

## DOKUMEN MEJA

Tajuk : Membekal, Memasang dan Mentauliah Sistem Telemetry dan Scada Water Discharge Beserta Sistem Amaran Awal SMS dan Kerja-kerja Lain Yang Berkaitan Di Regulator Parit 4 Sungai Haji Dorani Serta Intergration With Existing Station Sg. Tinggi Flowmeter, Daerah Sabak Bernam, Selangor

No. Sebutharga : JPS/P/SEL/S/SH/1/2008

No	Items	Qty	Rate	Total
1.0	<b>Preminalaries</b>			
1.01	Insurance Workmens Compesation & Public Liability, Contractor all risk	1		
1.02	Mobilisation of man power, tools, machinaries, equipments and other necessary items in order to execute the complete works	1		
1.03	Manual Gauging works for determining the latest flow of the canal. The works shall be conducted with approved type JPS Hidrology current meter, counter, windge and other accessories	1 Lot		
1.04	Crossection survey including preparing the full crossection report / drawing on the gauging section for collecting the data to be use by doppler curent profiler	1 Lot		
2.0	<b>Remote Station Hardware &amp; Software</b>			
	<b>Remote Station RTU</b>			
	To supply and install remote station RTU with the following details.			
2.01	RTU (CPU Unit) c/w 8DI, 8DO, 8AI - Powerful-modular software design - A real time I/O device - Intelligent data logger capability - Remote time stamping of event and logged data - Programmable logical control - Modular and easily expandable - Industrial standard high speed 16 bit processor - On-Board 512 Kbyte Flash and 512 K RAM memory - On-Board Real Time Clock and Watch Dog Timer - Capable to communicates with PLC's (MODBUS)	1		
2.02	Power Supply Unit - Load Shedding Protection - Battery charging capability - Short circuit protection	1		
2.03	10.1" Colour Touch panel display	1		
2.04	1 Gigabyte SDRAM for data logging	1		
3.0	<b>Remote Station Communication Medium (GSM)</b>			
	To supply and install communication medium with the following details			
3.01	Remote Station GSM/GPRS Modem c/w whipped antenna	2		
3.02	12 Month Period GSM Bill For Remote Station	12		
	Sub Total 1 (RM)			

4.0		<b>Remote Station Enclosures</b>			
	4.01	Wheatherproof Two Doors Compartmentarised IP55 Control Panel. Complete with switches, relays, MCB's, Fuses and others necessary switchgears components.	1 Lot		
5.0		<b>Remote Station Lightning &amp; Surge Protection</b>			
		To supply and install remote station lightning & surge protection with the following details			
	5.01	Surgre filter for RTU's	1		
	5.02	I/O's Transient Barriers	1		
6.0		<b>Solar Power System</b>			
		To supply and install solar power system with the following details			
	6.01	To supply and install solar panel 100W 12 vdc c/w brackets	2		
	6.02	Solar Charge Controller 10A	1		
	6.03	100 AH 12 vdc Lead Acid backup battery	2		
	6.04	Electrical earthing for less than 5 ohm	1		
7.0		<b>Doppler Current Profiler</b>			
	7.01	To supply and install Doppler Current Profiler sensor with the following details	1 Lot		
		0.5 Mhz, 2-D side looking real time acoustic Doppler current meter with programmable range selection, vertical acoustic beam for stage measurement, multi cell (10) current profiling, intergrated temperature sensor, compass/2-axis tilt sensor, pressure sensor (0.25% accuracy, 20m), and 4 MB data storage in low profile (14 cm) urethane pressure case (80m max. depth) with base mounting plate. Includes RS232/SDI-12 interface and internal flow calculations.			
		Software bundle includes ViewArgonaut (Windows 9X/2K/NT/XP) software for data acquisition, analysis, and flow calculation			
8.0		<b>Platform for Doppler current profiler</b>			
		To supply and install platform size 1000mm X 1000mm or stage made by mild steel, concrete RC pile, hand railing, chain block for lifting the sensor, guide rail, concrete steps and others accessories	1 Lot		
9.0		<b>Doppler Platform Security Fencing &amp; Signboard</b>			
	9.01	To supply and install security fencing diamond type size 10' (L) x 10' (W) x 7' (H), concrete skirting, door and barb wire	1		
	9.02	To supply and install warning notice board size 4' x 3 ' with JPS logo and character	1		
		Sub Total 2 (RM)			

10.0		<b>Cabling And Field Installation</b>			
	10.01	To supply man power machinaries, tools, components, equipments for field installation including cabling, GI Conduit, cable tray to a complete system	1 Lot		
11.0	11.01	<b>To Integrate With Existing Sg. Tenggi Flowmeter Telemetry Station And SCADA Software</b>	1		
12.0		<b>RTU Programming and configuration</b>	1 Lot		
13.0		<b>Master Server Hardware</b> <ul style="list-style-type: none"> <li>- Dual Core Xeon Pro 5120, 4MB Cache, 1.86GHz, 1066MHZ FSB</li> <li>- 2nd Dual Core Xeon Processor 5120, 4MB Cache, 1.86GHz, 1066MHZ FSB</li> <li>- Microsoft® Windows® Server 2003 R2 Standard Edition English (5 CALs),FI</li> <li>- CD Kit for Microsoft® Windows® Server 2003 R2 Standard Edition (English)</li> <li>- Software Driver for TCP/IP Offload Engine</li> <li>- CD Kits For TCP/IP Offload Engine</li> <li>- 1GB (4x256), DDR-2 533MHz ECC 1R Fully-Buffered Memory</li> <li>- 250GB 3.5-inch 7.2K RPM SATA II Hard Drive - Non Hotplug</li> </ul>	1		
14.0		<b>Master Server Monitor</b> 21" LCD Flat Panel Display	1		
15.0		<b>Training, Testing &amp; Commisioning</b> - Drawing and operation manuals	1 Lot		
16.0		<b>Maintenance &amp; Support During Warranty Period Of One Year</b> - Regular maintenance every 2 month - Repair and replacement of faulty equipments	1 Lot		
17.0		<b>Portable Data Retrieval Unit</b> Intel Core 2 Duo Processor T5500 1.66 GHz, 667-MHz, 2 MB L2 cache 1024 MB, 667-MHz DDR2 SDRAM x 1 pcs 80 GB smart SATA hard disk No floppy, optional via USB port 10" TFT XGA Display DVD+/-RW Dual Layer Drive Intergrated bluetooth Intergrated 802.11 a/b/g wireless network connection	1		
Sub Total 3 (RM)					

**SUMMARY OF PRICES**

	Sub Total 1 (RM)	0.00
	Sub Total 2 (RM)	0.00
	Sub Total 3 (RM)	0.00
	<b>Grand Total (RM)</b>	<b>0.00</b>

Ringgit Malaysia : \_\_\_\_\_

Tempoh Siap : \_\_\_\_\_

Tenderer Signature:

Witness Signature:

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Name:

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Name:

I/C: \_\_\_\_\_

I/C: \_\_\_\_\_

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Date: \_\_\_\_\_

Company Chop:

**Tajuk :MEMBEKAL, MEMASANG DAN MENTAULIAH SISTEM TELEMETRI DAN SCADA WATER DISCHARGE BESERTA SISTEM AMARAN AWAL SMS DAN KERJA-KERJA LAIN YANG BERKAITAN DI REGULATOR PARIT 4 SUNGAI HAJI DORANI SERTA INTERGRATION WITH EXISTING STATION SG. TENGI FLOWMETER, DAERAH SABAK BERNAM, SELANGOR**

**No. Sebutharga : JPS/P/SEL/S/SH/1/2008**

*The tenderer must indicate whether his offer complies with the specification by answering "YES" or "NO" against the respective items of the specifications as set out below. If the answer is "NO" comments shall be given.*

No.	Specification	Compliance with Specification				
<b>1.0 INTRODUCTION</b>						
1.0.1	<p>The tender is for the design and provision of material and equipment for installation of Online Water Discharge Monitoring System</p> <table border="1" data-bbox="370 793 1122 898"> <thead> <tr> <th data-bbox="370 793 930 827">Site Name</th> <th data-bbox="930 793 1122 827">Qty</th> </tr> </thead> <tbody> <tr> <td data-bbox="370 827 930 898">i. Regulator Parit 4, Sungai Haji Dorani, Projek Pengairan Barat Laut</td> <td data-bbox="930 827 1122 898">1</td> </tr> </tbody> </table>	Site Name	Qty	i. Regulator Parit 4, Sungai Haji Dorani, Projek Pengairan Barat Laut	1	
Site Name	Qty					
i. Regulator Parit 4, Sungai Haji Dorani, Projek Pengairan Barat Laut	1					
<b>2.0 SCOPE OF WORK</b>						
	<p>The tender is to 'Design, Supply, Install, Testing and Commissioning of Online Water Discharge Monitoring System</p> <p>The work involved are as follows:</p> <ul style="list-style-type: none"> <li>i. Design and supply of fully online water quality system including RTU, communications medium, open channel flowmeter</li> <li>ii. Rainfall station</li> <li>iii. SCADA software for online monitoring</li> <li>iv. Lightning arrestor</li> <li>v. Mechanical structure for Doppler sensor mounting</li> <li>vi. Solar power system</li> <li>vii. Sensor calibration and gauging works</li> <li>viii. Training and Operation Manual</li> <li>ix. Documentation and warranty</li> </ul>					
<b>3.0 CAPABILITY AND FUNCTIONALITY OF THE SYSTEM</b>						
	The system shall be capable of functioning and shall consist of but not limited to the following:-					
3.1	<p>Provide Water Discharge Monitoring System.</p> <ul style="list-style-type: none"> <li>- Water Discharge</li> <li>- Water Velocity</li> <li>- Water Level</li> <li>- Rainfall</li> <li>- Water Temperature</li> </ul>					

No.	Specification	Compliance with Specification
	<ul style="list-style-type: none"> <li>- Sensor angle</li> <li>- Battery / AC Supply Level monitoring</li> </ul>	
3.2	Logging the water discharge, velocity, water level, rainfall, battery level parameters for at least 6 month	
3.3	SMS alarms to user	
3.4	The system should provide LCD panel at site as a site monitoring and control panel.	
3.5	Data queries through mobile phone	
<b>4.0 GENERAL SPECIFICATION</b>		
<b>4.1 Design</b>		
	Tenderers shall adopt an <b>open architecture system</b> (an architecture where common products are applied and users can easily get it from the market) approach in the design of the equipment with Industrial Standard Multiple Protocol all the equipment shall be designed and constructed so that they function as in integrated system efficiently, economically and in a reliable and ergonomic manner. There shall be no interference or interface problems both within the Equipment and between the Equipment and other units connected to it.	
<b>4.2 Compliance with International Regulation.</b>		
	All equipment shall comply with the relevant rules, regulations, recommendations and resolutions of the CCITT, CCIR, ITU, IFRB, IMCO and other relevant world bodies.	
<b>4.3 Equipment Construction.</b>		
4.3.1	All equipment offered shall be fully of solid state and compact. The equipment offered shall preferably be of industrial standard design. All necessary cables, connectors and material for a complete installation shall be supplied together with the equipment and their costs included therein.	
4.3.2	The equipment offered shall be fully tropicalised and suitable for working in ambient temperature of 0 deg.C to +65 deg.C and 95% non-condensing relative humidity without any degradation in performance and reliability. All metal surfaces shall be treated against corrosion.	
4.3.3	Adequate measure shall be taken to prevent overheating of all equipment under normal operating condition.	

No.	Specification	Compliance with Specification
4.3.4	The design, workmanship, material and finish of all parts of the equipment offered shall be in accordance with good engineering practices, and where applicable, conform to appropriate latest BSI specification, IEE safety regulation, and other relevant world bodies. The equipment offered shall be mechanically robust.	
4.3.5	Material used in the equipment offered should generally be incombustible. Should the use of the combustible materials be unavoidable, attention of the Superintending Officer (SO) must be drawn to these, and location and layout in particular of wiring, shall be such as to minimize the risk of fire.	
4.3.6	All components and printed circuit board must be tested and burnt-in before supply. They shall be rugged construction and shall be design with adequate safety margin to withstand continuous service with a minimum of maintenance.	
4.3.7	Component or assembly shall be capable of replacement by one of an equivalent type, the characteristic of which fall within the limits of tolerance without effecting the performance, reliability, and stability of the system. All components shall be readily accessible and items such as relays switch and connectors shall be removable without having to remove other components.	
4.3.8	Capacitor, inductors and resistor shall have values, tolerances, wattage and working voltage marked. Their commercial type number or names shall designated semiconductor devices.	
4.3.9	All components, units, board and their mounting, shall be sign written or marked to the satisfaction of the S.O to permit easy identification and cross reference to the as per built diagram.	
<b>4.4 Working Life</b>		
	The system shall be designed and constructed to give a minimum operational life of 10 years continuous service when operated on a 24 hours, 365 days per year basis. The RCU manufacturer shall provide guarantee for spare parts availability for period of (10) years.	
<b>4.5 Wiring And Cabling</b>		
4.5.1	All wiring and cabling in the system shall be of adequate size and rating neatly arrange and installed, for easy carrying out of normal maintenance operations.	
4.5.2	Where wiring and cabling is adjacent to or attached to any	

No.	Specification	Compliance with Specification
	part of the metal framework they shall be covered with approved insulating materials. Where wiring and cabling passes through a panel, suitable insulating bushing shall be provided to prevent chaffing of the insulation.	
4.5.3	Sufficient slack be left at the end of all wiring and cabling so as to permit replacement of components and sub-assemblies without difficulty.	
4.5.4	All wiring and cabling shall be neatly terminated to give good mechanical and electrical connection.	
4.5.5	All wiring and cabling installed shall be such that inductive interference is reduce to a minimum.	
<b>4.6 Power Supply</b>		
4.6.1	The main power supply of the system shall use DC power whereby the autonomy of the system can handle up to 2 days operation without charging. The charging shall be done by solar panel fixed at site with adequate battery backup. The solar panel shall be properly install and must be anti theft protection.	
4.6.2	Instruments which are easy expose to water should use 12 or 24 VDC in term of using AC power for safety purpose.	
<b>4.7 Electrical Equipment</b>		
4.7.1	All electrical equipment connected to the public power supply shall comply with the relevant rules and regulations of Tenaga Nasional Berhad. All telecommunication equipment shall comply with relevant rules and regulation of Jabatan Telekom Malaysia and SIRIM type approved.	
<b>4.8 Protection Against lightning Surge.</b>		
4.8.1	Electrical and electronics system deployed externally in the Malaysian environment may encounter lightning surge problems during heavy thunderstorms. The system shall be designed with maximum protection against lightning surge.	
<b>5.0 DETAIL SPECIFICATION</b>		
<b>5.1 Site Equipment</b>		
	System site control shall consist of but not limited to the following:-  (i) RTU (Remote Terminal Unit) (ii) Doppler sensor	

No.	Specification	Compliance with Specification
	<ul style="list-style-type: none"> <li>(iii) Water level sensor</li> <li>(iv) Rainfall sensor</li> <li>(v) SMS alert and information request</li> <li>(vi) Solar panel and battery</li> <li>(vii) Wiring/Cabling</li> <li>(viii) Control Panel</li> <li>(ix) 10" Touch Panel LCD display</li> <li>(x) Surge Protection System</li> <li>(xi) Others Instruments (Relays, Contactors, Lighting and others)</li> </ul>	
<b>5.1.1 RTU (Remote Terminal Unit)</b>		
5.1.1.1	The RTU shall be capable of long term data collection, monitoring water quality system and other facilities include it's own power supply status.	
5.1.1.2	The RTU shall be a high-reliability, Industrial grade Controller capable of Data Acquisition, Control and Communication. The RTU shall employ special embedded controllers using Programmable Logic Controller (PLC) or processor based design suitable for outdoor environment.	
5.1.1.3	The RTU shall have proven reference for interface to all type of common communication equipment available in the market today: GSM Cellular Network. Reference for such installation shall be submitted together with submission for future expansion.	
5.1.1.4	The RTU Controller equipment shall be designed for continuous operation on 12-24V DC power source. The RTU Controller shall be designed with minimum power consumption, which preferred to be less or around 100mA to achieve reliable operation.	
5.1.1.5	The RTU shall be powered by 24V switching power supply with enough cooling capabilities from 230V AC. Adequate protection shall be proposed in the converter to convert from 240V AC to 24V DC for the switching power supply.	
5.1.1.6	The RTU shall, in general, be of a single module type to facilitate ease of field service. It shall be possible and easy to remove the RTU board for replacement, without disturbing the field wiring and without breaking any current loops in the RTU.	
5.1.1.7	The contractor shall propose full capabilities and technical specification of RTU controller.	
5.1.1.8	The RTU shall have the ability to Time-Stamp and Log Data / Alarm in its Internal Memory Buffer.	

No.	Specification	Compliance with Specification
5.1.1.9	<p>The RTU shall utilize non-volatile memory for storing the logged event or time triggered logged data complete with event timestamp (up to every seconds). The logged data shall be any changes of state on digital input, every pulse input captured, controller reset or any controller fault / error.</p>	
5.1.1.10	<p>The data logging facilities inclusive of the following data logging mode</p> <ul style="list-style-type: none"> <li>i. Time Event Logging such as record of all sensor parameter in every 5 minutes interval.</li> <li>ii. Alarm Event Logging such as alarm due to sensor threshold setting or hardware such as lost of power, reset or software failure, enter / exit 'TEST' mode, etc.</li> </ul>	
5.1.1.11	<p>The storage capacity of these logged data or events in the RTU shall be minimum of <b>6 months</b> without being retrieve. It shall be based on normal rainfall rate and time triggered data logging of every 5 minutes hour interval for minimum 7 parameters.</p>	
5.1.1.12	<p>For time triggered data logging, the logging interval shall be user settable from the RTU and shall range from 1 second, 1 minute to 24 hours. The time triggered data logging shall be able to be stopped and restart by user when required.</p>	
5.1.1.13	<p>The RTU shall store all logged data into data logging buffer on every logging interval (default 5 minutes).</p>	
5.1.1.14	<p>The minimum feature of the RTU Controller shall be as follow :</p> <ul style="list-style-type: none"> <li>i. 1GB system base memory or more</li> <li>ii. 32KB EPROM for system firmware storage or more</li> <li>iii. Minimum 2 channel of RS232 serial communication port for interface to MODEM and other communication device</li> <li>iv. Battery backup for RAM for minimum 3 month period</li> <li>v. Wide supply voltage range (24V DC)</li> <li>vi. Ability to Time-Stamp and Log Data internally up to a period of minimum 1 months</li> <li>vii. Ring Data Logging Buffer</li> <li>viii. Alarm Report by Exception</li> <li>ix. Ability to accept Control Commands</li> <li>x. Multiple Programmable Communication Channels</li> <li>xi. Multiple Protocol Communications</li> <li>xii. Multiple Alarm Reporting Number Of Tries Rugged Operating Limits</li> </ul>	

No.	Specification	Compliance with Specification
	xiii. Configuration Program	
<b>5.1.2 Doppler Sensor</b>		
5.1.2.1	<p>0.5 Mhz, 2-D side looking real time acoustic Doppler current meter with programmable range selection, vertical acoustic beam for stage measurement, multi cell (10) current profiling, integrated temperature sensor, compass/2-axis tilt sensor, pressure sensor</p> <p>(0.25% accuracy, 20m), and 4 MB data storage in low profile (14 cm) urethane pressure case (80m max. depth) with base mounting plate. Includes RS232/SDI-12 interface and internal flow calculations. Software bundle includes View Argonaut (Windows 9X/2K/NT/XP) software for data acquisition, analysis, and flow calculation.</p> <p>Parameters:</p> <ul style="list-style-type: none"> <li>- Flow</li> <li>- Velocity</li> <li>- Area</li> <li>- Water Level</li> <li>- Temperature</li> <li>- Sensor Pitch &amp; Roll status</li> <li>- Sensor Battery status</li> <li>- The voltage supply of the sensor shall be 14.0 vdc</li> <li>- The output of the sensor shall be RS232 ASCII format.</li> <li>- The sensor shall be watertight and submersible proof</li> <li>- Accuracy +/-1%</li> <li>- Signal cabling max to 1000m</li> </ul>	
<b>5.1.3 Rainfall Sensor</b>		
	<ul style="list-style-type: none"> <li>- Receiver: 200 mm diameter machined alluminium rim. Powder coated.D6</li> <li>- Bucket capacity: 0.2 mm, 0.5 mm or 0.01 inch of rainfall.- Sensitivity: one tip.</li> <li>- Measuring range: 0 to 700 mm / hr.</li> <li>- Calibration accuracy: ±3 % for intensities from 25 to 500 mm/hr for 0.2 mm and 0.01 inch bucket. ±2 % for intensities from 25 to 500 mm/hr for 0.5 mm. Long term stable calibration.</li> <li>- Humidity: 0 to 100 %</li> <li>- Temperature: - 20 to +70 Degree Celsius</li> <li>- Contact system: dual reed switches potted in soft silicon rubber with varistor protection.</li> <li>- Capacity: 0.5 amp, 12 Volts D.C.- Resistance: Initial contact resistance 0.1 OHMS</li> <li>- M.T.B.F: 10exp 8 to 10exp9 Operations</li> </ul>	

No.	Specification	Compliance with Specification
	<ul style="list-style-type: none"> <li>- Syphon: made from injection moulded, non hydroscopic ABB.</li> <li>Bucket: chrome plated injection moulded, ABS bucket balanced to <math>\pm 0.05</math> gms. Retains less than 0.2 ml of water in each bucket after tipping.</li> </ul>	
<b>5.1.4 GSM Modem</b>		
	<p>The communication medium shall use GSM/GPRS network. The modem shall support AT command.</p> <ul style="list-style-type: none"> <li>• GSM dual band (900/1800 MHz)</li> <li>• Small size (54.5 x 36.0 x 3.6 mm)</li> <li>• Low power consumption (stand-by mode: 25 mA, talk mode: 300 mA)</li> <li>• SIM Application Toolkit</li> <li>• Extended AT commands for M2M applications</li> <li>• Output power 1 watt, GSM 1800</li> <li>• Voltage supply 12 vdc</li> <li>• Operating temperature -20 to 70 degree celcius</li> </ul>	
<b>5.1.5 Remote Terminal Unit (RTU)</b>		
	<p><b>RTU</b> CPU unit</p> <ul style="list-style-type: none"> <li>- Processor Intel Strong ARM CPU, 206MHz</li> <li>- Operating System Windows CE.NET</li> <li>- SDRAM 64M bytes</li> <li>- Flash 32M bytes</li> <li>- EEPROM 16K bytes</li> <li>- Expansion Slot 1 x Compact Flash type II insert with ejector</li> <li>- Interface 1x USB1.1, 2 x PS/2 port(Keyboard and Mouse), 1 x VGA port</li> <li>- Ethernet Port 1 x RJ45, 10BaseT</li> <li>- COM 2 9-pin D-Sub (RS-232)</li> <li>- COM 3 2-wire Terminal Block (RS-485)</li> <li>- Default Function 64-bit hardware unique serial number</li> <li>Reset button</li> <li>Power LEDs</li> <li>Watchdog Timer</li> <li>Real Time Clock</li> <li>- I/O Expansion Slot 3</li> <li>- Operating Temp. -25<math>\phi</math>XC to +75<math>\phi</math>XC</li> <li>- Storage Temp. -30<math>\phi</math>XC to +85<math>\phi</math>XC</li> <li>- Humidity 5~95%</li> <li>- Power Supply 20W, Unregulated +10Vdc to +30Vdc</li> <li>- Dimensions (LxHxD)(mm) 229x110x90</li> </ul>	

No.	Specification	Compliance with Specification
<b>5.1.6 Surge Protection Devices</b>		
<b>5.1.6.1</b>	RTU level <ul style="list-style-type: none"> <li>- Nominal voltage 240 vac</li> <li>- Maximum operating voltage 275 vac</li> <li>- Frequency 50 / 60 Hz</li> <li>- Technology in line series filter</li> <li>- Protection level up to 750 vac (3KA @ 8/20 micro sec)</li> <li>- Backup over current protection 6A</li> <li>- Temperature -35 - +55 degree celcius</li> <li>- Humadity 0-90%</li> </ul>	
<b>5.1.6.2</b>	Instruments <ul style="list-style-type: none"> <li>- Protection must be at both instruments and RTU side</li> <li>- 2.5 Kvolt Galvanic isolation</li> <li>10KA Surge protection</li> </ul>	
<b>6.0 SCADA Software</b>		
<b>6.0.1</b>	Customize SCADA Server software. The SCADA server shall capable to interrogate with the remote station. All the data, report queries shall be available. The SCADA server application shall be password protected. <ul style="list-style-type: none"> <li>- Graphical user interface</li> <li>- Real time and historical data trending</li> <li>- Alarms report</li> <li>- Customized data report</li> <li>- Online data queries</li> </ul>	
<b>7.0 SMS alert and information request</b>		
7.0.1	The system should able to send SMS to at least 7 users to alert the users during any critical events. Hand phone numbers of these 7 users are configurable and protected by password. Below are the list of condition when the system need to alert the users: <ol style="list-style-type: none"> <li>i. Normal, Warning, Danger Parameter of Water Flow, Rainfall, Water Level</li> <li>ii. Battery Alarms</li> <li>iii. Power Fail Alarms</li> </ol>	
<b>8.0 Wiring and Cabling</b>		
	As mentioned in section 4.5	
<b>9.0 Control Panel</b>		

No.	Specification	Compliance with Specification
9.1	This shall be an IP 45 type wall mounted / floor standing panel or wall mounted similar in construction to L.V boards. It shall be bottom entry of all cable and front access of all components.	
9.2	<p>The panel shall be located in the control and shall comprise the following:</p> <ul style="list-style-type: none"> <li>i) Suitably rated main switch</li> <li>ii) Adequate distribution MCBs with 100% spare capacity.</li> <li>iii) Programmable Logic Control.</li> <li>iv) Battery Operated Clock</li> <li>v) Thermostat controlled anti condensation heater, switch, indicating lights, push buttons and emergency stop switch.</li> <li>vi) Ventilation fan for panel</li> </ul>	
9.3	The tenderer is required to supply and deliver all of the open cable shall be armored type.	
9.4	The tenderer is required to excavate, backfill and reinstate all cable trenches.	
<b>10.0 Lightning Protection Unit (LPU)/Earthing</b>		
10.1	The tenderer shall provided a complete LPU for the systems offered and both the transmitting end/receiving end of the sensors connection if necessary.	
10.2	All field instruments especially with analogue signal shall be protected by analogue signal surge protectors.	
10.3	Nominal Voltage:15 to 30 v Frequency (1200hm term): 2MHz	
10.4	Max. Discharge Current: 20KA Protection mode: Differential & Common Mode	
10.5	<p>The tenderer is required to connect all Lightning Protection Units (LPU) to earthing system which shall consists of:</p> <ul style="list-style-type: none"> <li>- Earth Continuity Conductor (ECC)</li> <li>- Earth Chamber (EC) resistance not more than 5 ohms</li> </ul>	
10.6	ECC shall connect all LPUs, sensors, power equipment, armored cable, metal casings and other equipment to the central earthing system.	
10.7	The ECC shall be PVC insulated green earth wire of minimum size 6-sq mm or copper tape of similar cross-sectional area. The ECC shall not be coiled. All ECC shall be terminated to a main earth conductor by means of	

No.	Specification	Compliance with Specification
	cable lugs, bronze bolts and washers.	
<b>11.0 Others Instruments (Relays, Contactors, Lighting, and others)</b>		
11.1	The system should provide device signal surge protection. Device like relays signal surge protectors should be installed to protect the system.	
11.2	Main circuit breaker (MCB) with correct amps and Earth Leakage Circuit Breaker (ELCB) should be installed to protect the system.	
<b>12.0 Master Server Hardware</b>		
12.1	<ul style="list-style-type: none"> <li>- Dual Core Xeon Pro 5120, 4MB Cache, 1.86GHz, 1066MHZ FSB</li> <li>- 2nd Dual Core Xeon Processor 5120, 4MB Cache, 1.86GHz, 1066MHZ FSB</li> <li>- Microsoft® Windows® Server 2003 R2 Standard Edition English (5 CALs),FI</li> <li>- CD Kit for Microsoft® Windows® Server 2003 R2 Standard Edition (English)</li> <li>- 1GB (4x256), DDR-2 533MHz ECC 1R Fully-Buffered Memory</li> <li>- 250GB 3.5-inch 7.2K RPM SATA II Hard Drive - Non Hotplug</li> <li>- 24 x DVD/CD drive</li> <li>- 2 x USB ports</li> </ul>	
<b>13.0 Master Server Monitor</b>		
13.1	21" LCD Flat Panel Monitor	
<b>14.0 Portable Data Retrieval</b>		
14.1	<ul style="list-style-type: none"> <li>- Intel Core 2 Duo Processor T5500</li> <li>- 1.66 GHz, 667-MHz, 2 MB L2 cache</li> <li>- 1024 MB, 667-MHz DDR2 SDRAM x 1 pcs</li> <li>- 80 GB smart SATA hard disk</li> <li>- No floppy, optional via USB port</li> <li>- 10" TFT XGA Display</li> <li>- DVD+/-RW Dual Layer Drive</li> <li>- Intergrated Bluetooth</li> <li>- Intergrated 802.11 a/b/g wireless network connection</li> </ul>	
<b>15.0 TESTING AND COMMISSIONING</b>		
15.1	The contractor is required to calibrate and test all equipment prior to delivery to the required accuracy.	
15.2	The contractor shall arrange for Site Test of all Equipment	

No.	Specification	Compliance with Specification
	after installation, and provide certified records, in triplicate, of the results.	
15.3	Testing and Commissioning of the entire system shall be performed to the satisfaction of the S.O.	
15.4	The contractor shall provide all necessary testing procedure, testing form, necessary equipment and instruments for the Testing and Commissioning.	
<b>16.0 MANUALS AND DRAWINGS</b>		
16.1	The contractor shall submit all manual and drawing upon completion of the commissioning.	
16.2	The contractor shall supply four (2) copies of Operation and Maintenance (O&M) Manuals to Jabatan Pengairan dan Saliran Selangor. The O&M manual shall provide sufficient instructions and details to allow equipment and system operation, routine maintenance and troubleshooting to be performed by competent personnel or any competent persons appointed by Jabatan Pengairan Dan Saliran Malaysia	
16.3	The O&M manual shall be standalone, not requiring reference to other manuals or instructions. It shall reflect the 'as built' status of the proposed system after final acceptance and start-up. It shall be in English, typed, A4 size, and neatly bound.	
16.4	The tenderer shall provide complete documentation, operation manuals, programming language, data format (ASCII code format in Comma Separated Variable), flow chart, source code listings and sample output in all software provided.	
16.5	All drawings and schematic wiring diagrams shall be competently drawn in accordance with good engineering practice, and may be sized to A3 size.	
<b>17.0 TRAINING</b>		
17.1	The successful tenderer is required to provide a practical training to four (4) Jabatan Pengairan Dan Saliran Negeri Selangor staffs for site and a big overall training. This will comprise Engineers and Technician who will ultimately be responsible for the operation and maintenance of the system. The training course shall comprise the following lectures and practice.	

No.	Specification	Compliance with Specification
17.2	The tenderer shall provide place, lecturers, lecture notes, and beverage for all the participants during the training session.	
<b>18.0 MAINTENANCE SCHEDULE DURING WARRANTY PERIOD.</b>		
18.1	The tenderer shall carry out schedule maintenance for the period of 1 year (Once every 2 months) after successful commissioning of the system during the warranty period.	
18.2	The tenderer shall prepare 'Schedule Maintenance Plan' every quarterly during the warranty period and the cost shall be included in the tender.	
18.3	The tenderer shall bear the cost of all communication bills like SMS and Streamyx or GPRS where the system connected to	
<b>19.0 SAFETY</b>		
	The tenderer shall be responsible for all safety act base on AKTA KESELAMATAN & KESIHATAN PEKERJAAN 1994 (OSHAS).	
<b>20.0 EQUIPMENT WARRANTY AND GUARANTEE</b>		
20.1	The tenderer shall guarantee to repair or renew free of charge any part or parts of the equipment, which may become defective or do not perform according to the specifications with in twelve (12) months of the putting into service or twelve (12) months after the date of completion of delivery which ever is earlier.	
20.2	Under normal storage and proper use, and arising solely from the faulty design, materials or workmanship. This period shall be designated as the primary Guarantee Period The tenderer liability is limited to free replacement of such defective part or parts C.I.F. Jabatan Pengairan Dan Saliran Malaysia.	
20.3	If it should become necessary for the successful tenderer to renew any defective portion of the equipment under this clause, the provision of the clause shall apply to the portions, so renew until the expiration of nine (9) months from the date of such renewal or until the end of the primary guarantee period whichever may be later. This shall be designated as the secondary Guarantee period.	
20.4	The tenderer's liabilities is limited to free replacement of such defective part or parts C.I.F. Jabatan Pengairan Dan	

No.	Specification	Compliance with Specification
	Saliran Malaysia.	
20.5	If it should become necessary for the contractor to renew any defective portion so renew until the expiration of another five (5) years from the date of such renewal. This shall be designated as the Secondary Guarantee Period.	
20.6	Unless otherwise stated to the contrary, all equipment supplied shall have warranty against Manufacturing Commissioning. Any part of the equipment that may become defective or does not perform according to the Specifications as offered within the warranty period shall be repaired or replaced free of charge.	
20.7	The warranty shall not cover repair and/or replacement of the Instrument/System due to the vandalism, theft or other damages due to natural disaster or 'Act Of god'.	
20.8	The contractor shall guarantee that the spare of all equipment shall be available in West Malaysia for the next tenth (10) years after the expiry of the warranty period defect for a period of twelve (12) months, which shall take effect from the date after the successful testing and commissioning.	
<b>21.0 DELIVERY PERIOD</b>		
21.1	The delivery period shall not more than 3 months after the official order.	