

Site Information & Scope of Work

Site Information

Site Name : Mirasarai
Site Code : 20-MIR-100M

Site Address : To be provided later.

Coordinates : N 22° 42' 15.8 " : E 91° 36' 46.6 "
** Coordinates are surveyed by handy type GPS and might be inaccurate.*

Site Type

<input type="checkbox"/> Control Center	<input checked="" type="checkbox"/> Master Telemetry Station
<input type="checkbox"/> Gas Field	<input type="checkbox"/> Operating Company Terminal (OCT)
<input type="checkbox"/> CGS (City Gas Station)	<input type="checkbox"/> Power station/Fertilizer Factory
<input type="checkbox"/> Compressor Station	<input type="checkbox"/> TBS (Town Bordering Station)
<input type="checkbox"/> Pig Station	<input type="checkbox"/> DRS (District Regulating Station)
<input type="checkbox"/> MS (Metering Station)	<input type="checkbox"/> GMS (Gas Manifold Station)
<input type="checkbox"/> VS (Valve Station)	

Site Status

- Originally covered by The Existing System and shall be covered by The New System.
- Currently not covered by The Existing System but shall be covered by The New System.
- Upcoming site which will be covered by The New System after the completion of the Project.

Operating Company : BGSL

Remarks : _____

Scope of Work

Works checked off hereinafter shall be carried out for the Project

1. SCADA System

■ : No SCADA System at this site.

2. Communication System

- : Master Telemetry Station (Former Microwave Radio Station)
 - Removal of existing communication system
Remove and dispose following existing items used for microwave transmission system:
 - Microwave equipment/facilities in the radio equipment room
 - Antenna mounted on the existing tower
 - Cables between radio equipment room and existing tower

 - Radio equipment to connect Master Telemetry Station with Provider's Access Point
Design, supply and install IP radio equipment at existing radio equipment room to connect Master Telemetry Station with nearest Provider's Access Point (BTCL's AP), including all necessary cables, accessories and the antenna to be mounted on the existing tower.

 - Master telemetry equipment
Design, supply and install master telemetry equipment at existing radio equipment room to connect with slave telemetry equipment, including all necessary cables, accessories and the antenna to be mounted on the existing tower.

 - Radio equipment to connect Master Telemetry Station with OCT
Design, supply and install IP radio equipment at radio equipment room to connect Master Telemetry Station with Operating Company Terminal (OCT) at another site, including all necessary cables, accessories and the antenna to be mounted on the existing tower.

 - Radio equipment to connect Provider's Access Point with Master Telemetry Station
Design, supply and install IP radio equipment at nearest BTCL's access point to connect BTCL's AP with Master Telemetry Station, including all necessary cables, accessories and the antenna with monopole.

 - Network equipment
Design, supply and install all necessary Network equipment at radio equipment room of Master telemetry station as well as at nearest BTCL's access point.

 - Network cable to OCT
Design, supply and install network cable between Master Telemetry Station and OCT which shall be installed within the same site.

- : IP PBX System
 - IP PBX main unit
Design, supply and install IP PBX main unit with necessary accessories and spare parts.

 - Extension telephone set Q'ty
Design, supply and install extension telephone set(s) with required cables. [2]

3. Electrical Works

- : Backup Batteries for Radio Equipment at Master Station
 - Remove and dispose existing backup batteries for radio equipment.
Supply & install new backup batteries with charger suitable to backup new radio equipment for 48 hours.

- : Replacement of Emergency Generator
 - Remove and dispose existing emergency generator.
Supply & install new emergency generator suitable for power supply to related equipment and facilities.

- : Replacement of Air conditioner at Radio room of Master Station
 - Remove and dispose existing window type air conditioner at radio room, and Supply & install new air conditioner suitably selected to maintain the specified temperature and humidity of radio room.

4. Civil Works

- : Refurbishment of Existing Radio Building/Radio Equipment Room
 - Refurbishment of Radio Building
Examine the condition of the whole existing radio building and repair the defects if any.
Clean and touch-up the external and internal finish of the whole existing radio building.

 - Refurbishment of Radio Equipment Room
Examine the condition of existing rooms where radio equipment and backup batteries are installed and repair the defects if any.
Clean and touch-up the internal finish of the said rooms.

 - Cleaning of Radio Equipment Room
Clean and tidy up the existing rooms where radio equipment and backup batteries are installed.

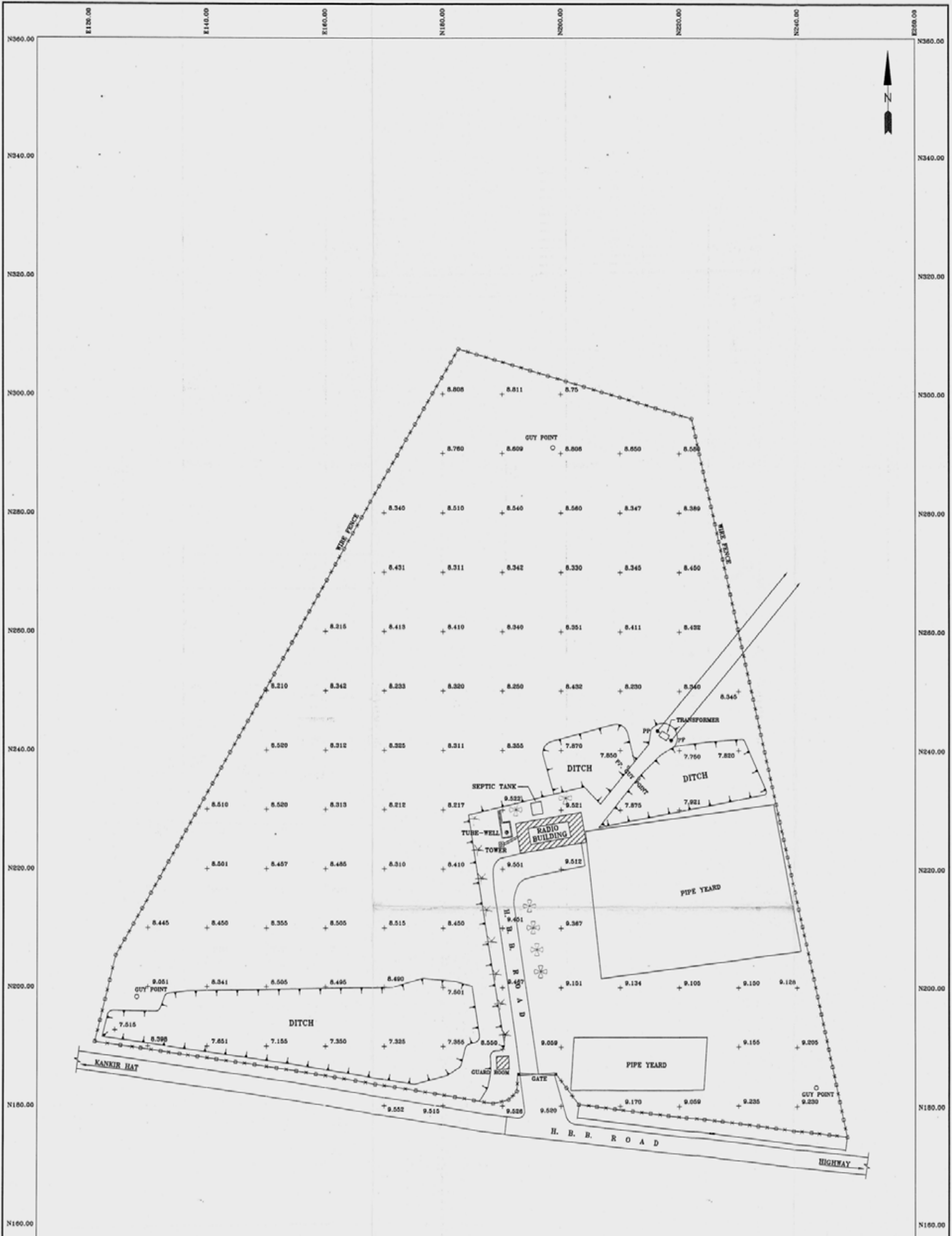
5. Site Photo



Existing Radio Building

6. Site Layout

See attached Layout Plan.



LEGEND:-

JACKFRUIT TREE	OTHER TREE
COCONUT TREE	PALM TREE

SCALE : 1 :300

NOTE:-
 BM. MARKED ON THE PLINTH LEVEL, SOUTH- WEST CORNER OF RADIO BUILDING AS SHOWN ON THE DRAWING.
 EL=10.00m.(Assumed)
 H.F.L=9.100m in 1998 (Local information)
 DISTANCE FROM SYLHET TO SITE 46Km.
 LATITUDE 22°-42.31' LONGITUDE 91°-36.60'

ISSUE A	Revision ISSUED FOR DESIGN APPROVAL	Date	D.D. Ref	Contractor CONTROL LOG	Sub Contractor SURVEY CORPORATION	S.D. No.	Employer GAS TRANSMISSION COMPANY Ltd (GTCL)
Parsons Brinckerhoff Limited (PBL) AS BUILT Employer's Representative: Date: 26/01/05				CONTRACT DRAWING APPROVAL Drawing Status: DESIGN APPROVAL REQUIRED CHANGES: [] APPROVED NO CHANGES: [] PRINT NAME: _____ DATE: _____		Drawing Title: SITE CODE : 118 SITE NAME : MIRASARAI Drawing No. 118-60-72 Rev: _____ Sheet: _____ Drig. Size: A1 By: HADHEM M. A. HADYAT M. A. HADYAT Date: 24-04-99 24-04-99 24-04-99	
Consultant: PB TECHNOLOGIES LTD Employer Contract No: GTCL/RL-1109/C2						THE BANGLADESH GAS INFRASTRUCTURE DEVELOPMENT PROJECT. SUPERVISORY CONTROL, DATA ACQUISITION AND TELECOMMUNICATIONS SYSTEMS.	

Site Information & Scope of Work

Site Information

Site Name : Mitachara
Site Code : 20-MIR-101

Site Address : To be provided later.

Coordinates : N 22° 48' 16.2 " : E 91° 33' 20.6 "
* Coordinates are surveyed by handy type GPS and might be inaccurate.

Site Type

<input type="checkbox"/> Control Center	<input type="checkbox"/> Master Telemetry Station
<input type="checkbox"/> Gas Field	<input type="checkbox"/> Operating Company Terminal (OCT)
<input type="checkbox"/> CGS (City Gas Station)	<input type="checkbox"/> Power station/Fertilizer Factory
<input type="checkbox"/> Compressor Station	<input checked="" type="checkbox"/> TBS (Town Bordering Station)
<input type="checkbox"/> Pig Station	<input type="checkbox"/> DRS (District Regulating Station)
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Operating Company : BGSL

Remarks : Additional instruments are required at this site.

Scope of Work

Works checked off hereinafter shall be carried out for the Project

1. SCADA System

- : RTU
 - RTU without display monitor
Design, supply and install a self-standing IP65 enclosure equipped with following items:
 - RTU
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - RTU with display monitor
Design, supply and install a self-standing IP65 enclosure equipped with following items:
 - RTU
 - Display monitor
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - RTU (design & supply only)
Design and supply self-standing IP65 enclosure equipped with following items:
 - RTU
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - Interface with flow computer
Make provision for:
 - Installation of the flow computer which shall be prepared by GTCL in the enclosure
 - Interface between RTU and the said flow computer
 - Interface with receiver for turbine meter
Install the existing receiver for turbine meter(s) in the RTU enclosure and interface it (them) via communication (MODBUS) cable.

- Interface with other system
Provide the interface between RTU and other system such as PLC or PC operated by the operating company including all communication cables between RTU and other system.

- Cable between RTU and Master Telemetry Station
Design, supply and install the cable between RTU and Master Telemetry Station in case RTU and Master Telemetry Station are located in the same site.

■ : Instruments

- Existing instruments
Re-use the existing instruments and cables.

Note:

Existing instruments and cables shall be serviced by the Employer.

- New Instruments
Design, supply and install the following instruments.
Output signals from instruments are to be cabled via field junction box to the RTU.

■ : Pressure transmitters Q'ty

- Design, supply and intall:
 - Pressure transmitter on the existing spare tapping point
 - Tubing between tapping point and transmitter
- Prepare the tapping point for the pressure transmitter, and design, supply and install:
 - Pressure transmitter on the prepared tapping point
 - Tubing between tapping point and transmitter[1]

■ : Differential pressure transmitters Q'ty

- Design, supply and install:
 - Differential pressure transmitter on the existing spare tapping point
 - Tubing between tapping point and transmitter
- Prepare the tapping point for the differential pressure transmitter, and design, supply and install:
 - Differential pressure transmitter on the tapping point
 - Tubing between tapping point and transmitter

■ : Temprature transmitters Q'ty

- Design, supply and install:
 - Thermowell in the spare boss on the pipe
 - Resistance temperater detector complete with a head mounted transmitter into the thermowell[1]

■ : Limit switch Q'ty

- Design, supply and install the limit switch on the existing shutdown valve for valve position monitoring.

- Pick up Signal from the Existing Turbine Meter Q'ty
Supply and install a dual pulse output pickup head in place of the single pulse output pickup in the existing turbine flowmeter sensor head. The output signal from the existing turbine flowmeter to be cabled via junction box to RTU.

- Local Field Instrument Junction Box Q'ty
Design, supply and install an Intrinsic safety junction box. The junction box to be suitable for glanding appropriate cables. [1]

- Instrument Cables
Design, supply, install the instrument cables from the field instruments to RTU via junction box including each cable termination with gland.

2. Communication System

■ : Slave Telemetry System

- Removal of existing slave telemetry equipment
Remove and dispose the existing slave telemetry system including antenna and cable.
- Slave Telemetry Equipment
Design, supply and install new slave telemetry equipment in the RTU enclosure, including cables and antenna.
- Slave Telemetry Equipment (design & supply only)
Design and supply new slave telemetry equipment in the RTU enclosure, including cables and antenna.
- Existing monopole
Re-use existing monopole to mount new antenna.
- New monopole
Design, supply and install new monopole with foundation to mount new antenna.
- New monopole (design & supply only)
Design and supply new monopole to mount new antenna.

3. Electrical Works

■ : Power Supply to RTU

- Electrical power shall be supplied to RTU from existing PDB, and existing power cable shall be re-used.
- Design, supply and install MCB box for the power supply to RTU including all cables from existing PDB to MCB box and from MCB box to RTU.
- Design, supply and install power controller and power cable to RTU at remote site where electrical power is supplied from existing solar panel.
- Design, supply and install new solar panel, power controller and power cable to RTU.

4. Civil Works

■ : Foundation & Sunshade for RTU

- Re-use existing foundation & sunshade for RTU
Examine the condition of existing foundation and sunshade for RTU and repair the defects, if any.
- Provide new foundation & sunshade for RTU
Design and construct the foundation and sunshade for new RTU at suitable location. The foundation and sunshade should be designed to suitably accommodate new RTU.

■ : Instrument Stand with Foundation & Sunshade

- Re-use existing Instrument stand(s) with foundation & sunshade
Examine the condition of existing Instrument stand(s) with foundation & sunshade and repair the defects, if any.
- Provide new Instrument stand(s) with foundation & sunshade
Design and construct the Instrument stand(s) with foundation & sunshade at suitable location. It should be designed to suitably accommodate the required number of instruments and explosion proof instrument field junction box.

5. Site Photo



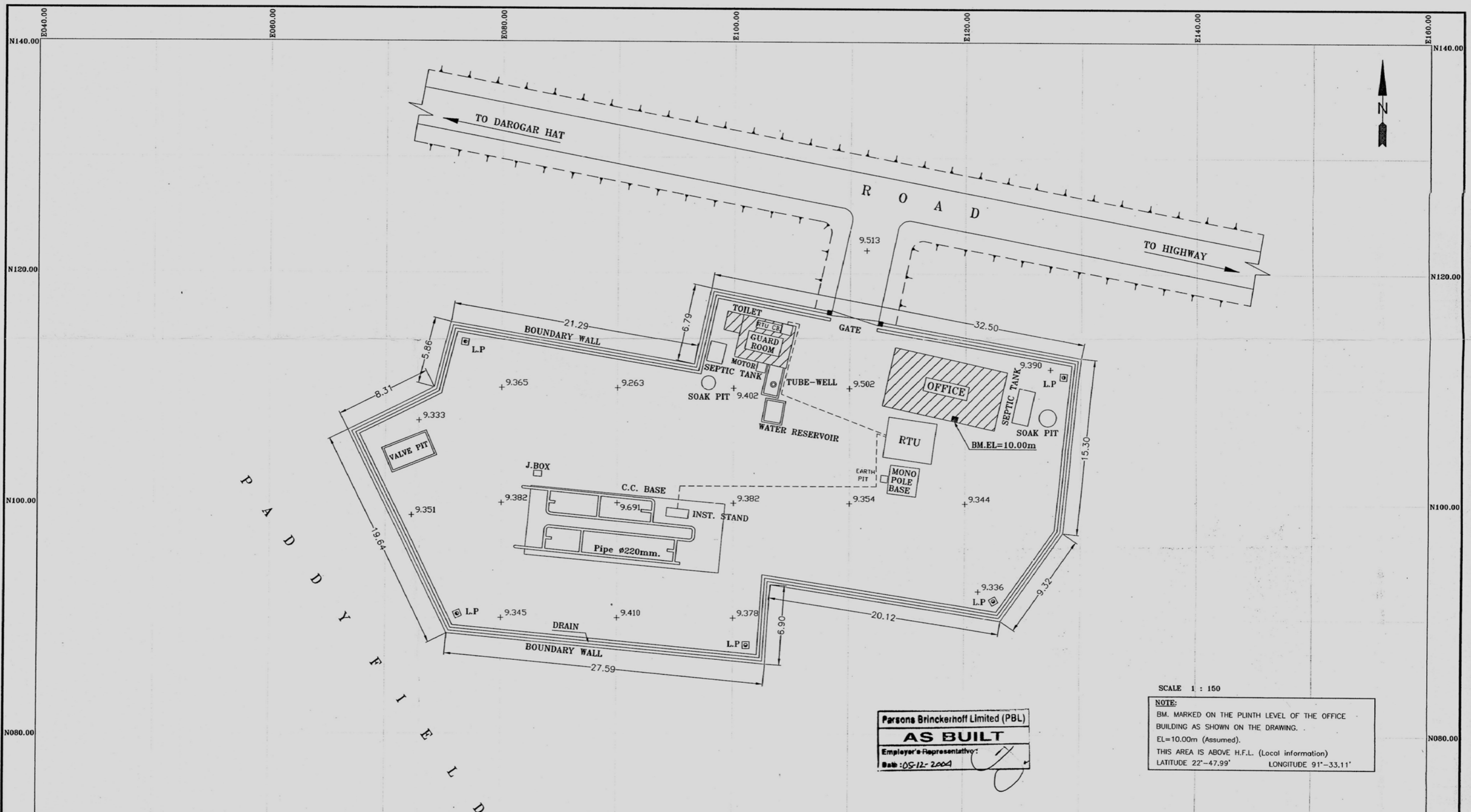
Site view with existing Instrument Stand



Existing RTU

6. Site Layout

See attached Layout Plan.



SCALE 1 : 150

NOTE:
 BM. MARKED ON THE PLINTH LEVEL OF THE OFFICE BUILDING AS SHOWN ON THE DRAWING.
 EL=10.00m (Assumed).
 THIS AREA IS ABOVE H.F.L. (Local Information)
 LATITUDE 22°-47.99' LONGITUDE 91°-33.11'

Parsons Brinckerhoff Limited (PBL)
AS BUILT
 Employer's Representative:
 Date: 05-12-2004

ISSUE	Revision	Date	DD. Ref	Contractor	Sub Contractor	S.D. No.	Employer
A	ISSUED FOR DESIGN APPROVAL			CONTROLS Ltd	SURVEY CORPORATION		GAS TRANSMISSION COMPANY Ltd (GTCL)
B	ISSUED FOR DESIGN APPROVAL	25-09-04					

CONTRACT DRAWING APPROVAL Drawing Status: DESIGN APPROVAL <input type="checkbox"/> RECLINED CHANGES <input type="checkbox"/> APPROVED NO CHANGES PRINT NAME: _____ DATE: _____				Drawing Title: SITE CODE: 103 SITE NAME: MITHACHARA Drawing No. 103-60-72 Rev _____ Sheet _____ Dwg. Size A1 BY: _____ Date _____ Drawn _____ Checked _____ Approved _____			
Consultant: PB Technologies Ltd.				Employer Contract No: GTCL/RL-1109/C2			

Site Information & Scope of Work

Site Information

Site Name : Barakubundu TBS
Site Code : 20-MIR-401

Site Address : To be provided later.

Coordinates : N 22° 34' 58.0 " : E 91° 39' 58.2 "
* Coordinates are surveyed by handy type GPS and might be inaccurate.

Site Type

<input type="checkbox"/> Control Center	<input type="checkbox"/> Master Telemetry Station
<input type="checkbox"/> Gas Field	<input type="checkbox"/> Operating Company Terminal (OCT)
<input type="checkbox"/> CGS (City Gas Station)	<input type="checkbox"/> Power station/Fertilizer Factory
<input type="checkbox"/> Compressor Station	<input checked="" type="checkbox"/> TBS (Town Bordering Station)
<input type="checkbox"/> Pig Station	<input type="checkbox"/> DRS (District Regulating Station)
<input type="checkbox"/> MS (Metering Station)	<input type="checkbox"/> GMS (Gas Manifold Station)
<input type="checkbox"/> VS (Valve Station)	

Site Status

- Originally covered by The Existing System and shall be covered by The New System.
- Currently not covered by The Existing System but shall be covered by The New System.
- Upcoming site which will be covered by The New System after the completion of the Project.

Operating Company : GTCL

Remarks : _____

Scope of Work

Works checked off hereinafter shall be carried out for the Project

1. SCADA System

- : RTU
 - RTU without display monitor
Design, supply and install a self-standing IP65 enclosure equipped with following items:
 - RTU
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - RTU with display monitor
Design, supply and install a self-standing IP65 enclosure equipped with following items:
 - RTU
 - Display monitor
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - RTU (design & supply only)
Design and supply self-standing IP65 enclosure equipped with following items:
 - RTU
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - Interface with flow computer
Make provision for:
 - Installation of the flow computer which shall be prepared by GTCL in the enclosure
 - Interface between RTU and the said flow computer
 - Interface with receiver for turbine meter
Install the existing receiver for turbine meter(s) in the RTU enclosure and interface it (them) via communication (MODBUS) cable.

- Interface with other system
Provide the interface between RTU and other system such as PLC or PC operated by the operating company including all communication cables between RTU and other system.

- Cable between RTU and Master Telemetry Station
Design, supply and install the cable between RTU and Master Telemetry Station in case RTU and Master Telemetry Station are located in the same site.

■ : Instruments

- Existing instruments
Re-use the existing instruments and cables.

Note:

Existing instruments and cables shall be serviced by the Employer.

- New Instruments
Design, supply and install the following instruments.
Output signals from instruments are to be cabled via field junction box to the RTU.

■ : Pressure transmitters Q'ty

- Design, supply and intall:
 - Pressure transmitter on the existing spare tapping point
 - Tubing between tapping point and transmitter

- Prepare the tapping point for the pressure transmitter, and design, supply and install:
 - Pressure transmitter on the prepared tapping point
 - Tubing between tapping point and transmitter

■ : Differential pressure transmitters Q'ty

- Design, supply and install:
 - Differential pressure transmitter on the existing spare tapping point
 - Tubing between tapping point and transmitter

- Prepare the tapping point for the differential pressure transmitter, and design, supply and install:
 - Differential pressure transmitter on the tapping point
 - Tubing between tapping point and transmitter

■ : Temprature transmitters Q'ty

- Design, supply and install:
 - Thermowell in the spare boss on the pipe
 - Resistance temperature detector complete with a head mounted transmitter into the thermowell

■ : Limit switch Q'ty

- Design, supply and install the limit switch on the existing shutdown valve for valve position monitoring.

- Pick up Signal from the Existing Turbine Meter Q'ty
Supply and install a dual pulse output pickup head in place of the single pulse output pickup in the existing turbine flowmeter sensor head. The output signal from the existing turbine flowmeter to be cabled via junction box to RTU.

- Local Field Instrument Junction Box Q'ty
Design, supply and install an Intrinsic safety junction box. The junction box to be suitable for glanding appropriate cables.

- Instrument Cables
Design, supply, install the instrument cables from the field instruments to RTU via junction box including each cable termination with gland.

2. Communication System

■ : Slave Telemetry System

- Removal of existing slave telemetry equipment
Remove and dispose the existing slave telemetry system including antenna and cable.
- Slave Telemetry Equipment
Design, supply and install new slave telemetry equipment in the RTU enclosure, including cables and antenna.
- Slave Telemetry Equipment (design & supply only)
Design and supply new slave telemetry equipment in the RTU enclosure, including cables and antenna.
- Existing monopole
Re-use existing monopole to mount new antenna.
- New monopole
Design, supply and install new monopole with foundation to mount new antenna.
- New monopole (design & supply only)
Design and supply new monopole to mount new antenna.

3. Electrical Works

■ : Power Supply to RTU

- Electrical power shall be supplied to RTU from existing PDB, and existing power cable shall be re-used.
- Design, supply and install MCB box for the power supply to RTU including all cables from existing PDB to MCB box and from MCB box to RTU.
- Design, supply and install power controller and power cable to RTU at remote site where electrical power is supplied from existing solar panel.
- Design, supply and install new solar panel, power controller and power cable to RTU.

4. Civil Works

■ : Foundation & Sunshade for RTU

- Re-use existing foundation & sunshade for RTU
Examine the condition of existing foundation and sunshade for RTU and repair the defects, if any.
- Provide new foundation & sunshade for RTU
Design and construct the foundation and sunshade for new RTU at suitable location. The foundation and sunshade should be designed to suitably accommodate new RTU.

■ : Instrument Stand with Foundation & Sunshade

- Re-use existing Instrument stand(s) with foundation & sunshade
Examine the condition of existing Instrument stand(s) with foundation & sunshade and repair the defects, if any.
- Provide new Instrument stand(s) with foundation & sunshade
Design and construct the Instrument stand(s) with foundation & sunshade at suitable location. It should be designed to suitably accommodate the required number of instruments and explosion proof instrument field junction box.

5. Site Photo



Site view

6. Site Layout

Site layout shall be provided later.

Site Information & Scope of Work

Site Information

Site Name : Semutang Gas Field
Site Code : 20-MIR-701

Site Address : To be provided later.

Coordinates : N 22° 49' 59.3 " : E 91° 46' 01.2 "
* Coordinates are surveyed by handy type GPS and might be inaccurate.

Site Type

<input type="checkbox"/> Control Center	<input type="checkbox"/> Master Telemetry Station
<input checked="" type="checkbox"/> Gas Field	<input type="checkbox"/> Operating Company Terminal (OCT)
<input type="checkbox"/> CGS (City Gas Station)	<input type="checkbox"/> Power station/Fertilizer Factory
<input type="checkbox"/> Compressor Station	<input type="checkbox"/> TBS (Town Bordering Station)
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Site Status

- Originally covered by The Existing System and shall be covered by The New System.
- Currently not covered by The Existing System but shall be covered by The New System.
- Upcoming site which will be covered by The New System after the completion of the Project.

Operating Company :

Remarks : BAPEX

Scope of Work

Works checked off hereinafter shall be carried out for the Project

1. SCADA System

- : RTU
 - RTU without display monitor
Design, supply and install a self-standing IP65 enclosure equipped with following items:
 - RTU
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - RTU with display monitor
Design, supply and install a self-standing IP65 enclosure equipped with following items:
 - RTU
 - Display monitor
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - RTU (design & supply only)
Design and supply self-standing IP65 enclosure equipped with following items:
 - RTU
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
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 - Interface with flow computer
Make provision for:
 - Installation of the flow computer which shall be prepared by GTCL in the enclosure
 - Interface between RTU and the said flow computer
 - Interface with receiver for turbine meter
Install the existing receiver for turbine meter(s) in the RTU enclosure and interface it (them) via communication (MODBUS) cable.

- Interface with other system
Provide the interface between RTU and other system such as PLC or PC operated by the operating company including all communication cables between RTU and other system.

- Cable between RTU and Master Telemetry Station
Design, supply and install the cable between RTU and Master Telemetry Station in case RTU and Master Telemetry Station are located in the same site.

2. Communication System

■ : Slave Telemetry System

- Removal of existing slave telemetry equipment
Remove and dispose the existing slave telemetry system including antenna and cable.

- Slave Telemetry Equipment
Design, supply and install new slave telemetry equipment in the RTU enclosure, including cables and antenna.

- Slave Telemetry Equipment (design & supply only)
Design and supply new slave telemetry equipment in the RTU enclosure, including cables and antenna.

- Existing monopole
Re-use existing monopole to mount new antenna.

- New monopole
Design, supply and install new monopole with foundation to mount new antenna.

- New monopole (design & supply only)
Design and supply new monopole to mount new antenna.

3. Electrical Works

■ : No electrical works at this site.

4. Civil Works

■ : No civil works at this site.

5. Site Photo

Not Available

6. Site Layout

Not Available

Site Information & Scope of Work

Site Information

Site Name : Faujdarhat
Site Code : 20-FAU-100/100M

Site Address : To be provided later.

Coordinates : N 22° 23' 00.0 " : E 91° 46' 07.0 "
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<input type="checkbox"/> Control Center	<input checked="" type="checkbox"/> Master Telemetry Station
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 - Pressure transmitter on the existing spare tapping point
 - Tubing between tapping point and transmitter
- Prepare the tapping point for the pressure transmitter, and design, supply and install:
 - Pressure transmitter on the prepared tapping point
 - Tubing between tapping point and transmitter

■ : Differential pressure transmitters Q'ty

- Design, supply and install:
 - Differential pressure transmitter on the existing spare tapping point
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- Design, supply and install:
 - Thermowell in the spare boss on the pipe
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■ : Limit switch Q'ty

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Remove and dispose following existing items used for microwave transmission system:
 - Microwave equipment/facilities in the radio equipment room
 - Antenna mounted on the existing tower
 - Cables between radio equipment room and existing tower

 - Radio equipment to connect Master Telemetry Station with Provider's Access Point
Design, supply and install IP radio equipment at existing radio equipment room to connect Master Telemetry Station with nearest Provider's Access Point (BTCL's AP), including all necessary cables, accessories and the antenna to be mounted on the existing tower.

 - Master telemetry equipment
Design, supply and install master telemetry equipment at existing radio equipment room to connect with slave telemetry equipment, including all necessary cables, accessories and the antenna to be mounted on the existing tower.

 - Radio equipment to connect Master Telemetry Station with OCT
Design, supply and install IP radio equipment at radio equipment room to connect Master Telemetry Station with Operating Company Terminal (OCT) at another site, including all necessary cables, accessories and the antenna to be mounted on the existing tower.

 - Radio equipment to connect Provider's Access Point with Master Telemetry Station
Design, supply and install IP radio equipment at nearest BTCL's access point to connect BTCL's AP with Master Telemetry Station, including all necessary cables, accessories and the antenna with monopole.

 - Network equipment
Design, supply and install all necessary Network equipment at radio equipment room of Master telemetry station as well as at nearest BTCL's access point.

 - Network cable to OCT
Design, supply and install network cable between Master Telemetry Station and OCT which shall be installed within the same site.

- : IP PBX System
 - IP PBX main unit
Design, supply and install IP PBX main unit with necessary accessories and spare parts.

 - Extension telephone set Q'ty
Design, supply and install extension telephone set(s) with required cables. [3]

3. Electrical Works

- : Power Supply to RTU
 - Electrical power shall be supplied to RTU from existing PDB, and existing power cable shall be re-used.

 - Design, supply and install MCB box for the power supply to RTU including all cables from existing PDB to MCB box and from MCB box to RTU.

 - Design, supply and intall power controller and power cable to RTU at remote site where electrical power is supplied from existing solar panel.

 - Design, supply and install new solar panel, power controller and power cable to RTU.

- : Backup Batteries for Radio Equipment at Master Station
 - Remove and dispose existing backup batteries for radio equipment.
Supply & install new backup batteries with charger suitable to backup new radio equipment for 48 hours.

- : Replacement of Air conditioner at Radio room of Master Station
 - Remove and dispose existing window type air conditioner at raido room, and Supply & install new air conditioner suitably selected to maintain the specified temperature and humidity of radio room.

4. Civil Works

- : Foundation & Sunshade for RTU
 - Re-use existing foundation & sunshade for RTU
Examine the condition of existing foundation and sunshade for RTU and repair the defects, if any.
 - Provide new foundation & sunshade for RTU
Design and construct the foundation and sunshade for new RTU at suitable location. The foundation and sunshade should be designed to suitably accommodate new RTU.

- : Instrument Stand with Foundation & Sunshade
 - Re-use existing Instrument stand(s) with foundation & sunshade
Examine the condition of existing Instrument stand(s) with foundation & sunshade and repair the defects, if any.
 - Provide new Instrument stand(s) with foundation & sunshade
Design and construct the Instrument stand(s) with foundation & sunshade at suitable location. It should be designed to suitably accommodate the required number of instruments and explosion proof instrument field junction box.

- : Refurbishment of Existing Radio Building/Radio Equipment Room
 - Refurbishment of Radio Building
Examine the condition of the whole existing radio building and repair the defects if any. Clean and touch-up the external and internal finish of the whole existing radio building.
 - Refurbishment of Radio Equipment Room
Examine the condition of existing rooms where radio equipment and backup batteries are installed and repair the defects if any. Clean and touch-up the internal finish of the said rooms.
 - Cleaning of Radio Equipment Room
Clean and tidy up the existing rooms where radio equipment and backup batteries are installed.

5. Site Photo



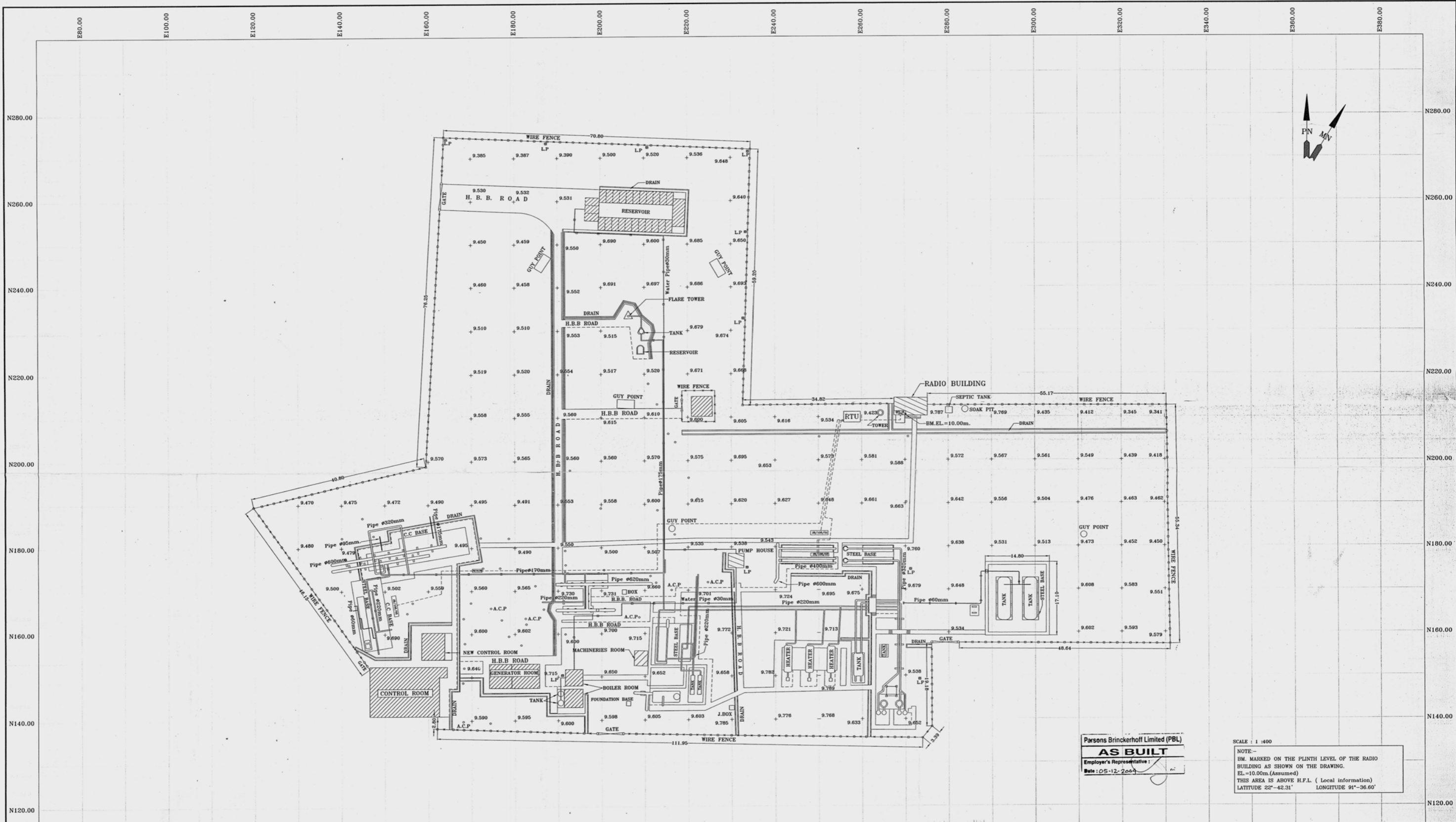
Existing Radio Building



Existing RTU (cable link)

6. Site Layout

See attached Layout Plan.



Parsons Brinckerhoff Limited (PBL)
AS BUILT
 Employer's Representative:
 Date: 05-12-2004

SCALE : 1 : 400
 NOTE -
 BM. MARKED ON THE PLINTH LEVEL OF THE RADIO BUILDING AS SHOWN ON THE DRAWING.
 EL. = 10.00m. (Assumed)
 THIS AREA IS ABOVE H.F.L. (Local information)
 LATITUDE 22°-42.31' LONGITUDE 91°-36.60'

ISSUE	Revision	Date	D.D. Ref
A	ISSUED FOR DESIGN APPROVAL		
B	ISSUED FOR DESIGN APPROVAL	25-09-04	

Contractor: CONTROLIS Ltd

Sub Contractor: SURVEY CORPORATION

CONTRACT DRAWING APPROVAL

Drawing Status: **DESIGN APPROVAL**

REDLINED CHANGES
 APPROVED NO CHANGES

PRINT NAME: _____ DATE: _____

Drawing Title		S.D. No.	
RTU & CABLE LAY-OUT PLAN			
SITE CODE : 105&131			
SITE NAME : FAUJDARHAT			
Drawing No.	Rev	Sheet	Drig. Size
105-60-72	C		A1
BY	Drawn	Checked	Approved
MH	M.A. HAYAT	M.A. HAYAT	M.A. HADAYET
Date	26.07.04	26.07.04	27.07.04

Employer	GAS TRANSMISSION COMPANY Ltd (GTCL)	
Employer Contract No	GTCL/RL-1109/C2	
Consultant	PB Technologies Ltd.	
THE BANGLADESH GAS INFRASTRUCTURE DEVELOPMENT PROJECT. SUPERVISORY CONTROL, DATA ACQUISITION AND TELECOMMUNICATIONS SYSTEMS.		

Site Information & Scope of Work

Site Information

Site Name : CUFL
Site Code : 20-FAU-101

Site Address : To be provided later.

Coordinates : N 22° 13' 22.3 " : E 91° 49' 48.3 "
* Coordinates are surveyed by handy type GPS and might be inaccurate.

Site Type

<input type="checkbox"/> Control Center	<input type="checkbox"/> Master Telemetry Station
<input type="checkbox"/> Gas Field	<input type="checkbox"/> Operating Company Terminal (OCT)
<input type="checkbox"/> CGS (City Gas Station)	<input checked="" type="checkbox"/> Power station/Fertilizer Factory
<input type="checkbox"/> Compressor Station	<input type="checkbox"/> TBS (Town Bordering Station)
<input type="checkbox"/> Pig Station	<input type="checkbox"/> DRS (District Regulating Station)
<input type="checkbox"/> MS (Metering Station)	<input type="checkbox"/> GMS (Gas Manifold Station)
<input type="checkbox"/> VS (Valve Station)	

Site Status

- Originally covered by The Existing System and shall be covered by The New System.
- Currently not covered by The Existing System but shall be covered by The New System.
- Upcoming site which will be covered by The New System after the completion of the Project.

Operating Company : BGSL

Remarks : _____

Scope of Work

Works checked off hereinafter shall be carried out for the Project

1. SCADA System

- : RTU
 - RTU without display monitor
Design, supply and install a self-standing IP65 enclosure equipped with following items:
 - RTU
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - RTU with display monitor
Design, supply and install a self-standing IP65 enclosure equipped with following items:
 - RTU
 - Display monitor
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - RTU (design & supply only)
Design and supply self-standing IP65 enclosure equipped with following items:
 - RTU
 - Instrumentation and communication equipment
 - Backup battery system with charger for 24 hours
 - Lighting
 - Anti-condensation heater
 - Earthing and lightning protection
 - All internal wiring
 - Other equipment to satisfy the functional requirements
 - Interface with flow computer
Make provision for:
 - Installation of the flow computer which shall be prepared by GTCL in the enclosure
 - Interface between RTU and the said flow computer
 - Interface with receiver for turbine meter
Install the existing receiver for turbine meter(s) in the RTU enclosure and interface it (them) via communication (MODBUS) cable.

- Interface with other system
Provide the interface between RTU and other system such as PLC or PC operated by the operating company including all communication cables between RTU and other system.

- Cable between RTU and Master Telemetry Station
Design, supply and install the cable between RTU and Master Telemetry Station in case RTU and Master Telemetry Station are located in the same site.

■ : Instruments

- Existing instruments
Re-use the existing instruments and cables.

Note:

Existing instruments and cables shall be serviced by the Employer.

- New Instruments
Design, supply and install the following instruments.
Output signals from instruments are to be cabled via field junction box to the RTU.

■ : Pressure transmitters Q'ty

- Design, supply and intall:
 - Pressure transmitter on the existing spare tapping point
 - Tubing between tapping point and transmitter
- Prepare the tapping point for the pressure transmitter, and design, supply and install:
 - Pressure transmitter on the prepared tapping point
 - Tubing between tapping point and transmitter

■ : Differential pressure transmitters Q'ty

- Design, supply and install:
 - Differential pressure transmitter on the existing spare tapping point
 - Tubing between tapping point and transmitter
- Prepare the tapping point for the differential pressure transmitter, and design, supply and install:
 - Differential pressure transmitter on the tapping point
 - Tubing between tapping point and transmitter

■ : Temprature transmitters Q'ty

- Design, supply and install:
 - Thermowell in the spare boss on the pipe
 - Resistance temperature detector complete with a head mounted transmitter into the thermowell

■ : Limit switch Q'ty

- Design, supply and install the limit switch on the existing shutdown valve for valve position monitoring.

- Pick up Signal from the Existing Turbine Meter Q'ty
Supply and install a dual pulse output pickup head in place of the single pulse output pickup in the existing turbine flowmeter sensor head. The output signal from the existing turbine flowmeter to be cabled via junction box to RTU.

- Local Field Instrument Junction Box Q'ty
Design, supply and install an Intrinsic safety junction box. The junction box to be suitable for glanding appropriate cables.

- Instrument Cables
Design, supply, install the instrument cables from the field instruments to RTU via junction box including each cable termination with gland.

2. Communication System

■ : Slave Telemetry System

- Removal of existing slave telemetry equipment
Remove and dispose the existing slave telemetry system including antenna and cable.
- Slave Telemetry Equipment
Design, supply and install new slave telemetry equipment in the RTU enclosure, including cables and antenna.
- Slave Telemetry Equipment (design & supply only)
Design and supply new slave telemetry equipment in the RTU enclosure, including cables and antenna.
- Existing monopole
Re-use existing monopole to mount new antenna.
- New monopole
Design, supply and install new monopole with foundation to mount new antenna.
- New monopole (design & supply only)
Design and supply new monopole to mount new antenna.

3. Electrical Works

■ : Power Supply to RTU

- Electrical power shall be supplied to RTU from existing PDB, and existing power cable shall be re-used.
- Design, supply and install MCB box for the power supply to RTU including all cables from existing PDB to MCB box and from MCB box to RTU.
- Design, supply and install power controller and power cable to RTU at remote site where electrical power is supplied from existing solar panel.
- Design, supply and install new solar panel, power controller and power cable to RTU.

4. Civil Works

■ : Foundation & Sunshade for RTU

- Re-use existing foundation & sunshade for RTU
Examine the condition of existing foundation and sunshade for RTU and repair the defects, if any.
- Provide new foundation & sunshade for RTU
Design and construct the foundation and sunshade for new RTU at suitable location. The foundation and sunshade should be designed to suitably accommodate new RTU.

■ : Instrument Stand with Foundation & Sunshade

- Re-use existing Instrument stand(s) with foundation & sunshade
Examine the condition of existing Instrument stand(s) with foundation & sunshade and repair the defects, if any.
- Provide new Instrument stand(s) with foundation & sunshade
Design and construct the Instrument stand(s) with foundation & sunshade at suitable location. It should be designed to suitably accommodate the required number of instruments and explosion proof instrument field junction box.

5. Site Photo



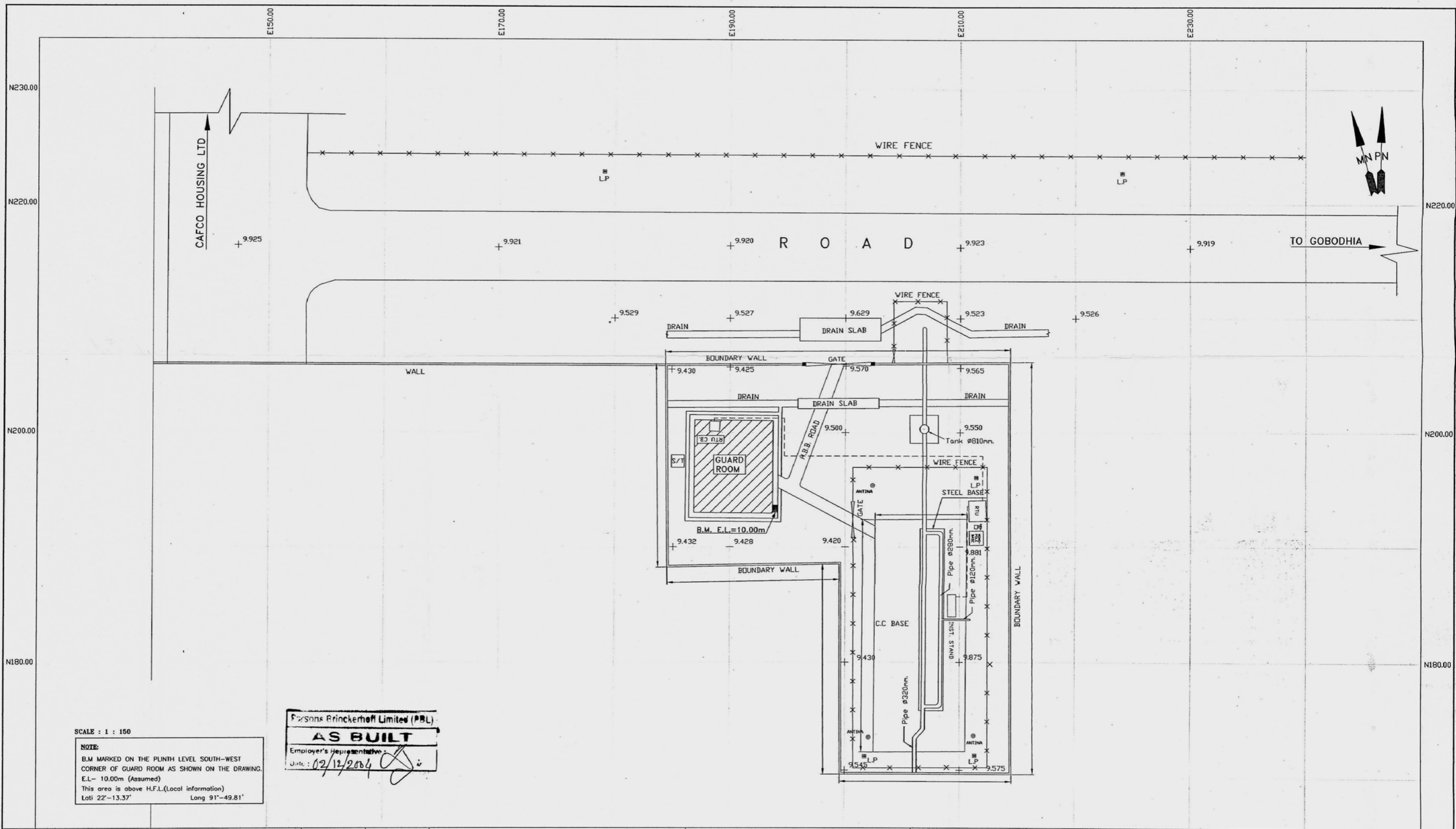
Existing RTU



Existing Instrument Stand

6. Site Layout

See attached Layout Plan.



SCALE : 1 : 150

NOTE:
 B.M MARKED ON THE PLINTH LEVEL SOUTH-WEST CORNER OF GUARD ROOM AS SHOWN ON THE DRAWING.
 E.L- 10.00m (Assumed)
 This area is above H.F.L.(Local information)
 Loti 22'-13.37' Long 91'-49.81'

Parsons Brinckerhoff Limited (PBL)
AS BUILT
 Employer's Representative
 Date: 02/12/2004

ISSUE	Revision	Date	B.D. Ref	Contractor	Sub Contractor	S.D. No.	Employer
A	ISSUED FOR DESIGN APPROVAL			CONTROLS Ltd	SURVEY CORPORATION		GAS TRANSMISSION COMPANY Ltd (GTCL)
B	ISSUED FOR DESIGN APPROVAL	25-09-04					

CONTRACT DRAWING APPROVAL Drawing Status: DESIGN APPROVAL <input type="checkbox"/> REDLINED CHANGES <input type="checkbox"/> APPROVED NO CHANGES PRINT NAME: _____ DATE: _____		Drawing Title RTU & CABLE LAY-OUT PLAN SITE CODE : 122 SITE NAME : CUFCL		Employer THE BANGLADESH GAS INFRASTRUCTURE DEVELOPMENT PROJECT. SUPERVISORY CONTROL, DATA ACQUISITION AND TELECOMMUNICATIONS SYSTEMS.	
Drawing No. 122-60-72		Rev B Sheet		Orig. Size A1	
BY: HASHEM Date: 17-03-99		Checked: M. A. HAYAT Date: 20-03-99		Approved: M. A. HADAYET Date: 20-03-99	
Consultant: PB Technologies Ltd.			Employer Contract No: GTCLRL-1109/C2		