rasul Nagar

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
	(90mm) o/d	0.25	1	1	47740	2.000	1.000	95,480.00	Cft
	(125mm) o/d	0.33	1	1	16080	2.000	1.000	32,160.00	Cft
	(180mm) o/d	0.5	1	1	16405	2.500	1.000	41,012.50	Cft
	(225mm) o/d	0.67	1	1	2790	2.500	1.000	6,975.00	Cft
	(315mm) o/d	0.83	1	1	330	3.000	1.000	990.00	Cft
	(355mm) o/d	1	1	1	165	3.000	1.000	495.00	Cft
							Total	235,559.63	Cft
								235.56	1000 Cft
	Above Pipe on Crossings 5% of all lines		1	1	4167	2.400	3.750	37,505.25	Cft
							Total	273,064.88	Cft
								2,730.65	100Cft
	Compaction								
								37,505	Cft
								37.51	1000Cft
8	Rehandling								
	Total Excavation						Total (A)	680,663.50	Cft
	Deductions								
	Sand Filling Pipe volume							273,064.88	Cft
	(90mm) o/d	0.25	3.142	1/4	47740	0.295	0.295	3,262.99	Cft
	(125mm) o/d	0.33	3.142	1/4	16080	0.426	0.426	2,291.90	Cft
	(180mm) o/d	0.5	3.142	1/4	16405	0.590	0.590	4,485.08	Cft
	(225mm) o/d	0.67	3.142	1/4	2790	0.754	0.754	1,245.77	Cft
	(315mm) o/d	0.83	3.142	1/4	330	1.040	1.040	280.33	Cft
	(355mm) o/d	1	3.142	1/4	165	1.180	1.180	180.44	Cft
							Total (B)	284,811.39	Cft
							Total (A-B)	395,852.11	Cft
								395.85	1000 Cft
								284.81	1000 Cft
9	Transportation								
								965.47	1000 Cft
10	HDPE Pipe SDR 21 PN8 Class -B								
	(90mm) o/d	0.25	-	-	47740	-	-	47,740.00	Rft
							Total 90	47,740.00	Rft
	(125mm) o/d	0.33	-	-	16080	-	-	16,080.00	Rft
							Total 125	16,080.00	Rft
	(180mm) o/d	0.5	-	-	16405	-	-	16,405.00	Rft
							Total 180	16,405.00	Rft
	(225mm) o/d	0.67	-	-	2790	-	-	2,790.00	Rft
							Total 225	2,790.00	Rft
	(315mm) o/d	0.83	-	-	330	-	-	330.00	Rft

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.1: Distribution Network of Rasul Nagar

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
								Total 315	330.00 Rft
	(355mm) o/d	1			165			165.00 Rft	
								Total 355	165.00 Rft
11	Thrust Block								
	Bends		80	1	2.00	2.000	2.000	640.00 Cft	
	Tees		32	1	2.00	2.000	2.000	256.00 Cft	
	Reducing Tee		12	1	2.00	2.000	2.000	96.00 Cft	
								Total (A)	992.00 Cft
	Around Pipe								
	(90mm) o/d							0.00 Cft	
	(125mm) o/d							0.00 Cft	
	(180mm) o/d	0.5	3.142		100	1.570	1.570	774.47 Cft	
	(225mm) o/d	0.67	3.142		50	1.738	1.738	474.54 Cft	
	(315mm) o/d	0.83	3.142		50	2.034	2.034	649.95 Cft	
	(355mm) o/d	1	3.142		50	2.165	2.165	736.36 Cft	
	Deductions								
	pipe								
	(90mm) o/d	0.25	3.142	- 1/4	0	0.295	0.295	0.00 Cft	
	(125mm) o/d	0.33	3.142	- 1/4	0	0.426	0.426	0.00 Cft	
	(180mm) o/d	0.5	3.142	- 1/4	100	0.590	0.590	-27.34 Cft	
	(225mm) o/d	0.67	3.142	- 1/4	50	0.754	0.754	-22.33 Cft	
	(315mm) o/d	0.83	3.142	- 1/4	50	1.040	1.040	-42.47 Cft	
	(355mm) o/d	1	3.142	- 1/4	50	1.180	1.180	-54.68 Cft	
								Total (B)	2,488.51 Cft
								Net Quantity (A+B)	3,480.51 Cft
									34.81 100 Cft
12	Restoration of road								
	Carpeting								
	(90mm) o/d	0.25	1	1	2387.00	2.000		4,774.00 Sft	
	(125mm) o/d	0.33	1	1	804.00	2.000		1,608.00 Sft	
	(180mm) o/d	0.5	1	1	820.25	2.500		2,050.63 Sft	
	(225mm) o/d	0.67	1	1	139.50	2.500		348.75 Sft	
	(315mm) o/d	0.83	1	1	16.50	3.000		49.50 Sft	
	(355mm) o/d	1	1	1	8.25	3.000		24.75 Sft	
								Total	8,855.63 Sft
									88.56 100Sft
									14.79 100cft
13	Prime coat								
	(90mm) o/d	0.25	1	1	2387.00	2.000		4,774.00 Sft	
	(125mm) o/d	0.33	1	1	804.00	2.000		1,608.00 Sft	
	(180mm) o/d	0.5	1	1	820.25	2.500		2,050.63 Sft	
	(225mm) o/d	0.67	1	1	139.50	2.500		348.75 Sft	
	(315mm) o/d	0.83	1	1	16.50	3.000		49.50 Sft	
	(355mm) o/d	1	1	1	8.25	3.000		24.75 Sft	
								Total	8,855.63 Sft

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.1: Distribution Network of Rasul Nagar

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
--------	-------------	-----------------	----	----	--------------	---------------	--------------	----------	------

88.56 100Sft

14 Base

(90mm) o/d	0.25	1	1	2387	2.000	0.330	1,575.42 Cft
(125mm) o/d	0.33	1	1	804	2.000	0.330	530.64 Cft
(180mm) o/d	0.5	1	1	820	2.500	0.330	676.71 Cft
(225mm) o/d	0.67	1	1	140	2.500	0.330	115.09 Cft
(315mm) o/d	0.83	1	1	17	3.000	0.330	16.34 Cft
(355mm) o/d	1	1	1	8	3.000	0.330	8.17 Cft
Total							2,922.37 Cft
							29.22 100Cft

15 Sub base

(90mm) o/d	0.25	1	1	2387	2.000	0.830	3,962.42 Cft
(125mm) o/d	0.33	1	1	804	2.000	0.830	1,334.64 Cft
(180mm) o/d	0.5	1	1	820	2.500	0.830	1,702.02 Cft
(225mm) o/d	0.67	1	1	140	2.500	0.830	289.46 Cft
(315mm) o/d	0.83	1	1	17	3.000	0.830	41.09 Cft
(355mm) o/d	1	1	1	8	3.000	0.830	20.54 Cft

Under p.c.c

(90mm) o/d	0.25	1	1	26257	2.000	0.500	26,257.00 Cft
(125mm) o/d	0.33	1	1	8844	2.000	0.500	8,844.00 Cft
(180mm) o/d	0.5	1	1	9023	2.500	0.500	11,278.44 Cft
(225mm) o/d	0.67	1	1	1535	2.500	0.500	1,918.13 Cft
(315mm) o/d	0.83	1	1	182	3.000	0.500	272.25 Cft
(355mm) o/d	1	1	1	91	3.000	0.500	136.13 Cft

Under R.c.c

(90mm) o/d	0.25	1	1	16709	2.000	0.670	22,390.06 Cft
(125mm) o/d	0.33	1	1	5628	2.000	0.670	7,541.52 Cft
(180mm) o/d	0.5	1	1	5742	2.500	0.670	9,617.43 Cft
(225mm) o/d	0.67	1	1	977	2.500	0.670	1,635.64 Cft
(315mm) o/d	0.83	1	1	116	3.000	0.670	232.16 Cft
(355mm) o/d	1	1	1	58	3.000	0.670	116.08 Cft

Total 97,588.99 Cft
975.89 100Cft

take 90% of (base and sub base) as sub base 878.30 100Cft

VALVE CHAMBERS

16 Excavation in foundation upto 1.5m.

Sluice Valve Chamber		34	1	7.136	7.136	4.500	7,791.14 Cft
Air Valve Chamber		12	1	7.136	7.136	4.500	2,749.81 Cft

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.1: Distribution Network of Rasul Nagar

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
	Washout Chamber		8	1	7.136	7.136	4.500	1,833.21	Cft
	BFM+Garden hydrant chamber		14	1	7.136	7.136	4.500	3,208.12	Cft
	Total							15,582.28	Cft
								Total (A)	15.58 1000 Cft
	above 1.5m.								
	Sluice Valve Cahamber		34	1	7.136	7.136	0.500	865.68	Cft
	Air Valve Chamber		12	1	7.136	7.136	0.500	305.53	Cft
	Washout Chamber		8	1	7.136	7.136	0.500	203.69	Cft
	BFM+Garden hydrant chamber		14	1	7.136	7.136	0.500	356.46	Cft
	Total							1,731.36	Cft
								Total (B)	1.73 1000 Cft
								Net Quantity (A+B)	17.31 1000 Cft
17	Rehandling								
	Sluice Valve Cahamber		34	1	25.000	0.830	4.500	3,174.75	Cft
	Air Valve Chamber		12	1	25.000	0.830	4.500	1,120.50	Cft
	Washout Chamber		8	1	25.000	0.830	4.500	747.00	Cft
	BFM+Garden hydrant chamber		14	1	25.000	0.830	4.500	1,307.25	Cft
	Total							6,349.50	Cft
								6.350	1000 Cft
18	Transportation of Earth								
	Excavation							17,313.64	Cft
	Deduction								
	sand							-180.60	Cft
	Rehandling							17,133.04	Cft
								Total	17.13 1000 Cft
19	Plain Cement concrete								
	1:4:8 In Bed								
	Sluice Valve Cahamber		34	1	6.150	6.150	0.500	642.98	Cft
	Air Valve Chamber		12	1	6.150	6.150	0.500	226.94	Cft
	Washout Chamber		8	1	6.150	6.150	0.500	151.29	Cft
	BFM+Garden hydrant chamber		14	1	6.150	6.150	0.500	264.76	Cft
	Total							1,285.97	Cft
								12.86	100 Cft
	1:2:4 under valves								
	Sluice Valve Cahamber		34	1	1.394	0.500	0.984	23.32	Cft
	Air Valve Chamber		12	1	1.394	0.500	0.984	8.23	Cft
	Washout Chamber		8	1	1.394	0.500	0.984	5.49	Cft
	BFM+Garden hydrant chamber		14	3	1.394	0.500	0.984	28.81	Cft
	Indication Posts		68	1	1.760	0.984	0.492	57.94	Cft
	- do		68	1	0.738	0.250	0.984	12.35	Cft

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.1: Distribution Network of Rasul Nagar

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
Total								136.14 Cft	
								1.36	100 Cft
20	Pacca brick work other than building 1st Step								
	Sluice Valve Cahamber		34	1	20.178	1.108	0.500	380.07 Cft	
	Air Valve Chamber		12	1	20.178	1.108	0.500	134.14 Cft	
	Washout Chamber		8	1	20.178	1.108	0.500	89.43 Cft	
	BFM+Garden hydrant chamber		14	1	20.178	1.108	0.500	156.50 Cft	
	Sluice Valve Cahamber		34	1	18.700	0.738	4.429	2,078.18 Cft	
	Air Valve Chamber		12	1	18.700	0.738	4.429	733.47 Cft	
	Washout Chamber		8	1	18.700	0.738	4.429	488.98 Cft	
	BFM+Garden hydrant chamber		14	1	18.700	0.738	4.429	855.72 Cft	
Total								4,916.49 Cft	
								49.16	100 Cft
21	Angle Iron Step								
	Sluice Valve Cahamber		34	4	-	-	-	136.00 Nos	
	Air Valve Chamber		12	4	-	-	-	48.00 Nos	
	Washout Chamber		8	4	-	-	-	32.00 Nos	
	BFM+Garden hydrant chamber		14	4	-	-	-	56.00 Nos	
Total								272.00 Nos	
22	½" (13 mm) thick Cement plaster 1:3								
	Sluice Valve Cahamber		34	2	15.748	-	4.921	5,269.72 Sft	
	Air Valve Chamber		12	2	15.748	-	4.921	1,859.90 Sft	
	Washout Chamber		8	2	15.748	-	4.921	1,239.93 Sft	
	BFM+Garden hydrant chamber		14	2	15.748	-	4.921	2,169.89 Sft	
Total								10,539.44 Sft	
								105.394	100 Sft
24	RCC top slab								
	Sluice Valve Cahamber		34	1	5.413	5.413	0.500	498.11 Cft	
	Air Valve Chamber		12	1	5.413	5.413	0.500	175.80 Cft	
	Washout Chamber		8	1	5.413	5.413	0.500	117.20 Cft	
	BFM+Garden hydrant chamber		14	1	5.413	5.413	0.500	205.10 Cft	
Total (A)								996.21 Cft	
	Deductions								
	Manhole covers								
	Sluice Valve Cahamber		34	0.785	2.132	2.132	0.500	60.66 Cft	
	Air Valve Chamber		12	0.785	2.132	2.132	0.500	21.41 Cft	
	Washout Chamber		8	0.785	2.132	2.132	0.500	14.27 Cft	
	BFM+Garden hydrant chamber		14	0.785	2.132	2.132	0.500	24.98 Cft	
Total (B)								121.32 Cft	

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.1: Distribution Network of Rasul Nagar

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
								Net quantity (A-B)	874.89 Cft
								Say	875 Cft
25	Steel								
	1.75 kg / cft							Total concrete =42407.8 Cft	74,213.6 kgs
								Say	745.00 100 kg
26	Sand filling under floor								
	Sluice Valve Cahamber		34	1	4.000	4.000	0.166	90.30	Cft
	Air Valve Chamber		12	1	4.000	4.000	0.166	31.87	Cft
	Washout Chamber		8	1	4.000	4.000	0.166	21.25	Cft
	BFM+Garden hydrant chamber		14	1	4.000	4.000	0.166	37.18	Cft
								Total	180.60 Cft
									1.81 100 Cft
27	Brick on edge flooring								
	Sluice Valve Cahamber		34	1	4.000	4.000		544.00	Sft
	Air Valve Chamber		12	1	4.000	4.000		192.00	Sft
	Washout Chamber		8	1	4.000	4.000		128.00	Sft
	BFM+Garden hydrant chamber		14	1	4.000	4.000		224.00	Sft
								Total	1,088.00 Sft
									10.88 100 Sft
28	Manhole cover								
	Sluice Valve Cahamber		34	1	-	-	-	34.00	Nos
	Air Valve Chamber		12	1	-	-	-	12.00	Nos
	Washout Chamber		8	1	-	-	-	8.00	Nos
	BFM+Garden hydrant chamber		14	1	-	-	-	14.00	Nos
								Total	68.00 Nos
29	Sluice Valves								
	(90mm) o/d		15	-	-	-	-	15.00	Nos
	(125mm) o/d		5	-	-	-	-	5.00	Nos
	(180mm) o/d		5	-	-	-	-	5.00	Nos
	(225mm) o/d		3	-	-	-	-	3.00	Nos
	(315mm) o/d		3	-	-	-	-	3.00	Nos
	(355mm) o/d		3	-	-	-	-	3.00	Nos
								Total	34.00 Nos
30	Air Valves								
	(90mm) o/d		5	-	-	-	-	5.00	Nos
	(125mm) o/d		2	-	-	-	-	2.00	Nos
	(180mm) o/d		2	-	-	-	-	2.00	Nos
	(225mm) o/d		1	-	-	-	-	1.00	Nos
	(315mm) o/d		1	-	-	-	-	1.00	Nos
	(355mm) o/d		1	-	-	-	-	1.00	Nos
								Total	12.00 Nos
31	Fire Hydrants								12.00 Nos

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.1: Distribution Network of Rasul Nagar

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
--------	-------------	-----------------	----	----	--------------	---------------	--------------	----------	------

32 Quantity of Crush aggregate for Carriage

Description	BOQ Item	Quantity	Unit	Factor	Quantity of Crush
Pipe Line					
(f) Nominal Ratio 1: 2: 4		35	100 Cft	0.88	30.63 100 Cft
base		29	100 Cft		29.22 100 Cft
asphalt (restoration)		15	100 Cft		14.79 100 cft
Chambers					
(h) Nominal Ratio 1: 4: 8		13	100 Cft	0.94	12.09 100 Cft
(f) Nominal Ratio 1: 2: 4		824	100 Cft	0.88	725.52 100 Cft
(2) Type B (nominal mix 1: 1½: 3)		9	100 Cft	0.84	7.35 100Cft
				Total	819.60 100 Cft
				Say	820 100 Cft

33 Recovery of steel obtained from dismantling.

0.91 kg / cft	Total concrete =42407.8 Cft		38,591.1 kgs
		Say	38,600 kg

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
1	Dismantling								
	(a) p.c.c road dismantling								
	(90mm) o/d	0.250	1	1	14889	2.000	0.420	12,506.34	Cft
	(125mm) o/d	0.330	1	1	3069	2.000	0.420	2,577.96	Cft
	(180mm) o/d	0.500	1	1	7582	2.500	0.420	7,960.84	Cft
	(225mm) o/d	0.670	1	1	814	2.500	0.420	854.70	Cft
	(315mm) o/d	0.830	1	1	363	3.000	0.420	457.38	Cft
	(355mm) o/d	1.000	1	1	91	3.000	0.420	114.35	Cft
							Total	24,471.57	Cft
								244.72	100 Cft
2	(b) Dismantling and removing R.C.C in road								
	(90mm) o/d	0.250	1	1	9475	2.000	0.670	12,695.83	Cft
	(125mm) o/d	0.330	1	1	1953	2.000	0.670	2,617.02	Cft
	(180mm) o/d	0.500	1	1	4825	2.500	0.670	8,081.46	Cft
	(225mm) o/d	0.670	1	1	518	2.500	0.670	867.65	Cft
	(315mm) o/d	0.830	1	1	231	3.000	0.670	464.31	Cft
	(355mm) o/d	1.000	1	1	58	3.000	0.670	116.08	Cft
							Total	24,842.35	Cft
								248.42	100 Cft
3	(b) Dismantling and removing road metalling.								
	(90mm) o/d	0.09	1	1	1354	2.000	0.166	449.36	Cft
	(125mm) o/d	0.11	1	1	279	2.000	0.166	92.63	Cft
	(180mm) o/d	0.16	1	1	689	2.500	0.166	286.04	Cft
	(225mm) o/d	0.2	1	1	74	2.500	0.166	30.71	Cft
	(315mm) o/d	0.250	1	1	33	3.000	0.166	16.43	Cft
	(355mm) o/d	0.320	1	1	8	3.000	0.166	4.11	Cft
							Total	879.28	Cft
								8.79	100 Cft
4	(c) Dismantling and removing road pavement								
	(90mm) o/d	0.25	1	1	1354	2.000	0.830	2,246.81	Cft
	(125mm) o/d	0.33	1	1	279	2.000	0.830	463.14	Cft
	(180mm) o/d	0.5	1	1	689	2.500	0.830	1,430.19	Cft
	(225mm) o/d	0.67	1	1	74	2.500	0.830	153.55	Cft
	(315mm) o/d	0.830	1	1	33	3.000	0.830	82.17	Cft
	(355mm) o/d	1.000	1	1	8	3.000	0.830	20.54	Cft
	under p.c.c								
	(90mm) o/d	0.250	1	1	14889	2.000	0.500	14,888.50	Cft
	(125mm) o/d	0.330	1	1	3069	2.000	0.500	3,069.00	Cft
	(180mm) o/d	0.500	1	1	7582	2.500	0.500	9,477.19	Cft

CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
	(225mm) o/d	0.670	1	1	814	2.500	0.500	1,017.50	Cft
	(315mm) o/d	0.830	1	1	363	3.000	0.500	544.50	Cft
	(355mm) o/d	1.000	1	1	91	3.000	0.500	136.13	Cft
	under R.c.c								
	(90mm) o/d	0.250	1	1	9475	2.000	0.670	12,695.83	Cft
	(125mm) o/d	0.330	1	1	1953	2.000	0.670	2,617.02	Cft
	(180mm) o/d	0.500	1	1	4825	2.500	0.670	8,081.46	Cft
	(225mm) o/d	0.670	1	1	518	2.500	0.670	867.65	Cft
	(315mm) o/d	0.830	1	1	231	3.000	0.670	464.31	Cft
	(355mm) o/d	1.000	1	1	58	3.000	0.670	116.08	Cft
								Total	58,371.57 Cft
									583.72 100 Cft
5	(d) Brick Dismantling								
	(90mm) o/d	0.25	1	1	1354	2.000		2,707.00	Sft
	(125mm) o/d	0.33	1	1	279	2.000		558.00	Sft
	(180mm) o/d	0.5	1	1	689	2.500		1,723.13	Sft
	(225mm) o/d	0.67	1	1	74	2.500		185.00	Sft
	(315mm) o/d	0.830	1	1	33	3.000		99.00	Sft
	(355mm) o/d	1.000	1	1	8	3.000		24.75	Sft
								Total	5,296.88 Sft
									52.97 100 Sft
6	Excavation in foundation 0 to 1.5m' depth								
	(90mm) o/d	0.25	1	1	27070	2.000	3.750	203,025.00	Cft
	(125mm) o/d	0.33	1	1	5580	2.000	3.383	37,754.28	Cft
	(180mm) o/d	0.5	1	1	13785	2.500	4.000	137,850.00	Cft
	(225mm) o/d	0.67	1	1	1480	2.500	4.140	15,318.00	Cft
	(315mm) o/d	0.83	1	1	660	3.000	4.330	8,573.40	Cft
	(355mm) o/d	1	1	1	165	3.000	4.500	2,227.50	Cft
								Total	404,748.18 Cft
									404.75 1000 Cft
7	Sand Filling								
	In Bed of pipe								
	(90mm) o/d	0.25	1	1	27070	2.000	0.330	17,866.20	Cft
	(125mm) o/d	0.33	1	1	5580	2.000	0.330	3,682.80	Cft
	(180mm) o/d	0.5	1	1	13785	2.500	0.330	11,372.63	Cft
	(225mm) o/d	0.67	1	1	1480	2.500	0.330	1,221.00	Cft
	(315mm) o/d	0.83	1	1	660	3.000	0.330	653.40	Cft
	(355mm) o/d	1	1	1	165	3.000	0.330	163.35	Cft
	Above pipe								

CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
	(90mm) o/d	0.25	1	1	27070	2.000	1.000	54,140.00	Cft
	(125mm) o/d	0.33	1	1	5580	2.000	1.000	11,160.00	Cft
	(180mm) o/d	0.5	1	1	13785	2.500	1.000	34,462.50	Cft
	(225mm) o/d	0.67	1	1	1480	2.500	1.000	3,700.00	Cft
	(315mm) o/d	0.83	1	1	660	3.000	1.000	1,980.00	Cft
	(355mm) o/d	1	1	1	165	3.000	1.000	495.00	Cft
	Above Pipe on Crossings								
	5% of all lines		1	1	2429	2.400	3.750	21,858.75	Cft
							Total	162,755.63	Cft
								1,627.56	100Cft
	Compaction								
								21,859	Cft
								21.86	1000Cft
8	Rehandling								
	Total Excavation						Total (A)	404,748.18	Cft
	Deductions								
	Sand Filling							162,755.63	Cft
	Pipe volume								
	(90mm) o/d	0.25	3.142	1/4	27070	0.295	0.295	1,850.21	Cft
	(125mm) o/d	0.33	3.142	1/4	5580	0.426	0.426	795.32	Cft
	(180mm) o/d	0.5	3.142	1/4	13785	0.590	0.590	3,768.78	Cft
	(225mm) o/d	0.67	3.142	1/4	1480	0.754	0.754	660.84	Cft
	(315mm) o/d	0.83	3.142	1/4	660	1.040	1.040	560.66	Cft
	(355mm) o/d	1	3.142	1/4	165	1.180	1.180	180.44	Cft
							Total (B)	170,571.88	Cft
							Total (A-B)	234,176.30	Cft
							Say	234.18	1000 Cft
9	Transportation							638.92	1000 Cft
10	HDPE Pipe SDR 21 PN8								
	Class -B								
	(90mm) o/d	0.25	-	-	27070	-	-	27,070.00	Rft
							Total 90	27,070.00	Rft
	(125mm) o/d	0.33	-	-	5580	-	-	5,580.00	Rft
							Total 125	5,580.00	Rft
	(180mm) o/d	0.5	-	-	13785	-	-	13,785.00	Rft
							Total 180	13,785.00	Rft
	(225mm) o/d	0.67	-	-	1480	-	-	1,480.00	Rft
							Total 225	1,480.00	Rft
	(315mm) o/d	0.83	-	-	660	-	-	660.00	Rft
							Total 315	660.00	Rft
	(355mm) o/d	1	-	-	165	-	-	165.00	Rft
							Total 355	165.00	Rft
11	Thrust Block								

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
	Bends		50	1	2.00	2.000	2.000	400.00	Cft
	Tees		20	1	2.00	2.000	2.000	160.00	Cft
	Reducing Tee		10	1	2.00	2.000	2.000	80.00	Cft
							Total (A)	640.00	Cft
	Around Pipe								
	(90mm) o/d							0.00	Cft
	(125mm) o/d							0.00	Cft
	(180mm) o/d	0.5	3.142		100	1.570	1.570	774.47	Cft
	(225mm) o/d	0.67	3.142		50	1.738	1.738	474.54	Cft
	(315mm) o/d	0.83	3.142		50	2.034	2.034	649.95	Cft
	(355mm) o/d	1	3.142		50	2.165	2.165	736.36	Cft
	Deductions								
	pipe								
	(90mm) o/d	0.25	3.142	- 1/4	0	0.295	0.295	0.00	Cft
	(125mm) o/d	0.33	3.142	- 1/4	0	0.426	0.426	0.00	Cft
	(180mm) o/d	0.5	3.142	- 1/4	100	0.590	0.590	-27.34	Cft
	(225mm) o/d	0.67	3.142	- 1/4	50	0.754	0.754	-22.33	Cft
	(315mm) o/d	0.83	3.142	- 1/4	50	1.040	1.040	-42.47	Cft
	(355mm) o/d	1	3.142	- 1/4	50	1.180	1.180	-54.68	Cft
							Total (B)	2,488.51	Cft
							Net Quantity (A+B)	3,128.51	Cft
								31.29	100 Cft
13	Prime coat								
	(125mm) o/d	0.33	1	1	1353.50	2.000		2,707.00	Sft
	(180mm) o/d	0.5	1	1	279.00	2.000		558.00	Sft
	(225mm) o/d	0.67	1	1	689.25	2.500		1,723.13	Sft
	(315mm) o/d	0.83	1	1	74.00	2.500		185.00	Sft
	(355mm) o/d	1	1	1	33.00	3.000		99.00	Sft
	Above Pipe on Crossings	0	1	1	8.25	3.000		24.75	Sft
							Total	5,296.88	Sft
								52.97	100Sft
14	Base								
	(90mm) o/d	0.25	1	1	1354	2.000	0.330	893.31	Cft
	(125mm) o/d	0.33	1	1	279	2.000	0.330	184.14	Cft
	(180mm) o/d	0.5	1	1	689	2.500	0.330	568.63	Cft
	(225mm) o/d	0.67	1	1	74	2.500	0.330	61.05	Cft
	(315mm) o/d	0.83	1	1	33	3.000	0.330	32.67	Cft
	(355mm) o/d	1	1	1	8	3.000	0.330	8.17	Cft
							Total	1,747.97	Cft
								17.48	100Cft
15	Sub base								
	(90mm) o/d	0.25	1	1	1354	2.000	0.830	2,246.81	Cft
	(125mm) o/d	0.33	1	1	279	2.000	0.830	463.14	Cft

CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
	(180mm) o/d	0.5	1	1	689	2.500	0.830	1,430.19	Cft
	(225mm) o/d	0.67	1	1	74	2.500	0.830	153.55	Cft
	(315mm) o/d	0.83	1	1	33	3.000	0.830	82.17	Cft
	(355mm) o/d	1	1	1	8	3.000	0.830	20.54	Cft
	Under p.c.c								
	(90mm) o/d	0.25	1	1	14889	2.000	0.500	14,888.50	Cft
	(125mm) o/d	0.33	1	1	3069	2.000	0.500	3,069.00	Cft
	(180mm) o/d	0.5	1	1	7582	2.500	0.500	9,477.19	Cft
	(225mm) o/d	0.67	1	1	814	2.500	0.500	1,017.50	Cft
	(315mm) o/d	0.83	1	1	363	3.000	0.500	544.50	Cft
	(355mm) o/d	1	1	1	91	3.000	0.500	136.13	Cft
	Under R.c.c								
	(90mm) o/d	0.25	1	1	9475	2.000	0.670	12,695.83	Cft
	(125mm) o/d	0.33	1	1	1953	2.000	0.670	2,617.02	Cft
	(180mm) o/d	0.5	1	1	4825	2.500	0.670	8,081.46	Cft
	(225mm) o/d	0.67	1	1	518	2.500	0.670	867.65	Cft
	(315mm) o/d	0.83	1	1	231	3.000	0.670	464.31	Cft
	(355mm) o/d	1	1	1	58	3.000	0.670	116.08	Cft
	Total							58,371.57	Cft
								583.72	100Cft
	take 90% of (base and sub base) as sub base							525.34	100Cft

VALVE CHAMBERS

16 Excavation in foundation upto 1.5m.

Sluice Valve Cahamber	25	1	7.136	7.136	4.921	6,264.74	Cft
Air Valve Chamber	12	1	7.136	7.136	4.921	3,007.08	Cft
Washout Chamber	7	1	7.136	7.136	4.921	1,754.13	Cft
BFM+Garden hydrant chamber	11	1	7.136	7.136	4.921	2,756.49	Cft
Total						13,782.44	Cft
Total (A)						13.78	1000 Cft
above 1.5m.							
Sluice Valve Cahamber	25	1	7.136	7.136	0.500	636.53	Cft
Air Valve Chamber	12	1	7.136	7.136	0.500	305.53	Cft
Washout Chamber	7	1	7.136	7.136	0.500	178.23	Cft
BFM+Garden hydrant chamber	11	1	7.136	7.136	0.500	280.07	Cft
Total						1,400.36	Cft
Total (B)						1.40	1000 Cft
Net Quantity (A+B)						15.18	1000 Cft

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
17	Rehandling								
	Sluice Valve Cahamber		25	1	25.000	0.830	4.921	2,552.77 Cft	
	Air Valve Chamber		12	1	25.000	0.830	4.921	1,225.33 Cft	
	Washout Chamber		7	1	25.000	0.830	4.921	714.78 Cft	
	BFM+Garden hydrant chamber		11	1	25.000	0.830	4.921	1,123.22 Cft	
							Total	5,616.10 Cft	
								5.616 1000 Cft	
18	Transportation of Earth								
	Excavation							20,798.90 Cft	
	Deduction								
	Rehandling							-146.08 Cft	
							Total	20,652.82 Cft	
								20.65 1000 Cft	
19	Plain Cement concrete								
	1:4:8 In Bed								
	Sluice Valve Cahamber		25	1	6.150	6.150	0.500	472.78 Cft	
	Air Valve Chamber		12	1	6.150	6.150	0.500	226.94 Cft	
	Washout Chamber		7	1	6.150	6.150	0.500	132.38 Cft	
	BFM+Garden hydrant chamber		11	1	6.150	6.150	0.500	208.02 Cft	
							Total	1,040.12 Cft	
								10.40 100 Cft	
	1:2:4 under valves								
	Sluice Valve Cahamber		25	1	1.394	0.500	0.984	17.15 Cft	
	Air Valve Chamber		12	1	1.394	0.500	0.984	8.23 Cft	
	Washout Chamber		7	1	1.394	0.500	0.984	4.80 Cft	
	BFM+Garden hydrant chamber		11	3	1.394	0.500	0.984	22.63 Cft	
	Indication Posts		55	1	1.760	0.984	0.492	46.86 Cft	
	- do		55	1	0.738	0.250	0.984	9.99 Cft	
							Total	109.66 Cft	
								1.10 100 Cft	
20	Pacca brick work other than building								
	1st Step								
	Sluice Valve Cahamber		25	1	20.178	1.108	0.500	279.47 Cft	
	Air Valve Chamber		12	1	20.178	1.108	0.500	134.14 Cft	
	Washout Chamber		7	1	20.178	1.108	0.500	78.25 Cft	
	BFM+Garden hydrant chamber		11	1	20.178	1.108	0.500	122.96 Cft	
	Sluice Valve Cahamber		25	1	18.700	0.738	4.429	1,528.07 Cft	
	Air Valve Chamber		12	1	18.700	0.738	4.429	733.47 Cft	
	Washout Chamber		7	1	18.700	0.738	4.429	427.86 Cft	
	BFM+Garden hydrant chamber		11	1	18.700	0.738	4.429	672.35 Cft	

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
								Total	3,976.57 Cft
									39.77 100 Cft
21	Angle Iron Step								
	Sluice Valve Cahamber		25	4	-	-	-	100.00	Nos
	Air Valve Chamber		12	4	-	-	-	48.00	Nos
	Washout Chamber		7	4	-	-	-	28.00	Nos
	BFM+Garden hydrant chamber		11	4	-	-	-	44.00	Nos
								Total	220.00 Nos
22	½" (13 mm) thick Cement plaster 1:3								
	Sluice Valve Cahamber		25	2	15.748	-	4.921	3,874.80	Sft
	Air Valve Chamber		12	2	15.748	-	4.921	1,859.90	Sft
	Washout Chamber		7	2	15.748	-	4.921	1,084.94	Sft
	BFM+Garden hydrant chamber		11	2	15.748	-	4.921	1,704.91	Sft
								Total	8,524.55 Sft
									85.246 100 Sft
24	RCC top slab								
	Sluice Valve Cahamber		25	1	5.413	5.413	0.500	366.26	Cft
	Air Valve Chamber		12	1	5.413	5.413	0.500	175.80	Cft
	Washout Chamber		7	1	5.413	5.413	0.500	102.55	Cft
	BFM+Garden hydrant chamber		11	1	5.413	5.413	0.500	161.15	Cft
								Total (A)	805.76 Cft
	Deductions								
	Manhole covers								
	Sluice Valve Cahamber		25	0.785	2.132	2.132	0.500	44.60	Cft
	Air Valve Chamber		12	0.785	2.132	2.132	0.500	21.41	Cft
	Washout Chamber		7	0.785	2.132	2.132	0.500	12.49	Cft
	BFM+Garden hydrant chamber		11	0.785	2.132	2.132	0.500	19.62	Cft
								Total (B)	98.12 Cft
								Net quantity (A-B)	707.64 Cft
								Say	708 Cft
25	Steel 1.75 kg / cft								
								Total concrete =25550.0 Cft	44,712.5 kgs
								Say	450.00 100 kg
26	Sand filling under floor								
	Sluice Valve Cahamber		25	1	4.000	4.000	0.166	66.40	Cft
	Air Valve Chamber		12	1	4.000	4.000	0.166	31.87	Cft
	Washout Chamber		7	1	4.000	4.000	0.166	18.59	Cft
	BFM+Garden hydrant chamber		11	1	4.000	4.000	0.166	29.22	Cft
								Total	146.08 Cft

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
									1.46 100 Cft
27	Brick on edge flooring								
	Sluice Valve Cahamber		25	1	4.000	4.000		400.00	Sft
	Air Valve Chamber		12	1	4.000	4.000		192.00	Sft
	Washout Chamber		7	1	4.000	4.000		112.00	Sft
	BFM+Garden hydrant chamber		11	1	4.000	4.000		176.00	Sft
								Total	880.00 Sft
									8.80 100 Sft
28	Manhole cover								
	Sluice Valve Cahamber		25	1	-	-	-	25.00	Nos
	Air Valve Chamber		12	1	-	-	-	12.00	Nos
	Washout Chamber		7	1	-	-	-	7.00	Nos
	BFM+Garden hydrant chamber		11	1	-	-	-	11.00	Nos
								Total	55.00 Nos
29	Sluice Valves								
	(90mm) o/d		9	-	-	-	-	9.00	Nos
	(125mm) o/d		2	-	-	-	-	2.00	Nos
	(180mm) o/d		5	-	-	-	-	5.00	Nos
	(225mm) o/d		3	-	-	-	-	3.00	Nos
	(315mm) o/d		3	-	-	-	-	3.00	Nos
	(355mm) o/d		3					3.00	Nos
								Total	25.00 Nos
30	Air Valves								
	(90mm) o/d		3	-	-	-	-	3.00	Nos
	(125mm) o/d		1	-	-	-	-	1.00	Nos
	(180mm) o/d		2	-	-	-	-	2.00	Nos
	(225mm) o/d		1	-	-	-	-	1.00	Nos
	(315mm) o/d		1	-	-	-	-	1.00	Nos
	(355mm) o/d		1					1.00	Nos
								Total	9.00 Nos
31	Fire Hydrants								9.00 Nos
32	Quantity of Crush aggregate for Carriage								
	Description		BOQ Item		Quantity	Unit	Factor	Quantity of Crush	
	Pipe Line								
	(f) Nominal Ratio 1: 2: 4				31	100 Cft	0.88	27.53	100 Cft
	base				17	100 Cft		17.48	100 Cft
	asphalt (restoration)				9	100 Cft		9.00	100 cft
	Chambers								
	(h) Nominal Ratio 1: 4: 8				10	100 Cft	0.94	9.78	100 Cft
	(f) Nominal Ratio 1: 2: 4				493	100 Cft	0.88	433.96	100 Cft
	(2) Type B (nominal mix 1: 1½: 3)				7	100 Cft	0.84	5.94	100Cft

CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Backup Calculations

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road

BILL NO. 1.2: Distribution Network of Mandiala Road

Sr. No	Description	Outer Dia (Rft)	No	No	Length (Rft)	Breadth (Rft)	Height (Rft)	Quantity	Unit
								Total	503.69 100 Cft
								Say	505 100 Cft

33 Recovery of steel obtained from dismantalling.

0.91 kg / cft

Total concrete =25550.0 Cft

23,250.5 kgs
23,250 kg

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

**TUBE WELL ROOM
MEASURMENT SHEET**

Bill No. 2.2 TUBE WELL ROOM

Sr.No	Description	No	Measurement			Qty	Unit
			L	B	H/D		
1	Excavation in foundation of building i/c refilling around structures						
	Walls	4	10.000	2.50	2.50	250.00	
	Column	2	4.000	4.00	2.50	80.00	
	Plinnth protection	4	12.00	1.50	0.75	54.00	
	Enrerence side wall	2	4.50	1.50	2.50	33.75	
	Enrerence Step wall	1	9.00	1.50	2.50	33.75	
	Total					451.50	Cft
	TOTAL QUANTITY					0.45	1000Cft
2i	Filling watering ramming earth under floor						
	Total Structure excavation		451.50	0.66		297.99	Cft
	Sub Total B					0.30	1000Cft
ii	Earthfilling under floors brought from outside.						
	Room	1	10.00	10.00	3	300.00	
	Enterence	1	9.00	4.50	3	121.50	
	Total Filling D					421.50	Cft
	D/d surplus Earth					-297.99	
						123.51	
	Net Required from Borrow pit					0.12	1000Cft
	Total D- Sub total C						
3	Spraying anti-termite liquid mixed with water in the ratio of 1:40.						
	Walls	4	10.000		2.50	100.00	
	Column	2	4.000		2.50	20.00	
	Plinth protection wall	4	12.00		0.75	36.00	
	Enrerence side wall	2	4.50		2.50	22.50	
	Enrerence Step wall	1	9.00		2.50	22.50	
	Floor	1	10.00		10	100.00	
	Enterence	1	4.50		9	40.50	
	TOTAL QUANTITY					341.50	Sft
4	Cement concrete (1:4:8)						
	Walls	4	10.000	2.50	0.50	50.00	
	Room	1	10.000	10.00	0.33	33.00	
	Column	2	4.000	4.00	0.50	16.00	
	Plinth protection wall	4	12.00	1.50	0.25	18.00	
	Enrerence side wall	2	4.50	1.50	0.50	6.75	
	Enrerence Step wall	1	9.00	1.50	0.50	6.75	
	Plinth protection floor	4	12	2	0.25	24.00	
	TOTAL QUANTITY					154.50	Cft
	TOTAL QUANTITY					1.545	100Cft
5	Pacca Brick work in foundation and plinth						
	Ratio 1:6 cement Sand Morter						
	Walls 1st step	4	10.000	1.88	0.50	37.50	

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

**TUBE WELL ROOM
MEASURMENT SHEET**

Bill No. 2.2 TUBE WELL ROOM

Sr.No	Description	No	Measurement			Qty	Unit
			L	B	H/D		
	2nd step	4	10.000	1.50	0.50	30.00	
	3rd step	4	10.000	1.13	0.50	22.50	
	4th step up to Road level	4	10.000	0.75	1.38	41.25	
	up to F.F level	4	10.000	0.75	1.13	33.75	
	Plinth protection wall	4	12.00	0.75	1.50	54.00	
	Enrerence side wall	2	4.50	0.75	2.00	13.50	
	Enrerence front wall	1	9.00	1.50	0.50	6.75	
	Enrerence 1st Step	2	3	1	0.5	3.00	
	2nd step	2	2	1	0.5	2.00	
	3rd step	2	1	1	0.5	1.00	
			TOTAL QUANTITY			245.25	Cft
			TOTAL QUANTITY			2.453	100Cft
6	Providing and laying damp proof course of cement concrete 1:2:4 (Using Cement Sand & Shingle) i/c bitumen coating with one coat of bitumen & one layer polethene sheet 500guage						
	Walls 1st DPC	4	10.000		0.75	30.00	
	2nd DPC	4	10.000		0.75	30.00	
			TOTAL QUANTITY			60.00	Sft
			TOTAL QUANTITY			0.600	100Sft
7	Providing and laying Vertical Damp Proof course of cement sand plaster and bitumen coating Ratio 1:3 thick 20mm (3/4") Walls						
		4	10.000		1.00	40.00	
			TOTAL QUANTITY			40.00	Sft
			TOTAL QUANTITY			0.400	100Sft
8	Sand Filling Under Floor Room Plinth						
	Room	4	10.000	10.00	0.33	132.00	
	Plinth	4	12	2	0.25	24.00	
			TOTAL QUANTITY			156.00	Cft
			TOTAL QUANTITY			1.560	100Cft
9	Pacca Brick work in Ground Floor Ratio (1:5 cement Sand Morter)						
	Walls 1st step	4	10.000	0.75	12.00	360.00	
	parapit wall	4	10.000	0.75	1.875	56.25	
	Girder lift wall (avg)	2	2.5	2.5	5.33	66.63	
	D1	-1	4	0.75	7	(21.00)	
	W1	-1	4	0.75	4	(12.00)	
			TOTAL QUANTITY			449.88	Cft
			TOTAL QUANTITY			4.499	100Cft

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

**TUBE WELL ROOM
MEASURMENT SHEET**

Bill No. 2.2 TUBE WELL ROOM

Sr.No	Description	No	Measurement			Qty	Unit
			L	B	H/D		
10	Providing and laying reinforced cement concrete (including prestressed concrete), using coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.):- Reinforced Cement Conrete in Raft slab(1:2:4) Coloumn foundation	2	3.33	3.33	0.75	16.63	
			TOTAL QUANTITY			16.63	Cft
11	Reinforced Cement Conrete in roof slab, beams columns litels, girder and other structural memebers.laid in situe or precast complete in all respect Type C 1:2:4 Room Enterence Coloumn Beam -B1 Door Lintls D1 Window Lintls W1 Window shed	1 1 2 1 1 2 2	10.75 9 0.441 10 6 5.5 4	10.75 5 0.75 0.75 0.75 0.75 1.5	0.5 0.5 12 0.75 0.5 0.5 0.25	57.78 22.50 10.58 5.63 2.25 4.13 3.00	
			TOTAL QUANTITY			105.87	Cft
12	Fabrication of mild steel reinforcement bars for cement concrete i/c cutting, bending, laying in position making joints and fastening including cost of binding wire and labour charges complte Plinth beam bath Slab & Lintls Total Concrete		16.63 105.87 122.50		6.5 6.5	28.75 1,659.98	
			TOTAL QUANTITY			1,688.74	Kg
			TOTAL QUANTITY			16.89	100Kg
13	PCC (1:2:4) 2" thick plinth protection	4	12	2		96.00	

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

**TUBE WELL ROOM
MEASURMENT SHEET**

Bill No. 2.2 TUBE WELL ROOM

Sr.No	Description	No	Measurement			Qty	Unit
			L	B	H/D		
			TOTAL QUANTITY			96.00	Sft
			TOTAL QUANTITY			0.96	100Sft
14	Mosaic floor 1/2" topping						
	Room	1	10	10		100.00	
	Entrance	1	9	4.5		40.50	
			TOTAL QUANTITY			140.50	Sft
			TOTAL QUANTITY			1.41	100Sft
15	Plaster To ceiling						
	Plaster work 3/8" thick at GF						
	Ceiling 1:3						
			Ceiling Area				
	Room	1	10	10		100.00	
	Verandah	1	8	5		40.00	
	window sheds	2	4	1.875		15.00	
			TOTAL QUANTITY			155.00	Sft
			TOTAL QUANTITY			1.55	100Sft
16	Cement Plaster 3/4" Thick (1:5)						
	Room wall	4	10		12	480.00	
	D1	-1	4		7	(28.00)	
	Window					-	
	W1	-2	5		4	(40.00)	
			TOTAL QUANTITY			412.00	Sft
			TOTAL QUANTITY			4.12	100Sft
17	Cement pointing deep struck						
	Walls external side	4	10		12	480.00	
	Prapit wall	4	10		1.875	75.00	
	Girder lift wall (avg)	4	2.5		5.33	53.30	
	W1	-2	4		4	(32.00)	
			TOTAL QUANTITY			576.30	Sft
			TOTAL QUANTITY			5.76	100Sft
18	Distemper on ceilings						
	Room	1	10	10		100.00	
	Verandah	1	8	5		40.00	
			TOTAL QUANTITY			140.00	Sft
			TOTAL QUANTITY			1.40	100Sft
19	Emulsion Paint To Walls						
	Room wall	4	10		12	480.00	
	D1	-1	4		7	(28.00)	
	Window					-	
	W1	-2	5		4	(40.00)	
			TOTAL QUANTITY			412.00	Sft
			TOTAL QUANTITY			4.12	100Sft

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

**TUBE WELL ROOM
MEASURMENT SHEET**

Bill No. 2.2 TUBE WELL ROOM

Sr.No	Description	No	Measurement			Qty	Unit
			L	B	H/D		
20	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, applicati on of primer complete in all respect: a) new sur f ace: i) 1st coat i i) 2nd coat Window sheds Coloumn Verandah	4 2 1	4 2.35 8	1.875 8 4	30.00 37.60 32.00		
		TOTAL QUANTITY			99.60	Sft	
		TOTAL QUANTITY			1.00	100Sft	
21	Providing and fixing steel windows using M.S. sheet (16 SWG) moulded tubular pipe 1½"x1½" (40x40mm) for frame and 1¼"x1¼" (30x30mm) for leaves including M.S. square bars ¼"x¼" (6x6 mm) welded around each panel of frame, 5 mm thick glass panes fixed with double M.S. square tubular pipe 3/8"x3/8" (10x10mm) (22 SWG) beading with U' shaped rubber lining, brass fitting, holdfast, including painting three coats complete in all respects. For openable panels fixed with wire gauze 24 SWG, 12x12 mesh and glass panes ¼" (6 mm) thick. W1	2	4	4	32.00		
		TOTAL QUANTITY			32.00	Sft	
22	Chain block 5 ton capacity	1			1.00	Each	
					1.00	Each	

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

**TUBE WELL ROOM
MEASURMENT SHEET**

Bill No. 2.2 TUBE WELL ROOM

Sr.No	Description	No	Measurement			Qty	Unit
			L	B	H/D		
23	Small iron work, such as gusset plates, knees, bends, stirrups, straps, rings, etc. including cutting, drilling, riveting, handling, assembling and fixing; but excluding erection in position. Measureent sheet atatched						
						267.12	Kg
						2.67	100 Kg
24	Providing and fixing single leef steel door frame L1-1/2" x1-1/2" x1/4" and 18 Gauge M.S sheet with L 1-1/4" x1-1/4" x13/ 16" center cross frame ,hold fast, hinges, earl, including paint as per drawing complete in all respect and approved by the Engineer in-charge.	1	4		7	28	
						28	Sft
25	Providing and fixing MS steel Grill 1.5"x1.5" pipe 14 SWG use internal design 3/8"x3/8" Sq bar as per approved design complete in all respect including paints complete. W1	2	4		4	32.00	
						32.00	Sft
26	Single layer of tiles 9"x4½"x1½" (225x113x40 mm) laid over 4"(100 mm) earth and 1" (25 mm) mud plaster without Bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with 34 lbs. per %Sft. or 1.72 Kg/Sq.m bitumen coating sand blinded. including one layer of polythene sheet 500 Gauge Room Verandah D/d Khurras	1 1 -2	10 8 2	10 4 2		100.00 32.00 (8.00)	
						124.00	Sft
						1.24	100Sft
27	Khurras	2				2.00	Nos
						2.00	Nos

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE No. 2 (Hafizabad, Kamoke & Muridke)

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Measurement of small iron work

Bill No. 2.2.1

S.No	Description	Unit	Nos	Cut Length	Total Length	Weight Kg/Ft	Total Qty/Sft	Sheet Weight Kg/SqFt	Total Weight/Kg
Mearment of cup baord									
1	Horizontal and Vertical angle iron 2" x 2"x 1/4"	Kg	1	13.00	13.00	1.447			18.8110
2	Steel Single Shutter Plate 16 SWG (4.5' X 2')	Kg	1				9.000	1.143	10.2870
Stiffner Plate of Tube well									
1	Horizontal and Vertical angle iron 2" x 2"x 3/16"	Kg	1	17.00	17.00	1.107			18.819
2	Stiffner plate 3/16" (4.5" x4.5")	Kg	1				20.250	3.475	70.3688
Girder WF 10 X 30									
	Girder WF 10 X 30	Kg	1	10.00	10.00	13.611			136.1100
	Total								254.3958
	Total Kg =								254.3958
	Total 100 Kg =								2.5440

APPENIDX-C RATE ANALYSIS & QOUTATIONS

RATE ANALYSIS

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Rate Analysis (Non-Schedule items)

RA-1: Taking Samples(Length 100 Rft)

Taking sample at every 5 ft.(1.52m) 100 Rft.
length from bore hole No. of samples =20 Nos

Sr. No.	Description	Amount
1	1 No. Helper (Skilled) for collecting samples @ Rs. 1060/- Per 8 hrs (LB-061)	1060
2	1 No. Site supervisor for ½ day @ 976 (Add items Sr. No. 2)	488
3	Site engineer ¼ day @ Rs. 2656/- per day. (Add:item Sr. No. 1)	664
4	Cost of polythene bags	220
	Sub Total	2432
	Add 10% sundries	203
	Sub Total	2635
	Add 20% contractors profit	527
	Total	3162
	Rate per sample	158

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Rate Analysis (Non-Schedule items)

RA-2: Geophysical logging of borehole.

Sr. No.	Description	Amount
1	Geophysical logging of borehole using self-potential resistivity both short normal	50000
	Sub Total	50000
	Add 20% contractor profit	10000
	Grand Total	60000

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Rate Analysis (Non-Schedule items)

RA-3: M.S Cenerlizers

Sr. No.	Description	Amount
1	Helper 02 Nos. @ Rs:1060/-Per day for ½ hour (LB-061)	132.5
2	1 No Site supervisor@ 976/-day & 1 no foreman for ½ hour @976/-day	122
3	Site engineer ½ hour @ Rs.2656/- per day. (Add items Sr. No. 1)	166
4	1 No. welder (Skilled) for ½ hour @ Rs.1450/- per day (LB-052)	81.25
5	1 No. driller (Skilled) for 0.25 hrs @ Rs. 1450/- per day (LB-033)	40.625
6	Hire charges for rig for 0.25 hrs (EQ-32)@Rs. 1000/- per hour	250
7	Pol for Rig, vehicle and Plants etc. 2 lit @ 227.80 /lit	455.6
8	Mild Steel centralizer using M.S Flat iron 1.5"x1/8"having 2.15 kg weight @ 170 Rs /kg (material -12.041)	365.5
	Sub Total	1613
	Add 10% sundries	54.24
	Sub Total	1668
	Add 20% contractors profit	333.54
	Total	2001
	Say	2001

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Rate Analysis (Non-Schedule items)

RA-4: Sand seal with puddle clay b/w 26 inch dia bore and 18 inch dia casing

Sr. No.	Description	Amount
1	Vol = $0.785 \times (20/12)^2 - 0.785 \times (10/12)^2 = 2.47$ Sft	23865.00
	Vol = 2.47 Sftx5' = 12.35 Cft	
	Bentonite clay Material (23.555) @43 per kg 555x43=	
2	Pouring with manual Labor 2 Helper for 16 hours(2x1060x2) (LB-061)	4240
	Add 10% sundries on Sr. No. 2	424
	Sub Total	28529.00
	Add 20% Contractor profit	5705.80
	Grand Total	34234.80
	Say Per Job	34234.80

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Rate Analysis (Non-Schedule items)

RA-5: Cement/Sand Slurry 1:1 Ratio

Sr. No.	Description	Amount
1	Vol of 1:1 cement sand slurry in borehole = $0.785(D_2-d_2)$ $0.785\{(26/12)^2 - (26/12)^2\} \times 3.14/4 \times 250 = 479.72\text{cft}$ Dry material (130 Dry = 100 wet) $479.72 \text{ Cft} \times 1.3 = 619.73/2\text{Cft} = 311.81 \text{ Cft}$ $1 \text{ Bag} = 1.25\text{Cft} = 311.81/1.25\text{Cft} = 249.44 \text{ Bags}$ 249.44Bags of cements @ 1000 per bag (Material-06-008)	250000.00
2	sand Local at site (481.65 Cft I/C loading and unloading @ of Rs. 21 per Cft) (Material - 06-007)	10114.65
3	Charges of mixer machine from market to site (08 hours) @ 465 / hour) (EQ-24)	3720
4	Trimmie G.I pipe of 3" dia 240Rft @ Rs:20/rft per 8 hours	4800
5	Diesel for operation of mixer machine 10 liter@ Rs. 227.80 per liter.	2278
6	Mobile oil 4 liters @ Rs. 900 per liter.	900
7	Lowering/ Un lowering of trimmie pipes in bore hole with the help of helpers skilled 4 Nos. @ Rs. 1060 per day for 8 hours.	4240
8	One operator for 16 hours (Mixture machine @ of Rs:1450/day)	1450
9	Driller for 08 hours controlling the verticality during whole Operation @ of Rs.1450/day. for 8 hours.	1450
10	One skilled colly and three helpers for pouring slurry in bore hole through trimmie pipe Nos. for 8 hours (1x1450 LB-024)+(3x1060 LB-061=	4630
	Add 2% wastage on items No. 1, 2	5202.29
	Add 10% sundries on Sr. No. 7, 8, 9, 10	1177.00
	Sub Total	289961.94
	Add 20% contractor profit	57992.39
	Sub Total	347954.33
	(Rate of Slurry per Rft = $257576.41/250\text{Rft}$)	1391.82
	Say Per RFT:	1392

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Rate Analysis (Non-Schedule items)

RA-6: Development and testing of tube well

Sr. No.	Description	Amount
1	Hiring charges of tractor with shaft driven pulley diesel engine have with special clutch system of back washing process duly maintaining of up to 150% of design capacity pump for 72 hours @ Rs; 1335 hr.(EQ-18)	115776
2	Hiring charges of bowl assembly column pipe oil lubricated tubes and shaft along with head etc complete set 6 inch dia for 48 hours @ Rs;95 per hour.	4560
3	Lowering of pump and fixing of diesel engine fixing charge line and pizeometer, system etc, by 5-skilled labour and one pump setters (Time as detailed below)	
	Helpers 5 Nos. 08 hours @ Rs.1060 per day=5x1060=5300	
	P/Setter/colley skilled 8 hours @ Rs. 1450 per day	
	Mechanic 8 Hours @ Rs. 1450 per day	
	2 Jobs Total = 8200x2=16400	16,400
4	Mobile oil for diesel engine and oil lubricated turbine pump and discharge head 08 liters @ Rs. 900 per liter.	7200
5	Diesel 4 liters per hour for 12hour running of diesel engine (22hrs D&T time) 2 hours inspection/checking 48x227.80=21868.8	10934.4
6	During D&T operation staff working hours 8 hours per shift (3 shifts) pump setters/ skilled colley 8 hours @ Rs.1450 per day mechanic(LB-043) 8 hours @ Rs. 1450 per day, helper(LB-061) 8 hours @ Rs.1060 per day 3960x3=11880	11,880
7	Auto-cum power electrician 8 hours @ Rs. 1450 (LB- 035) per day (1450x3)=4350	4350
8	D&T observer /colly skilled for 3 shift each shift 8 hours @ Rs; 1450 per day 8 hours working 3x1450= 4350	4350
9	Geologist inspection/checking of D&T processes of 24 hours recording D&T data @ Rs. 2424 per day 2424x3=6384	7272
10	Hiring charges for suitable tripod along with chain block for 48 hrs @ 2750.00/24 hrs (2750.00x2=5550.00)	5500
	Sub Total	188222.4
	Add 10% sundries on Sr. No. 4, 7, 8, 9, 10	4425.2
	Sub Total	192647.6
	Add 20% contractor profit	38529.52
	Grand Total	231177
	Say Per Job	231177

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Rate Analysis (Non-Schedule items)

RA-7: Water Sampling and Testing from approved Laboratory

Sr. No.	Description	Amount
1	Chemical, Physical and Arsenic Analysis of water from approved Water Testing	5000
	Sub Total	5000
	Add 20% contractor profit	1000
	Total	6000

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Rate Analysis (Non-Schedule items)

RA-8: Providing and fixing of M.S Cap

Sr. No.	Description	Calculations	Amount (Rs)
1	Area $\pi d^2/4 = 0.7(16/12)^2 = 1.24\text{Sft}$	1.40	679
	Volume = $1.24 \times (0.02) = 0.02$	0.03	
	Weight = $0.02 \times 494/2.204 = 4.48\text{Kg}$	6.26	
	Cost @ Rs. 151x4.48Kg		
	Materials – Items No. (12.156)		
2	Welding and fixing charges(including labour, equipments & assesories)		450
	Sub Total		1129
	Add 20% Contractors profit		225.80
	Total		1354.8
	Say		1355

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

Rate Analysis (Non-Schedule items)

RA-9: Deepwell pump 2.0 cusec capacity

Sr. No.	Description	Amount
1	Sub-Total	6796000
	Sub-Total	6796000
	Total	6796000

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

**IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

(Input Material & Labour 1st Bi-Annual 2023 - Gujranwala)

RA-10 : CHOLRINATOR

Dosing pump to dose sodium hypochloritenwith flowrate 08 1/hr max pressure 10 barg, construction material pump head PVDF , diaphragm in PVDF/ PTFE, Lip valve in FPM, sealing in EPDM, suction & delivery turbine in Teflon , Robust potentiometer for flow rate setting, IP 65 ON/OFF switch, with rated power as per manufacture,220 volt Hz and IP65, including. Chemical storage container with capacity 80 liters, equipped with inlet and outlet connection, Construction material PE or Plastic, for indoor application. complete in all respect as directed by the Engineer Incharge.

Sr. No.	Description	Ref.	Quantity	Unit	Rate (Rs)	Unit: Each Amount (Rs)
1	Material					
a.	Cholrinator pump	Quotation	1	No.	105,000	105,000.00
b.	Contractor Profit 20%				20%	21,000.00
	Total Material					126,000.00
2	Labour					
a.	Pipe Fitter	LB-045	1	No.	1,450	1,450.00
b.	Helper	LB-061	1	No.	1,060	1,060.00
	Total					2,510.00
	Sundries				10%	251.00
	Total					2,761.00
c.	Contractor Profit 20%				20%	552.20
	Total Labour					3,313.20
	Total (1+2)					129,313.20
Total Cost (Rs.)						129,313.20

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE
& MURIDKE)**

**IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

(Input Material & Labour 1st Bi-Annual 2023 - Gujranwala)

RA-11 : PRESSURE GAUGE

Providing, installing, testing and commissioning 4" dia Pressure Gauge as per standard of ISO, specification complete in all respect as directed by the Engineer Incharge.

Unit: Each

Sr. No.	Description	Ref.	Quantity	Unit	Rate (Rs)	Amount (Rs)
1	Material					
a.	Pressure Gague	Quotation	1	No.	8,000	8,000.00
c.	Contractor Profit 20%			20%		1,600.00
	Total Material					9,600.00
2	Labour					
a.	Pipe Fitter	LB-045	0.125	No.	1,450	181.00
b.	Helper	LB-061	0.125	No.	1,060	133.00
	Total					314.00
	Sundries			10%	-	31.40
	Total					345.40
c.	Contractor Profit 20%			20%		69.08
	Total Material					414.48
	Total (1+2)					10,014.48
Total Cost (Rs.)						10,014.50

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL PLANNING AND
RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

**IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

(Input Material & Labour 1st Bi-Annual 2023 - Gujranwala)

RA-13 : MS FLANGES

Providing, transportation, fixing and Jointing of MS flanges to joint the valves with HDPE pipe line complete in all respect and as per approval of The Engineer.

Unit= Each

Sr. No	Ref.	Description	90 mm o/d	125 mm o/d	180 mm o/d	225 mm o/d	315 mm o/d	355 mm o/d
	Quotation	M.S Flange	1,200.00	1,500.00	1,800.00	3,000.00	3,500.00	6,000.00
		Total Material Cost (Rs/ Each)	1,200.00	1,500.00	1,800.00	3,000.00	3,500.00	6,000.00
2		Labour						
	LB-045	Pipe Fitter (Man-Day)	1,450 0.15	1,450 0.15	1,450 0.15	1,450 0.15	1,450 0.15	1,450 0.15
		Cost (per No)	217.5	217.5	217.5	217.5	217.5	217.5
	LB-015	Cooly Un-skilled (all types) (Man-Day)	1,060 0.15	1,060 0.15	1,060 0.15	1,060 0.15	1,060 0.15	1,060 0.15
		Cost (per No)	159	159	159	159	159	159
		Total	376.50	376.50	376.50	376.50	376.50	376.50
		Sundries 10%	37.65	37.65	37.65	37.65	37.65	37.65
	Total Labour Cost (Rs/ Each)	414.15	414.15	414.15	414.15	414.15	414.15	
	Total Material & Labour Cost (Rs/ Each)	1,614.15	1,914.15	2,214.15	3,414.15	3,914.15	6,414.15	
3		CONTRACTOR PROFIT						
		Contractor's Profit + Overheads @ 20%	322.83	382.83	442.83	682.83	782.83	1282.83
	Total	1936.98	2296.98	2656.98	4096.98	4696.98	7696.98	
Total (Material, Carriage & Labour) (Rs.) for Each			1,937.00	2,297.00	2,657.00	4,097.00	4,697.00	7,697.00

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL PLANNING AND
RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

**IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

(Input Material & Labour 1st Bi-Annual 2023 - Gujranwala)

RA-14 : FLEXIBLE COUPLING

Providing, transportation, fixing and Jointing of Flexible Coupling to joint the valves with HDPE pipe line complete in all respect and as per approval of The Engineer.

Unit= Each

Sr. No	Ref.	Description	90 mm o/d	125 mm o/d	180 mm o/d	225 mm o/d	315 mm o/d	355 mm o/d
	Quotation	Flexible Coupling	10,125.00	11,625.00	14,625.00	17,625.00	25,125.00	32,625.00
		Total Material Cost (Rs/ Each)	10,125.00	11,625.00	14,625.00	17,625.00	25,125.00	32,625.00
2		Labour						
	LB-045	Pipe Fitter (Man-Day)	1,450.00 0.15	1,450.00 0.15	1,450.00 0.15	1,450.00 0.15	1,450.00 0.15	1,450.00 0.15
		Cost (per No)	217.50	217.50	217.50	217.50	217.50	217.50
	LB-015	Cooly Un-skilled (all types) (Man-Day)	1,060.00 0.15	1,060.00 0.15	1,060.00 0.15	1,060.00 0.15	1,060.00 0.15	1,060.00 0.15
		Cost (per No)	159.00	159.00	159.00	159.00	159.00	159.00
		Total	376.50	376.50	376.50	376.50	376.50	376.50
		Sundries 10%	37.65	37.65	37.65	37.65	37.65	37.65
		Total Labour Cost (Rs/ Each)	414.15	414.15	414.15	414.15	414.15	414.15
		Total Material & Labour Cost (Rs/ Each)	10,539.15	12,039.15	15,039.15	18,039.15	25,539.15	33,039.15
3		CONTRACTOR PROFIT						
		Contractor's Profit + Overheads @ 20%	2,107.83	2,407.83	3,007.83	3,607.83	5,107.83	6,607.83
		Total	12,646.98	14,446.98	18,046.98	21,646.98	30,646.98	39,646.98
		Say	12,647	14,447	18,047.00	21,647.00	30,647.00	39,647.00

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL PLANNING
AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

RA-15(A)(i) : CONSUMER CONNECTIONS

Providing, fixing and testing consumer connections of 25 mm dia polyethylene pipe, cost of PE pipe, including the cost of brass ferrule, adapter & PP saddle clamp, ,MTF/FTA ,and End Cap, brass ball valve ,1" dia G.I pipe of B.S.S. 1387-1967 including G.I fitting, uPVC pipe (SDR-41/SN-4) 4" i/d (100 mm), P.C.C (1:2:4) complete in all respects as per drawings specification and instructions of the Engineer incharge.

Sr. No.	Ref.	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
A)CONSUMER CONNECTIONS OF 25 MM O/D ON (90MM LINE O/D)						
A		<u>Material</u>				
1	Quotation	PE Consumer Connection (including PP Clamp Saddle, PP Tapping Ferrule, MTF/FTA and End Cap)	Each	1	970.00	970.00
2	23/43(b)	High Density Polyethylene Pipe 25 mm (HDPE) PE-100, (PN-8) 12 ft length (avg)	Rft	12	75.70	908.40
3	19.050	Brass ball valves 1" ferrule	Each	1	500.00	500.00
4	19.133	uPVC pipe (SDR-41/SN-4) 4" i/d (100 mm)	Rft	3.75	149.88	562.05
5	Ch-5/5f	P.C.C (1:2:4) 4" X 4" X 3'.75" = 0.320 Cft	Cft	0.320	388.80	124.42
6	Ch-23/23(ii)(c)	Providing, laying, cutting, jointing, testing and disinfecting .G.I pipe of B.S.S. 1387-1967 and Cost of sockets, tees, elbows, etc.	Rft	3.00	340.90	1,022.70
		Total				4,087.57
		Contractor's Profit + Overheads @ 20% of only Item 1,3&4				406.41
		Total Material Cost (Rs/ Each)				4,493.98
B		<u>Manpower</u>				
1	LB-045	Pipe Fitter	Day	0.125	1450.00	181.25
2	LB-015	Cooly Un-skilled (all types)	Day	0.125	1,060	132.50
		Total				313.75
		Add Sundries @ 10% on Labour				31.38
		Total Labour				345.13
		Contractor's Profit + Overheads @ 20%				69.03
		Total Labour Cost (Rs/ Each)				414.15
		Total Material & Labour Cost (Rs/ Each)				4,908.13
		Total				4,908.13
Total (Material, Carriage & Labour) (Rs.) for Each						4,908.13

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL PLANNING
AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

RA-15 (A) (ii) : CONSUMER CONNECTIONS

Providing, fixing and testing consumer connections of 25 mm dia polyethylene pipe, cost of PE pipe, including the cost of brass ferrule, adapter & PP saddle clamp, ,MTF/FTA ,and End Cap, brass ball valve ,1" dia G.I pipe of B.S.S. 1387-1967 including G.I fitting, uPVC pipe (SDR-41/SN-4) 4" i/d (100 mm), P.C.C (1:2:4) complete in all respects as per drawings specification and instructions of the Engineer incharge.

Sr. No.	Ref.	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
A)CONSUMER CONNECTIONS OF 25 MM O/D ON (125MM LINE O/D)						
A		<u>Material</u>				
1	Quotation	PE Consumer Connection (including PP Clamp Saddle, PP Tapping Frerule, MTF/FTA and End Cap)	Each	1	1,150.00	1,150.00
2	23/43(b)	High Density Polyethylene Pipe 25 mm (HDPE) PE-100, (PN-8) 12 ft length (avg)	Rft	12	75.70	908.40
3	19.050	Brass ball valves 1" ferrule	Each	1	500.00	500.00
4	19.133	uPVC pipe (SDR-41/SN-4) 4" i/d (100 mm)	Rft	3.75	149.88	562.05
5	Ch-5/5f	P.C.C (1:2:4) 4" X 4" X 3'.75" = 0.320 Cft	Cft	0.320	388.80	124.42
6	Ch-23/23(ii)(c)	Providing, laying, cutting, jointing, testing and disinfecting .G.I pipe of B.S.S. 1387-1967 and Cost of sockets, tees, elbows, etc.	Rft	3.00	340.90	1,022.70
		Total				4,267.57
		Contractor's Profit + Overheads @ 20% of only Item 1,3&4				442.41
		Total Material Cost (Rs/ Each)				4,709.98
B		<u>Manpower</u>				
1	LB-045	Pipe Fitter	Day	0.125	1450.00	181.25
2	LB-015	Cooly Un-skilled (all types)	Day	0.125	1,060	132.50
		Total				313.75
		Add Sundries @ 10% on Labour				31.38
		Total Labour				345.13
		Contractor's Profit + Overheads @ 20%				69.03
		Total Labour Cost (Rs/ Each)				414.15
		Total Material & Labour Cost (Rs/ Each)				5,124.13
		Total				5,124.13
Total (Material, Carriage & Labour) (Rs.) for Each						5,124.13

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL PLANNING
AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)
IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

RA-15(A) (iii) : CONSUMER CONNECTIONS

Providing, fixing and testing consumer connections of 25 mm dia polyethylene pipe, cost of PE pipe, including the cost of brass ferrule, adapter & PP saddle clamp, ,MTF/FTA ,and End Cap, brass ball valve ,1" dia G.I pipe of B.S.S. 1387-1967 including G.I fitting, uPVC pipe (SDR-41/SN-4) 4" i/d (100 mm), P.C.C (1:2:4) complete in all respects as per drawings specification and instructions of the Engineer incharge.

Sr. No.	Ref.	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
A)CONSUMER CONNECTIONS OF 25 MM O/D ON (180MM LINE O/D)						
A		Material				
1	Quotation	PE Consumer Connection (including PP Clamp Saddle, PP Tapping Frrule, MTF/FTA and End Cap)	Each	1	1,750.00	1,750.00
2	23/43(b)	High Density Polyethylene Pipe 25 mm (HDPE) PE-100, (PN-8) 12 ft length (avg)	Rft	12	75.70	908.40
3	19.050	Brass ball valves 1" ferrule	Each	1	500.00	500.00
4	19.133	uPVC pipe (SDR-41/SN-4) 4" i/d (100 mm)	Rft	3.75	149.88	562.05
5	Ch-5/5f	P.C.C (1:2:4) 4" X 4" X 3'.75" = 0.320 Cft	Cft	0.320	388.80	124.42
6	Ch-23/23(ii)(c)	Providing, laying, cutting, jointing, testing and disinfecting .G.I pipe of B.S.S. 1387-1967 and Cost of sockets, tees, elbows, etc.	Rft	3.00	340.90	1,022.70
		Total				4,867.57
		Contractor's Profit + Overheads @ 20% of only Item 1,3&4				562.41
		Total Material Cost (Rs/ Each)				5,429.98
B		Manpower				
1	LB-045	Pipe Fitter	Day	0.125	1450.00	181.25
2	LB-015	Cooly Un-skilled (all types)	Day	0.125	1,060	132.50
		Total				313.75
		Add Sundries @ 10% on Labour				31.38
		Total Labour				345.13
		Contractor's Profit + Overheads @ 20%				69.03
		Total Labour Cost (Rs/ Each)				414.15
		Total Material & Labour Cost (Rs/ Each)				5,844.13
		Total				5,844.13
Total (Material, Carriage & Labour) (Rs.) for Each						5,844.13

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT SECTORIAL
PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE & MURIDKE)**

**IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
ROUGH COST ESTIMATE**

(Input Material & Labour 1st Bi-Annual 2023 - Gujranwala)

RA-16: CONSUMER MULTIJET BRASS BODY DRY WATER METERS

Providing, fixing, testing and commission of multi jet brass body dry water meter of best quality dry-dial, magnetic drive, protected against external magnetic tampering; vacuum-sealed register, frost resistant, conforming to ISO4064 standard Class B as per approved sample complete in all respects or/and as directed by Engineer In Charge.

Unit: Each

Sr.No	Ref.	Description	15mm	20mm	25mm
1	Quotation	Material			
		Dry Water Meter	10,750.00	14,500.00	18,000.00
		Contractor's Profit + Overheads @ 20%	2,150.00	2,900.00	3,600.00
		Total Material Cost (Rs/ Each)	12,900.00	17,400.00	21,600.00
2	LB-045	Labour			
		Pipe Fitter	1,450.00	1,450.00	1,450.00
		(Man-Day)	0.65	0.65	0.65
		Cost (per No)	942.50	942.50	942.50
	LB-015	Cooly Un-skilled (all types)	1,060.00	1,060.00	1,060.00
		(Man-Day)	0.65	0.65	0.65
		Cost (per No)	689.00	689.00	689.00
		Total	1,631.50	1,631.50	1,631.50
		Sundries 10%	163.15	163.15	163.15
		Total Labour	1,794.65	1,794.65	1,794.65
		Contractor's Profit + Overheads @ 20%	358.93	358.93	358.93
		Total Labour Cost (Rs/ Each)	2,153.58	2,153.58	2,153.58
3		Total Material & Labour Cost (Rs/ Each)	15,053.58	19,553.58	23,753.58
		Total	15,053.58	19,553.58	23,753.58
		Total (Material, Carriage & Labour) (Rs.) for Each	15,053.60	19,553.60	23,753.60

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD, KAMOKE &
MURIDKE)**

IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY

ROUGH COST ESTIMATE

(Input Material & Labour 1st Bi-Annual 2023 - Gujranwala)

RA-17: CARRIAGE

Carriage of Aggregate

			Unit = Cu.m
Sr. No.	Ref.	Description	Amount (Rs.)
1	Chap-1, I-1/P- 2	Carriage of 100 Cf t. (2.83 cu.m) of all materials like stone aggregate, spawl , kankar lime (unslaked), surkhi , etc. or 150 Cf t. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor. Lead 185.00 Km	
		1st Km	306.7
		2nd Km	146.25
		3rd Km	114.5
		4th Km	81.45
		5th Km	76
		6th Km	74.75
		7th Km	69.8
		8th Km	69
		9th Km	64.9
		10th Km	60.8
		11th Kms to 200Kms @ Rs. 52.30/Km	9152.50
Cost of Aggregate For 100 Cft (2.83 cu.m)			10216.65

RATE ANALYSIS ELECTRICAL

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

1.1 Wiring of light or fan point from switch board/dimmer to the point with 3x1.5mm sq (P+N+E) PVC insulated single core stranded cables in 25 mm PVC conduit/pipe concealed in walls, columns and slabs including accessories, PVC box, 10 Amp. gang switch 1 or 2 way as required, one for each light or fan and installed as in specifications complete in all respects.

UNIT = EACH

MATERIAL

Unit Qty. Rate(Rs.) Total (Rs.)

MRS 1st Bi-Annual 2023 (Ref: Item/Chapter)

i)	Cost of three No. 3x1.5mm sq PVC 1-core Cable [Ref: Item 10(c-ii)/24]	Rft	45	35.60	1,602.00
ii)	Cost of 1" PVC pipe [Ref: Item 3(iii)/24]	Rft	15	103.80	1,557.00
iii)	Back Box (10x10 cm, 4"x4") [Ref : Item 14(i)/24]	Each	1	302.60	302.60
iv)	10 Amp Gang Switch [Ref : Item 32(ii)/24]	Each	1	98.30	98.30

Total = 3,559.90

Say/Unit = 3,560.00

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

1.2 Circuit wiring from DB MCBs to gang switches board and from switch board to switch board with 3x2.5mm sq (P+N+E) PVC insulated single core stranded cables in 25mm PVC pipe/conduit concealed in walls, columns and slabs as required complete in all respects.

UNIT = EACH

MATERIAL

Unit Qty. Rate(Rs.) Total (Rs.)

MRS 1st Bi-Annual 2023 (Ref: Item/Chapter)

i)	Cost of three No. 3x2.5mm sq PVC 1-core Cable [Ref: Item 10(c-iii)/24]	Rft.	90	50.65	4,558.50
ii)	Cost of 1" PVC pipe [Ref: Item 3(iii)/24]	Rft.	30	103.80	3,114.00

Total = 7,672.50

Say/Unit = 7,673.00

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

1.3 The same as item No. 1.1(a) but from one light point to another light point.

UNIT = EACH

MATERIAL

MRS 1st Bi-Annual 2023 (Ref: Item/Chapter)

	Unit	Qty.	Rate(Rs.)	Total (Rs.)
i) Cost of three No. 3x1.5mm sq PVC 1-core Cable [Ref: Item 10(c-ii)/24]	Rft.	30	35.60	1,068.00
ii) Cost of 1" PVC pipe [Ref: Item 3(iii)/24]	Rft.	10	103.80	1,038.00

Total = 2,106.00

Say/Unit = 2,106.00

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

1.4 10/13 Amp 3 pin universal flush mounting switch socket outlet wired from DB MCBs to first outlet with 3x4mm sq (P+N+E) single core cable stranded (away from switch board) in 25mm PVC pipe/conduit concealed in walls, columns and slabs as required complete in all respects.

UNIT = EACH

MATERIAL

MRS 1st Bi-Annual 2023 (Ref: Item/Chapter)

	Unit	Qty.	Rate(Rs.)	Total (Rs.)
i) Cost of three No. 3x4mm sq PVC 1-core Cable [Ref: Item 10(c-iv)/24]	Rft.	75	67.25	5,043.75
ii) Cost of 1" PVC pipe [Ref: Item 3(iii)/24]	Rft.	25	103.80	2,595.00
iii) Back Box (10 x 10 cm (4"x4")) [Ref: item 14(i)/24]	Each	1	302.60	302.60
iv) 5 Amp 2/3 pin socket (Ref: item 36(i)/24)	Each	1	128.30	128.30
Total =				8,069.65
Say/Unit =				8,070.00

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

1.5 The same as item No.1.4 but wiring from one socket outlet to another socket outlet with 3x2.5mm sq (P+N+E) single core stranded cable in 25mm PVC pipe/conduit concealed in walls, columns and slabs as required complete in all respects.

UNIT = EACH

MATERIAL

	Unit	Qty.	Rate(Rs.)	Total (Rs.)
MRS 1st Bi-Annual 2023 (Ref: Item/Chapter)				
i) Cost of three No. 3x2.5mm sq PVC 1-core Cable [Ref: Item 10(c-iii)/24]	Rft.	45	50.65	2,279.25
ii) Cost of 1" PVC pipe [Ref: Item 3(iii)/24]	Rft.	15	103.80	1,557.00
iii) Back Box (10 x 10 cm (4"x4")) [Ref: item 14(i)/24]	Each	1	302.60	302.60
iv) 5 Amp 2/3 pin socket (Ref: item 36(i)/24)	Each	1	128.30	128.30
	Total	=		4,267.15
	Say/Unit	=		4,267.00

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

1.6 20 Amp 3 pin universal flush mounting switch socket outlet wired from DB MCBs to independent socket outlet with 3x6mm sq (P+N+E) single core stranded cable (away from switchboard) in 25mm PVC pipe/conduit concealed in walls, columns and slabs as required complete in all respects.

UNIT = EACH

MATERIAL

Unit Qty. Rate(Rs.) Total (Rs.)

MRS 1st Bi-Annual 2023 (Ref: Item/Chapter)

i)	Cost of 3 No. 3x6mm sq PVC 1-core Cable [Ref: Item 10(c-v)/24]	Rft.	75	94.10	7,057.50
ii)	Cost of 1" PVC pipe [Ref: Item 3(iii)/24]	Rft.	25	103.80	2,595.00
iii)	3 pin socket, 15 Amp, recessed, combined [Ref. Item 36(ii)/24]	Each	1	169.10	169.10
iv)	Back Box (10 x 10 cm (4"x4")) [Ref: item 14(i)/24]	Each	1	302.60	302.60

Total = 10,124.20

Say/Unit = 10,124.00

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

1.2(a) Copper conductor PVC insulated 450/750 V 1-core cable as earth continuity conductor/circuit protective conductor (ECC/CPC). Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing)

MATERIAL

Unit = Rft.

- 1 core 50 mm²

Rft.	1	639.55	639.55
------	---	--------	--------

Sub total:		= Rs.	639.55
------------	--	-------	--------

LABOUR

- Carriage to site and unloading etc.

		= Rs.	20.00
--	--	-------	-------

- Installation including end connections, sundries, testing and commissioning.

		= Rs.	30.00
--	--	-------	-------

Total:		= Rs.	689.55
--------	--	-------	--------

- Contractor's overheads @ 10% and profit @ 10% on Material

		= Rs.	137.91
--	--	-------	--------

Grand Total:		= Rs.	827.46
--------------	--	-------	--------

Say		= Rs.	827.00
------------	--	-------	---------------

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

1.2(b) Copper conductor PVC insulated 450/750 V 1-core cable as earth continuity conductor/circuit protective conductor (ECC/CPC). Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing)

MATERIAL

Unit = Rft.

- 1 core 70 mm²

Rft. 1 920.66 920.66

Sub total: = Rs. 920.66

LABOUR

- Carriage to site and unloading etc.

= Rs. 10.00

- Installation including end connections, sundries, testing and commissioning.

= Rs. 20.00

Total: = Rs. 950.66

- Contractor's overheads @ 10% and profit @ 10%

= Rs. 190.13

Grand Total: = Rs. 1,140.79

Say = Rs. **1,141.00**

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

2.1 Light Fixture Type LED Batten Ceiling/surface mounted, 18W complete in all respect with allied accessories. The fitting shall be approved by the Engineer.

MATERIAL

Unit = Each

Light Fixture Type LED Batten Ceiling/surface mounted, 18W complete in all - respect with allied accessories. The fitting shall be approved by the Engineer.

Each 1 2,820.20 2,820.20

Sub total: = Rs. 2,820.20

LABOUR

- Carriage to site and unloading etc.

= Rs. 150.00

- Installation including end connections, sundries, testing and commissioning.

= Rs. 200.00

Total: = Rs. 3,170.20

- Contractor's overheads @ 10% and profit @ 10%

= Rs. 634.04

Grand Total: = Rs. 3,804.24

Say = Rs. **3,804.00**

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

2.2 Light Fixture Type LED Batten Ceiling/surface mounted, 10W above mirror in toilets complete in all respect with allied accessories. The fitting shall be approved by the Engineer.

MATERIAL

Unit = Each

Light Fixture Type LED Batten Ceiling/surface mounted, 10W above mirror in toilets complete in all respect with allied accessories. The fitting shall be approved by the Engineer.

Each	1	1,882.10	1,882.10
Sub total:		= Rs.	1,882.10

LABOUR

- Carriage to site and unloading etc. = Rs. 150.00

- Installation including end connections, sundries, testing and commissioning. = Rs. 200.00

Total:		= Rs.	2,232.10
--------	--	-------	----------

- Contractor's overheads @ 10% and profit @ 10% = Rs. 446.42

Grand Total:		= Rs.	2,678.52
--------------	--	-------	----------

Say = Rs. **2,679.00**

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

2.3 Wall bracket Light Fixture Type LED 12W energy saving lamp with holder and complete in all respect with allied accessories. The fitting shall be approved by the Engineer.

MATERIAL

Unit = Each

Wall bracket Light Fixture Type LED 12W energy saving lamp with holder and - complete in all respect with allied accessories. The fitting shall be approved by the Engineer.

Each	1	4,130.00	4,130.00
------	---	----------	----------

Sub total:		= Rs.	4,130.00
------------	--	-------	----------

LABOUR

- Carriage to site and unloading etc.

	= Rs.	150.00
--	-------	--------

- Installation including end connections, sundries, testing and commissioning.

	= Rs.	200.00
--	-------	--------

Total:		= Rs.	4,480.00
--------	--	-------	----------

- Contractor's overheads @ 10% and profit @ 10%

	= Rs.	896.00
--	-------	--------

Grand Total:		= Rs.	5,376.00
--------------	--	-------	----------

Say		= Rs.	5,376.00
------------	--	-------	-----------------

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

2.4 20W LED Water tight light fixture IP 65 complete in all respect with all allied accessories. The fitting shall be approved by the Engineer.

MATERIAL

Unit = Each

- 20W LED Water tight light fixture IP 65 complete in all respect with all allied accessories. The fitting shall be approved by the Engineer.

Each	1	18,290.00	18,290.00
------	---	-----------	-----------

Sub total:	= Rs.	18,290.00
------------	-------	-----------

LABOUR

- Carriage to site and unloading etc.

= Rs.	150.00
-------	--------

- Installation including end connections, sundries, testing and commissioning.

= Rs.	200.00
-------	--------

Total:	= Rs.	18,640.00
--------	-------	-----------

- Contractor's overheads @ 10% and profit @ 10%

= Rs.	3,728.00
-------	----------

Grand Total:	= Rs.	22,368.00
--------------	-------	-----------

Say	= Rs.	22,368.00
------------	-------	------------------

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

2.5 Smart Bright Highbay wide beam LED Luminaries 100W efficient and reliable and all accessories/ components required for the proper operation of the system. The luminaries shall be fully flexible for future upgrades and easy replacements for maintenance purposes.

MATERIAL

Unit = Each

Smart Bright Highbay wide beam LED Luminaries 100W efficient and reliable and all accessories/ components required for the proper operation of the system. The luminaries shall be fully flexible for future upgrades and easy replacements for maintenance purposes.

Each	1	28,000.00	28,000.00
------	---	-----------	-----------

Sub total:		= Rs.	28,000.00
------------	--	-------	-----------

LABOUR

- Carriage to site and unloading etc.		= Rs.	200.00
---------------------------------------	--	-------	--------

- Installation including end connections, sundries, testing and commissioning.		= Rs.	250.00
--	--	-------	--------

Total:		= Rs.	28,450.00
--------	--	-------	-----------

- Contractor's overheads @ 10% and profit @ 10%		= Rs.	5,690.00
---	--	-------	----------

Grand Total:		= Rs.	34,140.00
--------------	--	-------	-----------

Say		= Rs.	34,140.00
------------	--	-------	------------------

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
2.8	Wall Bracket fan 20" sweep make capacitor type,copper winding complete with all required accessories etc.				
MATERIAL				Unit = Each	
	- Wall Bracket fan 20" sweep make capacitor type,copper winding complete with all required accessories etc.	Each	1	11,440.00	11,440.00
				Sub total:	= Rs. 11,440.00
LABOUR					
	- Carriage to site and unloading etc.			= Rs.	200.00
	- Installation including end connections, sundries, testing and commissioning.			= Rs.	250.00
				Total:	= Rs. 11,890.00
	- Contractor's overheads @ 10% and profit @ 10%			= Rs.	2,378.00
				Grand Total:	= Rs. 14,268.00
				Say	= Rs. 14,268.00

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
3.1(a)	PVC pipe/conduit Class-B 100 mm dia with accessories suitable for laying multi-core cables.				
	MATERIAL			Unit = Rft.	
	PVC pipe/conduit Class-B 100 mm dia with accessories suitable for laying multi-core cables.	Rft.	1	625.40	625.4
				Sub total:	= Rs. 625.40
	LABOUR				
	Carriage to site and unloading etc.			= Rs.	45.00
	Installation including end connections, execution, sundries etc			= Rs.	70.00
				Total:	= Rs. 740.40
	- Contractor's overheads @ 10% and profit @ 10%			= Rs.	148.08
	- GST @ 18% on Material			= Rs.	112.57
				Grand Total:	= Rs. 1,001.05
				Say	= Rs. 1,001.00

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
3.1(b)	PVC pipe/conduit Class-D 100 mm dia with accessories suitable for laying multi-core cables.				
MATERIAL				Unit = Rft.	
	PVC pipe/conduit Class-D 100 mm dia with accessories suitable for laying multi-core cables.	Rft.	1	1,085.60	1,085.6
				Sub total:	= Rs. 1,085.60
LABOUR					
	- Carriage to site and unloading etc.			= Rs.	45.00
	- Installation including end connections, execution, sundries etc			= Rs.	70.00
				Total:	= Rs. 1,200.60
	- Contractor's overheads @ 10% and profit @ 10%			= Rs.	240.12
				Grand Total:	= Rs. 1,440.72
				Say	= Rs. 1,441.00

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

4.1(a) Perforated cable tray with cover (14 SWG & 16 SWG) G.I Sheet including installation accessories such as wall support bracket assembly, saddles or straps secured with brass or cadmium nuts, rawal plugs, bolts & washer, cable ladder for horizontal run of cable as and provided specification or as required.

MATERIAL

Unit = Rft.

- 150 mm x 75 mm	Rft.	1	926.09	926.09
- Installation accessories such as wall bracket, ceiling hanger, rawal plugs, bolts and grouting etc.	Lumsump		125.00	125.00
Sub Total:				1,051.09

LABOUR

- Carriage to site and unloading etc.			= Rs.	45.00
- Installation including end connections, sundries, testing and commissioning.			= Rs.	70.00
Total:				= Rs. 1,166.09
- Contractor's overheads @ 10% and profit @ 10%			= Rs.	233.22
Grand Total:				= Rs. 1,399.31

SAY = Rs.

1,399.00

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

5.1 DBs with all installation and operational accessories as per specification or as shown on the drawings.

MATERIAL

Unit = Each.

DB- Tubewell Room

- 1 No. 32 Amps (Adj.) MCCB TP, RC=25kA, Icu=100%Ics	Each	1	20,060	20,060.00
- 4 Nos. outgoing 20A, MCB, SP, RC=10 kA, Icu=100%Ics	No.	4	2,006	8,024.00
- 5 Nos. outgoing 10A, MCB, SP, RC=10 kA, Icu=100%Ics	No.	5	2,006	10,030.00
- 3 Nos. Spare 10/20A, MCB, SP, RC=10 kA, Icu=100%Ics	No.	3	2,006	6,018.00
Indication lights, push buttons, digital ammeter with selector switch, digital - voltmeter with selector switch, Panel box SWG 16 powder coated RAL colour 7032, IP class 44 and with all accessories.	Lumpsum		20,000.0	20,000.00

Sub total: = Rs. 64,132.00

LABOUR

- Carriage to site and unloading etc.			= Rs.	3000.00
- Installation including end connections, sundries, testing and commissioning.			= Rs.	5000.00

Total: = Rs. 72,132.00

- Contractor's overheads @ 10% and profit @ 10%			= Rs.	14,426.40
---	--	--	-------	-----------

Grand Total: = Rs. 86,558.40

Say = Rs. 86,558.00

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

6.1 LOW TENSION MAIN PANEL BOARD (MPB)

Main panel board designated as MPB with all installation and operational accessories as per site requirements, as per tender specifications and as directed by the Engineer. The MPB shall comprise the following:

INCOMING

			Unit = Number		
- 01 No.	200 Amps TP (Adj.) MCCB, RC= 36 kA, Icu=100%Ics	Each	1	68,440.0	68,440.00
- 01 No.	VSS (07 position)	Each	1	68,440.0	68,440.00
- 01 No.	0-600 Volts AC DIGITAL Voltmeter	Each	1	68,440.0	68,440.00
- 03 Nos.	200/5 Amps Current Transformers	No.	3	68,440.0	205,320.00
- 01 No.	ASS (R-Y-B-OFF)	No.	1	68,440.0	68,440.00
- 01 No.	0-200 Amps AC DIGITAL Ammeter	No.	1	68,440.0	68,440.00
- 06 Nos.	RYB and ON OFF TRIP LED indication lights	No.	6	68,440.0	410,640.00
-	14 SWG steel sheet Panel RAL 7032, IP= 54/44 and all other accessories,	Lumsump		35,000.0	35,000.00

OUTGOING

- 01 No.	160 Amp MCCB TP, (Adj.) RC=25KA , Icu=100%Ics (For Motor)	Each	1	34,220.0	34,220.00
- 01 No.	100 Amp MCCB TP, (Adj.) RC=25KA , Icu=100%Ics (For PFI)	Each	1	20,060.0	20,060.00
- 01 No.	32 Amp MCCB, TP, (Adj.) RC=25KA , Icu=100%Ics	Each	1	20,060.0	20,060.00
- 01 No.	25 Amp MCCB, TP, (Adj.) RC=25KA , Icu=100%Ics	Each	1	20,060.0	20,060.00
- 01 No.	Spare 160 Amp MCCB TP, (Adj.) RC=25KA , Icu=100%Ics	Each	1	34,220.0	34,220.00
- 01 No.	Spare 40 Amp MCCB TP, (Adj.) RC=25 kA, Icu=100%Ics	Each	1	20,060.0	20,060.00
- 01 No.	Space 160 Amp MCCB TP				
- 01 No.	Panel light with limit switch	Each	1	2,773.0	2,773.00
- 02 Nos.	Exhaust fan 6" (copper) & Louver 8" sweep with thermosttae relay and all accessories etc.	Each	2	2,950.0	5,900.00
-	Electrolytic copper bus bar with electrical grade PVC mountings 3 for each, nuts, bolts and washers, control MCB etc. (400 Amps. R+Y+B N, 50 Hz, 415 V, AC)	Lumsump		35,000.0	35,000.00
-	All other accessories required for completion of the qulaity works	Lumsump		30,000.0	30,000.00

Contractor shall submit the genuine certificate from the manufacturer/authorized agent clear by indicating the project name make/model/rating of MCCB, MCB, magnetic contactors, terminal blocks and voltmeters/ ammeter alongwith warranties.

LABOUR

- Carriage to site and unloading etc.	= Rs.	12,500.00
- Installation including Glands, Lugs, end connections, sundries, testing and commissioning	= Rs.	17,500.00
Total:	= Rs.	1,245,513.00
- Contractor's overheads @ 10% and profit @ 10%	= Rs.	249,102.60
Grand Total:	= Rs.	1,494,615.60

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

Say = Rs. 1,494,616.00

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

8.1 14 SWG steel sheet clad power factor improvement panel (PFI) including Cu busbar, heavy duty incoming and outgoing circuit breaker to capacitor, magnetic contactors, continuous digital p.f controller, on & off pushbuttons etc. complete with all components/accessories as per specifications and drawings.

MATERIAL

Unit = Number

PFI - 40 kVAR

06 steps with continuous digital power factor and capacitor controller with all accessories etc.

	No.	1	80,240	80,240.00
- 01 No. Neutral/OFF/Auto selector switch	No.	1	2,950	2,950.00
04 Nos. 10 kVAR capacitor	No.	4	19,470	77,880.00
- 04 Nos. 53A Magnetic contactor (AC-3)	No.	4	28,320	113,280.00
- 04 Nos. 32A MCCB, TP (Adj.) RC= 25 kA Circuit breaker	No.	4	20,060	80,240.00
- 08 Nos. Indication light - (for magnetic contactor and phase)	No.	8	1,298	10,384.00
- 08 Nos. Push Buttons (ON/OFF)	No.	8	1,534	12,272.00
- 05 Nos. Auxiliary contractor (NO/NC)	No.	5	1,416	7,080.00
- 01 No. Panel light with limit switch	No.	1	2,773	2,773.00
02 No. Exhaust fan 6" & Louver 8" sweep with thermostae relay and all accessories etc.	No.	2	2,950	5,900.00
- 14 SWG steel sheet Panel RAL 7032, IP= 54/44 and all other accessories, Electrolytic copper bus bar with electrical grade PVC mountings 3 for each, nuts, bolts and washers, control MCB etc. (400 Amps. R+Y+B N, 50 Hz, 415 V, AC)	Lumsump		35,000	35,000.00
- All other accessories required for completion of the qulaity works	Lumsump		35,000	35,000.00
Contractor shall submit the genuine certificate from the manufacturer/authorized agent clear by indicating the project name make/model/rating of MCCB, MCB, magnetic contactors, terminal blocks and voltmeters/ ammeter alongwith warranties.	Lumsump		30,000	30,000.00

Total: = Rs. 492,999.00

LABOUR

- Carriage to site and unloading etc.	= Rs.	12,500.00
- Installation including Glands, Lugs, end connections, sundries, testing and commissioning	= Rs.	17,500.00

Total: = Rs. 522,999.00

- Contractor's overheads @ 10% and profit @ 10%	= Rs.	104,599.80
---	-------	------------

Grand Total: = Rs. 627,598.80

Note:-

Say = Rs. 627,599.00

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
9.1	Earth point comprising of 10 ft. 5/8" dia. (16 mm dia) copper coated M.S. rods driven in ground near each lighting control panel. The earthing rods shall be completed with fixing clamps etc.				
MATERIAL				Unit = Number	
	Earth point comprising of 10 ft. 5/8" dia. (16 mm dia) copper coated M.S. rods driven in ground	No.	1	16,409	16,409.08
	- Civil work of earth point and R.C.C. cover.	No.	1	2,500	2,500.00
Sub Total:					18,909.08
LABOUR					
	- Carriage to site and installation			= Rs.	2,500.00
Total:					= Rs. 21,409.08
	- Contractor's overheads @ 10% and profit @ 10%			= Rs.	4,281.82
Grand Total:					= Rs. 25,690.90
Say					= Rs. 25,691.00

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

9.2 Bore type, earthing up to permanent water level/moist soil by arrangement of earth pit/point comprising of concrete/brickwork housing with lifting cover 50mm perforated GI pipe, appropriate bare copper stranded conductor as per details in drawing. The earthing and bonding shall be complete with fixing clamps etc. & all metal works shall be bonded to the proposed earthing network.

Unit = Number

MATERIAL

<p>- Drilling of earth bore 3" dia 100 ft. deep or up to permanent water level.</p>	No.	3	9,440	28,320.0
<p>Supply and installation of G.I pipe 2" dia 14 SWG to be installed in pre-made bore including all accessories like tees, bends, sockets etc. Pipe shall be connected to tinned copper spike as per detail shown on drawing, complete in all respects.</p>	Rft.	80	236	18,880.0
<p>Supply and installation of tinned copper spike to be manufactured as per detail shown on drawing. Spike shall be connected/screwed at bottom of G.I pipe including all accessories like nuts and bolts complete in all respect.</p>	No.	1	8,850	8,850.0
<p>Supply and installation of 70 mm² bare stranded electrolytic copper conductor lead in pre-laid G.I pipe and connected to tinned copper spike as shown on drawing. 2 Nos. of leads to be installed including all accessories like brass nuts, bolts, washers etc complete in all respect.</p>	Rft.	180	413	74,340.0
<p>Supply and installation of tinned earth test link in earthing pit consisting of copper plate (12"x2"x1/2") with fixing arrangement on the wall of man hole including brass nuts, bolts washers lugs etc. complete in all respect.</p>	No.	1	2,950	2,950.0
<p>Construction of earthing pit (manhole) of internal size 18"x18"x24" deep with 9" thick brick wall with cement mortar, internal plaster 1:4, RCC 4" thick cover with lifting hooks including all accessories complete in all respect.</p>	No.	1	5,900	5,900.0
<p>- Testing and commissioning of the earthing system alongwith all testing accessories complete in all respect.</p>	Lumsump	1	4,000	4,000.0
	Sub total:		= Rs.	143,240.0

LABOUR

<p>- Carriage to site and unloading etc.</p>			= Rs.	5,000.0
<p>Installation including Glands, Lugs, end connections, sundries, testing and commissioning</p>			= Rs.	10,000.0
	Total:		= Rs.	158,240.0
<p>- Contractor's overheads @ 10% and profit @ 10%</p>			= Rs.	31,648.0
	Grand Total:		= Rs.	189,888.0

Say **189,888.0**

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE - II

TUBEWELL - MC KAMOKE

UNIT RATE ANALYSIS FOR ELECTRIFICATION WORKS

Sr./No.	Description	Unit	Qty.	Unit Price Rs.	Total Rs.
---------	-------------	------	------	-------------------	--------------

10.1(a) #REF!

MATERIAL

Unit = Number

- Supply of 100 kVA Pole Mounted Transformer	Job	1	1,602,650	1,602,650.00
11kV HT/LT Steel Poles, HT/LT Conductor, platform, Civil Works, allied				
- hardware complete with all respects. etc., as required for proper completion of job as per WAPDA/DISCO standards.	Job	1	350,000	350,000.00

Sub total:	= Rs.	1,952,650.00
------------	-------	--------------

LABOUR

- Carriage to site, transportation and unloading etc.	= Rs.	35,000.00
- Installation including connections, sundries, testing and commissioning.	= Rs.	25,000.00

Total:	= Rs.	2,012,650.00
--------	-------	--------------

- Contractor's overheads @ 10% and profit @ 10%	= Rs.	402,530.00
---	-------	------------

Grand Total:	= Rs.	2,415,180.00
--------------	-------	--------------

Say	= Rs.	2,415,180.00
------------	-------	---------------------

Note:-

- The cost of materials are inclusive of General Sales Tax (G.S.T)
- The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.

QOUTATIONS

National Engineering Services
Pakistan (Pvt.) Limited

Ref: ECS/NESPAK/202203d24

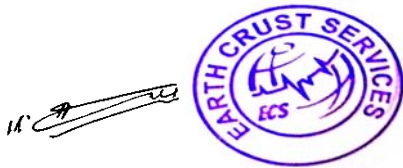
QUOTATION

Borehole Geophysical Logging

Sr. #	Description	Qty	Rs.	
			Rate	Amount
1	<ul style="list-style-type: none"> • Geophysical Logging of borehole for the identification of lithology , general quality of formation fluid & selection of suitable depths for the placement of screen lengths by using OYO 3400 Geologger JAPAN. • Interpretation, Compilation & submission of Logging report. • Mob & Demob of equipment and field crew from Lahore to site and back 	1 No.	50,000/-	50,000/-
		Total		50,000.00
		Rupees: Fifty Thousand Only		

TERMS AND CONDITIONS:

- 1- 50% payment will be made after completion of field work.
- 2- 50% on Submission of report.
- 3- The rates are exclusive of all taxes(e.g. Income Tax, GST) and will be paid by the client itself against the credit of ECS.



Muhammad Haroon
Geoscientist

Quotation
Vertical Line Shaft Turbine Pump
DWT

NESPAK
Model Town Extension
Lahore

Kind Attn:- Mr. Syed Usman

Your Ref. No.	<u>Telecome</u>	Date	27-02-23	OUR REF:	LEA 15816 REV-1
No. of Pumps	<u>1</u>	Pump Size	B12B /4 stages	DATE:	27-02-23

Operating Conditions Detail Design of Infrastructure Sub Project Sectorial Planning and Resident Supervision Package-II (Hafizabad, Kamoke and Muridke)
Medium (H2O) Clean, clear water free from sand & chemicals

Capacity	2.00 CUSEC	Max. O.D of bowl	11.5 inches
Pump total head	175 Ft	I.D tube well	14 inches min.
Speed	1450 rpm	Length of suction pipe	
Efficiency	81%	Length of bowl assembly	
Bowl Input	49.08 HP	Length of column pipe	100 Ft
Line Shaft loss	1.10 HP	Length of top Pipe	1 Ft
Pump Input	50.18 HP	Total Length of Column	101 Ft
Prime Mover (SEM/DE)	60 HP	Total Length of Pump	

Material Specifications

Pump Assembly

Bowls	Cast Iron
Impellers	Bronze
Wearing Ring	Cast Iron
Shaft	Stainless Steel
Shaft Sleeves	Bronze
Bearings	Bronze

Column pipe assembly

Column pipe	M. Steel
Shaft	Carbon Steel
Shaft Sleeves	S.S
Shaft couplings	Steel
Bearings	Rubber Lined
Bearing retainer (Ready Cast)	Cast Iron
Column Pipe Coupling	Flanged
Top Shaft	Stainless Steel

Component parts of each pumping unit

Pump assembly of	4	stages with mixed flow type impeller			
Column assembly of	8	inches I.D. with flanged joints	each 10 ft length	10	sets
			each 5 ft length		sets
			each 2 m length		sets
			and one top set	1	feet length
			shaft dia	30	mm
Discharge head with	8	inches discharge branch, type	VN-2030	flange BSS with	Prelubrication tank
Vertical Solid shaft electrical motor, totally enclosed fan cooled, tropically insulated, 3 phase, 50 cycles, 400 ± 5% volts, with non-reverse ratchet, make KSB / Siemens/ ABB, insulation class F and temperature rise 80°C above 40°C ambient temperature.					60 HP/ 1450 rpm

Price of pumping unit as specified above

ACCESSORIES

- (1) Motor Control Unit 60HP (Standard) ASD
- (2) Mounting Clamps 8 inches column 4 Halves
- (3) 01 No. Each Cast Iron Sluice Valve & NRV 8 inches
- (4) Mechanical Installation with in pump house without civil works.

Price Basis: Ex Site Unit Price Inc. 18% GST Rs.

Delivery Period: 14-16 weeks

Pymtent: 50 % Advance, Balance before delivery

Validity: 30days

Included
included
included
included
Included

6,796,000

for KSB PUMPS COMPANY LTD

Disclaimer:

Working out the prices of above mentioned engineered products should be acknowledged as KSB's prerogative. This quotation will have no bearing on previously quoted prices anywhere or on prices to be quoted in future to any prospective client. After expiry of quotation's validity, KSB reserves the right to change prices as a result of market forces / manufacturing variables
Procuring Agency is requested to comply with all PPRA rules as it is its responsibility



B.H. INDUSTRIES

Mushtaq Plaza, 5-Chenab Market, Madina Town, Faisalabad.

Tel: 041-8554460, 61, 62, 63, E-mail: sales@bhi.com.pk

National Tax Number: 3206366-7



To: **NESPAK**

Lahore.

E-mail: mlktrq@yahoo.com

Quotation / Order

No.: bhi-2301120

Date: 12.01.2023

Customer Ref.: E-mail

Dated: 11.01.2023

GST #.:

Attn: Malik Tariq Mahmood
0332-4507327

Hypo Dosing Pump Manual

Dear Sir,

Thank you for your interest in our products and the enquiry. We are pleased to submit our quotation as under:

S. No.	Description	Model/Size	Qty.	Unit	Rate	Amount (PKR)
1	Hypo Dosing Pump Manual Max. injection capacity: 8-lit/hr. Max. pressure: 10-bar Made in Europe. with Local 80-liter dosing tank.		10	Sets	105,000 \$ 465	1,050,000 4,650
Total Ex-works Fsd.:						

PAYMENT: 100% advance with order. Price is subject to change with the increase of forex rate.

DELIVERY: 30~45 days after advance.

VALIDITY: Quote is valid for 3 working days.

Direct contact for this project:

TAXES: All taxes to buyer's account in addition to offer price.

Ateeq Herl: 0301-8554460

TRANSPORTATION: To be paid at actual by client directly to the transporter upon delivery.

for B.H. INDUSTRIES

info@bhi.com.pk , www.bhi.com.pk

Customer's Sign/stamp

required as order confirmation

TEEPU ENGINEERING COMPANY
TEEPU CAST IRON & DUCTILE CAST IRON PRODUCTS
PIPE & FITTINGS | COVERS & GRATING | VALVES & PENSTOCKS
TEEPU PIPE & FITTINGS



TEEPU DUCTILE IRON
UNIVERSAL FLANGE JOINT | MECHANICAL FLANGE JOINTS
VK FLANGE JOINT | FLANGE ADAPTOR

Price List
Effective from 01.01.2023

Sr.#	Size	Unit	Unit Price
01	2" diameter	Set	8625
02	3" diameter	Set	10125
03	4" diameter	Set	11625
05	6" diameter	Set	14625
06	8" diameter	Set	17625
07	10" diameter	Set	25125
08	12" diameter	Set	32625
09	15" diameter	Set	44625
10	18" diameter	Set	64125
11	21" diameter	Set	86625
12	24" diameter	Set	116625

- **Price included rubber gasket & nut bolts.**

Specification:

In accordance with British Standard 2035 / BS: 4772 / EN: 545 / EN: 598

Flanges in accordance with BS: 10 Table D / Table E

Pressure rating Class: PN10 / PN16

GENERAL TERM & CONDITIONS:

- Prices are ex-factory, Faisalabad.
- Prices are exclusive of any tax.
- Validity of price is 3-months.
- Prevailing foreign currency rate.
- Prevailing government taxes & duties.
- Current raw material prices.
- Force majeure clause.

PAYMENT: Prices are subject to advance payment and make-to-order basis.

Cell: 0300-8411966 | Email: teepupipe@hotmail.com | <https://www.teepuengineering.com>

RAHMAN ENGINEERING WORKS

**SPECIALIST: WATER & WASTE WATER ACCESSORIES
CASTING, MANUFACTURING, MACHINING, FABRICATION, IMPORTER &
JOINTING/FITTING/INSTALLING**

REF # REW/NESPAK/031-A.

DATE: 05-09-2022.

TO: M/S NESPAK

PROJECT : DEVELOPMENT OF QUAID-E-AZAM BUSINESS PARK, SHEIKHUPURA.

ATTN: MALIK TARIQ SB

QUOTATION HDPE COMPRESSION FITTING

SR No.	DISCRIPTION	SIZE (mm) OD	UNIT	Rate/Each
1	P.E HOUSE CONNECTION (INCLUDING PP SADDLE CLAMP,PP TAPPING FRRULE,MTF/FTA & END CAP)	25 X 90	SET	970/-
2	----- DO ----- -----	25 X 110	SET	1,150/-
3	----- DO ----- -----	25 X 160	SET	1,750/-
4	----- DO ----- -----	25 X 200	SET	3,700/-
5	----- DO ----- -----	25 X 250	SET	6,500/-
6	----- DO ----- -----	25 X 315	SET	8,900/-
7	----- DO ----- -----	50 X 90	SET	1,900/-
8	----- DO ----- -----	50 X 110	SET	2,100/-
9	----- DO ----- -----	50 X 160	SET	2,700/-
10	----- DO ----- -----	50 X 200	SET	4,700/-

**RAHMAN ENGINEERING WORKS: RAHMAN PLAZA , RING ROAD, LAHORE
Ph# +92-321-9790007, +92-333-4322515**

RAHMAN ENGINEERING WORKS

**SPECIALIST: WATER & WASTE WATER ACCESSORIES
CASTING, MANUFACTURING, MACHINING, FABRICATION, IMPORTER &
JOINTING/FITTING/INSTALLING**

11	----- DO ----- -----	50 X 250	SET	7,600/-
12	----- DO ----- -----	50 X 315	SET	9,900/-

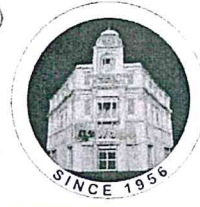
RATES ARE EXCLUDING ALL TAXES AND DUTIES

RATES ARE INCLUDING TRANSPORT CHARGES AT SHEIKHUPURA.

RATES ARE VALID FOR 65 DAYS

THANKING YOU,
YOUR'S TRULY,

MUHAMMAD MUZAMMIL RAHMAN CHAUDHARY
DIRECTOR



Customer : **NESPAK** 13167
 Address : Lahore.
 Attention :
 Payment Term: 50% Advance Bal Before Delivery

Document Date : 06-JAN-23
 Document No : 2301-01B-QTN-0143-NCPL
 Customer Inquiry : 116/06/46223-1
 Project : NIL
 Revised Version : 2 17-FEB-23

Dear Sir / Madam,

We thank you for your inquiry. Please find below our offer along with terms and conditions.

Sr. #	Item Description	UOM	Quantity	Rate	Amount (Rs)
1	1 x 1.5mm sq Cu.PVC/PVC Std. 300/500 V	Mtr	1	69.86	69.86
2	2 x 1.5mm sq Cu.PVC/PVC Flat Std. 600/1000 V	Mtr	1	159.67	159.67
3	3 x 1.5mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	242.28	242.28
4	1 x 2.5mm sq Cu.PVC/PVC Std. 300/500 V	Mtr	1	107.23	107.23
5	2 x 2.5mm sq Cu.PVC/PVC Flat Std. 600/1000 V	Mtr	1	233.58	233.58
6	3 x 2.5mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	356.54	356.54
7	1 x 4mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	167.81	167.81
8	1 x 6mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	243.59	243.59
9	1 x 10mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	410.96	410.96
10	1 x 16mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	638.49	638.49
11	1 x 25mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	990.74	990.74
12	1 x 35mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	1,345.04	1,345.04
13	1 x 50mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	1,825.56	1,825.56
14	1 x 70mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	2,613.71	2,613.71
15	1 x 95mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	3,615.79	3,615.79
16	1 x 120mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	4,545.88	4,545.88
17	1 x 150mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	5,581.88	5,581.88
18	1 x 185mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	6,993.41	6,993.41
19	1 x 240mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	9,174.67	9,174.67
20	1 x 300mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	11,496.44	11,496.44
21	1 x 400mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	14,676.93	14,676.93
22	1 x 630mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	23,799.69	23,799.69
23	2 x 4mm sq Cu.PVC/PVC Flat Std. 600/1000 V	Mtr	1	360.85	360.85
24	2 x 6mm sq Cu.PVC/PVC Flat Std. 600/1000 V	Mtr	1	515.05	515.05
25	2 x 10mm sq Cu.PVC/PVC Flat Std. 600/1000 V	Mtr	1	828.78	828.78
26	2 x 16mm sq Cu.PVC/PVC Flat Std. 600/1000 V	Mtr	1	1,286.48	1,286.48
27	2 x 25mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	2,020.73	2,020.73
28	2 x 35mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	2,763.46	2,763.46
29	2 x 50mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	3,725.06	3,725.06
30	2 x 70mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	5,336.25	5,336.25



NEWAGE CABLES PRIVATE LIMITED

Head Office: Newage House 33K
 Gulberg-II Lahore- 54660
 Pakistan

UAN: +92-42111-777-300
 Tel No: +92-42-35778742-51
 Fax: +92-42-35778740-41

Email: info@newagecables.com
 Web: www.newagecables.com



This is a computer generated document no signature required.



Customer : NESPAK	13167	Document Date : 06-JAN-23
Address : Lahore.		Document No : 2301-01B-QTN-0143-NCPL
Attention :		Customer Inquiry : 116/06/46223-1
Payment Term: 50% Advance Bal Before Delivery		Project : NIL
		Revised Version : 2 17-FEB-23

Sr. #	Item Description	UOM	Quantity	Rate	Amount (Rs)
31	4 x 16mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	2,588.83	2,588.83
32	4 x 10mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	1,678.36	1,678.36
33	4 x 16mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	2,588.83	2,588.83
34	4 x 25mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	3,996.77	3,996.77
35	4 x 35mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	5,479.84	5,479.84
36	4 x 50mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	7,403.56	7,403.56
37	4 x 70mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	10,619.72	10,619.72
38	4 x 95mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	14,703.31	14,703.31
39	4 x 120mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	18,501.74	18,501.74
40	4 x 150mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	22,730.38	22,730.38
41	4 x 185mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	28,468.99	28,468.99
42	4 x 240mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	37,356.48	37,356.48
43	4 x 300mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	46,842.31	46,842.31
44	4 x 400mm sq Cu.PVC/PVC Std. 600/1000 V	Mtr	1	59,822.80	59,822.80
45	1 x 4mm sq Cu.PVC Std. 450/750 V	Mtr	1	183.15	183.15
46	1 x 6mm sq Cu.PVC Std. 450/750 V	Mtr	1	268.71	268.71
47	1 x 10mm sq Cu.PVC Std. 450/750 V	Mtr	1	466.52	466.52
48	1 x 16mm sq Cu.PVC Std. 450/750 V	Mtr	1	710.87	710.87
49	1 x 25mm sq Cu.PVC Std. 450/750 V	Mtr	1	952.97	952.97
50	1 x 35mm sq Cu.PVC Std. 450/750 V	Mtr	1	1,313.64	1,313.64
51	1 x 50mm sq Cu.PVC Std. 450/750 V	Mtr	1	1,778.28	1,778.28
52	1 x 70mm sq Cu.PVC Std. 450/750 V	Mtr	1	2,559.91	2,559.91
53	1 x 95mm sq Cu.PVC Std. 450/750 V	Mtr	1	3,548.85	3,548.85
54	1 x 150mm sq Cu.PVC Std. 450/750 V	Mtr	1	5,495.43	5,495.43
55	1 x 185mm sq Cu.PVC Std. 450/750 V	Mtr	1	6,891.04	6,891.04
56	1 x 240mm sq Cu.PVC Std. 450/750 V	Mtr	1	9,051.83	9,051.83
57	1 x 300mm sq Cu.PVC Std. 450/750 V	Mtr	1	11,352.41	11,352.41
58	1 x 400mm sq Cu.PVC Std. 450/750 V	Mtr	1	14,507.51	14,507.51
59	1 x 500mm sq Cu.PVC Std. 450/750 V	Mtr	1	18,280.01	18,280.01
60	1 x 630mm sq Cu.PVC Std. 450/750 V	Mtr	1	23,568.96	23,568.96



NEWAGE CABLES PRIVATE LIMITED

Head Office: Newage House 33K
Gulberg-II Lahore- 54660
Pakistan

UAN: +92-42111-777-300
Tel No: +92-42-35778742-51
Fax: +92-42-35778740-41

Email: info@newagecables.com
Web: www.newagecables.com



This is a computer generated document no signature required.



Customer : NESPAK	13167	Document Date : 06-JAN-23
Address : Lahore.		Document No : 2301-01B-QTN-0143-NCPL
Attention :		Customer Inquiry : 116/06/46223-1
Payment Term: 50% Advance Bal Before Delivery		Project : NIL
		Revised Version : 2 17-FEB-23

Sr. #	Item Description	UOM	Quantity	Rate	Amount (Rs)
61	1 x 500mm sq Al.XLPE/PVC/AWA/PVC Std. 8.7/15 KV (17.5) (W)	Mtr	1	7,103.56	7,103.56
62	1 x 240mm sq Al.XLPE/PVC/AWA/PVC Std. 8.7/15 KV (17.5) (W)	Mtr	1	4,593.56	4,593.56
63	1 x 120mm sq Al.XLPE/PVC/AWA/PVC Std. 8.7/15 KV (17.5) (W)	Mtr	1	3,141.47	3,141.47
64	3 x 240mm sq Al.XLPE/PVC/SWA/PVC Std. 8.7/15 KV (17.5) (W)	Mtr	1	12,714.41	12,714.41
65	3 x 120mm sq Al.XLPE/PVC/SWA/PVC Std. 8.7/15 KV (17.5) (W)	Mtr	1	8,651.16	8,651.16
66	1 x 500mm sq Cu.XLPE/PVC/AWA/PVC Std. 8.7/15 KV (17.5)	Mtr	1	22,794.52	22,794.52
67	1 x 240mm sq Cu.XLPE/PVC/AWA/PVC Std. 8.7/15 KV (17.5)	Mtr	1	11,937.56	11,937.56
68	1 x 120mm sq Cu.XLPE/PVC/AWA/PVC Std. 8.7/15 KV (17.5)	Mtr	1	6,577.40	6,577.40
69	3 x 240mm sq Cu.XLPE/PVC/SWA/PVC Std. 8.7/15 KV (17.5)	Mtr	1	37,525.80	37,525.80
70	3 x 120mm sq Cu.XLPE/PVC/SWA/PVC Std. 8.7/15 KV (17.5)	Mtr	1	20,867.37	20,867.37

Amount Exclusive Of Sale Tax :	605,745.184
Sale Tax Amount @ 18 :	109,034.133
Futher Tax @ 0 :	.000
Delivery Charges :	
Inspection Amount :	.000
Amount Inclusive Of Tax :	714,779.317

Terms and Conditions:

Specifications	IEC-60502-1, 60502-2/ WAPDA/ BS- 6360, 6004, 6346
Validity	This offer is valid for 5 days thereafter subject to our confirmation.
Delivery Period	Depend upon quantity (Qty.less than 200 meter is not feasible to manufacture and will be offered from stock if available at the time of order or an alternative option will be provided).
Packing:	Lagged wooden drums on returnable basis
Prices:	Ex-works and exclusive of unloading charges
Tax	If during execution of the contract any changes in legislative, statutory, budgetary or SRO's, either by FBR or Government Authorities effect the prices of cables, prices are subject to adjustment and revision by the company.
Force Majeure:	Newage Cables shall not be liable for any delivery delay due to the occurrence and/or impact(s) of force majeure event(s) such as fire, flood, earthquake, strike, lockdown, civil unrest and other circumstances beyond its control.
Tolerance:	Packing Length ±5% per individual drum length and on total quantity. the actual Length will be invoiced.
Financial Charges:	After Completion of cable, if client fails to lift cable within 2 weeks, financial charges @ 0.5% per week will be charged from client

Note :



NEWAGE CABLES PRIVATE LIMITED

Head Office: Newage House 33K
Gulberg-II Lahore- 54660
Pakistan

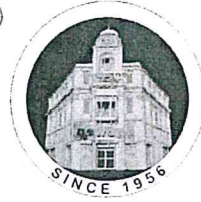
UAN: +92-42111-777-300
Tel No: +92-42-35778742-51
Fax: +92-42-35778740-41

Email: info@newagecables.com
Web: www.newagecables.com



This is a computer generated document no signature required.

newage[®] CABLES



Sale Quotatio

Customer Copy

STRN: 0308854400219

NTN: 07862377

Page 4 / 4

Customer : NESPAK	13167	Document Date : 06-JAN-23
Address : Lahore.		Document No : 2301-01B-QTN-0143-NCPL
Attention :		Customer Inquiry : 116/06/46223-1
Payment Term: 50% Advance Bal Before Delivery		Project : NIL
		Revised Version : 2 17-FEB-23

Sr. #	Item Description	UOM	Quantity	Rate	Amount (Rs)
3% further tax will be paid by you in case you do not posses a sales tax registration number or Non-Active. We are exempted form deduction of income tax (withholding tax). Certification will be provided with the invoice. Please do not deduct.					

Thank you for selecting Newage Cables. Please do not hesitate to contact us if further assistance required.

Yours Sincerely:

Shahid Mobeen
GM Sales & Marketing
923008856729



NEWAGE CABLES PRIVATE LIMITED

Head Office: Newage House 33K
Gulberg-II Lahore- 54660
Pakistan

UAN: +92-42111-777-300
Tel No: +92-42-35778742-51
Fax: +92-42-35778740-41

Email: info@newagecables.com
Web: www.newagecables.com

This is a computer generated document no signature required.





CABLES

Fast Cables Limited



LIGHTS

(* Fast Lights is a Product of Fast Cables Limited)

Quotation

Attention : Mr. Irfan Ullah Khan	Date : 28-FEB-23
Customer : NESPAK	Ref No : 2302-01B-QTN-1216
Address : 17-C-1 CIVIC CENTER FAISAL TOWN LAHORE	Customer inquiry :
Contact : 03345475607	Project : Budgeting
Fax # :	City : Lahore
Email :	

Dear Sir,

Thank you for your inquiry. Please find below detail of our offer:

Ref.#	Sr.#	Item Description	UoM	Qty.	Rate	Amount
01	1	1.5MM SQ S/C CU/PVC/INS STRANDED (7 - STAND) 450/750V (BLACK)	MTR	1.00	91.00	91.00
02	2	1.5MM SQ 2/C CU/PVC/PVC STRANDED FLAT 600/1000 V (	MTR	1.00	261.00	261.00
03	3	1.5MM SQ 3/C CU/PVC/PVC STAND 600/1000 V (BLACK)	MTR	1.00	371.00	371.00
04	4	2.5MM SQ S/C CU/PVC/INS STRANDED(7-STD) 450/750V (BLACK)	MTR	1.00	148.00	148.00
05	5	2.5 MM SQ 2/C CU/PVC/PVC (7-STD) FLAT 600/1000V (B	MTR	1.00	374.00	374.00
06	6	2.5MM SQ 3/C CU/PVC/PVC STAND 600/1000 V (BLACK)	MTR	1.00	537.00	537.00
07	7	4.0MM SQ S/C CU/PVC/INS 450/750 V (BLACK)	COIL	1.00	19,703.00	19,703.00
08	8	10MM SQ S/C CU/PVC/INS 450/750 V (BLACK)	COIL	1.00	48,597.00	48,597.00
09	9	16MM SQ S/C CU/PVC/INS 450/750 V (BLACK)	MTR	1.00	836.00	836.00
10	10	25MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	1,222.00	1,222.00
11	11	35MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	1,661.00	1,661.00
12	12	50MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	2,240.00	2,240.00
13	13	70MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	3,206.00	3,206.00
14	14	95MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	4,422.00	4,422.00
15	15	120MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	5,578.00	5,578.00
16	16	150MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	7,030.00	7,030.00
17	17	185MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	8,569.00	8,569.00
18	18	240MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	11,262.00	11,262.00
19	19	300MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	14,303.00	14,303.00
20	20	400MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	18,383.00	18,383.00
21	21	630MM SQ S/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	29,784.00	29,784.00
22	22	4.0MM SQ 2/C CU/PVC/PVC FLAT 600/1000 V (BLACK)	MTR	1.00	543.42	543.42
23	23	6.0MM SQ 2/C CU/PVC/PVC FLAT 600/1000 V (BLACK)	MTR	1.00	768.00	768.00
24	24	10MM SQ 2/C CU/PVC/PVC FLAT 600/1000 V (BLACK)	MTR	1.00	1,230.00	1,230.00
25	25	16MM SQ 2/C CU/PVC/PVC FLAT 600/1000 V (BLACK)	MTR	1.00	1,894.00	1,894.00
26	26	35 MM SQ 2/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	3,354.00	3,354.00
27	27	50MM SQ 2/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	4,556.00	4,556.00
28	28	70MM SQ 2/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	6,518.00	6,518.00



Head Office: 192-Y Block, Commercial Area, DHA, Lahore

Regional Offices: Lahore, Karachi, Islamabad, Multan, Sialkot, Peshawar, Faisalabad, Gujranwala, Hyderabad, Quetta



Fast Cables Limited



LIGHTS

(* Fast Lights is a Product of Fast Cables Limited)

Ref. # CABLES

Ref. #	Sr. #	Item Description	UoM	Qty.	Rate	Amount
29	29	6.0MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	1,472.00	1,472.00
30	30	10MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	2,390.00	2,390.00
31	31	16MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	3,156.00	3,156.00
32	32	25MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	4,877.00	4,877.00
33	33	35MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	6,708.00	6,708.00
34	34	50MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	9,112.00	9,112.00
35	35	95MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	18,092.00	18,092.00
36	36	120MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	22,842.00	22,842.00
37	37	150MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	28,029.00	28,029.00
38	38	185MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	35,130.00	35,130.00
39	39	240MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	45,901.00	45,901.00
40	40	300MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	58,088.00	58,088.00
41	41	400MM SQ 4/C CU/PVC/PVC 600/1000 V (BLACK)	MTR	1.00	72,932.00	72,932.00
42	42	4.0MM SQ S/C CU/PVC/INS 450/750 V (GREEN)	COIL	1.00	19,703.00	19,703.00
43	43	6.0MM SQ S/C CU/PVC/INS 450/750 V (GREEN)	COIL	1.00	29,206.00	29,206.00
44	44	10MM SQ S/C CU/PVC/INS 450/750 V (GREEN)	COIL	1.00	48,597.00	48,597.00
45	45	16MM SQ S/C CU/PVC/INS 450/750 V (GREEN-YELLOW)	MTR	1.00	836.00	836.00
46	46	25MM SQ S/C CU/PVC/INS 450/750 V (GREEN-YELLOW)	MTR	1.00	1,166.00	1,166.00
47	47	35MM SQ S/C CU/PVC/INS 450/750 V (GREEN-YELLOW)	MTR	1.00	1,611.00	1,611.00
48	48	50MM SQ S/C CU/PVC/INS 450/750V (GREEN-YELLOW)	MTR	1.00	2,181.00	2,181.00
49	49	70MM SQ S/C CU/PVC/INS 450/750 V (GREEN-YELLOW)	MTR	1.00	3,144.00	3,144.00
50	50	95MM SQ S/C CU/PVC/INS 450/750 V (GREEN/YELLOW)	MTR	1.00	4,339.00	4,339.00
51	51	150MM SQ S/C CU/PVC/INS 450/750 V (YELLOW/GREEN)	MTR	1.00	6,909.00	6,909.00
52	52	185 MM SQ S/C CU/PVC/INS 450/750 V (YELLOW-GREEN)	MTR	1.00	8,436.00	8,436.00
53	53	240MM SQ S/C CU/PVC/IN 450/750 V (GREEN/YELLOW)	MTR	1.00	11,120.00	11,120.00
54	54	1 X 500MM SQ AL/XLPE/PVC/AWA/PVC 8.7/15KV (17.5) (BLACK) (W)	MTR	1.00	10,771.00	10,771.00
55	55	1 X 240MM SQ AL/XLPE/PVC/AWA/PVC 8.7/15KV (17.5) BLACK (W)	MTR	1.00	6,938.00	6,938.00
56	56	1 X 120MM SQ AL/XLPE/PVC/AWA/PVC 8.7/15KV (17.5) (BLACK) (W)	MTR	1.00	4,732.00	4,732.00



Head Office: 192-Y Block, Commercial Area, DHA, Lahore

Regional Offices: Lahore, Karachi, Islamabad, Multan, Sialkot, Peshawar, Faisalabad, Gujranwala, Hyderabad, Quetta



CABLES

Fast Cables Limited



LIGHTS

(* Fast Lights is a Product of Fast Cables Limited)

Ref. #	Sr. #	Item Description	UoM	Qty .	Rate	Amount
57	57	3 X 240MM SQ AL/XLPE/PVC/SWA/PVC 8.7/15KV (17.5) (BLACK) (W)	MTR	1.00	18,333.00	18,333.00
58	58	3 x 120MM SQ AL/XLPE/PVC/SWA/PVC 8.7/15KV (17.5) BLACK (W)	MTR	1.00	12,276.00	12,276.00
59	59	1 X 500MM SQ CU/XLPE/PVC/AWA/PVC 8.7/15KV (17.5) BLACK (W)	MTR	1.00	30,534.00	30,534.00
60	60	1 X 240MM SQ CU/XLPE/PVC/AWA/PVC 8.7/15KV (17.5) B	MTR	1.00	16,238.00	16,238.00
61	61	1 X 120MM SQ CU/XLPE/PVC/AWA/PVC 8.7/15KV (17.5) BLACK (W)	MTR	1.00	8,944.00	8,944.00
62	62	3 X 240MM SQ CU/XLPE/PVC/SWA/PVC 8.7/15KV (17.5) BLACK (W)	MTR	1.00	48,293.00	48,293.00
63	63	3 X 120MM SQ CU/XLPE/PVC/SWA/PVC 8.7/15KV (17.5) BLACK (W)	MTR	1.00	26,284.00	26,284.00
Total:				63.00		826,761.42

Terms and Conditions:

- Quality & Standard:** All Cables are being manufactured as per relevant British Standard Specification (BSS) and IEC.
- Quality Model System:** Our Quality model system is ISO-9001-14001,18001 CE Certified.
- Manufacturing excellence:** MV cables are being manufactured using advanced dry curing technology called CCV (Catenary Continuous Vulcanization) with real time special monitoring equipment .
- Cable life:** As per IEC (Approximately 40 Years) comparison between both (Dry cure peroxide & Moisture cure Sioplas) technologies is attached for reference.
- Availability:** Negotiable.
- Government Taxes:** Above prices are inclusive of 18% Sales Tax and 3% further tax shall be applicable over the above quoted prices in the event where buyer's status is found to be "non-active" on the FBR portal at the time of order processing by the Supplier.
- Income Tax/Sales Tax:** Fast Cables Limited is exempted from deduction of Withholding Income Tax U/S 153(1)(a) of the Income Tax Ordinance 2001 and it is also exempted from Withholding Sales Tax by virtue of SRO 586(I)/2017 and of Sales Tax Special Procedure Withholding Rules 2007.
- Packing:** (Packing Length) ±5% per individual drum length and on total quantity. The actual length will be invoiced.
- Validity:** This offer is valid for 5 days there after subject to our confirmation.
- Force Majeure:** The Supplier shall not be liable for the delivery delay due to force majeure such as shortage of material due to delay in release of consignments or LC opening by the local banks, Fire, Flood, Earthquake, Strike, Lockout, Civil unrest and other circumstances beyond the Supplier's control.
- Payment:** 100% Advance.
- Delivery:** Ex our factory.
- Currency:** PKR.
- Certification** We have total 8 certificates from DNVGL KEMA Holland. 2 Gold in LV & MV , 2 silver in LV and 4 silver in LOW SMOKE ZERO Halogen Cables.

Thank you for selecting Fast Cables. We look forward to providing you the best quality product. Please let us know if any further information is required.



Head Office: 192-Y Block, Commercial Area, DHA, Lahore

Regional Offices: Lahore, Karachi, Islamabad, Multan, Sialkot, Peshawar, Faisalabad, Gujranwala, Hyderabad, Quetta



Fast Cables Limited



LIGHTS

Sinc CABLES

(* Fast Lights is a Product of Fast Cables Limited)

HAFA
SR.
3214

Sincerely Yours,
HAFIZ SOHAIL ASHRAF
SR. AREA SALE MANAGER
3214434410



Head Office: 192-Y Block, Commercial Area, DHA, Lahore
Regional Offices: Lahore, Karachi, Islamabad, Multan, Sialkot, Peshawar, Faisalabad, Gujranwala, Hyderabad, Quetta

FOR 68 YEARS, WE ARE

TRUSTED

NOT TO COMPROMISE.



021-111-222-537 | pakistancables.com

TRUSTED NOT TO COMPROMISE



PAKISTAN CABLES LIMITED QUOTATION



TRUSTED NOT TO COMPROMISE

60-A, F.C.C. Zahoor Elahi Road Gul, Gulberg IV, Lahore, Pakistan, Phone: (042) 3578-5611-4, Website: www.pakistancables.com

Quote to:		Quote Detail:		
Customer Name :	NESPAK	PCL Quotation # :	316494-LHR-W&C	Version : 1
Attn :	Mr. Irfan Ullah Khan	Quote Date :	28-FEB-2023	
Address :	NESPAK House, Lahore.	Customer Inquiry # :	Email	
Phone # :		Inquiry Date:	23-JAN-2023	
Fax # :		Project :	Budgetary Offer for NESPAK	
Email :		Account Manager :	Rashid, Mr. Hammad	
Currency :	PKR		hammad.rashid@pakistancables.com	

Dear Sir/ Madam ,

We thank you for your inquiry dated 23-JAN-2023. Please find below special prices under the attached/given terms and conditions of offer:

S.#	Description	Requested Quantity	Unit	Unit Price	Amount (Excluding GST)	Sales Tax @ 18 %	Amount (Including GST)
1	CU/PVC/PVC 1X1.5MM ² (STRANDED) 600/1000 V ((RED) BLACK) (BS:6346)	1	Meter	109.8082	110	20	130
5-7 WEEKS()							
2	CU/PVC/PVC 2x1.5MM ² (STRANDED) 600/1000 V ((RED & BLACK) BLACK) (BS:6346)	1	Meter	231.9617	232	42	274
7-9 WEEKS()							
3	CU/PVC/PVC 3x1.5MM ² (STRANDED) 600/1000V ((RED, YELLOW & BLUE) BLACK) (BS:6346)	1	Meter	303.7181	304	55	359
7-9 WEEKS()							
4	CU/PVC/PVC 1X2.5MM ² (STRANDED) 600/1000 V ((RED) BLACK) (BS:6346)	1	Meter	159.4920	159	29	188
5-7 WEEKS()							
5	CU/PVC/PVC 2x2.5MM ² (STRANDED) 600/1000 V ((RED & BLACK) BLACK) (BS:6346)	1	Meter	333.1767	333	60	393
7-9 WEEKS()							
6	CU/PVC/PVC 3X2.5MM ² (STRANDED) 600/1000V ((BROWN, BLACK & GREEN/YELLOW) BLACK) (IEC 60502-1)	1	Meter	464.8048	465	84	549
0							
7	CU/PVC/PVC 1X4MM ² 600/1000 V ((RED)BLACK) (BS:6346)	1	Meter	222.0607	222	40	262
5-7 WEEKS()							
8	CU/PVC/PVC 1X6MM ² (STRANDED) 600/1000V ((RED) BLACK) (BS:6346)	1	Meter	308.1050	308	55	363
5-7 WEEKS()							
9	CU/PVC/PVC 1X10MM ² 600/1000 V ((RED) GREEN) (BS:6346)	1	Meter	504.6974	505	91	596
5-7 WEEKS()							
10	CU/PVC/PVC 1X16MM ² 600/1000 V ((RED) BLACK)	1	Meter	743.0788	743	134	877
5-6 WEEKS()							
11	CU/PVC/PVC 1X25MM ² 600/1000V ((RED) RED) (BS:6346)	1	Meter	1,157.0500	1,157	208	1,365
5-6 WEEKS()							
12	CU/PVC/PVC 1X35MM ² 600/1000V ((RED) BLACK) (BS:6364)	1	Meter	1,588.9787	1,589	286	1,875
5-6 WEEKS()							
13	CU/PVC/PVC 1X50MM ² 600/1000V ((RED) RED) (BS:6346)	1	Meter	2,154.4368	2,154	388	2,542
5-6 WEEKS()							
14	CU/PVC/PVC 1X70MM ² 600/1000V ((RED) RED) (BS:6346)	1	Meter	3,062.4580	3,062	551	3,613
0							



PAKISTAN CABLES LIMITED QUOTATION



TRUSTED NOT TO COMPROMISE

60-A, F.C.C. Zahoor Elahi Road Gul, Gulberg IV, Lahore, Pakistan. Phone: (042) 3578-5611-4. Website: www.pakistancables.com

15	CU/PVC/PVC 1X95MM ² 600/1000V {(BLACK) BLACK} (BS:6346)	1	Meter	4,264.4949	4,264	768	5,032
5-6 WEEKS()							
16	CU/PVC/PVC 1X120MM ² 600/1000V {(RED) RED} (BS:6346)	1	Meter	5,301.5859	5,302	954	6,256
5-6 WEEKS()							
17	CU/PVC/PVC 1X150MM ² 600/1000V {(RED) GREEN} (BS:6346)	1	Meter	6,535.8495	6,536	1,176	7,712
5-6 WEEKS()							
18	CU/PVC/PVC 1X185MM ² 600/1000V {(RED) RED} (BS:6346)	1	Meter	8,184.1114	8,184	1,473	9,657
5-6 WEEKS()							
19	CU/PVC/PVC 1X240MM ² 600/1000V {(BLACK) BLACK} (BS:6346)	1	Meter	10,578.5742	10,579	1,904	12,483
5-6 WEEKS()							
20	CU/PVC/PVC 1X300MM ² 600/1000V {(BLUE) BLACK} (61 WIRES) (BS:6346)	1	Meter	13,311.6414	13,312	2,396	15,708
5-6 WEEKS()							
21	CU/PVC/PVC 1X400MM ² 600/1000 V {(BLACK) BLACK} (BS:6346)	1	Meter	16,929.0030	16,929	3,047	19,976
5-6 WEEKS()							
22	CU/PVC/PVC 1X630 MM ² (Circular Compacted Conductor) 600/1000V (BS:6346)	1	Meter	28,065.3827	28,065	5,052	33,117
5-6 WEEKS()							
23	CU/PVC/PVC 2x4MM ² 600/1000 V {(RED & BLACK) BLACK} (BS:6346)	1	Meter	487.4368	487	88	575
7-9 WEEKS()							
24	CU/PVC/PVC 2x6MM ² 600/1000 V {(RED & BLACK) BLACK} (BS:6346)	1	Meter	676.9057	677	122	799
7-9 WEEKS()							
25	CU/PVC/PVC 2X10MM ² 600/1000V {(RED & BLACK) BLACK} (BS:6346)	1	Meter	1,058.0565	1,058	190	1,248
7-8 WEEKS()							
26	CU/PVC/PVC 2x16MM ² 600/1000 V {(RED & BLACK) BLACK} (BS:6346)	1	Meter	1,572.1190	1,572	283	1,855
5-6 WEEKS()							
27	CU/PVC/PVC 2X25MM ² 600/1000V {(RED & BLACK) BLACK} (BS:6346)	1	Meter	2,397.7847	2,398	432	2,830
5-6 WEEKS()							
28	CU/PVC/PVC 2x35 MM ² 600/1000 V	1	Meter	3,309.6354	3,310	596	3,906
5-6 WEEKS()							
29	CU/PVC/PVC 2X50MM ² (FLEXIBLE) 600/1000 V {(RED & BLACK) BLACK} (BS:6346)	1	Meter	4,833.7305	4,834	870	5,704
6-8 WEEKS()							
30	CU/PVC/PVC 2x70MM ² (Flexible) (BS:6346)	1	Meter	6,887.0052	6,887	1,240	8,127
6-8 WEEKS()							
31	CU/PVC/PVC 4X6MM ² 600/1000 V {(RED, YELLOW, BLUE & GREEN) BLACK} (BS:6346)	1	Meter	1,224.1787	1,224	220	1,444
7-9 WEEKS()							
32	CU/PVC/PVC 4x10MM ² 600/1000 V {(RED, YELLOW, BLUE & BLACK) BLACK} (BS:6346)	1	Meter	1,984.5505	1,985	357	2,342
7-8 WEEKS()							
33	CU/PVC/PVC 4x16MM ² 600/1000 V {(RED, YELLOW, BLUE & BLACK) BLACK} (BS:6346)	1	Meter	3,083.9022	3,084	555	3,639
5-6 WEEKS()							
34	CU/PVC/PVC 4x25MM ² 600/1000 V {(RED, YELLOW, BLUE & BLACK) BLACK} (BS:6346)	1	Meter	4,667.1706	4,667	840	5,507
5-6 WEEKS()							
35	CU/PVC/PVC 4X35MM ² 600/1000 V (RED, YELLOW, BLUE & GREEN/YELLOW) (BS:6346)	1	Meter	6,462.8470	6,463	1,163	7,626
5-6 WEEKS()							
36							



PAKISTAN CABLES LIMITED QUOTATION



TRUSTED NOT TO COMPROMISE

60-A, F. C. C. Zahoor Elahi Road Gul, Gulberg IV, Lahore, Pakistan. Phone: (042) 3578-5611-4, Website: www.pakistancables.com

37	CU/PVC/PVC 4X70MM ² 600/1000 V {(BROWN, BLACK, GREY & BLUE) BLACK} (BS:6346)	1	Meter	12,313.1346	12,313	2,216	14,529
0							
38	CU/PVC/PVC 4X95MM ² 600/1000 V {(BROWN, BLACK, GREY & BLUE) BLACK} (BS:6346).	1	Meter	17,227.4752	17,227	3,101	20,328
5-6 WEEKS()							
39	CU/PVC/PVC, 4X120MM ² (STRANDED) 600/1000V {(BROWN, BLACK, GREY & BLUE) BLACK} (BS:6346)	1	Meter	21,501.5266	21,502	3,870	25,372
0							
40	CU/PVC/PVC 4x150 MM ² 600/1000V (BS 6346)	1	Meter	26,425.3626	26,425	4,757	31,182
5-6 WEEKS()							
41	CU/PVC/PVC 4x185 MM ² 600/1000 V (BS 6346)	1	Meter	33,293.2688	33,293	5,993	39,286
5-6 WEEKS()							
42	CU/PVC/PVC 4x240 MM ² 600/1000 V (BS 6346)	1	Meter	43,052.1128	43,052	7,749	50,801
5-6 WEEKS()							
43	CU/PVC/PVC 4x300 MM ² 600/1000 V (BS 6346)	1	Meter	55,679.4315	55,679	10,022	65,701
5-6 WEEKS()							
44	CU/PVC/PVC 4x400 MM ² 600/1000 V (BS 6346)	1	Meter	70,385.5303	70,386	12,669	83,055
5-6 WEEKS()							
45	AL/XLPE/AWA/PVC 1x500 MM ² (TRIPPLE EXT.) 8.75/15 KV (WAPDA)	1	Meter	8,957.1252	8,957	1,612	10,569
16-18 WEEKS()							
46	AL/XLPE/AWA/PVC 1x240 MM ² (TRIPPLE EXT.) 8.75/15 KV (WAPDA)	1	Meter	5,650.0053	5,650	1,017	6,667
16-18 WEEKS()							
47	AL/XLPE/AWA/PVC 1x120 MM ² (DUAL EXT.) 8.75/15 KV	1	Meter	3,304.5701	3,305	595	3,900
16-18 WEEKS()							
48	AL/XLPE/SWA/PVC 3x240 MM ² (TRIPPLE EXT.) 8.75/15 KV	1	Meter	13,835.7882	13,836	2,490	16,326
16-18 WEEKS()							
49	AL/XLPE/SWA/PVC 3X120 MM ² (TRIPPLE EXT.) 8.75/15 KV (WAPDA)	1	Meter	9,489.3752	9,489	1,708	11,197
16-18 WEEKS()							
50	CU/XLPE/AWA/PVC 1x500 MM ² (TRIPPLE EXT.) 6.35/11 KV	1	Meter	27,145.4969	27,145	4,886	32,031
16-18 WEEKS()							
51	CU/XLPE/AWA/PVC 1x240 MM ² (DUAL EXT.) 8.75/15 KV	1	Meter	14,157.2274	14,157	2,548	16,705
16-18 WEEKS()							
52	CU/XLPE/AWA/PVC 1X120 MM ² 6.35/11 KV (TRIPLE EXT) (IEC 60502-2)	1	Meter	7,595.3929	7,595	1,367	8,962
16-18 WEEKS()							
53	CU/XLPE/SWA/PVC 3x240 MM ² (TRIPPLE EXT.) 8.75/15 KV	1	Meter	44,060.8343	44,061	7,931	51,992
16-18 WEEKS()							
54	CU/XLPE/SWA/PVC 3x120 MM ² (TRIPPLE EXT.) 8.75/15 KV	1	Meter	23,962.3920	23,962	4,313	28,275
16-18 WEEKS()							
55	AL/PVC/PVC/SWA/PVC 4X10 MM ² (WAPDA- NTDC) 600V (DDS-8:2007)	1	Meter	1,292.5953	1,293	233	1,526
7-9 WEEKS()							
56	AL/PVC/PVC/SWA/PVC 4X25 MM ² (WAPDA- NTDC) 600 V (DDS:8-2007)	1	Meter	2,011.2267	2,011	362	2,373
10-12 WEEKS()							
57	AL/PVC/PVC 4x120 mm ² 600 V (DDS-8:2007) (WAPDA)	1	Meter	4,152.4934	4,152	747	4,899
10-12 WEEKS()							
58	AL/PVC/PVC 4X300MM ² 600/1000 V (WAPDA) (DDS-8:2007)	1	Meter	9,423.3513	9,423	1,696	11,119



PAKISTAN CABLES LIMITED QUOTATION



TRUSTED NOT TO COMPROMISE

60-A, F.C.C. Zahoor Elahi Road Gul, Gulberg IV, Lahore, Pakistan, Phone: (042) 3578-5611-4. Website: www.pakistancables.com

10-12 WEEKS()							
59	AL/PVC/PVC 4x16 MM ² 600/1000 V	1	Meter	675.3460	675	122	797
10-12 WEEKS()							
60	AL/PVC/PVC 4x35 MM ² 600/1000 V	1	Meter	1,292.3871	1,292	233	1,525
10-12 WEEKS()							
61	AL/PVC/PVC 4x50 MM ² 600/1000 V	1	Meter	1,693.9780	1,694	305	1,999
10-12 WEEKS()							
62	AL/PVC/PVC 4x95 MM ² 600/1000 V	1	Meter	3,051.6472	3,052	549	3,601
10-12 WEEKS()							
63	AL/PVC/PVC 4X185MM ² 600/1000 V (WAPDA)	1	Meter	5,924.1060	5,924	1,066	6,990
10-12 WEEKS()							
64	AL/PVC/PVC 1X16MM ² 600/1000V {(RED) BLACK} (GENERALLY TO BS:6346)	1	Meter	204.0404	204	37	241
0							
65	AL/PVC/PVC 1x50 MM ² 600/1000 V	1	Meter	437.1347	437	79	516
6-8 WEEKS()							
66	AL/PVC/PVC 1X70 MM ² (WAPDA)	1	Meter	641.7012	642	116	758
6-8 WEEKS()							
Total :					611,993	110,158	722,151



TRUSTED NOT TO COMPROMISE

PAKISTAN CABLES LIMITED QUOTATION



60-A, F.C.C. Zahoor Elahi Road Gul, Gulberg IV, Lahore, Pakistan. Phone: (042) 3578-5611-4, Website: www.pakistancables.com

PCL Quotation # : 316494-LHR-
W&C Version : 1

Terms & Conditions of Offer

- Prices :** Prices quoted herein are ex-works Karachi and inclusive of transportation and exclusive of unloading charges. The quoted prices are valid for 01 day and subject to raw material availability. The prices will be subject to revision at the time of order finalization.
- Payments :** 50% advance, balance 50% before shipment
- Government Taxes :** Prices are inclusive of 18% GST.
- Delivery Time :** Ex-stock subject to prior sales.
- Quantity Variation :** $\pm 5\%$ will be acceptable but within ten (10) days from the date of confirmation of order or as mutually agreed at the time of placement of an order.
- Packing :** Lagged wooden drums on returnable basis.
Tolerance (Packing Length) $\pm 5\%$ per individual length and/or total quantity.
However, the actual length will be invoiced.
- Tax Clause :** If during execution of the contract any changes in legislative, statutory, budgetary or SROs, either by Federal Board of Revenue or Government Authorities affect the prices of cables, prices are subject to adjustment and revision by the company.
- Income Tax :** Pakistan Cables is exempted from deduction of Income Tax under Section 153 of the Income Tax Ordinance 2001.
- Force Majeure :** Pakistan Cables shall not be liable for any delivery delay due to the occurrence and/or impact(s) of force majeure event(s) such as fire, flood, earth quack, strike, lockout, civil unrest and other circumstances beyond its control.
- Cable Description :** In case of cable description mismatch between Pakistan Cables Limited and the customer, the description provided by Pakistan Cables Limited shall be considered as valid and accepted by the customer, until and unless the customer can prove that such mismatch was identified by the customer at initial stage of communications and requested to be amended.
- Currency :** In PKR
- Purity :** For all copper cables and wires, the above quoted rates are based on 99.99% pure Copper LME Grade A-C10100 OFE, which yields 101% conductivity.

Looking forward to your order and assuring you of our continuous cooperation at all times. If you need any further assistance, please feel free to contact us.

Rashid, Mr. Hammad
hammad.rashid@pakistancables.com

Sincerely Yours,
Per Pro Pakistan Cables Ltd.

THIS IS A COMPUTER-GENERATED DOCUMENT AND DOES NOT REQUIRE A SIGNATURE.

To: Mr. Irfan Ullah Khan
 Des: Project Consultant
 Com: M/s NESPAK House - LHR
 Mob:
 Email: irfankibzai@gmail.com

Ref: SA / NESPAK / 1323
 Date: 01st MARCH, 2023

Subject: Quotation for NESPAK HOUSE (LHR).

S.NO.	DESCRIPTION	Qty	Retail Price (Rs.)	AMOUNT
1	T-5 LED Battern PRO 18W / 4000k, IP 20	1	2,390	2,390
2	T-5 LED Battern PRO 10W / 4000k, IP 20	1	1,595	1,595
3	Phantom 7W, LED Spot Adjustable IP 20 rating (Recessed Type)	1	1,990	1,990
4	Phantom 10W, LED Spot Adjustable IP 20 rating (Recessed Type)	1	2,310	2,310
5	Splinter GEN 2 14W / 4000k, LED Downlight (Recessed Type)	1	2,720	2,720
6	Splinter GEN 2 20W / 4000k, LED Downlight (Recessed Type)	1	4,580	4,580
7	Splinter GEN 2 25W / 4000k, LED Downlight (Recessed Type)	1	5,370	5,370
8	UFO - SMDL GEN 2 6W /4000k, LED Downlight (Surface Type)	1	1,940	1,940
9	UFO - SMDL GEN 2 12W /4000k, LED Downlight (Surface Type)	1	3,190	3,190
10	UFO - SMDL GEN 2 18W /4000k, LED Downlight (Surface Type)	1	4,295	4,295
11	ELITE LED Panel 40W / 4000k (Size: 2X2)	1	9,975	9,975
12	Serene LED Panel 40W / 4000k (Size: 2X2)	1	7,500	7,500
13	Zenio LED Strip 14W / Mtr, IP 65 rating	1	1,595	1,595
14	Adapter for Zenio LED Step Light	1	1,250	1,250
15	Zenio Mini NEON 6W / 3000k (per Mtr), IP 65 rating	1	3,315	3,315
16	Adapter for Zenio Mini	1	2,500	2,500
17	LUNNAR 2 35W, LED Track Light	1	15,500	15,500
18	Track Rod for LUNNAR 2 , Track Patti	1	4,500	4,500
19	DPHO 12W / LED Bulk Head IP 65 rating	1	5,000	5,000
20	Centrina ECO Bulk Head 20W / 3000k, IP 65 rating	1	15,500	15,500
21	Centrina ECO Bulk Head 30W / 3000k, IP 65 rating	1	18,500	18,500
22	Eleva ECO GEN 2 100W, LED High Bay IP 65	1	25,845	25,845
23	Eleva ECO GEN 2 120W, LED High Bay IP 65	1	27,835	27,835
24	Eleva ECO GEN 2 150W, LED High Bay IP 65	1	29,160	29,160
25	Star Flood Gen 2 50W, LED Flood Light, IP 66 rating	1	29,160	29,160
26	Star Flood Gen 2 100W, LED Flood Light, IP 66 rating	1	37,775	37,775
27	Star Flood Gen 2 150W, LED Flood Light, IP 66 rating	1	43,735	43,735
28	Down Town 18W / 3000k, LED Inground IP 67 rating	1	30,365	30,365
29	Riser 8.4W / 3000k, LED Step Light IP 65 rating	1	12,595	12,595
30	Blinker Step Light (P.2161) 6W / 3000k, IP 65 rating (Size: 193.5 X 238.5 X 73)	1	11,265	11,265
31	Broad Wave Wall Washer 9W / 3000k, IP 66 rating (Size: 500 X 47 X 54)	1	22,270	22,270
32	Broad Wave Wall Washer 18W / 3000k, IP 66 rating (Size: 1000 X 47 X 54)	1	26,750	26,750
33	Vintage Spike 7W / 3000k, LED Garden Light IP 65 rating	1	12,595	12,595
34	Vintage Spike 15W / 3000k, LED Garden Light IP 65 rating	1	18,555	18,555
35	Orion LED Post Top 25W / 3000k, Di Cast Aluminium IP 66 rating	1	55,000	55,000

Terms and Conditions:

GST: Above prices are Exclusive of GST (which has to be paid by client separately @ 18% for registered & for non registered as per govt. Policy).
 Price: Ex-Works Karachi Stores Basis.
 Price Validity: 07 days from today.
 Payment: 100% advance with confirmed purchase order.
 Delivery Time: Ex-stocks OR Else Estimated 14 to 16 Weeks after confirmed purchase order and with advance payment.

Delivery Charges:

- i. Prices are without Packing and Ex-our stores Karachi.
- ii. Packing and forwarding expenses will be charged extra at actual.

Insurance: All dispatches will be made on customer's risk, unless insured at customer's cost.

Sale Return Policy:

- i. Sale Returns would be entertained if light fixtures are returned in the same good condition and packing they were sold.
- ii. No return will be accepted after 90 days from delivery challan date.
- iii. GST will only be refunded if return is processed before the 5th of the next month of the sale date.

Warranty:

- i) All Pierlite Products supplied are BRAND NEW which are warranted against defects in design, workmanship and materials.
- ii) The warranties shall be for a period of 02 Years Only from the Date of supply.
- iii) The following conditions will VOID the warranty of Light fixtures:
 - Misuse OR Mishandling of component
 - Modification OR Repair of component
 - Faulty/Wrong installation of component

Other Terms and Conditions are as follows:

- a) This quotation is subject to force major clause.
- b) This quotation is subject to current exchange rates, Govt. taxes, levies and duties. Any change will effect the prices consequently.
- c) Any sample submitted / installed with respect to this quotation will be adjusted in final billing.
- d) This offer is subject to attached General terms and conditions.
- e) Price escalation clause: The prices are based upon Current Currency Exchange rates & metal rates (LME). The Prices have been worked out at the current exchange rates. In case US Dollar rate or LME changes by more than 5%, we reserve the right to revise our quotations within the validity period of the quotation.

Your's Faithfully,

Syed Shafi Ahmed
Brand Manager
0322-2880031; 0300 2375904



Ph: +92 42 35302800
Email: awais@stesp.com

By Email

M/s. Nespak

Attn: Mr. Irfan Ullah Khan (Senior Engineer)
Contact: 0333-3635573
Subject: Quotation of NVC LED Lights

Ref:	LHR/ST/NP/680
Date:	25-Jan-23
Urgent	Review
Remarks	Reply
Project: Estimated Rate	

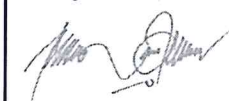
Sr. #	Description	Qty	U/Rate	Total Amount
NVC OVERSEAS CORPORATION				
1	NVC LED surface Mounted Downlight <u>Model:NLED9488M</u> c/w 18W.(4000k)	1	2,700.00	2,700.00
2	NVC LED Batten Light <u>Model:NBTLEDT5E7</u> c/w 7W.(4000k)	1	1,450.00	1,450.00
3	NVC LED Wall Bracket Light <u>Model:NWLED3505</u> c/w 6.5W.(3000k)	1	14,000.00	14,000.00
4	NVC LED Wall Bracket Light <u>Model:NWLED3505</u> c/w 6.5W.(3000k)	1	14,000.00	14,000.00
5	NVC LED Bulkhead Light <u>Model:LEDH BULKHEADLIGHT</u> c/w 20W.	1	6,500.00	6,500.00
6	NVC LED Bulkhead Light <u>Model:LEDH BULKHEADLIGHT</u> c/w 20W.	1	6,500.00	6,500.00
7	NVC LED surface Mounted Downlight <u>Model:NLED9484M</u> c/w 6W.(4000k)	1	1,140.00	1,140.00
8	NVC LED surface Mounted Downlight <u>Model:NLED9486M</u> c/w 12W.(4000k)	1	1,500.00	1,500.00
9	NVC LED surface Mounted Downlight <u>Model:NLED9488M</u> c/w 18W.(4000k)	1	2,700.00	2,700.00
10	NVC LED Highbay Light <u>Model:NHBLED307G</u> c/w 100W.(4000k)	1	28,000.00	28,000.00
11	NVC LED Highbay Light <u>Model:NHBLED307G</u> c/w 150W.(4000k)	1	33,000.00	33,000.00
12	NVC LED Highbay Light <u>Model:NHBLED307G</u> c/w 200W.(4000k)	1	43,000.00	43,000.00
13	NVC LED Flood Light <u>Model:NFDLED254</u> c/w 30W.(3000k)	1	5,000.00	5,000.00
14	NVC LED Flood Light <u>Model:NFDLED254</u> c/w 50W.(3000k)	1	8,000.00	8,000.00
15	NVC LED Flood Light <u>Model:NFDLED254</u> c/w 50W.(3000k)	1	8,000.00	8,000.00
16	NVC LED Panel Light 2x2 <u>Model:NPLED4502</u> c/w 40W.(4000k)	1	8,000.00	8,000.00
17	NVC LED Inground Light <u>Model:T-NE601C</u> c/w 15W.(3000k)	1	22,000.00	22,000.00
18	NVC LED Strip Light <u>Model:LEDH2835</u> c/w 5W/M.(4000k)	1	650.00	650.00
19	NVC LED Flood Light <u>Model:NFDLED254</u> c/w 50W.(3000k)	1	8,000.00	8,000.00
20	NVC LED Downlight <u>Model:NLED9128</u> c/w 20W.(4000k)	1	2,800.00	2,800.00

21	NVC LED Step Light <u>Model:NWLED4522</u> c/w 7.5W.(3000k)	1	13,000.00	13,000.00
22	NVC LED Wallwasher Light c/w 24W.(4000k)	1	30,000.00	30,000.00
23	NVC LED Track Light <u>Model:NTR322D</u> c/w 30W.(4000k)	1	5,000.00	5,000.00
24	NVC LED Bulkhead Light <u>Model:LEDH BULKHEADLIGHT</u> c/w 20W.	1	6,500.00	6,500.00
25	NVC LED Step Light <u>Model:NWLED4522</u> c/w 7.5W.(3000k)	1	13,000.00	13,000.00
26	NVC LED Step Light <u>Model:NWLED4522</u> c/w 7.5W.(3000k)	1	13,000.00	13,000.00
27	ST LED Spike Light <u>Model:LEDFLASHLIGHT</u> c/w 7W.	1	7,000.00	7,000.00
28	NVC LED POST TOP Light c/w 25W(3000k)	1	N/A	
29	NVC LED POST TOP Light c/w 35W(3000k)	1	N/A	
30	NVC LED POST TOP Light c/w 45W(3000k)	1	N/A	
31	NVC LED Batten Light <u>Model:NLED491A12</u> c/w 36W(4000k)	1	6,000.00	6,000.00
32	NVC LED Flood Light <u>Model:NFDLED254</u> c/w 50W.(3000k)	1	8,000.00	8,000.00
33	NVC LED Panel Light 2x2 <u>Model:NPNLED4502</u> c/w 40W.(4000k)	1	8,000.00	8,000.00
34	NVC LED Batten Light <u>Model:NBTLED</u> c/w 14W(4000k)	1	1,850.00	1,850.00
35	NVC LED Batten Light <u>Model:NBTLED</u> c/w 14W(4000k)	1	1,850.00	1,850.00
36	NVC LED Batten Light <u>Model:NLED491A12</u> c/w 36W(4000k)	1	6,000.00	6,000.00
37	NVC LED Flood Light <u>Model:NFDLED254</u> c/w 50W.(3000k)	1	8,000.00	8,000.00
38	NVC LED Flood Light <u>Model:NFDLED254</u> c/w 30W.(3000k)	1	5,000.00	5,000.00
39	NVC LED Flood Light <u>Model:NFDLED254</u> c/w 50W.(3000k)	1	8,000.00	8,000.00
40	Not Available		-	-

Terms and Conditions:

Delivery Schedule	Ex-Stock Prior to sales otherwise 10 - 12 weeks after confirm order along with advance.
Prices	Pak Rs. and delivery F.O.R site basis.
Payment Terms	100% advance payment along with confirm purchase order.
Warranty	3 years standard warranty.
Taxes & duties	Prices are Exclusive of all Taxes. As per govt. rules and regulations. Above prices are based on today's rate of exchange between PAK. RS and USD any variation in rate of exchange will be charged additionally as price variation. In case of any change in this tariff from Govt. of Pakistan that will be applicable accordingly.
Validity	15 Days
Others	Force majour clause is applicable, Part payment / part delivery is allowed.

FOR,
ST Engineering Solutions



Imran A. Alvi
General Manager -
0321-9492864



M. Awais Khan
Key Account Manager
0322-6696826

PRICE LIST
01-10-2022



ROYAL®

SMART *Lifestyle* Series *Deluxe*
AC/DC INVERTER FANS

بدلیہ ہوا کے رنگ

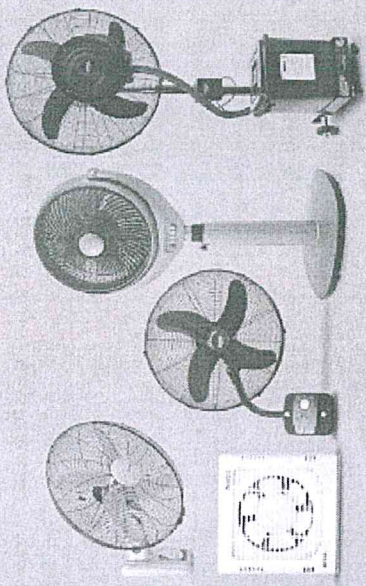


65 YEARS

TERMS AND CONDITIONS

- i- All Ceiling Fans are supplied without dimmer or regulator.
- ii- All previous price lists are cancelled forthwith.
- iii- Prices are subject to change anytime without notice.
- iv- Prices Inclusive of Sales Tax.
- v- All Prices are ex-factory.

بدلیہ ہوا کے رنگ



Fans | Room Coolers | Washing Machines



RAFIQ ENGINEERING INDUSTRIES (PVT) LTD.
www.royalfans.com | /RoyalFansOfficial
@royalfans_official /RoyalFans_PK | /RoyalFans

EXHAUST PLASTIC FANS

SR.NO.	MODEL	SIZE	PRICE
107	SQUARE	6" 1WAY	3295
108	SQUARE	8" 2WAY	3855
109	SQUARE	10" 2WAY	3955
110	SQUARE	12" 2WAY	4255
111	ROUND WINDOW	6" 1WAY	2095
112	ROUND WINDOW	8" 1WAY	2595

EXHAUST METAL FANS

SR.NO.	MODEL	SIZE	PRICE
113	SQUARE /ROUND	8"	3795
114	SQUARE /ROUND	10"	3995
115	SQUARE /ROUND	12"	4795
116	SQUARE	12" Front Grill	4895
117	ROUND	16" Hi-Speed	6795
118	ROUND	18" Hi-Speed	7295
119	ROUND	24" Hi-Speed	9195

CEILING EXHAUST FAN

SR.NO.	MODEL	SIZE	PRICE
120	GRILL	8"	3295
121	GRILL	8" Wood	3445
122	GRILL	10"	3495
123	GRILL	10" Wood	3645
124	GRILL	12" New	3895
125	GRILL	12" Wood	4045
126	PANEL	8"	3345
127	PANEL	8" Wood	3525
128	PANEL	10"	3545
129	PANEL	10" Wood	3725

ECCA WINDED FANS

SR.NO.	MODEL	SIZE	PRICE
130	DELUXE	56" Ceiling Fans	6795
131	HI-STANDARD	56" Ceiling Fans	5995
132	ELEGANT	18" Bracket Fans	6095
133	PLASTIC CIRCO	18" Circumatic Fans	5895
134	BRACKET	14" Louver Fans	5255
135	PEDESTAL	14" Louver Fans	6255
136	EXHAUST FAN PLASTIC	8" 2WAY	3595
137	EXHAUST FAN PLASTIC	10" 2WAY	3755
138	EXHAUST FAN PLASTIC	12" 2WAY	4015

CEILING FANS - DELUXE SERIES

SR.NO.	MODEL	SIZE	PRICE
1	DELUXE	36"	6095
2	DELUXE	56"	7295
3	DELUXE	56" 3 STAR	7495
4	ENERGY SAVER	56" 50 WATT	7695
5	PLATINUM	56"	7295
6	EMPEROR	56" Water Proof	7395
7	MAJESTY	56" Water Proof	7495
8	REGENCY	56"	7545
9	PASSION	24"	5435
10	PASSION	36"	6435
11	PASSION	56"	7495
12	VIP WITH DECORATION	56"	7395
13	REGAL	56"	7595
14	REGENT	56"	7595
15	OPAL	56"	7295
16	NOBLE	56"	7895
17	VALOR	56"	7695
18	VALOR PREMIUM	56"	8195
19	GALANT	56" New	7895
20	IMPERIAL	56" New	7895
21	IMPERIAL FANTASY	56" New	8195
22	IMPERIAL	56" New 4 Blade	8095
23	JEM WAVES	56" New	7695
24	JEM TRINITY	56"	7695
25	CROWN	56"	7495
26	HI-STANDARD	56"	6495
27	HI-STANDARD GARNET	56"	6545
28	EXPO DELUXE	56"	7095
29	FALSE CEILING FAN (2*2)	56"	8395
30	FALSE CEILING FAN (2*2)	56"	8795

Note: For 48" Ceiling Fans Reduce Rs. 300, per Fan

SMART LIFESTYLE AC/DC INVERTER

SR.NO.	MODEL	SIZE	PRICE
31	PRIME	56" ACDC Inverter	7595
32	PASSION	56" ACDC Inverter	7795
33	REGENCY	56" ACDC Inverter	7795
34	CRESCENT	56" New ACDC Inverter	7795
35	IMPERIAL	56" ACDC Inverter	8195

SMART LIFESTYLE AC/DC INVERTER HIGH STANDARD

SR.NO.	MODEL	SIZE	PRICE
36	OPAL	56" HS ACDC Inverter	7295
37	EXPO DELUXE	56" New HS ACDC Inverter	7195

SMART LIFESTYLE AC/DC INVERTER TURBO RF

SR.NO.	MODEL	SIZE	PRICE
38	CRESCENT DECOR	56" New ACDC Inverter RF Kit	8045
39	GALANT	56" New ACDC Inverter RF Kit	8295
40	RL 050	56" New ACDC Inverter RF Kit	8995
41	RL 055	56" New ACDC Inverter RF Kit	8995
42	RL 010	56" New ACDC Inverter RF Kit	9595
43	RL 040	56" New ACDC Inverter RF Kit	9595
44	RL 150	56" New ACDC Inverter RF Kit	11395
45	NOVA 5 BLADE	56" New ACDC Inverter RF Kit	11495
46	ORNAMENT	56" New ACDC Inverter RF Kit	11995
47	DECORUM	56" New ACDC Inverter RF Kit	12395

LIFESTYLE HIGH SPEED SERIES

SR.NO.	MODEL	SIZE	PRICE
48	OPTIMA	56" New 370 RPM	7295
49	EMERALD	56" New 370 RPM	7395
50	CRESCENT	56" New 370 RPM	7495
51	CRESCENT DECOR	56" New 370 RPM	7645
52	RL 050	56" New 370 RPM	8595
53	RL 055	56" New 370 RPM	8595
54	PHANTOM	56" New 370 RPM	8895
55	RL 010	56" New 370 RPM	9195
56	RL 040	56" New 370 RPM	9195
57	NOVA	56" New 370 RPM	9295
58	RL 150	56" New 370 RPM	10995
59	NOVA 5 BLADE	56" New 348 RPM	11095
60	ORNAMENT 5 BLADE	56" New 348 RPM	11595
61	DECORUM 5 BLADE	56" New 348 RPM	11995

PEDESTAL FAN

SR.NO.	MODEL	SIZE	PRICE
62	MAGNUM	18"	8095
63	DELUXE	20" 24" Motor	10895
64	DELUXE	22" 24" Motor	10825
65	DELUXE	24"	10995
66	DELUXE	24" 24" Mix Base	10695
67	DE 301E R30W	24" REUNR D X Base / Round Base	11395
68	DELUXE	30" X-Base / Round Base	14895

BRACKET FANS METAL

SR.NO.	MODEL	SIZE	PRICE
69	MAGNUM	18"	7295
70	MAGNUM	20" 24" Motor	9695
71	MAGNUM	24"	9795
72	MAGNUM	24" Control Box	10095
73	MAGNUM CROWN GUARD	24"	10195
74	MAGNUM CROWN GUARD	24" Control Box	10495
75	MAGNUM	30"	14295
76	MAGNUM	30" Control Box	14595

MIST FAN

77	MYSTIC MIST	24"	19295
----	-------------	-----	-------

BRACKET FANS PLASTIC

SR.NO.	MODEL	SIZE	PRICE
78	PETITE	12"	5195
79	PETITE	14"	5395
80	ELEGANT	16"	6595
81	ELEGANT	18"	6695
82	ELEGANT	18" Remote Control	7395
83	ELEGANT	20"	7655
84	ELEGANT	24"	9095

CIRCOMATIC FANS

SR.NO.	MODEL	SIZE	PRICE
85	PLASTIC CIRCO	16"	6395
86	PLASTIC CIRCO	16"	6495
87	DELUXE CIRCO	18" New Fix Fan	6495
88	DELUXE CIRCO	20" New Fix Fan	8795
89	DELUXE CIRCO	24" New Fix Fan	8895

TCP TABLE FANS

SR.NO.	MODEL	SIZE	PRICE
90	PETITE TABLE	12"	5195
91	PETITE TABLE	14"	5395

STAND FANS

SR.NO.	MODEL	SIZE	PRICE
92	UNIQUE STAND	16" New	7935
93	UNIQUE STAND	18" New	7995
94	UNIQUE STAND	18" New Remote Control	8795
95	GLAMOUR STAND	16" New	7535
96	GLAMOUR STAND	18" New	7595

LOUVER FANS

SR.NO.	MODEL	SIZE	PRICE
97	BRACKET	14"	5695
98	BRACKET	14" Colour	5795
99	BRACKET	14" Remote Control	6295
100	BRACKET	14" Remote Control	6395
101	PEDESTAL	14"	6595
102	PEDESTAL	14" Colour	6795
103	PEDESTAL	14" Remote Control	7195
104	PEDESTAL	14" Remote Control	7395
105	CIRCOMATIC	14"	5695
106	TABLE	14"	5995



NFC Fans

Price W.E.F 1st Feb 2023

Sr #	Model	Size	Wholesale Price	Retailer Price
<i>Gold Series</i>				
1.	Ceiling Fan Nova	48"	7700	8200
2.	Ceiling Fan Deluxe	56"	7800	8300
3.	Ceiling Fan Rose Gold	56"	7900	8400
4.	Ceiling Fan Rose Multi	56"	8000	8500
5.	Ceiling Fan Prime	56"	8100	8600
6.	Ceiling Fan Magnum	56"	8300	8800
7.	Ceiling Fan Victoria	56"	8400	8900
8.	Ceiling Fan Lotus	56"	8850	9350
9.	Bracket Fan	18"	7050	7550
10.	Exhaust Fan Plastic	8"	5000	5500
11.	Exhaust Fan Plastic	10"	5200	5700
12.	Exhaust Fan Plastic	12"	5300	5800
13.	Ceiling Fan Prime AC/DC (IR)	56"	8150	8650
14.	Ceiling Fan Prime AC/DC (RF)	56"	8350	8850
15.	Ceiling Fan Magnum AC/DC (IR)	56"	8350	8850
16.	Ceiling Fan Magnum AC/DC (RF)	56"	8550	9050
17.	Ceiling Fan Lotus AC/DC (IR)	56"	8900	9400
18.	Ceiling Fan Lotus AC/DC (RF)	56"	9100	9600
<i>Diamond Series</i>				
19.	Ceiling Fan Desire	56"	9100	9700
20.	Ceiling Fan Florence	56"	9300	9900
21.	Ceiling Fan Marvel	56"	9600	10200
22.	Ceiling Fan Water Proof	56"	9600	10200
23.	Ceiling Fan Sapphire	56"	10300	10900
24.	Ceiling Fan Elegant	56"	11500	12100
25.	Ceiling Fan Emerald	56"	12300	12900
26.	Mega Bracket Fan	24"	12000	12600
27.	Pedestal Fan	24"	12450	13050
28.	Exhaust Fan Metal	10"	5600	6200
29.	Exhaust Fan Metal	12"	5800	6400
30.	Exhaust Fan Metal	16"	9000	9600
31.	Exhaust Fan Metal	18"	9800	10400
32.	Exhaust Fan Metal	20"	10600	11200
33.	Exhaust Fan Metal	24"	11600	12200
34.	Ceiling Fan Galaxy (5 Blades)	56"	21500	23500
35.	Ceiling Fan Falcon (5 Blades) Inverter	56"	21500	23500

Ali Electrical Industries

Street 4, Bajwa Industrial Zone,
Kotli Pir Ahmed Shah, Gujranwala.
Phone # 055-3256375
Fax # 055-3843433

SK FANS

CHANDNI TRADER'S

Al-Madina Road, Township, Lahore. PH# 042-35123033 - 37233033

99.9% Pure Copper Wire SK FAN New Rate List From 10th February 2023

SR#	MODEL	SIZE	PRICE
Ceiling Fan			
1-A	Ceiling Fan Deluxe	40"	7650
2-A	Ceiling Fan Deluxe Standard	56"	8150
3-B	Ceiling Fan Supreme Gold	56"	8550
4-B	Ceiling Fan Supreme Multi	56"	8550
5-B	Ceiling Fan Deluxe Plus	56"	8550
6-B	Ceiling Fan Super Deluxe	56"	8550
7-B	Ceiling Fan Super Deluxe Multi	56"	8650
8-B	Ceiling Fan VIP Standard	56"	8850
9-C	Ceiling Fan Super Deluxe Multi RF-AC/DC	56"	10000
10-C	Ceiling Fan SK Executive	56"	9400
11-C	Ceiling Fan Magnum	56"	10200
12-C	Ceiling Fan Victoria	56"	9700
13-C	Ceiling Fan Antique WP	56"	11700
14-C	Ceiling Fan Crescent	56"	11250
15-C	Ceiling Fan Caroma	56"	11950
16-C	Ceiling Fan Caroma Plus	56"	12150
17-C	Ceiling Fan Sareen	56"	12150
18-C	Ceiling Fan Antique Plus (4-Blade)	56"	12150
19-C	Ceiling Fan Antique RF-AC/DC	56"	12500
Inverter Ceiling Fan With Remote			
20-C	Ceiling Fan Super Deluxe Multi Inverter	56"	10000
21-C	Ceiling Fan Magnum Inverter	56"	12000
22-C	Ceiling Fan Caroma Plus Inverter	56"	14000
23-D	Ceiling Fan Butterfly Inverter (4-Blade)	56"	19000
24-D	Ceiling Fan Grace & Iris & Spider Inverter (5-Blade)	56"	23300
Pedestal Fans			
25-B	Pedestal Fan TCP (DC-12V)	18"	7400
26-B	Pedestal Fan TCP (Plastic)	18"	9800
27-B	Pedestal Fan TCP (Metal)	18"	9600
28-C	Pedestal Fan	21"	11250
29-C	Pedestal Fan	24"	15100
30-C	Pedestal Fan	27"	15900
31-B	Table Fan	16"	8200

Exhaust Fans Plastic Body

32-A	Exhaust Fans Plastic	8"	5350
33-A	Exhaust Fans Plastic (A1,A2)	8"	5700
34-A	Exhaust Fans Plastic	10"	5700
35-A	Exhaust Fans Plastic (A1,A2)	10"	6050
36-A	Exhaust Fans Plastic	12"	6150

Exhaust Fans Metal Body

37-A	Exhaust Fans Metal	8"	5950
38-A	Exhaust Fans Metal	10"	6350
39-A	Exhaust Fans Metal With Grill	10"	6450
40-A	Exhaust Fans Metal	12"	6650
41-A	Exhaust Fans Metal With Grill	12"	6800
42-C	Exhaust Fans Metal	16"	10200
43-C	Exhaust Fans Metal	18"	11800
44-C	Exhaust Fans Metal	20"	12550
45-C	Exhaust Fans Metal	24"	14350

Wall Bracket Fans

46-A	Wall Bracket Fan (Plastic Blades)	12"	6850
47-A	Wall Bracket Fan (Plastic Blades)	14"	7400
48-B	Wall Bracket Fan (Plastic Blades)	16"	7750
49-B	Wall Bracket Fan Model 501	18"	8150
50-B	Wall Bracket Fan (Cream) Old	18"	7950
51-C	Mega Bracket Fan	21"	11900
52-C	Mega Bracket Fan	24"	13500
53-C	Mega Bracket Fan	27"	14100
54-B	Circomatic Fan With Remote Control	18"	9100
55-B	Fix Fan	21"	10100

False Ceiling Fan

56-C	False Ceiling 2x2	16"	10700
------	-------------------	-----	-------

Window Exhaust Fans

57-A	Window Exhaust Fan	6"	3800
58-A	Window Exhaust Fan	8"	4300

False Ceiling Exhaust Fans

59-A	Ceiling Exhaust Fan	8"	4900
60-A	Ceiling Exhaust Fan	10"	5150
61-A	Ceiling Exhaust Fan	12"	5450

SHAFISONS ENGINEERING (PVT) LIMITED
 HEAD OFFICE: 37-P BLOCK MODEL TOWN EXTENSION, LAHORE
 PHONE NO. +92 42 35172409-11 FAX NO. +92 42 35172408
 E-MAIL: enquiries@betapipes.com.pk
 URL: www.betapipes.com.pk



Price List

PVC-U Pressure Pipes (PS-3051 = BSS 3505)
 Effective from January 09, 2023

Size OD Inch	Class-B 200-Ft Head 87 PSI		Class-C 300-Ft Head 130 PSI		Class-D 400-Ft Head 173 PSI		Class-E 500-Ft Head 217 PSI	
	Rs./Rft	Rs./Mtr	Rs./Rft	Rs./Mtr	Rs./Rft	Rs./Mtr	Rs./Rft	Rs./Mtr
1/2"	-	-	-	-	-	-	48	159
3/4"	-	-	-	-	-	-	69	225
1"	-	-	-	-	-	-	99	324
1-1/4"	-	-	-	-	127	417	155	509
1-1/2"	-	-	-	-	161	527	201	660
2"	-	-	204	671	249	818	312	1,025
2-1/2"	-	-	304	999	384	1,261	474	1,556
3"	352	1,154	426	1,397	553	1,814	679	2,227
4"	530	1,740	706	2,315	920	3,019	1,117	3,664
5"	742	2,433	1,062	3,484	1,375	4,512	1,700	5,577
6"	1,029	3,377	1,516	4,973	1,992	6,536	2,428	7,966
8"	1,628	5,341	2,346	7,697	3,040	9,975	3,730	12,239
10"	2,526	8,287	3,680	12,073	4,810	15,781	5,927	19,445
12"	3,536	11,601	5,179	16,990	6,754	22,158	8,415	27,607
14"	4,227	13,868	6,218	20,400	8,146	26,726	10,106	33,155
16"	5,684	18,649	8,202	26,910	10,591	34,747	13,216	43,358
18"	7,239	23,751	10,534	34,559	13,410	43,996	-	-
20"	8,939	29,328	13,081	42,916	-	-	-	-
24"	11,975	39,289	-	-	-	-	-	-

- 1 This Price List supersede previous prices with immediate effect
- 2 Current Prices are subject to change without prior Notice.
- 3 Pipes are supplied in Standard Lengths of 13-Rft (Specific Length in Meters are produced on request).
- 4 Prices are quoted in Rft as well as in Mtrs. Subject to requirement.
- 5 (+) sign indicates that the relevant diameter may be produced on specific request
- 6 Prices are in Pakistan Rupees Ex-Factory, Lahore
- 7 Pipes are supplied in Plain Ends, Z-Joint (without Rubber Seal) and Bell End (without Solvent Solution)
- 8 The above Prices are Inclusive of GST (Govt. Taxes shall be charged subject to negotiated unit price)
- 9 Any other Govt. Levies, Duties, Taxes etc will be on buyer's account
- 10 Supplies to Govt. Donor and Private Agencies the Prices shall be quoted subject to bulk order.
- 11 For further assistance please feel free to contact us on 042-35172409-11.
- 12 Prices for Rubber Seal will be provided if requested



Authorized Signature & Stamp

POPULAR UPVC PRESSURE PIPE AS PER PS-3051/BS-3505				
PIPE & FITTING (CLASS-B) 6 BAR			BEND 90d, 45d	SOCKET
SIZE	PRICE PER FT	PRICE PER LENGTH	RS./ UNIT	RS./ UNIT
	RS	RS		
3"	367.00	4,771.00	502.00	288.00
4"	552.50	7,182.50	952.00	485.00
5"	774.00	10,062.00	2,205.00	715.00
6"	1,066.00	13,858.00	3,752.00	1,038.00
8"	1,697.00	22,061.00	9,930.00	2,182.00
10"	2,605.00	33,865.00	26,745.00	5,018.00
12"	3,647.00	47,411.00	43,330.00	8,245.00
14"	4,381.00	56,953.00	93,745.00	14,400.00
PIPE & FITTING (CLASS-C) 9 BAR			BEND 90d, 45d	SOCKET
SIZE	PRICE PER FT	PRICE PER LENGTH	RS./ UNIT	RS./ UNIT
	RS	RS		
2"	205.20	2,667.60	221.00	106.00
2 1/2"	315.70	4,104.10	414.00	226.00
3"	442.00	5,746.00	695.00	352.00
4"	734.00	9,542.00	1,635.00	650.00
5"	1,105.00	14,365.00	3,635.00	1,150.00
6"	1,579.00	20,527.00	7,095.00	1,935.00
8"	2,447.00	31,811.00	18,455.00	3,575.00
10"	3,789.00	49,257.00	39,345.00	7,385.00
12"	5,328.00	69,264.00	56,710.00	11,615.00
14"	6,393.00	83,109.00	122,360.00	18,760.00
PIPE & FITTING (CLASS-D) 12 BAR			BEND 90d, 45d	SOCKET
SIZE	PRICE PER FT	PRICE PER LENGTH	RS./ UNIT	RS./ UNIT
	RS	RS		
1 1/4"	132.60	1,723.80	136.00	64.00
1 1/2"	165.75	2,154.75	176.00	93.00
2"	260.45	3,385.85	312.00	147.00
2 1/2"	386.75	5,027.75	703.00	296.00
3"	576.15	7,489.95	1,240.00	456.00
4"	963.00	12,519.00	2,402.00	881.00
5"	1,437.00	18,681.00	5,452.00	1,506.00
6"	2,076.00	26,988.00	11,410.00	2,519.00
8"	3,173.00	41,249.00	33,380.00	5,074.00
10"	4,933.00	64,129.00	48,500.00	10,390.00
12"	6,925.00	90,025.00	121,875.00	16,960.00
14"	8,366.00	108,758.00	152,915.00	24,260.00
PIPE & FITTING (CLASS-E) 15 BAR			BEND 90d, 45d	SOCKET
SIZE	PRICE PER FT	PRICE PER LENGTH	RS./ UNIT	RS./ UNIT
	RS	RS		
1/2"	48.95	636.35	48.55	24.50
3/4"	71.10	924.30	68.95	34.00
1"	102.60	1,333.80	104.00	50.00
1 1/4"	157.85	2,052.05	164.00	88.00
1 1/2"	205.20	2,667.60	219.00	116.00
2"	323.60	4,206.80	424.00	211.00
2 1/2"	489.35	6,361.55	971.00	429.00
3"	702.45	9,131.85	1,628.00	648.00
4"	1,161.00	15,093.00	3,998.00	1,134.00
5"	1,760.00	22,880.00	7,928.00	1,957.00
6"	2,510.00	32,630.00	23,920.00	3,570.00
8"	3,852.00	50,076.00	42,500.00	6,790.00
10"	5,959.00	77,467.00	59,340.00	12,784.00
12"	8,445.00	109,785.00	146,580.00	21,490.00
14"	10,182.00	132,366.00	140,000.00	38,900.00

NOTE:

"Suggested consumer price list"

All above prices are inclusive of discounts & applicable government taxes(Sale Tax).

WAHEED SHAHZAD PLASTIC WORKS (PVT) LTD
 TEL:042-35979601-6 UAN 111-11-8782(UPVC)
 FAX:042-35979604 E-mail:info@popularpipesgroup.com



SOUTH ASIAN ELECTRICAL CONCERN

Manufacture, Contractor and Supplier of Switchgear Panels (HT,LT) and Accessories

SAEC-NM/22-52-R2-LHR

Dated: 12-01-2023

M/s. Nespak

Add: Lahore, Pakistan.

Attn: *Mr. Ahmad Munir*

SUBJECT: Bill of quantity for supply of Cable Tray & Ladder

Dear Sir,

South Asian Electrical Concern, an eminent firm all over the country for its distinctive and incomparable products of switchgear panels i.e (HT,LT) and accessories. **SAEC** inherits a wide spectrum of expertise from the rich experience and successful track record of its management team, earned over the years, which is gained through untiring efforts and facing the challenges of the era successfully to promote **SAEC** nationwide.

We are with gratification submitting you our technical and commercial proposal to make you expedient in subject cited job and hopefully looking forward to your appreciativeness. Quality work with excellence and precision is the main motive of the company.

TERMS & CONDITIONS:

1. Offered Prices / rates are Exclusive of GST.
2. 50% payment in advance in favour of **South Asian Electrical Concern** and balance before delivery.
3. Delivery time 6-8 weeks from the date of **Purchase Order** with advance payment & approval of shop drawings.
4. Inspection and Certification of equipment by your authorized persons at our works by appointment only.
5. In case of the quantum of work or any item excluding of BOQ, we will charge extra as per actual.
6. Our offer valid for 3 days. Our confirmation in writing will be necessary to extend the validity date.
7. The rates are based on Ex-work and do not cover the cost for installation and transportation at site.

Thanking you in anticipation and feel free to contact us If you have any query.

Engr. Dr. Suhail A. Qureshi

Manging Director (Cell: 0300-8477057)

Saeed ul Zaman

Director Marketing

Cell: 0300-8477067



Price Summary

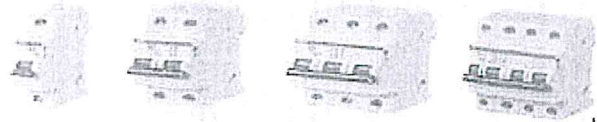
Sr. No.	Description	UOM	Qty	Rate	Total
GI Sheet, 16 SWG, Perforated Cable Tray with Cover					
1	25x25mm	Mtr	1	817	817
2	50x25mm	Mtr	1	1,061	1,061
3	50x50mm	Mtr	1	1,331	1,331
4	100x50mm	Mtr	1	1,818	1,818
5	150x50mm	Mtr	1	2,305	2,305
6	200x50mm	Mtr	1	2,791	2,791
7	100x75mm	Mtr	1	2,088	2,088
8	150x75mm	Mtr	1	2,575	2,575
9	200x75mm	Mtr	1	3,062	3,062
10	250x75mm	Mtr	1	3,548	3,548
GI Sheet, 14 SWG, Perforated Cable Tray with 16SWG Cover					
11	250x75mm	Mtr	1	4,086	4,086
12	300x100mm	Mtr	1	4,971	4,971
13	350x100mm	Mtr	1	5,519	5,519
14	400x100mm	Mtr	1	6,067	6,067
15	500x100mm	Mtr	1	7,162	7,162
16	600x100mm	Mtr	1	8,257	8,257
17	700x100mm	Mtr	1	9,353	9,353
18	800x100mm	Mtr	1	10,448	10,448
19	900x100mm	Mtr	1	11,543	11,543
GI Sheet, 14 SWG, Cable Ladder without Cover					
20	250 x 100mm	Mtr	1	2,233	2,233
21	300 x 100mm	Mtr	1	2,324	2,324
22	350 x 100mm	Mtr	1	2,415	2,415
23	400 x 100mm	Mtr	1	2,507	2,507
24	500 x 100mm	Mtr	1	2,689	2,689
25	600 x 100mm	Mtr	1	2,872	2,872
26	700 x 100mm	Mtr	1	3,054	3,054
27	800 x 100mm	Mtr	1	3,237	3,237
28	900 x 100mm	Mtr	1	3,419	3,419
Note:	Cable Tray hanging arrangements & all other accessories are not included in our offer.				

MINIATURE CIRCUIT BREAKERS (MCB)

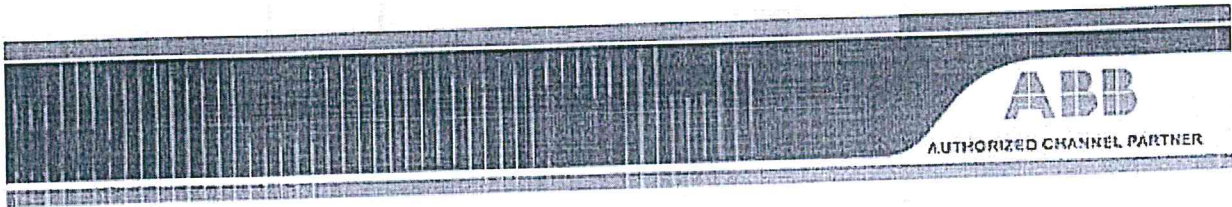
10 KA

According to IEC / EN 60898 / 60947-2

MADE IN GERMANY

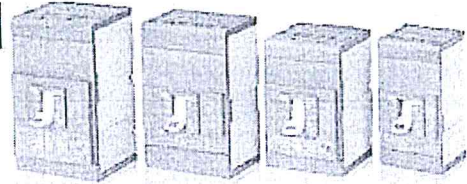


<u>RATING</u>	<u>MODEL</u>	<u>POLE / BREAKING CAPACITY</u>	<u>UNIT PRICE</u> <u>PKR</u>
S P / 10kA			
1A ~ 4A	S 201	1 Pole / 10KA	3,600
6A - 10A			1,700
16A ~ 40A			1,500
50A - 63A			1,700
D P / 10kA			
1A ~ 4A	S 202	2 Pole / 10KA	12,000
6A - 10A			5,500
16A ~ 40A			4,500
50A ~ 63A			5,500
T P / 10kA			
1A ~ 6A	S 203	3 Pole / 10KA	14,000
6A - 10A			8,500
16A ~ 40A			7,000
50A ~ 63A			8,000
F P / 10kA			
1A ~ 4A	S 204	4 Pole / 10KA	25,000
6A - 10A			13,500
16A - 40A			11,000
50A ~ 63A			12,000
Aux for MCB			
Auiliary contact 1NO/1NC	S2C-H11L	Auxiliary for MCB S200 series	8,000
Signal Contact /Auiliary Switch 1CO	S2C-S/H6R		10,000



MOULDED CASE CIRCUIT BREAKERS (MCCB)

3 POLE WITH THERMO MAGNETIC AND MICROPROCESSOR BASED RELEASES
 XT Series
MADE IN ITALY

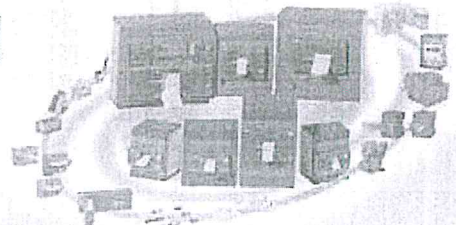


<u>RATING</u>	<u>ADJUSTABLE RANGE</u>	<u>MODEL</u>	<u>THERMAL / ELECTRONIC</u>	<u>ICS AT 415VAC</u>	<u>UNIT PRICE PKR</u>
BREAKING CAPACITY ICU "18KA"					
16 A	11 ~ 16A	XT1B 160	THERMAL	100%	16,000
20 A	14 ~ 20A	XT1B 160	THERMAL	100%	16,000
25 A	17 ~ 25A	XT1B 160	THERMAL	100%	16,000
32 A	22 ~ 32A	XT1B 160	THERMAL	100%	16,000
40 A	28 ~ 40A	XT1B 160	THERMAL	100%	16,000
50 A	35 ~ 50A	XT1B 160	THERMAL	100%	16,000
63 A	44 ~ 63A	XT1B 160	THERMAL	100%	16,000
80 A	56 ~ 80A	XT1B 160	THERMAL	100%	16,000
100 A	70 ~ 100A	XT1B 160	THERMAL	100%	16,000
125 A	87 ~ 125A	XT1B 160	THERMAL	100%	24,000
160 A	112 ~ 160A	XT1B 160	THERMAL	100%	28,000

<u>RATING</u>	<u>ADJUSTABLE RANGE</u>	<u>MODEL</u>	<u>THERMAL / ELECTRONIC</u>	<u>ICS AT 415VAC</u>	<u>UNIT PRICE PKR</u>
BREAKING CAPACITY ICU "25KA"					
25 A	17 ~ 25A	XT1C 160	THERMAL	100%	17,000
32 A	22 ~ 32A	XT1C 160	THERMAL	100%	17,000
40 A	28 ~ 40A	XT1C 160	THERMAL	100%	17,000
50 A	35 ~ 50A	XT1C 160	THERMAL	100%	17,000
63 A	44 ~ 63A	XT1C 160	THERMAL	100%	17,000
80 A	56 ~ 80A	XT1C 160	THERMAL	100%	17,000
100 A	70 ~ 100A	XT1C 160	THERMAL	100%	17,000
125 A	87 ~ 125A	XT1C 160	THERMAL	100%	25,000
160 A	112 ~ 160A	XT1C 160	THERMAL	100%	29,000

MOULDED CASE CIRCUIT BREAKERS (MCCB)

3 POLE WITH THERMO MAGNETIC AND MICROPROCESSOR BASED RELEASES
MADE IN ITALY



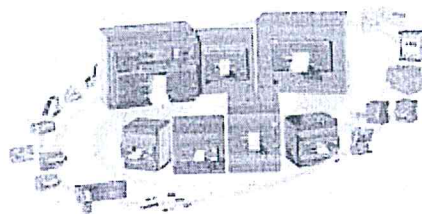
<u>RATING</u>	<u>ADJUSTABLE RANGE</u>	<u>MODEL</u>	<u>THERMAL / ELECTRONIC</u>	<u>ICS AT 415VAC</u>	<u>UNIT PRICE PKR</u>
BREAKING CAPACITY ICU "36KA"					
32 A	22 - 32A	XT1N 160	THERMAL	100%	20,000
40 A	28 ~ 40A	XT1N 160	THERMAL	100%	20,000
50 A	35 - 50A	XT1N 160	THERMAL	100%	20,000
63 A	44 - 63A	XT1N 160	THERMAL	100%	20,000
80 A	56 - 80A	XT1N 160	THERMAL	100%	20,000
100 A	70 - 100A	XT1N 160	THERMAL	100%	20,000
125 A	87 - 125A	XT1N 160	THERMAL	100%	30,000
160 A	112 - 160A	XT1N 160	THERMAL	100%	36,000
250 A	175 - 250A	XT3N 250	THERMAL	75%	58,000
250 A	175 - 250A	XT4N 250	THERMAL	100%	58,000
320 A	128 - 320A	T5N 400	ELECTRONIC	100%	85,000
400 A	160 ~ 400A	T5N 400	ELECTRONIC	100%	85,000
630 A	250 ~ 630A	T5N 630	ELECTRONIC	100%	110,000
800 A	320 - 800A	T6N 800	ELECTRONIC	100%	220,000
1000 A	400 ~ 1000A	T6N 1000	ELECTRONIC	100%	245,000

ABB

AUTHORIZED CHANNEL PARTNER

MOULDED CASE CIRCUIT BREAKERS (MCCB)

3 POLE WITH THERMO MAGNETIC AND
MICROPROCESSOR BASED RELEASES
MADE IN ITALY



<u>RATING</u>	<u>ADJUSTABLE RANGE</u>	<u>MODEL</u>	<u>THERMAL / ELECTRONIC</u>	<u>ICS AT 415VAC</u>	<u>UNIT PRICE PKR</u>
BREAKING CAPACITY ICU "50KA"					
16 A	12.5 - 16A	XT2S 160	THERMAL	100%	34,000
20 A	16 - 20A	XT2S 160	THERMAL	100%	34,000
25 A	17 - 25A	XT2S 160	THERMAL	100%	34,000
32 A	22 - 32A	XT2S 160	THERMAL	100%	34,000
40 A	28 - 40A	XT2S 160	THERMAL	100%	34,000
50 A	35 - 50A	XT2S 160	THERMAL	100%	34,000
63 A	44 - 63A	XT2S 160	THERMAL	100%	34,000
80 A	56 - 80A	XT2S 160	THERMAL	100%	34,000
100 A	70 - 100A	XT2S 160	THERMAL	100%	34,000
125 A	87 - 125A	XT2S 160	THERMAL	100%	42,000
160 A	112 - 160A	XT2S 160	THERMAL	100%	44,000
200 A	140 - 200A	XT4S 250	THERMAL	100%	70,000
250 A	175 - 250A	XT4S 250	THERMAL	100%	70,000
320 A	128 - 320A	T5S 400	ELECTRONIC	100%	110,000
400 A	160 - 400A	T5S 400	ELECTRONIC	100%	110,000
630 A	250 - 630A	T5S 630	ELECTRONIC	100%	135,000
800 A	320 - 800A	T6S 800	ELECTRONIC	100%	245,000
1000 A	400 - 1000A	T6S 1000	ELECTRONIC	100%	270,000
1250 A	500 - 1250A	T7S 1250	ELECTRONIC	100%	294,000
1250 A (for motorized)	500 - 1250A	T7S 1250 M	ELECTRONIC	100%	304,000
1600 A	640 - 1600A	T7S 1600	ELECTRONIC	100%	340,000
1600 A (for motorized)	640 - 1600A	T7S 1600 M	ELECTRONIC	100%	360,000

Note: Spring Charging Motor can be installed in T7S 1250 M & T7S 1600 M.

AIR CIRCUIT BREAKERS (ACB)

EMAX 2 Series (Digital Touch Screen Display)

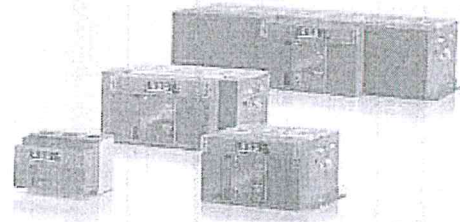
3 POLE ADJUSTABLE

Rated Service Voltage 690V

Rated insulation voltage 1000V

Rated impulse withstand voltage Uimp 12KV

MADE IN ITALY



According to IEC60947-2

RATING	ADJUSTABLE RANGE	MODEL	BREAKING CAPACITY AT 415VAC		UNIT PRICE PKR
			ICU	ICS	
			1250 AMPS	500 ~ 1250A		E1.2N 1250	66 KA	75%	560,000
1600 AMPS	640 ~ 1600A	E1.2N 1600	66 KA	75%	600,000
1000 AMPS	400 ~ 1000A	E2.2N 1000	66 KA	100%	590,000
1250 AMPS	500 ~ 1250A	E2.2N 1250	66 KA	100%	590,000
1600 AMPS	640 ~ 1600A	E2.2N 1600	66 KA	100%	650,000
2000 AMPS	800 ~ 2000A	E2.2N 2000	66 KA	100%	735,000
2500 AMPS	1000 ~ 2500A	E2.2N 2500	66 KA	100%	935,000
3200 AMPS	1280 ~ 3200A	E4.2N 3200	66 KA	100%	1,150,000
4000 AMPS	1600 ~ 4000A	E4.2N 4000	66 KA	100%	1,600,000
1000 AMPS	400 ~ 1000A	E2.2S 1250	85 KA	100%	675,000
1250 AMPS	500 ~ 1250A	E2.2S 1250	85 KA	100%	675,000
1600 AMPS	640 ~ 1600A	E2.2S 1600	85 KA	100%	725,000
2000 AMPS	800 ~ 2000A	E2.2S 2000	85 KA	100%	875,000
2500 AMPS	1000 ~ 2500A	E2.2S 2500	85 KA	100%	1,050,000
3200 AMPS	1280 ~ 3200A	E4.2S 3200	85 KA	100%	1,300,000
4000 AMPS	1600 ~ 4000A	E4.2S 4000	85 KA	100%	1,725,000
1000 AMPS	400 ~ 1000A	E2.2H 1250	100 KA	100%	695,000
1250 AMPS	500 ~ 1250A	E2.2H 1250	100 KA	100%	695,000
1600 AMPS	640 ~ 1600A	E2.2H 1600	100 KA	100%	770,000
2000 AMPS	800 ~ 2000A	E2.2H 2000	100 KA	100%	930,000
2500 AMPS	1000 ~ 2500A	E2.2H 2500	100 KA	100%	1,100,000
3200 AMPS	1280 ~ 3200A	E4.2H 3200	100 KA	100%	1,400,000
4000 AMPS	1600 ~ 4000A	E4.2H 4000	100 KA	100%	1,800,000
5000 AMPS	2000 ~ 5000A	E6.2H 5000	100 KA	100%	On Request
6300 AMPS	2820 ~ 6300A	E6.2H 6300	100 KA	100%	On Request

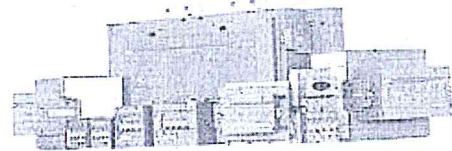
Note: Other types available on request (Withdrawable / Extra High Breaking Capacities).

ABB

AUTHORIZED CHANNEL PARTNER

3 POLE MAGNETIC CONTACTORS

NEW AF SERIES (Electronic Coil)
Made in FRANCE



<u>MODEL</u>	<u>CONTACT ARRANGEMENT</u>	<u>CAPACITY KW / HP</u>	<u>OPERATIONAL AMPERE AC-3</u>	<u>1th THERMAL AMPERE AC-1</u>	<u>UNIT PRICE PKR</u>
(100-250V AC/DC 50/60HZ):					
AF09-30-10-13	1 NO	4 / 5.0	9	25	4,500
AF12-30-10-13	1 NO	5.5 / 7.5	12	28	5,000
AF16-30-10-13	1 NO	7.5 / 10	18	30	6,500
AF26-30-00-13	-----	11 / 15	26	45	8,500
AF30-30-00-13	-----	15 / 20	32	50	12,000
AF40-30-11-13	1 NO + 1 NC	18.5 / 30	40	70	22,000
AF52-30-11-13	1 NO + 1 NC	22 / 40	53	100	24,000
AF65-30-11-13	1 NO + 1 NC	30 / 50	65	105	28,000
AF80-30-11-13	1 NO + 1 NC	37 / 80	80	125	36,000
AF96-30-11-13	1 NO + 1 NC	45 / 60	96	130	38,000
Made in SWEDEN					
AF116-30-11-13	1 NO + 1 NC	55 / 75	110	160	42,000
AF146-30-11-13	1 NO + 1 NC	75 / 100	145	200	49,000
AF190-30-11-13	1 NO + 1 NC	90 / 125	185	250	94,000
AF205-30-11-13	1 NO + 1 NC	110 / 150	205	350	113,000
AF265-30-11-13	1 NO + 1 NC	132 / 200	265	400	128,000
AF305-30-11-13	1 NO + 1 NC	160 / 250	305	500	160,000
AF370-30-11-13	1 NO + 1 NC	200 / 300	370	600	190,000
AF400-30-11	1 NO + 1 NC	200 / 350	400	600	210,000
AF460-30-11	1 NO + 1 NC	250 / 400	460	700	230,000
AF580-30-11	1 NO + 1 NC	315 / 500	580	800	360,000
AF750-30-11	1 NO + 1 NC	400 / 600	750	1050	950,000
AF1350-30-11	1 NO + 1 NC	475 / 800	860	1350	On Request
AF1650-30-11	1 NO + 1 NC	560 / 900	1050	1650	On Request

Note: Other Voltage Range of 24-60V, 48 - 130V, 250 - 500V also available. Price and delivery on request.

legrand

PRICE LIST

Dated: 01.01.2022

Miniature Circuit Breakers

Rating	Model	AC Breaking IEC 898 & BS-EN 60-898/ EN 60-898/ IEC 60-898. @ 230/400V	Capacity IEC 60947-2 @ 230/400V	Unit Price In Rupees
--------	-------	--	---------------------------------------	-------------------------

1-Pole:

6A, 10A	LR / RX ³	6KA	6KA	1,350.00
16A, 20A, 25A, 32A, 40A	LR / RX ³	6KA	6KA	1,250.00
50A, 63A	LR / RX ³	6KA	6KA	1,500.00
1A, 2A, 3A, 4A	DX ²	6KA	10KA	3,150.00
6A, 10A	TX ³	10KA	10KA	2,150.00
16A, 20A, 25A, 32A, 40A	TX ³	10KA	10KA	2,100.00
50A, 63A	TX ³	10KA	10KA	2,600.00

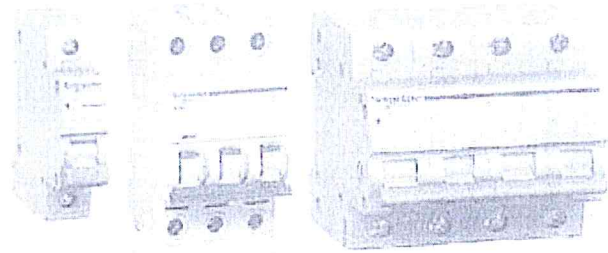
2-Pole:

6A, 10A	LR / RX ³	6KA	6KA	3,200.00
16A, 20A, 25A, 32A, 40A	LR / RX ³	6KA	6KA	3,000.00
50A, 63A	LR / RX ³	6KA	6KA	4,300.00
6A, 10A	TX ³	10KA	10KA	5,700.00
16A, 20A, 25A, 32A, 40A	TX ³	10KA	10KA	5,500.00
50A, 63A	TX ³	10KA	10KA	6,500.00

Continued P. # -09

Ref. # PL/SE-21-10

Miniature Circuit Breakers



Domae, Acti-9, iC60N, C120N & C60H-DC

1 POLE

Type	Ratings	Icu	Icu	Price
		IEC 898	IEC 947-2	
Domae, C Curve	6, 10, Amps	6 kA	-	1,150
Domae, C Curve	16, 20, 25 Amps	6 kA	-	1,000
Domae, C Curve	32, 40 Amps	6kA	-	1,100
iC60N, C Curve	2, 4 Amps	6 kA	10 kA	4,300
iC60N, C Curve	6, 10 Amps	6 kA	10 kA	2,000
iC60N, C Curve	16, 20 Amps	6 kA	10 kA	1,600
iC60N, C Curve	25, 32, 40 Amps	6 kA	10 kA	1,700
iC60N, C Curve	50, 63 Amps	6 kA	10 kA	2,000

2 POLE

Domae, C Curve	6, 10, Amps	6 kA	-	4,250
Domae, C Curve	16, 20, 25 Amps	6 kA	-	3,500
Domae, C Curve	32, 40 Amps	6 kA	-	3,700
iC60N, C Curve	2, 4 Amps	6 kA	10 kA	15,000
iC60N, C Curve	6, 10 Amps	6 kA	10 kA	6,700
iC60N, C Curve	16, 20 Amps	6 kA	10 kA	5,300
iC60N, C Curve	25, 32, 40 Amps	6 kA	10 kA	5,700
iC60N, C Curve	50, 63 Amps	6 kA	10 kA	6,100

3 POLE

Domae, C Curve	6, 10 Amps	6 kA	-	6,700
Domae, C Curve	16, 20, 25 Amps	6 kA	-	5,500
Domae, C Curve	32, 40 Amps	6 kA	-	5,700
iC60N, C Curve	6, 10 Amps	6 kA	10 kA	10,000
iC60N, C Curve	16, 20 Amps	6 kA	10 kA	8,000
iC60N, C Curve	25, 32, 40 Amps	6 kA	10 kA	8,500
iC60N, C Curve	50, 63 Amps	6 kA	10 kA	9,500
C120N	80, 100 Amps	-	10 kA	24,000

legrand

Made In Italy

PRICE LIST

Dated: 01.01.2022

Moulded Case Circuit Breakers

Rating	Trip Range	Model	Breaking Capacity 380-415 VAC/ 250 VDC IEC 60947-2, Icu/Ics(%)	Unit Price In Rupees
--------	------------	-------	--	-------------------------

MCCBs 3-POLE.

ADJUSTABLE STANDARD MODELS:

TRIP SETTING: 0.8-1xIn.

16A	11.25-16A	DPX ³ -160	16KA/100%	18,000.00
25A	18.00-25A	DPX ³ -160	16KA/100%	18,000.00
40A	28.00-40A	DPX ³ -160	16KA/100%	18,000.00
63A	45.00-63A	DPX ³ -160	16KA/100%	18,000.00
100A	70.00-100A	DPX ³ -160	16KA/100%	18,000.00
125A	88.00-125A	DPX ³ -160	16KA/100%	25,000.00

TRIP SETTING: 0.8-1xIn.

16A	11.25-16A	DPX ³ -160	25KA/100%	22,000.00
25A	18.00-25A	DPX ³ -160	25KA/100%	22,000.00
40A	28.00-40A	DPX ³ -160	25KA/100%	22,000.00
63A	45.00-63A	DPX ³ -160	25KA/100%	22,000.00
100A	70.00-100A	DPX ³ -160	25KA/100%	22,000.00
125A	88.00-125A	DPX ³ -160	25KA/100%	32,000.00
160A	102.4-160A	DPX ³ -160	25KA/100%	38,000.00

TRIP SETTING: 0.8-1xIn.

16A	11.25-16A	DPX ³ -160	36KA/100%	27,000.00
25A	18.00-25A	DPX ³ -160	36KA/100%	27,000.00
40A	28.00-40A	DPX ³ -160	36KA/100%	27,000.00
63A	45.00-63A	DPX ³ -160	36KA/100%	27,000.00
100A	70.00-100A	DPX ³ -160	36KA/100%	27,000.00
125A	88.00-125A	DPX ³ -160	36KA/100%	33,000.00
160A	102.4-160A	DPX ³ -160	36KA/100%	45,000.00
200A	128 - 200A	DPX ³ -250	36KA/100%	57,000.00
250A	160 - 250A	DPX ³ -250	36KA/100%	57,000.00

THERMAL AND MAGNETIC ADJUSTABLE:

TRIP SETTING: THERMAL: 0.8-1xIn AND MAGNETIC: 5-10xIn.

320A	260 -320A	DPX ³ -630	36KA/100%	87,000.00
400A	320 -400A	DPX ³ -630	36KA/100%	87,000.00
500A	400 -500A	DPX ³ -630	36KA/100%	135,000.00
630A	500 -630A	DPX ³ -630	36KA/100%	135,000.00

Continued P. # -03

legrand

Made In Italy

PRICE LIST

Dated: 01.01.2022

Moulded Case Circuit Breakers

Rating	Trip Range	Model	Breaking Capacity 380-415 VAC/ 250 VDC IEC 60947-2, Icu/Ics(%)	Unit Price In Rupees
--------	------------	-------	--	-------------------------

MCCBs 3-POLE.

Adjustable Standard Models.

TRIP SETTING: 0.8-1xIn.

63A	40.32-63A	DPX ³ -160	50KA/100%	36,000.00
100A	64 -100A	DPX ³ -160	50KA/100%	36,000.00
160A	102.4-160A	DPX ³ -160	50KA/100%	55,000.00
250A	160 -250A	DPX ³ -250	50KA/100%	71,500.00

TRIP SETTING: THERMAL: 0.8-1xIn AND MAGNETIC: 5-10xIn.

400A	320 -400A	DPX ³ -630	50KA/100%	105,000.00
630A	500 -630A	DPX ³ -630	50KA/100%	145,000.00
800A	640 -800A	DPX ³ -1600	50KA/100%	240,000.00
1000A	800-1000A	DPX ³ -1600	50KA/100%	285,000.00
1250A	1000-1250A	DPX ³ -1600	50KA/100%	300,000.00

STANDARD ELECTRONIC MODELS:

TRIP SETTING: 0.4-1xIr.

1600A	640 -1600A	DPX ³ -1600	50KA/100%	460,000.00
-------	------------	------------------------	-----------	------------

EXTRA HIGH BREAKING CAPACITY:

THERMAL AND MAGNETIC ADJUSTABLE:

TRIP SETTING: THERMAL: 0.8-1xIn AND MAGNETIC: 5-10xIn.

100A	70.00 - 100A	DPX ³ -H 250	70KA/100%	40,000.00
160A	102.4 - 160A	DPX ³ -H 250	70KA/100%	65,000.00
250A	160 - 250A	DPX ³ -H 250	70KA/100%	80,000.00

TRIP SETTING: THERMAL: 0.8-1xIn AND MAGNETIC: 5-10xIn.

320A	260 -320A	DPX ³ -H 630	70KA/100%	130,000.00
400A	320 -400A	DPX ³ -H 630	70KA/100%	130,000.00
500A	400 -500A	DPX ³ -H 630	70KA/100%	170,000.00
630A	500 -630A	DPX ³ -H 630	70KA/100%	170,000.00
800A	640 -800A	DPX ³ -H 1600	70KA/100%	275,000.00
1000A	800-1000A	DPX ³ -H 1600	70KA/100%	345,000.00
1250A	1000-1250A	DPX ³ -H 1600	70KA/100%	360,000.00

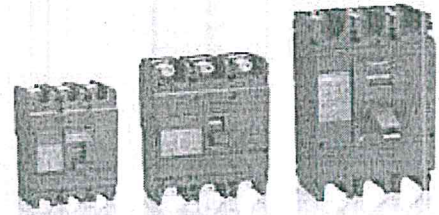
STANDARD ELECTRONIC MODELS:

TRIP SETTING: 0.4-1xIr.

1600A	640 -1600A	DPX ³ -H 1600	70KA/100%	490,000.00
-------	------------	--------------------------	-----------	------------

Continued P. # -04

Molded Case Circuit Breakers



3 POLE MCCB - EasyPact with Fixed Thermal-Magnetic Trip

Type	Ratings	Icu	Ics = % of Icu	Price
EZC100B	15, 20, 30, 40, 50, 60 Amps	7.5 kA	25%	12,000
EZC100F	15, 20, 30, 40, 50, 60, 80, 100 Amps	10 kA	50%	13,000
EZC100N	15, 20, 30, 40, 50, 60, 80, 100 Amps	15 kA	50%	14,000
EZC100H	15, 20, 30, 40, 50, 60, 80, 100 Amps	30 kA	25%	20,000
EZC250F	125, 150 Amps	18 kA	50%	30,000
EZC250F	200 Amps	18 kA	50%	32,000
EZC250F	225, 250 Amps	18 kA	50%	34,000
EZC250N	125, 150 Amps	25 kA	50%	32,000
EZC250N	200, 225, 250 Amps.	25 kA	50%	42,000
EZC250H	125, 150 Amps	36 kA	50%	39,000
EZC250H	200, 225 Amps	36 kA	50%	56,000
EZC250H	250 Amps	36 kA	50%	60,000
EZC400N	320, 400 Amps	36 kA	50%	85,000
EZC400H	320, 400 Amps	50 kA	50%	105,000

4 POLE MCCB - EasyPact with Fixed Thermal-Magnetic Trip

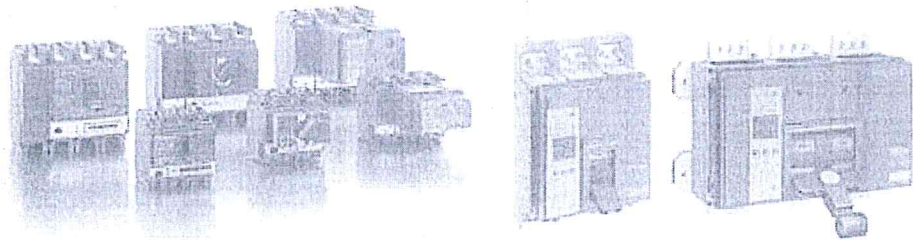
Type	Ratings	Icu	Ics = % of Icu	Price
EZC100H	15, 20, 30, 40, 50, 63, 80, 100 Amps	30 kA	50%	32,000
EZC250H	125 Amps	36 kA	50%	60,000
EZC250H	150, 200 Amps	36 kA	50%	70,000
EZC250H	250 Amps	36 kA	50%	85,000
EZC400H	320, 400 Amps	50 kA	50%	140,000

Optional Accessories for EasyPact

Type	Description	Price
EZAUX10	Aux Switch for EZC100	7,000
EZEAX	Aux Switch for EZC250	7,000
EZAROTDS	Direct Rotary Handle for EZC100	13,000
EZEROTDS	Direct Rotary Handle for EZC250	13,000
EZAROTE	Extended Rotary handle for EZC100	17,000
EZEROTE	Extended Rotary handle for EZC250	17,000

Ref. # PL/SE-21-10

**Molded Case
Circuit Breakers**



**3 POLE Compact NSX Molded Case Circuit Breakers
With Adjustable Thermal-Magnetic Trip (70 - 100%)**

Type	Ratings	Icu	Ics = % of Icu	Price
NSX100F TM-D	16, 25, 32, 40, 50, 63, 80, 100 Amps	36 kA	100%	27,500
NSX160F TM-D	125 Amps	36 kA	100%	40,000
NSX160F TM-D	160 Amps	36 kA	100%	49,000
NSX250F TM-D	200, 250 Amps	36 kA	100%	75,000
NSX100H TM-D	16, 25, 32, 40, 50, 63, 80, 100 Amps	70 kA	100%	45,000
NSX160H TM-D	125 Amps	70 kA	100%	53,000
NSX160H TM-D	160 Amps	70 kA	100%	63,000
NSX250H TM-D	200, 250 Amps	70 kA	100%	95,000

**3 POLE Compact NSX & NS Molded Case Circuit Breakers
With Adjustable Electronic Trip (40 - 100%)**

Type	Ratings	Icu	Ics = % of Icu	Price
NSX400N (Micrologic 2.3)	400 Amps. Adj. 160 to 400A	50 kA	100%	140,000
NSX630N (Micrologic 2.3)	630 Amps. Adj. 250 to 630A	50 kA	100%	175,000
NSX400H (Micrologic 2.3)	400 Amps. Adj. 160 to 400A	70 kA	100%	180,000
NSX630H (Micrologic 2.3)	630 Amps. Adj. 250 to 630A	70 kA	100%	210,000

Type	Ratings	Icu	Ics = % of Icu	Price
NS800N (Micrologic 2.0)	800 Amps Adj. 320 to 800A	50 kA	100%	310,000
NS1000N (Micrologic 2.0)	1000 Amps Adj. 400 to 1000A	50 kA	100%	365,000
NS1250N (Micrologic 2.0)	1250 Amps Adj. 500 to 1250A	50 kA	100%	375,000
NS1600N (Micrologic 2.0)	1600 Amps Adj. 640 to 1600A	50 kA	75%	470,000
NS800H (Micrologic 2.0)	800 Amps Adj. 320 to 800A	70 kA	75%	360,000
NS1000H (Micrologic 2.0)	1000 Amps Adj. 400 to 1000A	70 kA	75%	435,000
NS1250H (Micrologic 2.0)	1250 Amps Adj. 500 to 1250A	70 kA	75%	450,000
NS1600H (Micrologic 2.0)	1600 Amps Adj. 640 to 1600A	70 kA	50%	540,000



Push Buttons & Lights

Made in Italy

8LM Series Push Buttons, Selectors & Lights

Operational Characteristics

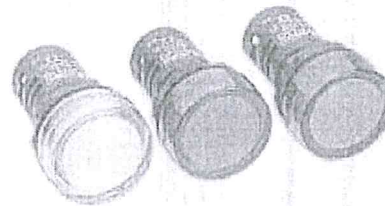
- Any mounting position is allowed.
- Ambient conditions: Operating temperature: -25...+60°C, Storage temperature: -40...+70°C
- Mechanical Endurance: Spring return: 1,000,000 cycles, Push-push: 500,000 cycles
- Degree of protection: Per IEC/EN: IP66, IP67 and IP69K

PRICE-EACH

I. "LOVATO" Monoblock Pilot Lights: LED: 22mm

8LP2T ILM4P+	230VAC	Red
8LP2T ILM3P+	230VAC	Green
8LP2T ILM5P+	230VAC	Yellow
8LP2T ILM6P+	230VAC	Blue
8LP2T ILM8P+	230VAC	White

LPM LM3	230VAC	Green
LPM LM4	230VAC	Red
LPM LM5	230VAC	Yellow
LPM LM6	230VAC	Blue
LPM LM7	230VAC	White



Rs.1,100/=
Rs.1,100/=
Rs.1,100/=
Rs.1,100/=
Rs.1,100/=
Rs.1,150/=
Rs.1,150/=
Rs.1,150/=
Rs.1,150/=
Rs.1,150/=

II. "LOVATO" Push Buttons with Mounting Block⁺: 22mm: Momentary

A) Red (N.C):

Pushbutton	8LM2TB104 (Rs.1,000)
Contact Block	8LM2TC01 (Rs. 600)
Mounting	8LM2TAU120(Rs. 450)

B) Green (N.O):

Pushbutton	8LM2TB103 (Rs.1,000)
Contact Block	8LM2TC10 (Rs. 600)
Mounting	8LM2TAU120(Rs. 450)



Rs.2,050/=
Rs. 2,050/=

III. "LOVATO" ILLUMINATED Push Buttons with Mounting BLOCK: 22mm: Momentary

A) Red (N.C):

Illuminated Pushbutton	8LP2TBL104 (Rs.1,500)
Red LED Lamp Holder	8LM2TLM4 (Rs.3,200)
Contact Block:	8LM2TC01 (Rs. 600)
Mounting:	8LM2TAU120(Rs. 450)

B) Green (N.O):

Illuminated Pushbutton	8LP2TBL103 (Rs.1,500)
Red LED Lamp Holder	8LM2TLM3 (Rs.3,200)
Contact Block:	8LM2TC10 (Rs. 600)
Mounting:	8LM2TAU120(Rs. 450)

Rs. 5,750/=
Rs. 5,750/=

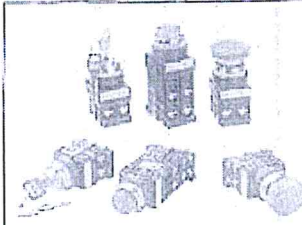
VI. "LOVATO" Control Selector Switches (I-0-II) ⁺

A) Control Selection Switches

Selector	8LP2TS2303 (Rs. 3,100)
Contact:	8LM2TC10 x2 (Rs. 600x2)
Mounting:	8LM2TAU120 (Rs. 450)

Rs. 4,750/=

⁺ Available till stock lasts, Replacement "Platinum Series" on next page.



MARUYASU

Push Buttons and Pilot Lights

Made in Japan

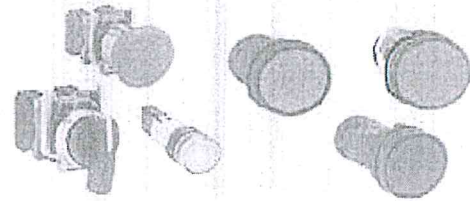


	<u>TYPE</u>	<u>TYPE</u>	<u>CONTACTS</u>	<u>PRICE-EACH</u>
<u>Push Buttons:</u>				
1. Round Push Buttons, 25mm Dia with Green Cap for "ON"	FLUSH	A25PF10G	1A	Rs. 1,300/=
2. Round Push Buttons, 25mm Dia with Red Cap for "OFF"	FLUSH	A25PF01R	1B	Rs. 1,300/=
3. Round Push Buttons, 25mm Dia with Red, Green & Yellow Caps	FLUSH	A25PF11RGY	1A+1B	Rs. 1,950/=
4. Round Push Buttons, 30mm Dia with Green Cap for "ON"	FLUSH	A30PF10G	1A	Rs. 1,400/=
5. Round Push Buttons, 30mm Dia with Red Cap for "OFF"	FLUSH	A30PF01R	1B	Rs. 1,400/=
6. Round Push Buttons, 30mm Dia with Red, Green & Yellow Caps.	FLUSH	A30PF11RGY	1A+1B	Rs. 2,050/=
7. Round Push Buttons, 25mm Dia Roto Lock, Red Cap	PUSH LOCK TURN RESET	A25PMD01R	1B	Rs. 3,500/=
8. Round Push Button, 25mm Dia Roto Lock, Red Cap	PUSH LOCK TURN RESET	A25PMD11R	1A+1B	Rs. 4,250/=
9. Round Push Button, 25mm Dia (key Locked in turned position)	KEY LOCK	A25SK2-11CB	1A+1B	Rs. 6,500/=
10. Round Push Button 30mm Dia Roto Lock, Red Cap	PUSH LOCK KEY RESET	XMDK-3011R	1A+1B	Rs. 7,950/=
<u>Selector Switches:</u>				
11. Selector Switch, 30mm Dia, 2-Position		A30SN211	1A+1B	Rs. 2,400/=
12. Selector Switch, 30mm Dia, 3-Position		A30SN311	1A+1B	Rs. 3,200/=
<u>Pilot Lights:</u>				
13. Pilot Light w/Round head, w/Transformer 220V 25mm Dia, Red, Green, Yellow or Blue		A25ILT220	---	Rs. 2,950/=
14. Pilot Light w/Square head, w/Transformer 220V 25mm Square, Red, Green, Yellow or Blue		A25ILTSB220	---	Rs. 2,950/=
<u>Illuminated Push Buttons:</u>				
15. Illuminated Push Button w/Transformer 220V, 25mm Dia Red, Green or Yellow		A25FT-220-11	1A+1B	Rs. 4,300/=
<u>Spares:</u>				
16. Spare Contact Block Suitable for items 1 to 9 above			1A or 1B	Rs. 550/=
17. Spare Lens for Pilot Lights Suitable for items 13 and 15				Rs. 400/=

All MARUYASU Push Buttons & Pilot Lights (Round) are with metal collar for long and durable life. The Protective structure is IP65 (jet- proof type) and oil proof type.

NOTE:

This list is subject to change without notice and goods being in stock. The prices in the list are reference prices and not sale prices. Discounts/Multipliers are applicable. The delivery, packing and forwarding charges are extra. All despatches are made on buyer's risk and account.



Control & Indication Products

Pushbuttons Plastic Circular Bezel - Flush, Spring Return				
1 NO	Black		XB7NA21	1,600
1 NO	Green		XB7NA31	1,600
1 NC	Red		XB7NA42	1,600
Pushbuttons Plastic Circular Bezel - Flush, Push-to-Release				
1 NO	Black		XB7NH21	3,500
1 NO	Green		XB7NH31	3,500
Emergency Stop Pushbuttons - Ø40				
1 NC	Red	Turn to Release	XB4BS8442	7,000
Selector Switches Complete				
1 NO	Black	Sel. Switch, 2 pos. stayput	XB7ND21	1,900
1 NO + 1 NC	Black	Sel. Switch, 2 pos. stayput	XB7ND25	3,000
2 NO	Black	Sel. Switch, 3 pos. stayput	XB7ND33	2,600
1 NO	Black	Key Switch 2 pos. Stayput	XB7NG21	4,500
2 NO	Black	Key Switch 3 pos. Stayput	XB7NG33	5,000
Pilot Lights with Integral LED				
230...240VAC	Green		XB7EV03MP	1,250
	Red		XB7EV04MP	1,250
	Yellow		XB7EV05MP	1,250
	Orange		XB7EV08MP	1,250
	Blue		XB7EV06MP	1,250
	Clear		XB7EV07MP	1,250
Illuminated Pushbuttons: Complete, Spring Return, Direct Supply, for BA 9s Bulb, U y 250 V, 2.4 W Max (Bulb not Included)				
<=250VDC, 1NO + 1NC	White		XB4BW3165	6,000
	Green		XB4BW3365	6,000
	Red		XB4BW3465	6,000
	Orange		XB4BW3565	6,000



Made In Turkey

PRICE LIST

Dated: 01-01-2022

SWITCHBOARD INSTRUMENTS

<u>Model</u>	<u>Description</u>	<u>Unit Price</u>
<u>Digital Ampere Meters:</u>		
EPM-4D-96	96 x 96 1A TO 10000/5A	7,000.00
EPM-4C-96	96 x 96 1A to 10000/5A, Output Contact, Under / Over set points, Instant Tripping Function, Programmable Fault & Fault Recovery Delay	10,500.00
EPM-4D-72	72 x 72 1A TO 10000/5A	7,000.00
EPM-4C-72	72 x 72 1A to 10000/5A, Output Contact, Under / Over set points, Instant Tripping Function, Programmable Fault & Fault Recovery Delay	10,500.00
EPM-4A-72	72 x 72 1.2 A TO 210A, Direct Connect Ammeter	9,000.00
EPM-4D-48	48 x 96 1A TO 10000/5A	7,500.00
<u>Digital Volt Meters:</u>		
EVM-3-96	96 x 96 0-600 Volt	6,500.00
EVM-3-72	72 x 72 0-600 Volt	6,500.00
EVM-3-48	48 x 96 0-600 Volt	7,000.00
EVM-3S-96	96 x 96 0-600 Volt Built in Selector Switch	7,500.00
EVM-3S-72	72 x 72 0-600 Volt Built in Selector Switch	7,000.00
<u>Din Type Volt & Ampere Meter (Digital) True Rms:</u>		
EVM-R3	0-600 Volt	9,000.00
EPM-R4D	1-10000/5A	10,000.00
<u>Digital Frequency Meter:</u>		
EFC-3-96	96 x 96 220V & 415V	9,500.00
EFC-3-48	48 x 96 415V	9,500.00

Note:

This list is subject to change without notice and goods being in stock. The prices in the list are reference prices and not sale prices. Discounts/Multiplies are applicable. The delivery, packing and forwarding charges are extra. All dispatches are made on buyer's risk and account.

Continued P. # -19

Autonics

Digital Panel Meters

Made in S. Korea

Ref. No. AU03 / S.No. 68
16th September, 2019

I) DIGITAL PANEL METERS



1. DIGITAL AC AMMETER+

Model: M4W-AA 96x48 mm
 Ranges: 0 - 60A, 0 - 100A, 0 - 200A, 0 - 400A, 0 - 800A, 0 - 1000A, 0 - 1999A
 With 3½ Digits, 0.55" LED Display
 Power Supply: 110V/220VAC
 Suitable for use with 60/5A, 100/5A, 200/5A, 400/5A, 800/5A, 1000/5A or 1999/5A CT
 Other current ranges available on request

PRICE EACH

Rs 14,000/=

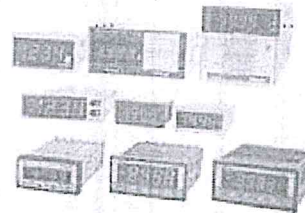
2. DIGITAL PROGRAMMABLE AC AMMETER

Model: MT4W-AA 96x48 mm
 Range: 0 - 2500A / 0 - 3200A / 0 - 4000A / 0 - 5000A / 0 - 6300A
 With 4 Digits, 0.55" LED Display
 Power Supply: 100 ~ 240VAC ± 10%
 Suitable for use with 2500/5A, 3200/5A, 4000/5A, 5000/5A, 6300A/5A CT

Rs 16,000/=

3. DIGITAL PROGRAMMABLE AC VOLTMETER

Model: MT4W-AV 96x48 mm
 4-Digit Display with Data Hold Facility
 Power Supply: 100 ~ 240VAC ± 10%
 Selectable: RMS or AVG value display
 Accuracy: F.S. ± 0.3%
 Also suitable for 11KV/110V PT
 Other input ranges: 50V and 5V



Rs 16,000/=

Model: MT4Y-AV 72x36 mm
 4-Digit Display with Data Hold Facility
 Power Supply: 100 ~ 240VAC ± 10%
 Selectable: RMS or AVG value display
 Accuracy: F.S. ± 0.3%

Rs 18,000/=

4. DIGITAL PROGRAMMABLE DC AMMETER

Model: MT4W-DA 96x48 mm
 4-Digit Display with Data Hold Facility
 Power Supply: 100 ~ 240VAC ± 10%
 Accuracy: F.S. ± 0.1%
 Good for analog signals

Rs 17,200/=

Input Ranges

0 ~ 2mA
 0 ~ 20mA
 0 ~ 500mA
 0 ~ 5A

Display

0 ~ 100.0 or any display range
 from -999 to 9999

+ Available till stock lasts.

Autonics

Page # 2/2

PRICE-EACH

5. DIGITAL PROGRAMMABLE DC VOLTMETER

Model: MT4W-DV 96x48 mm Rs 17,200/=

4-Digit Display with Data Hold Facility
Power Supply: 100 ~ 240VAC ± 10%
Accuracy: F.S. ± 0.1%

Input Ranges

0 ~ 50mV
0 ~ 5V/1V
0 ~ 50V/10V
0 ~ 500V/100V

- Good for analog signals

Display

0 ~ 100.0 or any display range
from -999 to 9999

Optional Outputs Models:

- Relay Output
- NPN/PNP Open Collector + BCD O/P
- Open Collector Output + Current 4 – 20mA O/P
- Open Collector Output + RS485 Output
- Open Collector Output + Low Speed Serial Output

Model: MT4Y-DV 72x36 mm Rs 18,500/=

4-Digit Display with Data Hold Facility
Power Supply: 100 ~ 240VAC ± 10%
Accuracy: F.S. ± 0.1%



6. SCALING METER

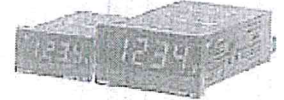
Model: M4YS-NA 72x36 mm Rs 18,000/=

Loop powered type: Power from measured input
Measured input DC4-20mA
Max Display Range: -1999 to 9999
Pre-scale Function (High/Low scale setting)
4-Digit LED Display

NOTE:

This list is subject to change without notice and goods being in stock. The prices in the list are reference prices and not sale prices. Discounts/Multipliers are applicable. The delivery, packing and forwarding charges are extra. All despatches are made on buyer's risk and account.

INDEX



PRICELIST

PL - 56

October-2021

DIGITAL PANEL METERS

MODEL	DESCRIPTION	UNIT PRICE (Rupees)
MP3-4AA	DIGITAL AMPERE METER RANGE: 0 TO 9999 AMPERE (C.T OPERATED) WITH 4 DIGITS, LED DISPLAY POWER SUPPLY: 100V ~ 240VAC, 50 Hz SIZE: 96 x 48 MM	13,000 /=-
MP3-4AV	DIGITAL VOLTMETER RANGE: 0 TO 500V WITH 4 DIGITS, LED DISPLAY POWER SUPPLY: 100V ~ 240VAC, 50 Hz SIZE: 96 x 48 MM	13,000 /=-
BS6-NA20	DIGITAL AMPERE METER RANGE: 0 TO 1999 AMPERE (C.T OPERATED) WITH 3 ½ DIGITS, LED DISPLAY POWER SUPPLY: 110V ~ 220VAC, 50 Hz SIZE: 72 x 36 MM	12,000 /=-
BS6-NA10	DIGITAL VOLTMETER RANGE: 0 TO 500V WITH 3 ½ DIGITS, LED DISPLAY POWER SUPPLY: 110V ~ 220VAC, 50 Hz SIZE: 72 x 36 MM	12,000 /=-

1. This list is subject to change without notice and goods being in stock.
2. The prices in the list are reference prices and not sale prices.
3. Discount/Multipliers are applicable.

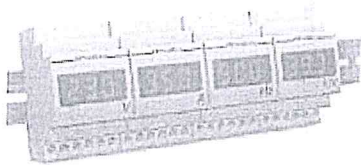
'HANYOUNG NUX' WORLD LEADER IN CONTROL & MEASUREMENT



Made in Spain

Current Transformers, Cable/Bus-Bar Type

Model	Ratio	Class	Burden	Price Each
TU20PS	30/5A	3	0.5VA	Rs.3,800/=
TU20PS	60/5A	1	1VA	Rs.3,800/=
TU30PS	100/5A	1	1.5VA	Rs.3,800/=
TU30PS	150/5A	0.5	1.5VA	Rs.3,800/=
TU30PS	200/5A	0.5	2.5VA	Rs.3,800/=
TU40PS	300/5A	0.5	5VA	Rs.4,500/=
TU40PS	400/5A	0.5	5VA	Rs.5,000/=
TU 60PS	400/5A	0.5	5VA	Rs. 6,000/=
TU50PS	600/5A	0.5	7.5VA	Rs.6,300/=
TU80PS	800/5A	0.5	7.5VA	Rs.7,500/=
TU80PS	1000/5A	0.5	10VA	Rs.9,500/=
TU100PS	800/5A	0.5	7.5VA	Rs.10,500/=
TU100PS	1000/5A	0.5	10VA	Rs.12,000/=
TU125PS	1200/5A	0.5	15VA	Rs.14,000/=
TU125PS	1600/5A	0.5	15VA	Rs.16,000/=
TU125PS	2000/5A	0.5	20VA	Rs.17,000/=
TU125PS	2500/5A	0.5	20VA	Rs.18,500/=
TU125PS	3000/5A	0.5	20VA	Rs.24,000/=
TU125PS	4000/5A	0.5	25VA	Rs.32,000/=
TU125RS	5000/5	0.5	15VA	Rs.55,000/=
TU125RS	6000/5	0.5	15VA	Rs.63,000/=



Revalco

Page No. 2/3

Price-Each

V. MODULAR TIME SWITCH

Power back-up 150hrs, 180-240VAC, 16A **1ROM1R** ... Rs. 10,500/=

VI. HOUR METER

55 x 55mm, 220VAC, 50Hz, Display: 99999.99 hrs. **4RK46** ... Rs. 6,500/=

VII. MODULAR SELECTOR SWITCHES, DIN MOUNTING

VOLTMETER SEL. SWITCH: (4 - Position) **RCO 1216D** ... Rs. 4,800/=

AMMETER SEL. SWITCH: (4 - Position) **RCO 1222D** ... Rs. 6,000/=

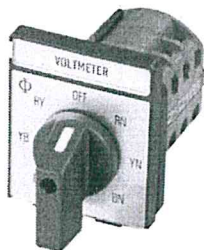
VIII. CURRENT TRANSFORMERS, CABLE/BUS-BAR TYPE



<u>Model</u>	<u>Rated Prim. Current</u>	<u>Class</u>	<u>Burden</u>	<u>Price-Each</u>
TAR 3DE	60/5A	3	1VA ...	... Rs. 4,000/=
TAR 3DE	100/5A	1	3VA ...	... Rs. 4,000/=
TAR 3DE	150/5A	1	3VA ...	... Rs. 4,000/=
TAR 3DE	200/5A	0.5	3VA ...	... Rs. 4,000/=
TAR 3DE	300/5A	0.5	5VA ...	... Rs. 4,800/=
TAR 4DE	400/5A	0.5	5VA ...	... Rs. 5,500/=
TAR 5	500/5A	0.5	5VA ...	... Rs. 6,500/=
TAR 5E	600/5A	0.5	5VA ...	... Rs. 6,800/=
TAR 6E	800/5A	0.5	10VA ...	... Rs. 8,500/=
TAR 6E	1000/5A	0.5	10VA ...	... Rs. 10,000/=
TAR 12VE / TAR 12E	1200/5A	0.5	20VA ...	... Rs. 15,000/=
TAR 12V / TAR 12E	1500/5A	0.5	20VA ...	... Rs. 18,000/=
TAR 12VE / TAR 12E	1600/5A	0.5	20VA ...	... Rs. 18,000/=
TAR 12VE / TAR 12E	2000/5A	0.5	20VA ...	... Rs. 19,000/=
TAR 12VE / TAR 12E	2500/5A	0.5	20VA ...	... Rs. 20,000/=
TAR 12E	3200/5A	0.5	20VA ...	... Rs. 27,000/=
TAR 12E	4000/5A	0.5	20VA ...	... Rs. 35,000/=
TAR 12E / TAR 12VE	5000/5A	0.5	20VA ...	... Rs. 59,000/=
TAR 12E / TAR 12VE	6000/5A	0.5	20VA ...	... Rs. 66,000/=

Φ KRAUS & NAIMER

Cam Switches Blue Line Series Made in New Zealand



3-POLE "ON-OFF" SWITCHES:

	I_{th}	STANDARDS : IEC, VDE, BS 380/440V, 3Ph, AC3	Price-Each
MODEL: CA10 A202 PK9000E	20A	5.5KW/7.5HP	Rs. 5,500/=

3-POLE "CHANGE OVER" SWITCHES:

MODEL: CA10 A212 PK9021E	20A	5.5KW/7.5HP	Rs. 9,500/=
--------------------------	-----	--------------------	-------------

4-POLE "CHANGE OVER" SWITCHES:

MODEL: CA10 A213 PK9033E	20A	5.5KW/7.5HP	Rs. 12,000/=
--------------------------	-----	--------------------	--------------

VOLTMETER SELECTOR SWITCHES:

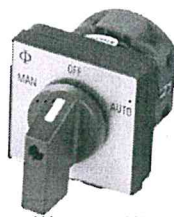
MODEL: CA10 A004 PK9053E	20A	(4 - Steps)	Rs. 6,200/=
CA10 A007 PK9054E	20A	(7 - Steps)	Rs. 7,800/=

AMMETER SELECTOR SWITCHES:

MODEL: CA10 A058 PK9009E	20A	(4 - Steps)	Rs. 7,800/=
--------------------------	-----	--------------------	-------------

MAN-OFF-AUTO SWITCHES:

MODEL: CA10 A710 PK9017E	20A	Rs. 4,400/=
--------------------------	-----	--------	-------------



1-POLE "ON-OFF" SWITCHES:

MODEL: CA10 A200 PK9038E	20A	Rs. 3,700/=
--------------------------	-----	--------	-------------

MULTI-STEPS SWITCHES:

MODEL: CA10 A233 PK9040E	20A	(6 - Steps)	Rs. 9,500/=
--------------------------	-----	--------------------	-------------

3-PHASE REVERSE-FORWARD SWITCHES:

MODEL: CA10 A401 PK9039E	20A	Rs. 8,500/=
--------------------------	-----	--------	-------------

PHASE SELECTOR SWITCHES:

MODEL: C42 PK9032	80A	(2P, 4-Steps, W/OFF & W/GEN)...	Rs. 55,000/=
-------------------	-----	---------------------------------	--------------

NOTE:

This list is subject to change without notice and goods being in stock. The prices in the list are reference prices and not sale prices. Discounts/Multipliers are applicable. The delivery, packing and forwarding charges are extra. All despatches are made on buyer's risk and account.



CYLINDRICAL POWER CAPACITORS

Made in Spain

PRICE-EACH

A) 3Phase 415V 50Hz Cylindrical Power Capacitors

• 5 KVAR	415V	50Hz	Rs.12,500/=
• 7.5 KVAR	415V	50Hz	Rs.16,500/=
• 12.5 KVAR	415V	50Hz	Rs. 24,000/=
• 25 KVAR	415V	50Hz	Rs. 31,000/=
• 50 KVAR	415V	50Hz	Rs. 54,000/=

B) 3Phase 440V 50Hz Cylindrical Power Capacitors

• 12.5 KVAR	440V	50Hz	Rs.24,500/=
• 25 KVAR	440V	50Hz	Rs.32,500/=
• 50 KVAR	440V	50Hz	Rs.57,000/=

C) 3Phase 460V 50Hz Cylindrical Power Capacitors

• 12.5 KVAR	460V	50Hz	Rs.27,000/=
• 25 KVAR	460V	50Hz	Rs.36,500/=
• 50 KVAR	460V	50Hz	Rs.62,000/=

D) 3Phase 525V 50Hz Cylindrical Power Capacitors

• 12.5 KVAR	525V	50Hz	Rs.30,000/=
• 25 KVAR	525V	50Hz	Rs.40,500/=
• 50 KVAR	525V	50Hz	Rs.67,500/=

- Self Healing
- Dry type with resin
- Excellent heat dissipation properties
- Aluminum Can
- With overpressure protection disconnection system

Digital Power Factor Regulator PR Series

Page No. 2/2

PRICE-EACH

POWER FACTOR REGULATORS: Microprocessor based (144 x 144 x 40 mm)

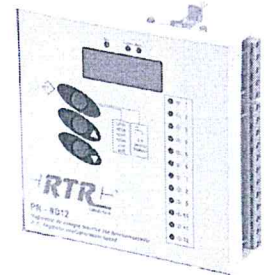
With Continuous Digital Power Factor Display

PR-8D Series (with Capacitor Power Indication)

A)	Type:	PR-8D06	6-Steps	...	...	...	Rs. 68,000/=
B)	Type:	PR-8D12	12-Steps	...	...	...	Rs. 81,000/=

FEATURES:

- Automatic & Manual operations
- Automatic CK Adjustment
- Capacitor Power on / off indication
- 4 Digit 7 segments LED Display
- Auto Polarization (CT Current Flow Direction)
- Adjustable Capacitor Switching ON/OFF Times
- Display of Cos phi values (Display range: 0.001-1.00 ind & cap)



PR12-D Series Digital Power Factor Regulator with Monitoring of Electrical Parameters & Harmonics "THD & upto 31st order" with Large Color LCD Screen with Communication RS485 Port (with capacitor power indication)

C)	Type:	PR12-D12	12 - Steps	...	Rs. 170,000/=
----	-------	-----------------	------------	-----	---------------

FEATURES:

- Informing the user for the capacitors losing power
- 40ms measurement, calculation and response time
- Quickly and accurately detection power of capacitors
- Connecting tri-phase, double-phase and single-phase capacitor
- Display the current and voltage up to the 31 harmonic simultaneously with the graphics
- Total current and voltage harmonics
- Displaying the phase or phases to which connected capacitors in color on the screen
- Making compensation for the generator according to the second Cos ϕ 2 set-up
- Password protected
- For balance or unbalance operating
- Measuring temperature
- Normal or fast operation mode selection
- Monitor electrical Parameters, (Voltage, Current, Cos ϕ , Tan ϕ , Power Factor, Active Powers, and Inductive Reactive powers capacitive reactive powers, apparent powers, Total active energy, Total inductive reactive energy, and Total capacitive reactive energy) of three phases at the same time.



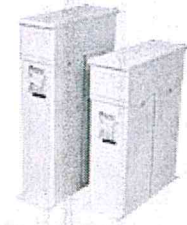
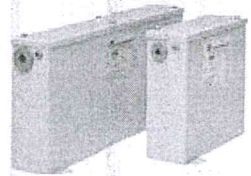
NOTE:

This list is subject to change without notice and goods being in stock. The prices in the list are reference prices and not sale prices. Discounts/Multipliers are applicable. The delivery, packing and forwarding charges are extra. All dispatches are made on buyer's risk and account.

Power Capacitors

(COOL DESIGN, ENERGY SAVING)
Made in Finland

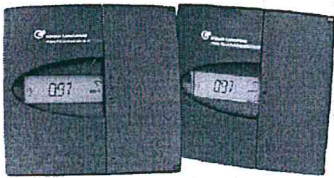
- ✓ COOL DESIGN
- ✓ SELF HEALING
- ✓ DRY TYPE
- ✓ POWER CAPACITORS IN STEEL ENCLOSURE
- ✓ EACH CAPACITOR ELEMENT INTERNALLY PROTECTED


L1, L2 Series

N3, N6 Series
Compact Size
FEATURES:

- Insulation Level: 4KVrms/12KVcrest.
- Internal Discharge Resistors discharge the residual voltage.
- Low losses: Less than 0.4 W/Kvar
- Cable Clamps on terminal screws for tightening.
- Corrosion resistant sheet steel casing.
- Temperature category: - 40°C to +50°C
- Self Healing dry type.
- Degree of Protection: IP42
- Cool type design
- Cable termination for one or two outputs (L2 Series): For example: 100KVAR (50+50KVAR)

PRICE-EACH

A. <u>POWER CAPACITORS:</u>	3-PHASE <u>400V</u> 50Hz						
1. Type : ML1D	12.5/13.5 KVAR	...	...	...	...	Rs. 49,000/=	
2. Type : FL1D	25/27 KVAR	...	...	...	...	Rs. 59,000/=	
3. Type : FL2D	50/54 KVAR	...	...	...	...	Rs. 104,000/=	
B. <u>POWER CAPACITORS:</u>	3-PHASE <u>415V</u> 50Hz						
1. Type : N3D	12.5 KVAR	...	...	...	...	Rs. 40,000/=	
2. Type : ML1D	12.5/13.5 KVAR	...	...	...	...	Rs. 49,000/=	
3. Type : N6D	25 KVAR	...	...	...	...	Rs. 51,000/=	
4. Type : FL1D	25/27 KVAR	...	...	...	...	Rs. 59,000/=	
5. Type : FL2D	50 KVAR	...	...	...	...	Rs. 104,000/=	
6. Type : FL2D	50/54 KVAR	...	...	...	...	Rs. 107,000/=	
7. Type : AL2D	100 KVAR	...	...	...	...	Rs. 198,000/=	
C. <u>POWER CAPACITORS:</u>	3-PHASE <u>440V</u> 50Hz						
1. Type : N3D	12.5 KVAR	...	...	...	...	Rs. 40,000/=	
2. Type : N6D	25 KVAR	...	...	...	...	Rs. 51,000/=	
3. Type : SL2D	50 KVAR	...	...	...	...	Rs. 104,000/=	
D. <u>POWER CAPACITORS:</u>	3-PHASE <u>460V</u> 50Hz						
1. Type : ML1D	12.5 KVAR	...	...	...	...	Rs. 53,000/=	
2. Type : FL1D	25 KVAR	...	...	...	...	Rs. 64,000/=	
3. Type : FL2D	50 KVAR	...	...	...	...	Rs. 126,000/=	
E. <u>POWER CAPACITORS:</u>	3-PHASE <u>525V</u> 50Hz						
1. Type : N3D	12.5 KVAR	...	...	...	...	Rs. 44,000/=	
2. Type : ML1D	12.5 KVAR	...	...	...	...	Rs. 52,000/=	
3. Type : FL1D	25 KVAR	...	...	...	...	Rs. 65,000/=	
4. Type : FL2D	50 KVAR	...	...	...	...	Rs. 114,000/=	
5. Type : ML2D	20 KVAR	...	...	...	...	Rs. 64,000/=	
6. Type : FL2D	40 KVAR	...	...	...	...	Rs. 84,000/=	
7. Type : SL2D	80 KVAR	...	...	...	...	Rs. 132,000/=	



Power Factor Controllers

With built-in Power Analyzer

Based on State of the Art Microprocessor Technology
Made in Finland

PRICE-EACH

I POWER FACTOR CONTROLLER:

Type : **N6** **6 Steps**

Rs. 95,000/=

- ✓ Digital 6 Steps with Alarms
- ✓ With Built-in Power Analyzer
- ✓ With Continuous Digital Power Factor & Capacitor Steps Display.
- ✓ With Automatic search of C/K values
- ✓ Automatic CT polarity adjustment and Automatic Phase Rotation polarity adjustment

II POWER FACTOR CONTROLLER:

Type : **N12** **12 Steps**

Rs.110,000/=

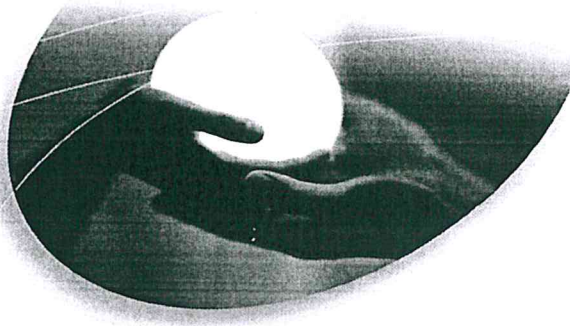
- ✓ Digital 12 Steps with Alarms
- ✓ With Built-in Power Analyzer
- ✓ With Continuous Digital Power Factor & Capacitor Steps Display.
- ✓ With Automatic search of C/K values
- ✓ Automatic CT polarity adjustment and Automatic Phase Rotation polarity adjustment

MEASUREMENT AND DISPLAY:

- Power Factor
- Connected Steps
- Switching Counter and duty cycles
- Current
- Voltage
- KVA
- KW
- KVAR
- Panel Temperature (built-in temperature probe)
- Total Voltage Harmonic Distortion: THD (U)
- Alarm Log

SPECIFICATIONS:

- i. Measurement and Supply Voltage:
230V±15% OR 400V±15% OR 110V±15%
- ii. Connection : with or without Neutral Line
i.e. LN=Phase to Neutral or LL=Phase to Phase
- iii. Frequency : 50 or 60Hz ± 2Hz, automatic selection.
- iv. Operation Sequence: user selectable from menu
normal 1: 2: 4: 4; stack 1: 1: 1: 1:
circulating A 1: 1: 1: 1; circulating B 1: 2: 2: 2:
- v. Output Relay : N.O., Contact Ratings: 2.0A/400VAC
- vi. Alarm Relay : N.O., Contact Ratings : 2.0A/400VAC
- vii. Ambient Temperature : 0 to 60°C
- viii. Size : 144 x 144 x 60mm, Protection Class : IP41
- ix. Step Reconnection Delay : Adjustable from 10 ... 600 secs.



Proposal for

Supply of ROD



Perimeter Security



Cooling



Power



Video Surveillance & Analytics



Access Control



Network



Command Central



Design

OSAL

Date: February 28th, 2023
Our Ref: ENTECH-MBK-RF-RF

PROPOSAL FOR SUPPLY OF Erico USA ROD.

Dear Sir/Madam,

We thank you for your interest in ENTECH US INC.. Allowing us to submit proposal for Erico USA copper cladded Rod.

ENTECH US INC.. Has both the expertise and the experience to supply this equipment on time and within budget. Our approach is one of working with, rather than for, our clients to ensure the most cost-effective results. We look forward to providing our control system integrator and supplier services and are confident you will find ENTECH US INC.. to be a valuable asset.

We hope you will find our offer most competitive and fully in accordance with your requirements and needs. Please feel free to contact us for any additional details, clarifications, or information, which you may require in this regard.

Regards,

Rama Nasir
Asst. Manager System
Buildings & Industrial Solutions
0332-6900704
rama@entech.ae



TABLE OF CONTENTS

1 COMMERCIAL PROPOSAL 4

1.1 BILL OF QUANTITY 4

2 COMMERCIAL TERMS & CONDITIONS..... 5

2.1 PAYMENT 5

2.2 TRANSFER OF TITLE OF EQUIPMENT..... 5

2.3 PRICE VALIDITY..... 5

2.4 CURRENCY FLUCTUATION..... 5

2.5 CANCELLATION OF ORDER..... 5

2.6 DELIVERY PERIOD 5

2.7 DELIVERY TERMS..... 5

2.8 INSTALLATION CONDITIONS 6

2.9 FORCE MAJEURE 6

3 CONTACTS US..... 6

4 END OF PROPOSAL..... 6

1 Commercial Proposal

1.1 Bill of Quantity

S/N	Product Description	Brand	New Part #	Qty	COO	Unit Price PKR	Extended Price PKR
1. ELECTRICAL PARTS							
1	COPPER-BONDED GROUND ROD, POINTED 3Meter long	ERICO	614300	1	USA	13,906	13,906.16
Total Price Exclusive of GST (PKR)							13,906.16

- Above offered prices are exclusive of GST, which shall be charged where applicable, at the time of invoicing.
- We are exempted of deduction against Income Tax. An Undertaking shall be submitted at the time of Invoicing.

Total: 18,603.00

[Quoted text hidden]

Ahmad Munir <enr.ahmadmunir@gmail.com>
To: irfankibzai@gmail.com

Wed, Mar 1, 2023 at 6:37

----- Forwarded message -----

From: **Imran Stz** <imran.stzengineers@gmail.com>
Date: Wed, 1 Mar 2023, 6:25 p.m.
Subject: Re: REvised Offer
To: <enr.ahmadmunir@gmail.com>

Dear Ahmed,

Received your email for revised offer ,We are sending you the updated prices for your review. Please see the following details.

Option -1 Copper Rod

No.	Item	Unit	Quantity	Unit Price	Total Price
1	Copper Earth Rod 3-meter long 16mm dia along with fixing Clamp Make:- FOREND (Turkey)	Nos	1	25,500.00	25,500.00
				Total Price: -	25,500.00
				GST 18%	4,590.00
				Grand Total:	30090.00
				-	

Option -2 Copper Clad Rod

No.	Item	Unit	Quantity	Unit Price	Total Price
1	Copper Clad Earth Rod 3-meter long 16mm dia along with fixing Clamp Make:- FOREND (Turkey)	Nos	1	15,900.00	15,500.00
				Total Price:	15,900.00
				-	
				GST 18%	2,862.00
				Grand Total:	18,762.00

[Quoted text hidden]



LAB 094

17025

**TRANSFOPOWER®****BUDGETARY QUOTATION**

Ref. NO. P230133/SA-R1

24-Feb-23

Mr. Irfanullah
M/S NESPAK Lahore

Please refer to your inquiry reference, we are pleased to submit our offer for the following Electrical Equipment.

S. No.	Items Name & Description	Qty.	Unit Price	Total Ex. Taxes	GST 18%	WAPDA Fee 2.5%	Total (PKR)
1	100 KVA Pad Mounted Transformer	1	2,650,000	2,650,000	477,000	66,250	3,193,250
2	200 KVA Pad Mounted Transformer	1	3,460,000	3,460,000	622,800	86,500	4,169,300
3	400 KVA Pad Mounted Transformer	1	4,790,000	4,790,000	862,200	119,750	5,771,950
4	630 KVA Pad Mounted Transformer	1	6,150,000	6,150,000	1,107,000	153,750	7,410,750
5	25 KVA Pole Mounted Transformer	1	750,000	750,000	135,000	18,750	903,750
6	50 KVA Pole Mounted Transformer	1	980,000	980,000	176,400	24,500	1,180,900
7	100 KVA Pole Mounted Transformer	1	1,330,000	1,330,000	239,400	33,250	1,602,650
8	200 KVA Pole Mounted Transformer	1	2,095,000	2,095,000	377,100	52,375	2,524,475
9	400 KVA Pole Mounted Transformer	1	3,250,000	3,250,000	585,000	81,250	3,916,250
10	630 KVA Pole Mounted Transformer	1	4,075,000	4,075,000	733,500	101,875	4,910,375

As per WAPDA Standards.

Note:

- 1) 3 % Additional GST will be charged in case STRN is not provided, in case of any changes in Government regulations, the same will be charged as per actual at the time of dispatch.
- 2) The above price is based upon current LME and exchange rates. The company reserves the right to charge the variations in case of fluctuation beyond 02% at the time of notice of readiness before dispatch.
- 3) The company reserves the right to cancel the order in case balance payment and dispatch is delayed beyond 07 working days of readiness notice.

Terms & Condition**Price:** Price is in PKR & Ex works.**Terms of Payment :** 100% amount of the total order value to be paid in advance along with the confirmed PO in shape of pay order/demand draft / cross cheque. Please note that any changes in Govt. taxes, will be to customer's account.**Validity:** Our quotation is valid for 3 days, after which it shall be subjected to our confirmation.**Warranty:** ONE (1) year standard warranty from the date of delivery/sales invoice. Our warranty does not cover any damage due to mishandling or negligence by the customer.**Inspection:** Customer inspection at our work will be exclusive of boarding and loading expenses.**Delivery :** Delivery time can be negotiated at the time of order confirmation, NOC from WAPDA, advance payment and approval of technical data. Delivery date may vary due to unavoidable circumstances like global shipment delays, Strikes, Govt Holidays, Lockdown, Pandemic, etc . Unloading, installation and commissioning are the responsibility of the customer. Unloading, Installation and commissioning are the responsibility of the customer.

NTN No. 0786364-7

GST No. 03-06-8504-005-46

Yours truly,

Transfopower Industries (Private) Limited



Syed Arsalan Hussain
Dy. Manager Sales & Marketing
0336-3163365



Jamal Jawad Awan
Dy. GM Sales & Marketing
0321-8211920

Transfopower Industries (Pvt.) Limited

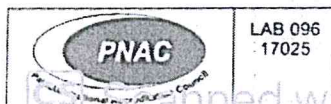
To	M/s NESPAK Lahore	Date	1 st March, 2023
Attn	Mr. Irfan Ullah Khan	Your Ref.	Email
Our Ref.	Q-BQ-00-0323-SE	Pages	1 of 1

Subject: Quotation for the Supply of Electrical Equipment (Budgetary Prices)

Dear Sir,

Please refer to your projects enquiry ; we our budgetary prices for each category are as follows,

Sr. No.	Item Description	Qty.	Unit Rate (Rs.)	Total Amount (Rs.)
1	25KVA 11/0.415KV, 3-Phase 50Hz, Distribution Transformer As Per WAPDA Specifications DDS-84:2020 with MI Certificate (PPMC)	1	497,925	497,925
2	50KVA 11/0.415KV, 3-Phase 50Hz, Distribution Transformer As Per WAPDA Specifications DDS-84:2020 with MI Certificate (PPMC)	1	498,615	498,615
3	100KVA 11/0.415KV, 3-Phase 50Hz, Distribution Transformer As Per WAPDA Specifications DDS-84:2020 with MI Certificate (PPMC)	1	1,037,344	1,037,344
4	200KVA 11/0.415KV, 3-Phase 50Hz, Distribution Transformer As Per WAPDA Specifications DDS-84:2020 with MI Certificate (PPMC)	1	1,908,714	1,908,714
5	400KVA 11/0.415KV, 3-Phase 50Hz, Distribution Transformer As Per WAPDA Specifications DDS-84:2020 with MI Certificate (PPMC)	1	3,070,539	3,070,539
6	630KVA 11/0.415KV, 3-Phase 50Hz, Distribution Transformer As Per WAPDA Specifications DDS-84:2020 with MI Certificate (PPMC)	1	4,315,353	4,315,353
7	100KVA 11/0.415KV, 3-Phase 50Hz, Pad Mounted Transformer As Per WAPDA Specifications DDS-84:2020 & DDS-71:2004 with MI Certificate (PPMC)	1	2,100,000	2,100,000
8	200KVA 11/0.415KV, 3-Phase 50Hz, Pad Mounted Transformer As Per WAPDA Specifications DDS-84:2020 & DDS-71:2004 with MI Certificate (PPMC)	1	2,821,577	2,821,577
9	400KVA 11/0.415KV, 3-Phase 50Hz, Pad Mounted Transformer As Per WAPDA Specifications DDS-84:2020 & DDS-71:2004 with MI Certificate (PPMC)	1	4,730,290	4,730,290
10	630KVA 11/0.415KV, 3-Phase 50Hz, Pad Mounted Transformer As Per WAPDA Specifications DDS-84:2020 & DDS-71:2004 with MI Certificate (PPMC)	1	5,643,154	5,643,154



elmetec

Elmetec (Private) Limited

Head Office: 19 km, Ferozepur Road, Lahore - 54600, PAKISTAN
Tel : +92 42 35457311-15 Fax : +92 42 35457310
E-mail: marketing@elmetecgroup.com www.elmetecgroup.com

Terms & Conditions:

Our offer is subject to following terms and conditions.

- Prices** : Prices are exclusive of 18% Sales Tax & 2.5% WAPDA Inspection Fee
Prices are ex-works, Lahore basis.
- Validity** : Offer is valid for 20 days but with the condition that if USD will vary (vary more than 2%), our prices will be subject to revision.
- Delivery** : Within 3 months after confirmation of order.
- Payment** : 50% payment in advance, balance 50% before delivery.
- Warranty** : **12 months** warranty for defects in design and workmanship.
- Force Majeure** : Our offer is subject to usual Force Majeure Clause.

We hope that our offer will fulfill your commercial and technical requirements. However, if you still have any query, please feel free to contact us.

Thanks & Regards,

for **Elmetec (Pvt.) Ltd.**

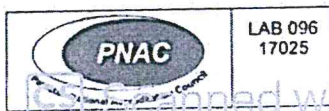
Syed Taimoor Mahmood
Manager Marketing
Cell: 0301-8454957, 0323-7100288

Digital Quotation doesn't requires physical signatures

Plant Trees, Save Pakistan

Please preserve trees on planet earth and don't print this Email unless you really need the print out.

Confidentiality Notice: This quotation and any attached file are intended only for the use of the individual or entity to which it is addressed. This communication is confidential and may also be privileged and exempt from disclosure under applicable law. If you are not the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. Please notify the sender immediately by return e-mail and destroy the present message and attachments and any copies thereof.



APPENDIX-D
ECONOMIC & FINANCIAL
ANALYSIS

ECONOMIC AND FINANCIAL ANALYSIS

1 Economic Analysis

The proposed project is framed to ensure improved, sustained, and equitable quantum of drinking water supplies, to selected population of Kamoke. This will result to foster the social and economic growth through improved health and living conditions, reduction in poverty and increased productivity etc. Economic cost- benefit analysis has been performed to assess the benefits from the investment done for water supply. Economic analysis for the said project provided a framework within which all aspects of the project completed have been evaluated in a coordinated and systematic manner. The analysis has been done with a view to determine whether a project will contribute significantly to the development of the total economy and whether its contribution would be significant enough to justify the expenditure of the resources. The investment justification for this purpose relied on the returns generated and meeting the selected criteria of Internal Rate of Return (IRR) and Net Present Value (NPV).

1.1 Objectives

The major objective of the economic analysis was to assess the future flow of incremental economic benefits of the proposed project resulting from direct investment in the proposed project to the society in order to evaluate its economic justification.

1.2 Methodology for Project Appraisal

Economic evaluation of the project has been decided on the basis of the results obtained by the application of the efficiency criterion of public investment using the "Discounted Cash Flow" technique. The technique is extensively being used by Planning Commission of Pakistan and the multilateral donor agencies like World Bank and Asian Development Bank etc for appraising the similar projects.

Three indicators namely "Net Present Value (NPV)", "Economic Internal Rate of Return (EIRR)" and "Benefit-Cost Ratio (B/C Ratio)" have been worked out to indicate the economic justification of the proposed project. Economic analysis details:

- Determination of economic parameters to express costs and benefits in real economic terms.
- Quantification of economic benefit of the project.
- Derivation of project costs in economic prices;
- Computation of EIRR, NPV and B/C ratio; and
- Sensitivity analysis by varying parameters used in the "Base Case" analysis.

The parameters used in economic analysis are discussed below:

1.3 Economic Parameters

1.3.1 Price Datum

The economic quantification of project benefits and project costs has been carried out at the constant price level.

1.3.2 Rate of Discount

In Pakistan, the marginal productivity of capital lies between 10 and 12 percent. The economic opportunity cost of capital has thus been taken as 12% for economic analysis, as used by Planning Commission of Pakistan and other multilateral agencies for appraising similar projects. For financial analysis, 12% opportunity cost of capital has been used.

1.3.3 Standard Conversion Factor

Standard Conversion Factor (SCF) represents the ratio of prices of all goods within the economy with respective international prices. The SCF is mainly influenced by the trade policies of the Government. The general distortion between international and domestic prices is caused by import/export duties, taxes and tariffs, subsidies and other price distortions to trade. The value of this general conversion factor has been estimated on the basis of statistics covering imports, exports, taxes and subsidies. The standard conversion factor has been used in shadow pricing.

Annex Table-1 shows the yearly data used to calculate the SCF for the fiscal years 2010-11 to 2014-15. An average of five years is taken to allow for annual fluctuations in trade and taxes. The value of SCF thus worked out is 0.908. This however, only takes into account distortions to domestic prices of traded goods caused by tariffs.

1.3.4 Economic Prices

The analysis derived the economic costs from its financial estimates of investment and operating costs, adjusted for transfer payments (taxes etc) and other market distortions. The real costs were converted to border parity prices using SCF. The economic capital costs are based on the financial capital costs used in the investment plan excluding all price contingencies, interest costs, taxes, and duties.

1.3.5 Project Life for Analytical Period

Project life or service life of the project is dependent upon the useful life of its diverse components. A project utilization period of 30 years (after implementation) has been assumed for the purpose of economic analysis.

1.4 Project Economic Benefits

1.4.1 Direct Quantifiable Benefits

A- Savings in Health Cost

AS per HEIS (2018-19) data, an average monthly medical expenditure of Rs. 1300 is being incurred by a household in Punjab urban areas. According to various studies, 30% of the population is suffering from water related diseases. The project area population served by clean drinking water supply in Kamoke has been estimated for all operational years. Savings in health cost has been estimated on basis of number of households and annual household health expenditure savings.

B- Productivity Improvement

Different studies show that 28% of household members have economic activity. Average monthly income per household is Rs. 55,189. Average household size is 6.68 persons. It translates into per-day income of Rs. 275 per person. Population suffering from diseases caused water and wastewater issues is 30%. An average four-day per month productivity increase of the economically active persons resulting from a diversion from medical related activities to economic activities would translate into economic benefits.

C- Reduction in Infant Mortality

According to Punjab MICS 2018, under-5 mortality rate per 1,000 live births in Gujranwala (district) is 52. Crude birth rate is 26 (Govt. of Pakistan, 2017). Various studies estimated that water supply and wastewater investments under the project would reduce the infant mortality to 40% in the 30% of project served population affected with water-borne diseases. US Department of Transportation estimated economic value of a statistical life (VSL) in year 2015 at US\$ 9.4 Million. By converting this to Pakistan/US GDP per capita ratio of 2015 (US\$ 1,275.30/53,041.98), it translates into Rs. 23.84 million per statistical life. This per capita approach of VSL gives conservative value and thus has been adopted in this economic value, in order to keep the economic benefits on a lower side. The annual economic value of under-5 saved lives has been calculated by using value of statistical life and number of expected lives saved.

Thus, total direct economic benefits of supplying water supply for project area were found as Rs 206 million in first year of project operation. The economic benefits for all operational years of project have been estimated on the basis of connected population. As the project is only about provision of ensured water supply thus a conservative 40% of these economic benefits have been attributed to drinking water supply and remaining to other water and sanitation related investments/interventions. The estimation of economic benefits has been detailed in **Annex Table- 2**.

1.4.2 Indirect Benefits

The indirect benefits of development would be:

- Increased employment

- Increased economic activity leading to increase in GDP
- Positive impact on poverty reduction through increased productivity and increased employment opportunities

Improvement in environmental conditions, increased commercial activities and overall socio-economic development would also arise in the project implementation areas. These indirect benefits although of vital importance for overall development of the area but difficult to quantify thus do not form part of economic appraisal.

1.5 Project Costs

The costs associated with the said project include initial capital or investment costs of the proposed infrastructure elements and future operations and maintenance costs. Total investment cost of the said project was estimated as Rs. 367.76 million. The all cost is assumed to phase out in one year. Project economic cost has been estimated by netting off the price escalation and taxes. This has been further expressed in economic terms as Rs. 275.22 million by using standard conversion factor. Annual Operation and maintenance cost has been estimated as Rs. 17.32 million in financial terms and Rs. 15.73 million in economic terms. Detailed investment and O & M cost is summarized in **Annex Table – 3**.

1.6 Economic Indicators

To judge the economic viability of the project economic indicators like Net Present Value (NPV), Benefit Cost Ratio (B/C Ratio) and Economic Internal Rate of Return (EIRR) have been calculated using the streams of project benefits and project costs discussed earlier and given in **Annex Table - 4**. The results are summarized below

Table-1.4 Summary Results of Economic Analysis

Economic Indicators	At 12% Discount Rate
Present Worth of Benefits (Rs million)	638.30
Present Worth of Costs (Rs million)	358.86
Net Present Value (Rs million)	279.45
B/ C Ratio	1.78
EIRR (Percent)	25.84

The EIRR calculated is above the economic opportunity cost of capital (12%) in Pakistan. The results of NPV and B/C ration also proved that project is economically viable.

1.7 Sensitivity Analysis

The results of economic analysis given above have been computed on the basis of a set of assumptions. Alternate analysis has therefore been undertaken by varying the following assumptions.

- 10 percent increase in project costs
- 10 percent decrease in project benefits.
- Benefit reduction and cost over-run (each by 10 percent) occurring simultaneously.

The sensitivity analysis is given in Annex Table-4 and the results are shown below:

Table – 1.5 Sensitivity Results

SCENARIO	EIRR (Percent)
Base Case	25.84
<u>Sensitivity Analysis:</u>	
10 percent decrease in project benefits	22.76
10 percent increase in project costs	23.04
Benefits reduction & cost over-run by 10 percent each both occurring simultaneously	20.22

A review of the sensitivity test results indicates that the calculated EIRR is robust and proposed project is not sensitive to assumptions made.

2 FINANCIAL ANALYSIS

The financial analysis of the subject project has been undertaken with a view to assess operational project cost reimbursement. Provision of facilities like adequate potable water etc are considered to be the responsibility of the Government and such projects are rarely intended to recover the invested financial resources.

In the financial analysis, generation of water supply revenues attributed to the implementation of the project has been estimated with a view to establish the financial sustainability of the project. The analysis carried out to identify and quantify benefits expressed in financial terms (using market prices), resulting from proposed investment and operational expenditure. The projected stream of total project revenues over the life of the project has been compared to the estimated stream of total project costs by bringing the two to a uniform basis through the process of discounting.

The analysis carried out for the project included:

- Estimation of incremental water supply revenues
- Estimation project financial costs (investment & operation)
- Calculation of financial indicators

2.1- Financial Benefits (Revenues)

Financial revenues have been estimated on the basis of following parameters.

2.1.1-Served Population and Connections

The served population of project area in Kamoke for water supply has been estimated using the household size.

2.1.2-Water Tariff

The initial average proposed tariff for domestic water supply is Rs. 300/household/month. The commercial tariff has been adopted as Rs. 800/Month/Unit. Proposed tariff has also been escalated @10% per annum for future operational years.

2.1.3-Water Revenues/Financial Benefits

Annual water supply revenues have been calculated on the basis of number of households and respective water tariff, detailed annual revenue calculation is given in **Annex Table – 5**.

2.2. Financial Cost

The project capital investment cost of Rs. 367.76 million has been used for the purpose of financial analysis. The annual operation and maintenance cost for water supply system (energy, repair and maintenance, staff etc) have been estimated as Rs. 17.32 million.

2.3. Unit Cost

Unit costs of water supplied have been estimated by using project cost (investment and operation) and annual water flows (million gallons). The annual costs and flows during project years have been discounted (@10%) to get a present value of cost and annual water supplied. The unit cost (Rs/000 gallons) of water supplied through the project system have been calculated by dividing discounted total cost to discounted total water flow for all operational years. As the major objective is to recover operational cost, thus unit cost (considering only O&M) has been calculated as RS. 28.28 per thousand gallons for water supplied. Unit cost calculations have been detailed in **Annex Table-6**.

2.4. Income and Expenditure Statement

Income statement has been prepared on the basis of operational revenues for water and operating cost. Income statement is detailed in **Annex Table-7**

2.5. Cash Flow Statement

Cash flow statement is presented below in **Annex Table-8**

2.6. Financial Indicators

To judge the financial viability of the project financial indicators like Net Present Value (NPV), Benefit Cost Ratio (B/C Ratio) and Financial Internal Rate of Return (FIRR) have been calculated. The streams of project financial benefits and costs are detailed in **Annex Table-9**. The results are summarized below:

Table- 1.6 Summary Results of Financial Analysis

Financial Indicators	At 12% Discount Rate
Present Worth of Benefits (Rs million)	434.03
Present Worth of Costs (Rs million)	408.34
Net Present Value (Rs million)	25.69
B/ C Ratio	1.06
FIRR (Percent)	12.58

Annex- Table - 1
Derivation of Standard Conversion Factor

(Rs.Million)

No.	Description/Years	2010-11	2011-12	2012-13	2013-14	2014-15	Average
1	Total Imports*	3,455,286	4,009,093	4,349,879	4,630,521	4,644,152	4,217,786
2	Total Exports*	2,120,847	2,110,605	2,366,478	2,583,463	2,397,513	2,315,781
3	Import Duties**	187,695	219,597	242,989	244,947	308,950	240,836
4	Sales Tax on Imports**	308,648	430,399	429,831	495,330	553,028	443,447
5	Subsidies on Imports***	20,200	49,198	10,000	30,000	23,700	26,620
6	Export Duties**	5,685	5,762	6,832	6,595	6,361	6,247
7	Export Rebates**	8,527	8,453	10,362	8,732	9,091	9,033

Standard Conversion
Factor (SCF) =

$$\frac{M + X}{(M+Tm)+(X-TX)} = \frac{6,533,567}{7,194,016}$$

$$= \mathbf{0.908}$$

M = CIF Value of Imports

X = FOB value of Exports

TM= Net Value of Taxes on Imports

TX= Net Value of Taxes on Exports

* Economic Survey 2015-16

**FBR Year Book 2014-15

*** Ministry of Finance, Islamabad

**Annex Table - 2
Economic Benefits of Water Supply**

Description	Unit	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53
Total Served Population	No	36,419	36,921	36,921	37,432	37,953	38,482	39,022	39,570	40,129	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	
Household Size	No	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Project Area Households	No	5452	5527	5527	5604	5682	5761	5842	5924	6007	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	6093	
Economic Benefits of Savings of Health Cost																																
Percent of Population With Waterborne Diseases	%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	
Average Monthly Health Expenditure	Rs	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	
Annual Health Cost Savings	Rs. Million	25.52	25.87	25.87	26.23	26.59	26.96	27.34	27.72	28.11	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	
Economic Benefits of Productivity Increases																																
Avg. Monthly Household Income	Rs	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189	55189
Economic Value of Daily Income Per Capita	Rs	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39	275.39
% of Economically Active Population	%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%
Average Expected Productivity Increase Days	Days	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Annual Economic Benefits of Productivity Increases	Rs. Million	40.44	41.00	41.00	41.56	42.14	42.73	43.33	43.94	44.56	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19	45.19
Economic Benefits of Infant Mortality Reduction																																
Crude Birth Rate (Per 000 Population)	No.	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Under 5 Mortality per 1000 Live Births	No	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Total Live Births per Year - Project Population	No	947	960	960	973	987	1001	1015	1029	1043	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058
Under 5 Mortality - Project Area	No	49	50	50	51	51	52	53	54	54	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
Expected Reduction in Mortality Rate	%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
Estimated Economic Value of Statistical Life (VSL)	Rs. Million	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	24.84	25.84	26.84	27.84	28.84	29.84	30.84	31.84	32.84	33.84
Economic Value of Saved Lives	Rs. Million	140.18	143.04	143.04	145.90	145.90	148.76	151.62	154.48	154.48	157.34	157.34	157.34	157.34	157.34	157.34	157.34	157.34	157.34	157.34	157.34	157.34	163.94	170.54	177.14	183.74	190.34	196.94	203.54	210.14	216.74	223.34
Total Economic Benefits	Rs. Million	206.13	209.90	209.90	213.69	214.63	218.45	222.29	226.15	227.16	231.05	231.05	231.05	231.05	231.05	231.05	231.05	231.05	231.05	231.05	231.05	231.05	237.65	244.25	250.85	257.45	264.05	270.65	277.25	283.85	290.45	297.05
Economic Benefits attributed to improved drinking water supply	Rs. Million	82.45	83.96	83.96	85.48	85.85	87.38	88.92	90.46	90.86	92.42	92.42	92.42	92.42	92.42	92.42	92.42	92.42	92.42	92.42	92.42	92.42	95.06	97.70	100.34	102.98	105.62	108.26	110.90	113.54	116.18	118.82

**CONSULTANCY SERVICES FOR DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT
 SECTORIAL PLANNING AND RESIDENT SUPERVISION PACKAGE-II (HAFIZABAD,
 KAMOKE & MURIDKE)
 IMPROVEMENT AND EXTENTION OF WATER SUPPLY SYSTEM IN KAMOKE CITY
 SUMMARY OF COST**

Bill No.	DESCRIPTION	AMOUNT (Rs.)
1.0	Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road	293,253,860
2.0	Installation of new Tubewell at Mandiala Water Works	30,206,932
TOTAL AMOUNT		323,460,792
	Contingencies @ 2%	6,469,216
	PST @ 5%	16,173,040
	Environmental & Social Management Plan	1,247,000
	Price Adjustment @ 6%	19,407,648
	WAPDA Meter Connection	1,000,000
GRAND TOTAL		367,757,695

Annex Table- 4
Calculation of Economic Internal Rate of Return

(Rs.Million)

Year	Project Economic Costs			Water Supply Benefits	Net Incremental Benefits Under Various Assumptions			
	Investment	O & M	Total	Total	(a)	(b)	(c)	(d)
1	275.22	0.00	275.22	0.00	-275.22	-275.22	-302.74	-302.74
2		15.73	15.73	83.96	68.23	59.84	66.66	58.26
3		15.73	15.73	83.96	68.23	59.84	66.66	58.26
4		15.73	15.73	85.48	69.75	61.20	68.18	59.63
5		15.73	15.73	85.85	70.13	61.54	68.55	59.97
6		15.73	15.73	87.38	71.65	62.91	70.08	61.34
7		15.73	15.73	88.92	73.19	64.30	71.62	62.72
8		15.73	15.73	90.46	74.73	65.68	73.16	64.11
9		15.73	15.73	90.86	75.13	66.05	73.56	64.47
10		15.73	15.73	92.42	76.69	67.45	75.12	65.88
11		15.73	15.73	92.42	76.69	67.45	75.12	65.88
12		15.73	15.73	92.42	76.69	67.45	75.12	65.88
13		15.73	15.73	92.42	76.69	67.45	75.12	65.88
14		15.73	15.73	92.42	76.69	67.45	75.12	65.88
15		15.73	15.73	92.42	76.69	67.45	75.12	65.88
16		15.73	15.73	92.42	76.69	67.45	75.12	65.88
17		15.73	15.73	92.42	76.69	67.45	75.12	65.88
18		15.73	15.73	92.42	76.69	67.45	75.12	65.88
19		15.73	15.73	92.42	76.69	67.45	75.12	65.88
20		15.73	15.73	92.42	76.69	67.45	75.12	65.88
21		15.73	15.73	92.42	76.69	67.45	75.12	65.88
22		15.73	15.73	92.42	76.69	67.45	75.12	65.88
23		15.73	15.73	92.42	76.69	67.45	75.12	65.88
24		15.73	15.73	92.42	76.69	67.45	75.12	65.88
25		15.73	15.73	92.42	76.69	67.45	75.12	65.88
26		15.73	15.73	92.42	76.69	67.45	75.12	65.88
27		15.73	15.73	92.42	76.69	67.45	75.12	65.88
28		15.73	15.73	92.42	76.69	67.45	75.12	65.88
29		15.73	15.73	92.42	76.69	67.45	75.12	65.88
30		15.73	15.73	92.42	76.69	67.45	75.12	65.88
31		15.73	15.73	92.42	76.69	67.45	75.12	65.88
Discount rates	Present Worth of Costs			Present Worth of Costs	Net Present Worth			
5%	262.11	230.28	492.39	1318.65	826.26	694.40	777.02	645.16
10%	250.20	134.79	384.99	763.65	378.66	302.29	340.16	263.79
12%	245.73	113.12	358.86	638.30	279.45	215.62	243.56	179.73
15%	239.32	89.80	329.13	503.91	174.78	124.39	141.87	91.48
ECONOMIC INTERNAL RATE OF RETURN (Percent) =					25.84	22.76	23.04	20.22
BENEFIT/COST RATIO AT 12% D.R. =					1.78 : 1			

- (a) Base Case assuming 30 Years period of analysis.
- (b) Benefits decreased by 10 %
- (c) Cost over-run by 10 %
- (d) Benefit reduction and cost over-run both occurring simultaneously.

Annex Table - 5
Financial Bnefits - Water Supply Revenues

Item	Unit	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53
Water Supply Population Served	Number	36,921	36,921	37,432	37,953	38,482	39,022	39,570	40,129	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698	40,698
Household Size	Number	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68
Served Household	Number	5,527	5,527	5,604	5,682	5,761	5,842	5,924	6,007	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093
Domestic Connections		5,527	5,527	5,604	5,682	5,761	5,842	5,924	6,007	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093	6,093
Commercial Connections		171	171	173	176	178	181	183	186	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188
Water Supply Tariff - Domestic	Rs/Month/Household	300	330	363	399	439	483	531	585	643	707	778	856	942	1,036	1,139	1,253	1,378	1,516	1,668	1,835	2,018	2,220	2,442	2,686	2,955	3,250	3,575	3,933	4,326	4,759
Water Supply Tariff - Commercial	Rs/Month/Unit	800	880	968	1,065	1,171	1,288	1,417	1,559	1,715	1,886	2,075	2,282	2,511	2,762	3,038	3,342	3,676	4,044	4,448	4,893	5,382	5,920	6,512	7,163	7,880	8,668	9,535	10,488	11,537	12,690
Annual Water Revenues	Rs. Million	22	24	26	29	33	37	41	46	51	56	62	68	75	82	90	99	109	120	132	145	160	176	193	213	234	257	283	311	342	377

Annex Table- 6
Unit Cost of Water Supplied (Rs per 000 Gallons)

Years	Construction Period	Years After Completion	Water Supplied(M.Gallions)	Project Costs (Rs. Million)		
				Investment	Recurring/O & M	Total
1	1			368		368
2		1	526		17.32	17.3
3		2	526		17.32	17.3
4		3	533		17.32	17.3
5		4	540		17.32	17.3
6		5	548		17.32	17.3
7		6	555		17.32	17.3
8		7	563		17.32	17.3
9		8	571		17.32	17.3
10		9	579		17.32	17.3
11		10	647		17.32	17.3
12		11	658		17.32	17.3
13		12	668		17.32	17.3
14		13	679		17.32	17.3
15		14	689		17.32	17.3
16		15	700		17.32	17.3
17		16	712		17.32	17.3
18		17	723		17.32	17.3
19		18	735		17.32	17.3
20		19	747		17.32	17.3
21		20	759		17.32	17.3
22		21	772		17.32	17.3
23		22	784		17.32	17.3
24		23	797		17.32	17.3
25		24	810		17.32	17.3
26		25	823		17.32	17.3
27		26	837		17.32	17.3
28		27	851		17.32	17.3
29		28	865		17.32	17.3
30		29	880		17.32	17.32
31		30	895		17.32	17.32
Present Worth @10%			5,739	289	162	436
		Cost of water Rs. /000 gallons based on Investment Cost				50.35
		Cost of water Rs. /000 gallons based on O & M Cost				28.28
		Cost of water Rs. /000 gallons based on Total Cost				78.63

**Annex Table-7
PROJECTED INCOME AND EXPENDITURE STATEMENT**

	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53	
INCOME																															
Water Supply Receipts	21.54	23.69	26.42	29.47	32.87	36.66	40.89	45.62	50.89	55.98	61.58	67.73	74.51	81.96	90.15	99.17	109.09	120.00	131.99	145.19	159.71	175.68	193.25	212.58	233.84	257.22	282.94	311.24	342.36	376.60	
Total	21.54	23.69	26.42	29.47	32.87	36.66	40.89	45.62	50.89	55.98	61.58	67.73	74.51	81.96	90.15	99.17	109.09	120.00	131.99	145.19	159.71	175.68	193.25	212.58	233.84	257.22	282.94	311.24	342.36	376.60	
EXPENDITURE																															
O&M Costs- Water	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	
Total	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	
PROFIT & LOSS (+/-)	4.22	6.37	9.10	12.15	15.55	19.34	23.57	28.30	33.57	38.66	44.26	50.42	57.19	64.64	72.84	81.85	91.77	102.68	114.68	127.88	142.39	158.37	175.93	195.26	216.52	239.90	265.62	293.92	325.04	359.28	

**Annex Table - 8
CASH FLOW STATEMENT**

	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53
CASH INFLOW																															
GOP	367.76																														
Water Supply Receipts		21.54	23.69	26.42	29.47	32.87	36.66	40.89	45.62	50.89	55.98	61.58	67.73	74.51	81.96	90.15	99.17	109.09	120.00	131.99	145.19	159.71	175.68	193.25	212.58	233.84	257.22	282.94	311.24	342.36	376.60
Total	367.76	21.54	23.69	26.42	29.47	32.87	36.66	40.89	45.62	50.89	55.98	61.58	67.73	74.51	81.96	90.15	99.17	109.09	120.00	131.99	145.19	159.71	175.68	193.25	212.58	233.84	257.22	282.94	311.24	342.36	376.60
CASH OUTFLOW																															
Capital Expenditure	367.76																														
O&M Costs Water		17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32
Total	367.76	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32	17.32
NET INFLOW/OUTFLOW	0.00	4.22	6.37	9.10	12.15	15.55	19.34	23.57	28.30	33.57	38.66	44.26	50.42	57.19	64.64	72.84	81.85	91.77	102.68	114.68	127.88	142.39	158.37	175.93	195.26	216.52	239.90	265.62	293.92	325.04	359.28
COMMULATIVE INFLOW	0.00	4.22	10.59	19.69	31.84	47.39	66.73	90.30	118.60	152.17	190.83	235.09	285.51	342.69	407.33	480.17	562.02	653.79	756.46	871.14	999.02	1141.41	1299.78	1475.71	1670.97	1887.49	2127.39	2393.01	2686.93	3011.97	3371.25

Annex Table- 9
Calculation of Financial Internal Rate of Return

(Rs.Million)

Year	Project Financial Costs			Financial Benefits	Net Incremental Benefits Under Various Assumptions			
	Investment	O & M	Total		(a)	(b)	(c)	(d)
1	368	0.00	367.76	0.00	-367.76	-367.76	-349.62	-349.62
2		17.32	17.32	21.54	4.22	2.06	2.49	0.33
3		17.32	17.32	23.69	6.37	4.00	4.64	2.27
4		17.32	17.32	26.42	9.10	6.46	7.37	4.73
5		17.32	17.32	29.47	12.15	9.20	10.42	7.47
6		17.32	17.32	32.87	15.55	12.26	13.82	10.53
7		17.32	17.32	36.66	19.34	15.67	17.61	13.94
8		17.32	17.32	40.89	23.57	19.48	21.84	17.75
9		17.32	17.32	45.62	28.30	23.74	26.57	22.00
10		17.32	17.32	50.89	33.57	28.48	31.84	26.75
11		17.32	17.32	55.98	38.66	33.06	36.93	31.33
12		17.32	17.32	61.58	44.26	38.10	42.53	36.37
13		17.32	17.32	67.73	50.42	43.64	48.68	41.91
14		17.32	17.32	74.51	57.19	49.74	55.46	48.01
15		17.32	17.32	81.96	64.64	56.44	62.91	54.71
16		17.32	17.32	90.15	72.84	63.82	71.10	62.09
17		17.32	17.32	99.17	81.85	71.93	80.12	70.20
18		17.32	17.32	109.09	91.77	80.86	90.04	79.13
19		17.32	17.32	120.00	102.68	90.68	100.94	88.95
20		17.32	17.32	131.99	114.68	101.48	112.94	99.74
21		17.32	17.32	145.19	127.88	113.36	126.14	111.62
22		17.32	17.32	159.71	142.39	126.42	140.66	124.69
23		17.32	17.32	175.68	158.37	140.80	156.63	139.07
24		17.32	17.32	193.25	175.93	156.61	174.20	154.88
25		17.32	17.32	212.58	195.26	174.00	193.53	172.27
26		17.32	17.32	233.84	216.52	193.13	214.79	191.40
27		17.32	17.32	257.22	239.90	214.18	238.17	212.45
28		17.32	17.32	282.94	265.62	237.33	263.89	235.60
29		17.32	17.32	311.24	293.92	262.79	292.19	261.06
30		17.32	17.32	342.36	325.04	290.81	323.31	289.07
31		17.32	17.32	376.60	359.28	321.62	357.55	319.89
Discount rates	Present Worth of Costs			Present Worth of Benefits	Net Present Worth			
5%	302.70	253.55	556.25	1362.11	805.86	669.65	750.23	614.02
10%	288.94	148.42	437.36	579.37	142.01	84.07	98.27	40.34
12%	283.78	124.56	408.34	434.03	25.69	-17.71	-15.14	-58.54
15%	276.38	98.88	375.26	296.46	-78.80	-108.45	-116.33	-145.98
FINANCIAL INTERNAL RATE OF RETURN (Percent) =					12.58	11.58	11.68	10.71
BENEFIT/COST RATIO AT 12% D.R. =					1.06 : 1			

- (a) Base Case assuming 30 Years period of analysis.
- (b) Benefits decreased by 10 %
- (c) Cost over-run by 10 %
- (d) Benefit reduction and cost over-run both occurring simultaneously.

APPENDIX-E
WORK SCHEDULE
CONSTRUCTION PLAN









IMPLEMENTATION PLAN

Detailed Design of the Infrastructure Sub-Project, Sectoral Planning and Resident Supervision in 16 Cities of Punjab Package-II (Hafizabad, Muridke & Kamoke)

SubProjects- Water Supply

I. Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road


II. Installation of new Tubewell at Mandiala Water Works

Sr. No.	Activities	Duration (Days)	Start Date	Finish Date	Financial Implementation	FY 2022-23				FY 2023-24				
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1	Approval of PC-I	25	01/02/2023	26/02/2023		 ★								
2	Technical Sanction	5	26/02/2023	03/03/2023		 ★								
3	Advertisement & Submission of Bid	15	04/03/2023	19/03/2023		 ★								
4	Evaluation	7	20/03/2023	27/03/2023		 ★								
5	Award of Work	8	28/03/2023	05/04/2023		 ★								
6	Mobilization	28	06/04/2023	04/05/2023		 ★								
7	Construction Supervision	190	05/05/2023	11/11/2023			 ★							
8	Testing and Commissioning	80	12/11/2023	31/01/2024					 ★					

Legend:

Q Quarter

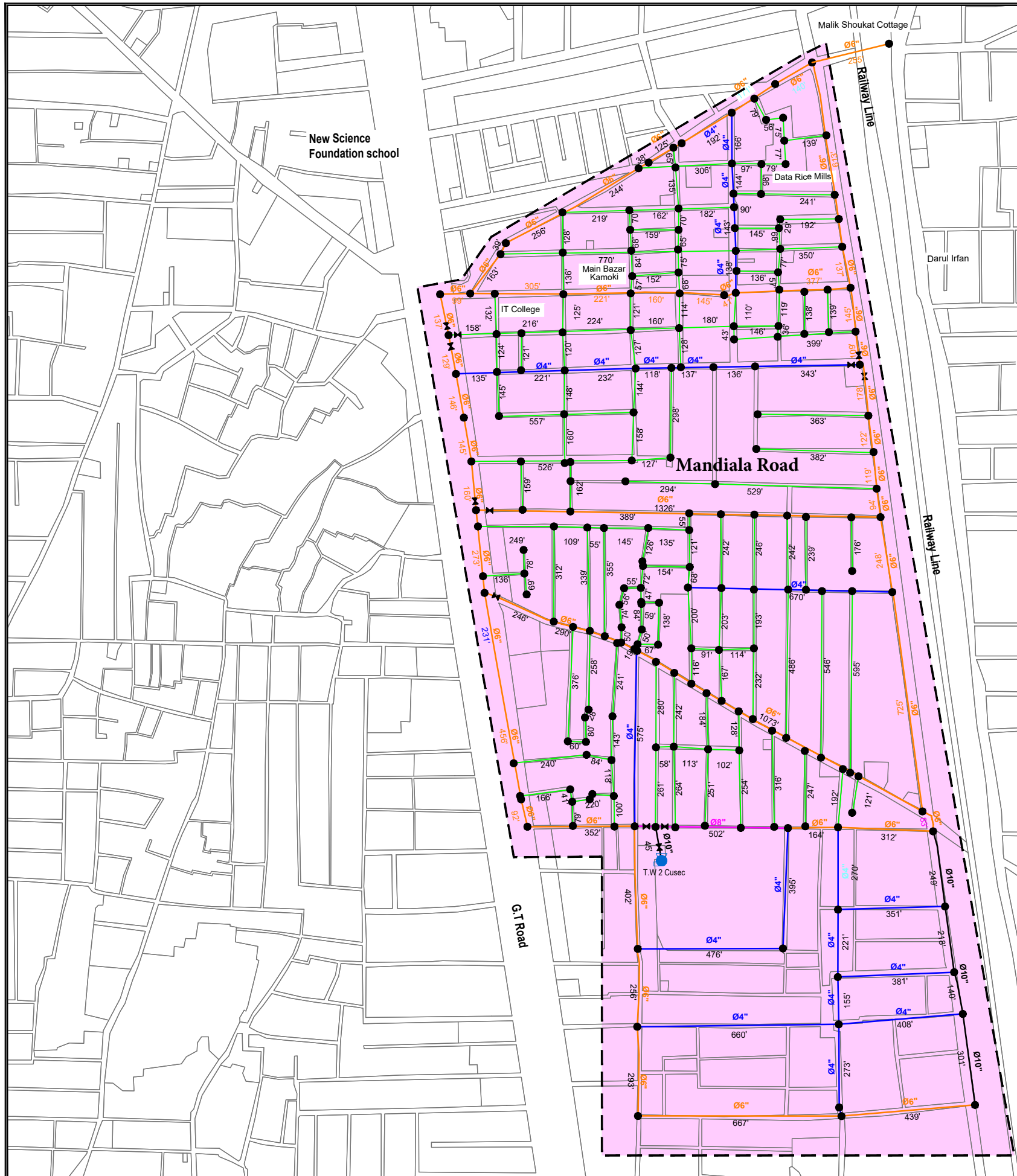
 Activity

 End of Activity

Note:-

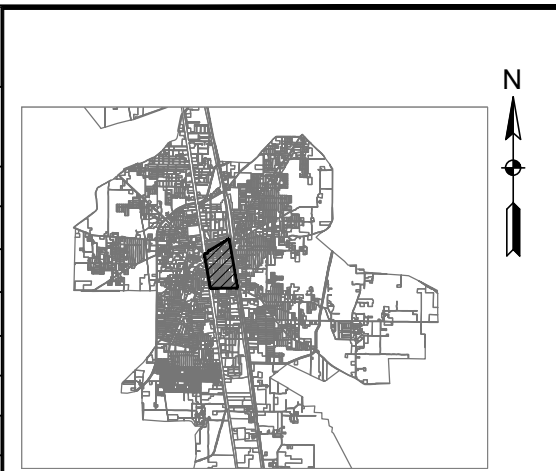
1) Any unforeseen delay in approval of documents from competent authority would affect the time line.

APPENDIX-F DRAWINGS



Kamoke Water Supply Design (2032)					
Area	Pipe Dia (inch)	Length (ft)	Others	Parameter	Units
Mandiala Road	3	25627	Population	15368.00	habs.
	4	5198	Avg Water Demand	0.60	MGD
	6	12978	Max Water Demand	0.90	MGD
	8	1283	Peak Water Demand	1.35	MGD
	10	621	TW Proposed	2.00	Cusecs
Total Length	45,707	TW Nos.	1.00	Nos.	

Note:
 39gpcd or 0.177m³/d per capita
 Pumps Working = 16 hours per day
 Tubewells at Max Day Demand



LEGEND

PIPE DIA (90mm) Ø3"	
PIPE DIA (125mm) Ø4"	
PIPE DIA (180mm) Ø6"	
PIPE DIA (225mm) Ø8"	
PIPE DIA (280mm) Ø10"	
PIPE DIA (355mm) Ø12"	
SLUICE VALVE	
AIR VALVE	A.V.
FIRE HYDRANT	F.H.
WASHOUT	W.O.
PROPOSED TUBE WELL (T.W.)	

- NOTES:**
- ALL PIPE DIAMETERS ARE IN MILLIMETER AND LENGTHS ARE IN METER UNLESS OTHERWISE SPECIFIED.
 - THE PIPE MATERIAL FOR WATER SUPPLY PIPE LINE SHALL BE HDPE PN-8 / SDR-21.
 - ALL HDPE PIPE DIAMETERS SHOWN ON DRAWINGS ARE EXTERNAL.
 - THE PIPE FROM TUBE WELL TO O.H.R SHALL BE OF M.S MATERIAL.
 - MINIMUM COVER OVER CROWN OF THE PIPE SHALL NOT BE LESS THAN 1m.
 - EXACT LOCATION OF AIR VALVES, WASHOUT, FIRE HYDRANTS & SLUICE VALVE WILL BE DECIDED BY ENGINEER AT SITE.
 - THRUST BLOCK WILL BE PROVIDED AT EACH BEND & JUNCTION.
 - SADDLE CLAMP FOR SERVICE CONNECTION WILL BE PROVIDED ON PIPES.
 - THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FROM RELEVANT DEPARTMENTS BEFORE EXECUTION OF WORKS.
 - THIS DRAWINGS IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
 - THE CONTRACTOR SHALL VERIFY THE ALIGNMENT OF PIPE AS PER APPROVED ROAD UTILITY X-SECTION.
- ALL DIA METER ARE (3") OTHER WISE SPECIFIED.

SHEET 1 OF 2

PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC)

CONSULTANT

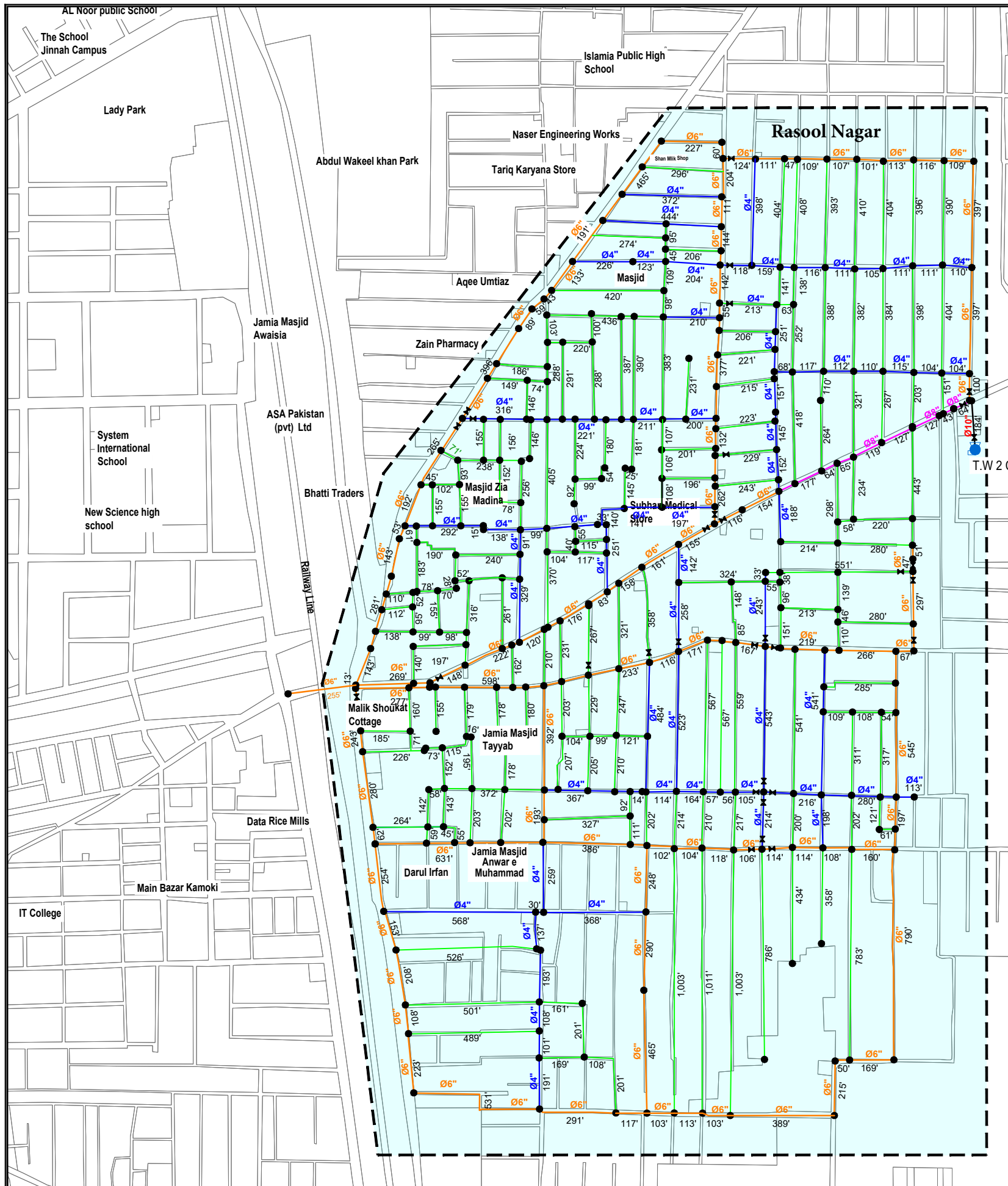
REV.	DATE	DESCRIPTION	APPROVED

DRAWN	M QASIM
SUBMITTED	
RECOMMENDED	
CHA.VER.	
APPROVED	

PROJECT

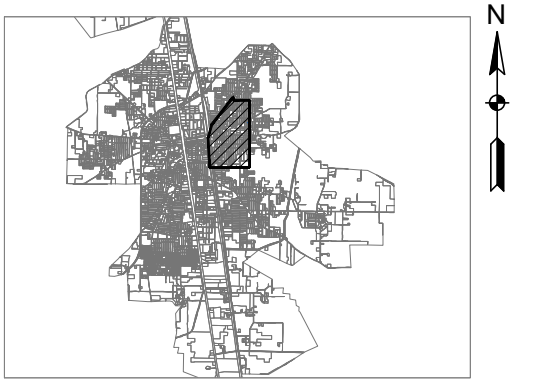
DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE-II

KAMOKI MANDIALA ROAD WATER SUPPLY SYSTEM LENGTH & DIA DESIGN 2032		
DATE	DRAWING NO.	REV.
SEPTEMBER, 2022	4396/11/TD/1J01	



Kamoke Water Supply Design (2032)					
Area	Pipe Dia (inch)	Length (ft)	Others	Parameter	Units
Rasool Nagar	3	45420	Population	30110	habs.
	4	15265	Avg Water Demand	1.17	MGD
	6	15477	Max Water Demand	1.76	MGD
	8	2551	Peak Water Demand	2.64	MGD
	10	244	TW Available	2.00	Cusecs
Total Length		78,957	TW Nos.	1.00	Nos.

Note:
 39gpcd or 0.177m3/d per capita
 Pumps Working = 16 hours per day
 Tubewells at Max Day Demand



LEGEND

PIPE DIA (90mm) Ø3"	
PIPE DIA (125mm) Ø4"	
PIPE DIA (180mm) Ø6"	
PIPE DIA (225mm) Ø8"	
PIPE DIA (280mm) Ø10"	
PIPE DIA (355mm) Ø12"	
SLUICE VALVE	
AIR VALVE	A.V.
FIRE HYDRANT	F.H.
WASHOUT	W.O.
EXISTING TUBE WELL (T.W)	

NOTES:

- ALL PIPE DIAMETERS ARE IN MILLIMETER AND LENGTHS ARE IN METER UNLESS OTHERWISE SPECIFIED.
- THE PIPE MATERIAL FOR WATER SUPPLY PIPE LINE SHELL BE HDPE PN-8 / SDR-21.
- ALL HDPE PIPE DIAMETERS SHOWN ON DRAWINGS ARE EXTERNAL.
- THE PIPE FROM TUBE WELL TO O.H.R SHELL BE OF M.S MATERIAL.
- MINIMUM COVER OVER CROWN OF THE PIPE SHALL NOT BE LESS THAN 1m.
- EXACT LOCATION OF AIR VALVES, WASHOUT, FIRE HYDRANTS & SLUICE VALVE WILL BE DECIDED BY ENGINEER AT SITE.
- THRUST BLOCK WILL BE PROVIDED AT EACH BEND & JUNCTION.
- SADDLE CLAMP FOR SERVICE CONNECTION WILL BE PROVIDED ON PIPES.
- THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FROM RELEVANT DEPARTMENTS BEFORE EXECUTION OF WORKS.
- THIS DRAWINGS IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
- THE CONTRACTOR SHALL VERIFY THE ALIGNMENT OF PIPE AS PER APPROVED ROAD UTILITY X-SECTION.

ALL DIA METER ARE (3") OTHER WISE SPECIFIED.

SHEET 1 OF 2

PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDFC)

CONSULTANT

M M Pakistan (Pvt) Ltd.

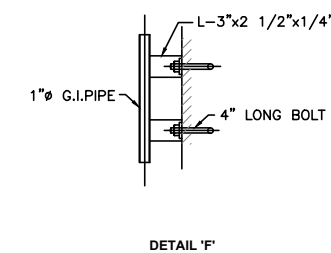
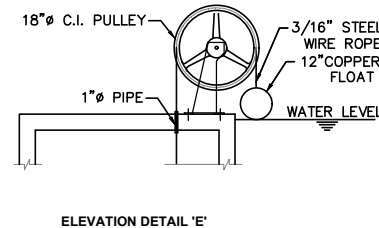
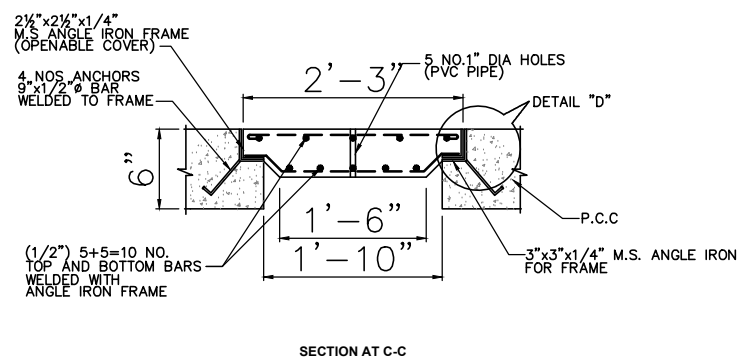
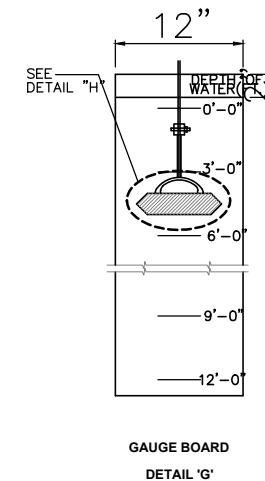
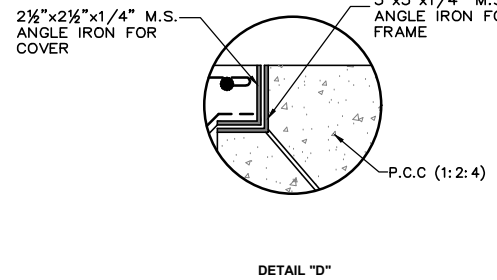
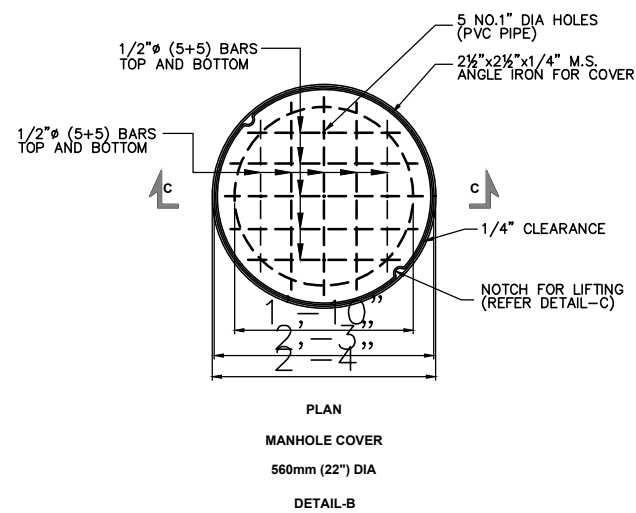
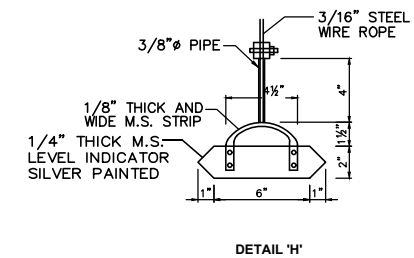
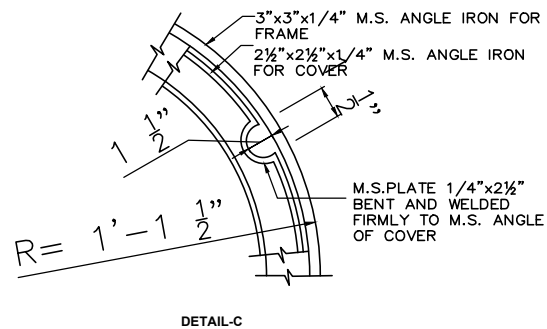
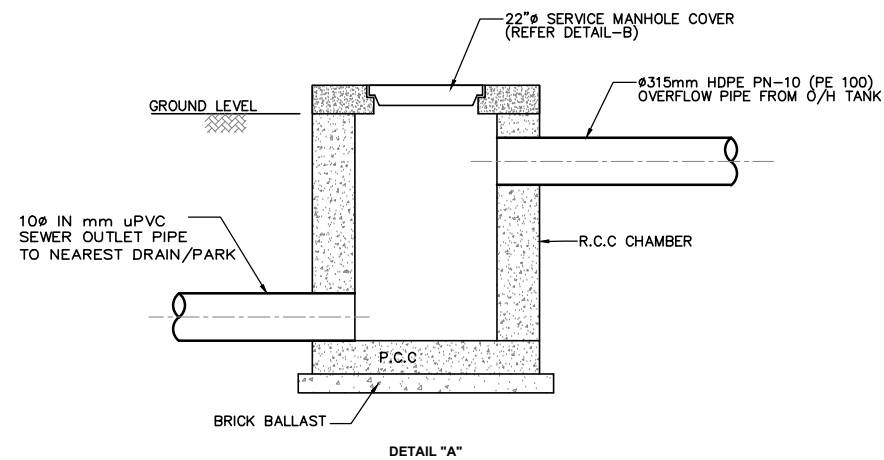
REV.	DATE	DESCRIPTION	APPROVED

DRAWN	M QASIM
SUBMITTED	
RECOMMENDED	
CHA.VER.	
APPROVED	

PROJECT

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE-II

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM LENGTH & DIA DESIGN 2032		
DATE	DRAWING NO.	REV.
SEPTEMBER, 2022	4396/11/TD/1J01	



NOTES

1. ALL DIMENSIONS ARE IN Millimeter UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL BE USED FOR PIPING ARRANGEMENT ONLY STRUCTURAL DETAIL, REFER TO STRUCTURAL DRAWINGS.
3. PIPE DIA FROM TUBEWELL TO O.H.W.T IS SUBJECT TO CHANGE AS PER DRAWING OF TUBEWELL AS RECOMMENDED BY HYDROLOGIST.
4. ALL PIPE DIAMETERS ARE IN Millimeter.

SHEET 2 OF 2

PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC)

CONSULTANT

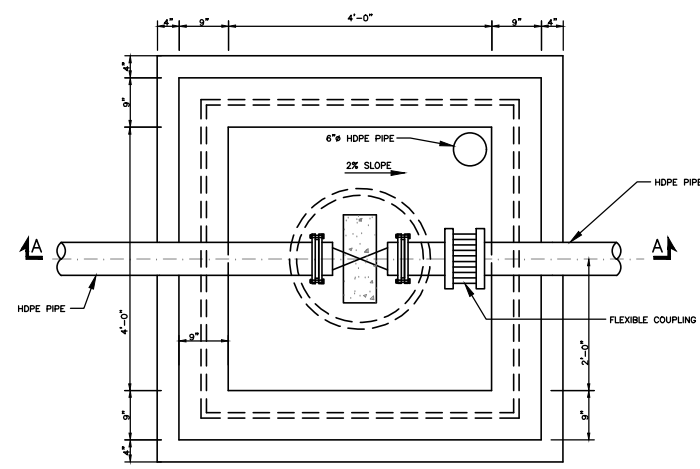
MMP Pakistan (Pvt) Ltd.

REV.	DATE	DESCRIPTION	APPROVED	DRAWN	M QASIM
				SUBMITTED	
				RECOMMENDED	
				CH.A/VER.	
				APPROVED	

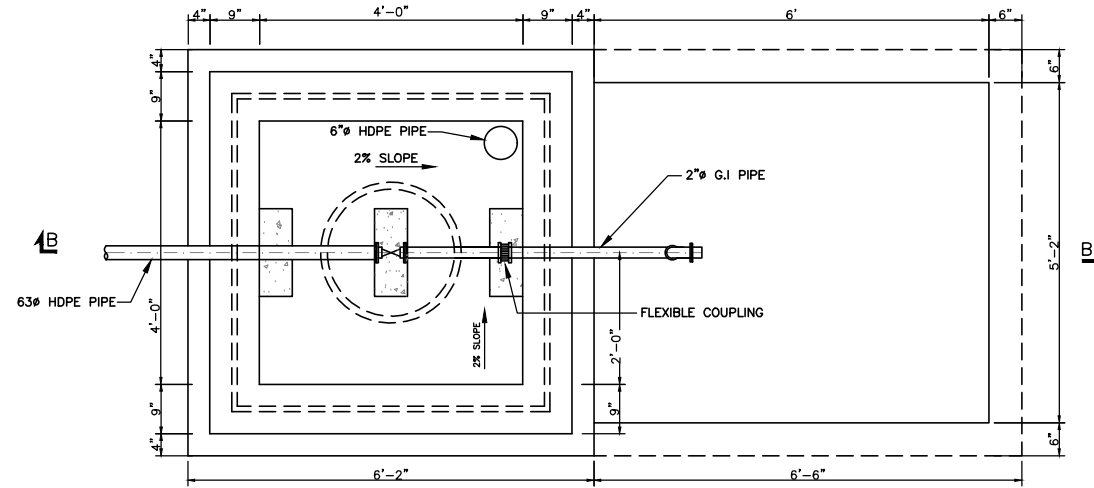
PROJECT

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE-II

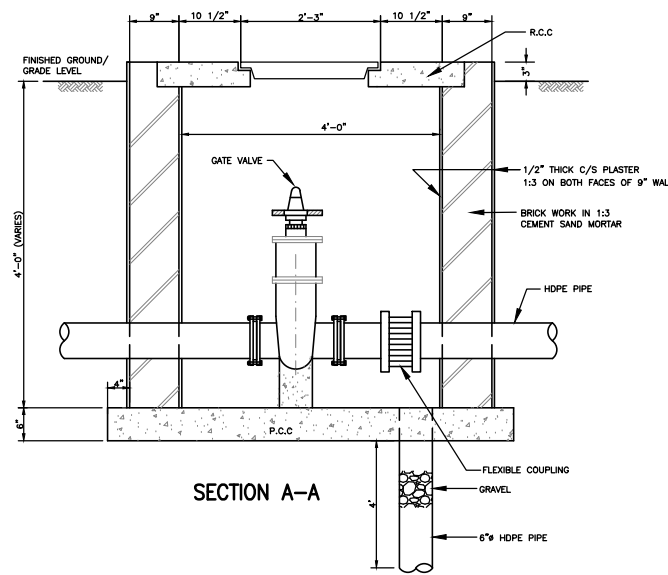
O.H.W.T CAPACITY 100,000 GALLONS MISCELLANEOUS DETAILS		
DATE SEPTEMBER, 2022	DRAWING NO. 4396/11/TD/1J03	REV.



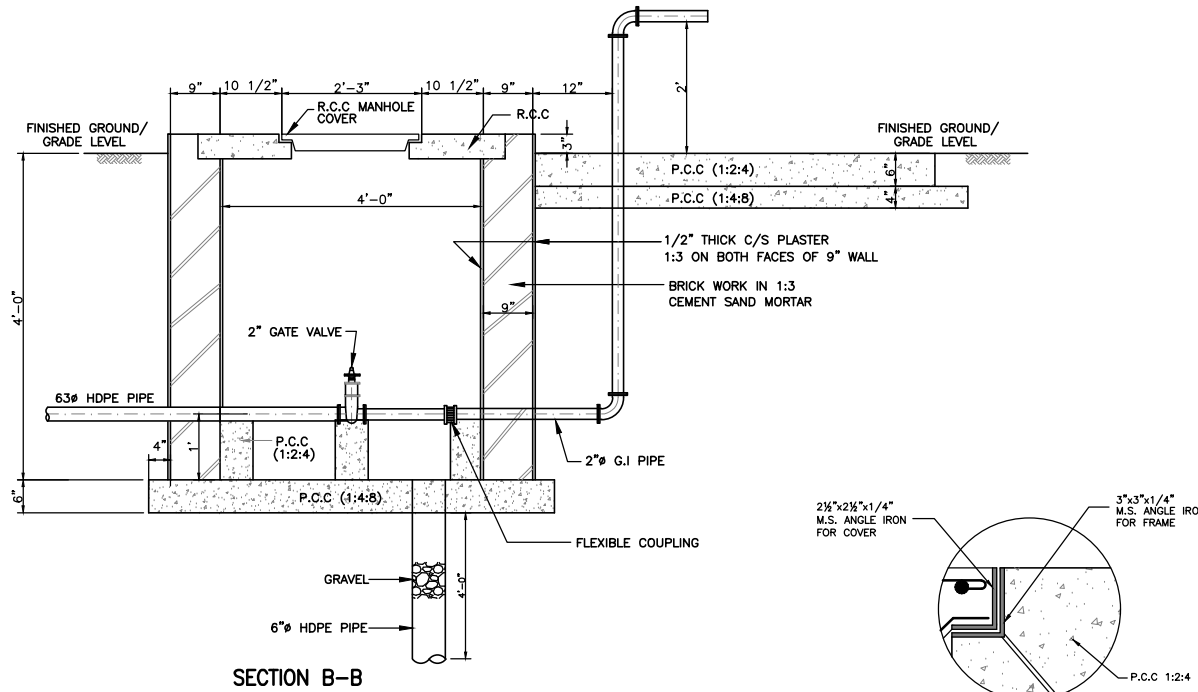
SLUICE VALVE CHAMBER SECTIONAL PLAN



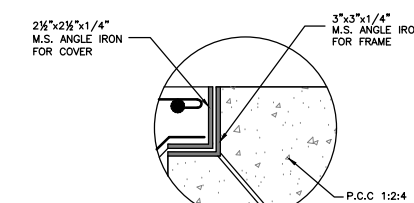
SECTIONAL PLAN OF GARDEN HYDRANT CHAMBER



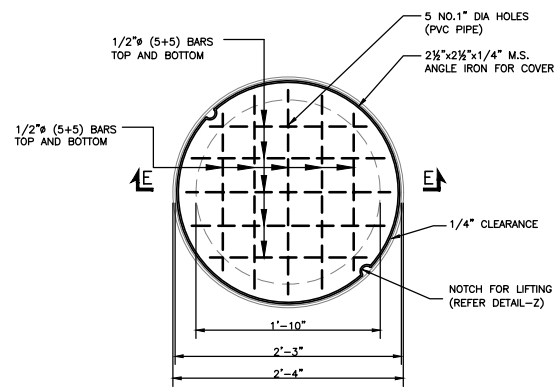
SECTION A-A



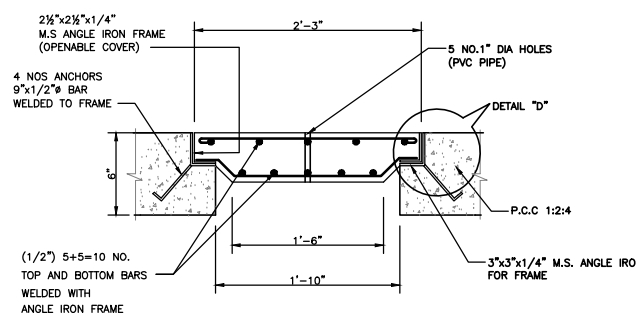
SECTION B-B



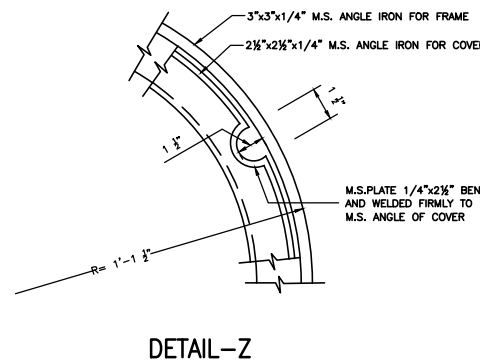
DETAIL "D"



PLAN OF MANHOLE COVER 560mm (22") DIA DETAIL-W



SECTION AT E-E

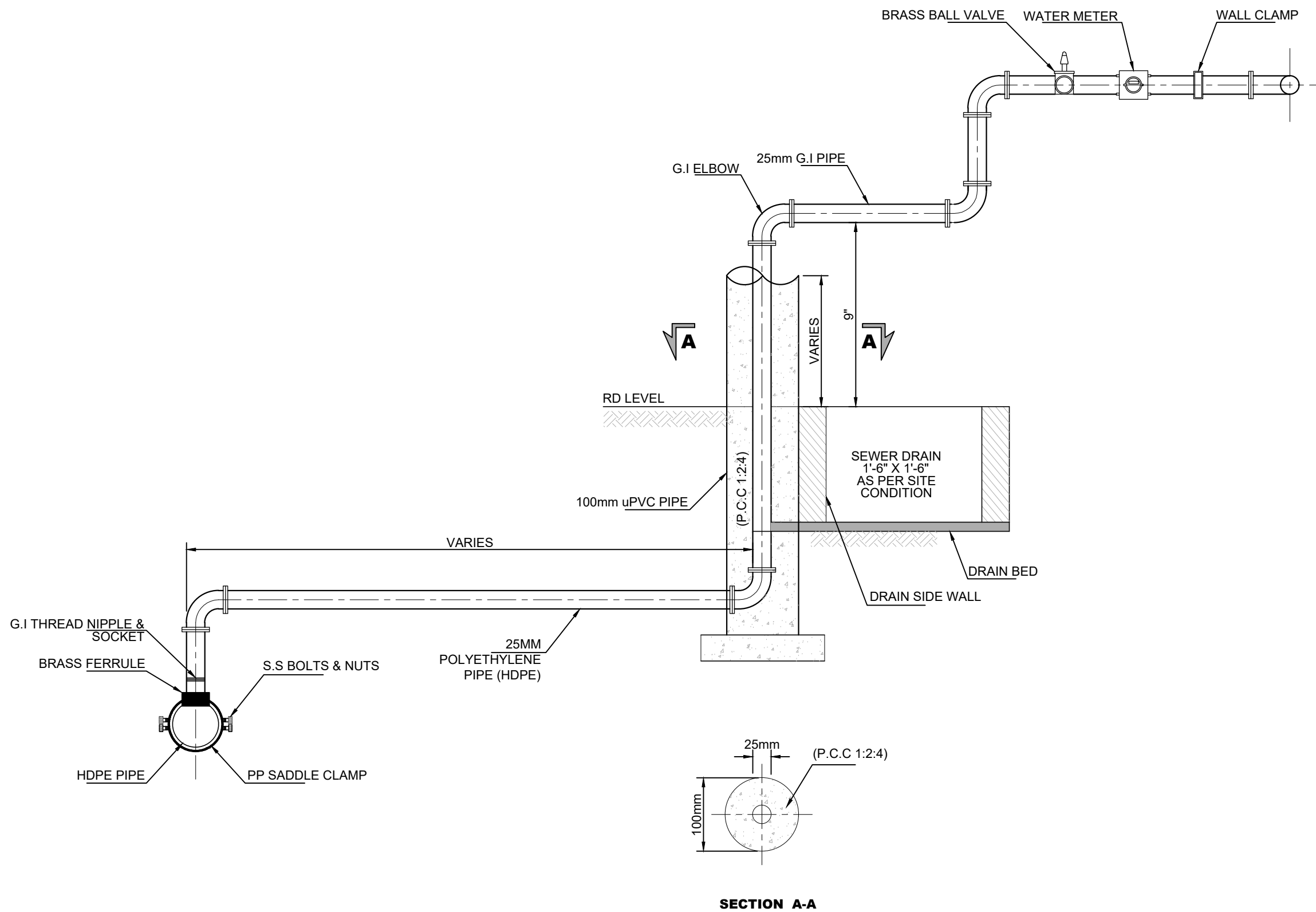


DETAIL-Z

NOTES

1. ALL PIPE DIAMETERS ARE IN INCH AND LENGTHS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. READ THIS DRAWING IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
3. FOR STRUCTURAL DETAILS REFER TO STRUCTURAL DRAWINGS.

PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC)	CONSULTANT 	DRAWN M QASIM SUBMITTED RECOMMENDED CHA./VER. APPROVED	PROJECT DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE-II	WATER SUPPLY SYSTEM MISCELLANEOUS DETAILS SLUICE VALVE CHAMBER & GARDEN HYDRANT	
				DATE SEPTEMBER, 2022	DRAWING NO. 4396/11/TD/1J03



SECTION A-A

PUNJAB MUNICIPAL DEVELOPMENT
FUND COMPANY (PMDEC)



CONSULTANT

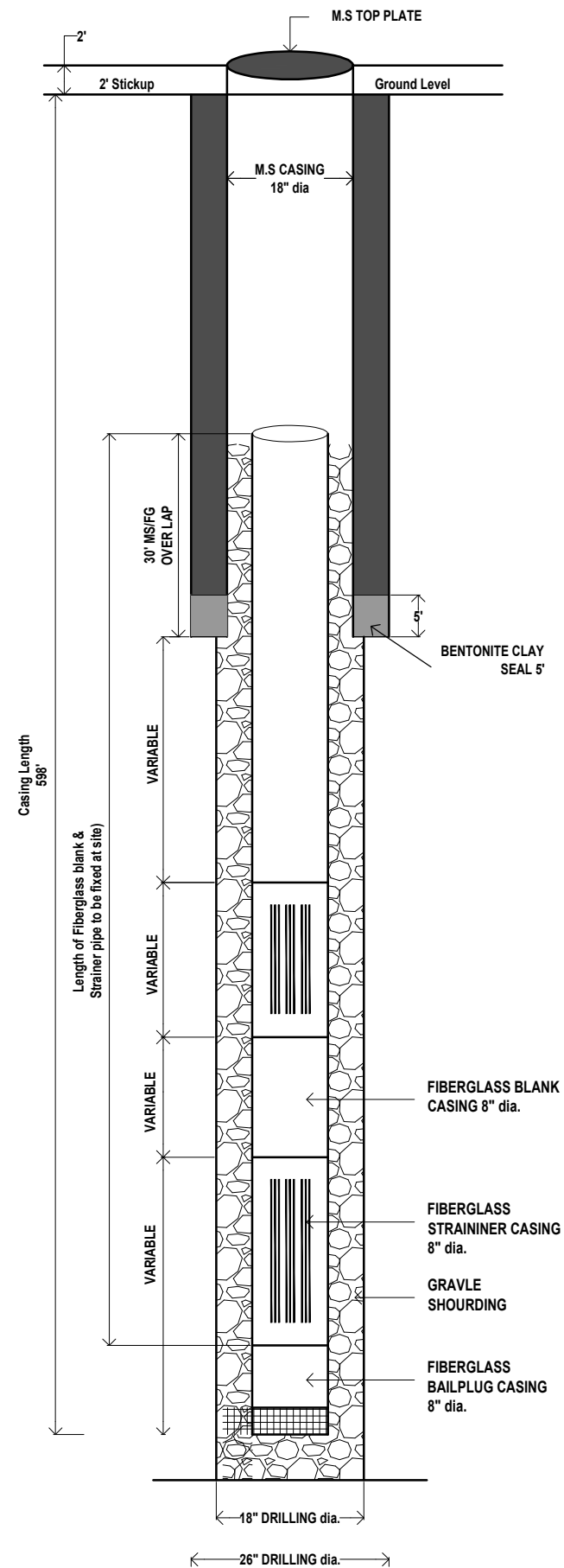


REV.	DATE	DESCRIPTION	APPROVED	DRAWN	M QASIM
				SUBMITTED	
				RECOMMENDED	
				CHA.VER.	
				APPROVED	

PROJECT
DETAIL DESIGN OF INFRASTRUCTURE
SUB-PROJECT, SECTORAL PLANNING &
RESIDENT SUPERVISION PACKAGE-II

**WATER SUPPLY CONNECTION
TYPICAL DRAWINGS**

DATE	DRAWING NO.	REV.
OCTOBER, 2022		



**SCHEMATIC SECTION OF
2.0 CFS CAPACITY TUBE WELL**

DETAIL OF TUBEWELL ASSEMBY		
Sr. No.	item	Length Feet
1	Mild Steel Pump Housing Casing 18" I/d Including 2' Stickup	250
2	Fiberglass Strainer pipe 8" dia	140
3	Fiberglass Blank pipe 8" dia	200
4	Fiberglass Bail plug pipe 8" dia	10
5	Total Casing pipe depth i/d Stickup	600
6	Overlap Fiber Glass	30
7	Total drilling depth including 5' over drilling	605

NOTE:-

1. GEOPHYSICAL LOGGING OF BORE HOLE IS RECOMMENDED FOR DETERMINING THE POTENTIAL ZONES AND FINALIZING THE PLACEMENT OF STRAINER / BLIND PIPE ETC
2. DIAMETER OF BOREHOLE AND CASING PIPE IS IN INCHES AND THE LENGTH IS IN FEET
3. SUITABLE SCREENABLE AQUIFER AND TOTAL DEPTH OF WELL TO BE DESIGNED AT SITE AFTER STRATA ANALYSIS AND GEOPHYSICAL LOGGING RECOMMENDATIONS

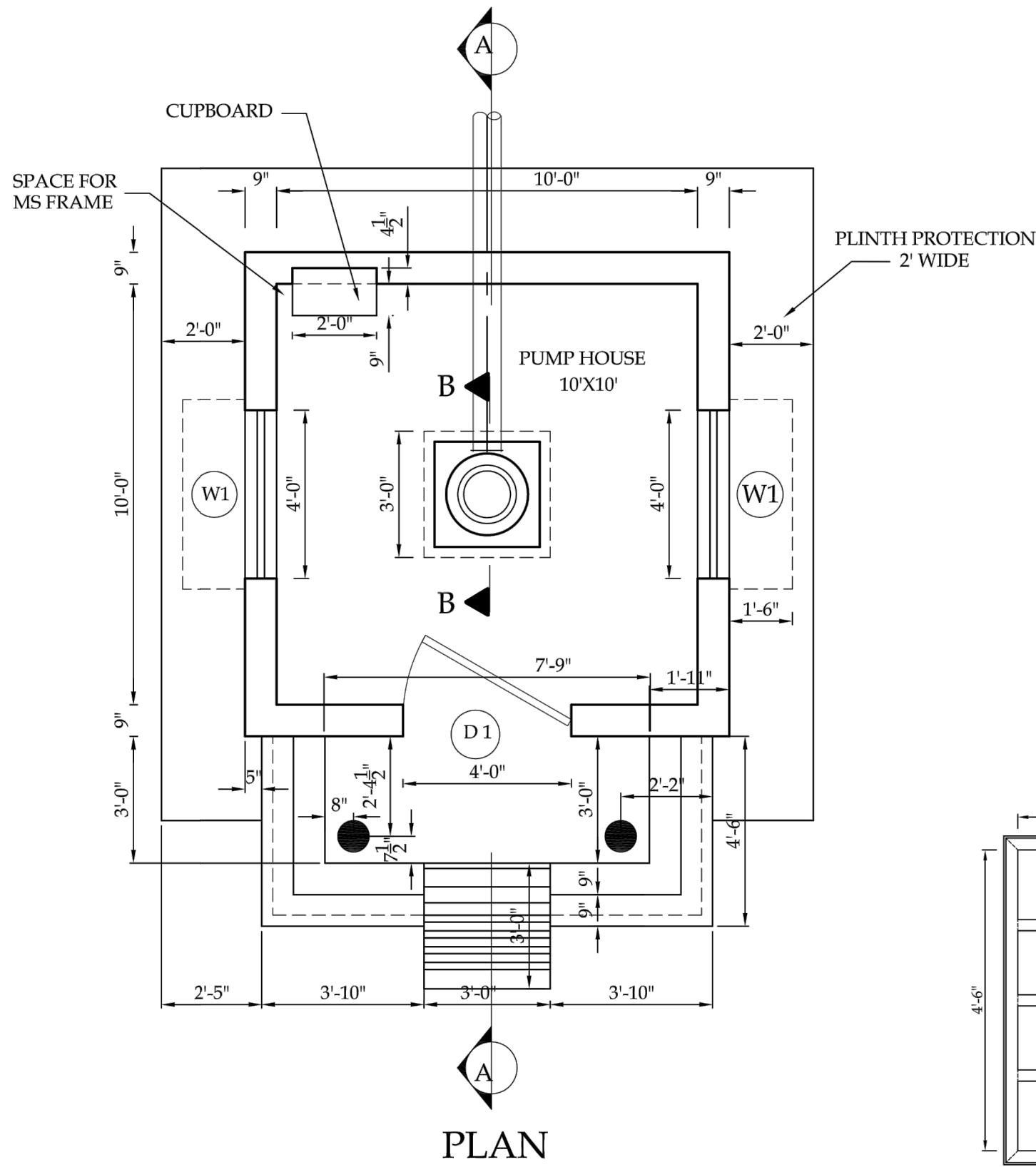
PUNJAB MUNICIPAL DEVELOPMENT
FUND COMPANY (PMDEC)

CONSULTANT

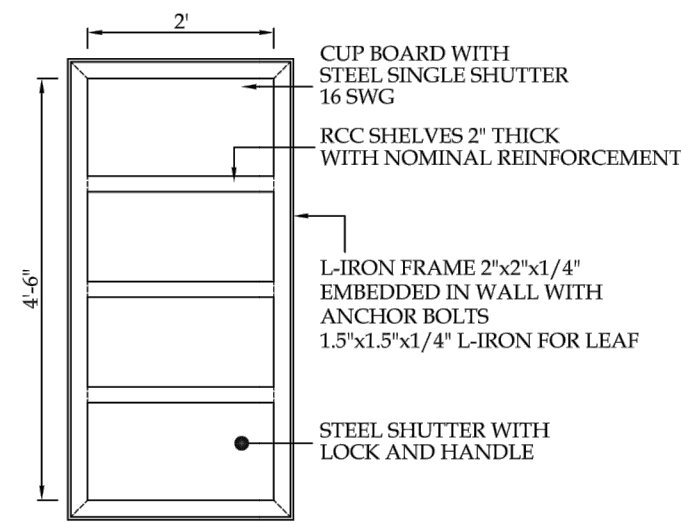
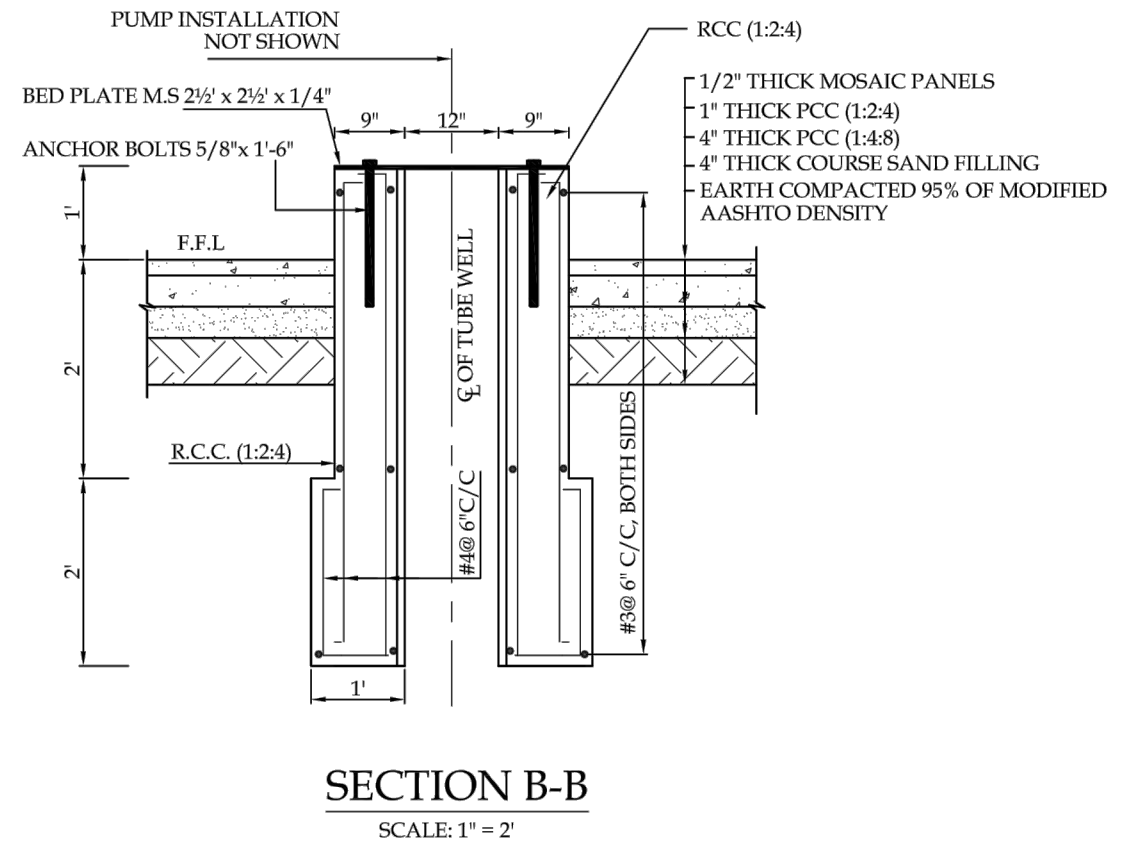
			DRAWN	
			SUBMITTED	
			RECOMMENDED	
			CHA./VER.	
REV. DATE	DESCRIPTION	APPROVED	APPROVED	

PROJECT
DETAIL DESIGN OF INFRASTRUCTURE
SUB-PROJECT, SECTORAL PLANNING &
RESIDENT SUPERVISION PACKAGE-II

TENTATIVE DESIGN OF TUBE WELL CAPACITY 2.0 cfs LOCATION: MANDIALA ROAD, MC, KAMOME		
DATE	DRAWING NO.	REV.
JANUARY, 2023	4396/11/TD/1J01	



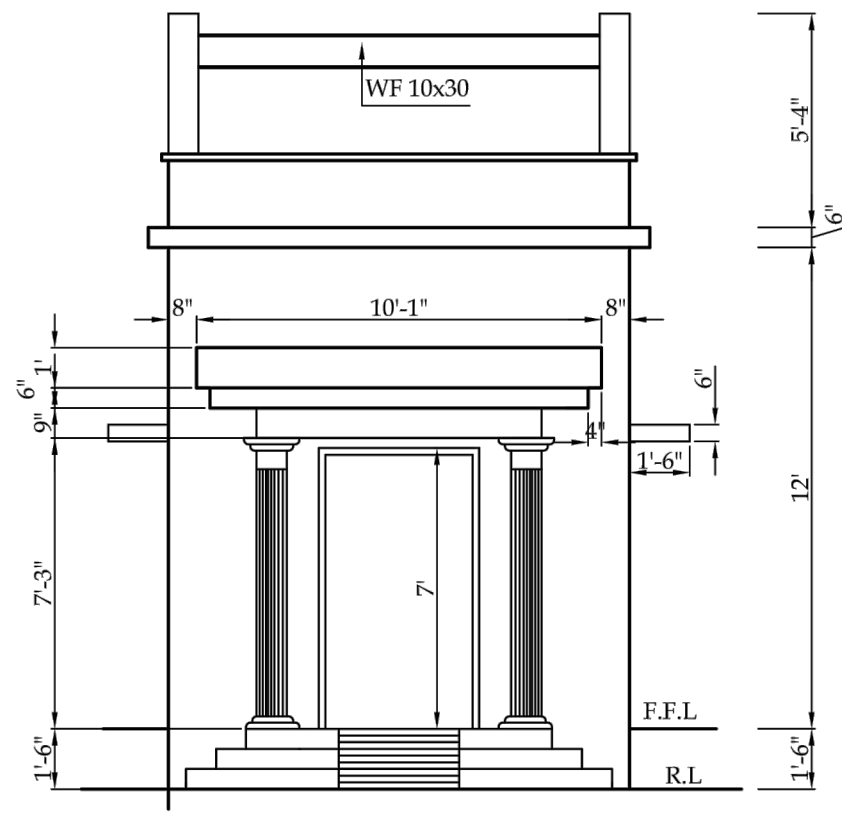
NOTE
 TUBE WELL DESIGN IS TENTATIVE. ACTUAL CONSTRUCTION/INSTALLATION SHALL CONFORM TO SITE SITUATION AND AS PER INSTRUCTIONS OF THE ENGINEER.



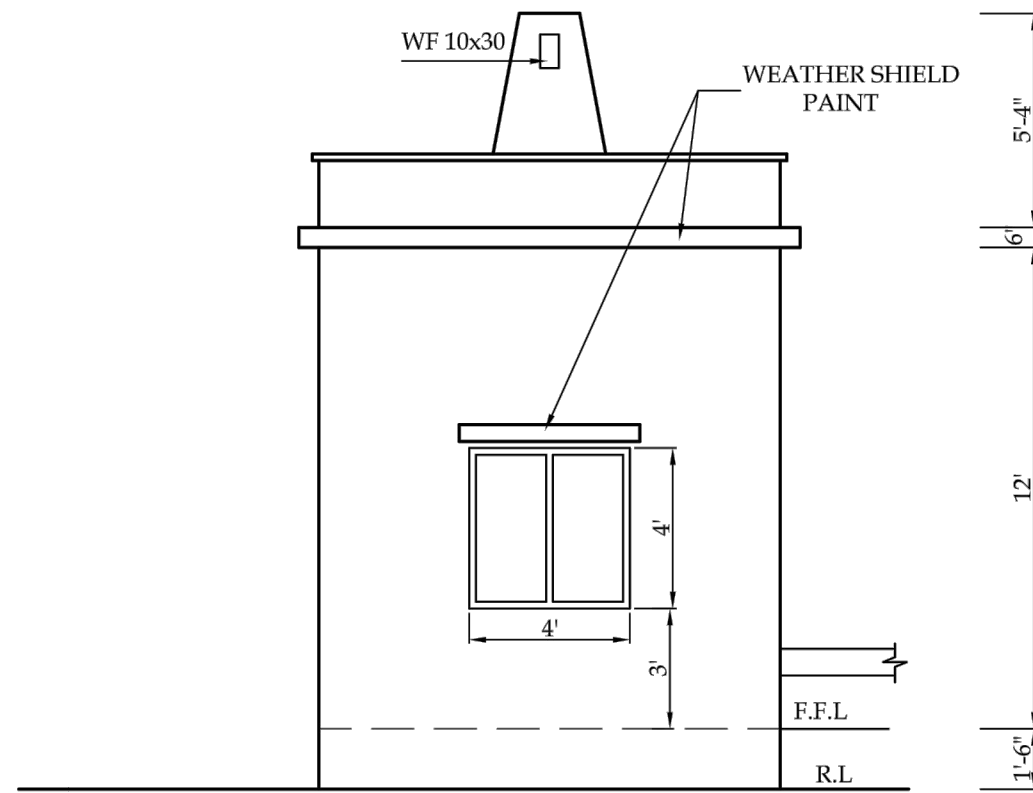
SCHEDULE OF PUMPS

S.No.	DESCRIPTION	SPECIFICATIONS
1	NO. OF PUMPS	ONE
2	TYPE	DEEP WELL TURBINE
3	PUMP MANUFACTURER	K.S.B or E.Q. APPROVED
4	CAPACITY	1.0 CUSECS
5	PUMPING HEAD	200'
6	MOTOR MANUFACTURER	SIEMENS or E.Q. APPROVED
7	MOTOR H.P	40 OR AS PER PUMP MANUFACTURER
8	SPEED	1450 RPM
9	SETTING DEPTH	90'

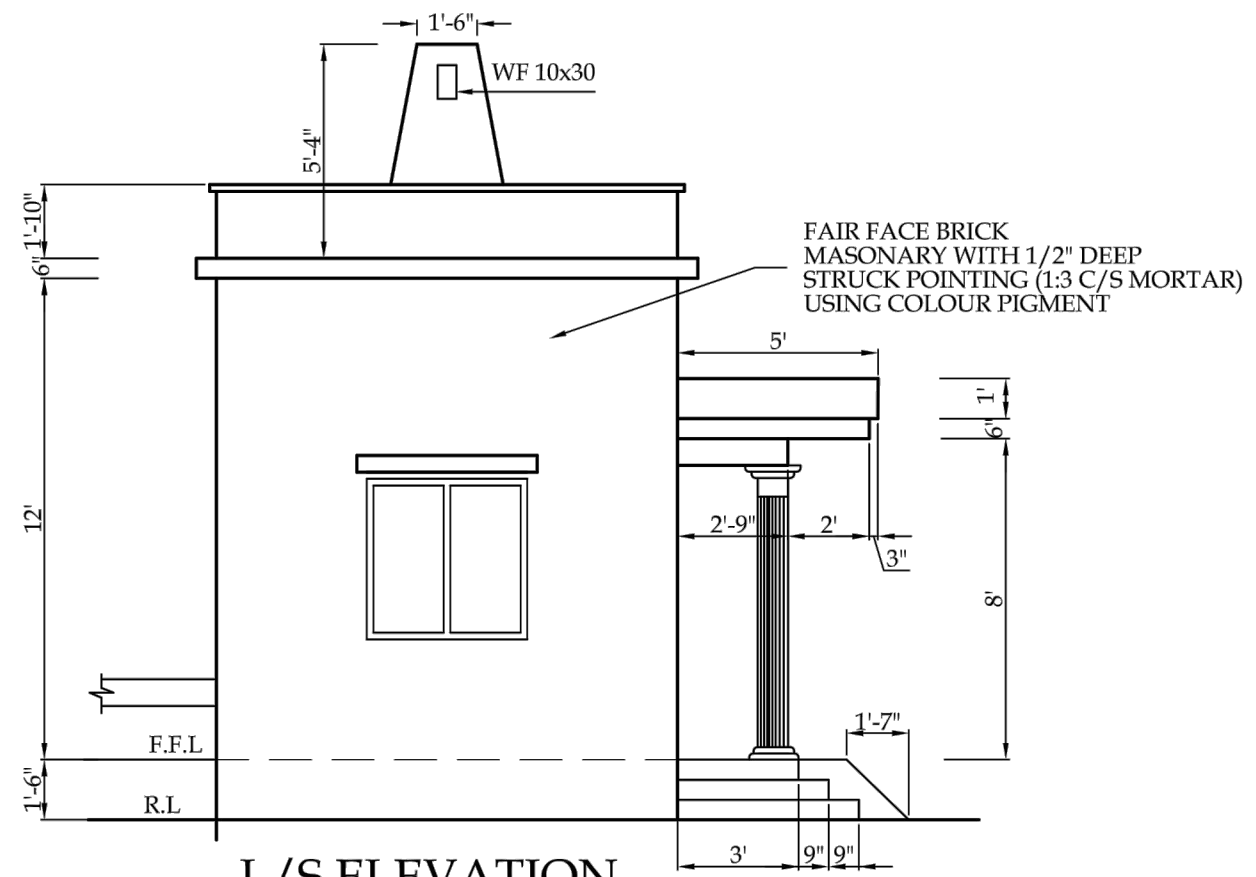
PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC)	CONSULTANT 				DRAWN M. Adnan	PROJECT DETAILED DESIGN FOR INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB PACKAGE-II (PRIORITY SUB-PROJECT)	PUMP HOUSE LAYOUT PLAN		SCAL
		REV.	DATE	DESCRIPTION	APPROVED		APPROVED	DATE FEB, 2023	DRAWING NO.	REV.



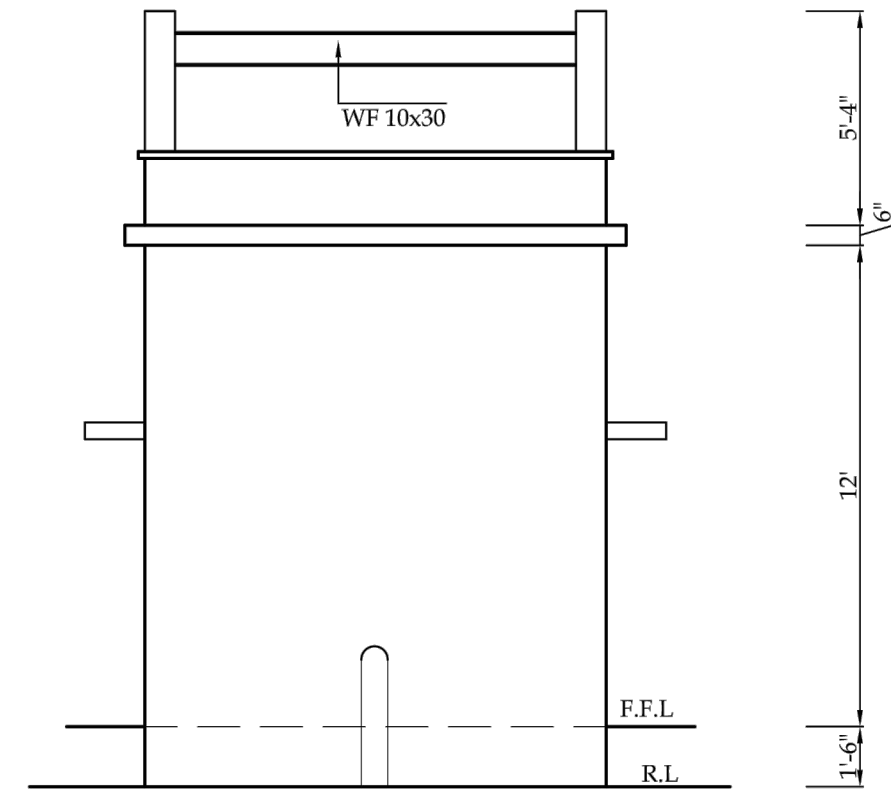
FRONT ELEVATION



R/S ELEVATION







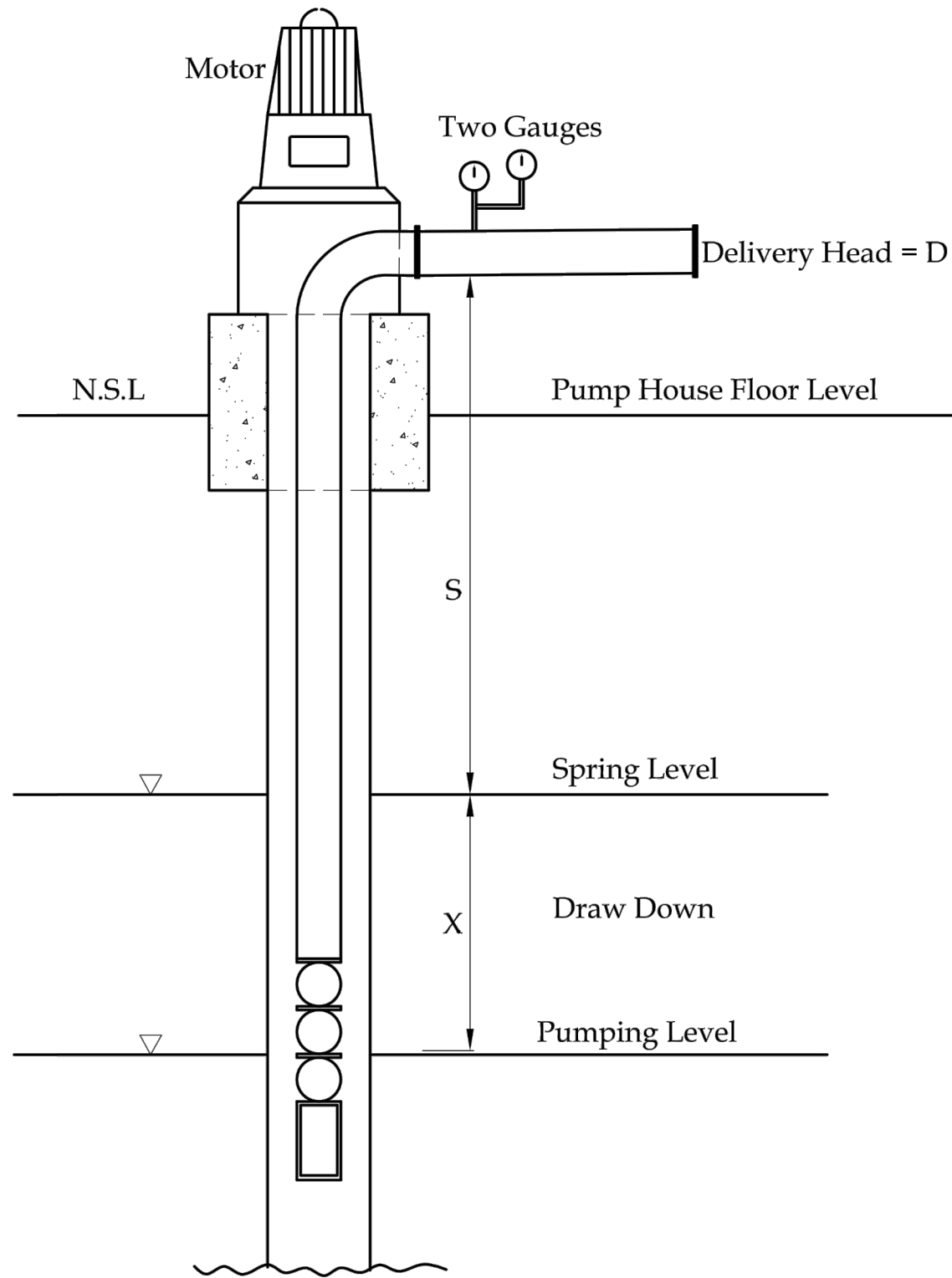
L/S ELEVATION



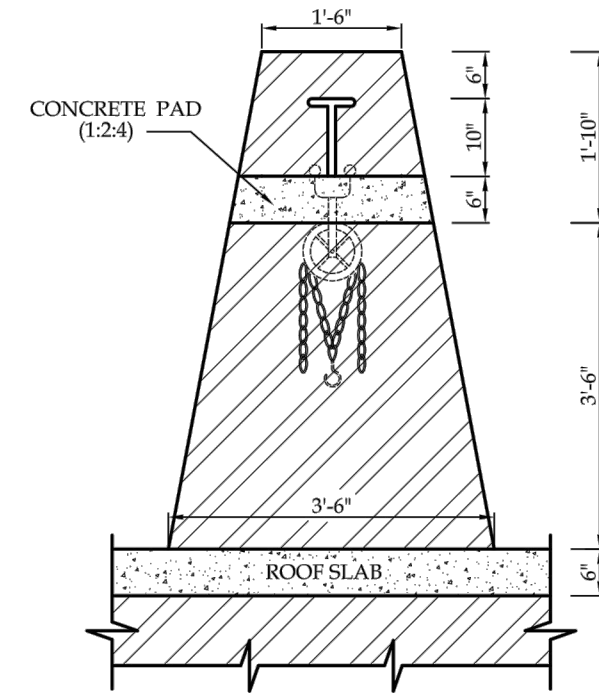
REAR ELEVATION

FAIR FACE BRICK MASONRY WITH 1/2" DEEP STRUCK POINTING (1:3 C/S MORTAR) USING COLOUR PIGMENT

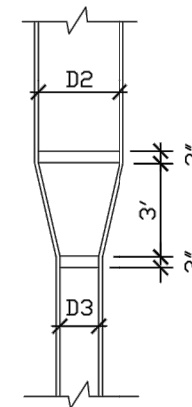
PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC) 	CONSULTANT   	REV.	DATE	DESCRIPTION	APPROVED	DRAWN	M. Adnan	PROJECT DETAILED DESIGN FOR INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB PACKAGE-II (PRIORITY SUB-PROJECT)	PUMP HOUSE CROSS SECTIONS		SCAL
										DATE	DRAWING NO.	REV.
									FEB, 2023		



- 1 - Pump Total Head = $S + X + D + 10\%$ Friction Losses in Pump
- 2 - Pump Testing should be at 1.0 Cusec discharge regulated through the Sluice Valve throttling for Muridke
- 3 - Two Pressure Gauges should be installed for measurement of delivery head



**SIDE ELEVATION OF GIRDER LIFT WALL
DETAIL A**

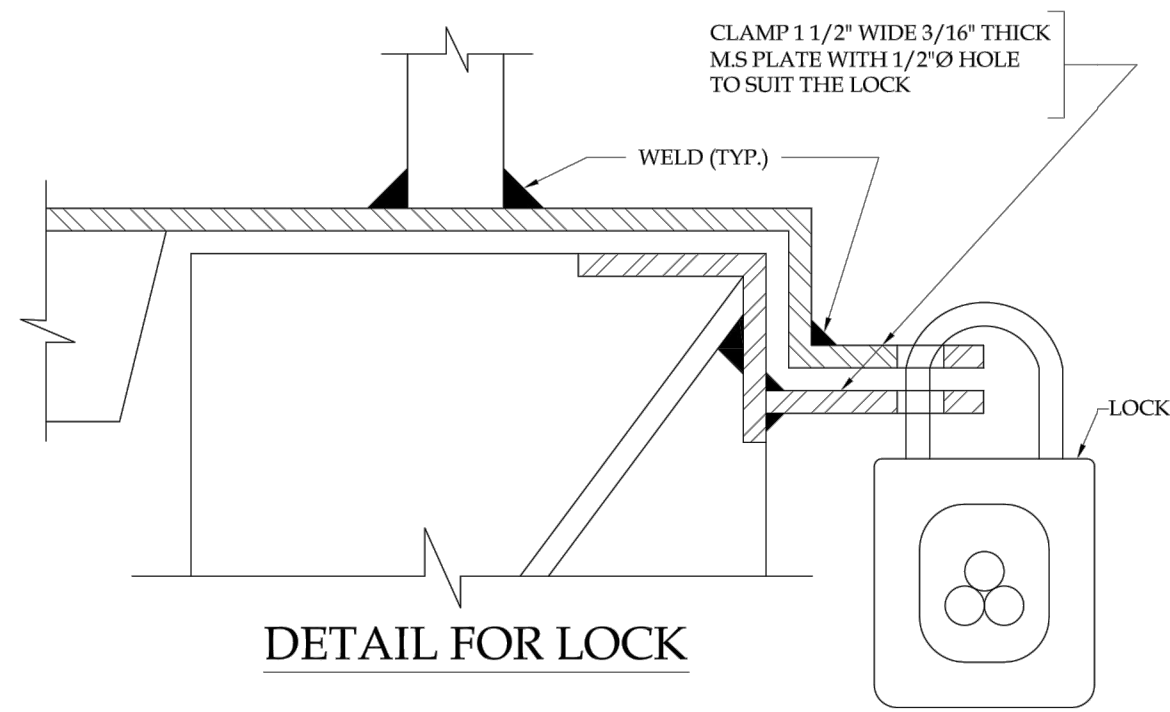


REDUCER DETAIL

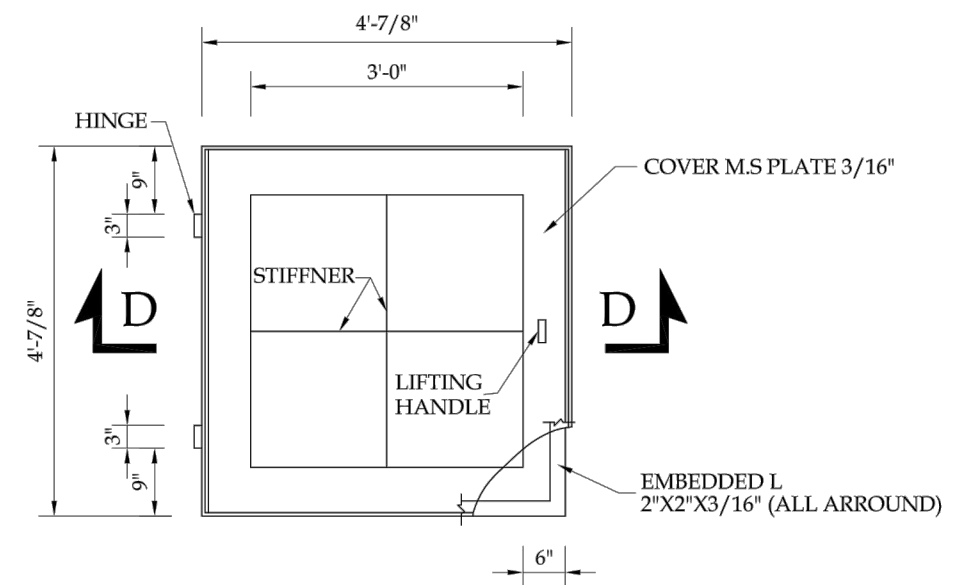
SCHEDULE OF TUBE WELL

DESCRIPTION	SIZE
D1	22"
D2	12"
D3	10"
D4	6"
TUBEWELL HOUSING	120'
STRAINER LENGTH	100'
BORE DEPTH	450'

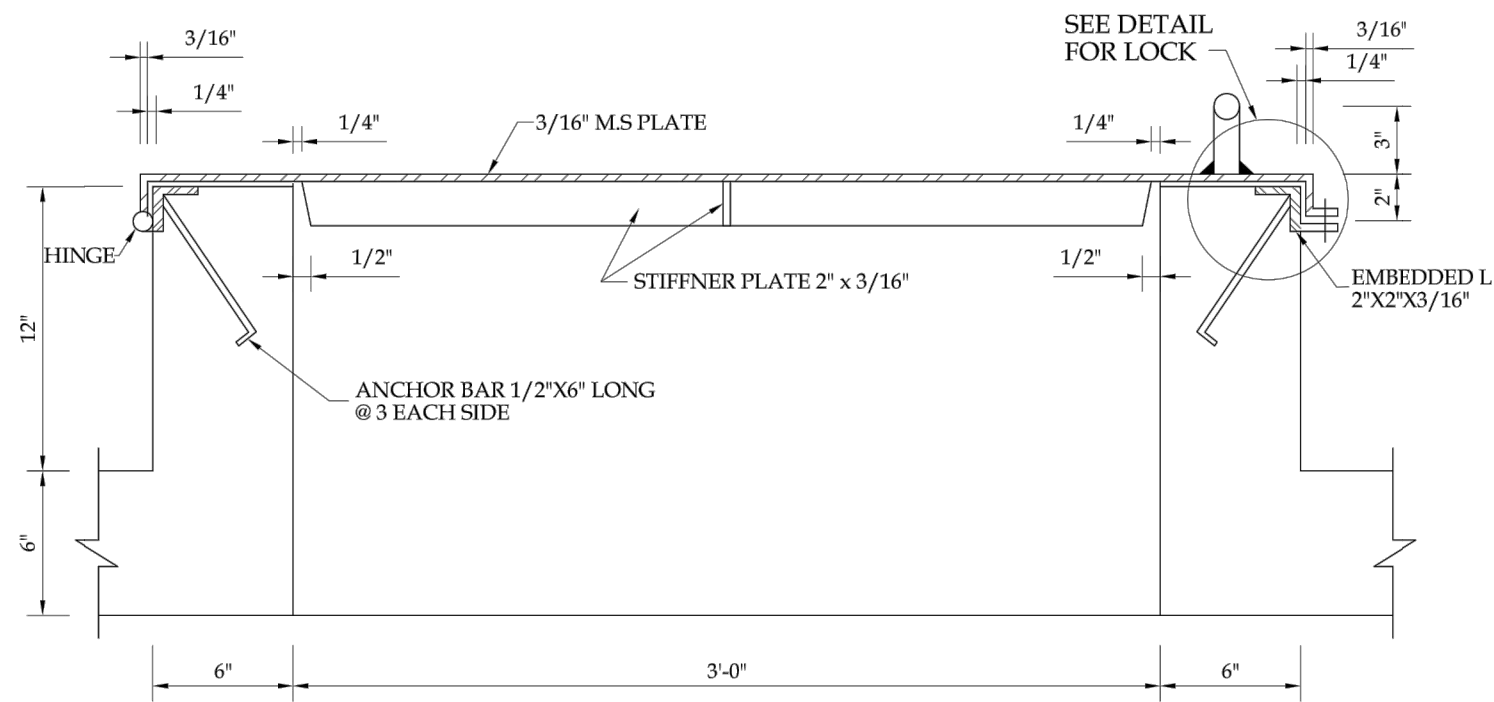
PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC)	CONSULTANT 												
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	DRAWN	M. Adnan	PROJECT	DETAILED DESIGN FOR INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB PACKAGE-II (PRIORITY SUB-PROJECT)	DATE	DRAWING NO.	SCAL
												FEB, 2023	REV.




DETAIL FOR LOCK

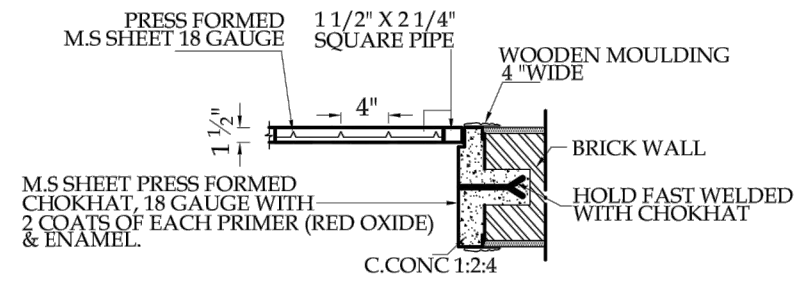


DETAIL "B"

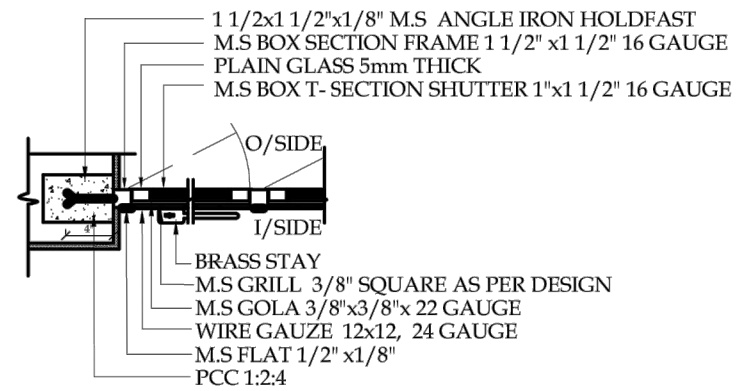


SECTION D-D

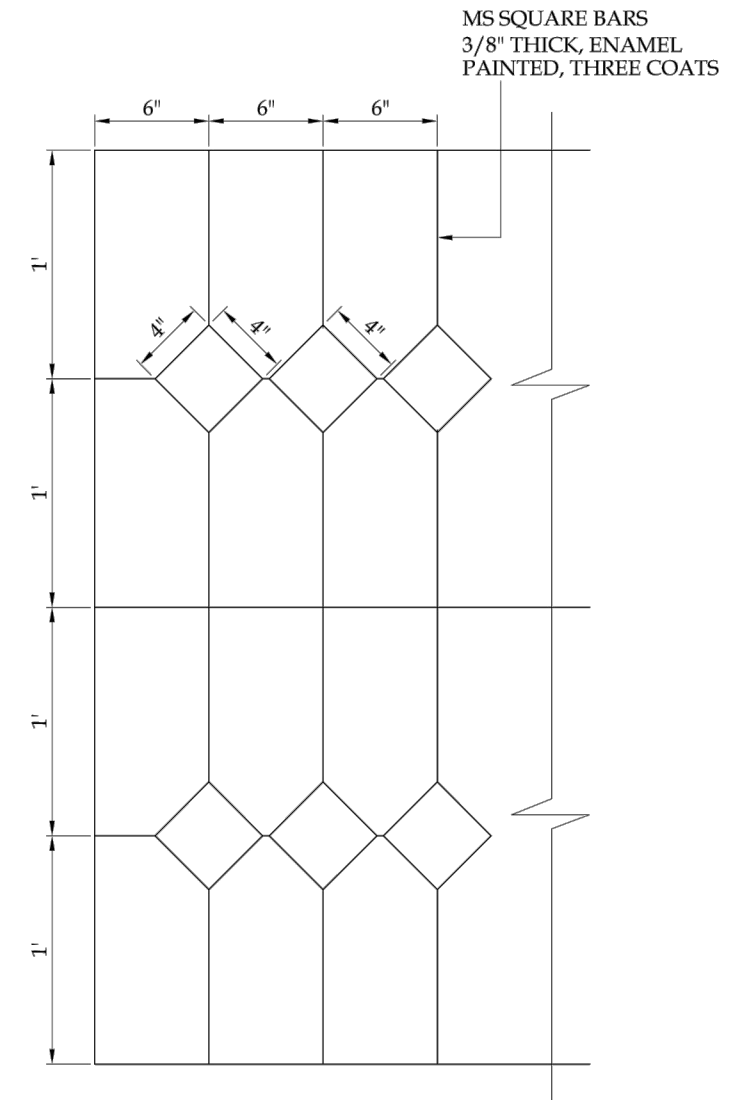
PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC)	CONSULTANT 	<table border="1"> <tr> <th>REV.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REV.	DATE	DESCRIPTION	APPROVED					DRAWN M. Adnan	PROJECT DETAILED DESIGN FOR INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB PACKAGE-II (PRIORITY SUB-PROJECT)	PUMP HOUS'S LOCK DETAILS		SCAL
			REV.	DATE	DESCRIPTION	APPROVED									
SUBMITTED RECOMMENDED CHA./VER. APPROVED	DATE FEB, 2023	DRAWING NO.	REV.												



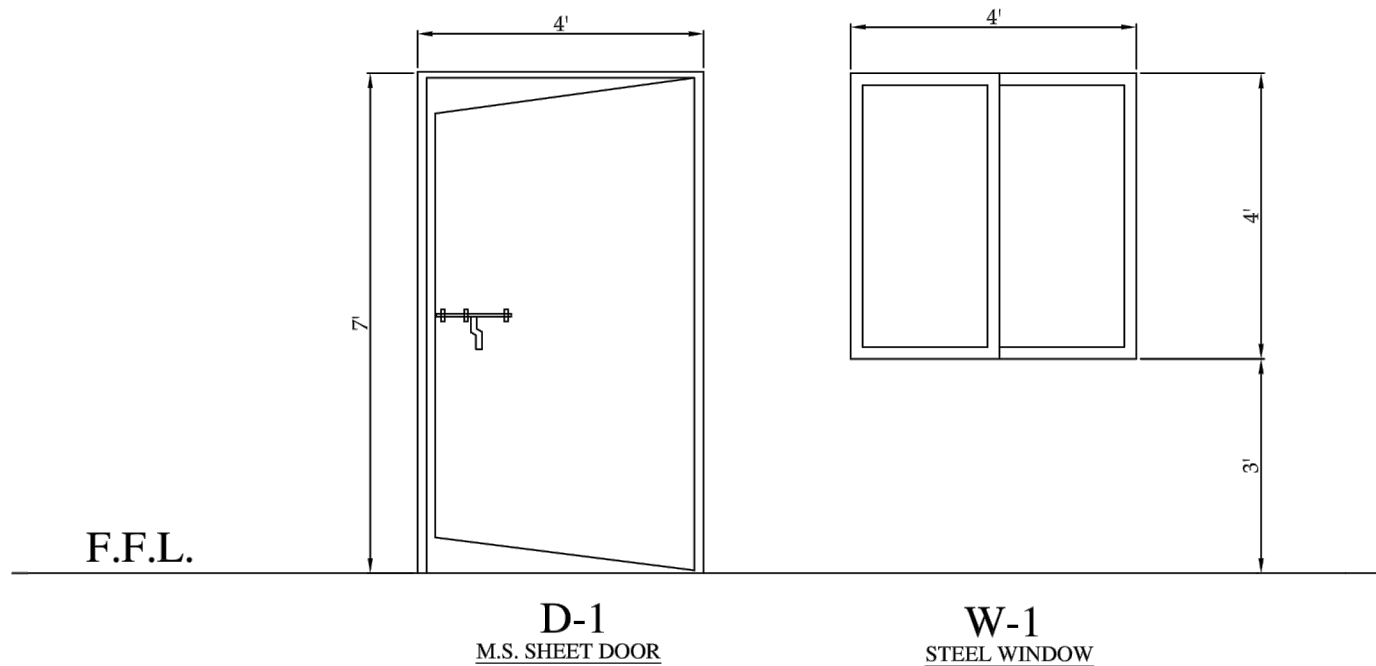
M.STEEL DOOR PROFILE



M.STEEL WINDOW PROFILE







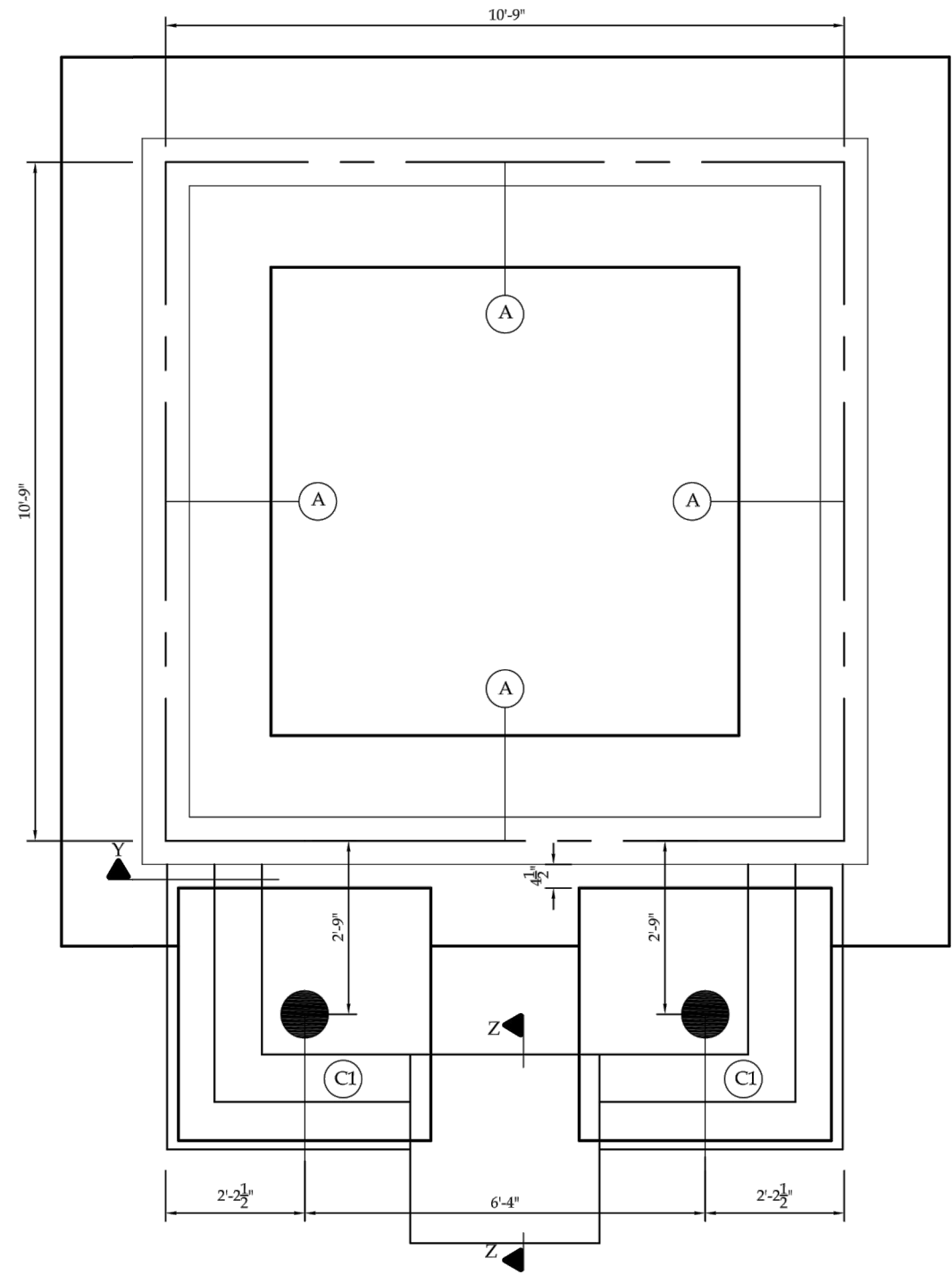
MS GRILL
(FOR WINDOWS)



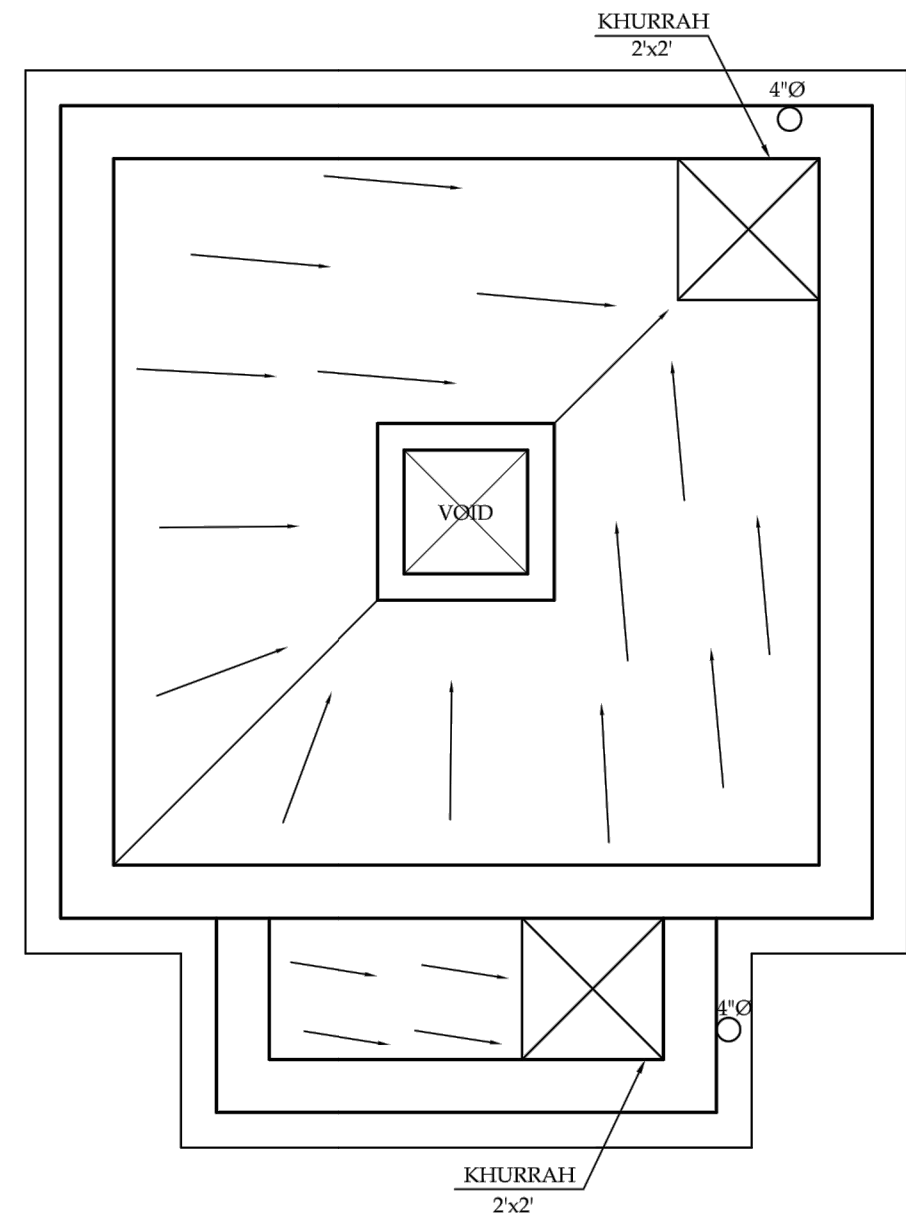
D-1
M.S. SHEET DOOR

W-1
STEEL WINDOW

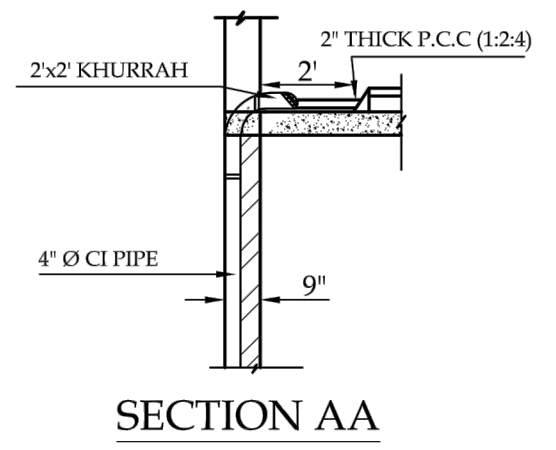
PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC) 	CONSULTANT   	DRAWN M. Adnan	PROJECT DETAILED DESIGN FOR INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB PACKAGE-II (PRIORITY SUB-PROJECT)	PUMP HOUSE'S DOOR, WINDOW & GRILL DETAILS		SCAL
		SUBMITTED RECOMMENDED CHA./VER.		DATE FEB, 2023	DRAWING NO.	REV.
REV. DATE DESCRIPTION APPROVED APPROVED						



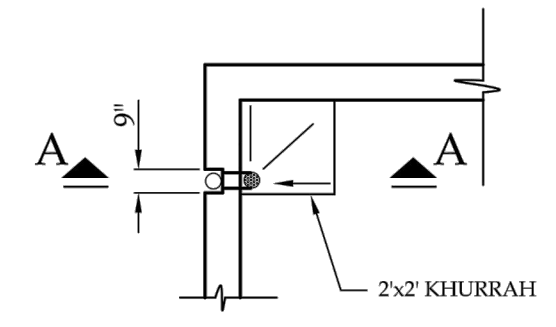
EXCAVATION PLAN




ROOF DRAINAGE PLAN

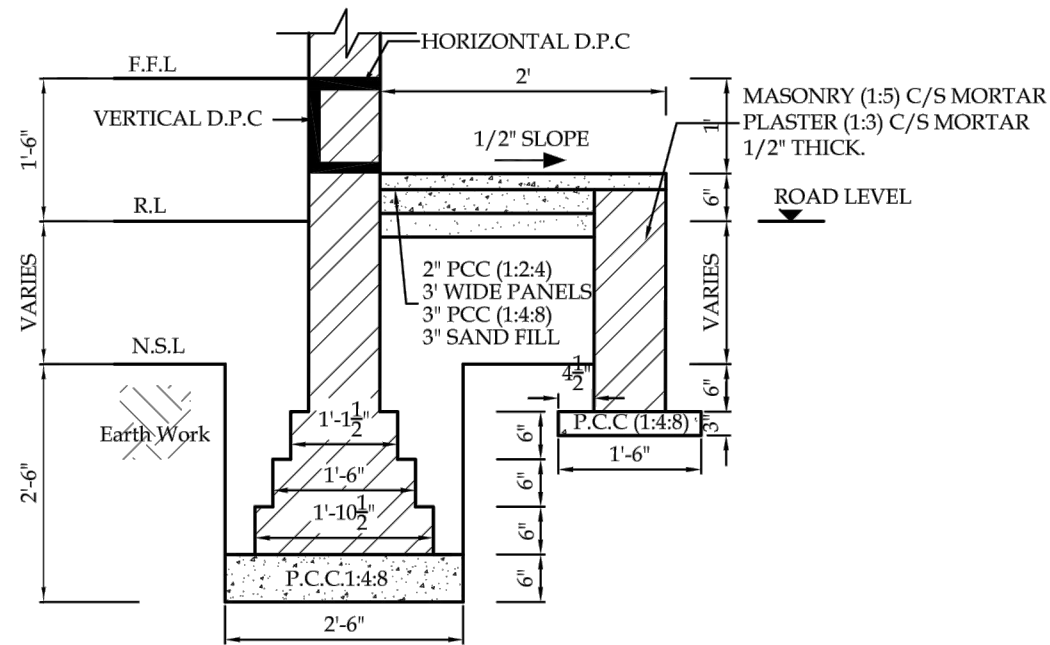


SECTION AA

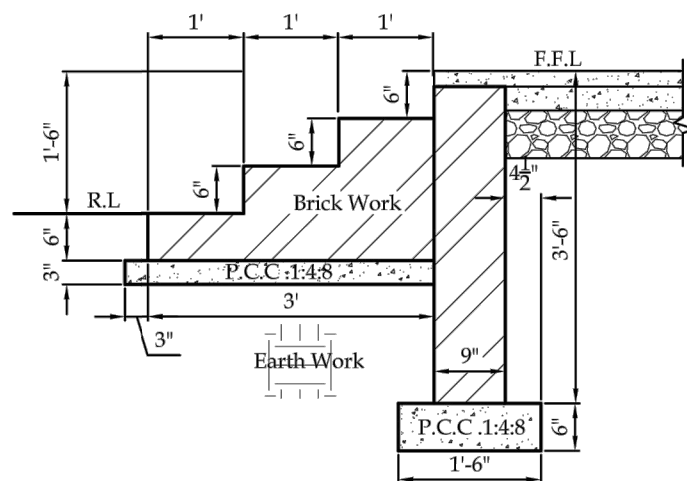


ROOF KHURRAH PLAN

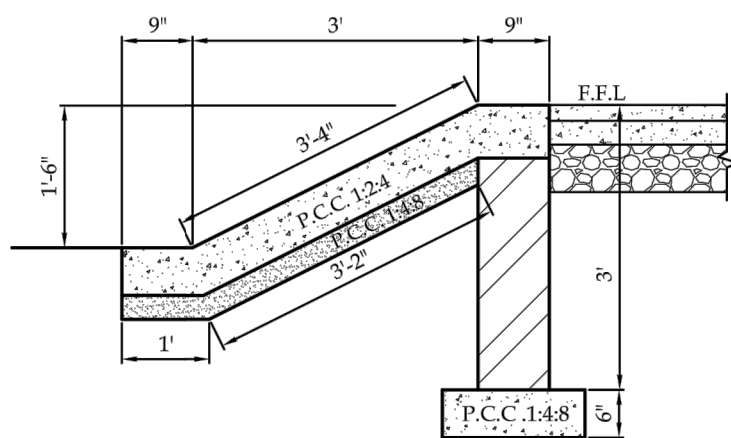
PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC)	CONSULTANT 	DRAWN M. Adnan	PROJECT DETAILED DESIGN FOR INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB PACKAGE-II (PRIORITY SUB-PROJECT)	PUMP HOUSE'S EXCAVATION & ROOF DRAINAGE PLAN		SCAL
		SUBMITTED RECOMMENDED CHA./VER.		DATE FEB, 2023	DRAWING NO.	REV.
REV.	DATE	DESCRIPTION	APPROVED	APPROVED		



TYPE A

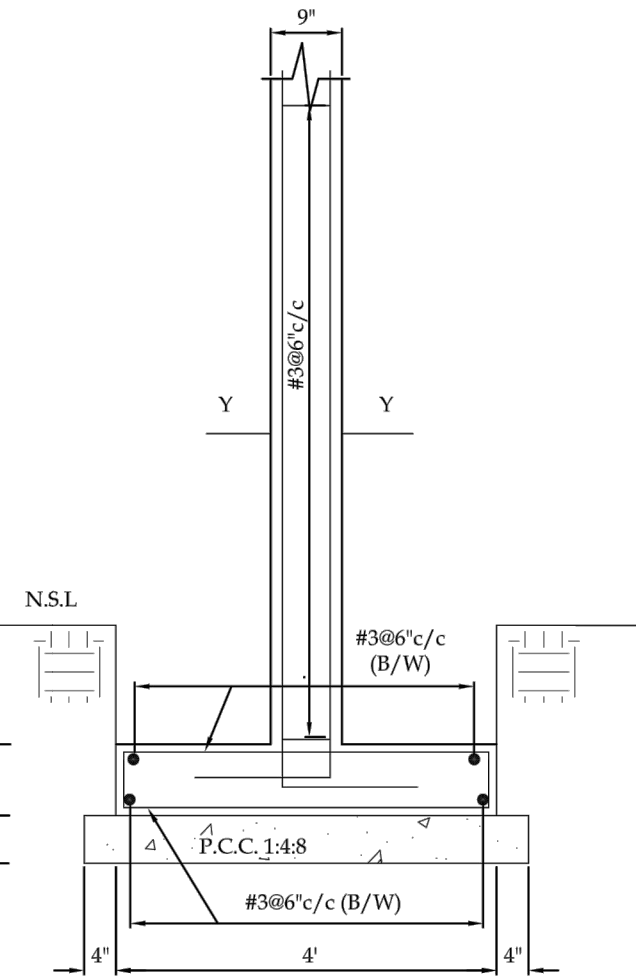


SECTION Y-Y

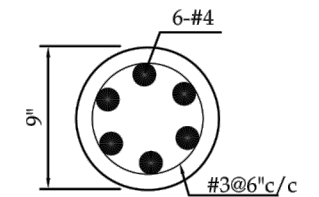


SECTION Z-Z

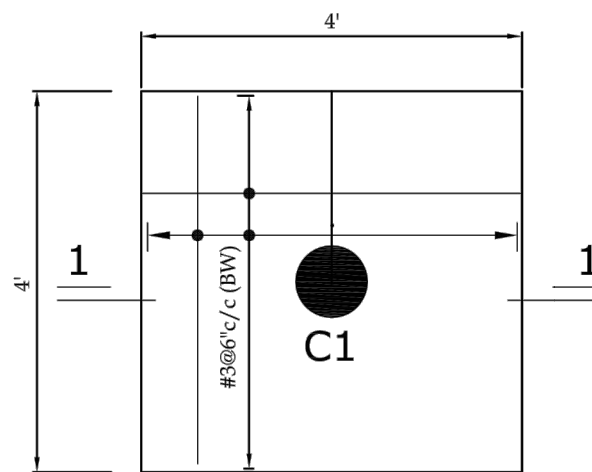
ROAD LEVEL



SECTION 1-1



COLUMN SECTION Y-Y

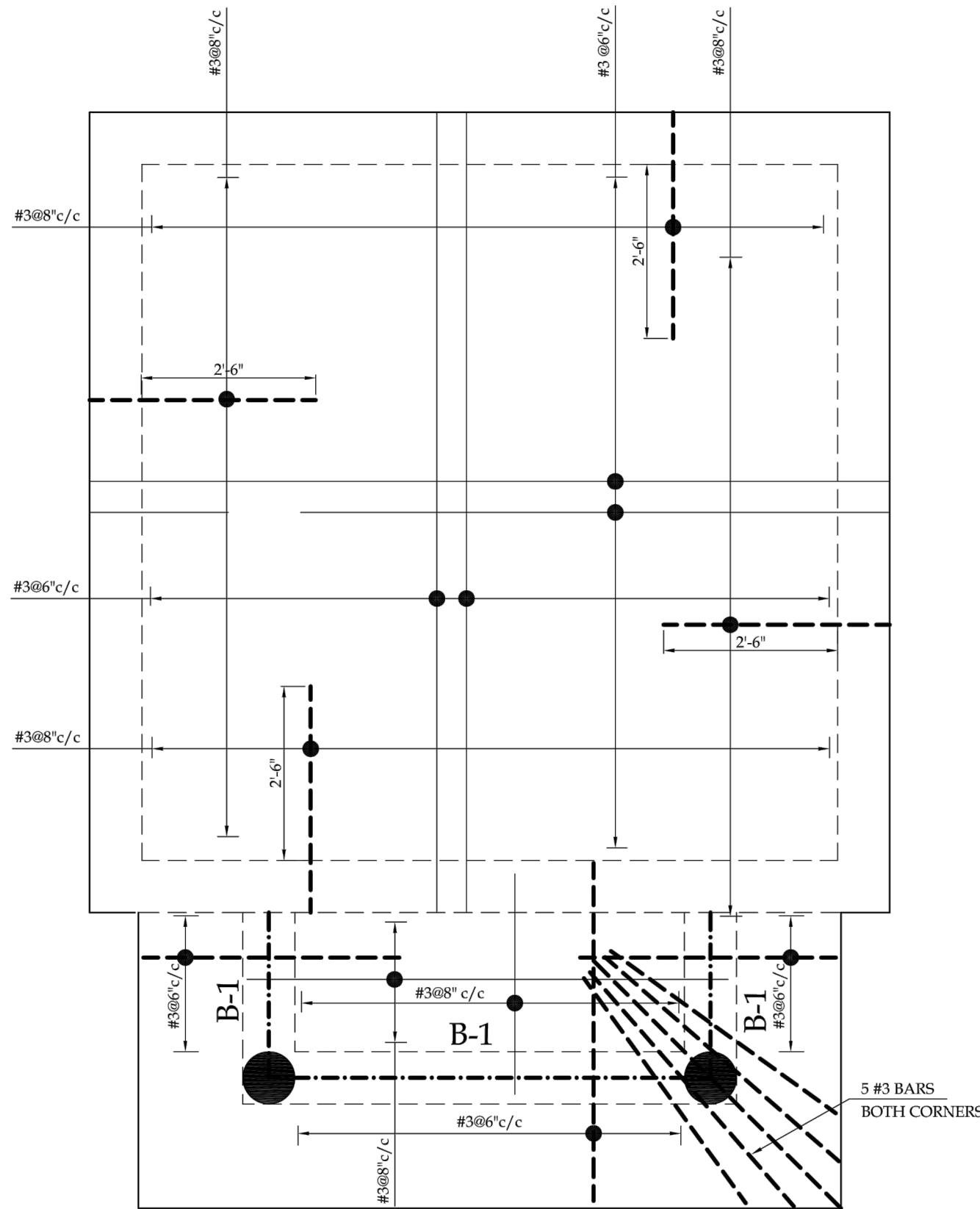


COLUMN

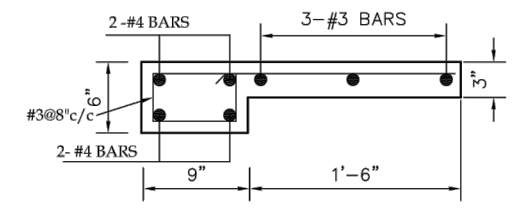
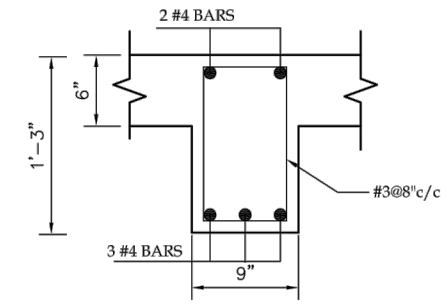
NOTES:

1. BRICK MASONRY
 - i. SUB STRUCTURE 1:6 CEMENT SAND MORTAR
 - ii. SUPER STRUCTURE 1:5 CEMENT SAND MORTAR
2. HORIZONTAL D.P.C.
 - i. 2" P.C.C. (1:2:4)
 - ii. HOT BITUMEN 1 COATS 10/20 @ 20 Lbs/100 Sft & ONE LAYER OF POLYTHENE SHEET, GAUGE 500
3. VERTICAL D.P.C.
 - i. 3/4" THICK VERTICAL D.P.C. 1:3 CEMENT SAND MORTAR WITH HOT BITUMEN 1 COAT 10/20 @ 20 Lbs/100 Sft & ONE LAYER OF POLYTHENE SHEET, GAUGE 500

PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC)	CONSULTANT 					DRAWN M. Adnan SUBMITTED RECOMMENDED CHA./VER. APPROVED	PROJECT DETAILED DESIGN FOR INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB PACKAGE-II (PRIORITY SUB-PROJECT)	PUMP HOUSE'S CROSS SECTION OF WALL & COLUMN		SCAL
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED		DATE FEB, 2023	DRAWING NO.	REV.







REINFORCEMENT PLAN
(SLAB THICKNESS = 6")

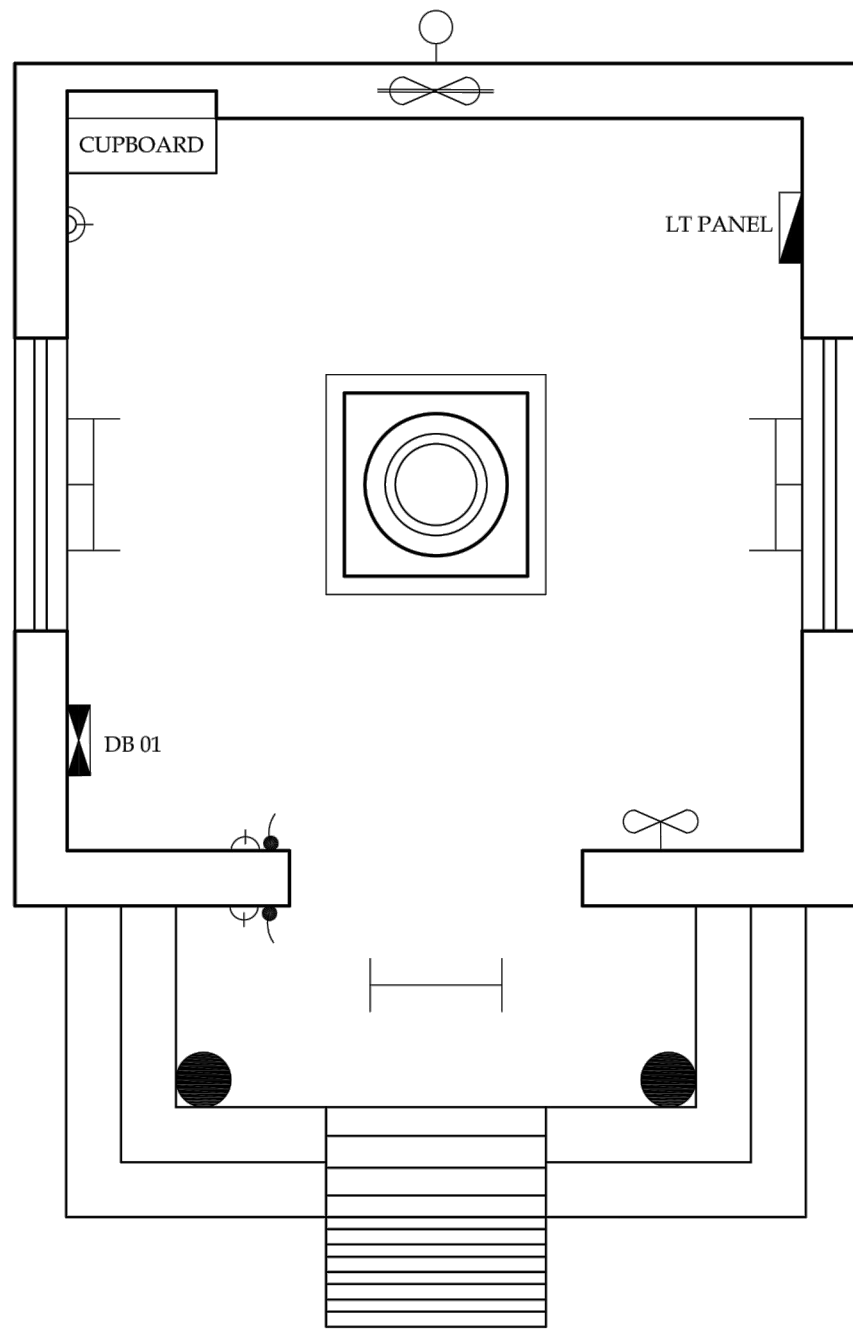


LINTEL & SHADE DETAIL

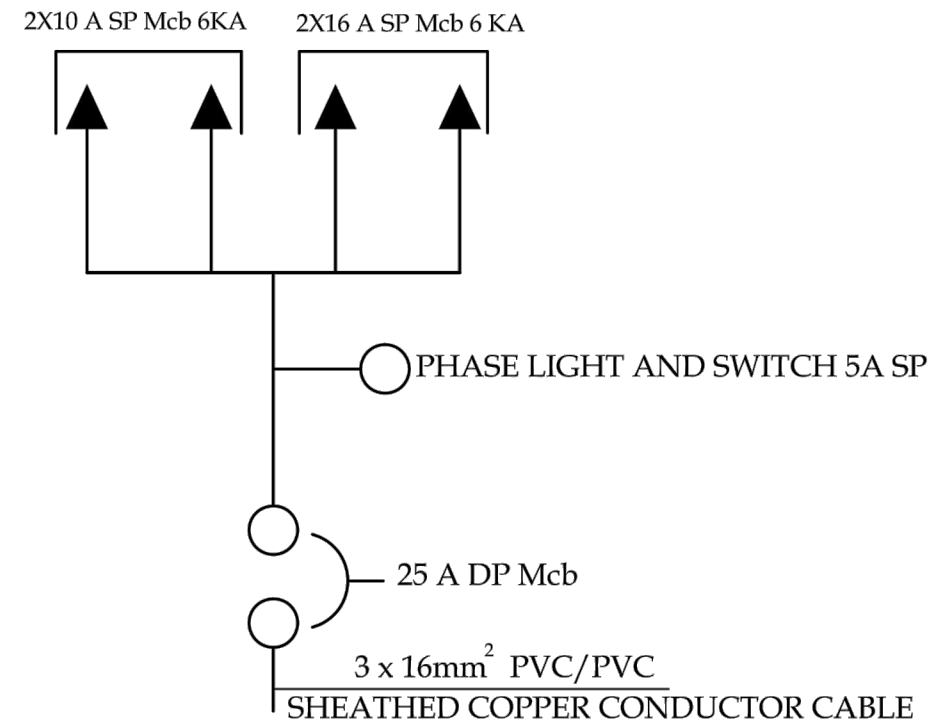
NOTES

1. USE PORTLAND CEMENT WITH 28 DAYS CUBE STRENGTH OF 3,000 PSI.
2. USE DEFORMED STEEL REINFORCEMENTS BARS WITH MAXIMUM YIELD STRENGTH OF 40,000 PSI AS PER ASTM SPECIFICATIONS.
3. CLEAR COVER TO REINFORCING BARS
SLAB = 3/4"
BEAM = 1-1/2"
COLUMN = 1-1/2"
FOUNDATION = 3"

PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC) 	CONSULTANT   	DRAWN M. Adnan	PROJECT DETAILED DESIGN FOR INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB PACKAGE-II (PRIORITY SUB-PROJECT)	PUMP HOUSE'S REINFORCEMENT DETAIL		SCAL
		SUBMITTED		DATE FEB, 2023	DRAWING NO.	REV.
		RECOMMENDED				
		CHA./VER.				
		APPROVED		REV.	DATE	DESCRIPTION	APPROVED



ELECTRICAL PLAN

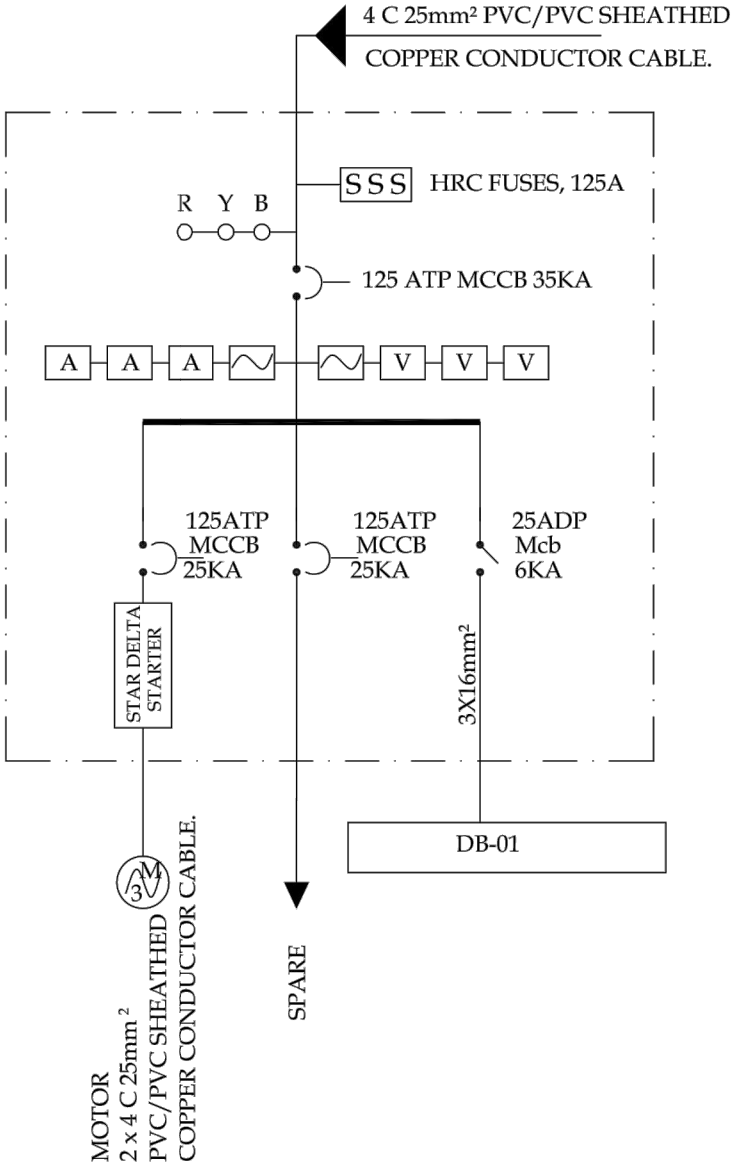


DB 01

LEGEND	
	LT PANEL
	DISTRIBUTION BOARD
	TMS - 140 / 136 WITH COLOUR 84 LAMP, OVER WINDOWS
	XGC - 532 WITH 18W SOX LAMP
	WALL BRACKET FAN 18" SWEEP WITH REGULATOR
	EXHAUST FAN
	5 AMP: SINGLE POLE FLUSH TYPE SWITCH (SWITCH BOARD)
	3-PIN 5AMP. WALL SOCKET PLUG POINT
	3-PIN 15AMP. WALL SOCKET POWER PLUG POINT

PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY (PMDEC)	CONSULTANT 	DRAWN M. Adnan	PROJECT DETAILED DESIGN FOR INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN 16 CITIES OF PUNJAB PACKAGE-II (PRIORITY SUB-PROJECT)	PUMP HOUSE'S ELECTRICAL PLAN		SCAL
		SUBMITTED RECOMMENDED CHA./VER.		DATE FEB, 2023	DRAWING NO.	REV.
REV.	DATE	DESCRIPTION	APPROVED	APPROVED		

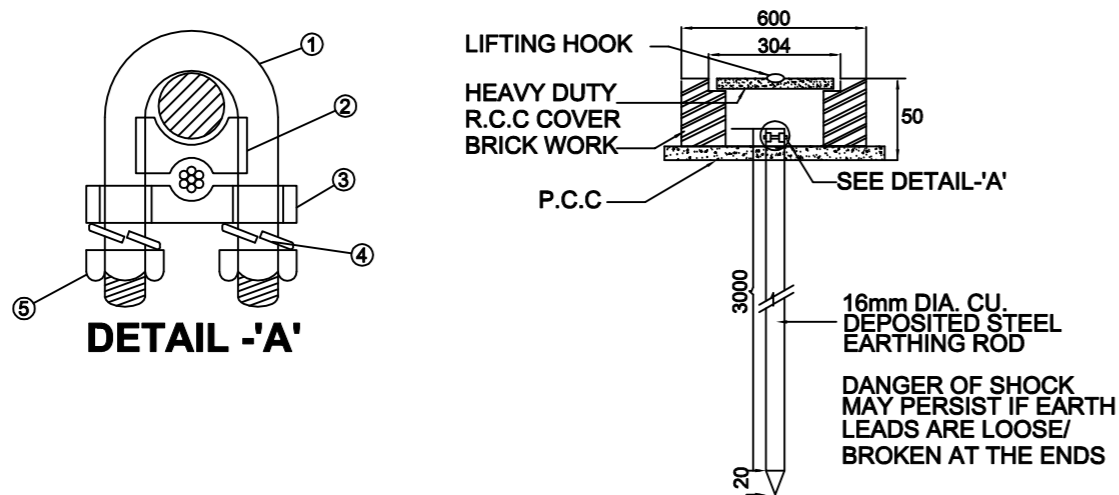
INCOMING CABLE FROM LOW VOLTAGE SOURCE
MOULDED CASE CIRCUIT BREAKERS
COPPER BUS BAR TPN & E (Tinned)
MOULDED CASE CIRCUIT BREAKERS AND MINIATURE CIRCUIT BREAKERS
STAR DELTA STARTERS COMPLETE WITH ACCESSORIES
PVC/PVC SHEATHED COPPER CONDUCTOR CABLE
THREE PHASE MOTOR / DB-01
CIRCUIT DESCRIPTION
MOTOR CAPACITY (HP)
CONNECTED LOAD ON EACH CIRCUIT (kW)
TOTAL CONNECTED LOAD (kW)



MOTOR PUMP NO. 1	SPARE	POWER SOCKET	LIGHTS/ FAN	SPARE	SPARE
40	-			-	-
29.84	-	1.00	0.360	-	-
31.20					

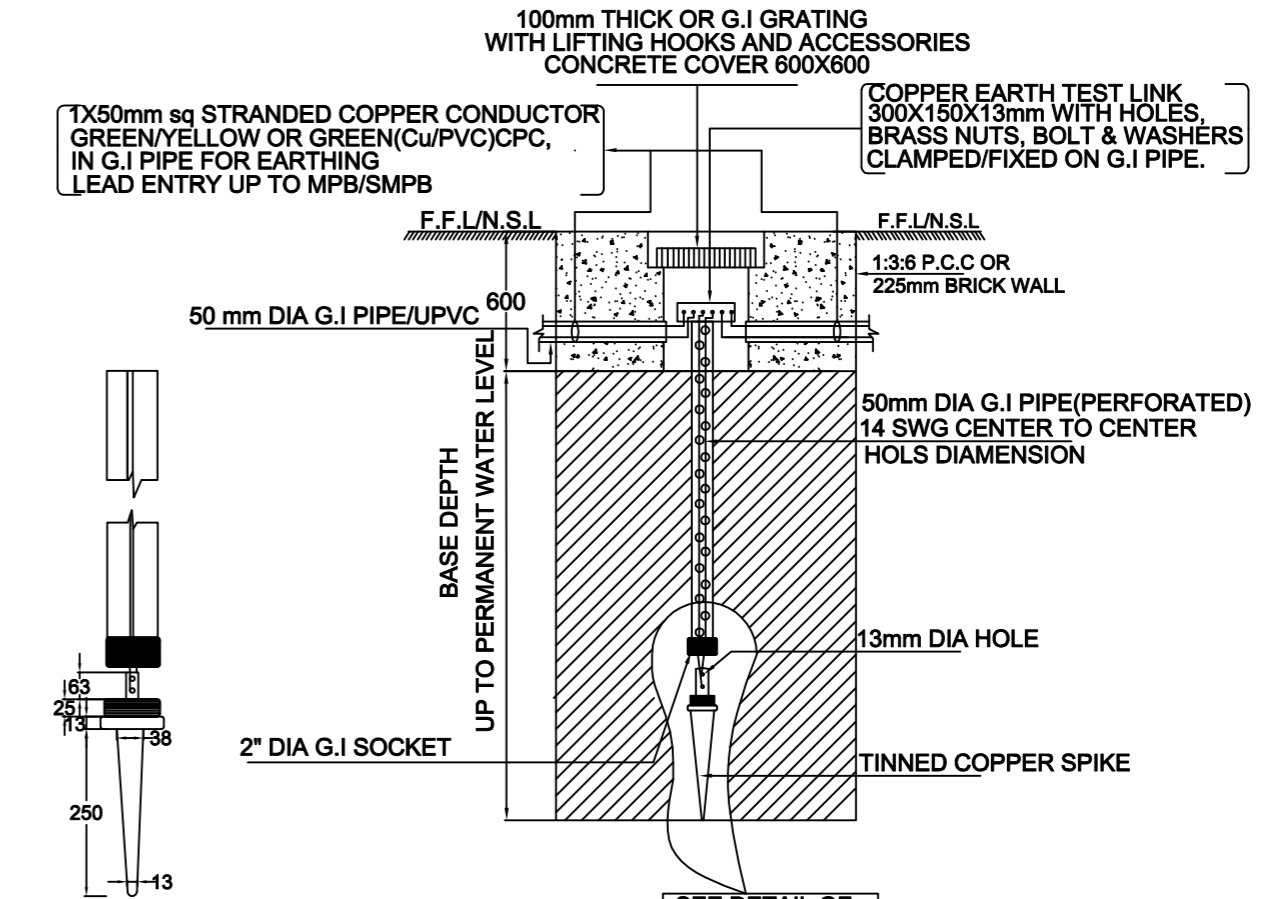
NOT FOR CONSTRUCTION

ROD TYPE DETAIL



ITEM NO.	ITEM NAME	MATERIAL
1	U-BOLT	MILD STEEL
2	SPACER	CAST IRON
3	BASE	MILD STEEL
4	SPRING WASHER	CARBON STEEL
5	NUT	MILD STEEL

BORE TYPE DETAIL



DETAILS OF EARTHING SPIKE

NOTE
EARTH PIT DIMENSION: 450X450X600

NOTES

- THIS DRAWING IS FOR INDICATIVE DESIGN MODEL AND SHOULD BE READ IN CONJUNCTION WITH SPECIFICATIONS AND ITEMS OF BILL OF QUANTITIES.
- EARTH BORE SHALL BE MADE AT 2000MM (2M) AWAY FROM FOUNDATION/STRUCTURE.
- DISTANCE BETWEEN TWO EARTH BORES SHALL NOT BE LESS THAN 3000MM (3M)
- CONNECTION SHALL BE BOLTED WITH THIMBLES, BRASS NUTS, BOLTS/WASHER ETC.
- CONTRACTOR SHALL MEASURE EARTHING RESISTANCE IN THE PRESENCE OF SITE ENGINEER, FOR FINAL ACCEPTANCE.
- THE VALUE OF EARTH RESISTANCE SHALL BE INCORPORATED IN FINAL AS-BUILT DRAWINGS.
- THE LOCATION OF MAIN PANEL BOARD & DISTRIBUTION BOARDS IS TENTATIVE & SHALL BE FINALIZED AS PER SITE CONDITION / REQUIREMENTS.

CONSULTANT NESPAC NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD. HEAD OFFICE:- NESPAK HOUSE, I-C, BLOCK-N, MODEL TOWN EXTENSION, LAHORE, PAKISTAN.	04				DRAWN	SA	ROD & BORE TYPE EARTHING DETAIL SCALE
	03				SUBMITTED		
	02				RECOMMENDED		
	01				CHD./VER.		
	REV.	DATE	DESCRIPTION	APPROVED	APPROVED		
							DATE: JANUARY, 2023 DRAWING No.: ----/---/PC1/5E001 REV.: 0

**APPENDIX-G
ENVIRONMENTAL &
SOCIAL MANAGEMENT
PLAN**

Environmental & Social Screening Checklist

Instructions:

Environmental and Social Focal Persons (ESFPs)¹ nominated by the MCs for PCP environmental and social management, will use this checklist in the field for environmental and social screening and categorization of every sub-project proposed to be executed under the Program.

Deputy Program Officers-Environmental and Social Management deputed by PMDFC in regional offices will technically assist and support the ESFPs/MCs in filling in this Checklist

It is to be attached with the main document² of sub-projects at the planning stage and will be duly signed by the relevant ESFP and endorsed by the respective DPO-ESM

This checklist focuses on environmental issues and social concerns. To ensure that social dimensions are adequately considered, Involuntary Resettlement Screening Checklist will also be used

(iii) The purpose of this E&S Screening Checklist is to identify potential "Negative" impacts of environmental and social attributes or to enhance the existing environmental & social benefits. Use the "remarks" section to discuss any anticipated mitigation measures.

Name of ESFP:

Name of MC:

Kamoke MC

Sub-Project Sector:

Water Supply Sector

Sub-Project Title:

Rehabilitation of water supply lines
& Replacement of Tubewell.

E-1

S-1

✓ E-2

✓ S-2

E-3

S-3

Date of Screening:

October, 18, 2022

Anticipated Project Activities

It is the sub-project of water supply for which rehabilitation and installation of new tube well will take place.

Estimated Cost of Subprojects

367.76 millions

Completion Time/Duration

10 Months

Estimated Labor for Subproject

20-25 persons

¹ In all MCs, ESFPs are notified by Local government; MO (I&S) are focal persons for environmental sector and MO(P) are focal persons for social sectors.

² It is meant as PC-1 and/or engineering estimates of sub-project

Screening Questions	Yes	No	Remarks
A. Project Siting			
Is the Sub-Project area adjacent to or within any of the following:			
Environmentally sensitive areas?			
Legally protected Area		✓	Unlikely as sub project falls in urban area.
Any surface water body (river, canal, stream, lake, wetland) within 250 meter of the proposed sub project ³		✓	Rajba canal exists about 2000 m away from project area.
Estuarine		✓	unlikely as sub project falls in urban area of city.
Special area for protecting biodiversity		✓	- Some as above -
Buffer zone of protected area		✓	- Some as above -
Mangroves Forest		✓	- Some as above -
Man-made forest /game reserve, orchid /crops or any other area of environmental importance		✓	unlikely sub-project located in urban area.
Socially sensitive /important areas/communities/ people?			
PCRs and or any site of cultural/religious importance (Graveyard, Shrine, Mosque, Church, <i>Gordwarah</i> , Temple, Fort, archeological/historical site) within 100 m of the proposed subproject ⁴	✓		No notified PCR observed at Sub Project area. Rasulnagar 10 Mosques, 8 School Mandila Road 12 Mosque, 8 School
Sensitive receptors (Schools, colleges, hospitals and clinics) within 100 meter of the proposed sub project ⁵	✓		Rasulnagar 02 } all mitigation measures implemented and monitoring as per Mandila 08 } 1 graveyard
Any graveyard of local community (Muslims or Christians)		✓	Not impacted but exists within 100 m of sub project area.
Any demographic or socio-economic aspects of the sub-project area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, squatters, ethnic minorities, people with disabilities, people in old age, socially isolated segments ⁶ of the society and women or children)?		✓	No demographic and socioeconomic impacts of sub-project area that are vulnerable.
Already existing infrastructure (including public amenities) which may be required to dismantle or may be affected temporarily by any means?		✓	No existing infrastructures which needs to required to dismantle or may be affected
B. Potential Environmental Impacts			
Will the Sub-Project cause...			
1. Disturbance to habitats/biodiversity of environmentally sensitive or protected areas? -		✓	Sub project is located at urban area of kenoke
2. Cutting of trees?		✓	as depicted in photos no trees present in streets hence no cutting involves.

³ Ibid.

⁴ According to Environmental Assessment Guidelines adopted by Punjab EPA

⁵ Ibid.



⁶ due to caste, creed, religion or gender e.g. transgender

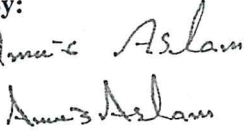
⁷ Sewerage /Drainage system, Water supply lines, tube-wells, WAPDA/Telephone transmission lines/electric poles, Railway tracks, Gas pipelines, Roads, Shops/Plazas, Banks, Industry, Disposal stations etc.

Rasulnagar Tanki
M. Ramzan 0305 6089063

3. Disruption to habitats/biodiversity of surrounding ecosystem/environment?		✓	due to urban env. no habitat/biodiversity disrupted further its replacement limited or site specific impact
4. Generation of wastewater during construction or operation?		✓	no impact anticipated as this is water supply rehabilitation project
5. Pollution of surface water/ground water due to wastewater discharge from construction site or due to direct/indirect disposal of waste water?	✓		No open dumping is allowed all waste material will be disposed of as per SSEM which will be approved by PMU/FC/Sungai Consultants
6. Alteration of surface water hydrology of waterways resulting in increased sediment in streams/ivers or due to increased soil erosion at construction site?		✓	No water body present within 500m of sub project area.
7. Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		✓	Rent-a-house will be used as camp all SOPs of EIS will adhere. No large scale of labour will hired.
8. Over pumping of ground water, leading to salinization and ground subsidence?		✓	Rehabilitation of tw is involved only over pumping of GW will not envisaged
9. Serious contamination of soil due to construction works?		✓	training will be given to the contractor on this no soil contamination is used envisaged as pre fabricated pipes will be used
10. Aggravation of solid waste problems in the area?	✓		disposal of SW will be done as per SWM mitigation measure and monitoring will be done.
11. Generation of hazardous waste?		✓	as pre fabricated material or pipes will be used hence no impact envisaged
12. Increased air pollution due to sub-project construction and operation?	✓		will comply with PEQs and monitor thoroughly as per Monitoring plan.
13. Noise and vibration due to sub-project construction or operation?	✓		All activities will be monitored as per approved Monitoring plan and will comply PEQs standard
14. Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents due to solid/liquid?	✓		All activities will be monitored by Project staff (EIS) as per EMP.
15. Use of chemicals during construction?		✓	Pre fabricated materials will be used no chemical usage envisaged.
C: Potential Social Impacts			
Will the Sub-Project cause...			
1. Impairment of historical/cultural areas; disfiguration of landscape or potential loss/damage to Physical Cultural Resources (PCRs)?	No impairment of historical/cultural areas or potential loss/damage of physical Cultural Resources (PCRs)		
2. Displacement or involuntary resettlement of people? (physical displacement and/or economic displacement) (If "Yes", please also fill Involuntary Resettlement Screening Checklist)		✓	No Displacement or involuntary resettlement of people.

3. Disproportionate impacts on the poor, women and children and or other vulnerable groups ⁸ (mentioned above)?		✓	No impact on poor, women children and vulnerable groups.
4. Temporary impediments in movements of people/transport and animals?	✓		there will be temporary impediments in movement of local people, transport and animals.
5. Large population influx during sub-project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	There will no population influx during construction and operation. Social conflicts may occur if workers from other areas are hired. Preference will be given to hired local labour.
6. Social conflicts if workers from other areas are hired?	✓		Exposure of dust and noise during construction (for a short time)
7. Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓	X	Job specific Hazards has been anticipated and mitigated through EHS SOPs.
8. Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		To address community health and safety issue, a complete HSE plan should be developed during construction & operation phases.
9. Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		impact of noise, vibration and dust emission.
10. Any impact on sensitive receptors (mentioned above)	✓		No impact on existing infrastructures including public amenities.
11. Any impact of negative nature on already existing infrastructure including public amenities		✓	

Env. Social
 Prepared By: Sameer / Adera
 Name:
 Signature:  / 
 Date: 18 oct 2022

Endorsed By:
 Name: Amna Aslam
 Signature: 
 Date: 18/10/22

⁸ Women, Children, Women headed households, People in old age, people having disabilities, socially isolated community groups and or people living below the poverty line

Appendix A-Environmental and Social Categorization of Sub-Projects

Using the Environmental and Social Screening Checklist, E & S Categorization of sub-projects of PCP is and will be carried out as following:

For Environmental Category:

E-1 = All those sub-projects having adverse environmental impacts and or those sub-projects that come under Schedule I and II of Pakistan Environment Protection Agency Review of IEE and EIA Regulations 2000 will need to submit **Initial Environmental Examination (IEE)** or **Environmental Impact Assessment (EIA)**⁹ report

E-2 = All those sub-projects which will have moderate negative environmental impacts will need to submit **Environmental and Social Management Plans (ESMP)**¹⁰

E-3 = All those sub-projects which will have no negative environmental impacts will be categorized as E3 and for those, no further process will be required¹¹ after E &S Screening

For Social Category:

S-1= All those sub-projects having negative social impacts of significant nature on > 40 households and or it require displacement/resettlement of > 40 households for land acquisition, will need to submit Social Assessment (SAR), Social Management Plan (SMP) and Resettlement Action Plan (RAP)

S-2= All those sub-projects having negative social impacts of significant nature on 1 – 40 households and or it require displacement/resettlement of 1- 40 households for land acquisition, will need to submit Social Assessment (SAR), Social Management Plan (SMP) and Abbreviated Resettlement Action Plan (ARAP)

S-3= All those sub-projects having no negative social impacts and or they are not involved in displacement/resettlement of any nature, will be categorized as S3 and No further process will be required after E &S Screening

Appendix B-Important Definitions

1. Environmentally sensitive areas¹²

Environmentally sensitive areas are landscape elements or places which are vital to the long-term maintenance of biological diversity, soil, water or other natural resources both on the site and in a regional context.

2. Cultural heritage¹³

- Tangible cultural heritage:
 - movable cultural heritage (paintings, sculptures, coins, manuscripts)
 - immovable cultural heritage (monuments, archaeological sites, and so on)
 - underwater cultural heritage (shipwrecks, underwater ruins and cities)
- Intangible cultural heritage: oral traditions, performing arts, rituals

3. Wetlands

⁹ .All the social impacts (except those that come under S1 and S2 Category of land acquisition) of E1 Category sub-projects will be covered in IEE/EIA report

¹⁰ .All the social impacts (except those that come under S1 and S2 Category of land acquisition) of E2 Category sub-projects will be covered in the ESMP

¹¹ .For all those sub-projects which will have no negative environmental impacts and are categorized as E3 but they require construction labor/workers for the execution ,will follow the Environment, Health and Safety SOPs prepared for PCP and they will follow the instructions given by ESM team of PCP

¹²<https://www.sciencedirect.com/science/article/abs/pii/S0169204694020169>

¹³<http://www.unesco.org/new/en/culture/themes/illicit-trafficking-of-cultural-property/unesco-database-of-national-cultural-heritage-laws/frequently-asked-questions/definition-of-the-cultural-heritage/>

- Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season.¹⁴
- areas of marsh, fen, peat and or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters”.¹⁵

4. Buffer zone of protected area

Areas peripheral to a specific protected area, where restrictions on resource use and special development measures are undertaken in order to enhance the conservation value of the protected area.¹⁶

5. Special area for protecting biodiversity/ Key Biodiversity Areas (KBA)

Sites that contribute significantly to the global persistence of biodiversity, in terrestrial, freshwater and marine ecosystems¹⁷

6. Estuarine

Area of the mouth of a river where it broadens into the sea, and where fresh and seawater intermingle to produce brackish water. The estuarine environment is very rich in wildlife, particularly aquatic, but it is very vulnerable to damage as a result of human activities.¹⁸

7. Hazardous substance means-

(a) A substance or mixture of substance, other than a pesticide as defined in the Agricultural Pesticide Ordinance, 1971 (II of 1971), which, by reason of its chemical activity is toxic, explosive, flammable, corrosive, radioactive or other characteristics causes, or is likely to cause, directly or in combination with other matters, an adverse environmental effect; and

(b) Any substance which may be prescribed as a hazardous substance;

Hazardous waste means waste which is or which contains a hazardous substance or which may be prescribed as hazardous waste, and includes hospital waste and nuclear waste;¹⁹

8. Waste

Waste means any substance or object which has been, is being or is intended to be, discarded or disposed of, and includes liquid waste, solid waste, waste gases, suspended waste, industrial waste, agricultural waste, nuclear waste, municipal waste, hospital waste, used polyethylene bags and residues from the incineration of all types of waste.²⁰

Pictures of Project Siting	

¹⁴<https://www.epa.gov/wetlands/what-wetland>

¹⁵<https://www.ramsar.org/sites/default/files/documents/library/info2007-01-e.pdf>

¹⁶<https://www.biodiversitya-z.org/content/buffer-zones.pdf>

¹⁷<https://biodiversitya-z.org/content/key-biodiversity-areas-kba>

¹⁸<https://biodiversitya-z.org/content/estuary>

¹⁹ Punjab Environmental Protection Act 2012

²⁰ ibid

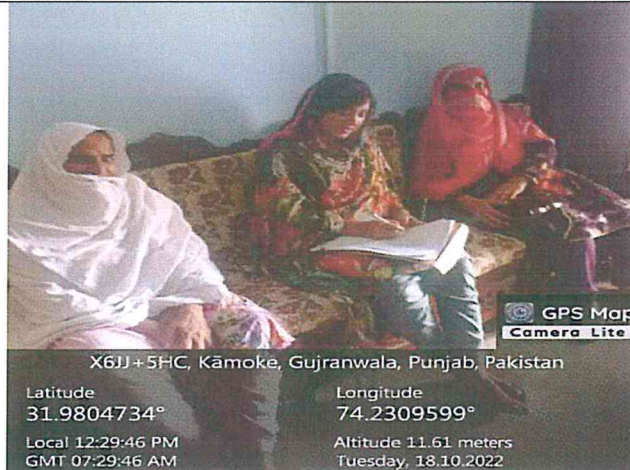
Pictures of Consultations at sub Project Area



Meeting with CO MC Kamoke- Findings of the Field Visit for Replacement of Old Water Supply Lines and Rehabilitation of Tube Well.



X6JJ+5HC, Kāmoke, Gujranwala, Punjab, Pakistan
 Latitude 31.979995° Longitude 74.23096166666666°
 Local 12:50:00 PM Altitude 11.61 meters
 GMT 07:50:00 AM Tuesday, 18.10.2022



X6JJ+5HC, Kāmoke, Gujranwala, Punjab, Pakistan
 Latitude 31.9804734° Longitude 74.2309599°
 Local 12:29:46 PM Altitude 11.61 meters
 GMT 07:29:46 AM Tuesday, 18.10.2022

Meeting with Director/ Principal at Zenith Model School of Mohallah Rasool Nagar-There are leakage of water supply lines. Water becomes contaminated due to poorly managed supply lines therefore it is not suitable to use for drinking purposes.

Gender Consultation Meeting with females at Mohallah Rasool Nagar-
 Concerns:Females shared that the water supply lines are available in their area. But line water is not able to drink due to impurities. Almost all females use filtered water for drinking purposes. Many houses also rely on water bores for household use.



Gender Consultation Meeting with females at Mandiala Road

Concerns:

Females shared that the water supply lines are available in their area. But line water is not able to drink due to impurities. Almost all females use filtered water for drinking purposes. Many houses also rely on water bores for household use

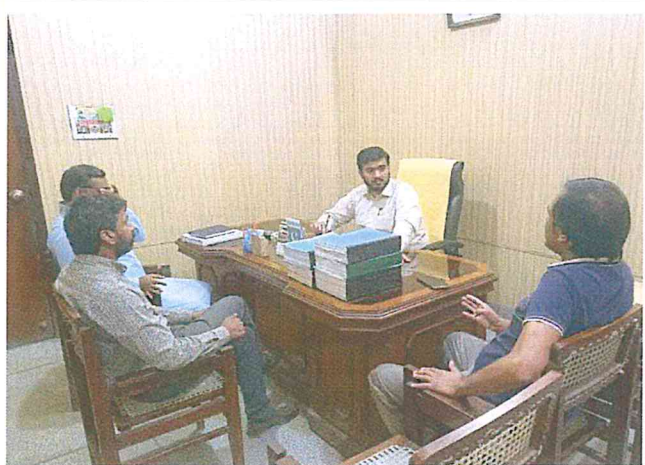


Gender Consultation Meeting with females at Mandiala Road

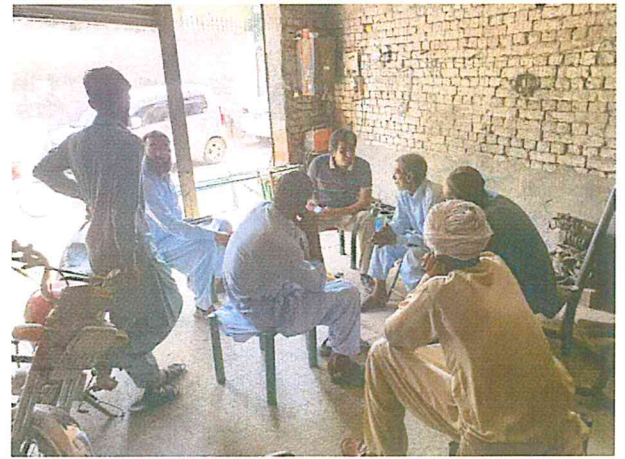
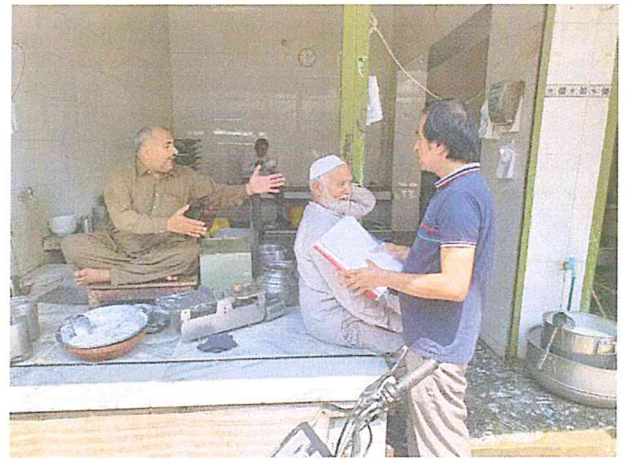
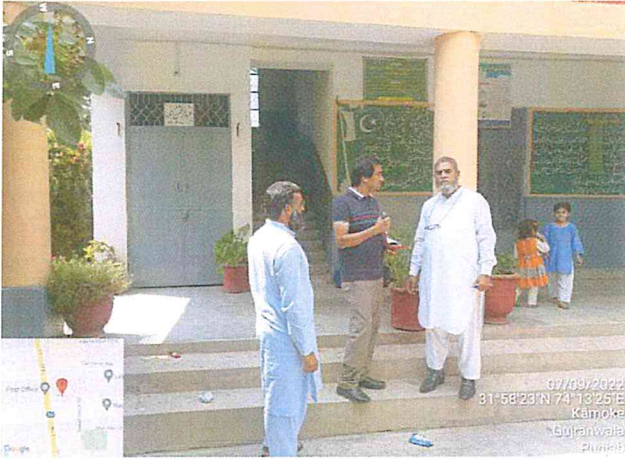
Concerns:

Females shared that the water supply lines are available in their area. However, line water is not able to drink due to impurities. Almost all females use filtered water for drinking purposes. Many houses also rely on water bores for household use.

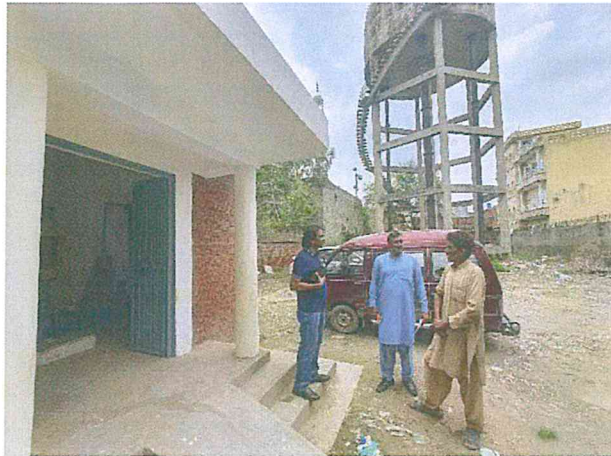
Pictures of Consultation at sub-Project Area (Previous Visit)



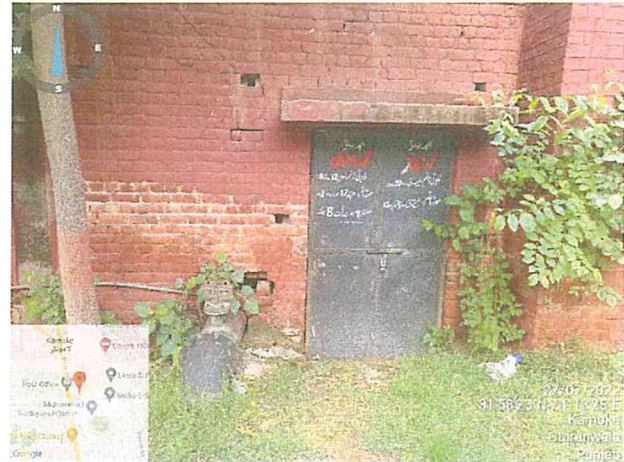
07/09/2022
31°58'51"N 74°13'55"E
Kamoke
Gujranwala
Punjab



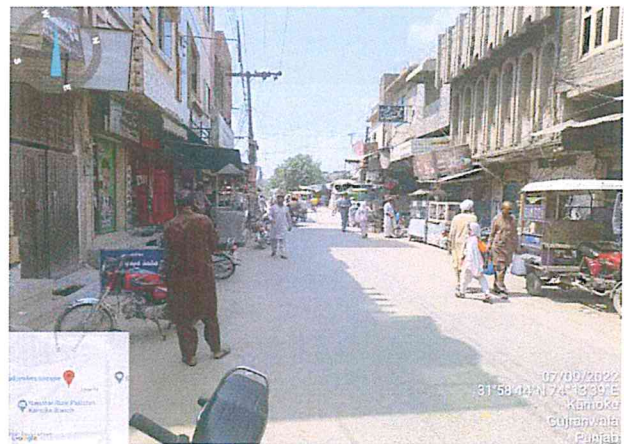
Pictures of Project Siting



Replacement of Water Supply Old Lived Pipes in Mohalla Rasulnagar & Mandiala Road etc.



Rehabilitation of Tubewell at Mandiala Water Works



View of Projce Area at Mohalla Rasulnagar and Mandiala Road

INVOLUNTARY RESETTLEMENT SCREENING

CHECKLIST Name of City/MC/LG : Kamoke

Sub-Project Sector: Water Supply Scheme

Sub-Project Title: Rehabilitation Water Supply Lines & Replacement of TW

Sub-Project Categorization: S-1

✓ S-2

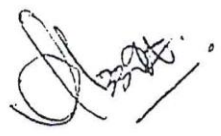
Date of Screening: 18-10-2022

SECTION 1	Yes	No	Expected	Remarks
Does the project require land acquisition? Yes/No	✓			Land Acquisition is required for the installation of new tube well hence IRS checklist was used during survey to assess social impacts.
If yes, then describe the type of land being acquired from the categories below:		-		A new tube well will be installed at Govt. School Boys High No 2. Land belongs to Education Department. NOC for installation of New tube well has been issued by the Principal, Govt. High School Kamoke received from District Education officer (SE) dated 31-10-2022.
Has any AED been conducted at the proposed location by the government ¹ ? Yes/No		✓		NO AED has been conducted in any part of sub-project area.
Land (Quantify and describe types of land being acquired in "Remarks column".				NO Land has been acquired for the Rehabilitation of water supply lines but for installation of new tube well, it will be done on govt. owned land.
Government and LG owned land free of occupation (agriculture or settlement)	✓			A new tube well will be installed at Govt. School Boys High No 2. Land belongs to Education Dept.
Government or state-owned land (other than LG) free of occupation (agriculture or settlement)		✓		
Private land		✓		
Residential		✓		
Commercial		✓		
Agricultural		✓		
Communal		✓		
Others (specify in "remarks").	✓			No Objection Certificate (NOC) for installation of New tube well has been issued by the Principal, Govt. School High No 2, Kamoke received from the District Education Officer (SE) dated 31-10-2022.
Name of owner/owners and type of ownership document if available.		✓		Land belongs to Education Department. NOC for installation of new tube well has been issued.
If land is being acquired, describe any structures constructed on itddwsxwxdwxwz		✓		NO Structures constructed on it.
Land-based assets:		✓		
Residential structures		✓		
Commercial structures (specify in "remarks")		✓		
Community structures (specify in "remarks")		✓		

Agriculture structures (specify in "remarks")		✓		
Public utilities (specify in "remarks")		✓		
Others (specify in "remarks")		✓		
If agricultural land is being acquired, specify the following:		✓		no agriculture land has been acquired as the sub project area falls in residential area.
Agriculture related impacts		✓		
Crops and vegetables (specify types and cropping area in ("Remarks)).		✓		
Trees (specify number and types in "remarks").		✓		
Others (specify in "remarks").		✓		
Affected Persons (APs)		✓		
Will any people be displaced from the land when acquired? Yes/No		✓		No displacement/relocation occurred because land acquisition is not involved in sub project area.
Number of APs		✓		No APs has been identified because of no land acquisition
Males		✓		
Females		✓		
Titled landowners		✓		
Tenants and sharecroppers		✓		
Leaseholders		✓		
Agriculture wage laborers		✓		
Encroachers and squatters (specify in remarks column)		✓		
Vulnerable APs (e.g. women headed households, minors and aged, orphans, disabled persons, and those below the poverty Line). Specify the number and vulnerability in "remarks".		✓		No vulnerable APs has been identified in the sub project area.
Others (specify in "remarks")		✓		
How will people be affected?		✓		

Prepared By: Adeera Nasar

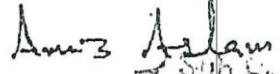
Name: Adeera Nasar

Signature: 

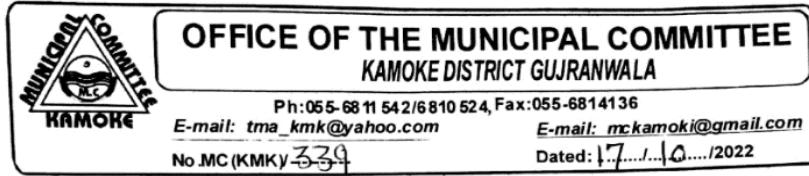
Date: 18-10-2022

Endorsed By:

Name: Amir Aslam

Signature: 
Sub Engineer

Date: 18/10/2022
Municipal Committee
Karachi



To

The Chief Executive Officer
Education Department, Gujranwala.

Subject:- **REQUEST FOR ISSUANCE OF NOC WITH REGARD TO INSTALLATION OF NEW TUBEWELL AT GOVT. BOYS HIGH SCHOOL NO.2 SHEESH MAHAL ROAD KAMOKE.**

Please refer to the subject cited above.

Municipal Committee Kamoke is executing different projects under Punjab Cities Program in collaboration of PMDFC with Govt. of the Punjab, LG&CD Department, funded by the World Bank in 16-No. M.Cs. The scheme namely "**Improvement & Extension of Water Supply System in city Kamoke**" is also the part of said projects of M.C. Kamoke.

In this regard, it is to inform you that the tubewell at Mandiala Water Tanki installed about 18-years ago, therefore the said tubewell is not functioning properly. Hence, the M.C. Kamoke intends to install the new tubewell to improve the existing provision of water supply at Mandiala Road and the site for new boring of tubewell for water supply has identified at Government Boys High School No.2 Sheesh Mahal Road Kamoke.

In the light of above, the M.C. Kamoke required **NOC** for the installation of new tubewell for water supply at said School. All necessary expenditure i/c electricity bills etc. would be paid by the M.C. Kamoke overall in future.


ADMINISTRATOR
MC Kamoke

CC

1. The District Education Officer, Gujranwala.
2. The Chief Officer, M.C. Kamoke
3. The Municipal Officer (I&S), M.C. Kamoke
4. The Headmaster, Govt. Boys High School No.2 Sheesh Mahal Road Kamoke.
5. The SPO(ID), PMDFC Lahore.
6. The Team Leader, NESPAK Consultant Lahore.



PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY

LICENSED UNDER SECTION 42 OF THE COMPANIES ORDINANCE 1984


PMDFC/PCP/PD/2711/1122

FAX/COURIER
08th November, 2022

Team Leader (Punjab Cities Program projects)
National Engineering Services Pakistan (Pvt) Ltd
IC, Block N, Model Town Ext,
Lahore

Subject: Punjab Cities Program-NOC for land for installation of tubewell in Kamoke city

Enclosed may please be found the NOC for land for installation of tubewell in water supply system in Kamoke city. The E&SM Plan may please be prepared and submitted to Senior Program Officer (E&SM) PCP for approval and inclusion in the PC-I of the subproject which after completion may please be submitted to the office of undersigned.


M. Ashiq Chaudhary
Senior Program Officer
Infrastructure Development

A copy, for information, is forwarded to:

1. Program Director PCP Lahore
2. Deputy Program Director PCP
3. Senior Program Officer (E&SM) PCP Lahore
4. Chief Officer MC Kamoke
5. Municipal Officer (I&S) kamoke
6. Program Officer (ID)-2 Lahore

CHIEF EXECUTIVE OFFICE
(DEA) GUJRANWALA.
No. 4823 /Dev
Dated 2/11 /2022.

Contact # 0559230105
Email. edoedu.gujranwala@gmail.com

To

✓ The Administrator
Municipal Committee
Kamoke

Subject: REQUEST FOR ISSUANCE OF NOC WITH REGARD TO INSTALLATION OF TUBEWELL AT GOVT BOYS HIGH SCHOOL NO.2 SHEESH MAHAL ROAD KAMOKE.

Please refer to your office letter No. MC(KMK)/ 339 dated 17-10-2022 on the subject cited above.

No **Objection Certificate** for Installation of Tube well for Water Supply issued by the Principal, Govt. High No.2 kamoke received from the District Education Officer (SE) Gujranwala vide No. 4657/Dev dated 31-10-2022, is hereby **endorsed**. with *Toko mentioned in the NOC.*

NO & DATE EVEN

M. M. M.
CHIEF EXECUTIVE OFFICER
(DEA) GUJRANWALA. *S*

Copy is forwarded for information & necessary action to:

- 1- The District Education Officer (SE) Gujranwala.
- 2- Principal, Govt. High No.2 kamoke

✓
CHIEF EXECUTIVE OFFICER
(DEA) GUJRANWALA.

Kamoke Case file

Jalim

Scanned with CamScanner



OFFICE OF THE SENIOR HEADMASTER
GOVERNMENT HIGH SCHOOL NO.2
SHEESH MAHAL ROAD KAMOKE DISTT. GRW.
Ph: 055-6811759

Ref. No. KMKJ2/ 89

Date 28-10-2022

To
The District Education Officer (SE),
District Gujranwala.

Subject: Issuance of NOC regarding installation of New Tubewell at Govt. Boys High School No.02 Sheesh Mehal Road Kamoke

Respected Sir,

With reference to your letter No. 4612 Dated 26-10-22, it is stated that after a meeting with school council regarding the above said matter, some suggestions and reservations are presented here:

1. Available Facility of School:

The school already has 400 feet bore and the latest filtration plant is also working very well.

2. Shortcoming of School:

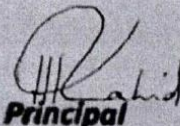
The surface level of school is 3 feet lower than that of the locality of the school and the sewerage system issue already exists.

3. Demands for issuance of NOC:

- The electricity meter must be installed by the Municipal Corporation Kamoke.
- The electricity bill must be paid by the Municipal Corporation.
- Above said corporation will take the responsibility of maintenance after installation.
- The corporation should be bound to supply water to the host school.
- Above said corporation will also be bound to take the responsibility of security and operating the tubewell.

4. Conclusion:

If MC Kamoke fulfills our above mentioned demands, we have no objection against the installation of tubewell, otherwise your highness may take any kind of decision in this regard.


Principal
Govt. High School No:2
Kamoke, Distt. Gujranwala

Estimated Cost of ESMP Implementation			
Item	Quantity	Tentative Cost/Item-PKR	Total Cost in PKR.
A-PPEs			
Face Masks (3 PLY) - box	50	300	15,000
Safety Hard Helmets	25	3,000	75,000
Safety Shoes	25	3,000	75,000
Hand Gloves	25	1,000	25,000
Ear Plugs	25	500	12,500
Reflective Safety Vest	25	1,000	25,000
Safety Goggles	25	500	12,500
B-Community Health and Safety			
First Aid Box Complete	1	10,000	10,000
Infrared Thermometer (Benetech GM-2200 or equivalent)	1	40,000	40,000
Safety Signs	10	15,000	150,000
Safety Cones	24	1,000	24,000
Safety Tapes	50	1,500	75,000
Emergency Portable Lights	4	3,000	12,000
Fire Fighting Equipment Purchase and refilling	2	10,000	20,000
Hiring of Environmental Specialist (for 03 months)	3	70,000	210,000
Labor Campsite Management	Lump sum		400,000
C- Environment Quality Testing			
Water Quality-at the time of installation of new tube-well, during installation and after installation. It should be ensured to install the tube-well only in case quality of water is meeting all the requirements as per WHO/PEQSS	3	22000	66,000
Total (PKR)-A+B+C			1,247,000

**APPENDIX-H
ENVIRONMENT, HEALTH
AND SAFETY SOPS FOR
LABOR/WORKERS**

PUNJAB CITIES PROGRAM

ENVIRONMENT, HEALTH AND SAFETY SOPs FOR LABOR/WORKERS

Labor /workers play key role in the infrastructure development and construction activities. The objective of preparation of the EHS SOPs for Labor/Workers is to address environment, health and safety issues related to the proposed sub-project implementation. These SOPs will provide guidelines to be followed by the contractors for effective management of EHS issues related to labor/workers/daily wagers (including women). These SOPs will be annexed in the general conditions of all the contracts carried out under the PCP. These SOPs are designed for Punjab Cities Program and will be applicable to all types of labor/workers/daily wagers (including women), hired for the construction activities under PCP. Following are the anticipated Environment, Health and Safety issues and their recommended mitigation measures.

Table 1: Construction Camp Management

Activity/ Impact Source	EHS Concerns/issues	Mitigation Measures/ Management Guidelines
Siting and Location of construction camps	<p>Camp sites for construction workers are the important locations that have significant impacts such as health and safety hazards on labor/workers</p> <p>Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.</p>	<p>The Contractor shall:</p> <p>Locate the construction camps at areas which are acceptable from environmental, cultural or social point of view.</p> <p>Consider the location of construction camps away from communities in order to avoid social conflict with the surrounding communities.</p> <p>Submit to the relevant MC for approval of a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps.</p> <p>Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters</p>
Construction Camp Facilities	<p>Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will generate social issues and impacts on health and environment.</p>	<p>Contractor shall provide the following facilities in the campsites:</p> <p>Adequate ventilation facilities</p> <p>Safe and reliable drinking water supply for personal hygiene (washing or bathing)</p> <p>Adequate housing for all workers</p> <p>Safe and reliable drinking water supply. Water supply from tube wells that meets the Punjab Environment Quality Standards</p> <p>Hygienic sanitary facilities, hand washing facilities and sewerage system.</p> <p>The toilets and domestic waste water will be collected</p>

Activity/ Impact Source	EHS Concerns/issues	Mitigation Measures/ Management Guidelines
		<p>through a common sewerage.</p> <p>Provide separate latrines and bathing places for males and females with total isolation by wall or by location. Female toilets should be clearly marked in language or signage clearly understood by the persons using them to avoid miscommunication. The minimum number of toilet facilities required is one toilet for every ten persons.</p> <p>Storm water drainage facilities. Both sides of roads are to be provided with shallow v drains to drain off storm water to a silt retention pond which shall be sized to provide a minimum of 20 minutes retention of storm water flow from the whole site. Channel all discharge from the silt retention pond to natural drainage via a grassed swale at least 20 meters in length with suitable longitudinal gradient.</p> <p>Paved internal roads. Ensure with grass/vegetation coverage to be made of the use of top soil that there is no dust generation from the loose/exposed sandy surface. Pave the internal roads of at least haring-bond bricks to suppress dusts and to work against possible muddy surface during monsoon.</p> <p>Provide child crèches for women working on the construction site. The crèche should have facilities for dormitory, kitchen, indoor/outdoor play area. Schools should be attached to these crèches so that children are not deprived of education whose mothers are construction workers</p> <p>Provide in-house community/common entertainment facilities. Dependence of local entertainment outlets by construction camps to be discouraged/prohibited to the extent possible.</p>
Disposal of Labor Camp waste	Management of wastes is crucial to minimize impacts on the environment as well as on the health of the workers/labor	<p>The Contractor shall:</p> <p>Ensure proper collection and disposal of solid wastes within the construction camps</p> <p>Insist waste separation by source; organic wastes in one pot and inorganic wastes in another pot at household level.</p> <p>Store inorganic wastes in a safe place within the household and clear organic wastes on daily basis to waste collector.</p> <p>Establish waste collection, transportation and disposal systems at their own.</p> <p>Dispose organic wastes in a designated safe place on daily basis. At the end of the day cover the organic wastes with a thin layer of sand so that flies, mosquitoes, dogs, cats, rats, are not attracted. One may dig a large hole to put organic wastes in it; take care to protect groundwater from contamination by leachate formed due to decomposition. Cover the bed of the pit with impervious layer of materials (clayey, thin concrete) to protect groundwater from</p>

Activity/ Impact Source	EHS Concerns/issues	Mitigation Measures/ Management Guidelines
		<p>contamination.</p> <p>Locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place by fencing and tree plantation to prevent children to enter and play with.</p> <p>All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.</p>
Fuel supplies for cooking purposes	Illegal sourcing of fuel wood by construction workers will impact the natural flora and fauna	<p>The Contractor shall:</p> <p>Provide fuel to the construction camps for their domestic purpose, in order to discourage them to use fuel wood or other biomass.</p> <p>Make available alternative fuels like natural gas or kerosene on ration to the workforce to prevent them using biomass for cooking.</p> <p>Conduct awareness campaigns to educate workers on preserving the protecting of biodiversity in the project area, and relevant government regulations and punishments on wildlife protection.</p>
Health and Hygiene	There will be a potential for diseases to be transmitted including COVID-19, malaria, exacerbated by inadequate health and safety practices. There will be an increased risk of work crews spreading sexually transmitted infections and HIV/AIDS.	<p>The Contractor shall:</p> <p>Provide adequate health care facilities within construction sites.</p> <p>Provide first aid box facility at the construction site round the clock. Maintain stock of medicines in the first aid facility in camp sites facility and appoint fulltime designated first aider or nurse.</p> <p>Provide ambulance facility for the laborers during emergency to be transported to nearest hospitals and telephone/mobile facility to call for Emergency Services 1122.</p> <p>Initial health screening of the laborers coming from outside areas</p> <p>Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work</p> <p>Provide HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education and communication for all workers on regular basis</p> <p>Provide adequate drainage facilities throughout camps to ensure that disease vectors habitats (stagnant water bodies, puddles) do not form.</p> <p>Regular mosquito repellent sprays in monsoon.</p> <p>Carryout short training sessions on best hygiene practices to</p>

Activity/ Impact Source	EHS Concerns/issues	Mitigation Measures/ Management Guidelines
		<p>be mandatorily participated by all workers.</p> <p>Place display boards at strategic locations within the camps containing messages on best hygienic practices</p> <p>Place display boards of contact information of nearest dispensary/health clinic/hospital</p>
Safety	<p>In adequate safety facilities to the construction camps may create security problems and fire hazards</p>	<p>The Contractor shall:</p> <p>Provide appropriate security personnel (police / home guard or private security guards) and enclosures to prevent unauthorized entry in to the camp area.</p> <p>Maintain register to keep track on a head count of persons present in the camp at any given time.</p> <p>Encourage use of flame proof material for the construction of labor housing/site office. Ensure that these houses/rooms are of sound construction and capable of withstanding storms/cyclones.</p> <p>Provide appropriate type of firefighting equipment suitable for the construction camps</p> <p>Display emergency contact numbers clearly and prominently at strategic places in camps.</p> <p>Communicate the roles and responsibilities of laborers in case of emergency in the monthly meetings with contractor.</p>
Food Safety	<p>There is potential for exposure to poisonous substances by ingestion</p>	<p>Suitable arrangements are to be made for provision of clean eating areas where workers are not exposed to the hazardous or noxious substances</p>
Site Restoration	<p>Restoration of the construction camps to original condition requires demolition of construction camps.</p>	<p>The Contractor shall:</p> <p>Dismantle and remove from the site all facilities established within the construction camp including the perimeter fence and lockable gates at the completion of the construction work.</p> <p>Dismantle camps in phases as the work decreases (do not wait for completion of the entire work.</p> <p>Give prior notice to the laborers before demolishing their camps/units</p> <p>Maintain the noise levels within the national standards during demolition activities</p> <p>Different contractors should be hired to demolish different structures to promote recycling or reuse of demolished material.</p> <p>Reuse the demolition debris to a maximum extent. Dispose remaining debris at the designated waste disposal site by MCs/ESFPs.</p> <p>Handover the construction camps with all built facilities as it is if agreement between both parties (contractor and land-owner) has been made so.</p>

Activity/ Impact Source	EHS Concerns/issues	Mitigation Measures/ Management Guidelines
		<p>Restore the site to its original condition or to an agreed condition with the landowner defined prior to the commencement of the works (in writing).</p> <p>Not make false promises to the laborers for future employment in O&M of the project.</p>

Table 2: Cultural and Religious Issues

Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities	Disturbance in performance of religious activities	<p>The Contractor shall:</p> <p>Provide separate prayer facilities (men and women) to the construction workers.</p> <p>Show appropriate and non-biased behavior with all construction workers irrespective of their religious or cultural affinities</p> <p>Allow the workers to participate in praying during construction time</p> <p>Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works so as to maintain effective surveillance over public health, social and security matters</p> <p>In case of working during COVID-19 pandemic, SOPs for prayers in Mosque issued by the Government of Punjab, will be applicable and it will be responsibility of contractor to sensitize the labor/workers about it</p>

Table 3: Workers/Labor Health and Safety at Construction Site

Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Construction Activities	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of (i) biophysical health risk factors, (e.g. noise,	<p>The Contractor shall:</p> <p>Implement suitable safety standards for all workers and site visitors which should not be less than those laid down on the international standards (e.g. International Labor Office guideline on ‘Safety and Health in Construction; World Bank Group’s ‘Environmental Health and Safety Guidelines’) and contractor’s own national standards or statutory regulations, in addition to complying with the national acts and rules of the Government of Pakistan</p> <p>Provide the workers with a safe and healthy work environment, taking into account inherent risks in its particular construction activity and specific classes of</p>

Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
	<p>dust, chemicals, construction material, solid waste, waste water, vector transmitted diseases etc), (ii) risk factors resulting from human behavior (e.g. STD, HIV etc) and (iii) road accidents from construction traffic.</p>	<p>hazards in the work areas, Provide Personal Protection Equipment (PPEs)¹ for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty ones and replacing them with the damaged ones. Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job Appoint an environment, health and safety manager to look after the health and safety of the workers Inform the local authorities responsible for health, religious and security before commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security matters</p>
	<p>Child and pregnant labor</p>	<p>The Contractor shall: not hire children of less than 14 years of age and pregnant women or women who delivered a child within 8 preceding weeks, in accordance with the Employment of Children Act (2015)² and Pakistani Labor Laws and policies respectively .</p>

¹ Table 4 presents general examples of occupational hazards and types of PPE available for different purposes.

² The ECA 2015 defines a child as a person who has not completed his/her 14th year of age. The ECA states that no child shall be employed or permitted to work in any of the occupations set forth in the ECA (such as transport sector, railways, construction, and ports) or in any workshop wherein any of the processes defined in the Act is carried out

Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Accidents	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	<p>Provide health care facilities and first aid facilities are readily available. Appropriately equipped first-aid stations should be easily accessible throughout the place of work</p> <p>Document and report occupational accidents, diseases, and incidents.</p> <p>Prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, so far as reasonably practicable, the causes of hazards. In a manner consistent with good international industry practice.</p> <p>Identify potential hazards to workers, particularly those that may be life-threatening and provide necessary preventive and protective measures.</p> <p>Provide awareness to the construction drivers to strictly follow the driving rules</p> <p>Provide adequate lighting in the construction area and along the roads</p>
Water and sanitation facilities at the construction sites	Lack of Water sanitation facilities at construction sites cause inconvenience to the construction workers and affect their personal hygiene.	<p>The contractor shall provide separate portable toilets and hand washing facilities at the construction sites, if about 25 people are working the whole day for a month. Location of portable facilities should be at least six m away from storm drain system and surface waters. These portable toilets should be cleaned once a day and all the sewerage should be pumped from the collection tank once a day and should be brought to the common septic tank for further treatment.</p> <p>Contractor should provide bottled drinking water facilities to the construction workers at all the construction sites.</p>
Other issues	Potential risks on health and hygiene of construction workers and general public	<p>The Contractor shall follow the following management measures to reduce health risks to the construction workers and nearby community:</p> <p>Drainage Management</p> <p>Air Quality Management</p> <p>Noise and Vibration Management</p> <p>Road Transport and Road Traffic Management</p>
Trainings	Lack of awareness and basic knowledge in health care among the construction workforce, make them susceptible to potential diseases.	<p>The Contractor shall:</p> <p>Train all construction workers in basic sanitation and health care issues (e.g., how to avoid COVID-19, malaria and transmission of sexually transmitted infections (STI) HIV/AIDS.</p> <p>Train all construction workers in general health and safety matters, and on the specific hazards of their work Training should consist of basic hazard awareness, site specific</p>

3 .SOPs issued by the GoPunjab during COVID-19 Pandemic will be implemented

Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
		<p>hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate.</p> <p>Commence the COVID-19, malaria, HIV/AIDS and STI education campaign before the start of the construction phase and complement it with by a strong condom marketing, increased access to condoms in the area as well as to voluntary counseling and testing.</p> <p>Implement COVID-19, malaria, HIV/AIDS and STI education campaign targeting all workers hired, international and national, female and male, skilled, semi- and unskilled occupations, at the time of recruitment and thereafter pursued throughout the construction phase on ongoing and regular basis. This should be complemented by easy access to condoms at the workplace as well as to voluntary counseling and testing.</p>

Table 4: Summary of Recommended Personal Protective Equipment According to Hazard4

Objective	Workplace Hazards	Suggested PPE
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.	Safety Glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords.	Plastic Helmets with top and side impact protection.
Hearing protection	Noise, ultra-sound.	Hearing protectors (ear plugs or ear muffs).
Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids and chemicals.
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors.	Facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapors and gases). Single or multi-gas personal monitors, if available.
	Oxygen deficiency	Portable or supplied air (fixed lines). On-site rescue equipment.
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.

4 Source: IFC Environmental, Health, and Safety (EHS) Guidelines

APPENDIX-I TECHNICAL SPECIFICATION



1 STATIC WATER LEVEL AND PUMPING HEAD CALCULATIONS

At this stage of sectoral Planning there is no provision of hiring contractor for test bore

PERMANENT PUMP SETTING DEPTH ALONG WITH PUMPING HEAD CALCULATIONS KAMOKE			
A	Basic Data		
	Capacity of Tubewell	2.00	Cusec
	Static water level	40.00	ft
	Drawdown in main well during Pumpout test	15.00	ft
	Deterioration of tubewell @ 25%	4.00	ft
	Seasonal Fluctuations of Water table	1.00	ft
	Assumed Regional decline of water levels after 15 years @ 2.0 ft/year	30.00	ft
	Expected Dynamic water level	90.00	ft
B	Proposed Length of Pump Housing Casing 18' i/d (Variable)	250.00	ft
C	Total Depth of Bore	600.00	ft
D	Total pumping head		
	Future pumping water level	90.00	ft
	Length above ground surface/ Delivery Head	85.00	ft
	Total pumping head	175.00	ft



2 TUBEWELL PUMP

2.1 GENERAL

This Section covers the requirements for designing, manufacturing/fabrication, testing at manufacturer's works, furnishing, supplying at site, installing, painting, testing and commissioning at designated site, placing in satisfactory operating conditions in the location with the intended duties and maintenance of the equipment/machinery for one (1) year during defect liability period (DLP) of vertical deep-well turbine pumps. The specifications given in this section are minimum requirements; the Contractor shall perform water analysis and design/propose materials/pumps having better qualities for extended useful life of the system.

The work will include but not be limited to the followings:

- Brand-new vertical shaft, centrifugal type turbine pump of maximum speed 1500 rpm, complete in all respects for successful operation during its design life. All the equipment shall be from internationally reputed manufacturers subject to approval of the Engineer. The parameters of the pump are given here:

Rated Discharge of Pump (cusec)	Rated Head of Pump (ft)	Minimum Efficiency Pump (%)	Minimum Efficiency Motor (%)
2	175	80	90

- Brand-new indoor type, totally enclosed, fan cooled, vertical solid shaft, AC induction motors suitable for and coupled with pump described in above. The motors shall conform to International Electrotechnical Commission (IEC) Standards and shall be from internationally reputed manufacturer subject to approval of the Engineer. The main parameters of the electric motors as in the below Table are considered appropriate for the intended duty:

Type	AC Induction
Rated power	Suitable for the pumps with min. 15% margin above pumps rated conditions as per ISO 5199
Duty	Continuous
Rated voltage	400 V (\pm 5%)
Phase connection	3 Phase
Rated frequency	50 Hz



Degree of protection	of	IP 54
Insulation Class		F
No. of Poles		4
Over-load		115 percent
Minimum Efficiency		IE-2

- Motor control unit/motor control center consisting of metallic box, auto star delta starter, circuit breaker, magnetic contactor, thermal overload relay, on/off switch, control fuse, under/over voltage relay, electronic over current relay, phase failure relay, indication lamps, digital ampere meter, volt meter, hour run meter, thermistor relay, high temperature protection, phase reversal protection, electrical cables, complete in all respects. All the equipment shall be from internationally reputed manufacturers subject to approval of the Engineer.
- All necessary piping along with pressure gauge, valves, flexible couplings, flanges, reducers, tees, elbows, strainers, gaskets, nuts and bolts etc. and complete in all respects for satisfactory operation of the system.
- Supply of spare parts and lubricants required for all mechanical equipment for one (1) year along with erection and maintenance tools.

2.2 REFERENCE STANDARDS

Latest edition of the following applicable standards:

ASTM A 48	Standard Specification for Grey Iron Castings
ASTM A 36	Standard Specification for Carbon Structural Steel
ASTM A193	Specification for Alloy-Steel and Stainless-Steel Bolting for High Temperature or High-Pressure Service and Other Special Purpose Applications
ASTM A194	Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A 276	Standard Specification for Stainless Steel Bars and Shapes
ASTM A 743	Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application
AWWA C500	Metal-Seated Gate Valves for Water Supply Service



AWWA C 508	Swing-Check Valves for Waterworks Service
AWS D1.1	Structural welding code — Steel
HI	Hydraulic Institute Standards for Rotodynamic (Centrifugal) Pumps
ISO 1940	Mechanical vibration — Balance quality requirements of rigid rotors
ISO 2858	End-suction centrifugal pumps (rating 16 bar) -- Designation, nominal duty point and dimensions
ISO 3661	End-suction centrifugal pumps -- Baseplate and installation dimensions
ISO 3069	End-suction centrifugal pumps -- Dimensions of cavities for mechanical seals and for soft packing
ISO 5198	Centrifugal, mixed flow and axial pumps -- Code for hydraulic performance tests -- Precision grade
ISO 5199	Technical Specifications for Centrifugal Pumps
ISO 7005	Metallic flanges – Cast Iron and Steel
ISO 9906	Rotodynamic Pumps-Hydraulic performance acceptance tests
ISO 10204	Metallic Products-Types of inspection documents
ISO 10441	Flexible couplings for mechanical power transmission — Special purpose applications
ISO 11342	Mechanical Vibration — Methods and criteria for the mechanical balancing of flexible rotors

2.3 DESIGN CRITERIA

- The pumps shall be designed in accordance with applicable requirements of Hydraulic Institute Standards or other internationally recognized pump manufacturing standards subject to approval of the Engineer.
- Contractor shall check the design duties of each equipment, verify the design heads of the pumping system, accordingly prepare system head curve and super impose the pump performance curve on it, verify the arrangement and sizes of the piping, analyse system pressure losses, check hydraulic transients for normal & emergency conditions and submit to the Engineer detailed report/design for approval before any material procurement.
- Each equipment shall be suitable for rendering intended duties under the Project's requirements, climatic and environmental conditions.
- Contractor shall ensure during design stage that pump shall operate near their best efficiency



points. Pumps shall have a preferred operating region of 70 % to 120 % of best efficiency flow rate of the pump as furnished.

- Pump shall have casings designed for working pressure at least one and half times the total pressure on the casing. Flange connections shall correspond to casing working pressure. The characteristic curves of pump performance showing power, dynamic head, Net positive suction head and efficiency versus flow shall be furnished to the Engineer for approval.

2.4 PUMP MANUFACTURER SELECTION

Based on the pumping requirements of the Project, the Contractor shall propose reputed international pump and motor manufacturers having relevant experience in designing and manufacturing of pumps of this type which could satisfy the actual requirements of the project. The pump & motor should be from approved manufacturers of HUD & PHED.

2.5 PRODUCTS GENERAL

Before placing the order for the pumps, the contractor shall calculate the total required dynamic head for the System with equipment, piping, fittings actually proposed by the Contractor and analyse system pressure losses and submit for Engineer's approval. No compensation will be paid to the contractor, if actual head requirements are above the specified values.

Each pump shall be guaranteed to perform operation continuously without overheating the bearings and motor etc. The pumps shall be assembled completely in the shop to ensure the correct fitting of all parts.

The pumps shall not overload the motors for any point on the pump performance characteristic curve within the limits of stable pump operation. The motor shall be selected by the pump manufacturer from a best-ranking motor make and most efficient. The motor's make, model no. and country of origin shall be identified during technical submission. The motor shall be capable of operating continuously at ambient temperature of minimum 50 degrees Celsius.

The completed units, when assembled and operating, shall be free of surging, cavitation, vibration, noise, and oil or water leaks throughout the entire pump operating range. Pumps shall not transmit vibration to the building and shall operate with permissible limits of sound determined by OSHA, ISO and WHO standards. To ensure vibration-free operation, all rotating components of each pumping units shall be statically and dynamically balanced. Excessive vibration shall be sufficient cause for rejection of the equipment. The mass of the unit and its distribution shall be such that resonance at normal operating speeds is avoided. In any case, the amplitude of vibration as measured at any point on the pumping unit shall not exceed the limits set forth in the latest edition of the Hydraulic Institute Standards.

All parts of each pump shall be designed to withstand the stresses that will be imposed upon them during their handling, shipping, erection, and operation. All units shall be so constructed that dismantling and repairing can be accomplished without difficulty. All components of the



pumping systems shall be provided by a single pump manufacturer such that pumps, motors, system controls and accessories are properly synchronized.

2.6 SUBMITTALS

The Contractor shall submit the following documents/drawings, copies of the applicable Standards (latest editions) and all other submittals as required in both electronic and hard form for review and approval of the Engineer:

2.6.1 Information to be Submitted with the Tender

- Technical catalogue, brochure of pump motor also indicating country of origin.
- Technical data sheets & characteristics curves of proposed pumping unit.
- Brochure/technical catalogue indicating country of origin of bearings.
- Brochure/technical catalogue indicating country of origin of shaft coupling.

2.6.2 Shop drawings

Indicate general assembly, components, dimensions, thicknesses of casings, impellers, weights, clearances and methods of assembly including material specifications. Detail plans and elevations giving complete dimensions for the plinths, cuts, bolt holes, cable ducts, foundation load and stresses, and other provisions to be made in the structures. Piping and instrumentation (P&I) drawings.

2.6.3 Product Data

Provide manufacturer's literature including general assembly, certified pump curves showing performance characteristics with pumps and system operating points indicated, NPSH curves, equipment technical data sheets, power curves, controls, wiring diagrams, and service connections.

- System design and pressure loss calculations of pumps to confirm the design heads.
- Proposed system operation description.

2.6.4 Manufacturer's Installation Instructions

- Including handling, storage, start-up and shut-down instructions for pumping system.
- Manufacturer's recommended spare parts and tools list for 5 years of successful operation.
- Details of complete equipment of motor control unit indicating make and country of origin.



- Single line diagrams

2.6.5 Manufacturer's Certificate

Certifying that pumps meet specified requirements at specified operating conditions. Submit results of shop tests performed in accordance with DIN EN ISO 9906 or HI 14.6 for all the pumps. The pumps shall be shop tested at manufacturer's manufacturing facility in presence of the Engineer and Employer. The material test certificates shall be submitted as per the requirements of ISO EN 10204 (3.1). Type test reports of pump drive shall also be submitted.

Test certificates regarding hydrostatic testing of casing, pump-motor alignment and dynamic balancing of impellers shall be submitted as per ISO 10204 (3.1).

2.6.6 Field Reports

Submit as directed by the Engineer.

2.6.7 O & M Manual

Operation & maintenance manual shall be submitted.

2.6.8 Quality Assurance

Quality assurance documents shall be submitted as described in clause 24.2.8 hereunder.

2.7 MATERIALS

2.7.1 General

- All the pump parts, unless otherwise specified shall be of standard materials of the manufacturer, suitable for the water quality and operating conditions.
- All materials shall be new and of first-class quality, suitable for the purpose, free from defects and imperfections.
- Materials of pumps shall be compatible with the corrosive and abrasive properties of the pumped water.

2.7.2 Component Materials

Casing/Bowl and Impeller

The pump casing/bowl shall be designed for one and half times the maximum discharge pressure at ambient temperature, with a 3 mm minimum corrosion allowance. The casing/bowl assembly shall be made of cast iron ASTM A-48 or better. The pump casing internal shall be coated with erosion resistant coating approved by the Engineer. Pump casing shall be easily removable for full inspection/maintenance of internals of the pump and should have an inspection window.



The pump casing shall be provided with removable and renewable wearing rings where there are close-running clearances between the impeller and the casing/bowl.

The impeller furnished for the pump shall be of lead-free bronze, carefully selected for resistance to corrosion and pitting and shall be fastened to the shaft in such a manner as to make it readily removable. The impeller shall be capable of running against closed valve.

The Contractor shall guarantee each impeller against excessive cavitation for a period of two (2) years from the date the pump is placed in service. The cavitation shall be considered excessive if the discharge head of pumps drops by 3 percent as per Hydraulic Institute Standard.

Shaft

The Shaft shall be made of stainless-steel equivalent to ASTM A 276 or better designed with a high safety factor to withstand the torsional loads and other stress to which it may be subjected. It shall be so designed that there will be no detrimental vibrational stresses. Shaft shall be accurately machined and ground over their entire length. The alignment of pump and motor shall be set as required to ensure satisfactory operation. The shaft shall be rigid design type of ample size to operate without vibration throughout the range of normal and runaway speed. The margin of safety between operating speed and critical speed shall be between 15% ~25% and allowable pump field vibrations shall be as per HI 9.6.4. The component balance shall be in accordance with ISO 1940 balance quality grade G6.3. The pump shall be so designed to prevent water from passing along the shaft and entering the pump bearings.

Stuffing Box

The seal area design shall prevent air pocket formation around the seal. The packing material shall be selected based on pumped fluid, shaft speed, pressure, dimensions of stuffing box done. The packing gland shall be split in two halves, so as to facilitate removal for packing.

Pump Bearings

The shaft shall be supported by bearings designed and manufactured in accordance with ABMA (American Bearing Manufacturers Association). The bearings shall have a high factor of safety. The bearings shall be designed for a nominal L10 life of 50,000 hours. Bearing housings shall be dust tight. Seals shall be provided to prevent loss of lubricant and entrance of moisture and dirt into the bearings.

Base frame

The base frame shall be of sufficient size and rigidity to maintain the pump and motor in proper alignment and position.

Testing of Materials



- The materials of the pump components shall be identified in the data sheets with ASTM standards. All materials or parts used in the equipment shall be tested, unless otherwise directed in conformity with applicable methods prescribed herein and with the ASTM, DIN or equivalent standards for mechanical, fracture, corrosion, fatigue, erosion, effect of temperature, metallography and chemical analysis. When requested, tests shall also be made in the presence of the Engineer.
- Certified material test reports / certificates shall be furnished after the tests are made. The test certificates shall identify the project name and component for which the material is to be used and shall contain all information necessary to verify compliance with the Contract Documents.

2.8 OPERATION AND MAINTENANCE MANUAL

The Contractor shall submit electronic and hard copies of O&M manual including following information as a minimum:

2.8.1 Instruction to manufacture pumping unit

Submit Step-by-step instructions describing how the pumping unit is prepared for start-up from a zero state.

2.8.2 Description of unit and component parts:

- Complete nomenclature and commercial number of replaceable parts
- Metallurgy of parts and their equivalence according to ASTM International Standards
- Function, normal operating characteristics, and limiting conditions
- System curves, performance curves, engineering data and tests

2.8.3 Operating procedures:

- Start-up, routine and normal operating instructions.
- Regulation, control, stopping, shut-down and emergency instructions.
- Summer and winter operation instructions
- Special operating instructions.

2.8.4 Maintenance Procedures:

- Routine operations/maintenance (daily, weekly, monthly or annual).
- Guide to "Trouble-shooting".
- Disassembly, repair and reassembly.
- Alignment, adjusting and checking.



2.8.5 Servicing and lubrication schedule:

- List of lubricants required
- Schedule for applying lubricants

2.8.6 Operation and maintenance instructions

Manufacturer's printed operation and maintenance instructions.

2.8.7 Sequence of operation

Description of sequence of operation by pump manufacturers.

2.8.8 Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance:

- Predicted life of parts subject to wear.
- Items recommended to be stocked as spare parts for five years of trouble-free operation.

2.8.9 Control diagrams

As-installed control diagrams by controls manufacturer.

2.8.10 Equipment's Layout plan

Coordination drawings to avoid physical conflicts in the layout of equipment, routing of cables and ducts, piping etc.

2.8.11 Color-coded piping diagrams

As-installed color-coded piping diagrams.

2.8.12 Spare parts

List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

2.8.13 Content for each electric and electronic system, as appropriate:

Description of system and component parts.

- Function, normal operating characteristics, and limiting conditions
- Engineering data and tests
- Complete nomenclature and commercial number of replaceable parts

Circuit directories of panel boards.



- Electrical service
- Controls
- Communications

Operating procedures:

- Routine and normal operating instructions.
- Sequences required.
- Special operating instructions.

Maintenance procedures:

- Routine Operations
- Guide to "trouble-shooting".
- Disassembly, repair and reassembly of motor parts
- Adjustment and checking

2.9 GUARANTEE

All items to be furnished shall be guaranteed for a period of one (1) year for pump parameters. All the items supplied shall have a defect liability period of one (1) year starting from the date of Preliminary Acceptance by the Employer against defective materials, design, performance or workmanship. Any deficiency mentioned above shall be replaced or corrected by the Contractor as directed by the Engineer at no additional expense to the Employer.

2.10 QUALITY ASSURANCE

- Manufacturer's Quality System certification to ISO 9001:2008.
- Inspection/testing of the material and casting of pump components during manufacturing as described in 2.9 hereunder
- Performance tests in accordance with DIN EN ISO 9906 or HI 14.6 after completion of manufacturing
- Maintain one copy of approved documents and drawings at Site.

2.11 TESTS

2.11.1 Shop Tests

Manufacturing and Material Tests



The shop inspection of the pumps shall be carried out by the manufacturer as described herein below:

The manufacture shall perform inspection for checking any defect in the casted parts, ultrasonically tested or any other suitable technique to detect any flaws in the casing or impeller, perform material test to verify the metallurgy of the pump components in presence of the Engineer and Employer.

The pumps shall be assembled completely in the shop to ensure correct fitting of all parts. The pump casings shall be tested hydrostatically at a pressure equal to 150 percent of maximum allowable working pressure of the pump as per ISO 5199 or API 610. The hydrostatic test pressure shall be held for not less than 30 minutes after all leaks have been stopped.

The manufacturer shall maintain record of all such inspections for submission to the Engineer.

Performance Tests

Performance tests shall be performed by the manufacturer on the pump before the pump is placed in service.

The pumps shall be tested at test bench in accordance with ISO 9906 or HI 14.6 by the manufacturer. The pumps shall be performance tested in presence of the Engineer and Employer to check the performance of pump & motor at the specified parameters. Readings shall be taken at a minimum of five capacity points, including one point within plus or minus 2 percent of specified capacity. The tests shall be conducted in accordance with the accepted practices at full speed and instruments used shall be duly calibrated. The procedures used for inspection and testing shall conform to the latest international standards.

The pumps shall be tested as mentioned above by and at the expense of the Contractor to establish that the materials and the performance requirements of these Specifications and the Contractor's guarantees have been fulfilled. The manufacturer shall maintain record of all such inspections for submission to the Engineer. The Contractor shall bear all expenses such as travel costs, hotel accommodation (including meals and incidentals) for all domestic and/or international transportation, per diem @USD 200/day/person for inspections abroad and PKR 5000/day/person for inspections in Pakistan for each visit by Employer's and Engineer's representative.

The performance tests at test bed shall cover but not be limited to:

- Determination of the total head
- Determination of flow rate of water pumped
- Measurement of the speed of rotation



- Measurement of input to the pump
- Determination of efficiencies of pump
- Determination of NPSH required
- Preparation of characteristic curve showing pump head, capacity, NPSH required, power and pump efficiency.
- Measurement of increase in temperature of pump and motor
- Measurement of vibration in the pump / motor
- Routine tests of motors as per design characteristics

Any other tests as required by the Employer's / Engineer's Representative (s) should be conducted during the Shop Inspection according to applicable standards and to the satisfaction of the Employer's / Engineer's Representative.

2.11.2 Field Tests

Following completion of the installation and satisfactory start-up of the equipment, the Contractor shall provide the services of the pump manufacturer's representative to operate each pumping unit over the entire specified range. The operation, over the entire speed range, shall be free of cavitation or excessive vibration or noise.

Vibration shall be checked and recorded. The full speed vibration of all pumps shall be within acceptable limits as set out in the latest edition of the Hydraulic Institute Standards. Excessive vibration shall constitute sufficient cause for rejection of the equipment.

Each pump performance shall be documented by obtaining concurrent readings showing motor voltage and amperage, pump discharge head. Readings shall be documented for at least three pumping conditions to ascertain the actual pumping curve. One test shall be at shutoff head. Each power lead to the motor shall be checked for proper current balance.

Bearing temperatures of each unit shall be determined and shall remain in the permissible limits. A running time of at least two hours shall be maintained at the maximum specified operating head. In the event any of the pumping equipment fails to meet the above test requirements, it shall be modified and retested in accordance with the requirements of these Specifications.

2.12 PUMP DRIVE

Suitable Electric motors, vertical shaft, induction type motors shall be provided. The rotor shall be solid and dynamically balanced. Power and control cables shall be clamped against tensile loads. Design of power cable shall be according to NEMA Standards. The length of the power cable shall be sufficient in order to reach the junction box without the needs to splice it with another cable.



The power provided by the motor shall be adequate e.g., providing enough power to ensure that pump is not overloading throughout the pump performance curve from zero to max flow.

2.13 ERECTION & MAINTENANCE TOOLS

Furnish list and complete set of erection & maintenance tools for pump and motor needed for normal maintenance of the pumping units. These tools shall be neatly mounted in steel cabinet provided with locks, suitable for wall mounting.

2.14 MANDATORY SPARES

Furnish the basic mandatory spare parts with the supply of each pump including but not limited to the following.

Wearing rings	1 sets (each set complete for one pump)
Gland Packing	1 sets (each set complete for one pump)
Bearings	1 sets (each set complete for one pump)

2.15 DELIVERY, STORAGE AND HANDLING

- Deliver, store, protect and handle products according to Manufacturer's Instructions.
- Accept pumps and components at Site in factory packing. Inspect for damage, comply with manufacturers rigging instructions.
- Protect pumps and components from physical damage, including effects of weather, water and construction debris.
- Provide temporary inlet and outlet caps, and maintain in place until installation.

2.16 FOUNDATIONS

The reinforced concrete foundations of the pumping units shall be so designed that the computed amplitude of vibrations at the top of the foundations and elastic deflections due to machinery loads shall remain within the permissible limits prescribed by the machinery manufacturers and international standards.

The natural frequency of the whole of the foundations or parts thereof and all structures adjacent thereto shall not coincide with the operating frequency of the vibrating plant to avoid resonance condition.

2.17 EXECUTION / INSTALLATION

- Install in accordance with manufacturer's instructions and recommendations.
- Provide access space around pumping unit for service. Provide space not less than as recommended by manufacturer.



- Decrease from line size with long radius reducing elbows or reducers if required.
- Support piping adjacent to pump such that no weight is carried on pump casings. Provide supports or thrust blocks under elbows and bends on pump suction and discharge wherever necessary and subject to approval of the Engineer.
- All suction and discharge piping shall be installed so as to prevent vibrations and strain in the pumps, valves and fittings and subject to approval of the Engineer-in-charge.
- Provide drains for bases and seals, piped to and discharging into floor drains.
- Lubricate pumps before start-up.
- Qualified supervisor/millwright shall check, align, and certify base mounted pumps prior to start-up.

All of the works shall be carried out under strict observance of the health, safety and environmental protection regulations and Standards valid for the construction Site. Handling of equipment and materials shall be carried out with utmost care and most skillful labour. Handling equipment shall be suitable for the intended purpose and for the size and weight of the goods to be handled.



3 MOTOR

3.1 GENERAL

Electric motors associated with mechanical equipment.

3.2 REFERENCE STANDARDS AND SPECIFICATIONS

NEMA MG-1	:	Motors and generators
NEMA MG-2	:	Safety Standard for Construction and Guide for Selection, Installation and use of Electric Motors and Generators.
ANSI-50.41	:	American National Standards
NFPA 70	:	National Electric Code
IEC-60034	:	Rotating Electrical Machines
SECTION - 1	:	General provision of Electrical Works

3.3 SUBMITTALS

- Provide product data.
- Provide manufacturer's installation instructions.
- Provide certificate of shop tests.
- Provide operation and maintenance data.

3.4 PRODUCTS

3.4.1 Motors

- All motors shall be totally enclosed fan cooled, squirrel cage induction type. All motors shall comply with the requirements of IP 55.
- NEMA MG -1 Class F insulation shall be utilized. The Time Duty of the motors shall be continuous.
- Motors shall be suitable for operation at 400/230 Volts three phase, 50 Hz supply.

The motors shall be capable to operate safely on following frequency and voltage variations.

± 10% of rated voltage with rated frequency

± 5% of rated frequency with rated voltage



Combined variation of rated voltage and frequency.

$\pm 10\%$ of rated voltage with frequency variation within $\pm 5\%$.

- Design ambient temperature for motors shall be 50°C.
- All motors driving auxiliaries which are essential to the operation of the plant shall be capable of starting their associated loads with minimum accelerating torque of not less than 5 percent of full load torque when the voltage at the motor terminals during starting is reduced to 80 percent of the nominal value.

3.5 EXECUTION

3.5.1 Installations

- Confirm loads, locations and final connections of motors prior to installation.
- Install motor in accordance with NFPA 70, MG-2 and manufacturer's instructions.
- Provide nameplate in accordance with relevant standards.
- The motor frame shall be as per relevant standard.
- Ground motor frame per relevant standards.
- Provide motor starters in accordance with this section.
- Motors shall be furnished, attached and installed by the mechanical equipment manufacturer.

3.5.2 Field Tests

After installation, check and test equipment as per requirement of relevant standards and submit test results.

3.6 MOTOR CONTROL CENTRE

The motor control centre (MCC) shall be of 16 SWG sheet steel fabricated, cubical type, totally enclosed, dust tight and vermin proof. It shall be complete in all respects with material and accessories, factory assembled, tested and finished all according to the specifications and to the normal requirements. The panel with all components and accessories shall be suitable for front operation and shall;

- be provided with adequate clearance from live parts so that flashovers cannot be caused by switching, vermins, pests etc.
- have all components rated for insulation class of 600 Volt minimum.
- have the components mounted so as to facilitate ease of maintenance from the front.



- be suitable for mounting on concrete foundation.

The MCC shall be complete with detachable steel base frame for embedding in concrete foundation on site.

- Motor starters shall be rated for continuous current suitable for the associated motor in accordance with NEMA standards and shall be A.C. general purpose. Ratings and combination configuration of motor starters shall be as specified and as shown on the Drawings.
- Above 1.0 h.p. Star Delta Star operable on 400/230 Volts, three phase, 50 Hz supply.
- Each motor will be provided with a control panel installed in the local control room. The panel will be floor mounted sheet steel cabinet housing with necessary start, stop, control and monitoring equipment. The panel will include all alarms tripping and protective devices.
- The motor starter for a particular motor shall be selected by the Contractor so that the operation philosophy and functional requirements are fulfilled.

3.7 STANDARDS

The following standards shall be complied with:

BS 88	:	Cartridge Fuses
IEC 60947-2	:	Moulded Case Circuit Breakers
IEC 60898-2	:	Miniature Circuit Breakers
UL 98	:	Enclosed switches
UL 198	:	Fuses
ASTM A47	:	Malleable iron castings
ASTM A525	:	Galvanized sheet steel
Section 1	:	General Provisions of Electrical Work

3.8 MATERIAL REQUIREMENTS

The motor control centre shall be equipped with the following:

3.8.1 Busbar System

Busbar making and arrangement, connections and grade of copper shall comply with BS 159 and 1433.



All connections in the current carrying parts shall be made by means of bolts and lock nuts. Cables connection to busbars shall be made by means of cable lugs and bolts and lock nuts. Neutral bar shall be full size and shall be provided with an adequate number of terminals, cable lugs, bolts, etc. to suit the installation.

3.8.2 Moulded Case Circuit Breakers

- Breakers shall be completely enclosed in a moulded case to IEC 60947-2, suitable for installation inside switchboards.
- Frame sizes shall be as per manufacturer's standard size and as approved by the Engineer.
- The ICU shall be equal to 100% of Ics.
- Should be rated for operation of 40 °C.

3.8.3 Fuses

- Fuses shall be the High Breaking Capacity (HBC) type to BS 88.
- Fuses shall either include a suitable fuse carrier or it shall be capable of isolation. If the fuse carrier is included it shall be such that when it is being withdrawn normally or when it is completely withdrawn, the operator is completely protected from accidental contact with any live metal of its fuse link fuse contacts and fixed contacts.

3.8.4 Protective Devices

The Contractor shall provide all necessary protective devices and he shall be responsible for so designing the protection that it is entirely suitable for the equipment being protected and relates correctly to the whole supply system. Protective devices shall comply with BS 142 and BSEN 60255-6.

3.8.5 Current Transformers

All current transformers required in the MCCs shall be supplied and installed. The current transformers shall have the correct ratios, output and type and class of accuracy for their function and shall comply with the relevant BS for instruments and protection transformers respectively.

3.8.6 Motor Control Units

The motor control units shall comply with BS EN 60947-4-1 and BS 587. The cubicles shall be easily accessible for maintenance purposes and shall be damp-proof and dust-proof. The motor starter shall be of rating to carry the full load current of its rated duty as its most severe load conditions. All starters shall be capable of at least 10 starts per hour at 100 percent full load torque. Motor starters shall be dust-proof.



Each starter shall be housed in a separate compartment. Each star delta starter shall contain the following:

- 1 No. Triple pole (TP) externally operated moulded case circuit breaker (MCCB).
- 1 No. TP contactor for star delta switching of motor.
- 1 No. TP magnetic overload relay.

Both the exterior and interior of the cubicle shall be stove enamelled to BS 4800 shade IBE 51 and the exterior shall be provided with warning notices to indicate hazard within. The cubicles shall be provided with adequate ventilation louvres.

The manufacturer or supplier shall submit the final proposed control wiring and layout to the Engineer for approval before proceeding to manufacture or take delivery of the motor control centres. MCCs equipped with wrong or inadequate facilities to suit requirements at site will be rejected and corrected at no additional cost to the Employer.

3.9 MANUAL STARTERS

Starters shall have quick-make, quick-break toggle mechanism, trip-free manual reset thermal overload relay, position indicator showing "On" "OFF" or "Tripped" position and a red indicating light showing the closed position. The overload relay shall have a field adjustment allowing up to $\pm 10\%$ variance in ratings of the nominal heater value.

3.10 ACROSS THE LINE MAGNETIC STARTER

- Non-reversing withdrawable type, with Start-Stop oil-tight push buttons mounted on the front.
- NEMA size: not smaller than size 1.
- 110 volts control voltage with fuse in one line and the other line grounded.
- Trip free manual reset thermal overload relay, one per phase. Overload shall have + $\pm 15\%$ adjustment from nominal heater rating to compensate for ambient conditions or to provide closer overload protection upon installation. Thermal relay shall prevent single phasing of motor.
- Two NO contacts with provision for the addition of two NO or NC contacts as required for interlocking.

3.11 COMBINATION STARTER

- Rated for 400 Volts, 3 phase, 50 Hz supply.
- Motor starter: Across-the-line starter as specified above.
- Non-fusible switch, fusible switch or motor circuit protector and current limiting fuses as required.



- Externally mounted operating handle with position indicator showing "On", "Off" or "Tripped" condition of the circuit breaker or disconnect switch as applicable. Operating handle interlocked to prevent opening and closing of the door when the circuit breaker or disconnect switch is in the "On" position. Defeater provided to bypass the interlock.

3.12 ACCESSORIES

Provide the following accessories:

- Extra interlocking and alarm contactors as required for plant control and indication.
- Pilot lights for 'on', 'off' and 'overload trip' indication, coloured green, red and white respectively.
- Hand-Off-Auto (H-O-A) switch on the starter or in the field as shown on the Drawings.
- Ammeters for motor starters rated for 10 KW motors or greater.

3.13 CONSTRUCTION REQUIREMENTS

3.13.1 Cable Entry

All cable entries to the MCCs shall be from the bottom. All the necessary glands, cable boxes, supporting brackets etc. shall be supplied and installed in the switchboards for all the incoming and outgoing cables.

Gland plates of non-corrosive metal shall be provided and positioned approximately 300 mm above floor level for reception of conduits and threaded glands. Where single core cables are to be terminated, gland plate shall be non-magnetic.

3.13.2 Cable Connections

All incoming cables to the MCCs shall be connected to the individual circuit breaker of each motor control unit. The circuit breaker shall isolate completely the incoming supply to the unit for the motor and shall not affect the adjacent units in the control board in any way.

All outgoing cables shall be connected through links or connectors rigidly mounted and insulated to the cable supporting frames. All cable terminations shall be labelled.

3.13.3 Enclosure

- For dry and dust free indoor location: NEMA, type 1/IP-55.
- For damp and dusty indoor location: NEMA, type 12/IP 65
- For outdoor location: NEMA, type 4/IP 65
- For outdoor marine locations: NEMA, type 4X/IP 66
- Materials shall be of fiber glass.



3.13.4 Control Components

All components used in each control unit shall be uniformly and systematically installed and labelled. Parts of similar function shall be 100 percent interchangeable. Control relays shall all be interchangeable where possible and shall be the plug-in type. All the control components including the motor and control fuses, contactors etc. shall be accessible from the front. The cover to the control components shall be hinged.

3.13.5 Earthing of the MCCs

A continuous bare copper strip shall be supplied and installed within the MCCs to run the full length of the structure. Terminals shall be provided for the connection to the metal cladding or armouring of all incoming and outgoing cables and to the main earth. Size of earth bar shall comply with BS 5486, BS 5227 and BS 7354.



4 BULK FLOW METERS

4.1 SCOPE

This specification sets the minimum acceptable requirements for the supply of Bulk Flow Meters battery powered with GSM Kit for SCADA integration to be used for water supply metering applications. In case of a difference between this specification and the listed international standards then the most stringent requirements shall prevail.

4.2 LIST OF ABBREVIATIONS

ACS	Sanitary Conformity Certification
ANSI	American National Standards Institute
AS	Australian Standard
BS EN	British Standard European Norm
CEN	Committee for Standardization
DN	Nominal Diameter
DVGW	Deutscher Verein des Gas- und Wasserfaches
EPDM	Ethylene Propylene Diene Terpolymer
EPROM	Erasable Programmable Read-Only Memory
FM	Factory Mutual
GSM	Global System for Mobile Communications
IrDA	Infrared Data Association
ISO	International Organization for Standardization
KIWA	Keuringsinstituut voor WaterleidingArtikelen
NEMA	National Electrical Manufacturers Association
NSF	National Sanitation Foundation
OD	Outside Diameter
OIML	Organisation Internationale de Métrologie Légale
PFA	Allowable operating pressure



PN	Nominal Pressure
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
WRAS	Water Regulations Advisory Scheme
WRc	Water Research Centre

4.3 APPLICABLE STANDARDS AND CODES

Bulk Flow Meters battery powered with GSM Kit for SCADA integration shall comply with the latest revision of the following standards and other relevant standards noted elsewhere in this specification.

- ISO 13359 Measurement of conductive liquid flow in closed conduits - Flanged electromagnetic flowmeters - Overall length
- OIML R 49 Water meters for cold potable water and hot water
- ISO 4064 Water meters for cold potable water and hot water
- BS EN 14154 Water meters, General requirements
- NSF/ANSI 61 Drink Water System Components

4.4 MATERIALS

The characteristic of the Bulk Flow Meters is mentioned below:

Table 4-1: Specification for Electromagnetic flow meters

General Features:	
No moving Parts	
Visual (LCD) display	
Tamper proof.	
No reverse flow measurement	
Detailed Metrological Specifications:	
Size:	200 mm (8 inch)
Accuracy:	Class -I (OIML/ISO)
Material:	Carbon steel
Protection Class:	IP-68
Ambient Temperature:	+5° to 55° C
Liquid Temperature:	up to 50° C
Pressure range:	1 bar to 10 bar minimum
Ratio R:	Q3/Q1 = 80
Permanent flow rate (m ³ / hr):	Q3 = 250
Battery life:	Minimum 10 years
Installation:	Horizontal
Compliance with:	ISO 4064



Certification

- OIML: R49 (International Organization for Legal Metrology) by a notified body
- Or
- Type examination certificate by a notified body under DIRECTIVE 2014/32/EU

4.5 INSPECTION AND TESTING PLAN

Prior to delivery, the manufacturer shall provide the Engineer with a comprehensive Inspection and Testing Plan (ITP) for their approval. The ITP shall detail all the certificates and documents that shall be provided by the manufacturer, together with details of the type testing and batch release testing that they have previously undertaken and shall undertake. Where the manufacturer cannot themselves undertake the required testing, they shall employ an independent third-party laboratory to undertake the testing on their behalf.

4.6 INSPECTION REQUIREMENTS

The manufacturer shall ensure that all the applicable codes and standards are available at their facility for the Engineer's reference during any visit or inspection. The manufacturer shall provide full assistance and co-operation for any inspection, when required by the Engineer. When requested, the manufacturer shall provide access to and copies of all material certificates and inspection and test results obtained in the course of quality verification.

4.7 ACCEPTANCE CRITERIA

The following criteria requirements shall be fulfilled by the manufacturer in order for the flow meters to be approved and accepted by the Engineer.

- Prior to delivery, the manufacturer shall provide the Engineer with copies of all the type test results and certification required by this specification.
- Application and operational training of the Client staff to be provided by the official trainer(s) of the original equipment manufacturer (OEM) in Pakistan. The training will cover all aspect of the instrument operation and application in detail including instrument setting, calibration, measurements, preventive maintenance, result interpretation, use of processing software, interfacing with GIS applications etc.
- The Engineer may reject that does not successfully pass the required tests or fully comply with the requirements of this specification.

4.8 SUBMITTALS AND SUPPLEMENTS

The contractor shall submit all the following documents/drawings, copies of the applicable international Standards (latest editions) and other submittals as required in both soft and hard form for review and approval by the Employer/Engineer:

- Catalogues / brochures of the proposed product
- Detailed material specification



-
- Details of testing facilities at the manufacturer's plant
 - Manufacturer's drawings showing dimensions
 - Quality assurance certificates

4.9 METHOD OF MEASUREMENT

The quantities to be measured for shall be in number.



5 CONSUMER WATER METERS

5.1 TECHNOLOGY

- Multi – Jet

5.2 GENERAL FEATURES

- Tamper proof
- Provided with non-return valve
- Un-affected by grit and particulates
- Provided with wire and lead seal
- Not effected by Magnetic field.

5.3 CERTIFICATION

- ISO 4064 (International Organization Standardization) **compliant**
- OIML: R49 (International Organization for Legal Metrology) by a notified body.
- Type examination certificate under **DIRECTIVE 2014/32/EU**

5.4 DETAILED METROLOGY SPECIFICATIONS

- Size: 15mm to 25mm
- Accuracy: Class II
- Material: Brass / Non-ferrous Metal
- Ambient Temperature: +5° to 55° C
- Liquid Temperature: Up to 50° C
- Pressure range: 0.03 bar to 10 bar
- Flow rate: Q3/Q1 = 160
- Permanent Flow rate (m³/hr):

Size of meter	15mm	20mm	25mm
Q3 (m ³ /h)	2.5	4	6.3

- Installation: horizontal but vertical possible with vertical design



6 PRESSURE GAUGE

6.1 SCOPE

This specification sets the minimum acceptable requirements for the supply of Pressure Gauges for use in water supply. In case of difference between this specification and the listed international standards then the most stringent requirements shall prevail. All pressure gauges shall be calibrated and their results shall be recorded before installation in the field. Pressure gauges shall be mounted such that they can be read easily from ground or access platform level. Gauges shall be fitted using a female screwed outlet on the pipe.

6.2 LIST OF ABBREVIATIONS

ASTM	American Society for Testing and Materials
BS	British Standard
ISO	International Organization for Standardization
ITP	Inspection and Testing Plan
OEM	Original Equipment Manufacturer
OD	Outside Diameter
PN	Nominal Pressure
MID	Molded Interconnect Device
RF Module	Radio-frequency module
AMR	Automatic Meter Reading

6.3 APPLICABLE STANDARDS AND CODES

Pressure Gauges shall comply with the latest revision of the following standards and other relevant standards noted elsewhere in this specification.

ASTM F2070	Standard Specification for Transducers, Pressure and Differential, Pressure, Electrical and Fiber-Optic
ISO 17025	Testing and Calibration Laboratories
ISO 1179-2	Connections for general use and fluid power



6.4 MAJOR FEATURES

Pressure gauges shall be of the Bourdon tube type with stainless steel wetted parts conforming to BS 1780. They shall have non-corrodible metal cases with stainless steel bezels and shall be not less than 100mm in diameter. Gauges shall be scaled in meters head of water, with zero representing atmospheric pressure unless otherwise specified. Lettering shall be black on white ground except for negative pressure on compound gauges which shall use red lettering. The range of the gauges shall be 30 to 50% higher than the maximum working pressure.

Diaphragms shall be fitted to all gauges subject to dirty or corrosive fluids. Snubbers shall be fitted to all gauges subject to pulsating pressure, alternatively glycerine filled gauges shall be supplied. The gauge shall be mounted to minimize damage from vibration. Each pressure gauge shall be fitted with an isolating valve at the point of connection to the main system and, where mounted remotely, the gauge shall also be fitted with local isolating valve

6.5 MATERIALS

The characteristic of the pressure gauge is mentioned below:

Table 6-1: Required Physical Characteristics

Characteristics	Least Required Value
Enclosure rating	IP 65
Shock Resistant	Survives falls with no effect on accuracy
Temperature self-compensation	-40 to +80°C Automatic correction of temperature drift
Make/ Origin	European/North American/Japan or approved equivalent
Accuracy	0.1%
Overvoltage protection	Tolerance 2-fold range
Gauge Battery Life	At least 1year
Data Logger	At least 30000 Data Points
Warranty	<ul style="list-style-type: none">• All equipment to be furnished shall be warranted for a period of two years.



Characteristics	Least Required Value
	<ul style="list-style-type: none">• All warranted equipment shall have defect liability period of one (1) year after taking over.

6.6 CERTIFICATION, DOCUMENTATION AND TESTING

Pressure Gauges shall come with an ISO 17025 calibration report.

6.7 INSPECTION AND TESTING PLAN

Prior to delivery, the manufacturer shall provide the Engineer with a comprehensive Inspection and Testing Plan (ITP) for their approval. The ITP shall detail all the certificates and documents that shall be provided by the manufacturer, together with details of the type testing and batch release testing that they have previously undertaken and shall undertake. Where the manufacturer cannot themselves undertake the required testing, they shall employ an independent third-party laboratory to undertake the testing on their behalf.

All Digital and Analog, indicators, gauges shall be subject to routine tests in accordance with BS 88, BS 1780 and 853680.

Test certificates shall be provided against each item of equipment.

6.8 INSPECTION REQUIREMENTS

The manufacturer shall ensure that all the applicable codes and standards are available at their facility for the Engineer's reference during any visit or inspection. The manufacturer shall provide full assistance and co-operation for any inspection, when required by the Engineer. When requested, the manufacturer shall provide access to and copies of all material certificates and inspection and test results obtained in the course of quality verification.

6.9 ACCEPTANCE CRITERIA

The following criteria requirements shall be fulfilled by the manufacturer in order for the flow meters to be approved and accepted by the Engineer.

- Prior to delivery, the manufacturer shall provide the Engineer with copies of all the type test results and certification required by this specification.
- Application and operational training of the Client staff to be provided by the official trainer(s) of the original equipment manufacturer (OEM) in Pakistan. The training will cover all aspect of the instrument operation and application in detail including instrument setting, calibration, measurements, preventive maintenance, result interpretation, use of processing software, interfacing with GIS applications etc.



- The Engineer may reject that does not successfully pass the required tests or fully comply with the requirements of this specification.

6.10 DOCUMENTATION

The manufacturer shall furnish the following vendor data as a minimum:

- Catalogues / brochures of the proposed product
- Dimensional details of pipes and fittings
- Detailed material specification
- Details of testing facilities at the manufacturer's plant
- Manufacturer's drawings showing dimensions
- Quality assurance certificates

6.11 METHOD OF MEASUREMENT

The quantities to be measured for shall be in number.

APPENDIX-J

Operation & Maintenance Calculations

DETAIL DESIGN OF INFRASTRUCTURE SUB-PROJECT, SECTORAL PLANNING & RESIDENT SUPERVISION PACKAGE No. 2 (Hafizabad, Kamoke & Muridke)

1st Prioritized and Need Based Water Supply Project In MC KAMOKE

1	Replacement of water supply and old lived pipes in Mohalla Rasulnagar & Mandiala Road	=	226.6	Million
2	Rehabilitation of Tubewell at Mandiala Water Works	=	44.7	Million
	SUB TOTAL	=	271.28	Million

1 Cost of Man Power			Salary Per	Total Per
Sr.	Personnel	No. of Persons	Month(RS)	Annum (Rs.)
No.	=	1	50,000	600,000
1	Foreman (BS-11)	2	35,000	840,000
2	Tubewell Operators (BS-5)	2	35,000	840,000
3	Plumber (BS-5)	3	25,000	900,000
4	Helper (BS-1)	1	35,000	420,000
5	Electrician (BS-5)		Rs.	3,600,000
	Sub-Total		Rs.	3.60 Million/Year

2 Other Costs				
Ancillary Items (Shovels, Bamboos, Genti, Gloves, Dust Masks, Caps, Jackets, Shoes) @ 7,000 per item		2	Rs.	0.01 Million/Year

3 Annual Repair and Maintenance	=	.50 % of Capital Cost		
Capital Cost	=		Rs.	98 Million
Annual Repair and Maintenance	=		Rs.	0.49 Million/Year

4 Machinery Cost	13	2%		0.27 Million/Year
-------------------------	----	----	--	--------------------------

5 Energy 2 Cusecs				
<u>Per Day Cost of Electricity</u>				
No. of Pumps	=	2		From Estimate
Motor Hp	=	60 hp		
Cost of Electricity	=	14 Rs./kWh		
Working Hours Per Day	=	16 Hours		
Units Per Day	=	716 kWh		
Total Cost	=	10,026 Rs./Day		
<u>Per Month Cost of Electricity</u>				
Working Days = 30 Days	=	300,787 /month		
<u>Per Annum Cost of Electricity</u>				
Working Months = 12 Months	=	3,609,446 /year		
Total electricity Cost for Operation of pumps	=			7.22 Million/year

6 Fuel for Generators				
Sr. No	Description	Fuel Consumed (liter/hour)	Working (hours)	Cost/ Year (M)
(a)	100 KVA Generator	30	2	5.26
			Total	5.26 Million/Year

7 O & M Cost for Electrical Equipment				
Sr. No	Description			
(a)	100 KVA Generator & 200 KVA Transformer	12	4%	0.47 Million/Year

Total Expenditure	=	Rs.	17.32 Million/Year
--------------------------	---	-----	---------------------------

APPENDIX-K
Design Calculations
(2032)

KAMOKI MNADIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
1	J-1	0.005	63.24	27.3
2	J-2	0.016	63.84	27.6
3	J-3	0.01	63.53	27.5
4	J-4	0.013	63.77	27.6
5	J-5	0.011	65.36	28.3
6	J-6	0.005	62.9	27.2
7	J-7	0.006	63.05	27.3
8	J-8	0.008	63.15	27.3
9	J-9	0.01	63.3	27.4
10	J-10	0.003	67.49	29.2
11	J-11	0.002	68.87	29.8
12	J-12	0.009	68.51	29.6
13	J-13	0.001	68.46	29.6
14	J-14	0.024	68.29	29.5
15	J-15	0.014	62.7	27.1
16	J-16	0.007	63.25	27.4
17	J-17	0.011	63.29	27.4
18	J-18	0.007	62.86	27.2
19	J-19	0.008	62.91	27.2
20	J-20	0.007	62.76	27.1
21	J-21	0.004	63	27.2
22	J-22	0.004	63.24	27.3
23	J-23	0.012	62.82	27.2
24	J-24	0.008	63.16	27.3
25	J-25	0.005	63.12	27.3
26	J-26	0.007	63.14	27.3
27	J-27	0.008	62.9	27.2
28	J-28	0.02	68.19	29.5
29	J-29	0.006	68.99	29.8
30	J-30	0.004	69.58	30.1
31	J-31	0.004	69.16	29.9
32	J-32	0.042	68.86	29.8
33	J-33	0.022	68.47	29.6
34	J-34	0.015	68.42	29.6
35	J-35	0.021	68.33	29.5
36	J-36	0.016	68.33	29.5
37	J-37	0.004	68.18	29.5
38	J-38	0.02	68.17	29.5
39	J-39	0.011	69.01	29.8
40	J-40	0.041	68.29	29.5
41	J-41	0.024	68.29	29.5
42	J-42	0.039	68.51	29.6
43	J-43	0.015	68.27	29.5

KAMOKI MNADIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
44	J-44	0.009	64.2	27.8
45	J-45	0.009	63.71	27.5
46	J-46	0.005	63.26	27.4
47	J-47	0.005	63.26	27.4
48	J-48	0.01	63.55	27.5
49	J-49	0.015	63.63	27.5
50	J-50	0.009	64.77	28
51	J-51	0.007	66.07	28.6
52	J-52	0.013	65.93	28.5
53	J-53	0.033	66.64	28.8
54	J-54	0.006	67.02	29
55	J-55	0.02	64.37	27.8
56	J-56	0.018	64.07	27.7
57	J-57	0.017	64.82	28
58	J-58	0.018	64.16	27.7
59	J-59	0.011	65.39	28.3
60	J-60	0.007	65	28.1
61	J-61	0.018	67.93	29.4
62	J-62	0.003	68.3	29.5
63	J-63	0.015	66.78	28.9
64	J-64	0.011	68.3	29.5
65	J-65	0.011	66.8	28.9
66	J-66	0.009	68.31	29.5
67	J-67	0.009	66.82	28.9
68	J-68	0.004	68.33	29.5
69	J-69	0.021	67.58	29.2
70	J-70	0.008	67.63	29.2
71	J-71	0.006	67.67	29.3
72	J-72	0.009	66.94	28.9
73	J-73	0.003	68.35	29.6
74	J-74	0.01	66.88	28.9
75	J-75	0.002	68.38	29.6
76	J-76	0.002	68.42	29.6
77	J-77	0.007	68.9	29.8
78	J-78	0.006	69.71	30.1
79	J-79	0.001	68.45	29.6
80	J-80	0.005	68.92	29.8
81	J-81	0.005	69.84	30.2
82	J-82	0.002	68.37	29.6
83	J-83	0.007	68.84	29.8
84	J-84	0.01	68.79	29.7
85	J-85	0.003	68.35	29.6
86	J-86	0.011	69.36	30

KAMOKI MNADIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
87	J-87	0.008	69.54	30.1
88	J-88	0.005	68.33	29.5
89	J-89	0.006	69.21	29.9
90	J-90	0.005	68.31	29.5
91	J-91	0.006	69.09	29.9
92	J-92	0.007	68.3	29.5
93	J-93	0.017	68.29	29.5
94	J-94	0.009	68.29	29.5
95	J-95	0.006	66.19	28.6
96	J-96	0.005	66.74	28.9
97	J-97	0.009	67.25	29.1
98	J-98	0.009	67.45	29.2
99	J-99	0.007	67.45	29.2
100	J-100	0.007	67.34	29.1
101	J-101	0.007	66.4	28.7
102	J-102	0.006	67.02	29
103	J-103	0.004	67.38	29.1
104	J-104	0.003	67.4	29.1
105	J-105	0.002	67.93	29.4
106	J-106	0.001	68.11	29.5
107	J-107	0.002	68.23	29.5
108	J-108	0.001	68.32	29.5
109	J-109	0	68.41	29.6
110	J-110	0.003	68.25	29.5
111	J-111	0.005	68.13	29.5
112	J-112	0.001	68.1	29.4
113	J-113	0.006	67.98	29.4
114	J-114	0.004	68.06	29.4
115	J-115	0.002	68.17	29.5
116	J-116	0.001	68.26	29.5
117	J-117	0.001	68.08	29.4
118	J-118	0.002	67.96	29.4
119	J-119	0.005	67.77	29.3
120	J-120	0.006	67.2	29.1
121	J-121	0.006	67.16	29
122	J-122	0.007	67.16	29
123	J-123	0.006	67.16	29
124	J-124	0.004	67.87	29.4
125	J-125	0.005	67.88	29.4
126	J-126	0.001	67.88	29.4
127	J-127	0.002	67.88	29.4
128	J-128	0.009	67.89	29.4
129	J-129	0	68.22	29.5

KAMOKI MNADIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
130	J-130	0.009	68.49	29.6
131	J-131	0.003	68.72	29.7
132	J-132	0.002	68.69	29.7
133	J-133	0.007	68.63	29.7
134	J-134	0.003	69.09	29.9
135	J-135	0.006	69.44	30
136	J-136	0.001	69.09	29.9
137	J-137	0.001	69.09	29.9
138	J-138	0.001	69.09	29.9
139	J-139	0.003	69.04	29.9
140	J-140	0.002	68.85	29.8
141	J-141	0.009	69.21	29.9
142	J-142	0.01	66	28.5
143	J-143	0.009	65.99	28.5
144	J-144	0.013	66.13	28.6
145	J-145	0.007	66.8	28.9
146	J-146	0.009	66.16	28.6
147	J-147	0.011	66.18	28.6
148	J-148	0.007	66.19	28.6
149	J-149	0.008	63.25	27.4
150	J-150	0.007	63.44	27.4
151	J-151	0.006	63.47	27.4
152	J-152	0.01	63.52	27.5
153	J-153	0.007	63.43	27.4
154	J-154	0.007	63.47	27.4
155	J-155	0.009	66.04	28.6
156	J-156	0.011	65.33	28.2
157	J-157	0.004	66.04	28.6
158	J-158	0.006	64.62	27.9
159	J-159	0.004	64.62	27.9
160	J-160	0.014	63.66	27.5
161	J-161	0.011	63.49	27.5
162	J-162	0.009	63.38	27.4
163	J-163	0.012	63.24	27.3
164	J-164	0.012	63.14	27.3
165	J-165	0.006	63.07	27.3
166	J-166	0.01	63.35	27.4
167	J-167	0.007	63.24	27.3
168	J-168	0.006	63.18	27.3
169	J-169	0.006	63.12	27.3
170	J-170	0.006	63.07	27.3
171	J-171	0.007	63.05	27.3
172	J-172	0.008	63.01	27.2

KAMOKI MNADIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
173	J-173	0.005	63.07	27.3
174	J-174	0.005	63.12	27.3
175	J-175	0.005	63.18	27.3
176	J-176	0.006	63.24	27.3
177	J-177	0.008	63.33	27.4
178	J-178	0.007	63.59	27.5
179	J-179	0.006	63.58	27.5
180	J-180	0.015	63.67	27.5
181	J-181	0.011	63.77	27.6
182	J-182	0.01	64.71	28
183	J-183	0.01	63.83	27.6
184	J-184	0.005	63.07	27.3
185	J-185	0.003	63.08	27.3
186	J-186	0.006	63.07	27.3
187	J-187	0.007	63.06	27.3
188	J-188	0.006	63.13	27.3
189	J-189	0.004	63.18	27.3
190	J-190	0.004	63.25	27.4
191	J-191	0.004	63.18	27.3
192	J-192	0.004	63.25	27.4
193	J-193	0.005	63.26	27.4
194	J-194	0.005	63.26	27.4
195	J-195	0.008	63.27	27.4
196	J-196	0.005	63.28	27.4
197	J-197	0.006	63.33	27.4
198	J-198	0.005	62.94	27.2
199	J-199	0.014	62.98	27.2
200	J-200	0.004	62.9	27.2
201	J-201	0.007	62.86	27.2
202	J-202	0.004	62.84	27.2
203	J-203	0.018	62.84	27.2
204	J-204	0.005	62.81	27.2

KAMOKI MANDIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. no	Start Node	Stop Node	Label	Length (ft)	Diameter (in)	Diameter (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
1	J-16	J-9	P-1	99	6.41	180	HDPE	120	-0.171	0.76	0.535
2	J-14	J-12	P-2	83	6.41	180	HDPE	120	-0.397	1.77	2.557
3	J-7	J-19	P-3	244	6.41	180	HDPE	120	0.174	0.78	0.555
4	J-19	J-6	P-4	38	6.41	180	HDPE	120	0.129	0.58	0.319
5	J-20	J-15	P-5	140	6.41	180	HDPE	120	0.155	0.69	0.449
6	J-22	J-1	P-6	39	6.41	180	HDPE	120	-0.005	0.02	0
7	J-18	J-23	P-7	192	6.41	180	HDPE	120	0.094	0.42	0.177
8	J-16	J-24	P-8	163	6.41	180	HDPE	120	0.169	0.76	0.528
9	J-24	J-8	P-9	40	6.41	180	HDPE	120	0.148	0.66	0.411
10	J-26	J-17	P-10	137	6.41	180	HDPE	120	-0.247	1.1	1.058
11	J-27	J-23	P-11	166	4.45	125	HDPE	120	0.054	0.54	0.465
12	J-13	J-30	P-12	575	8.01	225	HDPE	120	-0.617	1.76	1.95
13	J-30	J-32	P-13	402	6.41	180	HDPE	120	0.327	1.46	1.783
14	J-29	J-12	P-14	312	8.01	225	HDPE	120	0.544	1.55	1.544
15	J-33	J-29	P-15	270	4.45	125	HDPE	120	-0.115	1.17	1.92
16	J-12	J-34	P-16	250	6.41	180	HDPE	120	0.137	0.61	0.358
17	J-33	J-34	P-17	351	4.45	125	HDPE	120	0.029	0.3	0.151
18	J-35	J-33	P-18	221	4.45	125	HDPE	120	-0.065	0.66	0.655
19	J-34	J-36	P-19	218	6.41	180	HDPE	120	0.151	0.67	0.427
20	J-35	J-36	P-20	381	4.45	125	HDPE	120	0.004	0.04	0.004
21	J-37	J-28	P-21	29	4.45	125	HDPE	120	-0.028	0.28	0.138
22	J-37	J-38	P-22	439	6.41	180	HDPE	120	0.038	0.17	0.034
23	J-39	J-11	P-23	92	6.41	180	HDPE	120	0.306	1.37	1.581
24	J-37	J-40	P-24	667	6.41	180	HDPE	120	-0.092	0.41	0.169
25	J-28	J-41	P-25	273	4.45	125	HDPE	120	-0.047	0.48	0.37
26	J-41	J-35	P-26	155	4.45	125	HDPE	120	-0.039	0.4	0.261
27	J-32	J-42	P-27	256	6.41	180	HDPE	120	0.285	1.27	1.385
28	J-42	J-40	P-28	293	6.41	180	HDPE	120	0.201	0.9	0.726
29	J-41	J-42	P-29	660	4.45	125	HDPE	120	-0.045	0.46	0.333
30	J-36	J-43	P-30	140	6.41	180	HDPE	120	0.139	0.62	0.368
31	J-43	J-38	P-31	301	6.41	180	HDPE	120	0.137	0.61	0.357
32	J-41	J-43	P-32	408	4.45	125	HDPE	120	0.012	0.12	0.03
33	J-9	J-45	P-33	137	6.41	180	HDPE	120	-0.43	1.92	2.968
34	J-45	J-44	P-34	129	6.41	180	HDPE	120	-0.491	2.19	3.782
35	J-46	J-47	P-35	43	3.21	90	HDPE	120	0.001	0.02	0.008
36	J-17	J-48	P-36	145	6.41	180	HDPE	120	-0.331	1.48	1.822
37	J-48	J-2	P-37	109	6.41	180	HDPE	120	-0.403	1.8	2.632
38	J-4	J-49	P-38	166	3.21	90	HDPE	120	0.035	0.62	0.812
39	J-49	J-3	P-39	144	3.21	90	HDPE	120	0.033	0.58	0.729
40	J-44	J-50	P-40	146	6.41	180	HDPE	120	-0.5	2.23	3.911
41	J-50	J-5	P-41	145	6.41	180	HDPE	120	-0.509	2.27	4.042
42	J-51	J-5	P-42	160	6.41	180	HDPE	120	0.535	2.39	4.436
43	J-52	J-53	P-43	248	6.41	180	HDPE	120	-0.423	1.89	2.874
44	J-53	J-14	P-44	726	6.41	180	HDPE	120	-0.373	1.66	2.273
45	J-2	J-55	P-45	178	6.41	180	HDPE	120	-0.432	1.93	2.987
46	J-55	J-56	P-46	363	3.21	90	HDPE	120	0.035	0.62	0.821
47	J-55	J-57	P-47	121	6.41	180	HDPE	120	-0.487	2.17	3.735
48	J-57	J-58	P-48	385	3.21	90	HDPE	120	0.052	0.92	1.718
49	J-57	J-59	P-49	121	6.41	180	HDPE	120	-0.556	2.48	4.767
50	J-59	J-52	P-50	94	6.41	180	HDPE	120	-0.612	2.73	5.689
51	J-61	J-10	P-51	231	6.41	180	HDPE	120	0.338	1.51	1.899
52	J-53	J-63	P-52	131	4.45	125	HDPE	120	-0.083	0.85	1.051
53	J-62	J-63	P-53	595	3.21	90	HDPE	120	0.064	1.14	2.543
54	J-63	J-65	P-54	99	4.45	125	HDPE	120	-0.035	0.35	0.206
55	J-64	J-65	P-55	546	3.21	90	HDPE	120	0.067	1.19	2.748
56	J-66	J-67	P-56	486	3.21	90	HDPE	120	0.071	1.26	3.067
57	J-68	J-69	P-57	232	3.21	90	HDPE	120	0.073	1.3	3.234
58	J-69	J-70	P-58	114	3.21	90	HDPE	120	-0.026	0.46	0.465
59	J-70	J-71	P-59	91	3.21	90	HDPE	120	-0.023	0.42	0.393
60	J-71	J-54	P-60	200	3.21	90	HDPE	120	0.074	1.31	3.273
61	J-72	J-54	P-61	110	4.45	125	HDPE	120	-0.065	0.66	0.664
62	J-72	J-70	P-62	203	3.21	90	HDPE	120	-0.075	1.34	3.401
63	J-70	J-73	P-63	167	3.21	90	HDPE	120	-0.085	1.52	4.289
64	J-67	J-74	P-64	113	4.45	125	HDPE	120	-0.058	0.59	0.538
65	J-74	J-72	P-65	107	4.45	125	HDPE	120	-0.059	0.6	0.557
66	J-69	J-74	P-66	193	3.21	90	HDPE	120	0.078	1.38	3.616
67	J-71	J-75	P-67	116	3.21	90	HDPE	120	-0.103	1.84	6.135

KAMOKI MANDIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. no	Start Node	Stop Node	Label	Length (ft)	Diameter (in)	Diameter (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
68	J-76	J-75	P-68	67	6.41	180	HDPE	120	0.187	0.83	0.631
69	J-76	J-77	P-69	242	3.21	90	HDPE	120	-0.056	1	1.972
70	J-77	J-78	P-70	264	3.21	90	HDPE	120	-0.071	1.26	3.064
71	J-13	J-79	P-71	72	6.41	180	HDPE	120	0.082	0.37	0.138
72	J-79	J-76	P-72	70	6.41	180	HDPE	120	0.132	0.59	0.334
73	J-79	J-80	P-73	280	3.21	90	HDPE	120	-0.051	0.92	1.687
74	J-80	J-77	P-74	58	3.21	90	HDPE	120	0.02	0.36	0.302
75	J-78	J-81	P-75	65	9.97	280	HDPE	120	-1.122	2.07	2.035
76	J-81	J-30	P-76	68	9.97	280	HDPE	120	1.592	2.94	3.888
77	J-80	J-81	P-77	261	3.21	90	HDPE	120	-0.077	1.37	3.543
78	J-75	J-82	P-78	58	6.41	180	HDPE	120	0.081	0.36	0.135
79	J-82	J-73	P-79	56	6.41	180	HDPE	120	0.143	0.64	0.385
80	J-82	J-83	P-80	184	3.21	90	HDPE	120	-0.064	1.14	2.513
81	J-83	J-77	P-81	113	3.21	90	HDPE	120	-0.029	0.51	0.575
82	J-83	J-84	P-82	102	3.21	90	HDPE	120	0.026	0.46	0.47
83	J-73	J-85	P-83	66	6.41	180	HDPE	120	0.055	0.24	0.065
84	J-85	J-68	P-84	53	6.41	180	HDPE	120	0.127	0.57	0.311
85	J-84	J-85	P-85	128	3.21	90	HDPE	120	0.076	1.35	3.445
86	J-84	J-86	P-86	254	3.21	90	HDPE	120	-0.06	1.06	2.23
87	J-86	J-87	P-87	118	9.97	280	HDPE	120	-0.969	1.79	1.55
88	J-87	J-78	P-88	97	9.97	280	HDPE	120	-1.045	1.93	1.783
89	J-83	J-87	P-89	251	3.21	90	HDPE	120	-0.068	1.2	2.796
90	J-68	J-88	P-90	74	6.41	180	HDPE	120	0.05	0.22	0.055
91	J-88	J-66	P-91	52	6.41	180	HDPE	120	0.113	0.5	0.248
92	J-31	J-89	P-92	45	9.97	280	HDPE	120	-0.824	1.52	1.15
93	J-89	J-86	P-93	109	9.97	280	HDPE	120	-0.898	1.66	1.347
94	J-88	J-89	P-94	316	3.21	90	HDPE	120	-0.068	1.2	2.792
95	J-66	J-90	P-95	75	6.41	180	HDPE	120	0.033	0.15	0.025
96	J-90	J-64	P-96	57	6.41	180	HDPE	120	0.1	0.45	0.199
97	J-29	J-91	P-97	107	9.97	280	HDPE	120	-0.742	1.37	0.947
98	J-91	J-31	P-98	57	9.97	280	HDPE	120	-0.82	1.51	1.14
99	J-90	J-91	P-99	247	3.21	90	HDPE	120	-0.072	1.28	3.146
100	J-64	J-92	P-100	81	6.41	180	HDPE	120	0.022	0.1	0.012
101	J-92	J-62	P-101	29	6.41	180	HDPE	120	0.093	0.42	0.175
102	J-92	J-29	P-102	192	3.21	90	HDPE	120	-0.077	1.38	3.597
103	J-62	J-93	P-103	30	6.41	180	HDPE	120	0.025	0.11	0.016
104	J-93	J-14	P-104	239	6.41	180	HDPE	120	0	0	0
105	J-93	J-94	P-105	121	3.21	90	HDPE	120	0.009	0.15	0.062
106	J-95	J-96	P-106	55	3.21	90	HDPE	120	-0.134	2.39	9.993
107	J-96	J-97	P-107	135	3.21	90	HDPE	120	-0.08	1.41	3.776
108	J-97	J-98	P-108	145	3.21	90	HDPE	120	-0.046	0.82	1.386
109	J-98	J-99	P-109	55	3.21	90	HDPE	120	-0.002	0.04	0.004
110	J-99	J-100	P-110	109	3.21	90	HDPE	120	0.04	0.71	1.045
111	J-101	J-51	P-111	54	6.41	180	HDPE	120	0.637	2.84	6.142
112	J-100	J-101	P-112	249	3.21	90	HDPE	120	0.079	1.41	3.772
113	J-96	J-102	P-113	121	3.21	90	HDPE	120	-0.06	1.07	2.269
114	J-102	J-54	P-114	68	3.21	90	HDPE	120	-0.003	0.05	0.008
115	J-97	J-103	P-115	111	3.21	90	HDPE	120	-0.043	0.76	1.186
116	J-103	J-104	P-116	15	3.21	90	HDPE	120	-0.047	0.84	1.428
117	J-104	J-102	P-117	154	3.21	90	HDPE	120	0.064	1.14	2.526
118	J-104	J-105	P-118	72	3.21	90	HDPE	120	-0.114	2.02	7.32
119	J-106	J-107	P-119	84	3.21	90	HDPE	120	-0.049	0.87	1.522
120	J-107	J-108	P-120	50	3.21	90	HDPE	120	-0.051	0.91	1.661
121	J-109	J-13	P-121	11	6.41	180	HDPE	120	-0.534	2.38	4.421
122	J-108	J-109	P-122	19	3.21	90	HDPE	120	-0.09	1.61	4.795
123	J-108	J-110	P-123	67	3.21	90	HDPE	120	0.039	0.69	0.99
124	J-110	J-111	P-124	138	3.21	90	HDPE	120	0.035	0.63	0.838
125	J-105	J-112	P-125	47	3.21	90	HDPE	120	-0.077	1.37	3.575
126	J-112	J-106	P-126	6	3.21	90	HDPE	120	-0.047	0.84	1.449
127	J-111	J-112	P-127	59	3.21	90	HDPE	120	0.031	0.54	0.642
128	J-105	J-113	P-128	55	3.21	90	HDPE	120	-0.039	0.69	0.986
129	J-113	J-114	P-129	56	3.21	90	HDPE	120	-0.045	0.8	1.313
130	J-114	J-115	P-130	74	3.21	90	HDPE	120	-0.049	0.88	1.553
131	J-116	J-109	P-131	48	6.41	180	HDPE	120	-0.443	1.98	3.13
132	J-115	J-116	P-132	50	3.21	90	HDPE	120	-0.051	0.91	1.668
133	J-98	J-117	P-133	355	3.21	90	HDPE	120	-0.053	0.94	1.786
134	J-118	J-117	P-134	53	6.41	180	HDPE	120	-0.377	1.68	2.324

KAMOKI MANDIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. no	Start Node	Stop Node	Label	Length (ft)	Diameter (in)	Diameter (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
135	J-99	J-118	P-135	339	3.21	90	HDPE	120	-0.048	0.86	1.507
136	J-10	J-119	P-136	247	6.41	180	HDPE	120	-0.254	1.13	1.119
137	J-100	J-119	P-137	312	3.21	90	HDPE	120	-0.046	0.82	1.388
138	J-10	J-120	P-138	55	6.41	180	HDPE	120	0.59	2.63	5.319
139	J-120	J-101	P-139	164	6.41	180	HDPE	120	0.565	2.52	4.906
140	J-120	J-121	P-140	136	3.21	90	HDPE	120	0.019	0.34	0.275
141	J-121	J-122	P-141	78	3.21	90	HDPE	120	0.007	0.12	0.038
142	J-121	J-123	P-142	69	3.21	90	HDPE	120	0.006	0.11	0.033
143	J-119	J-124	P-143	65	6.41	180	HDPE	120	-0.305	1.36	1.568
144	J-124	J-118	P-144	57	6.41	180	HDPE	120	-0.306	1.37	1.578
145	J-124	J-125	P-145	376	3.21	90	HDPE	120	-0.003	0.05	0.006
146	J-125	J-126	P-146	60	3.21	90	HDPE	120	-0.007	0.13	0.046
147	J-126	J-127	P-147	80	3.21	90	HDPE	120	-0.009	0.15	0.061
148	J-127	J-128	P-148	28	3.21	90	HDPE	120	-0.011	0.19	0.094
149	J-128	J-118	P-149	258	3.21	90	HDPE	120	-0.02	0.36	0.299
150	J-117	J-129	P-150	46	6.41	180	HDPE	120	-0.432	1.93	2.983
151	J-129	J-116	P-151	13	6.41	180	HDPE	120	-0.391	1.75	2.487
152	J-129	J-130	P-152	241	3.21	90	HDPE	120	-0.041	0.73	1.101
153	J-130	J-131	P-153	143	3.21	90	HDPE	120	-0.05	0.89	1.588
154	J-131	J-132	P-154	84	3.21	90	HDPE	120	0.02	0.35	0.288
155	J-133	J-61	P-155	335	6.41	180	HDPE	120	0.356	1.59	2.087
156	J-132	J-133	P-156	240	3.21	90	HDPE	120	0.018	0.32	0.247
157	J-131	J-134	P-157	118	3.21	90	HDPE	120	-0.073	1.29	3.205
158	J-30	J-135	P-158	66	8.01	225	HDPE	120	0.644	1.84	2.116
159	J-134	J-135	P-159	100	3.21	90	HDPE	120	-0.076	1.34	3.432
160	J-134	J-136	P-160	71	3.21	90	HDPE	120	0	0.01	0
161	J-136	J-137	P-161	19	3.21	90	HDPE	120	-0.001	0.02	0.002
162	J-137	J-138	P-162	58	3.21	90	HDPE	120	-0.002	0.04	0.005
163	J-138	J-139	P-163	41	3.21	90	HDPE	120	0.045	0.8	1.299
164	J-11	J-140	P-164	11	6.41	180	HDPE	120	0.305	1.36	1.565
165	J-140	J-133	P-165	110	6.41	180	HDPE	120	0.345	1.54	1.968
166	J-139	J-140	P-166	166	3.21	90	HDPE	120	0.042	0.75	1.166
167	J-135	J-141	P-167	136	8.01	225	HDPE	120	0.563	1.61	1.649
168	J-141	J-39	P-168	149	8.01	225	HDPE	120	0.506	1.45	1.352
169	J-138	J-141	P-169	79	3.21	90	HDPE	120	-0.048	0.86	1.504
170	J-142	J-52	P-170	96	6.41	180	HDPE	120	0.202	0.9	0.73
171	J-142	J-143	P-171	176	3.21	90	HDPE	120	0.009	0.16	0.067
172	J-144	J-142	P-172	149	6.41	180	HDPE	120	0.221	0.98	0.861
173	J-65	J-145	P-173	53	4.45	125	HDPE	120	0.021	0.22	0.083
174	J-145	J-67	P-174	58	4.45	125	HDPE	120	-0.053	0.54	0.457
175	J-144	J-145	P-175	239	3.21	90	HDPE	120	-0.068	1.21	2.806
176	J-146	J-144	P-176	62	6.41	180	HDPE	120	0.166	0.74	0.507
177	J-146	J-67	P-177	242	3.21	90	HDPE	120	-0.067	1.19	2.746
178	J-147	J-146	P-178	108	6.41	180	HDPE	120	0.108	0.48	0.23
179	J-147	J-74	P-179	246	3.21	90	HDPE	120	-0.068	1.22	2.852
180	J-95	J-148	P-180	104	6.41	180	HDPE	120	-0.014	0.06	0.005
181	J-148	J-147	P-181	110	6.41	180	HDPE	120	0.05	0.22	0.056
182	J-148	J-72	P-182	242	3.21	90	HDPE	120	-0.072	1.28	3.116
183	J-149	J-16	P-183	81	6.41	180	HDPE	120	0.006	0.03	0.001
184	J-45	J-150	P-184	157	3.21	90	HDPE	120	0.051	0.91	1.681
185	J-149	J-150	P-185	132	3.21	90	HDPE	120	-0.048	0.85	1.47
186	J-150	J-151	P-186	124	3.21	90	HDPE	120	-0.016	0.28	0.183
187	J-151	J-152	P-187	145	3.21	90	HDPE	120	-0.022	0.39	0.341
188	J-150	J-153	P-188	82	3.21	90	HDPE	120	0.013	0.22	0.124
189	J-154	J-151	P-189	79	4.45	125	HDPE	120	0	0	0
190	J-153	J-154	P-190	121	3.21	90	HDPE	120	-0.019	0.34	0.271
191	J-51	J-155	P-191	152	6.41	180	HDPE	120	0.096	0.43	0.183
192	J-5	J-156	P-192	163	3.21	90	HDPE	120	0.016	0.28	0.184
193	J-155	J-156	P-193	159	3.21	90	HDPE	120	0.087	1.55	4.496
194	J-155	J-157	P-194	157	6.41	180	HDPE	120	0	0	0
195	J-157	J-95	P-195	389	6.41	180	HDPE	120	-0.143	0.64	0.385
196	J-157	J-60	P-196	99	3.21	90	HDPE	120	0.138	2.46	10.517
197	J-158	J-4	P-197	212	3.21	90	HDPE	120	0.082	1.47	4.028
198	J-60	J-158	P-198	63	3.21	90	HDPE	120	0.102	1.82	6.001
199	J-156	J-159	P-199	143	3.21	90	HDPE	120	0.092	1.64	4.952
200	J-159	J-158	P-200	19	3.21	90	HDPE	120	-0.014	0.24	0.145
201	J-49	J-160	P-201	228	3.21	90	HDPE	120	-0.013	0.24	0.139

KAMOKI MANDIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. no	Start Node	Stop Node	Label	Length (ft)	Diameter (in)	Diameter (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
202	J-160	J-152	P-202	214	3.21	90	HDPE	120	0.032	0.56	0.685
203	J-159	J-160	P-203	160	3.21	90	HDPE	120	0.102	1.81	5.946
204	J-3	J-161	P-204	232	4.45	125	HDPE	120	0.032	0.32	0.177
205	J-161	J-154	P-205	143	4.45	125	HDPE	120	0.027	0.27	0.126
206	J-160	J-161	P-206	148	3.21	90	HDPE	120	0.043	0.76	1.197
207	J-153	J-162	P-207	135	3.21	90	HDPE	120	0.025	0.44	0.433
208	J-161	J-162	P-208	120	3.21	90	HDPE	120	0.037	0.66	0.914
209	J-163	J-149	P-209	224	6.41	180	HDPE	120	-0.034	0.15	0.027
210	J-162	J-163	P-210	125	3.21	90	HDPE	120	0.04	0.71	1.055
211	J-24	J-164	P-211	204	3.21	90	HDPE	120	0.013	0.24	0.137
212	J-163	J-164	P-212	136	3.21	90	HDPE	120	0.034	0.61	0.792
213	J-8	J-165	P-213	207	6.41	180	HDPE	120	0.14	0.62	0.371
214	J-165	J-7	P-214	49	6.41	180	HDPE	120	0.161	0.72	0.482
215	J-164	J-165	P-215	128	3.21	90	HDPE	120	0.027	0.48	0.511
216	J-162	J-166	P-216	223	3.21	90	HDPE	120	0.012	0.22	0.118
217	J-3	J-166	P-217	127	3.21	90	HDPE	120	0.046	0.83	1.394
218	J-167	J-163	P-218	221	6.41	180	HDPE	120	-0.028	0.12	0.018
219	J-166	J-167	P-219	121	3.21	90	HDPE	120	0.037	0.66	0.91
220	J-167	J-168	P-220	57	3.21	90	HDPE	120	0.04	0.71	1.065
221	J-164	J-169	P-221	224	3.21	90	HDPE	120	0.009	0.16	0.064
222	J-168	J-169	P-222	84	3.21	90	HDPE	120	0.032	0.57	0.694
223	J-169	J-170	P-223	68	3.21	90	HDPE	120	0.033	0.58	0.722
224	J-7	J-171	P-224	179	3.21	90	HDPE	120	0.001	0.02	0.001
225	J-170	J-171	P-225	70	3.21	90	HDPE	120	0.022	0.4	0.363
226	J-6	J-1946	P-226	95	6.41	180	HDPE	120	0.124	0.56	0.298
227	J-1946	J-18	P-227	31	6.41	180	HDPE	120	0.15	0.67	0.421
228	J-19	J-1947	P-228	121	3.21	90	HDPE	120	0.006	0.11	0.033
229	J-1947	J-27	P-229	185	3.21	90	HDPE	120	0.006	0.11	0.033
230	J-1946	J-1947	P-230	65	3.21	90	HDPE	120	-0.028	0.5	0.559
231	J-171	J-172	P-231	160	3.21	90	HDPE	120	0.016	0.29	0.199
232	J-172	J-21	P-232	182	3.21	90	HDPE	120	0.008	0.15	0.057
233	J-1947	J-172	P-233	135	3.21	90	HDPE	120	-0.034	0.61	0.794
234	J-172	J-173	P-234	70	3.21	90	HDPE	120	-0.034	0.6	0.777
235	J-169	J-174	P-235	154	3.21	90	HDPE	120	0.002	0.03	0.002
236	J-174	J-25	P-236	189	3.21	90	HDPE	120	-0.004	0.07	0.009
237	J-173	J-174	P-237	65	3.21	90	HDPE	120	-0.034	0.61	0.801
238	J-174	J-175	P-238	75	3.21	90	HDPE	120	-0.034	0.6	0.765
239	J-1	J-176	P-239	146	6.41	180	HDPE	120	-0.01	0.04	0.003
240	J-176	J-167	P-240	161	6.41	180	HDPE	120	-0.017	0.07	0.007
241	J-175	J-176	P-241	68	3.21	90	HDPE	120	-0.036	0.64	0.879
242	J-166	J-177	P-242	159	3.21	90	HDPE	120	0.011	0.2	0.103
243	J-177	J-46	P-243	180	3.21	90	HDPE	120	0.025	0.44	0.432
244	J-176	J-177	P-244	114	3.21	90	HDPE	120	-0.035	0.62	0.83
245	J-177	J-178	P-245	128	3.21	90	HDPE	120	-0.057	1.01	2.028
246	J-3	J-179	P-246	117	4.45	125	HDPE	120	-0.056	0.56	0.495
247	J-179	J-178	P-247	31	4.45	125	HDPE	120	-0.042	0.42	0.29
248	J-179	J-180	P-248	316	3.21	90	HDPE	120	-0.02	0.35	0.281
249	J-180	J-4	P-249	115	3.21	90	HDPE	120	-0.035	0.62	0.808
250	J-178	J-181	P-250	107	4.45	125	HDPE	120	-0.105	1.07	1.612
251	J-59	J-182	P-251	530	3.21	90	HDPE	120	0.044	0.79	1.287
252	J-182	J-60	P-252	473	3.21	90	HDPE	120	-0.029	0.52	0.601
253	J-181	J-182	P-253	377	3.21	90	HDPE	120	-0.064	1.13	2.506
254	J-181	J-183	P-254	136	4.45	125	HDPE	120	-0.052	0.53	0.44
255	J-183	J-2	P-255	343	4.45	125	HDPE	120	-0.012	0.12	0.029
256	J-183	J-56	P-256	151	3.21	90	HDPE	120	-0.05	0.89	1.601
257	J-56	J-58	P-257	114	3.21	90	HDPE	120	-0.034	0.6	0.766
258	J-170	J-173	P-258	159	3.21	90	HDPE	120	0.004	0.08	0.018
259	J-168	J-175	P-259	152	3.21	90	HDPE	120	0.003	0.05	0.007
260	J-21	J-184	P-260	68	4.45	125	HDPE	120	-0.076	0.78	0.894
261	J-184	J-25	P-261	75	4.45	125	HDPE	120	-0.07	0.71	0.765
262	J-184	J-185	P-262	145	3.21	90	HDPE	120	-0.011	0.2	0.101
263	J-185	J-186	P-263	29	3.21	90	HDPE	120	0.016	0.29	0.202
264	J-186	J-187	P-264	192	3.21	90	HDPE	120	0.011	0.19	0.093
265	J-25	J-188	P-265	146	3.21	90	HDPE	120	-0.005	0.1	0.021
266	J-188	J-26	P-266	204	3.21	90	HDPE	120	-0.009	0.17	0.071
267	J-185	J-188	P-267	68	3.21	90	HDPE	120	-0.031	0.55	0.665
268	J-188	J-189	P-268	77	3.21	90	HDPE	120	-0.033	0.58	0.731

KAMOKI MANDIALA ROAD WATER SUPPLY SYSTEM - DESIGN 2032

Sr. no	Start Node	Stop Node	Label	Length (ft)	Diameter (in)	Diameter (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
269	J-190	J-22	P-269	143	6.41	180	HDPE	120	0.058	0.26	0.072
270	J-189	J-190	P-270	57	3.21	90	HDPE	120	-0.042	0.75	1.159
271	J-25	J-191	P-271	66	4.45	125	HDPE	120	-0.074	0.75	0.847
272	J-191	J-22	P-272	72	4.45	125	HDPE	120	-0.073	0.74	0.83
273	J-189	J-191	P-273	136	3.21	90	HDPE	120	0.005	0.09	0.024
274	J-190	J-192	P-274	119	3.21	90	HDPE	120	-0.008	0.14	0.052
275	J-192	J-46	P-275	146	3.21	90	HDPE	120	-0.004	0.08	0.008
276	J-47	J-193	P-276	143	3.21	90	HDPE	120	-0.004	0.06	0
277	J-192	J-193	P-277	36	3.21	90	HDPE	120	-0.008	0.14	0.045
278	J-194	J-190	P-278	82	6.41	180	HDPE	120	0.096	0.43	0.185
279	J-193	J-195	P-279	88	3.21	90	HDPE	120	-0.016	0.28	0.193
280	J-194	J-195	P-280	138	3.21	90	HDPE	120	-0.009	0.16	0.068
281	J-17	J-196	P-281	75	6.41	180	HDPE	120	0.073	0.33	0.111
282	J-196	J-194	P-282	77	6.41	180	HDPE	120	0.092	0.41	0.171
283	J-195	J-197	P-283	81	3.21	90	HDPE	120	-0.033	0.59	0.739
284	J-197	J-48	P-284	88	3.21	90	HDPE	120	-0.063	1.12	2.461
285	J-196	J-197	P-285	139	3.21	90	HDPE	120	-0.024	0.43	0.402
286	J-21	J-1975	P-286	45	4.45	125	HDPE	120	0.081	0.82	0.997
287	J-1975	J-27	P-287	99	4.45	125	HDPE	120	0.061	0.62	0.589
288	J-1975	J-198	P-288	90	3.21	90	HDPE	120	0.016	0.28	0.185
289	J-199	J-187	P-289	81	6.41	180	HDPE	120	-0.229	1.02	0.919
290	J-198	J-199	P-290	241	3.21	90	HDPE	120	-0.014	0.26	0.16
291	J-198	J-200	P-291	98	3.21	90	HDPE	120	0.025	0.45	0.451
292	J-200	J-27	P-292	97	3.21	90	HDPE	120	-0.006	0.1	0.029
293	J-200	J-201	P-293	79	3.21	90	HDPE	120	0.027	0.47	0.496
294	J-201	J-202	P-294	77	3.21	90	HDPE	120	0.02	0.35	0.291
295	J-15	J-203	P-295	246	6.41	180	HDPE	120	-0.177	0.79	0.574
296	J-203	J-199	P-296	197	6.41	180	HDPE	120	-0.2	0.89	0.718
297	J-202	J-203	P-297	139	3.21	90	HDPE	120	-0.005	0.09	0.023
298	J-202	J-204	P-298	75	3.21	90	HDPE	120	0.021	0.37	0.32
299	J-204	J-1983	P-299	56	3.21	90	HDPE	120	0.016	0.28	0.188
300	J-23	J-1984	P-300	88	6.41	180	HDPE	120	0.136	0.61	0.35
301	J-1984	J-20	P-301	83	6.41	180	HDPE	120	0.142	0.63	0.381
302	J-1983	J-1984	P-302	79	3.21	90	HDPE	120	0.012	0.21	0.112
303	J-46	J-22	P-303	110	3.21	90	HDPE	120	0.014	0.26	0.161
304	3512	J-81	P-304	45	12.65	355	HDPE	120	2.795	3.2	3.46
305	J-187	J-2214	P-305	69	6.41	180	HDPE	120	-0.225	1	0.893
306	J-2214	J-26	P-306	24	6.41	180	HDPE	120	-0.23	1.03	0.931

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
1	J-1	0.008	69.14	29.9
2	J-2	0.001	69	29.8
3	J-3	0.003	62.09	26.8
4	J-4	0.006	62.69	27.1
5	J-5	0.004	62.7	27.1
6	J-6	0.001	68.84	29.8
7	J-7	0.052	61.07	26.4
8	J-8	0.005	61.56	26.6
9	J-9	0.016	61.94	26.8
10	J-10	0.017	62.09	26.8
11	J-11	0.003	62.56	27.1
12	J-12	0.005	64.71	28
13	J-13	0.005	64.56	27.9
14	J-14	0.003	64.66	28
15	J-15	0.013	68.59	29.7
16	J-16	0.004	64.23	27.8
17	J-17	0.004	63.2	27.3
18	J-18	0.018	67.27	29.1
19	J-19	0.005	62.43	27
20	J-20	0.008	62.38	27
21	J-21	0.007	62.4	27
22	J-22	0.008	62.44	27
23	J-23	0.008	62.47	27
24	J-24	0.003	62.5	27
25	J-25	0.001	62.77	27.1
26	J-26	0.001	63.4	27.4
27	J-27	0.001	63.56	27.5
28	J-28	0.001	63.67	27.5
29	J-29	0.031	67.7	29.3
30	J-30	0.005	64.36	27.8
31	J-31	0.001	62.33	27
32	J-32	0.009	62.37	27
33	J-33	0.015	62.71	27.1
34	J-34	0.007	64.2	27.8
35	J-35	0.015	61.55	26.6
36	J-36	0.015	61.73	26.7
37	J-37	0.026	61.21	26.5
38	J-38	0.012	60.97	26.4
39	J-39	0.003	60.98	26.4
40	J-40	0.004	61.1	26.4
41	J-41	0.011	61.18	26.5
42	J-42	0.027	60.88	26.3
43	J-43	0.012	60.79	26.3
44	J-44	0.018	60.82	26.3
45	J-45	0.026	60.92	26.3

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
46	J-46	0.005	60.79	26.3
47	J-47	0.021	60.76	26.3
48	J-48	0.002	61.85	26.7
49	J-49	0.005	61.64	26.7
50	J-50	0.003	61.58	26.6
51	J-51	0.017	61.61	26.6
52	J-52	0.005	61.86	26.8
53	J-53	0.002	62.42	27
54	J-54	0.032	60.97	26.4
55	J-55	0.029	61.06	26.4
56	J-56	0.02	61.83	26.7
57	J-57	0.011	61.65	26.7
58	J-58	0.014	62.05	26.8
59	J-59	0.052	61.29	26.5
60	J-60	0.013	62.19	26.9
61	J-61	0.056	61.49	26.6
62	J-62	0.016	62.37	27
63	J-63	0.012	62.24	26.9
64	J-64	0.002	62.63	27.1
65	J-65	0.001	62.76	27.1
66	J-66	0.015	67.15	29
67	J-67	0.015	66.57	28.8
68	J-68	0.015	66.17	28.6
69	J-69	0.01	65.4	28.3
70	J-70	0.005	65.4	28.3
71	J-71	0.014	65.8	28.5
72	J-72	0.011	65.88	28.5
73	J-73	0.012	66.28	28.7
74	J-74	0.011	66.52	28.8
75	J-75	0.01	67.72	29.3
76	J-76	0.008	65.4	28.3
77	J-77	0.004	64.91	28.1
78	J-78	0.007	64.97	28.1
79	J-79	0.008	66.21	28.6
80	J-80	0.012	67.14	29
81	J-81	0.005	62.95	27.2
82	J-82	0.006	68.25	29.5
83	J-83	0.002	68.65	29.7
84	J-84	0.011	65.42	28.3
85	J-85	0.006	65.51	28.3
86	J-86	0.008	64.65	28
87	J-87	0.007	64.34	27.8
88	J-88	0.009	64.8	28
89	J-89	0.004	64.64	28
90	J-90	0.004	64.22	27.8

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
91	J-91	0.008	64.55	27.9
92	J-92	0.005	62.53	27
93	J-93	0.003	62.75	27.1
94	J-94	0.005	62.48	27
95	J-95	0.002	62.57	27.1
96	J-96	0.003	62.57	27.1
97	J-97	0.004	62.63	27.1
98	J-98	0.001	62.97	27.2
99	J-99	0.001	62.96	27.2
100	J-100	0.005	62.86	27.2
101	J-101	0.004	62.78	27.1
102	J-102	0.003	62.6	27.1
103	J-103	0.007	62.47	27
104	J-104	0.004	62.46	27
105	J-105	0.002	62.45	27
106	J-106	0.003	62.47	27
107	J-107	0.004	62.56	27.1
108	J-108	0.001	62.75	27.1
109	J-109	0.01	63.53	27.5
110	J-110	0.005	62.81	27.2
111	J-111	0.005	63.08	27.3
112	J-112	0.004	64.32	27.8
113	J-113	0.004	62.45	27
114	J-114	0.009	63.48	27.5
115	J-115	0.005	62.36	27
116	J-116	0.005	62.74	27.1
117	J-117	0.004	62.75	27.1
118	J-118	0.011	61.94	26.8
119	J-119	0.009	62.02	26.8
120	J-120	0.002	62.48	27
121	J-121	0.008	64.42	27.9
122	J-122	0.008	62.77	27.1
123	J-123	0.004	62.93	27.2
124	J-124	0.003	62.88	27.2
125	J-125	0.01	62.97	27.2
126	J-126	0.017	64.06	27.7
127	J-127	0.003	63.96	27.7
128	J-128	0.007	63.99	27.7
129	J-129	0.004	64.15	27.7
130	J-130	0.007	64	27.7
131	J-131	0.001	63.75	27.6
132	J-132	0.009	64.38	27.8
133	J-133	0.002	64.18	27.8
134	J-134	0.008	64.55	27.9
135	J-135	0.01	64.44	27.9

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
136	J-136	0.005	65.83	28.5
137	J-137	0.007	63.44	27.4
138	J-138	0.003	62.77	27.1
139	J-139	0.007	62.34	27
140	J-140	0.007	62.1	26.9
141	J-141	0.008	61.99	26.8
142	J-142	0.005	61.86	26.8
143	J-143	0.004	61.87	26.8
144	J-144	0.003	61.88	26.8
145	J-145	0.003	61.86	26.8
146	J-146	0.008	61.65	26.7
147	J-147	0.013	62.11	26.9
148	J-148	0.017	61.99	26.8
149	J-149	0.004	62.33	27
150	J-150	0.005	62.33	27
151	J-151	0.006	62.33	27
152	J-152	0.005	62.33	27
153	J-153	0.008	62.34	27
154	J-154	0.008	62.33	27
155	J-155	0.003	62.34	27
156	J-156	0.005	61.81	26.7
157	J-157	0.011	61.65	26.7
158	J-158	0.005	61.64	26.7
159	J-159	0.006	61.58	26.6
160	J-160	0.009	61.61	26.6
161	J-161	0.013	61.56	26.6
162	J-162	0.004	61.57	26.6
163	J-163	0.008	61.56	26.6
164	J-164	0.011	61.56	26.6
165	J-165	0.015	61.56	26.6
166	J-166	0.018	61.56	26.6
167	J-167	0.008	61.67	26.7
168	J-168	0.007	61.68	26.7
169	J-169	0.004	61.84	26.7
170	J-170	0.016	61.56	26.6
171	J-171	0.011	61.98	26.8
172	J-172	0.015	62.03	26.8
173	J-173	0.013	62.16	26.9
174	J-174	0.012	62.39	27
175	J-175	0.008	62.6	27.1
176	J-176	0.005	62.66	27.1
177	J-177	0.004	62.7	27.1
178	J-178	0.003	62.35	27
179	J-179	0.009	61.98	26.8
180	J-180	0.004	61.91	26.8

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
181	J-181	0.004	61.88	26.8
182	J-182	0.004	61.83	26.7
183	J-183	0.013	61.98	26.8
184	J-184	0.017	61.96	26.8
185	J-185	0.052	61.93	26.8
186	J-186	0.005	62.39	27
187	J-187	0.01	61.84	26.7
188	J-188	0.006	61.84	26.7
189	J-189	0.005	62.47	27
190	J-190	0.002	62.51	27
191	J-191	0.003	62.59	27.1
192	J-192	0.026	62.28	26.9
193	J-193	0.002	62.32	26.9
194	J-194	0.009	62.34	27
195	J-195	0.027	62.68	27.1
196	J-196	0.025	62.28	26.9
197	J-197	0.011	62.39	27
198	J-198	0.008	62.58	27.1
199	J-199	0.014	62.68	27.1
200	J-200	0.006	62.81	27.2
201	J-201	0.008	62.76	27.1
202	J-202	0.006	62.74	27.1
203	J-203	0.008	62.78	27.1
204	J-204	0.007	62.77	27.1
205	J-205	0.003	62.9	27.2
206	J-206	0.003	63.01	27.2
207	J-207	0.002	62.58	27.1
208	J-208	0.003	62.65	27.1
209	J-209	0.01	62.99	27.2
210	J-210	0.01	62.82	27.2
211	J-211	0.003	62.6	27.1
212	J-212	0.003	62.59	27.1
213	J-213	0.006	63.08	27.3
214	J-214	0.005	62.93	27.2
215	J-215	0.009	62.56	27.1
216	J-216	0.003	62.92	27.2
217	J-217	0.007	62.63	27.1
218	J-218	0.004	62.59	27.1
219	J-219	0.003	62.52	27
220	J-220	0.003	62.34	27
221	J-221	0.011	62.88	27.2
222	J-222	0.009	64.15	27.7
223	J-223	0.006	64.14	27.7
224	J-224	0.005	62.42	27
225	J-225	0.002	62.42	27

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
226	J-226	0.004	62.42	27
227	J-227	0.005	62.42	27
228	J-228	0.005	62.42	27
229	J-229	0.004	62.42	27
230	J-230	0.004	62.42	27
231	J-231	0.003	62.43	27
232	J-232	0.002	62.43	27
233	J-233	0.002	62.47	27
234	J-234	0.004	62.43	27
235	J-235	0.003	62.45	27
236	J-236	0.002	62.47	27
237	J-237	0.002	62.47	27
238	J-238	0.001	62.47	27
239	J-239	0	62.47	27
240	J-240	0.001	62.47	27
241	J-241	0.003	62.43	27
242	J-242	0.006	62.51	27
243	J-243	0.006	62.54	27
244	J-244	0.006	62.51	27
245	J-245	0.001	62.89	27.2
246	J-246	0.002	62.89	27.2
247	J-247	0.003	62.92	27.2
248	J-248	0.005	62.87	27.2
249	J-249	0.005	62.78	27.1
250	J-250	0.004	62.89	27.2
251	J-251	0.004	62.68	27.1
252	J-252	0.004	62.69	27.1
253	J-253	0.005	62.68	27.1
254	J-254	0.005	62.68	27.1
255	J-255	0.005	62.79	27.2
256	J-256	0.005	62.77	27.1
257	J-257	0.003	62.5	27
258	J-258	0.004	62.53	27
259	J-259	0.006	62.76	27.1
260	J-260	0.002	62.87	27.2
261	J-261	0.003	62.94	27.2
262	J-262	0.003	62.87	27.2
263	J-263	0.004	62.96	27.2
264	J-264	0.005	62.98	27.2
265	J-265	0.004	63.03	27.3
266	J-266	0.005	63.13	27.3
267	J-267	0.003	63	27.2
268	J-268	0.01	63.15	27.3
269	J-269	0.006	63.38	27.4
270	J-270	0.004	63.37	27.4

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
271	J-271	0.007	63.52	27.5
272	J-272	0.007	63.49	27.5
273	J-273	0.006	63.85	27.6
274	J-274	0.006	63.96	27.7
275	J-275	0.006	63.96	27.7
276	J-276	0.007	63.84	27.6

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
277	J-277	0.003	63.44	27.4
278	J-278	0.003	63.4	27.4
279	J-279	0.002	63.15	27.3
280	J-280	0	62.98	27.2
281	J-281	0.006	63.99	27.7
282	J-282	0.012	63.96	27.7
283	J-283	0.003	64.22	27.8
284	J-284	0.004	64.21	27.8
285	J-285	0.003	64.2	27.8
286	J-286	0.003	63.46	27.4
287	J-287	0.003	63.45	27.4
288	J-288	0.002	63.08	27.3
289	J-289	0.003	63.08	27.3
290	J-290	0.003	63.06	27.3
291	J-291	0.007	63.01	27.2
292	J-292	0.005	63.04	27.3
293	J-293	0.004	62.96	27.2
294	J-294	0.001	62.92	27.2
295	J-295	0.003	64.21	27.8
296	J-296	0.004	64.62	27.9
297	J-297	0.003	64.22	27.8
298	J-298	0.005	64.55	27.9
299	J-299	0.008	64.28	27.8
300	J-300	0.004	64.61	27.9
301	J-301	0.005	64.31	27.8
302	J-302	0.005	64.61	27.9
303	J-303	0.005	65.01	28.1
304	J-304	0.006	64.61	27.9
305	J-305	0.005	64.32	27.8
306	J-306	0.001	64.69	28
307	J-307	0.007	64.83	28
308	J-308	0.003	64.11	27.7
309	J-309	0.003	64.19	27.8
310	J-310	0.002	64.19	27.8
311	J-311	0.004	64.36	27.8
312	J-312	0.018	64.21	27.8
313	J-313	0.007	64.95	28.1
314	J-314	0.007	64.72	28
315	J-315	0.005	64.54	27.9
316	J-316	0.006	64.5	27.9
317	J-317	0.006	64.38	27.8
318	J-318	0.007	65.08	28.1
319	J-319	0.011	65.44	28.3
320	J-320	0.012	65.81	28.5
321	J-321	0.012	66.15	28.6

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr. No	Label	Demand (cfs)	Hydraulic Grade (ft)	Pressure (psi)
322	J-322	0.012	66.55	28.8
323	J-323	0.012	66.98	29
324	J-324	0.017	61.23	26.5

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
1	J-2	J-1	P-1	12	6.41	180	HDPE	120	-0.938	4.19	12.568
2	J-15	J-2	P-2	95	8.01	225	HDPE	120	-0.937	2.68	4.232
3	J-9	563	P-3	786	3.21	90	HDPE	120	0.049	0.87	1.543
4	J-1	J-6	P-4	73	9.97	355	HDPE	120	1.665	3.07	4.229
5	J-7	578	P-5	465	6.41	180	HDPE	120	0.136	0.61	0.354
6	580	J-7	P-6	290	6.41	180	HDPE	120	0.189	0.84	0.644
7	J-8	581	P-7	248	6.41	180	HDPE	120	0.259	1.16	1.16
8	J-10	J-9	P-8	214	4.45	125	HDPE	120	0.067	0.68	0.704
9	J-11	J-10	P-9	544	4.45	125	HDPE	120	0.075	0.76	0.87
10	J-29	J-15	P-10	397	8.01	225	HDPE	120	-0.668	1.91	2.262
11	J-18	J-29	P-11	397	8.01	225	HDPE	120	-0.445	1.27	1.066
12	J-21	J-20	P-12	147	6.41	180	HDPE	120	0.078	0.35	0.124
13	J-23	J-22	P-13	143	6.41	180	HDPE	120	0.095	0.42	0.18
14	J-27	J-26	P-14	89	6.41	180	HDPE	120	0.334	1.49	1.855
15	J-28	J-27	P-15	59	6.41	180	HDPE	120	0.335	1.49	1.864
16	J-33	716	P-16	790	6.41	180	HDPE	120	0.356	1.59	2.088
17	717	941	P-17	215	6.41	180	HDPE	120	0.096	0.43	0.186
18	J-35	J-37	P-18	254	6.41	180	HDPE	120	0.278	1.24	1.322
19	2083	940	P-19	544	6.41	180	HDPE	120	-0.084	0.37	0.143
20	J-38	J-39	P-20	15	4.45	125	HDPE	120	-0.081	0.82	0.999
21	J-39	J-40	P-21	83	4.45	125	HDPE	120	-0.099	1	1.437
22	J-41	J-37	P-22	568	4.45	125	HDPE	120	-0.016	0.16	0.047
23	J-40	J-41	P-23	54	4.45	125	HDPE	120	-0.103	1.04	1.543
24	J-42	940	P-24	223	6.41	180	HDPE	120	0.105	0.47	0.218
25	J-42	J-43	P-25	487	3.21	90	HDPE	120	0.016	0.28	0.184
26	J-44	J-38	P-26	193	4.45	125	HDPE	120	-0.069	0.7	0.736
27	J-45	J-42	P-27	108	6.41	180	HDPE	120	0.148	0.66	0.411
28	J-44	J-45	P-28	501	3.21	90	HDPE	120	-0.016	0.29	0.201
29	J-46	J-44	P-29	108	4.45	125	HDPE	120	-0.043	0.44	0.306
30	J-43	J-46	P-30	3	4.45	125	HDPE	120	0.004	0.04	0.003
31	J-44	J-47	P-31	161	3.21	90	HDPE	120	0.024	0.43	0.423
32	J-47	2094	P-32	201	3.21	90	HDPE	120	0.003	0.06	0.011
33	2094	2095	P-33	108	3.21	90	HDPE	120	-0.003	0.05	0.007
34	2083	2096	P-34	192	4.45	125	HDPE	120	-0.014	0.14	0.037
35	2096	J-46	P-35	101	4.45	125	HDPE	120	-0.042	0.43	0.298
36	2094	2096	P-36	169	3.21	90	HDPE	120	-0.007	0.13	0.042
37	2095	2097	P-37	201	3.21	90	HDPE	120	-0.025	0.44	0.434
38	578	2098	P-38	117	6.41	180	HDPE	120	0.179	0.8	0.584
39	2098	2083	P-39	291	6.41	180	HDPE	120	0.126	0.56	0.305
40	J-49	J-50	P-40	143	3.21	90	HDPE	120	0.024	0.43	0.414
41	J-51	J-35	P-41	62	6.41	180	HDPE	120	0.248	1.11	1.071
42	J-52	J-48	P-42	14	3.21	90	HDPE	120	0.037	0.65	0.903
43	J-39	J-54	P-43	91	3.21	90	HDPE	120	0.015	0.26	0.167
44	J-37	J-55	P-44	153	6.41	180	HDPE	120	0.237	1.06	0.981
45	J-55	J-45	P-45	208	6.41	180	HDPE	120	0.19	0.85	0.656
46	J-54	J-55	P-46	435	3.21	90	HDPE	120	-0.017	0.3	0.219
47	J-9	J-56	P-47	106	6.41	180	HDPE	120	0.237	1.06	0.984
48	J-56	J-36	P-48	119	6.41	180	HDPE	120	0.218	0.97	0.845

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
49	941	2108	P-49	389	6.41	180	HDPE	120	0.081	0.36	0.133
50	J-56	2108	P-50	1,003	3.21	90	HDPE	120	0.036	0.65	0.892
51	J-36	J-57	P-51	104	6.41	180	HDPE	120	0.212	0.95	0.8
52	J-57	J-8	P-52	105	6.41	180	HDPE	120	0.214	0.96	0.816
53	2110	578	P-53	103	6.41	180	HDPE	120	0.066	0.3	0.093
54	J-57	2110	P-54	1,003	3.21	90	HDPE	120	0.033	0.58	0.726
55	2108	2111	P-55	103	6.41	180	HDPE	120	0.058	0.26	0.074
56	2111	2110	P-56	113	6.41	180	HDPE	120	0.063	0.28	0.085
57	J-36	2111	P-57	1,011	3.21	90	HDPE	120	0.034	0.61	0.794
58	J-58	J-9	P-58	114	6.41	180	HDPE	120	0.235	1.05	0.969
59	J-58	J-59	P-59	434	3.21	90	HDPE	120	0.052	0.93	1.742
60	J-60	J-58	P-60	114	6.41	180	HDPE	120	0.273	1.22	1.28
61	J-60	J-61	P-61	358	3.21	90	HDPE	120	0.056	0.99	1.956
62	J-33	J-62	P-62	160	6.41	180	HDPE	120	0.361	1.61	2.146
63	J-62	J-60	P-63	114	6.41	180	HDPE	120	0.305	1.36	1.566
64	716	2117	P-64	169	6.41	180	HDPE	120	0.082	0.37	0.139
65	2117	717	P-65	50	6.41	180	HDPE	120	0.116	0.52	0.262
66	J-62	2117	P-66	783	3.21	90	HDPE	120	0.052	0.92	1.698
67	J-63	J-60	P-67	198	4.45	125	HDPE	120	0.038	0.38	0.241
68	J-66	J-29	P-68	110	4.45	125	HDPE	120	-0.192	1.95	4.911
69	J-67	J-66	P-69	111	4.45	125	HDPE	120	-0.198	2.01	5.229
70	J-68	J-67	P-70	112	4.45	125	HDPE	120	-0.162	1.65	3.611
71	J-69	J-70	P-71	12	4.45	125	HDPE	120	0.002	0.02	0.001
72	J-70	J-71	P-72	111	4.45	125	HDPE	120	-0.164	1.66	3.658
73	J-71	J-68	P-73	106	4.45	125	HDPE	120	-0.159	1.61	3.475
74	J-71	J-72	P-74	382	3.21	90	HDPE	120	-0.016	0.28	0.19
75	J-73	J-72	P-75	110	4.45	125	HDPE	120	0.164	1.66	3.66
76	J-68	J-73	P-76	384	3.21	90	HDPE	120	-0.02	0.35	0.28
77	J-74	J-73	P-77	115	4.45	125	HDPE	120	0.122	1.24	2.135
78	J-67	J-74	P-78	398	3.21	90	HDPE	120	0.013	0.22	0.125
79	J-15	J-75	P-79	104	4.45	125	HDPE	120	0.256	2.6	8.41
80	J-75	J-74	P-80	104	4.45	125	HDPE	120	0.303	3.08	11.493
81	J-66	J-75	P-81	404	3.21	90	HDPE	120	-0.047	0.83	1.408
82	J-72	J-76	P-82	112	4.45	125	HDPE	120	0.176	1.79	4.201
83	J-70	J-76	P-83	388	3.21	90	HDPE	120	-0.004	0.06	0.012
84	J-76	J-77	P-84	117	4.45	125	HDPE	120	0.177	1.79	4.228
85	J-77	J-14	P-85	68	4.45	125	HDPE	120	0.166	1.68	3.744
86	J-78	J-70	P-86	116	4.45	125	HDPE	120	-0.165	1.67	3.706
87	J-72	J-79	P-87	321	3.21	90	HDPE	120	-0.04	0.71	1.056
88	J-80	J-79	P-88	119	8.01	225	HDPE	120	1.301	3.72	7.78
89	J-73	J-80	P-89	267	3.21	90	HDPE	120	-0.073	1.3	3.23
90	J-74	J-81	P-90	203	3.21	90	HDPE	120	0.183	3.25	17.638
91	J-82	J-80	P-91	127	8.01	225	HDPE	120	1.387	3.96	8.748
92	J-6	J-83	P-92	43	9.97	280	HDPE	120	1.664	3.07	4.223
93	J-75	J-83	P-93	151	3.21	90	HDPE	120	-0.103	1.84	6.139
94	J-76	J-84	P-94	110	3.21	90	HDPE	120	-0.012	0.22	0.117
95	J-84	J-85	P-95	264	3.21	90	HDPE	120	-0.023	0.4	0.371
96	J-30	J-86	P-96	118	4.45	125	HDPE	120	-0.132	1.34	2.462

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
97	J-30	J-87	P-97	142	6.41	180	HDPE	120	0.095	0.43	0.182
98	J-77	J-88	P-98	252	3.21	90	HDPE	120	0.024	0.43	0.418
99	J-88	J-78	P-99	138	3.21	90	HDPE	120	-0.043	0.76	1.189
100	J-87	J-89	P-100	213	3.21	90	HDPE	120	-0.047	0.84	1.428
101	J-90	J-91	P-101	229	3.21	90	HDPE	120	-0.048	0.85	1.474
102	J-94	J-23	P-102	53	6.41	180	HDPE	120	0.103	0.46	0.21
103	J-95	J-96	P-103	15	4.45	125	HDPE	120	-0.049	0.5	0.399
104	J-96	J-97	P-104	138	4.45	125	HDPE	120	-0.053	0.54	0.453
105	J-97	J-101	P-105	99	4.45	125	HDPE	120	-0.102	1.03	1.519
106	J-103	J-19	P-106	149	6.41	180	HDPE	120	0.107	0.48	0.225
107	J-104	J-105	P-107	52	3.21	90	HDPE	120	0.005	0.09	0.024
108	J-105	J-106	P-108	96	3.21	90	HDPE	120	-0.015	0.26	0.166
109	J-107	J-97	P-109	91	4.45	125	HDPE	120	-0.07	0.71	0.752
110	J-106	J-107	P-110	240	3.21	90	HDPE	120	-0.024	0.42	0.396
111	J-5	J-108	P-111	67	6.41	180	HDPE	120	-0.205	0.91	0.751
112	J-12	J-109	P-112	188	4.45	125	HDPE	120	0.219	2.22	6.291
113	J-87	J-112	P-113	55	6.41	180	HDPE	120	0.136	0.61	0.349
114	J-53	J-113	P-114	116	6.41	180	HDPE	120	-0.118	0.53	0.269
115	J-34	J-114	P-115	155	6.41	180	HDPE	120	0.549	2.45	4.659
116	J-115	J-116	P-116	260	3.21	90	HDPE	120	-0.048	0.85	1.455
117	J-100	J-117	P-117	83	6.41	180	HDPE	120	0.288	1.28	1.407
118	J-116	J-117	P-118	7	4.45	125	HDPE	120	-0.053	0.53	0.449
119	J-118	J-52	P-119	114	4.45	125	HDPE	120	0.069	0.7	0.736
120	J-118	J-113	P-120	523	4.45	125	HDPE	120	-0.08	0.81	0.967
121	J-119	J-120	P-121	567	3.21	90	HDPE	120	-0.035	0.62	0.815
122	J-12	J-121	P-122	154	8.01	225	HDPE	120	0.611	1.74	1.915
123	J-121	J-34	P-123	116	8.01	225	HDPE	120	0.603	1.72	1.871
124	R-15	J-1	P-124	184	12.65	355	HDPE	120	3.281	3.76	4.657
125	J-123	J-124	P-125	33	4.45	125	HDPE	120	0.099	1.01	1.453
126	J-124	J-11	P-126	243	4.45	125	HDPE	120	0.094	0.95	1.307
127	J-113	J-125	P-127	258	4.45	125	HDPE	120	-0.119	1.21	2.024
128	J-125	J-114	P-128	142	4.45	125	HDPE	120	-0.162	1.64	3.588
129	J-126	J-127	P-129	226	4.45	125	HDPE	120	0.051	0.52	0.425
130	J-128	J-112	P-130	210	4.45	125	HDPE	120	-0.103	1.05	1.567
131	J-30	J-129	P-131	204	4.45	125	HDPE	120	0.083	0.84	1.041
132	J-129	J-126	P-132	123	4.45	125	HDPE	120	0.068	0.69	0.715
133	J-128	J-130	P-133	98	3.21	90	HDPE	120	-0.011	0.19	0.095
134	J-130	J-129	P-134	109	3.21	90	HDPE	120	-0.046	0.83	1.395
135	J-127	J-131	P-135	133	6.41	180	HDPE	120	0.308	1.37	1.592
136	J-131	J-28	P-136	43	6.41	180	HDPE	120	0.336	1.5	1.872
137	J-130	J-131	P-137	420	3.21	90	HDPE	120	0.029	0.51	0.58
138	J-135	J-132	P-138	111	6.41	180	HDPE	120	0.173	0.77	0.547
139	J-79	J-136	P-139	65	8.01	225	HDPE	120	1.128	3.22	5.968
140	J-136	J-85	P-140	65	8.01	225	HDPE	120	1.006	2.88	4.831
141	J-109	J-137	P-141	214	3.21	90	HDPE	120	0.024	0.43	0.41
142	J-137	J-110	P-142	280	3.21	90	HDPE	120	0.06	1.07	2.253
143	J-122	J-138	P-143	47	8.01	225	HDPE	120	-0.073	0.21	0.037
144	J-138	J-110	P-144	51	8.01	225	HDPE	120	-0.395	1.13	0.855

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
145	J-20	J-32	P-145	13	6.41	180	HDPE	120	0.167	0.74	0.512
146	J-32	J-139	P-146	199	6.41	180	HDPE	120	0.099	0.44	0.196
147	J-139	J-31	P-147	80	6.41	180	HDPE	120	0.044	0.2	0.044
148	J-139	J-140	P-148	160	3.21	90	HDPE	120	0.048	0.85	1.484
149	J-140	J-141	P-149	71	3.21	90	HDPE	120	0.049	0.87	1.536
150	J-141	J-142	P-150	122	3.21	90	HDPE	120	0.04	0.7	1.039
151	J-142	J-143	P-151	83	3.21	90	HDPE	120	-0.013	0.23	0.129
152	J-143	J-144	P-152	32	3.21	90	HDPE	120	-0.017	0.3	0.218
153	J-144	J-145	P-153	17	3.21	90	HDPE	120	0.044	0.78	1.24
154	J-146	J-49	P-154	104	3.21	90	HDPE	120	0.008	0.14	0.054
155	J-145	J-146	P-155	195	3.21	90	HDPE	120	0.04	0.72	1.082
156	J-142	J-49	P-156	151	3.21	90	HDPE	120	0.048	0.85	1.463
157	J-32	J-147	P-157	160	6.41	180	HDPE	120	0.316	1.41	1.67
158	J-140	J-147	P-158	185	3.21	90	HDPE	120	-0.008	0.14	0.054
159	J-147	J-148	P-159	80	6.41	180	HDPE	120	0.295	1.32	1.473
160	J-148	J-51	P-160	283	6.41	180	HDPE	120	0.279	1.24	1.326
161	J-141	J-148	P-161	181	3.21	90	HDPE	120	0.001	0.01	0.001
162	J-31	J-149	P-162	24	6.41	180	HDPE	120	0.043	0.19	0.041
163	J-149	J-150	P-163	155	3.21	90	HDPE	120	0.005	0.1	0.026
164	J-149	J-1997	P-164	119	6.41	180	HDPE	120	0.033	0.15	0.026
165	J-1997	J-144	P-165	179	3.21	90	HDPE	120	0.064	1.13	2.494
166	J-1997	J-151	P-166	120	6.41	180	HDPE	120	-0.039	0.17	0.034
167	J-151	J-152	P-167	178	3.21	90	HDPE	120	0.005	0.09	0.025
168	J-153	J-154	P-168	180	3.21	90	HDPE	120	0.008	0.14	0.055
169	J-153	J-155	P-169	70	6.41	180	HDPE	120	-0.027	0.12	0.017
170	J-155	J-156	P-170	391	4.45	125	HDPE	120	0.095	0.96	1.339
171	J-156	J-157	P-171	144	3.21	90	HDPE	120	0.042	0.74	1.145
172	J-157	J-146	P-172	122	3.21	90	HDPE	120	0.001	0.02	0.001
173	J-157	J-158	P-173	178	3.21	90	HDPE	120	0.005	0.09	0.024
174	J-50	J-159	P-174	60	3.21	90	HDPE	120	0.001	0.01	0.001
175	J-159	J-51	P-175	204	3.21	90	HDPE	120	-0.014	0.25	0.149
176	J-159	J-160	P-176	142	3.21	90	HDPE	120	-0.017	0.3	0.216
177	J-160	J-49	P-177	58	3.21	90	HDPE	120	-0.026	0.47	0.49
178	J-161	J-35	P-178	192	6.41	180	HDPE	120	0.045	0.2	0.045
179	J-159	J-161	P-179	59	3.21	90	HDPE	120	0.026	0.46	0.475
180	J-50	J-162	P-180	45	3.21	90	HDPE	120	0.021	0.37	0.309
181	J-162	J-163	P-181	55	3.21	90	HDPE	120	0.017	0.3	0.21
182	J-163	J-161	P-182	105	6.41	180	HDPE	120	0.031	0.14	0.023
183	J-164	J-163	P-183	58	6.41	180	HDPE	120	0.023	0.1	0.013
184	J-164	J-146	P-184	203	3.21	90	HDPE	120	-0.025	0.44	0.441
185	J-165	J-164	P-185	115	6.41	180	HDPE	120	0.01	0.04	0.003
186	J-165	J-157	P-186	202	3.21	90	HDPE	120	-0.025	0.44	0.442
187	J-166	J-165	P-187	162	6.41	180	HDPE	120	0	0	0
188	J-166	J-167	P-188	87	4.45	125	HDPE	120	-0.091	0.93	1.244
189	J-167	J-168	P-189	327	3.21	90	HDPE	120	-0.006	0.1	0.028
190	J-48	J-169	P-190	46	4.45	125	HDPE	120	0.035	0.35	0.206
191	J-168	J-169	P-191	92	3.21	90	HDPE	120	-0.053	0.93	1.751
192	J-170	J-166	P-192	325	6.41	180	HDPE	120	0.019	0.09	0.009

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
193	J-168	J-170	P-193	111	3.21	90	HDPE	120	0.039	0.7	1.031
194	J-167	J-156	P-194	111	4.45	125	HDPE	120	-0.094	0.95	1.314
195	J-8	J-2018	P-195	9	6.41	180	HDPE	120	-0.05	0.22	0.056
196	J-2018	J-170	P-196	58	6.41	180	HDPE	120	-0.004	0.02	0.001
197	J-52	J-2018	P-197	198	3.21	90	HDPE	120	0.048	0.86	1.501
198	J-118	J-57	P-198	214	3.21	90	HDPE	120	0.046	0.82	1.383
199	J-119	J-171	P-199	61	4.45	125	HDPE	120	0.064	0.65	0.649
200	J-171	J-118	P-200	103	4.45	125	HDPE	120	0.046	0.47	0.355
201	J-171	J-36	P-201	210	3.21	90	HDPE	120	0.043	0.76	1.185
202	J-10	J-172	P-202	108	4.45	125	HDPE	120	0.056	0.56	0.495
203	J-172	J-119	P-203	54	4.45	125	HDPE	120	0.039	0.39	0.253
204	J-56	J-172	P-204	217	3.21	90	HDPE	120	-0.037	0.66	0.93
205	J-10	J-173	P-205	112	4.45	125	HDPE	120	-0.064	0.65	0.645
206	J-173	J-63	P-206	104	4.45	125	HDPE	120	-0.071	0.72	0.776
207	J-58	J-173	P-207	200	3.21	90	HDPE	120	-0.028	0.51	0.564
208	J-63	J-174	P-208	113	4.45	125	HDPE	120	-0.095	0.96	1.331
209	J-62	J-174	P-209	202	3.21	90	HDPE	120	-0.011	0.2	0.098
210	J-174	J-175	P-210	108	4.45	125	HDPE	120	-0.116	1.18	1.936
211	J-175	J-4	P-211	59	4.45	125	HDPE	120	-0.105	1.07	1.61
212	J-175	J-176	P-212	121	3.21	90	HDPE	120	-0.027	0.47	0.499
213	J-4	J-177	P-213	120	6.41	180	HDPE	120	-0.053	0.24	0.062
214	J-177	J-33	P-214	78	6.41	180	HDPE	120	-0.09	0.4	0.162
215	J-176	J-177	P-215	61	3.21	90	HDPE	120	-0.032	0.57	0.696
216	J-155	J-178	P-216	66	6.41	180	HDPE	120	-0.083	0.37	0.14
217	J-178	J-115	P-217	104	6.41	180	HDPE	120	-0.096	0.43	0.183
218	J-178	J-179	P-218	203	3.21	90	HDPE	120	0.053	0.94	1.785
219	J-179	J-180	P-219	85	3.21	90	HDPE	120	0.037	0.65	0.902
220	J-180	J-181	P-220	31	3.21	90	HDPE	120	0.033	0.58	0.731
221	J-182	J-156	P-221	55	4.45	125	HDPE	120	0.046	0.47	0.353
222	J-181	J-182	P-222	90	3.21	90	HDPE	120	0.029	0.51	0.568
223	J-179	J-183	P-223	104	3.21	90	HDPE	120	0.007	0.13	0.044
224	J-183	J-184	P-224	99	3.21	90	HDPE	120	0.014	0.25	0.156
225	J-52	J-185	P-225	208	3.21	90	HDPE	120	-0.021	0.38	0.329
226	J-185	J-53	P-226	276	3.21	90	HDPE	120	-0.053	0.94	1.773
227	J-184	J-185	P-227	121	3.21	90	HDPE	120	0.02	0.36	0.294
228	J-115	J-186	P-228	116	6.41	180	HDPE	120	-0.104	0.47	0.215
229	J-186	J-53	P-229	117	6.41	180	HDPE	120	-0.11	0.49	0.237
230	J-184	J-186	P-230	247	3.21	90	HDPE	120	-0.052	0.93	1.723
231	J-183	J-115	P-231	229	3.21	90	HDPE	120	-0.051	0.92	1.686
232	J-187	J-182	P-232	111	4.45	125	HDPE	120	0.022	0.22	0.09
233	J-183	J-187	P-233	205	3.21	90	HDPE	120	0.031	0.55	0.667
234	J-169	J-188	P-234	58	4.45	125	HDPE	120	-0.021	0.22	0.085
235	J-188	J-187	P-235	101	4.45	125	HDPE	120	0.001	0.01	0
236	J-184	J-188	P-236	210	3.21	90	HDPE	120	0.029	0.51	0.578
237	J-113	J-189	P-237	116	6.41	180	HDPE	120	-0.083	0.37	0.141
238	J-189	J-120	P-238	55	6.41	180	HDPE	120	-0.124	0.55	0.297
239	J-189	J-171	P-239	567	3.21	90	HDPE	120	0.036	0.64	0.857
240	J-120	J-190	P-240	52	6.41	180	HDPE	120	-0.161	0.72	0.479

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
241	J-190	J-11	P-241	116	6.41	180	HDPE	120	-0.157	0.7	0.46
242	J-172	J-190	P-242	559	3.21	90	HDPE	120	-0.036	0.63	0.847
243	J-191	J-64	P-243	111	6.41	180	HDPE	120	-0.137	0.61	0.357
244	J-191	J-173	P-244	541	3.21	90	HDPE	120	0.034	0.61	0.801
245	J-192	J-193	P-245	40	3.21	90	HDPE	120	-0.038	0.67	0.943
246	J-193	J-194	P-246	18	3.21	90	HDPE	120	-0.04	0.71	1.053
247	J-5	J-195	P-247	119	6.41	180	HDPE	120	0.094	0.42	0.177
248	J-194	J-195	P-248	227	3.21	90	HDPE	120	-0.048	0.86	1.508
249	J-192	J-196	P-249	93	4.45	125	HDPE	120	0.011	0.11	0.025
250	J-196	J-63	P-250	311	4.45	125	HDPE	120	0.026	0.26	0.118
251	J-196	J-197	P-251	109	3.21	90	HDPE	120	-0.04	0.71	1.052
252	J-197	J-198	P-252	108	3.21	90	HDPE	120	-0.053	0.94	1.758
253	J-195	J-199	P-253	110	6.41	180	HDPE	120	0.018	0.08	0.008
254	J-199	J-4	P-254	316	6.41	180	HDPE	120	-0.049	0.22	0.052
255	J-198	J-199	P-255	54	3.21	90	HDPE	120	-0.053	0.94	1.773
256	J-197	J-174	P-256	311	3.21	90	HDPE	120	0.002	0.04	0.004
257	J-198	J-175	P-257	317	3.21	90	HDPE	120	-0.008	0.14	0.053
258	J-200	J-4	P-258	67	4.45	125	HDPE	120	0.106	1.08	1.649
259	J-108	J-201	P-259	102	8.01	225	HDPE	120	-0.085	0.24	0.05
260	J-201	J-122	P-260	195	8.01	225	HDPE	120	-0.1	0.28	0.067
261	J-201	J-202	P-261	280	3.21	90	HDPE	120	0.007	0.12	0.039
262	J-202	J-203	P-262	46	3.21	90	HDPE	120	-0.034	0.61	0.787
263	J-203	J-204	P-263	213	3.21	90	HDPE	120	0.007	0.12	0.038
264	J-204	J-205	P-264	96	3.21	90	HDPE	120	-0.045	0.79	1.296
265	J-205	J-124	P-265	55	3.21	90	HDPE	120	0.022	0.38	0.339
266	J-206	J-123	P-266	53	4.45	125	HDPE	120	0.103	1.04	1.552
267	J-205	J-206	P-267	38	3.21	90	HDPE	120	-0.069	1.23	2.935
268	J-11	J-207	P-268	57	6.41	180	HDPE	120	-0.142	0.63	0.38
269	J-207	J-191	P-269	55	6.41	180	HDPE	120	-0.1	0.45	0.198
270	J-204	J-207	P-270	151	3.21	90	HDPE	120	0.044	0.78	1.265
271	J-64	J-208	P-271	54	6.41	180	HDPE	120	-0.139	0.62	0.368
272	J-208	J-5	P-272	213	6.41	180	HDPE	120	-0.107	0.48	0.225
273	J-208	J-202	P-273	110	3.21	90	HDPE	120	-0.035	0.63	0.838
274	J-122	J-209	P-274	280	3.21	90	HDPE	120	-0.034	0.61	0.797
275	J-209	J-206	P-275	217	3.21	90	HDPE	120	-0.01	0.17	0.078
276	J-203	J-209	P-276	139	3.21	90	HDPE	120	-0.049	0.87	1.519
277	J-124	J-210	P-277	127	3.21	90	HDPE	120	0.024	0.43	0.423
278	J-210	J-125	P-278	197	3.21	90	HDPE	120	-0.033	0.59	0.751
279	J-210	J-211	P-279	148	3.21	90	HDPE	120	0.048	0.85	1.482
280	J-211	J-212	P-280	8	3.21	90	HDPE	120	0.045	0.8	1.304
281	J-212	J-190	P-281	77	3.21	90	HDPE	120	0.042	0.74	1.137
282	J-114	J-213	P-282	169	6.41	180	HDPE	120	0.379	1.69	2.341
283	J-213	J-214	P-283	64	3.21	90	HDPE	120	0.061	1.09	2.332
284	J-214	J-215	P-284	188	3.21	90	HDPE	120	0.056	1	1.982
285	J-215	J-53	P-285	101	3.21	90	HDPE	120	0.047	0.84	1.433
286	J-213	J-216	P-286	98	6.41	180	HDPE	120	0.312	1.39	1.635
287	J-216	J-100	P-287	54	6.41	180	HDPE	120	0.258	1.15	1.147
288	J-216	J-186	P-288	321	3.21	90	HDPE	120	0.051	0.91	1.662

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
289	J-117	J-217	P-289	125	6.41	180	HDPE	120	0.232	1.03	0.941
290	J-217	J-102	P-290	52	6.41	180	HDPE	120	0.181	0.81	0.599
291	J-217	J-178	P-291	231	3.21	90	HDPE	120	0.043	0.77	1.226
292	J-102	J-218	P-292	16	6.41	180	HDPE	120	0.21	0.94	0.785
293	J-218	J-92	P-293	104	6.41	180	HDPE	120	0.163	0.73	0.492
294	J-218	J-155	P-294	210	3.21	90	HDPE	120	0.042	0.76	1.183
295	J-92	J-219	P-295	30	6.41	180	HDPE	120	0.168	0.75	0.518
296	J-151	J-220	P-296	61	6.41	180	HDPE	120	-0.05	0.22	0.055
297	J-220	J-153	P-297	48	6.41	180	HDPE	120	-0.011	0.05	0.003
298	J-219	J-220	P-298	162	3.21	90	HDPE	120	0.042	0.74	1.136
299	J-109	J-206	P-299	113	4.45	125	HDPE	120	0.186	1.88	4.622
300	J-137	J-209	P-300	109	3.21	90	HDPE	120	0.084	1.49	4.137
301	J-110	J-221	P-301	100	8.01	225	HDPE	120	-0.34	0.97	0.647
302	J-221	J-81	P-302	344	8.01	225	HDPE	120	-0.178	0.51	0.196
303	J-221	J-222	P-303	220	3.21	90	HDPE	120	-0.1	1.79	5.814
304	J-136	J-223	P-304	220	3.21	90	HDPE	120	0.116	2.07	7.658
305	J-223	J-137	P-305	79	3.21	90	HDPE	120	0.126	2.25	8.903
306	J-222	J-223	P-306	58	3.21	90	HDPE	120	0.016	0.28	0.188
307	J-222	J-79	P-307	234	3.21	90	HDPE	120	-0.126	2.23	8.803
308	J-83	J-2082	P-308	19	9.97	280	HDPE	120	1.558	2.87	3.74
309	J-2082	J-82	P-309	109	9.97	280	HDPE	120	1.393	2.57	3.037
310	J-20	J-224	P-310	216	6.41	180	HDPE	120	-0.097	0.43	0.189
311	J-224	J-19	P-311	61	6.41	180	HDPE	120	-0.102	0.46	0.207
312	J-224	J-225	P-312	140	3.21	90	HDPE	120	0	0	0.004
313	J-225	J-226	P-313	197	3.21	90	HDPE	120	-0.002	0.03	0.002
314	J-226	J-227	P-314	46	3.21	90	HDPE	120	-0.006	0.11	0.03
315	J-227	J-104	P-315	194	3.21	90	HDPE	120	-0.014	0.26	0.159
316	J-227	J-228	P-316	98	3.21	90	HDPE	120	0.003	0.05	0.007
317	J-228	J-229	P-317	99	3.21	90	HDPE	120	0.007	0.13	0.042
318	J-2098	J-21	P-318	68	6.41	180	HDPE	120	0.084	0.38	0.145
319	J-229	J-2098	P-319	138	3.21	90	HDPE	120	0.01	0.17	0.074
320	J-2099	J-2098	P-320	84	6.41	180	HDPE	120	0.083	0.37	0.142
321	J-2099	J-230	P-321	112	3.21	90	HDPE	120	-0.004	0.07	0.013
322	J-230	J-231	P-322	52	3.21	90	HDPE	120	-0.014	0.24	0.143
323	J-231	J-232	P-323	15	3.21	90	HDPE	120	-0.017	0.3	0.21
324	J-232	J-233	P-324	183	3.21	90	HDPE	120	-0.016	0.28	0.188
325	J-94	J-2104	P-325	42	4.45	125	HDPE	120	-0.025	0.25	0.112
326	J-233	J-2104	P-326	61	3.21	90	HDPE	120	-0.018	0.32	0.236
327	J-232	J-234	P-327	78	3.21	90	HDPE	120	-0.003	0.06	0.009
328	J-234	J-235	P-328	70	3.21	90	HDPE	120	-0.016	0.28	0.185
329	J-235	J-105	P-329	28	3.21	90	HDPE	120	-0.018	0.32	0.247
330	J-106	J-236	P-330	24	3.21	90	HDPE	120	0.006	0.11	0.033
331	J-236	J-237	P-331	87	3.21	90	HDPE	120	0.004	0.07	0.016
332	J-237	J-238	P-332	13	3.21	90	HDPE	120	0.002	0.03	0.004
333	J-238	J-239	P-333	17	3.21	90	HDPE	120	0.001	0.02	0.002
334	J-239	J-240	P-334	12	3.21	90	HDPE	120	0.001	0.02	0.001
335	J-240	J-233	P-335	38	3.21	90	HDPE	120	0	0.01	0
336	J-22	J-241	P-336	67	6.41	180	HDPE	120	0.087	0.39	0.154

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
337	J-241	J-2099	P-337	62	6.41	180	HDPE	120	0.084	0.38	0.145
338	J-241	J-231	P-338	95	3.21	90	HDPE	120	-0.001	0.01	0
339	J-229	J-230	P-339	95	3.21	90	HDPE	120	-0.006	0.11	0.034
340	J-228	J-234	P-340	155	3.21	90	HDPE	120	-0.009	0.16	0.066
341	J-104	J-242	P-341	125	3.21	90	HDPE	120	-0.024	0.42	0.407
342	J-92	J-243	P-342	239	4.45	125	HDPE	120	-0.009	0.09	0.017
343	J-243	J-107	P-343	90	4.45	125	HDPE	120	-0.042	0.43	0.298
344	J-242	J-243	P-344	64	3.21	90	HDPE	120	-0.027	0.48	0.501
345	J-219	J-244	P-345	38	6.41	180	HDPE	120	0.123	0.55	0.294
346	J-244	J-103	P-346	155	6.41	180	HDPE	120	0.114	0.51	0.254
347	J-242	J-244	P-347	261	3.21	90	HDPE	120	-0.003	0.06	0.006
348	J-101	J-245	P-348	105	4.45	125	HDPE	120	-0.083	0.85	1.049
349	J-245	J-246	P-349	55	3.21	90	HDPE	120	0.009	0.16	0.069
350	J-99	J-247	P-350	55	4.45	125	HDPE	120	0.074	0.75	0.843
351	J-246	J-247	P-351	115	3.21	90	HDPE	120	-0.018	0.31	0.229
352	J-246	J-248	P-352	40	3.21	90	HDPE	120	0.025	0.44	0.44
353	J-101	J-249	P-353	88	3.21	90	HDPE	120	0	0.01	0
354	J-249	J-102	P-354	282	3.21	90	HDPE	120	0.031	0.55	0.66
355	J-248	J-249	P-355	104	3.21	90	HDPE	120	0.036	0.63	0.851
356	J-247	J-250	P-356	51	4.45	125	HDPE	120	0.054	0.55	0.466
357	J-250	J-100	P-357	145	4.45	125	HDPE	120	0.035	0.35	0.207
358	J-248	J-250	P-358	117	3.21	90	HDPE	120	-0.015	0.27	0.176
359	J-24	J-2122	P-359	27	6.41	180	HDPE	120	0.076	0.34	0.119
360	J-2122	J-94	P-360	165	6.41	180	HDPE	120	0.083	0.37	0.141
361	J-2122	J-2123	P-361	45	3.21	90	HDPE	120	-0.012	0.21	0.109
362	J-2123	J-2124	P-362	102	3.21	90	HDPE	120	-0.02	0.35	0.289
363	J-2124	J-2125	P-363	93	3.21	90	HDPE	120	-0.025	0.44	0.429
364	J-2125	J-251	P-364	93	3.21	90	HDPE	120	-0.041	0.74	1.13
365	J-251	J-252	P-365	60	3.21	90	HDPE	120	-0.016	0.29	0.196
366	J-252	J-253	P-366	152	3.21	90	HDPE	120	0.01	0.18	0.081
367	J-97	J-254	P-367	102	3.21	90	HDPE	120	-0.025	0.44	0.429
368	J-254	J-93	P-368	163	3.21	90	HDPE	120	-0.025	0.44	0.436
369	J-253	J-254	P-369	78	3.21	90	HDPE	120	0.005	0.09	0.024
370	J-252	J-255	P-370	156	3.21	90	HDPE	120	-0.03	0.53	0.613
371	J-25	J-256	P-371	79	4.45	125	HDPE	120	-0.005	0.05	0.005
372	J-256	J-255	P-372	62	4.45	125	HDPE	120	-0.039	0.4	0.257
373	J-251	J-256	P-373	155	3.21	90	HDPE	120	-0.029	0.52	0.59
374	J-2125	J-2132	P-374	74	3.21	90	HDPE	120	0.013	0.23	0.127
375	J-25	J-2132	P-375	147	6.41	180	HDPE	120	0.287	1.28	1.402
376	J-2104	J-257	P-376	61	4.45	125	HDPE	120	-0.045	0.45	0.331
377	J-2123	J-257	P-377	155	3.21	90	HDPE	120	0.005	0.09	0.021
378	J-257	J-258	P-378	106	4.45	125	HDPE	120	-0.043	0.44	0.307
379	J-258	J-95	P-379	84	4.45	125	HDPE	120	-0.047	0.48	0.365
380	J-2124	J-258	P-380	155	3.21	90	HDPE	120	0	0.01	0
381	J-93	J-259	P-381	30	3.21	90	HDPE	120	-0.028	0.5	0.538
382	J-259	J-260	P-382	146	3.21	90	HDPE	120	-0.033	0.59	0.756
383	J-260	J-261	P-383	62	4.45	125	HDPE	120	-0.081	0.82	0.995
384	J-101	J-261	P-384	405	3.21	90	HDPE	120	-0.023	0.41	0.376

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
385	J-255	J-262	P-385	99	4.45	125	HDPE	120	-0.074	0.75	0.834
386	J-262	J-260	P-386	16	4.45	125	HDPE	120	-0.046	0.46	0.344
387	J-262	J-263	P-387	146	3.21	90	HDPE	120	-0.031	0.55	0.652
388	J-2140	J-25	P-388	173	6.41	180	HDPE	120	0.283	1.26	1.369
389	J-263	J-2140	P-389	149	3.21	90	HDPE	120	-0.02	0.36	0.291
390	J-261	J-264	P-390	141	3.21	90	HDPE	120	-0.02	0.35	0.282
391	J-263	J-264	P-391	74	3.21	90	HDPE	120	-0.015	0.26	0.162
392	J-264	J-265	P-392	57	3.21	90	HDPE	120	-0.039	0.69	1.006
393	J-265	J-2143	P-393	115	3.21	90	HDPE	120	-0.023	0.42	0.39
394	J-26	J-2144	P-394	153	6.41	180	HDPE	120	0.333	1.49	1.844
395	J-2144	J-2140	P-395	70	6.41	180	HDPE	120	0.304	1.36	1.562
396	J-2143	J-2144	P-396	71	3.21	90	HDPE	120	-0.028	0.49	0.536
397	J-265	J-2145	P-397	95	3.21	90	HDPE	120	-0.019	0.34	0.271
398	J-2145	J-111	P-398	98	3.21	90	HDPE	120	-0.018	0.33	0.249
399	J-2145	J-2146	P-399	57	3.21	90	HDPE	120	-0.004	0.08	0.017
400	J-2146	J-2147	P-400	111	3.21	90	HDPE	120	-0.025	0.44	0.436
401	J-266	J-17	P-401	43	4.45	125	HDPE	120	-0.108	1.09	1.685
402	J-2147	J-266	P-402	288	3.21	90	HDPE	120	-0.012	0.21	0.075
403	J-261	J-267	P-403	56	4.45	125	HDPE	120	-0.087	0.89	1.148
404	J-2146	J-267	P-404	291	3.21	90	HDPE	120	0.017	0.3	0.206
405	J-111	J-268	P-405	167	3.21	90	HDPE	120	-0.023	0.42	0.389
406	J-2147	J-268	P-406	100	3.21	90	HDPE	120	-0.024	0.43	0.406
407	J-268	J-269	P-407	111	3.21	90	HDPE	120	-0.057	1.02	2.063
408	J-17	J-270	P-408	58	4.45	125	HDPE	120	-0.143	1.45	2.857
409	J-269	J-270	P-409	387	3.21	90	HDPE	120	0.006	0.11	0.023
410	J-269	J-271	P-410	49	3.21	90	HDPE	120	-0.069	1.23	2.921
411	J-271	J-128	P-411	109	3.21	90	HDPE	120	-0.085	1.51	4.28
412	J-270	J-272	P-412	45	4.45	125	HDPE	120	-0.141	1.43	2.789
413	J-271	J-272	P-413	390	3.21	90	HDPE	120	0.009	0.16	0.068
414	J-272	J-273	P-414	108	4.45	125	HDPE	120	-0.156	1.58	3.334
415	J-128	J-273	P-415	388	3.21	90	HDPE	120	0.022	0.39	0.343
416	J-273	J-274	P-416	109	3.21	90	HDPE	120	-0.037	0.67	0.938
417	J-274	J-275	P-417	106	3.21	90	HDPE	120	0.001	0.02	0.002
418	J-275	J-276	P-418	108	3.21	90	HDPE	120	0.04	0.71	1.059
419	J-276	J-277	P-419	139	4.45	125	HDPE	120	0.144	1.46	2.886
420	J-277	J-278	P-420	11	4.45	125	HDPE	120	0.152	1.54	3.188
421	J-278	J-279	P-421	84	4.45	125	HDPE	120	0.149	1.51	3.067
422	J-98	J-280	P-422	15	4.45	125	HDPE	120	-0.071	0.72	0.77
423	J-280	J-99	P-423	18	4.45	125	HDPE	120	0.075	0.77	0.871
424	J-279	J-280	P-424	56	4.45	125	HDPE	120	0.146	1.48	2.973
425	J-273	J-281	P-425	88	4.45	125	HDPE	120	-0.103	1.04	1.543
426	J-281	J-16	P-426	114	4.45	125	HDPE	120	-0.12	1.22	2.078
427	J-281	J-282	P-427	231	3.21	90	HDPE	120	0.012	0.21	0.109
428	J-283	J-90	P-428	20	6.41	180	HDPE	120	0.024	0.11	0.015
429	J-274	J-283	P-429	201	3.21	90	HDPE	120	-0.045	0.79	1.295
430	J-90	J-284	P-430	91	6.41	180	HDPE	120	0.068	0.3	0.097
431	J-275	J-284	P-431	196	3.21	90	HDPE	120	-0.044	0.79	1.286
432	J-285	J-34	P-432	61	6.41	180	HDPE	120	-0.047	0.21	0.049

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
433	J-276	J-285	P-433	200	4.45	125	HDPE	120	-0.111	1.13	1.791
434	J-272	J-286	P-434	181	3.21	90	HDPE	120	0.017	0.3	0.21
435	J-286	J-287	P-435	25	3.21	90	HDPE	120	0.013	0.24	0.139
436	J-287	J-277	P-436	140	3.21	90	HDPE	120	0.011	0.19	0.092
437	J-17	J-288	P-437	180	3.21	90	HDPE	120	0.031	0.56	0.669
438	J-288	J-289	P-438	13	3.21	90	HDPE	120	0.029	0.52	0.601
439	J-289	J-290	P-439	41	3.21	90	HDPE	120	0.027	0.47	0.499
440	J-290	J-291	P-440	99	3.21	90	HDPE	120	0.024	0.43	0.413
441	J-267	J-292	P-441	48	4.45	125	HDPE	120	-0.074	0.75	0.845
442	J-292	J-266	P-442	72	4.45	125	HDPE	120	-0.091	0.92	1.237
443	J-291	J-292	P-443	224	3.21	90	HDPE	120	-0.012	0.22	0.12
444	J-291	J-293	P-444	92	3.21	90	HDPE	120	0.03	0.53	0.616
445	J-245	J-294	P-445	18	4.45	125	HDPE	120	-0.094	0.95	1.309
446	J-294	J-98	P-446	67	4.45	125	HDPE	120	-0.069	0.7	0.748
447	J-293	J-294	P-447	86	3.21	90	HDPE	120	0.026	0.46	0.465
448	J-284	J-295	P-448	32	6.41	180	HDPE	120	0.019	0.09	0.009
449	J-295	J-285	P-449	79	6.41	180	HDPE	120	0.068	0.3	0.097
450	J-91	J-296	P-450	109	4.45	125	HDPE	120	-0.064	0.65	0.652
451	J-296	J-12	P-451	43	4.45	125	HDPE	120	-0.12	1.22	2.076
452	J-295	J-296	P-452	243	3.21	90	HDPE	120	-0.052	0.93	1.722
453	J-16	J-297	P-453	39	6.41	180	HDPE	120	0.028	0.12	0.019
454	J-297	J-283	P-454	74	6.41	180	HDPE	120	0.072	0.32	0.109
455	J-13	J-298	P-455	34	4.45	125	HDPE	120	0.045	0.45	0.33
456	J-298	J-91	P-456	111	4.45	125	HDPE	120	-0.009	0.09	0.016
457	J-297	J-298	P-457	223	3.21	90	HDPE	120	-0.048	0.85	1.471
458	J-299	J-16	P-458	120	6.41	180	HDPE	120	0.153	0.68	0.436
459	J-14	J-300	P-459	27	4.45	125	HDPE	120	0.103	1.05	1.56
460	J-300	J-13	P-460	125	4.45	125	HDPE	120	0.05	0.51	0.404
461	J-299	J-300	P-461	215	3.21	90	HDPE	120	-0.049	0.88	1.567
462	J-301	J-299	P-462	118	6.41	180	HDPE	120	0.111	0.5	0.242
463	J-14	J-302	P-463	83	4.45	125	HDPE	120	0.06	0.6	0.564
464	J-301	J-302	P-464	221	3.21	90	HDPE	120	-0.046	0.82	1.373
465	J-85	J-303	P-465	111	8.01	225	HDPE	120	0.977	2.79	4.577
466	J-303	J-12	P-466	66	8.01	225	HDPE	120	0.955	2.73	4.383
467	J-77	J-303	P-467	418	3.21	90	HDPE	120	-0.017	0.31	0.228
468	J-302	J-304	P-468	66	4.45	125	HDPE	120	0.009	0.09	0.016
469	J-304	J-89	P-469	102	4.45	125	HDPE	120	-0.044	0.44	0.317
470	J-112	J-305	P-470	49	6.41	180	HDPE	120	0.028	0.13	0.019
471	J-305	J-301	P-471	92	6.41	180	HDPE	120	0.07	0.31	0.104
472	J-304	J-305	P-472	206	3.21	90	HDPE	120	0.047	0.83	1.416
473	J-89	J-306	P-473	10	3.21	90	HDPE	120	-0.095	1.69	5.239
474	J-306	J-88	P-474	53	3.21	90	HDPE	120	-0.058	1.03	2.086
475	J-86	J-307	P-475	106	4.45	125	HDPE	120	-0.108	1.1	1.708
476	J-307	J-78	P-476	53	4.45	125	HDPE	120	-0.135	1.37	2.553
477	J-306	J-307	P-477	141	3.21	90	HDPE	120	-0.038	0.68	0.985
478	J-133	J-308	P-478	68	6.41	180	HDPE	120	0.242	1.08	1.022
479	J-308	J-127	P-479	123	6.41	180	HDPE	120	0.26	1.16	1.164
480	J-308	J-309	P-480	274	3.21	90	HDPE	120	-0.021	0.36	0.29

KAMOKI RASOOL NAGAR WATER SUPPLY SYSTEM - DESIGN 2032

Sr no.	Start Node	Stop Node	Label	Length (ft)	Diameter i/d (in)	Diameter o/d (mm)	Material	Hazen-Williams C	Flow (cfs)	Velocity (ft/s)	Headloss Gradient (m/km)
481	J-309	J-310	P-481	43	3.21	90	HDPE	120	0.002	0.04	0
482	J-132	J-311	P-482	91	6.41	180	HDPE	120	0.092	0.41	0.169
483	J-311	J-30	P-483	53	6.41	180	HDPE	120	0.052	0.23	0.058
484	J-310	J-311	P-484	206	3.21	90	HDPE	120	-0.036	0.64	0.859
485	J-132	J-312	P-485	207	4.45	125	HDPE	120	0.072	0.74	0.81
486	J-312	J-133	P-486	236	4.45	125	HDPE	120	0.029	0.29	0.146
487	J-309	J-312	P-487	52	3.21	90	HDPE	120	-0.026	0.46	0.47
488	J-310	J-129	P-488	45	3.21	90	HDPE	120	0.036	0.63	0.851
489	J-307	J-313	P-489	404	3.21	90	HDPE	120	-0.019	0.35	0.277
490	J-314	J-86	P-490	398	4.45	125	HDPE	120	0.031	0.32	0.172
491	J-313	J-314	P-491	111	4.45	125	HDPE	120	0.119	1.21	2.026
492	J-134	J-315	P-492	63	6.41	180	HDPE	120	0.118	0.53	0.271
493	J-314	J-315	P-493	124	4.45	125	HDPE	120	0.101	1.02	1.486
494	J-315	J-316	P-494	46	6.41	180	HDPE	120	0.213	0.95	0.808
495	J-316	J-135	P-495	96	6.41	180	HDPE	120	0.183	0.82	0.61
496	J-317	J-133	P-496	249	6.41	180	HDPE	120	0.216	0.96	0.826
497	J-316	J-317	P-497	296	3.21	90	HDPE	120	0.023	0.42	0.394
498	J-78	J-318	P-498	406	3.21	90	HDPE	120	-0.02	0.35	0.28
499	J-313	J-318	P-499	47	4.45	125	HDPE	120	-0.145	1.47	2.925
500	J-319	J-69	P-500	394	3.21	90	HDPE	120	0.012	0.21	0.107
501	J-318	J-319	P-501	109	4.45	125	HDPE	120	-0.154	1.56	3.277
502	J-320	J-71	P-502	413	3.21	90	HDPE	120	0.002	0.04	0.005
503	J-319	J-320	P-503	112	4.45	125	HDPE	120	-0.154	1.56	3.259
504	J-321	J-68	P-504	407	3.21	90	HDPE	120	-0.008	0.15	0.058
505	J-320	J-321	P-505	101	4.45	125	HDPE	120	-0.157	1.59	3.377
506	J-322	J-67	P-506	398	3.21	90	HDPE	120	-0.008	0.15	0.057
507	J-321	J-322	P-507	113	4.45	125	HDPE	120	-0.161	1.64	3.57
508	J-323	J-66	P-508	393	3.21	90	HDPE	120	-0.025	0.45	0.448
509	J-322	J-323	P-509	116	4.45	125	HDPE	120	-0.164	1.67	3.69
510	J-323	J-18	P-510	109	4.45	125	HDPE	120	-0.139	1.41	2.703
511	J-134	J-2213	P-511	226	4.45	125	HDPE	120	0.048	0.49	0.379
512	J-2213	J-317	P-512	121	6.41	180	HDPE	120	0.198	0.89	0.707
513	580	J-324	P-513	368	4.45	125	HDPE	120	0.022	0.23	0.092
514	J-324	J-41	P-514	30	4.45	125	HDPE	120	0.098	1	1.423
515	J-166	J-324	P-515	259	4.45	125	HDPE	120	0.093	0.94	1.285
516	J-135	J-2216	P-516	372	4.45	125	HDPE	120	0.001	0.01	0

