



PANDUAN PEMASANGAN SISTEM TELEMETRI

Pemasangan sistem telemetri di Kolam-kolam SAINS terbahagi kepada dua kategori iaitu:

1. Tiada Sistem Pam
2. Mempunyai Sistem Pam

Setiap kategori mempunyai keperluan khusus berdasarkan kepada infrastruktur bekalan air yang ada di tapak.

Tiada Sistem Pam

Bagi kolam yang menerima bekalan air secara terus ke kolam servis (tiada sistem rumah pam) keperluan telemetri di tapak adalah seperti berikut

1. Inlet Pressure (Battery Operated)

Spesifikasi	Catatan
LOGGER 1P <ol style="list-style-type: none">i. Fully integrated GSM/SMS/GPRS Data Loggerii. Supports 'average' and 'statistical' recordingiii. 1 pressure inputiv. Self powered using internal battery for > 5 yearsv. On-demand data retrieval optionvi. 15 minute, 30 minute, 60 minute, daily data transmission using frequent data modevii. PN16	

2. Paras Kolam

Spesifikasi	Catatan
GSM LOGGER C/W BREATHER BOX & HYDROSTATIC LEVEL SENSOR (DEPTH 10M) <ol style="list-style-type: none">i. Fully integrated SMS/GPRS Data Loggerii. Each channel independently selected for digital or analogue inputsiii. Two channels may be dedicated for high resolution 4-20mA inputs / flash powering externaliv. 4-20mA loops (factory configured)v. Self powered for > 5 years	

<ul style="list-style-type: none"> vi. Nationwide wireless coverage vii. On-demand data retrieval option viii. 15 minute, 30 minute, 60 minute, daily data transmission using frequent data mode ix. "Data on the web" option x. Threshold and profile alarms <p>HYDROSTATIC LEVEL SENSOR (DEPTH 10M)</p> <ul style="list-style-type: none"> i. Pressure/level ranges : 0...0.25 to 0...5 bar, 0...2.5 to 0...50 mH₂O ii. Output signals : 4...20 mA, 0...10 V iii. Non-linearity, hysteresis and repeatability : ±0.1 %FSO iv. Size (approx.) : Ø 22 x 129.5 mm 	
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3. Flow meter

Semua data bagi Pressure, Paras Kolam dan Flow meter perlulah di hantar ke server Command, Control and Crisis Center di Ibu Pejabat SAINS. Kaedah penghantaran adalah seperti berikut:

1. Telemetry Logger
 - a. GSM (SMS)

Spesifikasi	Catatan
<p>LOGGER 2i</p> <ul style="list-style-type: none"> i. Fully integrated GSM/SMS/GPRS Data Logger ii. Supports 'average' and 'statistical' recording iii. Optional pressure input iv. Two digital inputs configurable for flow or tamper/status v. Self powered using internal battery for > 5 years vi. On-demand data retrieval option vii. 15 minute, 30 minute, 60 minute, daily data transmission using frequent data mode viii. PN16 	

2. Flowmeter (Electromagnetic)

Spesifikasi	Catatan
<p>Battery-powered electromagnetic flow meter complete with LiSOCl₂ batteries</p> <ul style="list-style-type: none"> i. Accuracy 0.5% ii. liner: Hard Rubber iii. Electrodes: Stainless Steel iv. Sensor: IP 68 with 10m cable v. pressure rating : PN 16 vi. Converter: IP 67 vii. Surge protector: In-built as standard 	

viii. Power supply: 24 Vdc	
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3. Kabinet

Spesifikasi	Catatan
<ul style="list-style-type: none"> i. The Cabinet shall be made of steel with oven bake power coating. ii. It shall be not less than: <ul style="list-style-type: none"> a. 40 cm in length b. 30 cm in width c. 30 cm in height. iii. There shall be a full enclosure lid with rubber seal at the inner edge. iv. The lid and case shall be double hinged on one side. v. There shall be a lock the Cabinet. vi. There shall be a unique key for each Cabinet, with a master for all Cabinets. vii. At any one side of the Cabinet, there shall be storage to hold an A5 booklet, which shall only be opened by a latch. viii. The storage shall be accessible independently. ix. There shall be a separated metal deck roof installed at the top of the cabinet with reasonable air flow and should protect 50% of the cabinet body 	

Pihak pemaju perlulah mendapatkan kelulusan bahan daripada unit NRW/Telemetry sebelum melaksanakan pemasangan di tapak.

Semua peralatan yang dipasang perlulah bersesuaian dengan server yang sedia ada di SAINS.

Peralatan telemetri mestilah disertakan dengan kabinet yang diluluskan oleh unit NRW/Telemetry

Setiap logger mestilah mempunyai sistem alarm yang stabil.

Alarm mestilah boleh di hantar kepada individu-individu yang ditetapkan oleh Unit NRW/Telemetry melalui SMS

Mempunyai Sistem pam

Bagi kolam yang menggunakan sistem pam dan kolam servis keperluan telemetri di tapak adalah seperti berikut

Kolam Sedutan

1. Inlet Pressure (Pressure Sensor)
2. Paras Kolam (Submersibel Level Sensor)

Kolam Servis

1. Paras Kolam (Submersible Level Sensor)
2. Inlet Pressure (Pressure Sensor)
3. Outlet Pressure (Pressure Sensor)

Rumah Pam

1. Scada Sistem (sila rujuk konsep Scada sistem) (Spesifikasi rujuk **Lampiran 1**)
2. Flow Meter (Electromagnetic Flow Meter)
3. Outlet Pressure (Pressure Sensor)
4. Alarm (SMS)

Keperluan Scada Sistem

Scada sistem yang dipasang perlulah mengumpulkan data-data di bawah dan di hantar ke server di Command, Control and Crisis Center, SAINS

Data

1. Inlet Pressure (Kolam Sedutan)
2. Outlet Pressure (Rumah Pam & Kolam Servis)
3. TNB Status (On/Off/Trip)
4. Pam Status (On/Off/Trip)
5. Paras Kolam Sedutan (Trending, Low, High, Overflow)
6. Paras Kolam Servis (Trending, Low, High, Overflow)
7. Alarm (Low, High, Overflow)
8. Flowmeter (Trending, Totalizer (Tarikh boleh dipilih)
9. Berkeupayaan untuk berinteraksi dengan sistem logger sedia ada di SAINS (Sila rujuk unit NRW/Telemetry bagi sistem sedia ada di SAINS)

Telekomunikasi

Semakan signal telekomunikasi perlulah dibuat sebelum sebarang pemasangan boleh dilaksanakan

Command Control and Crisis Center

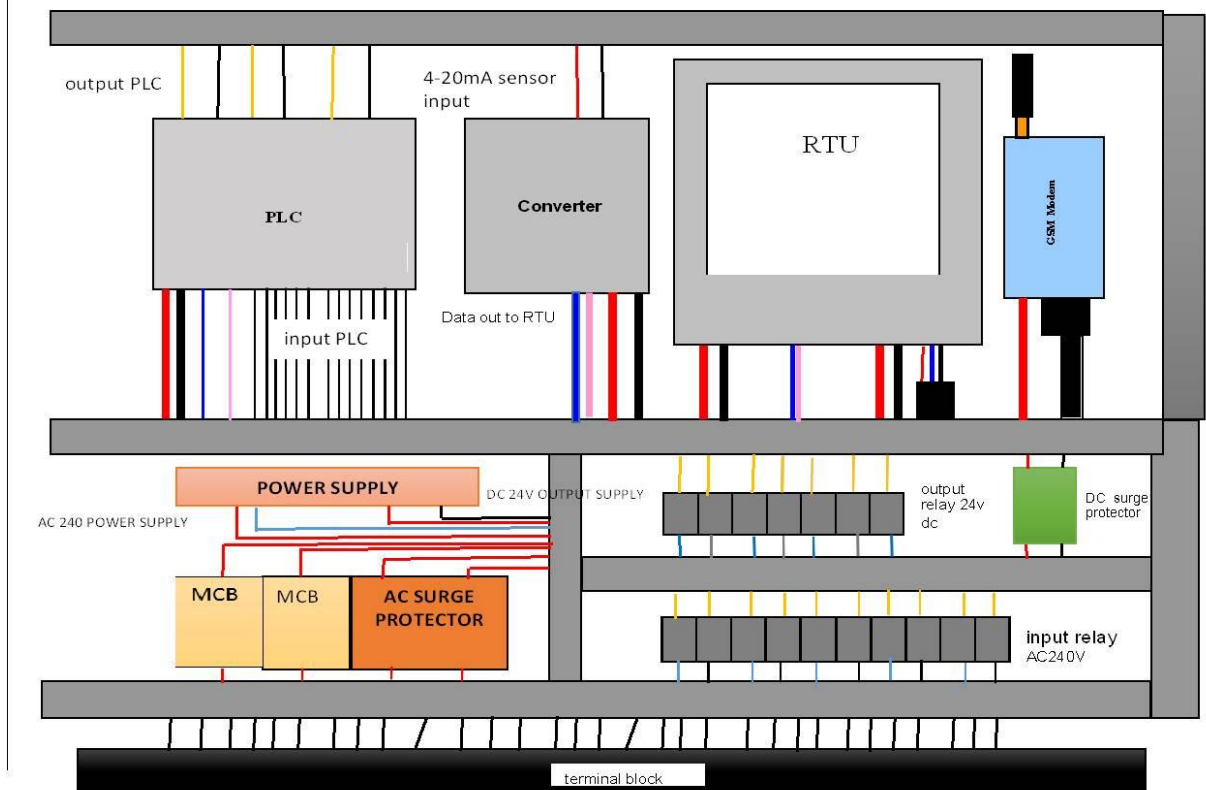
Pihak pemaju perlulah memasang sistem Mimic scada di server sedia ada di CCCC, SAINS HQ. Server perlulah berkeupayaan seperti berikut:

1. Menyimpan data di dalam database
2. Menunjukkan graf semua data-data
3. Mimic peralatan dan status semua peralatan di tapak
4. Konfigurasi sistem
5. Alarm Status
6. Remote control Pump (Pam mestilah boleh di tutup dan dibuka melalui sistem di CCCC)
7. Report

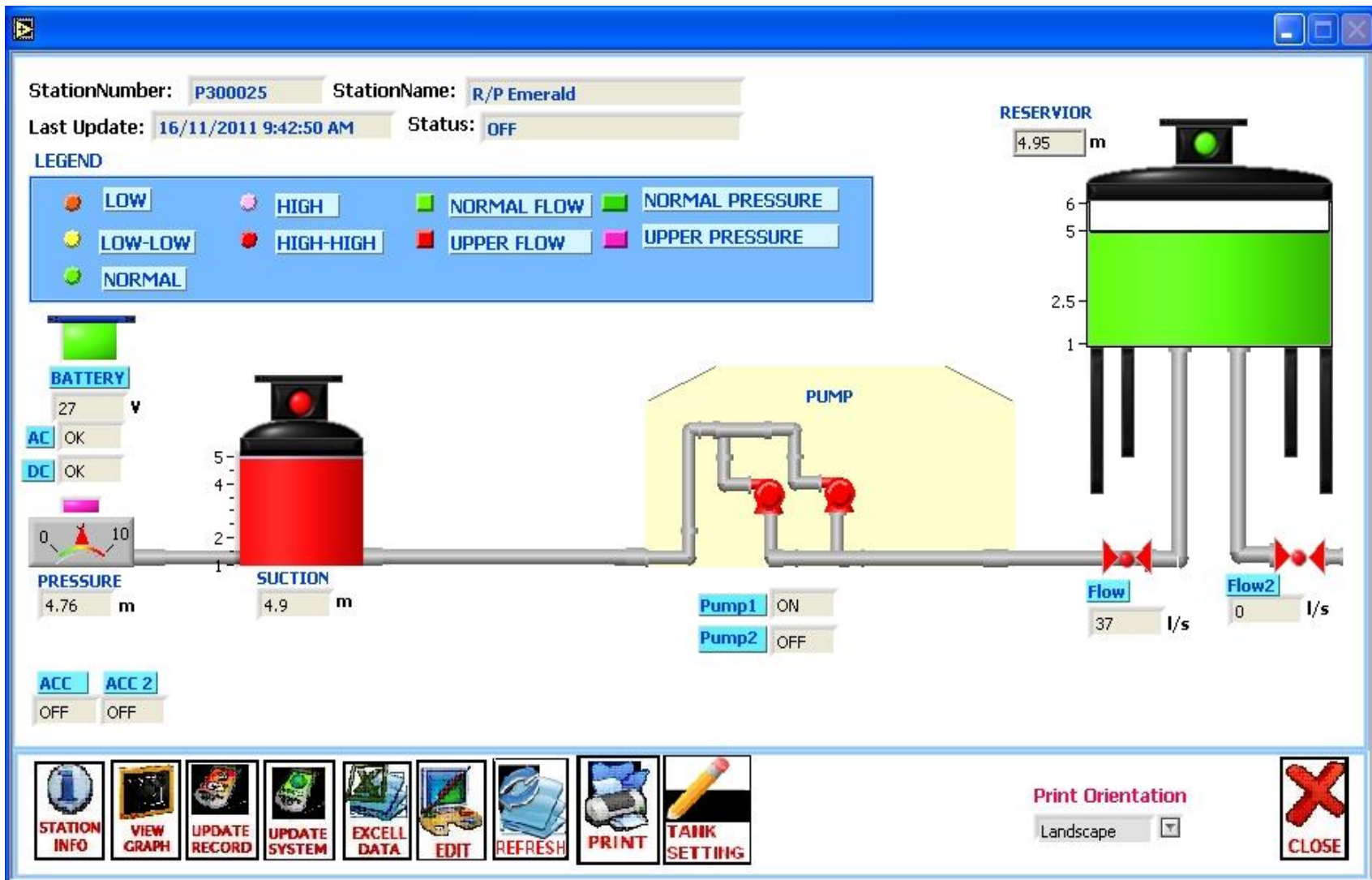
Pihak pemaju perlulah mendapatkan kelulusan bahan beserta lukisan konsep sistem daripada unit NRW/Telemetry bagi sistem scada yang hendak dipasang

Alarm mestilah boleh di hantar kepada individu-individu yang ditetapkan oleh Unit NRW/Telemetry melalui SMS

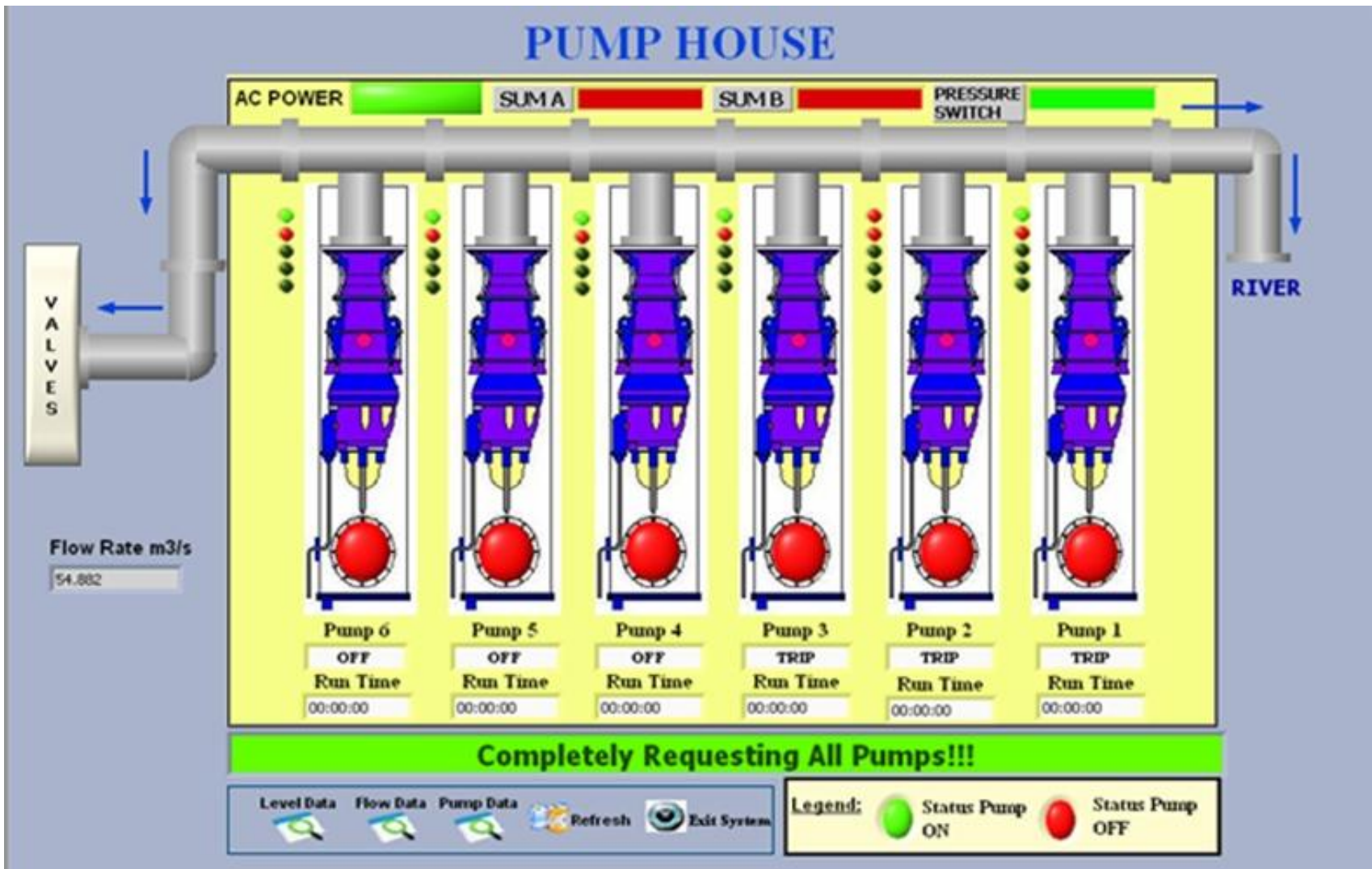
SAINS Pump House RTU Panel block diagram



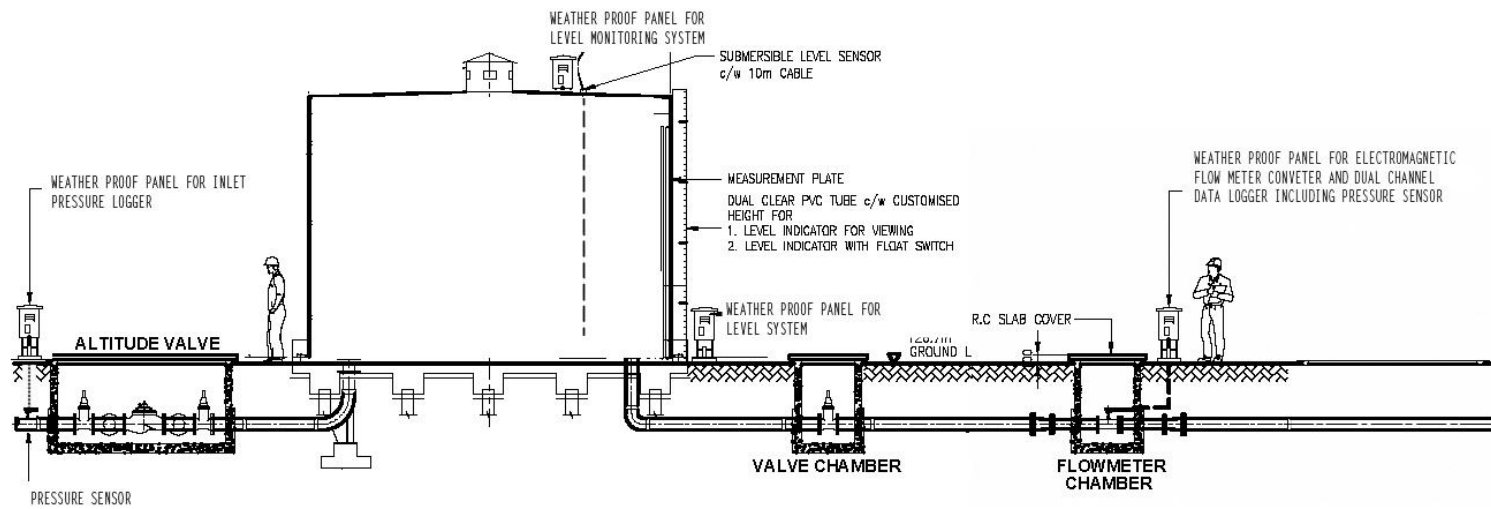
Contoh Konsep Sistem Scada



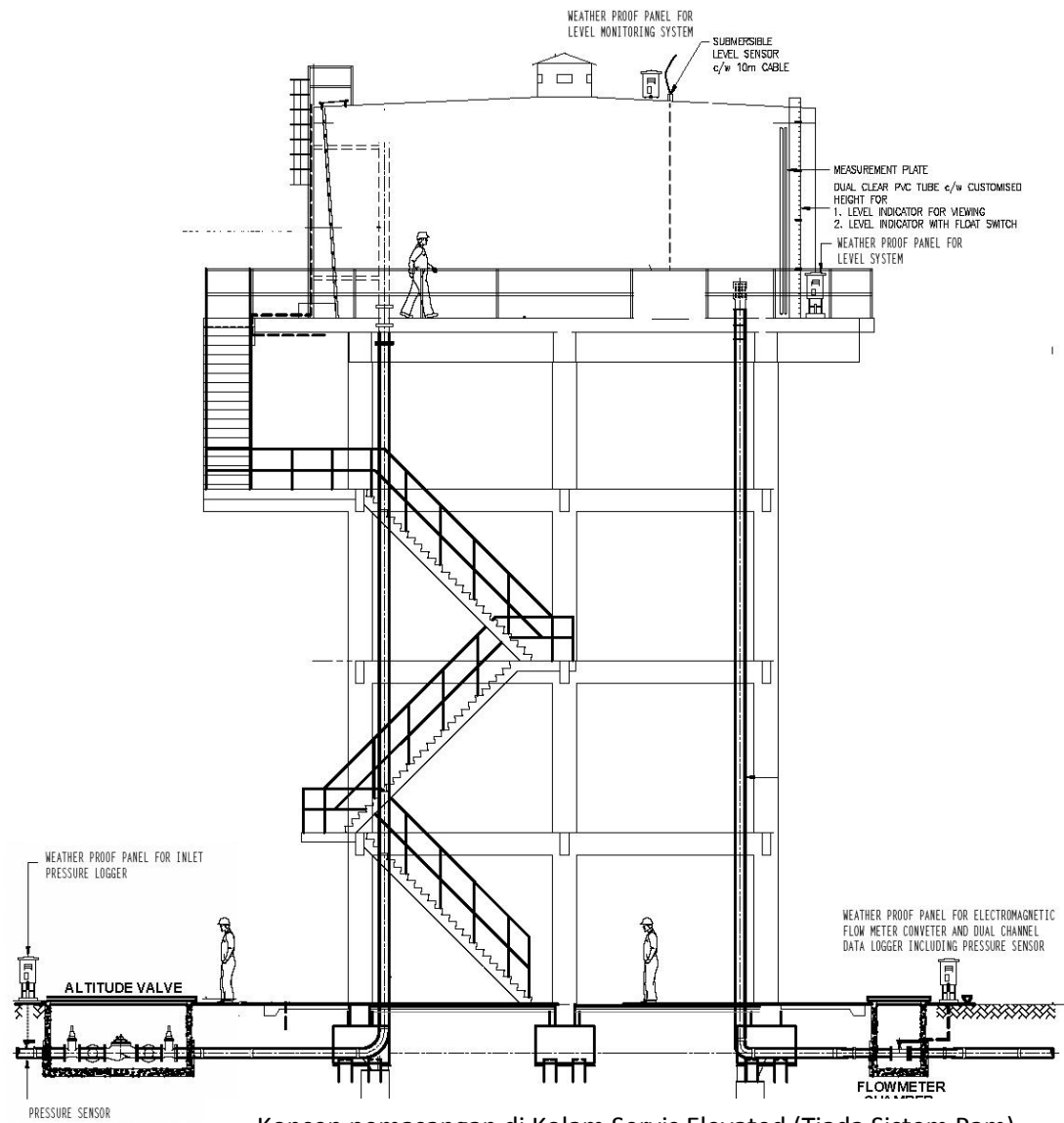
Contoh Mimic Scada



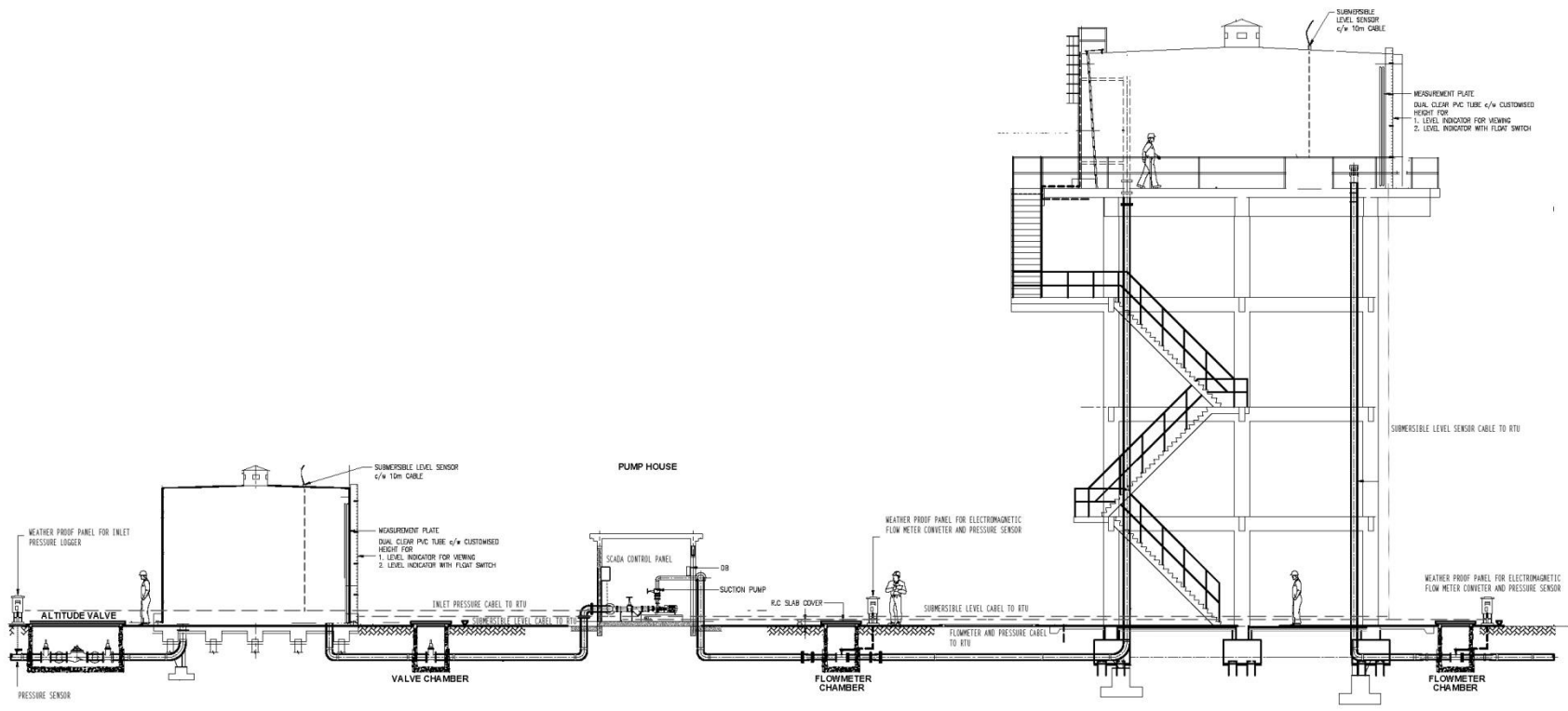
Contoh Mimic Scada



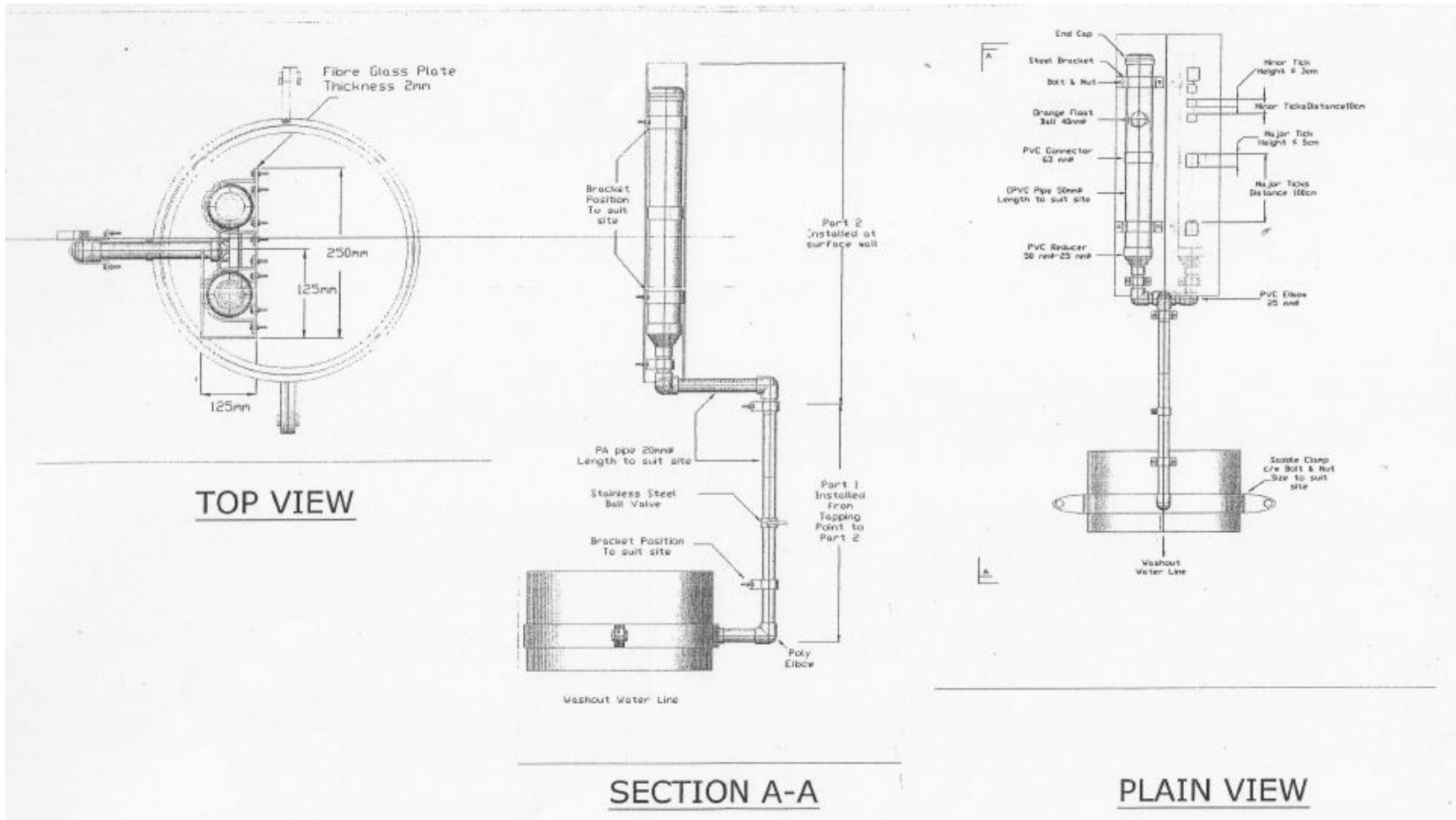
Konsep pemasangan di Kolam Servis Ground (Tiada Sistem Pam)



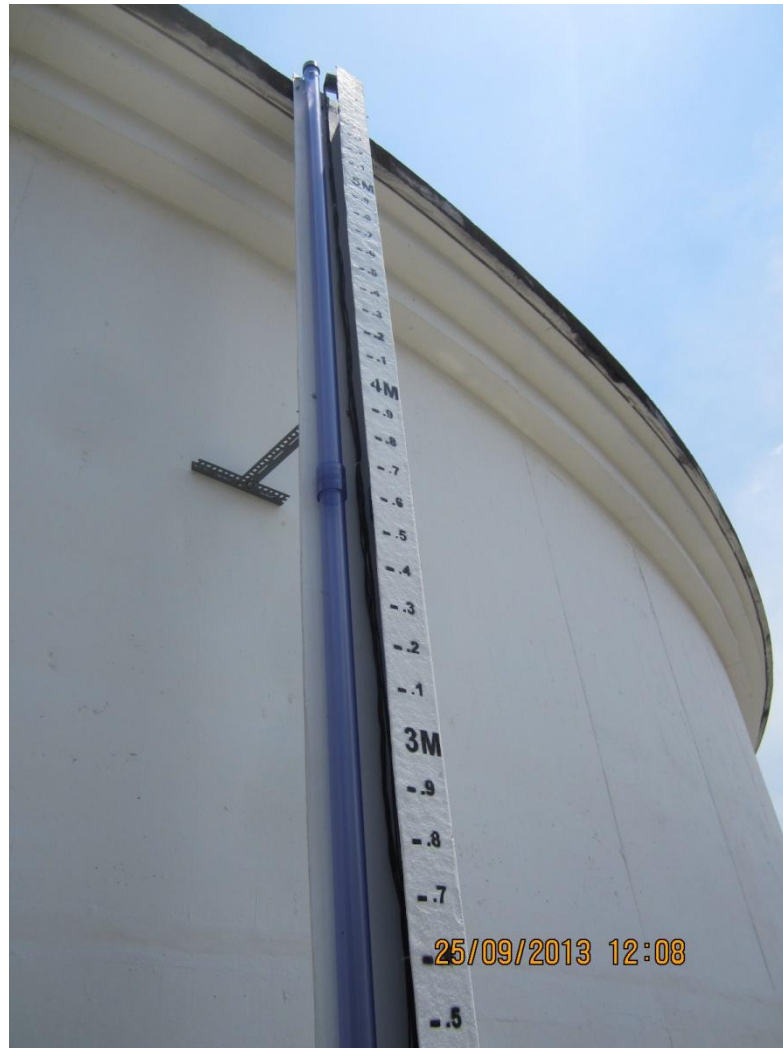
Konsep pemasangan di Kolam Servis Elevated (Tiada Sistem Pam)



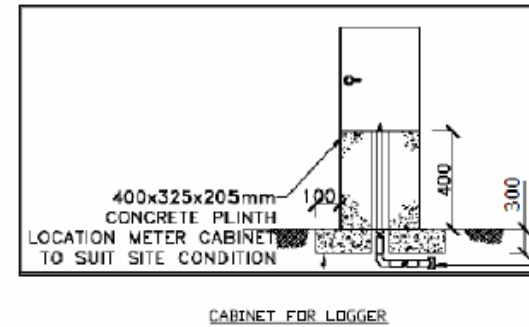
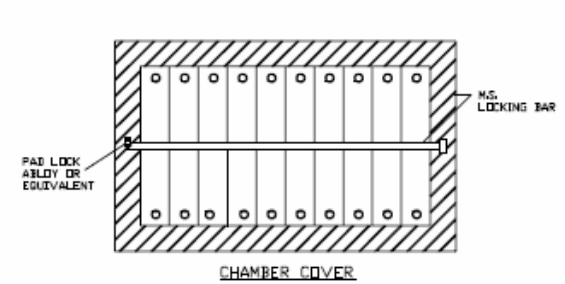
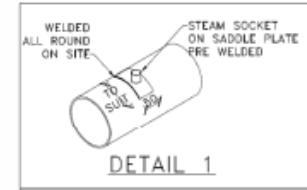
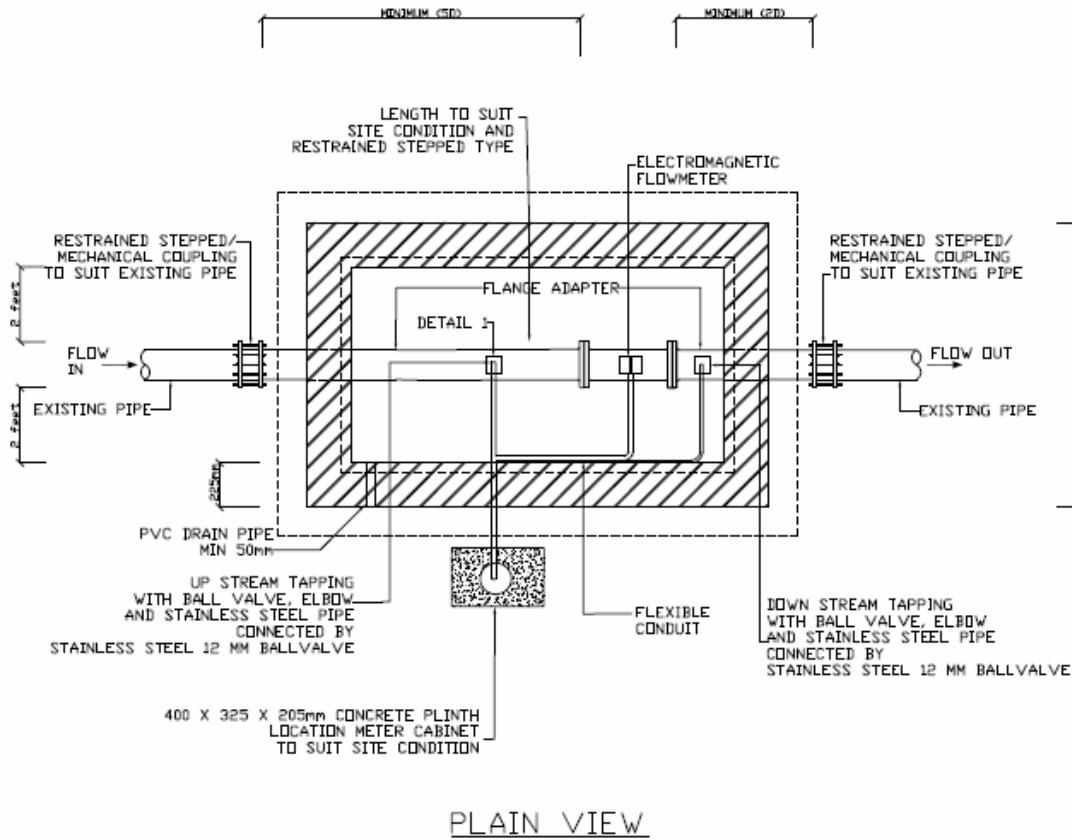
Konsep pemasangan Di Sistem Pam



Dual Clear PVC Tubes C/w Customised height



Contoh Dual Clear PVC Tubes C/w Customised height



Gambar Rajah Konsep Pemasangan Flow Meter, Kabinet dan Logger



Contoh Kabinet