GOVERNMENT OF PAKITAN
PLANNING COMMISSION

PC-II FORM

1	**Name by which Survey / Feasibility will be Identified:**	**CONSULTACNY SERVICES FOR "SEWERAGE SYSTEM IN JAHANGIR ABAD MULTAN AND ADJACENT AREAS"** (Annual Development Program (ADP) 2022-23 GS No. 4349)
2	**Administrative Authorities Responsible for:**	Housing Urban Development and Public Health Engineering Department
	i. Sponsoring:	Government of the Punjab
	ii. Execution:	Water and Sanitation Agency (WASA), Multan
3	**Details of Survey / Feasibility Study:**	
	i. General Description and Justification:	**Aims & Objectives:** The scheme is enlisted in Annual Development Program (ADP) 2022-23 GS No. 4349. The overall aim of PC-II is to hire consultant to review the preliminary design carried out in Master Plan 2015-40 and to update the Feasibility Study, Preparation of updated Detailed Engineering Design(s), Cost Estimate(s), PC-I, Tender / Bidding Documents and resident supervision of subject scheme, for the area of Jahangirabad, Multan. **General Description:** **A. Location:** Multan is the seventh largest City of Pakistan, located on the bank of the Chenab River, falling under the jurisdiction of Southern Punjab and is the major cultural and economic center of Southern Punjab. The coordinates of Multan city are 30.1575° N, 71.5249° E. The area of the scheme locates at the north-east side of Multan City. **B. Background:** The Government of the Punjab & Pakistan is taking keen interest to resolve the chronic sewerage / sanitation issues of Multan city on priority basis. In this regard, a

		meeting was held on 13.04.2022 in the Committee room of Deputy Commissioner Multan under the Chairmanship of Secretary P&D Board Lahore, to discuss and propose viable proposals to mitigate the sanitation related issues of the city. The main agenda of the meeting was to "Review of existing sewerage network of Multan city and finalization of viable proposals & projects to cater the futuristic demand of sanitation issues". After detailed deliberations, the following decisions regarding sewerage related issues were made during the meeting, conveyed from Deputy Commissioner Multan vide No. DDD/245/Mul dated: 16-04-2022. Copy enclosed as **Annexure –A** i. It was decided to propose new schemes of Augmentation/Improvement of Disposal Stations, Replacement of outlived sewerage, water Treatment Plants along-with procurement of Machinery amounting to Rs. 24.00 Billion in the next Annual Development Programme (ADP) 2022-23 in alignment with WASA Master Plan (2015-40), dully approved by Governing Body MDA in its 74th meeting held on 18-12-2017, which will aid to cater the sanitation issues for the 80% of the population and 70% of the area under jurisdiction of WASA Multan. ii. It was further decided in the meeting that WASA will also prepare a comprehensive scheme regarding provision of sullage carrier amounting to Rs. 15.00 Billion for inclusion of next ADP 2022-23 to mitigate the sewerage issues of the city for ultimate disposal of wastewater effluent from disposal stations located in South Zone. iii. The gestation period for these schemes will be taken for two (02) years. iv. It was decided that MD WASA in consultation with Urban Unit will plan and conduct proper survey and field visits of new proposed schemes and submit sub-schemes as per need of the city.

		v. Proper procurement strategy may be formulated by WASA Multan for successful planning and initiation of this development package. vi. PC-I of these schemes will be prepared and submitted in P&D Board through Secretary HUD & PHE Department within two weeks by WASA. vii. Third Party Validation of these schemes would be conducted by IDAP, Punjab. viii. In future, WASA will incorporate the restoration of roads component in their PC-I. ix. The need & pre-feasibility of the instant project has been vetted by 'The Urban Unit', Lahore team. The main aim of the project is to provide proper sewerage facilities in the unserved/partially served areas of Jahangir Abad with necessary arrangements of sewerage system and disposal station in the light of WASA Master Plan (2015-40). The major objectives of the schemes for the job to be done by the consultants are as under:- **Phase – I: <u>Feasibility Study / Design Phase</u>** **i. Preparation of Feasibility Study:** The main objective of the scheme is to propose a workable, technically sound, sustainable and financially viable sewerage solution for Jahangir Abad keeping in view WASA Master Plan 2015-40. **ii. Preparation of PC-I:** Prepare PC-I including surveying, drawings, preparing the specifications, summaries, explanatory notes, and bill of quantities, cost estimates and bidding documents. **iii. Detailed Engineering Design:**

		Preparation of Detailed Engineering design to ensure effective and efficient utilization of the public money which fulfill all the needs of the client for replacement of outlived sewers in Multan and making it an integral part of sewerage master plan for collection and disposal facilities in Multan. **iv. Preparation of Tender / Bidding Document for floating the Tenders:** Preparation of Tender Documents for the tendering of Contractor for the execution of instant ADP Scheme. **v. Preparation of IEE/EIA:** Preparation of IEE/EIA report for scheme and its subsequent approval from the EPA, Punjab. **Phase – II: <u>Resident Supervision</u>** **i. Resident Supervision:** Resident Supervision is the integral part of this consultancy as consultants have to perform full supervision of all the activities of the project to ensure the quality & quantity. Consultancy Firm having national repute and adequate experience in this domain will be hired to conduct this Feasibility Study, Detailed Engineering Design & preparation of PC-I & Resident Supervision **C. Project Description:** WASA Multan is providing sanitation services to 65% population of the city through more than 2055-Km sewer Network ranging from 9" to 72" i/d, through 15 Disposal Stations and 10 Lift Stations. WASA Multan is responsible for the planning, design, construction, operation & maintenance of water supply, sewerage and drainage facilities including rehabilitation and augmentation of the

		existing systems. The remaining 35% population of the city is still unserved in terms of sewerage facility. There exist one (01) Wastewater Treatment Plant (STP-02) at Suraj Miani having an area of 184 Acres with a treatment capacity of 59 Million Gallons per day (MGD). This wastewater treatment plant comprises waste stabilization ponds (Anaerobic & Facultative) which is collecting wastewater from the four (04) disposal stations (Bosan Road, Inner Bypass, Suraj Miani and Chungi No. 09) and disposing it off into River Chenab after treatment. WASA Multan has proposed to facilitate the residents of Jahangir Abad and its adjoining areas with proper sewerage facility, as rapid urbanization/development is taking place in these areas. At present, there exist partial/improper sewerage & disposal system in Jahangirabad. Non-Availability of proper sewerage facility in above unserved areas is leading towards serious environmental hazards. The said scheme is the integral part of WASA Master Plan 2015-40 **(Annexure –B).** The implementation of said scheme will provide better living conditions and improve sanitation and control water borne diseases, as a result the environment will be greatly improved. The second most important aspect of the project to safeguard city and city roads from ponding of wastewater. The technical expertise are not available with WASA Multan to conduct the feasibility report and carryout detailed design. Further, as per the framework issued by the P&D Board, the consultancy services are mandatory for the implementation of the instant project. Therefore, the consultancy services will be required to determine the viability and the cost effectiveness of the scheme. Water and Sanitation Agency, (MDA) Multan has proposed to hire the services of a consultancy Firm / Consultants to undertake the feasibility study, detailed engineering design & PC-I preparation and resident supervision for the said scheme.

		The proposed consultancy services can be divided into following two major phases: **i. <u>Phase-I: Feasibility Study/Design Phase:</u>** The major objectives of the Phase-1 & Phase-2 of the project will be as under: - • To conduct the preliminary study of the project to determine the suitability for provision of sewerage facility in the area of Jahangirabad. • To carry out the Topographic Survey/Geo-Tech investigation of the allocated land for the Disposal Stations and Sewerage System. • Preparation of Socioeconomic & Financial viability Assessment of the project. • Preparation of detailed engineering design of sewerage system and disposal Stations and other allied works. • Preparation of PC-I / rough cost estimate. • Preparation and approval of IEE/EIA from EPA Punjab. **ii. <u>Phase-II: Resident Supervision Phase:</u>** • To carry out the Resident Supervision, to perform full supervision of all the activities of the project to ensure the quality & quantity, by the experts & qualified team of consultant. The detailed Terms of Reference (TORs) for the subject consultancy has been provided at **Annexure-C.**
	iii. Implementation Period:	• Total of 36 Months are proposed from the date of hiring of Consultancy Firm by the client agency to complete the consultancy services. • Phase-I (Feasibility Study / Design Phase) will be of 03 months and Phase-II will be of 33 months (Resident Supervision Phase) or till the completion of the all components of project.

<table>
<tr><td></td><td>ii. Year Wise Estimated Cost:</td><td>Proposed Source of Financing: Source of financing is Annual Development Program (ADP) – 2022-23.

• Total Cost of Consultancy: 101.274 Million
• FY 2022-23: PKR. 24.274Million (Local)
• FY 2023-24: PKR. 38.50 Million (Local)
• FY 2024-25: PKR. 38.50 Million (Local)</td></tr>
<tr><td></td><td>iii. Manpower Requirements:</td><td>
<table>
<tr><th>Description</th><th>No.</th><th>Man-Month</th></tr>
<tr><td colspan="3"><u>Phase-I: Feasibility Study/Design Phase:</u></td></tr>
<tr><td>Team Leader / Senior Design Engineer (Sewerage)</td><td>01</td><td>03 Months</td></tr>
<tr><td>Sewerage Expert</td><td>01</td><td>02 Months</td></tr>
<tr><td>Mechanical Expert</td><td>01</td><td>0.5 Months</td></tr>
<tr><td>Electrical Expert</td><td>01</td><td>0.5 Months</td></tr>
<tr><td>Structural Expert</td><td>01</td><td>01 Months</td></tr>
<tr><td>Junior Design Engineer (Civil)</td><td>02</td><td>03 Months</td></tr>
<tr><td>Geotech Engineer</td><td>01</td><td>01 Month</td></tr>
<tr><td>Topographical Expert</td><td>01</td><td>01 Month</td></tr>
<tr><td>Environmental Expert</td><td>01</td><td>01 Months</td></tr>
<tr><td>Sociologist</td><td>01</td><td>0.5 Month</td></tr>
<tr><td>GIS Expert</td><td>01</td><td>01 Month</td></tr>
<tr><td>Material Expert</td><td>01</td><td>0.5 Month</td></tr>
<tr><td>Contracts Specialist</td><td>01</td><td>01 Month</td></tr>
<tr><td>Financial Expert</td><td>01</td><td>01Month</td></tr>
<tr><td>Quantity Surveyor</td><td>02</td><td>01Month</td></tr>
<tr><td colspan="3"><u>Phase-II: Resident Supervision Phase:</u></td></tr>
<tr><td>Team Leader / Resident Engineer</td><td>01</td><td>Full time</td></tr>
<tr><td>Assistant Resident Engineer (Civil)</td><td>01</td><td>Full time</td></tr>
<tr><td>Assistant Resident Engineer (Electrical)</td><td>01</td><td>06 Months</td></tr>
<tr><td>Assistant Resident Engineer (Mechanical)</td><td>01</td><td>06 Months</td></tr>
<tr><td>Surveyor/ Quantity Surveyor</td><td>03</td><td>Full time</td></tr>
<tr><td>Site Inspector Civil</td><td>06</td><td>Full time</td></tr>
<tr><td>Site Inspector Electrical</td><td>01</td><td>06 Months</td></tr>
<tr><td>Site Inspector Mechanical</td><td>01</td><td>06 Months</td></tr>
<tr><td>AutoCAD Operator/Office Assistant</td><td>02</td><td>Full Time</td></tr>
</table>
</td></tr>
<tr><td></td><td>iv. Financial Plan</td><td>N/A</td></tr>
<tr><td>4</td><td>Expected outcome of the Survey Feasibility Study and Details of Projects likely to be Submitted After the Survey:</td><td>i. Topographic Surveys & Geotechnical investigations of selected sites.
ii. Feasibility Study & Detailed Design for the provision of sewerage & disposal system for the instant area.
iii. Environmental Impact Assessment (EIA).
iv. BOQ / cost estimates and PC-I.
v. Tender documents.
vi. Financial model including financial analysis of the project.</td></tr>
</table>

CONSULTANCY SERVICES FOR
SEWERAGE SYSTEM IN JAHANGIR ABAD MULTAN AND ADJACENT AREAS

Prepared By:

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WASA (MDA) Multan
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Forwarded to P&D Department By:

Secretary
Govt. of the Punjab
HUD & PHE Department, Lahore

Annex-A

OFFICE OF THE
DEPUTY COMMISSIONER
MULTAN
No.DDD/ 245 / Mul
Dated. 16. 04.2022

Subject: **MEETING TO FINALIZE VIABLE PROPOSALS TO CATER THE SANIATATION ISSUES AND TRAFFIC CONGESTION ISSUES OF MULTAN CITY HELD ON 13.04.2022 AT 01:00 PM IN THE COMMITTEE ROOM OF DEPUTY COMMISSIONER OFFICE, MULTAN**

The subject meeting was held on 13.04.2022 at 01:00 PM in the Committee Room of DeputyCommissioner, Multanunder the Chairmanship of Secretary P&D Board, Lahore to discuss & propose viable options to mitigate the sanitation & traffic congestion issues of Multan city.

List of participant attached.

The meeting started with a recitation from the Holy Quran.

Deputy Commissioner, Multan welcomed the participants and apprised that Prime Minister of Pakistan has shown his keen interest to resolve the sanitation and traffic congestion issues of Multan on priority basis. In this regard, IDAP and urban unit has been requested to aid WASA & MDA Multan in sorting out these foremost issues of the city of Multan. Afterwards, the Deputy Commissioner requested the chair to elaborate the participants on the agenda of the meeting. TheChair welcomed the participants and apprised that as the population of Multan city will increase manifold in the days to come the sanitation issues and traffic congestion will also augment, therefore all out-efforts would be made to address these issues on priority basis. Moreover, he reiterated that after the implementation of these projects, it is envisaged that the sanitation and traffic issues will be resolved in the city.The Deputy Commissioner, Multan presented the agenda of the meeting which is as under:

- Review of existing sewerage network of Multan city & finalization of viable proposals & projects to cater for the futuristic demand of sanitation issues.
- Viable proposals to mitigate the traffic congestion in Multan city
- Implementation and current status of Nishtar-II Project and timelines for completion

Deliberations made during the meeting and decisions thereon are as under:

Sr. No	Issue/Agenda	Discussion	Decision	Action By
1	Review of existing sewerage network of Multan city & finalization of viable proposals & projects to cater for the futuristic demand of sanitation.	The Chair briefed the participants that foremost concern is to ascertain that what type of immediate planning is required to enhance the existing sewerage network and for that mapping of existing services is inevitable. Afterwards, comprehensive sewerage plan will be finalized and that will be included in the next year ADP. General Manager(WS&S), Urban Unit briefed the forum that under the *Punjab Cities Governance Improvement Project (PCGIP)*GIS Mapping for above and below ground assets of WASA had been conducted under this project.WASA Multan has	1. It was decided to propose new schemes of Augmentation / Improvement of Disposal Stations, Replacement of Outlived sewerage, Water Treatment Plants along with procurement of machinery amounting to Rs. 24 Billion in the nextAnnual Development Programme(ADP) 2022-23 in alignment with WASA master plan 2015-2040, which will aid to cater the sanitation issues for the 80% of the population and 70% of the area under the	MD(WASA)

Sr. No	Issue/Agenda	Discussion	Decision	Action By
		prepared its Master Plan of Water Supply, Sewerage and Drainage plan for 2015-40 and all the ADP projects are aligned according to this master plan. The new proposed schemes given by WASA will give an immediate relief to the citizens with regards to the sanitation issues after completion of these projects. It was further added that extended abadies will also be served / covered if these schemes will be executed. MD WASA apprised the forum that all the ongoing sewerage schemes are aligned according to the Master Plan. Currently, jurisdiction area of WASA Multan is 584 Km².Out of this 35% area and 60% population has been covered with sewerage network, 65% of this area still not catered / served. The number of disposal stations are not sufficient to manage the increasing sewerage volume that will increase manifold in coming years. Therefore, the necessity of new disposal stations is need of the hour. In this regard, new disposal stations, treatment plants and replacement of outlived sewers have been proposed in the next year ADP & MTDF. The Chair also stressed upon the need of incorporating the provision of Sullage carrier scheme that will help to cater the sewerage issues of city.	jurisdiction of WASA Multan. 2. It was decided that WASA will also prepare a comprehensive scheme regarding provision of sullage carrier amounting to Rs 15 Billion for inclusion of next ADP 2022-23 to mitigate the sewerage issues of the city. 3. The gestation period for these schemes will be taken for two (2) years. 4. It was decided that MD WASA in consultation with Urban Unit will plan and conduct proper survey and field visits of new proposed schemes and submit sub-schemes as per need of the city. 5. Proper procurement strategy may be formulated by WASA Multan for successful planning and initiation of this development package. 6. PC-Is of these schemes will be prepared and submit in P&D Board through Secretary, HUD&PHE department within Two weeks by WASA. 7. Third Part validation of these schemes would be conducted by IDAP, Punjab. 8. In future, WASA will incorporate the restoration of roads component in their PC-1s.	MD(WASA) CEO Urban Unit MD(WASA) MD(WASA) MD(WASA) MD(WASA)
2.	Viable proposals to mitigate the traffic congestion in Multan city	The chair brief the forum that with rapid growth in population there is surge in the no. of vehicles on the roads and as the population will increase manifold in the days to come the traffic congestion will also augment. Resultantly, integrated traffic management plan is necessary for the city.Hence elaborate survey and meticulous analysis of the	1. It was decided that consultant be engaged on priority basis for preparation of detailed holistic traffic management plan. Quality & Cost Based Selection(QCBS) may be preferred for the selection of consultant. All the deliverables in this respect will be prepared by urban unit for procuring and hiring of the consultant within period of one month.	CEO Urban Unit

Sr. No	Issue/Agenda	Discussion	Decision	Action By
		transportation system in the citysupported by an expansive collection of data with main objective to examine a recurring transportation problems, locations with complicated roadway geometry and propose a solution that will yield less traffic congestion in the city. General Manager(WS&S), Urban Unit briefed that MM Pakistan (Consultancy Firm) had prepared a master plan for Multan city which includes sectoral component for transport as well. The chair asserted that for preparation of proper traffic engineering management plan consultant will be engaged that will help to sort out this paramount issue. It was also briefed that funds for consultancy arranged by P&D Board after submission of comprehensive plan and draft terms of reference (TORs) by Urban unit within a month.	2. The funding for consultancy will be arranged by P&D Board, Lahore. 3. The Draft TORs for engaging of the consultant will be prepared by Urban Unit and shared with P&D Board, Lahore. 4. The consultant will complete the assignment within two (2) to three (03) months. 5. After submission of detailed traffic management plan including proposals for roads widening, under Passes, flyover, Slip Roads, roundabout and installation of traffic signals. Consequently MDA will prepare schemes for the inclusion in the next ADP 2022-23.	P&D Board CEO Urban Unit CEO Urban Unit DG MDA
3.	Implementation and current status of Nishtar-II Project and timelines for completion	The Deputy Commissioner, Multan briefed the forum that Prime Minister of Pakistan is taking keen interest towards the timely completion of Nishtar-II project, whichwill be landmark achievement in the health sector of Punjab. He asserted that the project will be made functional by March, 2023.	It was decided that the executing agency may gear up the progress of project and complete it by March 2023 in all respect to make it functional and the procurement process under revenue component should be completed in conjunction with the capital component.	VC Nishter PD IDAP

Meeting ended with a vote of thanks from the Chair

Amir Kareem Khan
Deputy Commissioner
Multan

Copy to:

1. The Secretary (P&D), Govt. of the Punjab, P&D Board, Lahore.
2. Secretary, Government of the Punjab, HUD & PHE Department, Lahore.
3. The Commissioner Multan Division, Multan
4. CEO Urban Unit Lahore
5. All members of Meeting.

LIST OF PARTICIPANTS

1	MujahidSherdil	Secretary, P&D Board, Lahore (**In chair**)
2	Amir Kareem Khan	Deputy Commissioner, Multan
3	Kaiser Saleem	Director General MDA, Multan
4	QaiserRaza	Managing DirectorWASA, Multan
5	Capt(R) ShahmeerIqbal	General Manager(HQ), IDAP,Lahore
6	Adnan Muzaffar	General Manager(E&P), IDAP, Lahore
7	AbidHussaini	General Manager(WSS), Urban Unit, Lahore
8	Muhammad Kashif	General Manager (P&D) IDAP, Lahore
9	Bilal Farooq	Manager (Mechanical), IDAP, Lahore
10	AzamFarhanMinhas	Manager (Public Health) IDAP Lahore
11	KhawajaUmair	Assistant Commissioner City, Multan
12	Aleemmajid,	Deputy Director (TE&TP), MDA Multan
13	TahirMajeed	DSP Traffic, Multan
14	ShahzadMunir	Director(Engineering), WASA Multan
15	RanaWaseem	Director(Engineering),MDA Multan

2.3.30 Distribution Chamber

- Designed on basis of Peak Flow
- Least dimension shall not be less than 4000mm
- Minimum free board shall be 1000mm

2.3.31 Inlet/Outlet Chamber

- Shall be designed at peak flow
- Minimum flow velocity shall not be less than 0.75m/sec
- Minimum free board shall be 500mm

2.4 PRELIMINARY DESIGN OF SEWERAGE NETWORK

Preliminary design of Sewerage network has been carried out after the approval of ***"Final Draft of Master Plan Report"*** by WASA Multan vide **letter No. 123/P&D/WASA dated 27-05-2017**.

Preliminary design of sewerage system **(priority areas)** is carried out for the list of schemes provided by WASA vide above referred letter. List of scheme is given below:

1. Replacement of outlived sewer in Multan on selected roads.
2. Up-gradation and environmental improvement at Chungi No. 9 Disposal Station.
3. Sewerage schemes for selected unserved Areas of Multan.
4. Construction of southern sullage carrier including wastewater treatment plant.

Afterwards meeting of NESPAK's Deputy Project Manager was held with Deputy Directors Sewerage North, Central and South Divisions on 30.05.217 whereby they have provided priority list of Outlived Sewers and Unserved Areas, which is given below.

Priority list for Replacement of Outlived Sewer

1. Replacement of outlived sewer from Kiri Jamandan Disposal Station to Laker Mandi Chowk via chowk Shahdeen
2. Replacement of outlived sewer.

i. MDA Chowk to Kutchery Chowk.
ii. Khayam Cinema to Ghanta Ghar Chowk.
iii. Replacement of outlived sewer from Shamsabad Chowk to Wahdat ColonyGate No.2 and Bawa Safra Road.
iv. MDA Chowk to Lodhi Colony Chowk

3. Replacement of outlived sewer at T.B Hospital Road from Khuni Burj Chowk to Chungi No. 14.
4. Replacement of outlived sewer from Hussain Aghai (National Bank) to Dehli Gate via Daulat gate.

5. Replacement of outlived sewer at Sharif Pura near Sameejabad.
6. Replacement of outlived sewer at Peoples Colony and Gulzaib Colony

Priority List for Unserved Areas

1. Old shujabad disposal station to Kotla Abdul Fateh Askari Bypass Road.
2. Shah Town Phase-II & Z Town.
3. Muzaffar Garh Road (Iqra Colony, Dera Muhammad, Jaffar Colony, Basti Telianwali).
4. Jahangirabad and Zakriya Town.

2.4.1 Replacement of outlived sewer in Multan on selected roads.

A. Kiri Jamandan Disposal Station

In the preliminary design three major lines that are disposing in this disposal station are to be replaced these are as following:

I. Replacement of outlived sewer from Kiri Jamandan Disposal Station to LakarMandi Chowk via Chowk Shaheedan.
II. Replacement of outlived sewer at T.B Hospital Road from Khuni Burj Hospitalto Chungi No.14.
III. Replacement of outlived sewer from Husain Agahi (National Bank) to Dehligate via Daulat Gate.

Kiri Jamanda Disposal Station is located in middle of the City. It is receiving sewage flows from one of the most densely populated areas of city. There are two disposal stations i.e. old Kiri Jamandan and New Kiri Jamadan. The wet well of new Kiri Jamandan Disposal Station is connected to screen of Old kiri Jamandan. Old disposal station is used only for Stormwater, during rainy seasons when flows increase, the increased flow is diverted towards old disposal station. All the sewage from this area iscollected and disposed of through New Disposal Station. In this disposal station one 36-inch sewer and one dot sewer of 60”x30” dispose of into a collection chamber. From there a 1520 mm sewer carry it towards screening chamber. Layout of existing sewerage system for this area is shown in following **Figure 2.1.**

G) Proposed Jahangirabad Disposal Station

Jahangirabad Disposal Station located at the start of proposed Southern Sullage Carrier along Naubahar Canal road. This disposal station encompasses the catchment area of 15,561 acres and serving population of 699,325 persons. Total design flow of Jahangirabad Disposal Station for design period of 25 years calculated to be 6.89m3/sec.

This disposal station is proposed to take the sewage flow of newly built and proposed housing societies and government buildings along Matital Road, N5, Green Road and Naubahar Canal Road. There is a strong need to construct the sewerage network and Jahangirabad disposal station because some main government buldings, hospitals and housing societies will be established around the vicinity in the near future.

Two trunk sewer lines on National Highway and Naubahar Canal Road of size 3.00 x 2.00 & 2.00 x 1.75 m carry the sewage flow to this disposal station. This disposal station pump the effluent into proposed Southern Sullage Carrier through forcemain of 1200mm diameter.

Catchment area of this disposal station is shown in the **Figure 2.30,** Location plan along with Trunk Sewer has been shown in **Figure 2.31** and Layout Plan of this disposal station has been shown in **Figure 2.32.** The hydraulic statement summary is given in following **Table 2.14** and the detail of disposal station has been given in **Table 2.15.**

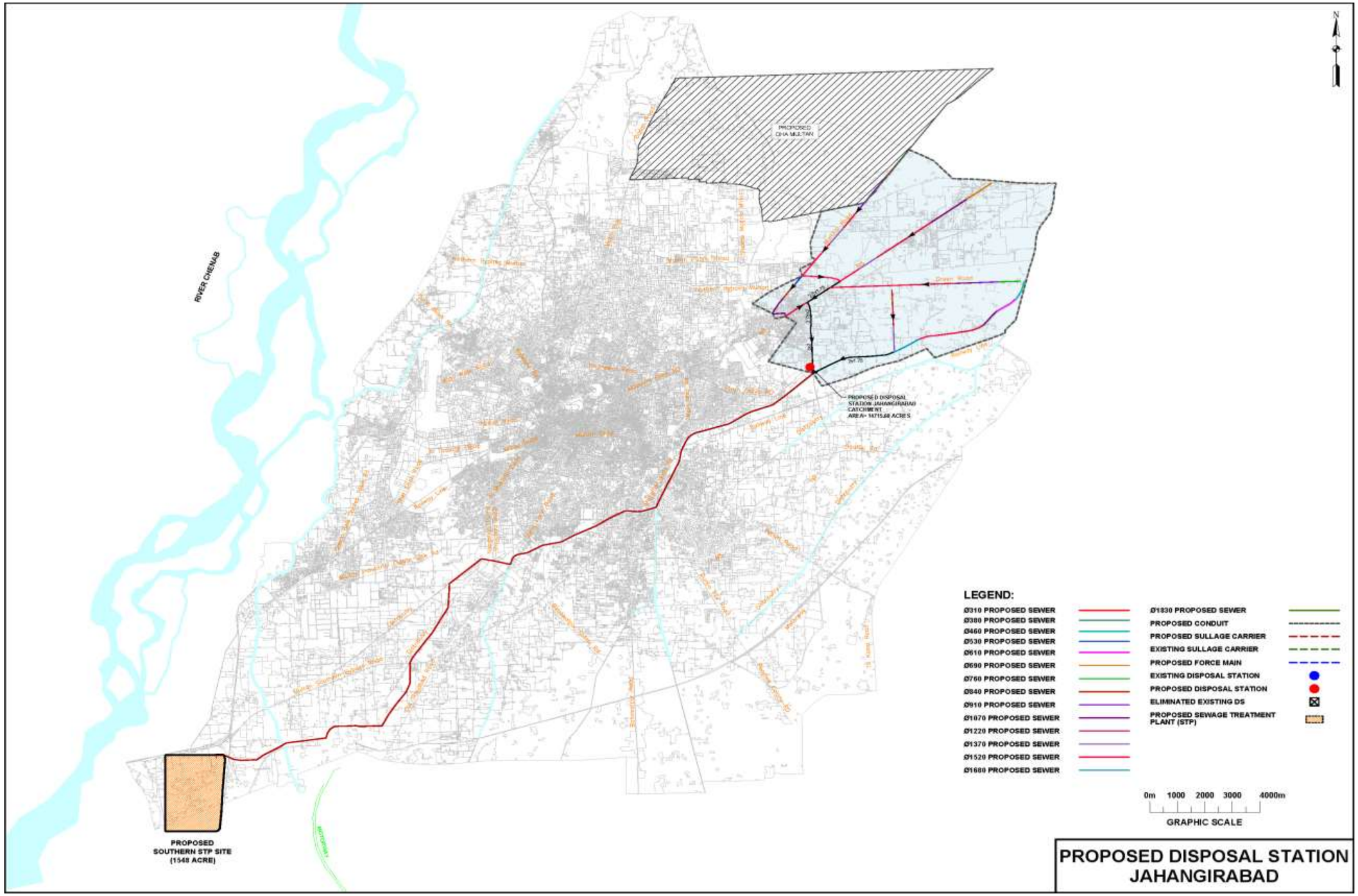
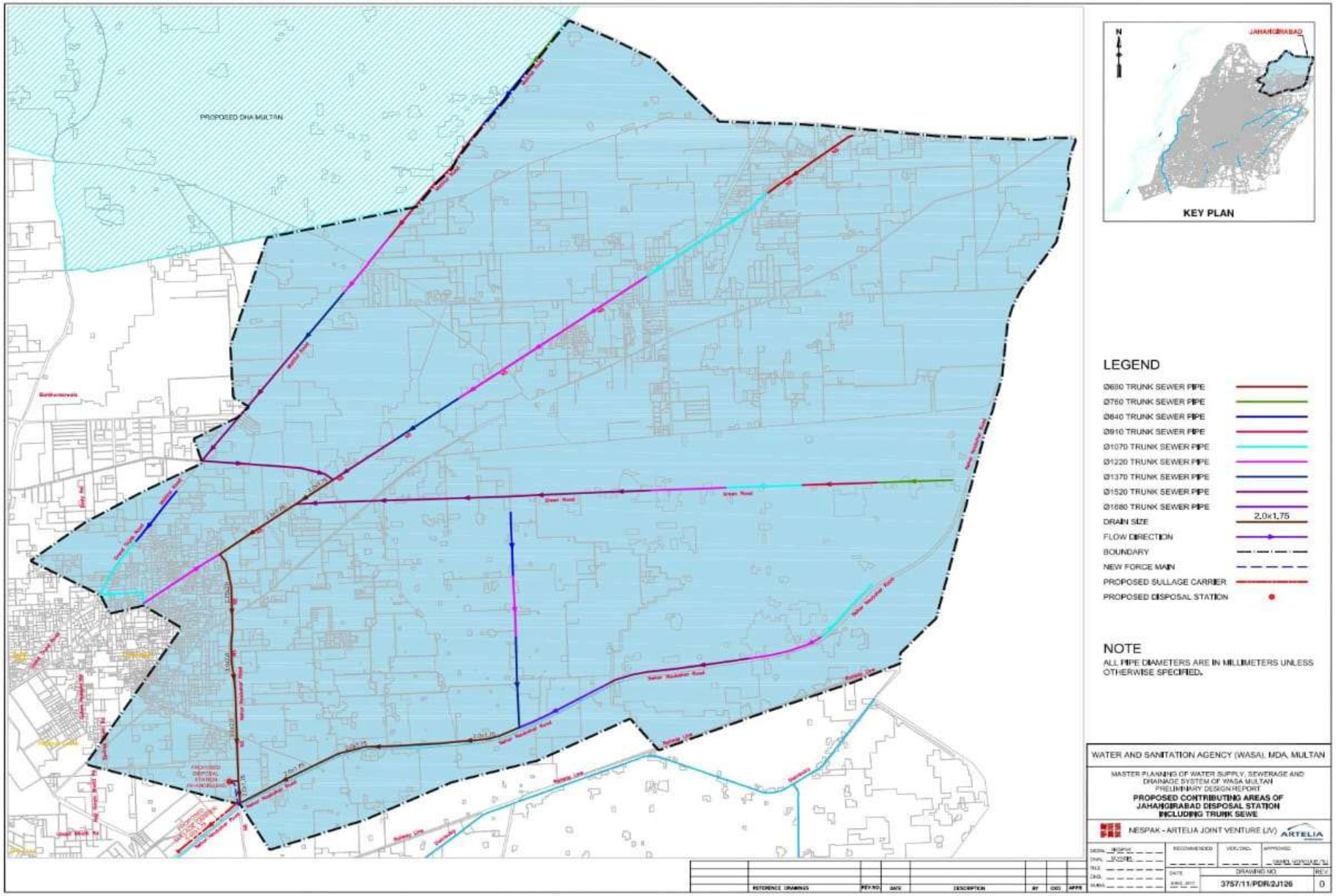


Figure 2.30: Catchment Area of Proposed Jahangirabad Disposal Station


PROPOSED DHA MULTAN
JAHANGIRABAD
KEY PLAN
LEGEND
Ø690 TRUNK SEWER PIPE
Ø760 TRUNK SEWER PIPE
Ø840 TRUNK SEWER PIPE
Ø910 TRUNK SEWER PIPE
Ø1070 TRUNK SEWER PIPE
Ø1220 TRUNK SEWER PIPE
Ø1370 TRUNK SEWER PIPE
Ø1520 TRUNK SEWER PIPE
Ø1680 TRUNK SEWER PIPE
DRAIN SIZE
2.0x1.75
FLOW DIRECTION
BOUNDARY
NEW FORCE MAIN
PROPOSED SULLAGE CARRIER
PROPOSED DISPOSAL STATION
NOTE
ALL PIPE DIAMETERS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
WATER AND SANITATION AGENCY (WASA), MDA, MULTAN
MASTER PLANNING OF WATER SUPPLY, SEWERAGE AND DRAINAGE SYSTEM OF WASA MULTAN
PRELIMINARY DESIGN REPORT
PROPOSED CONTRIBUTING AREAS OF JAHANGIRABAD DISPOSAL STATION INCLUDING TRUNK SEWE
NESPAK - ARTELIA JOINT VENTURE (JV)
ARTELIA
RECOMMENDED
APPROVED
DRAWING NO.
REV.
3757/11/PDR/2J126
0
REFERENCE DRAWINGS
DESCRIPTION

DRAFT TERMS OF REFERENCE (TORs)

PREPARATION OF FEASIBILITY STUDY DETAILED ENGINEERING DESIGN & RESIDENT SUPERVISION REGARDING "SEWERAGE SYSTEM IN JAHANGIR ABAD MULTAN AND ADJACENT AREAS" FOR THE ANNUAL DEVELOPMENT PRORAM (ADP) SCHEME 2022-23, GS NO. 4349.

1. INTRODUCTION:

Multan is the seventh largest city of Pakistan falling under the jurisdiction of Southern Punjab. Water and Sanitation Agency Multan was created in 1992. In major part of the city, the sewerage system is available consists of 2055 KM RCC pipes with a population coverage of about 65%. Water and Sanitation Agency (WASA) is responsible for its operation and maintenance. At present, there are 15 Disposal Stations and 10 lift stations in the City.

2. BRIEF BACKGROUND OF WORK:

Presently, WASA Multan is providing sewerage facility to 65% population of the Multan City. The remaining 35% population is deprived of improved sanitation/ sewerage facility. The sewage generated in Jahangirabad and adjacent areas is thrown into agricultural fields, depression areas and water bodies by the residents due to non-availability of proper sewerage system. The non-availability of improved sanitation/ sewerage facility in Jahangirabad and adjacent areas causing serious environmental and health issues. The provision of sewerage scheme in Jahangirabad and adjacent areas is of vital importance to eliminate environmental degradation and to improve health of the residents of these areas. The project is in line with WASA Master Plan 2015-40.

3. MAJOR SCOPE OF WORK:

The main activities of this project are here under:

Description	Details
Laying of sewerage	RCC Sewer 12" to 72" & above
Construction of Disposal Station	Screening chamber, wet well, pump house, Generator room etc.
Laying of Force main	HDPE

4. MAJOR OBJECTIVES:

i. The main objective of the scheme is to work out a workable, technically sound, sustainable and financially viable solution for provision of sewerage facility in un-served areas of Jahangir Abad Multan and adjacent areas, based on the recommendations of WASA Master Plan 2015-40.

ii. Preparation of PC-I / Rough Cost Estimate.

iii. Preparation of Detailed Engineering Design of the project to ensure effective and efficient utilization of the public funds which fulfill all the needs of the client for

provision of sewerage facility in Jahangir Abad & adjacent area and making it an integral part of WASA master plan (2015-40).

iv. Preparation of IEE/EIA and its approval from concerned department.

v. Supervision of huge public investment and expenditure on Project for better utilization of money so that investment has its earned value impact on social and environmental uplift to residents Jahangir Abad and adjacent areas.

vi. Qualitative input and real addition in quality of work and improved management financial benefits.

vii. Monitoring and supervision of Project will improve service delivery and level of service.

viii. Physical verification (quality and quantity) of construction work of project.

ix. An assessment of overall contract compliance.

x. Resident Supervision shall be provided for all activities throughout the completion of project, staff that shall perform their duties with due diligence and experienced supervisory staff.

5. DUTIES AND RESPONSIBILITIES OF THE CONSULTANT:

The duties and responsibilities of the consultants will include, but not limited to following: -

PHASE – I: FEASIBILITY STUDY / DESIGN PHASE:

a. Collection and Review of Available Data:

The consultancy services shall include collection of requisite data (primary and secondary) and related. Based on the available preliminary surveys, reports and data, the consultant will validate the existing data in accordance with the specified parameters/standards and best international practices and update the data or prepare new, if required, to meet the project objectives as stated above, as per client's satisfaction, prior to implementation of work.

b. Topographical and Site Survey:

The survey work shall comprise topographic and other necessary surveying, leveling and establishing bench marks with respect to GTS bench mark, drawing cross-sections where required and other related works required for preparation of design of disposal station & sewerage system in the area. The consultant shall also carry out site survey of Jahangir Abad and its surroundings, fix the benchmarks and work out levels to design the sewerage system & disposal station and will submit the findings in the form of a report.

c. Soil/Geotechnical Investigations:

The Consultant will carry out soil/geotechnical investigations of the site. Necessary field and laboratory testing will be carried out to assess the engineering properties of the soil strata for detailed engineering design of all component of works. Laboratory testing will be conducted by reputed laboratories and will be submitted in the form of report.

d. Preparation of PC-I:

The consultant will prepare PC-I / Rough Cost Estimate for its approval from the competent forum.

e. Detailed Engineering Design of Disposal Station:

Detailed Engineering Design of Disposal Station shall include the configuration and Detail Structural Design of the Pumping Station including various civil, electrical and mechanical components in accordance with international standards. General arrangement drawings, pumps, motors, electrical panels layouts, power requirement calculations, Phase wise implementation schedule for installing the pumps motors etc. shall be prepared by the consultant.

f. Detailed Design of Sewerage System & RCC Conduit:

The consultant shall be responsible for preparation of Detailed Engineering Design of Sewerage System including RCC conduit, if required, including the Structural & Hydraulic Design. Detailed Engineering Design must also include Technical Report, including Hydraulic Models, Hydraulic Profiles, Hydraulic Statements of Sewerage Network, Engineering Calculations, Architectural, Hydraulic and Structural Design for the project, keeping in view WASA Master Plan 2015-40.

g. Technical Specifications:

The consultant will prepare technical specifications of the proposed equipment/material for the project for specified items, not covered in the General Specifications. The Consultant will prepare 'Specifications Manual' in a clear, concise and uniform manner and will submit final copy to client.

h. Bill of Quantities and Engineers Cost Estimate:

The consultant will prepare Engineers Cost Estimate of the project based on MRS and latest market rates. The consultant shall also prepare Bill of Quantities (BOQ) & Technical Sanction of the project keeping in view the Rough cost estimate, detailed design and specifications. The Consultant shall also recommend remedies, alterations, omissions and corrections with supporting documents to the client / EA before or during implementation / execution.

i. EIA / IEE:

Consultant shall be responsible for preparation of environmental & social safeguards (including but not limited to EIA, IEE, land acquisition, re-settlement plans etc.) and its approval from concerned department including all expense/Fee.

j. Tender Documents & Construction Drawings:

Consultant will submit tendering documents & construction Drawings along with all supporting references including Design Calculations, drawings, specifications, summaries, and explanatory notes in Hard and Soft form (as described in section Reporting Requirements) to Client / EA for consideration, approval and information. The Consultant will prepare 'Tender & Construction Drawings' in a clear, concise and uniform manner in digital format using AutoCAD and will submit final copy of complete drawings after approval to client in DWG format as well as the consultant will submit hard copies of the drawings.

k. Tendering & Contract Agreement:

The consultant will assist the client in prequalification of prospective contenders and tendering process till the award of the work to the best & economical contractor. The consultant will also assist and validate all the tendering process in order to award of the project. The consultant will assist the client in preparation of contract agreement including general & special conditions of the contract.

PHASE-II: RESIDENT SUPERVISION PHASE:

i. The consultant shall perform the duties of "Resident Supervision" under the general supervision & control of WASA (MDA) Multan.

ii. The consultant shall be responsible for Resident Supervision of the work through qualified graduate engineers and other supervisory staff having sufficient experience in the relevant field. The consultant will perform resident supervision to monitor the output of all stages of construction and ensure that the works are executed in full compliance with the approved engineering design, drawings, agreed work schedule, technical specifications and with the terms & conditions of all the contract documents in accordance with the best engineering practices, standards & consultants technical / professional approach. In case of any subsequent changes, consultant will issue supplementary drawings, site instructions and variation orders to avoid delay to the works with prior approval from the client.

iii. The consultant shall supervise contractor's job and all works related matters and shall ensure that measures taken by contractor for safety of the public, properties and staff working at site are adequate and in accordance to the international standards / practices. If found any deficiency, the consultant shall give advice to the contractor for remedial measures informing concerned Executive Engineer, WASA.

iv. The consultant shall certify that the executed works are as per approved design, drawings, standard specifications, technically sanctioned estimates and within the provision of contract agreement.

v. The consultant shall examine the work schedule prepared by the contractor; recommend any change / modification / alteration, if required. Consultant shall also monitor progress carefully and certify that the work executed at site is strictly according to the schedule approved by the client. The consultant shall submit fortnightly inspection and progress reports to the Executive Engineer of WASA. In case if the contractor is lagging behind from the schedule, the consultant will point out and propose remedial measures / corrective actions that need to be taken to ensure progress leading a timely completion of works.

vi. The consultant shall prepare QA & QC manuals and assure its implementation and certify that the construction material brought by the contractor at site to be used in the execution of work is strictly in accordance to the standards & specifications and certify that the laboratory test reports meet the standards.

vii. The consultant will supervise all field / laboratory tests of material and works as per methods described in the specifications and will submit a copy of all field / laboratory test reports to the concerned. The field equipment required will be provided by the contractor whereas the consultant would arrange technician / supervisory staff to supervise the tests as per standard procedure / requirement laid in the specifications. For laboratory test sampling will be carried out by the consultant and laboratory fee will be paid by the contractor.

viii. To prepare project implementation schedule in line with the approved financial allocation plan, showing the different work activities/critical activities in the form of bar chart and their linkages and issues necessary guidelines/instructions to WASA (MDA) Multan and contractor. Review the project implementation schedule every month and make revision/update of the same, if necessary

ix. The consultant shall be responsible for preparation and implementation of bye pass arrangement of sewer and traffic management plan, during execution of the work etc. through the contractor.

x. Consultant will provide Mechanical and Electrical expert for supervision of installation of Equipment & Machinery and submit comprehensive performance report after carrying out equipments inspection at manufacturing site. He shall also provide operational Manual to client.

xi. The consultant shall ensure implementation of Health, Safety and environment (HSE) standards during execution of the project.

xii. Consultant shall prepare presentations/Reports etc. related to the Project as and when required / demanded by Management / EA.

xiii. Consultant shall be responsible for all arrangement's presentations for site visits by Management or any Govt. Representative.

xiv. The consultant shall be responsible for quality and quantity of work done and measurements and computation of quantities of the completed works / material for secure advance or any work which is about to be covered/buried, and maintain permanent records of all such measurements as basis for progressive payments to the contractor and keep the measurement documents and records in safe custody.

xv. The consultants shall certify under his seal, contractor's running bills/payments and final payment clearly indicating that the quality and quantity of work executed under their supervision is in accordance to the specifications, design, drawings, technical sanctioned estimates, contract agreement and shall make recommendations to Engineer Incharge (XEN/ Dy. Director) for payment to the contractor. Moreover, all test reports of different materials being used at sites for respective bill of the project shall be entire responsibility of the consultants. The measurement recorded the measurement book shall be certified by the Consultant under his seal before release of payment of contractor.

xvi. The consultant will maintain daily record of checks & approval, correspondence and site diaries supported with digital photographs. Submit the record of daily inspection reports, all the tests made, to the Deputy Director (Engineering) on a weekly basis in an electronic form as well as in hard copy or as and when required by engineer Incharge (XEN/ Dy. Director) WASA Multan.

xvii. One month prior to the expiry of the defect liability period (DLP) maintenance period of the work, the consultants shall carryout a detailed final inspection of the work along with representative of contractor and shall submit a report to WASA (MDA) Multan pointing out the defects if any, in the work.

xviii. The consultant shall assist client for interpretation of Contract Documents particularly with respect to disputes with the contractor or other affected parties. The Consultants will assist WASA (MDA) Multan in setting disputes (if any) with the Contractor and make recommendations to WASA (MDA) Multan for resolving the Contractor's claims regarding time extension and additional cost.

xix. The consultant will evaluate and make recommendations to the client for actions to be taken against contractor claims, disputes and time extensions. The consultants will administer the contractor's contract, make engineering decision in consultation with "Engineer In charge ", and ensure that all clauses of the Contract Agreement between WASA (MDA) Multan and the contractor, respective check all the project regarding quality & quantity with reference to project documents.

xx. The consultant will act at all time so as to protect the interest of WASA (MDA) Multan and will also take all reasonable steps to keep all expenses to a minimum level consistent with economic and engineering practices.

xxi. Water and Sanitation Agency Multan shall be at liberty to increase or decrease the quantum of work without assigning any reason. The consultants may adjust his staff as per pace of work during the execution.

xxii. The consultant will serve notice to the contractor with intimation to WASA (MDA) Multan, if any defect and deficiency occurs at site, may order suspension of the works, and ensure removal and substitution of the improper works and recommend any additional appropriate action against the contractor to WASA (MDA) Multan.

xxiii. The Consultant will provide to WASA (MDA) Multan complete record, reports and review "as built" drawings & plans prepared by the contractor, and also provide a final completion report testifying to the satisfactory completion of the work including the measurements of final quantities and certification final payment due to the contractor.

xxiv. The consultant shall carry out detailed final inspection of the work along with Client's staff and submit completion (As Built) drawings. The consultant shall prepare and submit complete set (06 No.) GIS based as built drawings showing disposal stations, Force-main, RCC Conduit, laid sewer lines and other allied structures/ necessary details along-with manholes on GIS maps under instant projects.

xxv. The consultant shall recommend to the Engineer for issuance of completion certificate stating that the work has been completed as per specifications, drawings, estimates and contract agreement, in accordance with the approved specification.

xxvi. The Consultant shall prepare and recommend the Revised PC-I, if required, or any variations / deviations occur in the original scope of work as per site conditions.

xxvii. No boarding and lodging will be provided by Water and Sanitation Agency Multan to the consultants. The consultant will be responsible for providing all necessary services required for the efficient, effective and in time execution of the consultancy services.

xxviii. The Consultant will assist WASA (MDA) Multan in settlement of Audit Paras and objections raised (if any) and prepare replies related to the Project and provide all the relevant documents / papers / letters etc, to support the replies.

6. CONSULTANT'S ACTION REQUIRING DEPARTMENT'S PRIOR APPROVAL:

Consultant engineers shall recommend the following in writing for prior approval to WASA (MDA) Multan.

a. Extension in time limit under any of clauses of Contract Agreement and due to any circumstances.
b. Any Claims of the contractor.
c. Variation orders having financial and time extension implications.
d. Variation in quantities of various items of work.
e. In fixing rates / prices due to variations, and
f. Any other required document as stated in Section - 5.

7. ADDITIONAL REQUIREMENTS FROM CONSULTANT AGREEMENT:

i. **Retention Money:-** Successful consultant shall be liable for deduction of retention money @ 5% from each bill, which will be returned after completion of the assignment on provision of completion certificate from the concerned Deputy Director(s).

ii. **Bid Security:-** The consultant shall furnish a bid security, as a part of his bid, amounting to Rs. 0.8 Million, in form of deposit at call or CDR. The bid security of unsuccessful consultants will be returned as promptly as possible, but not later than 30-days following the date set for opening of bid. The bid security of successful bidder will be returned after signing of the contract agreement.

iii. **Delayed Submission:**- If project cost increases due to delays in supply of design drawings by the consultant, the consultant shall be responsible for that and a penalty equal to 5% of contract value will be imposed @ 0.36% for each day delay up to max two weeks. Client shall have right to terminate the contract in case of delays more than two weeks.

iv. **Repeated Design:**- In case, there is any repetition in the design of some components of the work which has already been designed for any of the project of the client carried out by consultant, no payment will be made for that component of design work

v. **Design/Drawings:**- The consultant will provide soft copy along with design consultants and department has the right to get the design vetted from a third party and in case there is a variation of $\pm$ 5% in case, the consultant will be penalized by the same %age from the fee besides making required changes in design & drawing.

vi. **Best Effort:-** The consultant shall furnish a certificate to the effect that design carried out is most efficient and economical.

vii. The presentations, as and when required during the whole period of the assignment will be made by the consultant on multimedia to the entire satisfaction of WASA and Govt. of Punjab.

viii. **Consultant's work expected to result:**

a. Good quality of construction in accordance with stipulated specifications.

b. Timely completion of work.

ix. Consultant will make independent Design office arrangement including facilities for printing, copier and nonstop eight hour working, with generator and will provide a separate room to the client for his working on the proposals, if required.

8. TIME DURATION:

36 Months (including Feasibility Study / Design Phase Period of 03 Months). Keeping in view the gestation period exhibited in Annual Development Program (ADP) 2022-23 for the project.

9. CORE TEAM OF CONSULTANTS:

The core team of consultant shall comprise of the following staff: -

Description	No.	Qualification/ Experience	Nature of Duty
A. Feasibility Study / Design Phase Team for Three (03) Months:			
Team Leader / Senior Design Engineer (Sewerage)	01	M.Sc. / B.Sc. (Civil / Sanitary / Env. Engineering) Degree in relevant field with min. 15 years' experience in relevant works.	03 Months
Sewerage Expert	01	M.Sc./B.Sc. (Civil /Sanitary / Env. Engineer) Degree in relevant field with min. 15 years' experience in relevant works.	02 Months
Mechanical Expert	01	M.Sc. / B.Sc. (Mechanical Engineering) Degree in relevant field with min. 15 years' experience in relevant works.	0.5 Months
Electrical Expert	01	M.Sc. / B.Sc. (Electrical Engineering) Degree in relevant field with min. 15 years' experience in relevant works.	0.5 Months
Structural Expert	01	M.Sc. /B.Sc. Engineering Degree in relevant field with min. 15 years' experience in relevant works.	01 Months
Junior Design Engineer (Civil)	02	B.SC. Civil Engineering Degree with min. 05 years' experience in relevant design field.	03 Months
Geotech Engineer	01	M.Sc. / B.Sc. (Civil / Geotechnical Engineering) Degree with min. 10 years' experience in relevant design field.	01 Month
Topographical Expert	01	M.Sc. / B.Sc. (Civil / Topographical Engineering) Degree with min. 10 years' experience in relevant design field.	01 Month
Environmental Expert	01	M.Sc. / B.Sc. (Environmental Engineering / Environmental Sciences) Degree with min. 10 years' experience in relevant field.	01 Months
Sociologist	01	M.Sc. /B.Sc. in Sociology/Social Sciences Degree with min. 10 years' experience in relevant field.	0.5 Month
GIS Expert	01	M.Sc. / B.Sc. GIS or equivalent Degree with min. 10 years' experience in relevant field.	01 Month
Material Expert	01	M.Sc. /B.Sc. Civil Engineering Degree with min. 10 years' experience in relevant field.	0.5 Month
Contracts Specialist	01	M.Sc. /B.Sc. Engineering having experience of Contract Management Degree with min. 10 years' experience in relevant field.	01 Month
Financial Expert	01	MBA /CFA / CA / ACCA / ACMA Degree with min. 10 years' experience in relevant field.	01Month
Quantity Surveyor	02	DAE in Civil Engineering with Min 10years' experience.	01Month
B. Resident Supervision Phase Team for Thirty-Three (33) Months:			
Team Leader / Resident Engineer	01	M.Sc. /B.Sc. Civil Engineering Degree with min. 10 years' experience in relevant works.	Full time
Assistant Resident Engineer (Civil)	01	M.Sc. /B.Sc. Civil Engineering Degree with min. 07 years' experience in relevant field	Full time
Assistant Resident Engineer (Electrical)	01	M.Sc. /B.Sc. Electrical Engineering Degree with min. 07 years' experience in relevant field	06 Months

Assistant Resident Engineer (Mechanical)	01	M.Sc. /B.Sc. Mechanical Engineering Degree with min. 07 years' experience in relevant field	06 Months
Surveyor/ Quantity Surveyor	03	Diploma in (Civil/ Electrical/ Mechanical) Engineering with min. 5 years' experience in relevant field.	Full time
Site Inspector Civil	06	Diploma in (Civil) Engineering with min. 5 years' experience in relevant field.	Full time
Site Inspector Electrical	01	Diploma in (Electrical) Engineering with min. 5 years' experience in relevant field.	06 Months
Site Inspector Mechanical	01	Diploma in (Mechanical) Engineering with min. 5 years' experience in relevant field.	06 Months
AutoCAD Operator/Office Assistant	02	With min. 5 years' experience in relevant field.	Full Time

10. QUOTATION OF FEE:

The consultant will quote fee for Detailed Engineering Design and Residential Supervision separately. The fee for resident supervision phase will be paid proportionate to the contractor's work done / payment at approved rate.

11. SCHEDULE OF SUBMISSION OF DOCUMENTS:

S#	Deliverable	Timeline	Copies
A. Feasibility Study / Design Phase (03 Months)			
1	**Inception Report** (Design Phase)	Within one week after signing of Contract Agreement.	03 Copies
2	**Feasibility Study including Topographical Survey & Geotechnical Investigations**	Within 01 Month after signing of Contract Agreement.	03 Copies
3	**Submission of PC-I**	Within 01 Month after signing of Contract Agreement.	20 Copies
4	**Draft Detailed Design Report**	Within 02 Months after signing of Contract Agreement.	03 Copies
5	**Final Detailed Design Report along with the Specification Manual**	Within 2.5 months after signing of Contract Agreement.	05 Copies
6	**Tender & Construction Drawings**	Within 03 months after signing of Contract Agreement.	10 Copies
7	**Submission of IEE/EIA Report**	Within 2.5 months after signing of Contract Agreement.	05 Copies
8	**Approval of IEE/EIA Report**	Within 03 Months after signing of Contract Agreement	05 Copies
B. Resident Supervision Phase (33 Months)			
9	**Inception Report** (Resident Supervision Phase)	Within one week after signing of Contract Agreement.	03 Copies
10	**Monthly Progress Reports**	Every Month - upto 05th of every month	05 Copies
11	**Project Completion Report**	Upon completion of the project.	10 Copies

12. REPORTING REQUIREMENTS/DELIVERABLES:

a. Inception Report

The Inception Report shall include but shall not be limited to the following:

- Project Background.
- Consultants contract Agreement, discussion on TOR and their implementation strategy, consultant's team and their deployment schedule, main tasks, their accomplishment schedule through the available resources.
- Brief discussion on project planning, Designing and their implementation strategies.
- Brief discussion on Quality control Assurance Procedures and their implementation strategies.
- Preliminary discuss on project documents i.e. technically sanctioned cost estimates, contract agreement documents, deficiencies, guidelines and instructions.
- Discuss on project Implementation schedule of contractors and rationalization of the same.
- Reports preparation strategy, their major contents and schedule of submission.
- This report shall be submitted within 10 days after notification of award of consultancy.

b. Detailed Engineering Design

- The consultants will arrange the design team after the award of consultancy for three (03) months for the preparation and submission of detailed engineering design for the project **"Sewerage System in Jahangir Abad Multan and Adjacent Areas"** The three (03) months period for Design Phase also include time required for submission of inception report and mobilization time.
- The consultant will arrange the design engineers as and when required as per site requirement.
- The consultant shall undertake to complete services as stated in Scope of Work in all respects.
- The consultant will also submit EIA or IEE report and subsequent approval from EPD Punjab.

c. Monthly Progress Report

The Monthly Progress Reports shall include but shall not be limited to the following:

- Project Background.
- Financial Allocations.
- Physical provisions of different work components, progress during the month and updated progress.
- Financial provision of different works components, expenditure during the month and total updated expenditure.

- Tests required to be conducted on the construction materials and on the completed item of works with reference to international standard requirements.
- Details on the samples collection methodology for testing of construction materials and laboratory tests results.
- Details on tests conducted on the completed items of works and their results. Comments on the failure of test results of the samples and rejection of the entire lot of the fabricated product. Ensure for non-utilization of the rejected materials/products.
- Details of variations taken place at site and copy of "Variation Order" for record.
- Copy of approved/unapproved Requests Forms and instruction Forms for each completed activity for record.
- Copy of contractor's Claim recommended / approved by the consultants / Department.
- Photographs of the completed items of works including material sampling, testing at Laboratory, execution of activities, stating brief description about its start to completion.
- Consultant's inputs schedule of all the team members from start to completion of the activities.
- This report shall also contain progress report of Implementation of Health, Safety & Environment (HSE) standards as proposed in the EIA report.
- This report shall be submitted within week time after completion of month.

d. Project Completion Report

- Project Background.
- Consultancy services, TOR and schedule of consultant's activities, their inputs for accomplishment of different tasks with reference to TOR.
- Project scope of work implemented at site with reference to technically sanctioned cost estimate, changes/variations in scope of work with justification, delays by the contractor/Department in completion of activities.
- Claims of contractor together with reasons/recommendations of the consultants and their updated status of approvals.
- Quality controls procedures, tests result of different construction materials and on the completed items of works.
- Defects notified by the consultants during the construction and its updated corrections status.
- Project planning with reference to implementation of the project.
- Contract compliance status from the start to the completion of the project and action taken by the consultants/Department with reference to non-compliance.
- Photographs of different important activities of the project implementation.
- This report shall be prepared and submitted to the Department after completion and successful commissioning of the projects but not later than 15 days after issuance of project completion certificate by the Department.

13. PROFESSIONAL LIABILITY OF CONSULTANT:

Professional liability as stated in the prevalent conduct and practice of consulting Engineers prescribed by Pakistan Engineering Council (PEC) & clause 54 contained in PPRA Rules - 2014 amended up to date shall be applicable to the consultants.

14. ROLE OF CLIENT AGENCY:

- The Client will provide the all available data including Master Plan (2015-40) to the Consultants for the instant consultancy.
- The Client will assist the Consultants in coordination with other Government agencies/departments.
- The Client Agency will facilitate the Consultancy Firm to obtain NOC or any official documentation which may be required.
- No boarding and lodging will be provided by Water and Sanitation Agency Multan to the consultants.

15. PAYMENT SCHEDULE:

The phase-wise bifurcation of payment will be as follows. The cost estimates (given at Annexure – E) are adjusted accordingly.

- Design Phase: 12.50 % of Contract Amount
- Resident Supervision Phase: 87.50 % of Contract Amount

S#	Deliverable	Timeline	Payment
A. Feasibility Study / Design Phase (03 Months) – 12.50 % of Contract Amount			
1	**Inception Report** (Design Phase)	Within one week after signing of Contract Agreement.	05%
2	**Feasibility Study including Topographical Survey & Geotechnical Investigations**	Within 01 Month after signing of Contract Agreement.	20%
3	**Submission of PC-I**	Within 01 Month after signing of Contract Agreement.	20%
4	**Draft Detailed Design Report**	Within 02 Months after signing of Contract Agreement.	15%
7	**Final Detailed Design Report along with the Specification Manual**	Within 2.5 months after signing of Contract Agreement.	15%
8	**Tender & Construction Drawings**	Within 03 months after signing of Contract Agreement.	15%
9	**Submission of IEE/EIA Report**	Within 2.5 months after signing of Contract Agreement.	05%
10	**Approval of IEE/EIA Report**	Within 03 Months after signing of Contract Agreement	05%
B. Resident Supervision (33 Months) – 87.50% of Contract Amount			
12	**Inception Report** (Resident Supervision Phase)	Within one week after signing of Contract Agreement.	05%
13	**Monthly Progress Reports**	Every Month – up-to 05th of every month	**(90%)** The fee for Resident Supervision Phase will be paid proportionate to the contractor's works done / payment at approved rate.
14	**Project Completion Report**	Upon completion of the project.	05%

16. EXPECTED OUT PUTS AND BENEFITS:

The "Consultants" work is expected to deliver detailed engineering design and conduct resident supervision in safe and economical way for all items of the work keeping in view the latest international codes/standards and practices and the requirements of the client (WASA).

17. WORKING LANGUAGE:

The working language of the assignments, all reports and works prepared by the consultants will be in "English"/Urdu.

CORE TEAM OF EXPERTS REQUIRED FOR THE ASSIGNMENTS

The Core Team of Consultant will include but not limited to following:-

Description	No.	Qualification/ Experience	Nature of Duty
A. Feasibility Study / Design Phase Team for Three (03) Months:			
Team Leader / Senior Design Engineer (Sewerage)	01	M.Sc. / B.Sc. (Civil / Sanitary / Env. Engineering) Degree in relevant field with min. 15 years' experience in relevant works.	Must have experience in carrying out the similar assignments of sewerage system and be able to plan, organize and effectively implement all scheduled activities of the project and to Co-ordinate and lead the team to ensure the timely completion of tasks. He must have the experience to design the large-scale sewerage projects.
Sewerage Expert	01	M.Sc./B.Sc. (Civil /Sanitary / Env. Engineer) Degree in relevant field with min. 15 years' experience in relevant works.	Must have expertise in design of sewerage projects in at least 05 similar nature assignments and will support the Senior Design Engineer in design work.
Mechanical Expert	01	M.Sc. / B.Sc. (Mechanical Engineering) Degree in relevant field with min. 15 years' experience in relevant works.	Must have experience of designing mechanical installations systems of at least 05 large scale projects.
Electrical Expert	01	M.Sc. / B.Sc. (Electrical Engineering) Degree in relevant field with min. 15 years' experience in relevant works.	Must have experience of designing electrical installations systems of at least 05 large scale projects.
Structural Expert	01	M.Sc. /B.Sc. Engineering Degree in relevant field with min. 15 years' experience in relevant works.	Must have required expertise in designing of civil structure of conveyance system of sewerage & drainage and ancillary works as per concerned code in at least 05 assignments and will work in liaison with the Senior Design Engineer.
Junior Design Engineer (Civil)	02	B.SC. Civil Engineering Degree with min. 05 years' experience in relevant design field.	Must have experience in carrying out the similar assignments of sewerage system and will assist the Senior Design Engineer.
Geotech Engineer	01	M.Sc. / B.Sc. (Civil / Geotechnical Engineering) Degree with min. 10 years' experience in relevant design field.	Must have expertise in geotechnical designing, analysis & calculations of geotechnical investigations in at least 05 assignments and will support the Design Engineer in design work.

Topographical Expert	01	M.Sc. / B.Sc. (Civil / Topographical Engineering) Degree with min. 10 years' experience in relevant design field.	Must have experience in survey works of at least 05 large scale projects of sewerage system or in basic utility.
Environmental Expert	01	M.Sc. / B.Sc. (Environmental Engineering / Environmental Sciences) Degree with min. 10 years' experience in relevant field.	Must have experience of preparation of comprehensive EIA reports to get it approved from EPA preferably experience of assessing environmental Impacts related to sewerage projects.
Sociologist	01	M.Sc. /B.Sc. in Sociology/Social Sciences Degree with min. 10 years' experience in relevant field.	Must have expertise in social survey and social impact assessment studies of 05 large scale projects.
GIS Expert	01	M.Sc. / B.Sc. GIS or equivalent Degree with min. 10 years' experience in relevant field.	Must be able to prepare GIS maps of existing and new drains/channels leading to site of disposal station and other associated structures.
Material Expert	01	M.Sc. /B.Sc. Civil Engineering Degree with min. 10 years' experience in relevant field.	Must have expertise in procurement of equipment / materials for large scale water projects.
Contracts Specialist	01	M.Sc. /B.Sc. Engineering having experience of Contract Management Degree with min. 10 years' experience in relevant field.	Must have expertise in dealing & preparation of contract agreements for large scale water projects.
Financial Expert	01	MBA /CFA / CA / ACCA / ACMA Degree with min. 10 years' experience in relevant field.	Must have relevant experience of financial analysis of at least 05 large scale projects.
Quantity Surveyor	02	DAE in Civil Engineering with Min 10years' experience.	Must have the experience for estimation of quantities for 05 sewerage projects.
B. Resident Supervision Phase Team for Thirty-Three (33) Months:			
Resident Engineer	01	M.Sc. /B.Sc. Civil Engineering Degree with min. 10 years' experience in relevant works.	Must have experience in carrying out the similar assignments of sewerage system and be able to plan, organize and effectively implement all scheduled activities of the project and to Co-ordinate and lead the team to ensure the timely completion of tasks.
Assistant Resident Engineer (Civil)	01	M.Sc. /B.Sc. Civil Engineering Degree with min. 07 years' experience in relevant field	Must have the field experience to execute the sewerage projects including disposal station for at-least 05 projects and will assist the Resident Engineer.
Assistant Resident Engineer (Electrical)	01	M.Sc. /B.Sc. Electrical Engineering Degree with min. 07 years' experience in relevant field	Must have the field experience to execute the sewerage projects including disposal station for at-least 05 projects and will assist the Resident Engineer.

Assistant Resident Engineer (Mechanical)	01	M.Sc. /B.Sc. Mechanical Engineering Degree with min. 07 years' experience in relevant field	Must have the field experience to execute the sewerage projects including disposal station for at-least 05 projects and will assist the Resident Engineer.
Surveyor/ Quantity Surveyor	03	Diploma in (Civil/ Electrical/ Mechanical) Engineering with min. 5 years' experience in relevant field.	Must have experience in survey works and estimation at site in at least 05 projects.
Site Inspector Civil	06	Diploma in (Civil) Engineering with min. 5 years' experience in relevant field.	Must have the field experience to execute the sewerage projects including disposal station for at-least 05 projects and will assist the Assistant Resident Engineer.
Site Inspector Electrical	01	Diploma in (Electrical) Engineering with min. 5 years' experience in relevant field.	Must have the field experience to execute the sewerage projects including disposal station for at-least 05 projects and will assist the Assistant Resident Engineer.
Site Inspector Mechanical	01	Diploma in (Mechanical) Engineering with min. 5 years' experience in relevant field.	Must have the field experience to execute the sewerage projects including disposal station for at-least 05 projects and will assist the Assistant Resident Engineer.
AutoCAD Operator/Office Assistant	02	With min. 5 years' experience in relevant field.	Must have the experience of drafting AutoCAD drawings for 05 sewerage projects.

CONSULTANCY SERVICES (PLANNING, DETAILED ENGINEERING DESIGN AND RESIDENT SUPERVISION) FOR THE ANNUAL DEVELOPMENT PROGRAM (ADP) 2022-23 SCHEME AT GS NO. 4349

Sewerage System in Jahangir Abad and Adjacent Areas, Multan.

SUMMARY OF COST

S#	Item	Amount Rs.	
	A. Feasibility Study / Design Phase:		
1	Staff Cost (A):	PKR	5,990,000
2	Direct Cost (A):	PKR	4,920,000
	Sub-Total (A):	**PKR**	**10,910,000**
	Add 16% GST:	PKR	1,745,600
	Total (A):	**PKR**	**12,655,600**
	B. Resident Supervision Phase:		
1	Staff Cost (B):	PKR	58,575,000
2	Direct Cost (B):	PKR	17,820,000
	Sub-Total (B):	**PKR**	**76,395,000**
	Add 16% GST:	PKR	12,223,200
	Total (B):	**PKR**	**88,618,200**
	Grand Total (A+B):	**PKR**	**101,273,800**
	Grand Total (A+B) - in Million:	**PKR**	**101.274**

CONSULTANCY SERVICES (PLANNING, DETAILED ENGINEERING DESIGN AND RESIDENT SUPERVISION) FOR THE ANNUAL DEVELOPMENT PROGRAM (ADP) 2022-23 SCHEME AT GS NO. 4349

Sewerage System in Jahangir Abad and Adjacent Areas, Multan.

REMUNERATION COST

S#	Person	Nos.	Man-Months	Rate	Total
Design Team for Three (03) Months					
1	Team Leader / Senior Design Engineer (Sewerage)	1	3	400,000	1,200,000
2	Sewerage Expert	1	2	300,000	600,000
3	Mechanical Expert	1	0.5	300,000	150,000
4	Electrical Expert	1	0.5	300,000	150,000
5	Structural Engineer	1	1	300,000	300,000
6	Junior Design Engineer (Civil)	2	3	250,000	1,500,000
7	Geotechnical Engineer	1	1	300,000	300,000
8	Topographical Expert	1	1	300,000	300,000
9	Environmental Expert	1	1	300,000	300,000
10	Sociologist	1	0.5	250,000	125,000
11	GIS Expert	1	1	250,000	250,000
12	Procurement / Material Expert	1	0.5	250,000	125,000
13	Contract Specialist	1	1	250,000	250,000
14	Financial Expert	1	1	250,000	250,000
15	Quantity Surveyors	2	1	95,000	190,000
TOTAL (A)					**5,990,000**
TOTAL (A)				**Rs. In Million**	**5.990**

CONSULTANCY SERVICES (PLANNING, DETAILED ENGINEERING DESIGN AND RESIDENT SUPERVISION) FOR THE ANNUAL DEVELOPMENT PROGRAM (ADP) 2022-23 SCHEME AT GS NO. 4349

Sewerage System in Jahangir Abad and Adjacent Areas, Multan.

DIRECT COST

S#	Description	Unit	Qty	Rates	Amount
1	Office rent, Utilities and furnishing	Month	3	300,000	900,000
2	Communication - Telephone, Fax, Courier/Postage etc.	Month	3	100,000	300,000
3	Stationary,binding,printing and project consumable items	Month	3	40,000	120,000
4	Travelling	Month	3	100,000	300,000
5	Topographical Survey	L.S	1	1,500,000	1,500,000
6	Geotech & other Surveys	L.S	1	1,000,000	1,000,000
7	Purchase of satellite images and G.I.S Mapping	L.S	1	800,000	800,000
Total (B)					**4,920,000**
Total (B)				**Rs. In Million**	**4.920**

CONSULTANCY SERVICES (PLANNING, DETAILED ENGINEERING DESIGN AND RESIDENT SUPERVISION) FOR THE ANNUAL DEVELOPMENT PROGRAM (ADP) 2022-23 SCHEME AT GS NO. 4349

Sewerage System in Jahangir Abad and Adjacent Areas, Multan.

REMUNERATION COST

S#	Person	Nos.	Man-Months	Rate	Total
Resident Supervision Team for Thirty-Three (33) Months					
1	Resident Engineer	1	33	400,000	13,200,000
2	Assistant Resident Engineer (Civil)	1	33	300,000	9,900,000
3	Assistant Resident Engineer (Electrical)	1	6	300,000	1,800,000
4	Assistant Resident Engineer (Mechanical)	1	6	300,000	1,800,000
5	Surveyor / Quantity Surveyor	3	33	85,000	8,415,000
6	Site inspector (Civil)	6	33	85,000	16,830,000
7	Site inspector (Electrical)	1	6	85,000	510,000
8	Site inspector (Mechanical)	1	6	85,000	510,000
9	AutoCAD Operator / Office Assistant	2	33	85,000	5,610,000
TOTAL (A)					**58,575,000**
TOTAL (A)				**Rs. In Million**	**58.575**

CONSULTANCY SERVICES (PLANNING, DETAILED ENGINEERING DESIGN AND RESIDENT SUPERVISION) FOR THE ANNUAL DEVELOPMENT PROGRAM (ADP) 2022-23 SCHEME AT GS NO. 4349

Sewerage System in Jahangir Abad and Adjacent Areas, Multan.

DIRECT COST

S#	Description	Unit	Qty	Rates	Amount
1	Office rent, Utilities and furnishing	Month	33	300,000	9,900,000
2	Communication - Telephone, Fax, Courier/Postage etc.	Month	33	100,000	3,300,000
3	Stationary,binding,printing and project consumable items	Month	33	40,000	1,320,000
4	Travelling	Month	33	100,000	3,300,000
Total (B)					**17,820,000**
Total (B)				**Rs. In Million**	**17.820**

Annex-F

IMPLEMENTATION PLAN

Phase	Activities	YEAR - I												YEAR - II												YEAR - III											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Design Phase (03 Months)	Data Collection & Feasibility Study																																				
	Preliminary Design																																				
	Detailed Engineering Design																																				
	Preparation of PC-I																																				
	Tender Documents																																				
	Tendering																																				
	EIA Report																																				
Resident Supervision Phase (33 Months)	Resident Supervision																																				
	Project Completion Report																																				