CADANGAN KERJA-KERJA PENGOPERASIAN, SERVIS BERJADUAL DAN PENYELENGGARAAN KE ATAS SISTEM LOJI RAWATAN KUMBAHAN UNTUK TEMPOH SATU (1) TAHUN DI UNIVERSITI TEKNOLOGI MARA (UiTM) CAWANGAN SELANGOR, KAMPUS PUNCAK ALAM & PUNCAK PERDANA, SELANGOR DARUL EHSAN

SCOPE OF WORKS

1. GENERAL

The works to be covered under these specifications is as listed hereunder:

1.1 To carryout the scheduled service and maintenance of the sewerage treatment plant system and equipments.

1.2 To inspect and service all sewerage treatment plant system and equipments as listed in the Schedule of Inventory.

1.3 To carryout repair works inclusive spare parts during normal working hours/after office hour when required to do so by the S.O.

1.4 To conduct Condition Audit and update all inventory of the sewerage treatment plant system equipments and sewage facilities once a year. The contractor shall furnish the first condition audit within three (3) months upon signing the contract and the following condition audit within three (3) months before contract expired.

1.5 ~~The contractor shall also update all as built drawings to hard copy and digital softcopy (auto Cad) of all equipments related to sewerage treatment plant, i.e.: manhole, sewer line, NPS and STP etc., and shall be furnish within six (6) months upon signing the contract.~~

1.6 To provide a sufficient minimum workforce, **one (1) Supervisor and two (2) plant operators will be on duty from 8:00 AM to 5:00 PM at the Sewage Treatment Plant, UiTM Cawangan Selangor, Kampus Puncak Alam, Selangor Darul Ehsan.** They will carry out the tasks mentioned above to ensure that all systems are always functioning properly throughout the contract period, and will consist of the following:

a) Supervisor,

b) Skill Foreman,

c) Qualified worker/serviceman with competent certificate from IWK Training Centre or another recognized accreditation agency.

Positions in this job are responsible for the operation and maintenance of a wastewater treatment plant and sewage disposal.

Typical Functions:

• Cleans and adjusts sewage filters; adjusts bar screens and mechanical devices for sewage reduction; operates and maintains sand filters and aeration tanks, sludge digestion pumps, motors and other sewage treatment plant equipment.

• Maintains records and prepares reports as required by regulatory agencies; performs as a liaison to regulatory agencies regarding sewage disposal and treatment.

• Adjusts plant flow rates as necessary to maintain adequate effluent perimeters.

• Review and utilize laboratory reports to make appropriate operational changes.

Knowledge, Skills, and Abilities:

Knowledge of, and ability in, the maintenance and operation of equipment utilized in wastewater treatment plants. Ability to prepare and maintain records and reports; to communicate effectively, both orally and in writing; and to establish and maintain effective working relationships.

Education and Experience:

Minimum Qualifications: Preferably two (2) years of experience in wastewater/sewage plant operations and valid Wastewater Operator Certificate from IWK Training Centre.

1.7 Where applicable, to check the sewerage treatment plant system operational condition and record the readings in Operation Data Sheet (provided by Contractor) during each maintenance visit.

For Plant which are equipped with desludging pumps/sludge compactor/drying bed, the contractor shall conduct desludging operation as recommended in the Operation and Maintenance Manual unless otherwise directed by S.O in order to meet the designated condition/standard of the system requirements.

1.8 To conduct final effluent water sampling by *competent personnel* every month and submit the executive comprehensive report inclusive test result from recognized laboratory.

1.9 To use necessary equipment and materials to manually clear away all the sludge, scum and other kind of floating materials accumulated in

the basket screen and pump sum and to dispose it off in hygiene plastic bags, check and clean the basket screen and float switch

1.10 Desludge all the other kind of materials accumulated in the pump sum and to dispose it off. To hoist, check and service the impeller of the submersible pumps for a smooth suction.

1.11 Desludging of all harden grease, sludge and the other kind of waste materials found accumulated in the entire grease trap and to dispose it off. Flushing and service the pipes serving from the kitchen to the grease trap.

1.12 ~~Desilting of the sewer line and manholes serving from the building area to main sewerage treatment plant to prevent accumulation of silt, grease and other debris.~~

2. The contractor shall inspect and service all machinery and equipments comprising the complete Sewerage Treatment Plants, ~~Septic Tanks, Imhoff Tanks~~ and Grease Traps at the UiTM premises.

3. ~~The contractor shall carry out desludging works on all septic tanks and imhoff tanks as directed by S.O in order to meet the designated standard of the system requirements~~.

4. The successful contractor are required to submit the monthly progress report to the S.O every first weeks of the following month.

5. The contractor shall also provide repair services during normal working hours and after office hours if required to do so by the Resident Engineer of Facility Management Office (PPF/BPF).

6. To inspect and check Influent and Effluent Quality for all STP and Septic Tank except grease trap for and the contractor shall also produce complete report including recognized laboratory test result of the following requirements parameter:

a)	B.O.D -	Biological Oxygen Demand	250 mg/l
b)	C.O.D -	Chemical Oxygen Demand (if necessary)	500 mg/l
c)	S.S -	Suspended Solid	300 mg/l
d)	pH -		7.0
h)	Oil & Grease		

6.1 The Environment Quality Act (EQA) 1974 specifies two standards for effluent discharge. Standard A for discharge upstream of any raw water intake and Standard B for discharge downstream of any raw water intake.

6.2 To ensure the compliance of absolute effluent standards set by **Environmental Quality Act 1974**, all sewage treatment plants shall be designed to produce final effluents having BOD and SS values less than or equal to the average values.

Design Effluent Levels of BOD and SS

PARAMETER	STANDARD A		STANDARD B	
	Absolute	Design	Absolute	Design
BOD (mg/l)	20	10	50	20
SS (mg/l)	50	20	100	40

These reports must be submitted to Resident Engineer of UiTM within 21 days from the date of sample taken.

7. At each such inspection and service, the Contractor shall furnish all works as per detailed below:

7.1 **Grease Traps**

a) Remove all grease, fats, rubbish etc., from grease traps.

b) Clean grease trap using high pressure water jetting with a special self-propelling nozzle with pressure of 1,000~2,500 psi, or

c) Flush and scale the pipeline of fat, sand, silt, and debris etc., using high pressure water jetting.

d) All rubbish, grease, debris, sand etc., shall be placed in hygiene plastic bags and properly secured to prevent spillage and odors. These plastic bags shall be removed from site and disposed off.

e) House keeping ~ to tidy up work area after completion of works.

f) Grease Trap ~ desludging of all harden grease, sludge and the other kind of waste materials found accumulated in the entire grease trap and to dispose it off. Flushing and service the pipes serving from the kitchen to the grease trap

8. **Consumable Materials**

The contractor shall supply the following consumable materials as when required:-

a) All oils and grease required for lubrication of all bearings, bushes and other moving parts.

b) All soap, detergent, compressed air, nitrogen and other cleaning materials require for flushing / cleaning purposes.

The cost of these consumable materials shall not be charged separately by the contractor but shall be included in the price quoted by the contractor for the service and maintenance of the complete STP equipments.

9. ~~It is understood that the Contractor is not required to furnish replacement parts and supplies, not to supply labor to replace worn or broken parts or to repair damage to the equipment due to causes beyond the Contractor's control. Additional material and labor required will be furnished by the Contractor at normal selling prices as quoted in `Schedule of Rate' and `Provisional of Quantity'~~.

10. In the even the contractor is required to make emergency calls occasioned by the improper operation of the equipment or due to damaged caused by floods, lighting, fire, element rebellion, riots, strikes, laborers trouble, civil commotion of any kind or due to failure to follow the contractor's recommendations as noted above, or for any cause beyond the contractor's control. The contractor shall be reimbursed for the expenses occur in making the emergency call in question, in accordance with the current established rates for performing such services.

11. The contractor shall not be held liable for any loss damage due to delay in furnishing labor or material caused by reason of strike or labor troubles affecting his employee who perform the service herein agreed or by unusual delays in procuring supplies or for any other cause beyond his control. As mentioned in ISO 9001: 2000 Pejabat Pengurusan Fasiliti : Response time of any breakdown report.

Initially Repair	:	1 hour (normal working hours)
Minor Repair	:	1 ~ 3 days (working days)
Major Repair	:	5 days
Other repairs	:	Shall be in written application and to be determined by Resident Engineer

12. All workers and supervisors shall be easily identified in full uniforms as per UiTM design (refer to Attachment 1). The contractor shall ensure that his staffs were neatly and tidily attired at all times.

13. The contractor is responsible in submitting the monthly quality and attendance report to the Resident Engineer. Failure to comply with this provision shall render the contractor in breach of his obligation and the Resident Engineer shall have the right to deduct any monies due to contractor for the numbers of buildings has failed to submit the report.

14. The contractor are permitted to store his belonging and tools meant for use within the campus area but UiTM nor do staff/personnel bear no responsibility regarding their safety in whatever respect at any time.

15. The contractor shall follow UiTM Standard Operating Procedure on Managing Works Order for Maintenance (refer to Attachment 2). All works, either general servicing or repair work shall be started only after permission given from the Resident Engineer or his officers.

16. All defective/worn parts have been replaced, must be forwarded to the Resident Engineer or his officers before further action are taken.

17. Commencing and completion of works will only be recognized as done if instructions and certifications are recorded in writing.

18. The Resident Engineer shall follow the time frame below as a guidance to deduct any monies due to contractor, should the Resident Engineers feels that the contractor deliberately delaying works.

    Time frame below is effective from the time; a written instruction is issued by Resident engineer or his officers.

NO	DESCRIPTION OF WORKS	DURATION
1.	Replacement of pipe and fittings.	03 days
2.	Electrical faults (replacement of fuses, contactors, carbon brushes, isolator and associate works.	02 days
3.	Technical repair on pump, via remachining shaft, bearing replacement and associate works.	05 days
4.	Motor rewinding of all capacity	06 days
5.	Replacement of belting, flexible couplings and associate works.	01 days

Failure to comply within the time frame above mentioned, a fine will be imposed on the eventual claim of the job concerned and the rate deducted is 5% per no. of day or hour of delay which ever applicable. If only enough justification can be produced by contractor, exemption of the above mentioned fine can be granted by the Resident engineer.

19. The contractor shall be deemed to have visited and examined all the designated buildings and satisfied himself as to the local conditions of equipment operation. Any supply and conditions effecting labor and material, transportation of labor and material, materials, equipment etc., send the execution of the contract generally, as no claim on the ground of want of knowledge in this respect shall be entertained.

20. The contractor shall at all times have their employment sufficient numbers of competent employer in order to effectively perform this contract. The contractor shall employ only skilled workman to ensure the proper and efficient execution of the work.

The Resident Engineer shall be at liberty to object to and require the contractor to remove forth with from the buildings, compound or any site any person employed by the contractor, who in the opinion of the Resident Engineer as misbehaved himself/herself, or his incompetence or negligent in the proper performance of his/her resident engineer to be undesirable.

Any person so removed from the works shall be replaced as soon as possible but not later than one (1) week by acceptance of substitute approved by the Resident Engineer.

The contractor shall before the commencement of the contract, provide the resident Engineer with a list of names of the engineering staff employed for the contract.
The contractor must encourage his staff to behave in the best manner and at all times maintain good relations with staff of the University.

21. The Resident Engineer reserves the absolute right to engage other contractors to execute works and/or services which in his opinion are specialized in nature or in which the contractor has failed to perform in accordance to the specification. In such an event the Resident Engineer reserves the right to deduct money due to the contractor as provided for in the contract.

22. All water and electricity required for the works shall be provided free of charge. The contractor shall exercise every effort to prevent the abuse of this privilege and to economize in the use of water and electricity and to ensure that all rules and regulations applicable to the use of same are strictly complied by his technical staff.

The contractor must ensure that his staff switch off all lights and turn off taps as soon as their work is completed.

Proper connections must be made to power point accordance into the prevailing rules and safety precautions. The contractor shall be made liable for damages to electrical circuits and installations of designated building.

23. The contractor must remove all rubbish arising from the repair work all defective parts replaced must be shown to Resident Engineer or his officers before permission to bring them out is granted.

24. The contractor shall at all time observe and comply with all prevailing laws and regulations relating to safety law and thereafter in force and shall bear all costs connected with the compliance of same.

25. The contractor shall be responsible to take all safety precautions to eliminate danger to his workmen, the general public and property of others.
The contractor must immediately notify the Resident Engineer of any damages or accident occurring in their areas of work. Any claims arising from such accidents, be it affecting person or properties or furniture will be responsibility of the contractor if such accidents can be ascertained to have caused through the negligence of the contractor.

26. Should the contractor be found to have committed any irregularities such as using inferior materials and workmanship or creating, nuisance in the buildings to the inconvenience of the Resident Engineer or the public, the Resident Engineer reserves the right to charge the contractor the cost of making good to any inconvenience caused, and for the investigation and administrative expenses incurred by the Resident Engineer.

27. The term Resident Engineer (or initial "R.E") shall be deemed to include any person or persons who may be deputed by the Resident Engineer to act on his behalf.

28. The contract shall not be sub-let either wholly or in part without the written permission of the Resident Engineer.

    a). Injury to person – The contractor shall indemnify government in respect of any liability, loss, claim or proceedings whatsoever whether arising at common law or by status in respect of personal injuries to or caused by the execution of the works unless due to any act or neglect of government or its servant.

    b). Injury to property – The contractor shall indemnify government in respect of any liability, loss, claim, or proceeding and for any injury or damage whatsoever arising out of or in the cause of any reason of the execution of the works to any negligence, omission or default or himself, his agent or his servants or any authorized sub-contractor or to any circumstances within this contract.

29. Default – If the contractor shall make default in any of the following respect, namely:-

i). without any reasonable cause suspend the service maintenance required hereunder.

ii). Fails to proceed with the service and maintenance with the reasonable diligence, if any such default shall continue for fourteen (14) days after a notice sent by registered post to the contractor from the Resident Engineer, the Resident Engineer may there upon by notice sent by Registered post determine this contract.

30. **ACID NEUTRALIZATION TANK MAINTENANCE**

a. For proper acid neutralization tank maintenance all limestone chips must be replaced within a maximum of two years. This is because the surfaces of the stones becomes crystallized and are no longer effective. In cases where gel or oily type substances develop on the stones surfaces, more frequent changing of the limestone is necessary. If too much of this is occurring, the use of a filtering device prior to the limestone tank would be necessary (such as our sediment interceptors). This is also true if a lot of debris is coming out with the effluent to clog up and cause stoppages in the pipe lines or limestone tank.

b. Care must be taken not to damage the tank walls or bottom, internal fittings, and gasket on top when taking out old limestone and putting in new.

c. Always fill the tank with water, up to the bottom of the outlet fitting (lowest fitting). Gently add the proper limestone chips in the manner describes in paragraph #a above. As the limestone is added, some water will overflow out the outlet fitting.

d. Safety precautions must always be taken. Check with O.S.H.A. requirements. Generally, you should always ventilate the room and/or area prior to opening the tank covers, i.e. open windows, doors, etc. you should wear eye protection and rubber gloves at a minimum. A carbon filter mask and possibly a rubber apron with rubber boots should be used on the larger units. Do not allow sparks, matches, or cigarettes near the unit as solvents are often discharges through the units. These can be Flammable or Explosive! Take the old limestone and put it on heavy7 plastic polyethylene sheeting. Sprinkle baking soda (sodium bicarbonate) all over the old stones. Let them sit there for a few hours to neutralize any residual acids/chemicals still on the stones. Afterwards, wash the stones down with water.

e. If no toxic chemicals have been discharges through the tanks, you may now (after you have completed paragraph #5), dump the old stones into a dumpster. If, however, toxic chemicals were used, then the limestone could be contaminated with the toxic chemicals. If this is the case, you must hire a licensed and insured toxic waste disposal service to take the material away and incinerate it. (They must have government approval documents to do this works. If they improperly dispose of your wastes, you could be fined seriously. You must get certificates of insurance from them to cover you.)

f. When ordering new limestone, order extra bags for maintenance purposes. Every month (or every other month in some cases), you must remove the cover following the safety procedures above and check to see if the level of the limestone has settled or dissolved down. The level must be maintained at the bottom of the outlet fitting. If it is too high, stones will fall out and clog your drain line. If it is too low, you may not be completely neutralizing.

g. If you have algae growing (a greenish or reddish growth) on your limestone, pour some liquid bleach (such as "Clorox") on them to kill the algae. Of course, follow paragraph #e above when working with bleach.