



Republic of Uganda

MINISTRY OF WATER AND ENVIRONMENT

PROJECT: INTEGRATED WATER MANAGEMENT AND DEVELOPMENT PROJECT

PROJECT ID NO.:

Volume III: DETAILED DRAWINGS

CIVIL WORKS FOR INSTALLATION OF HYDROMETRIC EQUIPMENT UNDER CATEGORIES I, II, III & IV.

- i. 5 No. Category I Digital Water Level Recording Stations**
- ii. 5 No. Category II Ground Water Level Recording Stations**
- iii. 2 No. Category III Automated Full Climate Stations**

SPECIFIC DRAWINGS

FOR

DIGITAL WATER LEVEL RECORDING STATION

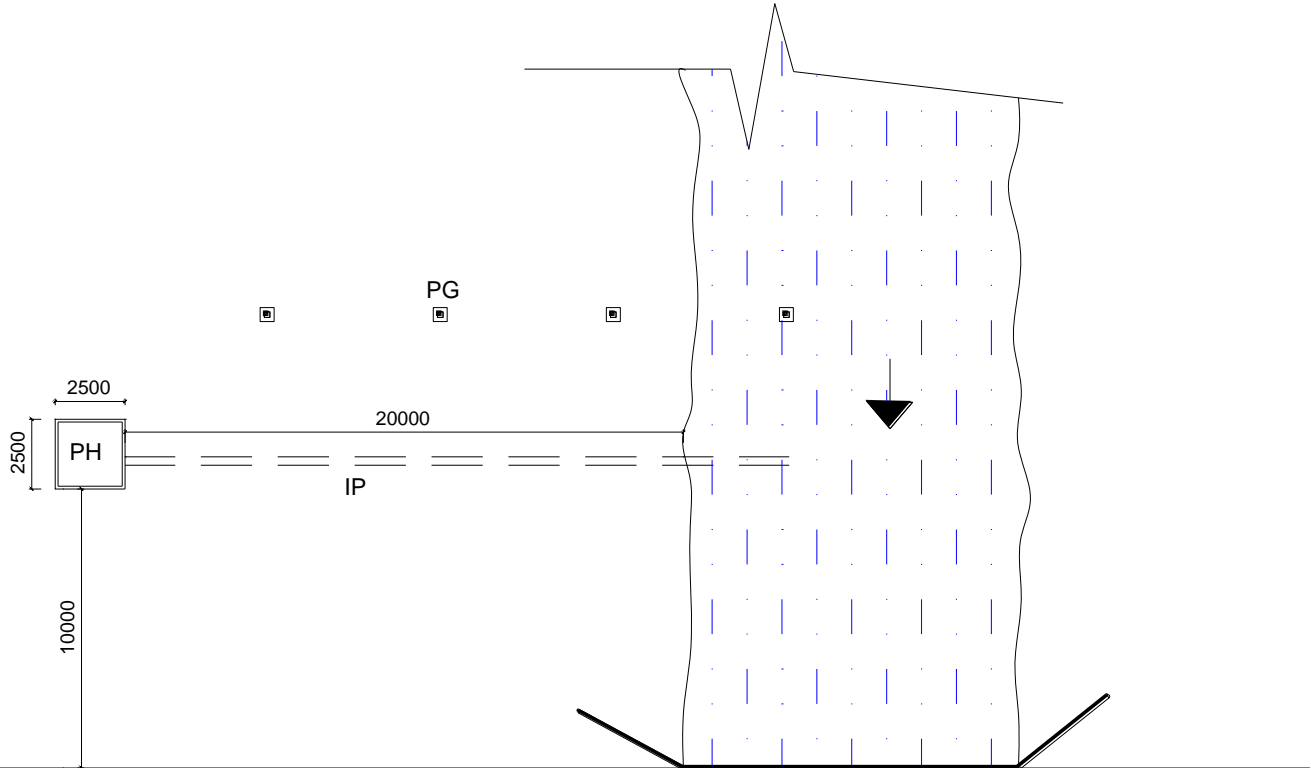
ON

RIVER NCHWERA

1.SITE PLAN

2.SECTION THROUGH PILLAR GAUGES

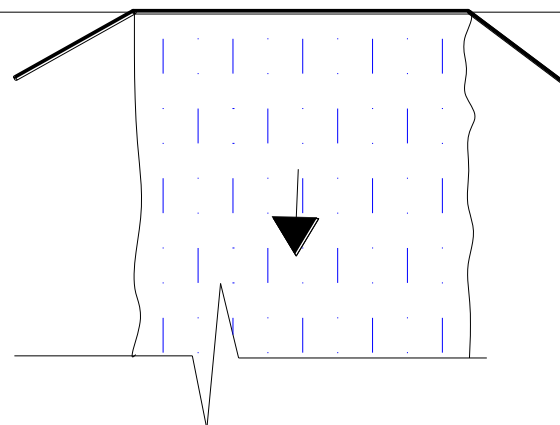
BM ●



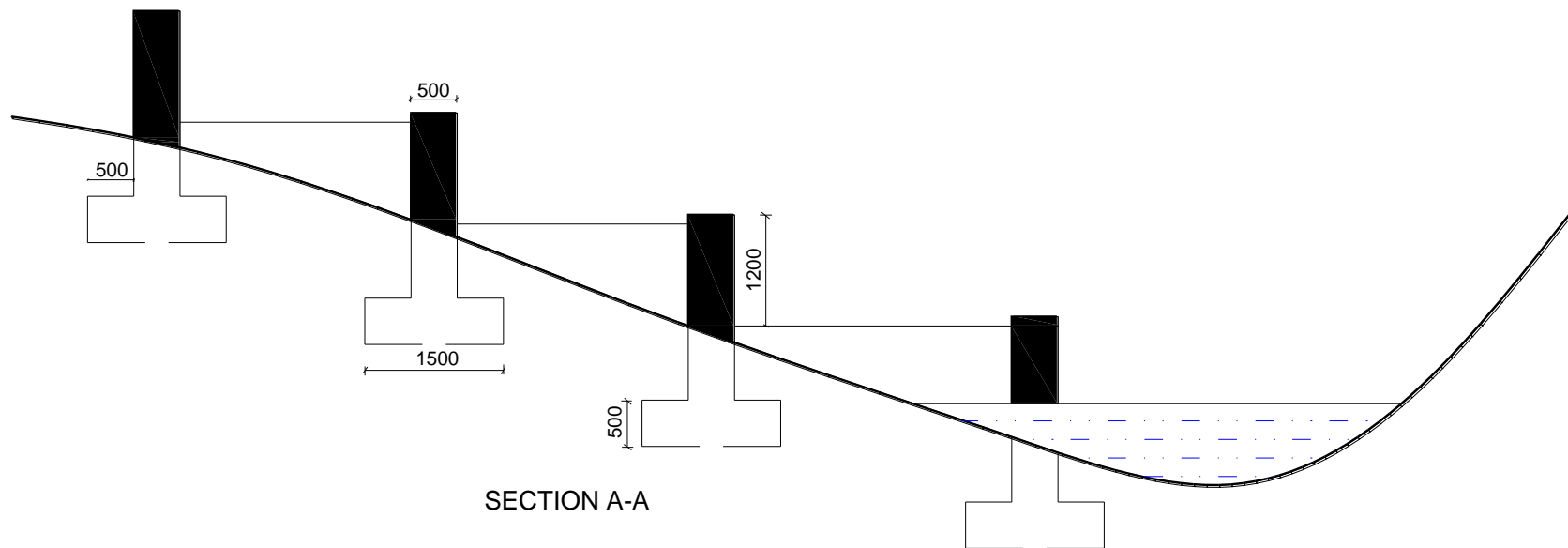
← TO KATUNGULU

TO ISHASHA →

SITE PLAN



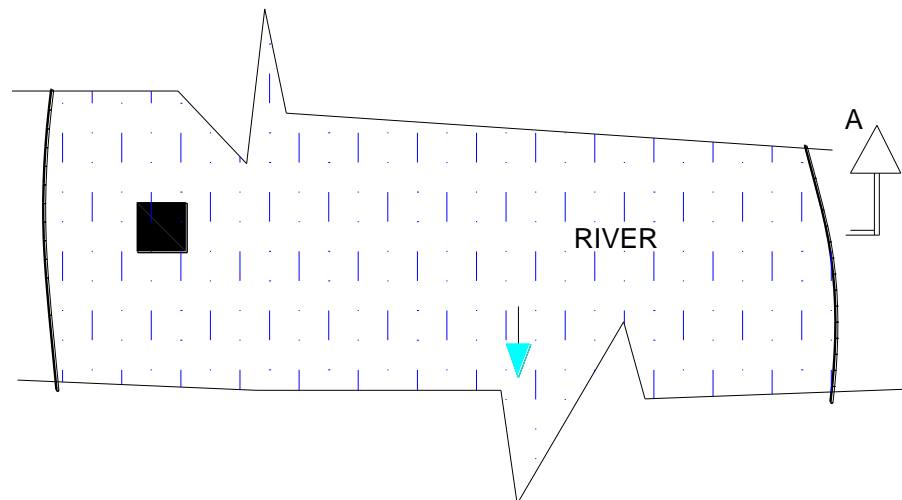
LEGEND		
PH: Protective House on top of stilling well		
IP: Inlet Pipe		
PG: Pillar Gauges		
BM: Bench Marks		
PROJECT: PROPOSED GAUGING STATION AT RIVER NCHWERA		
CLIENT: MINISTRY OF WATER AND ENVIRONMENT Directorate of Water Resources Management		
TITLE: GENERAL WORKING DRAWINGS		
Drawing Scale:		NTS
Drawn: WRM&A	Sheet no: 001	Project no: IWRMD-01/Feb/2018
Notes: All dimensions are in millimeters River is approx. 12m wide		



SECTION A-A



PLAN OF RIVER CHANNEL AND PILLAR GAUGES



PROJECT PROPOSED GAUGING STATION AT RIVER NCHWERA	TITLE GENERAL WORKING DRAWINGS	Drawing Scale NTS	NOTES The following will be determined on site with the approval of the supervising Engineer. 1. The reduced levels at each pillar gauge 2. The distances between pillars gauges 3. The depth of excavation is up to firm ground, not less than 1m or according to site conditions
CLIENT MINISTRY OF WATER AND ENVIRONMENT Directorate of Water Resources Management	Project no: IWRMD-01/Feb/2018	Drawn WRM&A	

SPECIFIC DRAWINGS

FOR

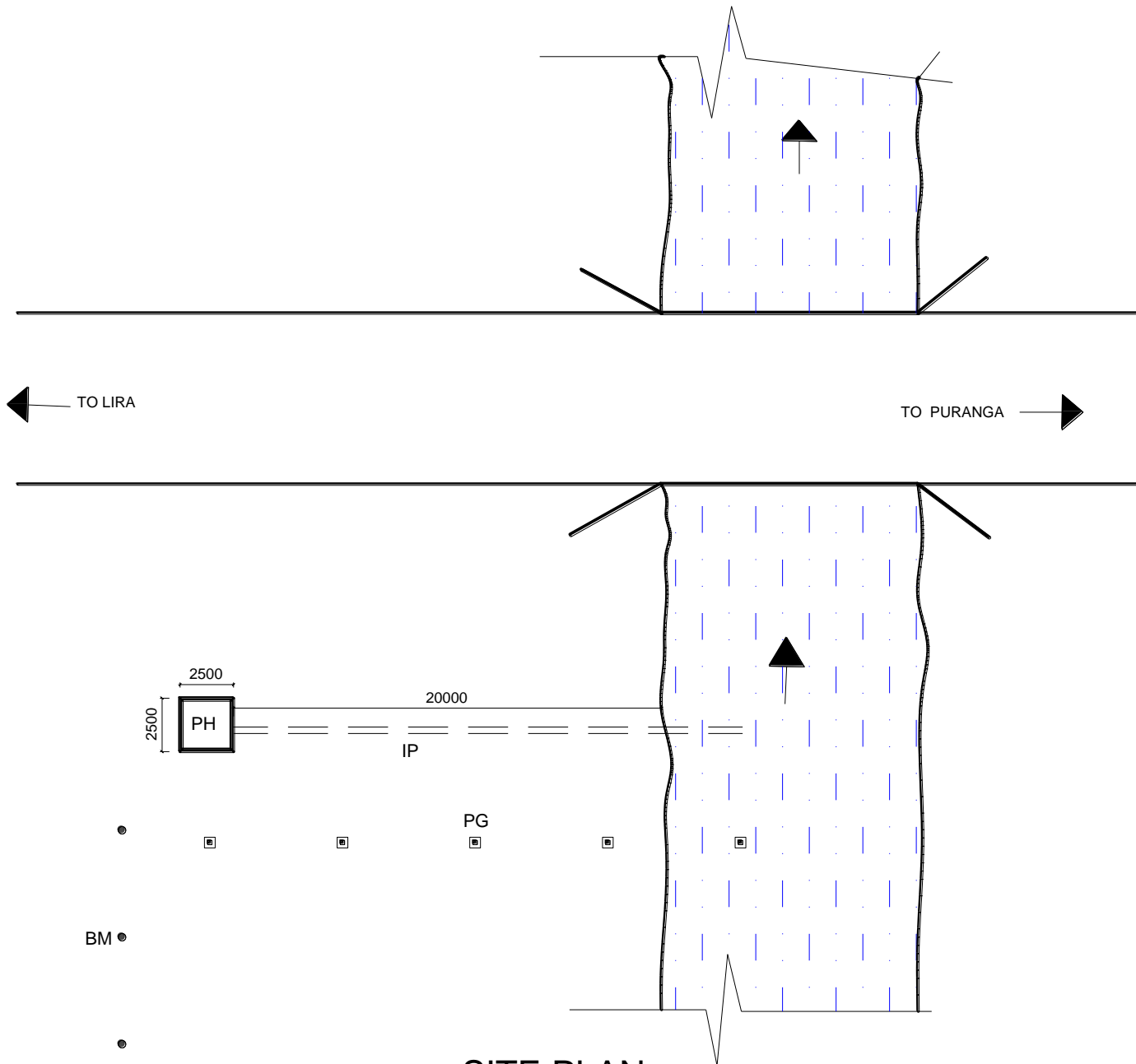
DIGITAL WATER LEVEL RECORDING STATION

ON

RIVER ASWA-1

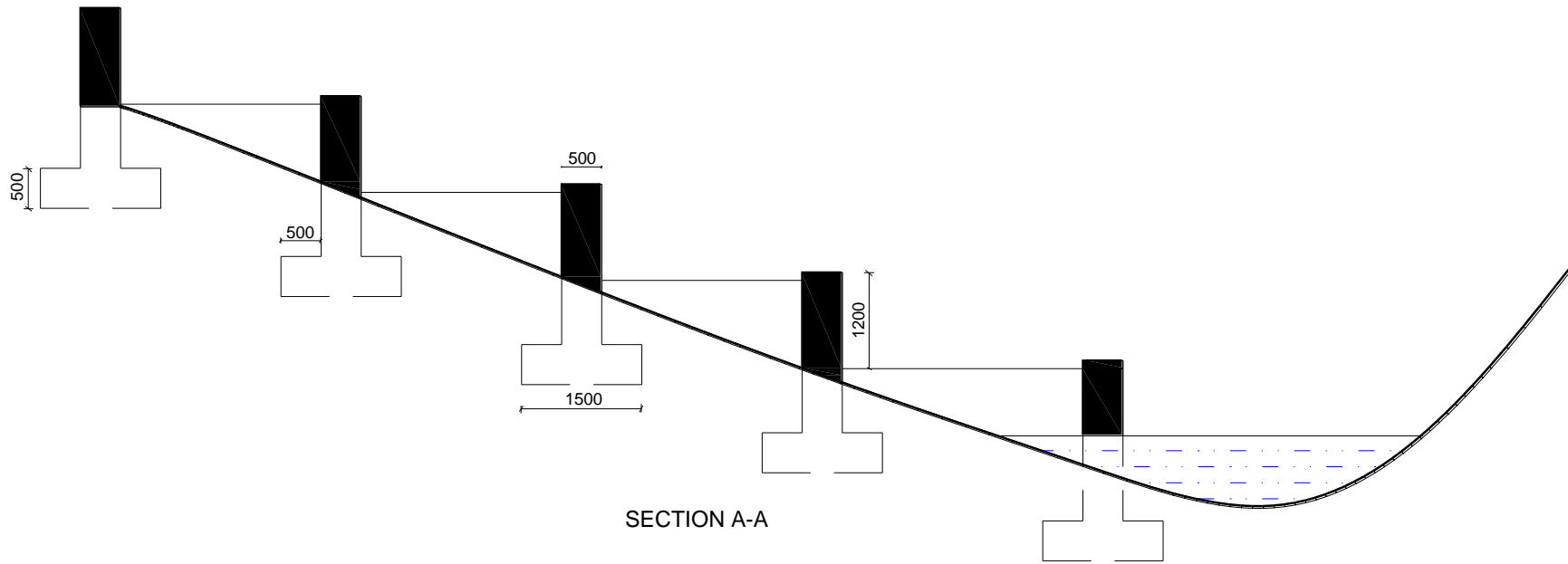
1.SITE PLAN

2.SECTION THROUGH PILLAR GAUGES

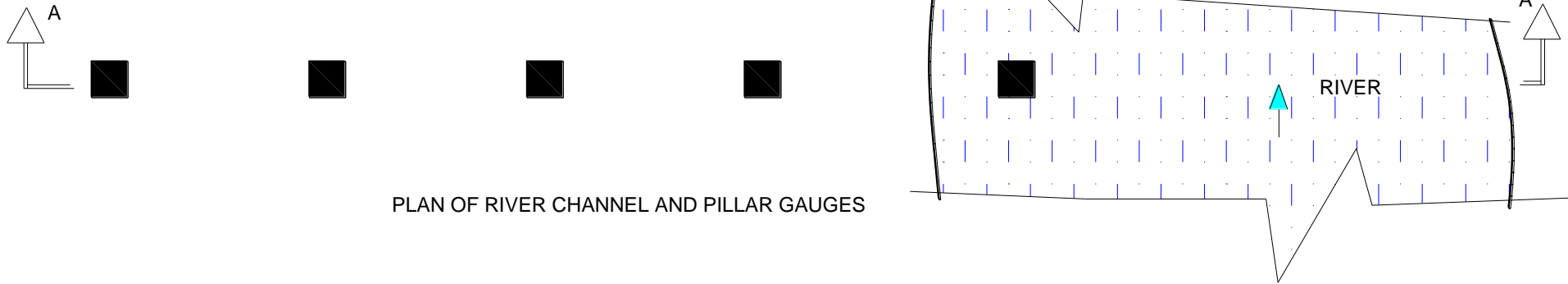


SITE PLAN

LEGEND		
PH: Protective House on top of stilling well		
IP: Inlet Pipe		
PG: Pillar Gauges		
BM: Bench Marks		
PROJECT: PROPOSED GAUGING STATION AT RIVER ASWA-1, PURANGA		
CLIENT: MINISTRY OF WATER AND ENVIRONMENT Directorate of Water Resources Management		
TITLE: GENERAL WORKING DRAWINGS		
Drawing Scale:		NTS
Drawn:	Sheet no:	Project no:
WRM&A	002	IWRMD-01/Feb/2018
Notes:		
All dimensions are in millimeters		
Min.depth of excavation for stilling well: 6m		



SECTION A-A



PLAN OF RIVER CHANNEL AND PILLAR GAUGES

PROJECT PROPOSED GAUGING STATION AT RIVER ASWA-1	TITLE GENERAL WORKING DRAWINGS	Drawing Scale NTS	NOTES The following will be determined on site with the approval of the supervising Engineer. 1. The reduced levels at each pillar gauge 2. The distances between pillars gauges 3. The depth of excavation is up to firm ground, not less than 1m or according to site conditions
CLIENT MINISTRY OF WATER AND ENVIRONMENT Directorate of Water Resources Management	Project no: IWRMD-01/Feb/2018	Drawn WRM&A	

SPECIFIC DRAWINGS

FOR

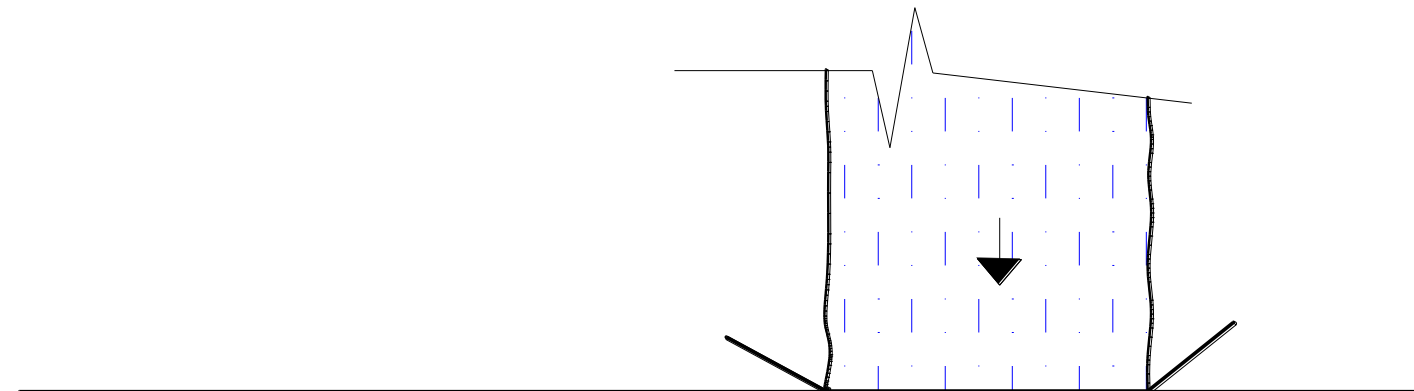
DIGITAL WATER LEVEL RECORDING STATION

ON

RIVER PAGER

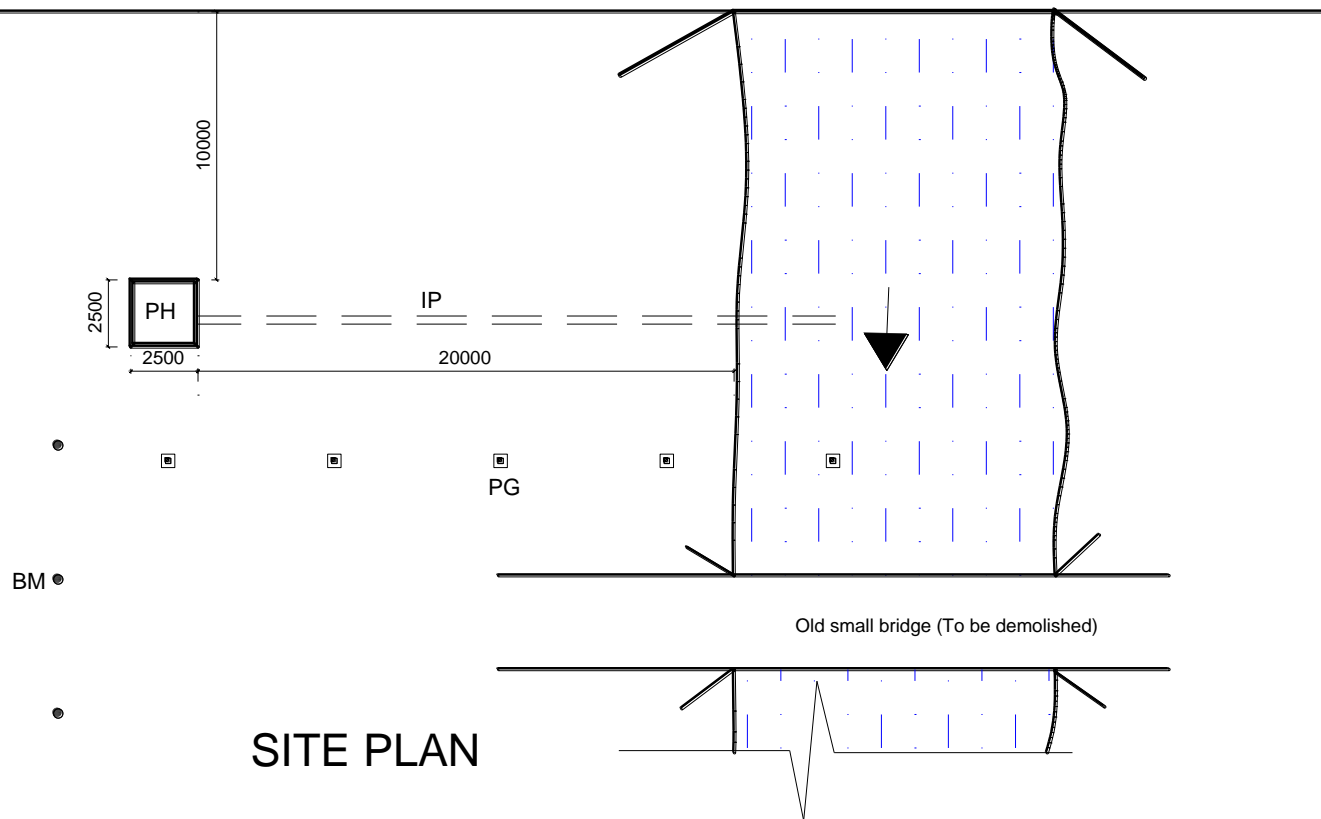
1.SITE PLAN

2.SECTION THROUGH PILLAR GAUGES



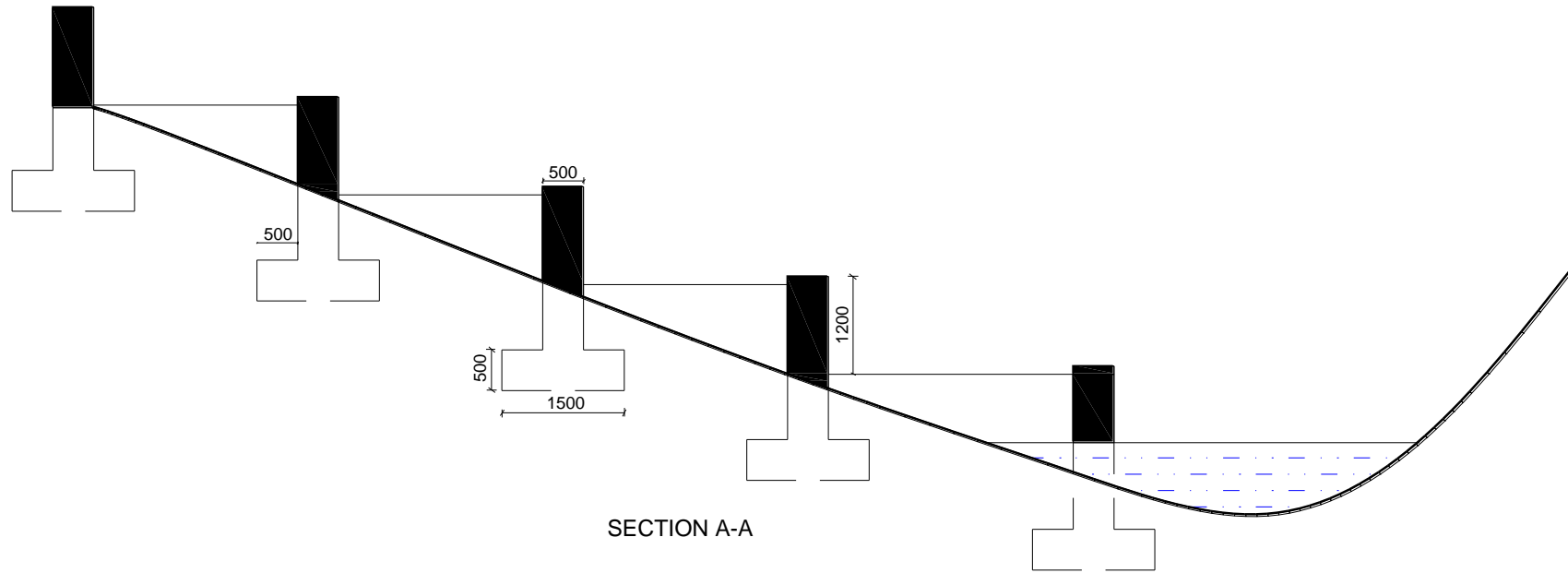
← TO PALABEK

TO KITGUM →



SITE PLAN

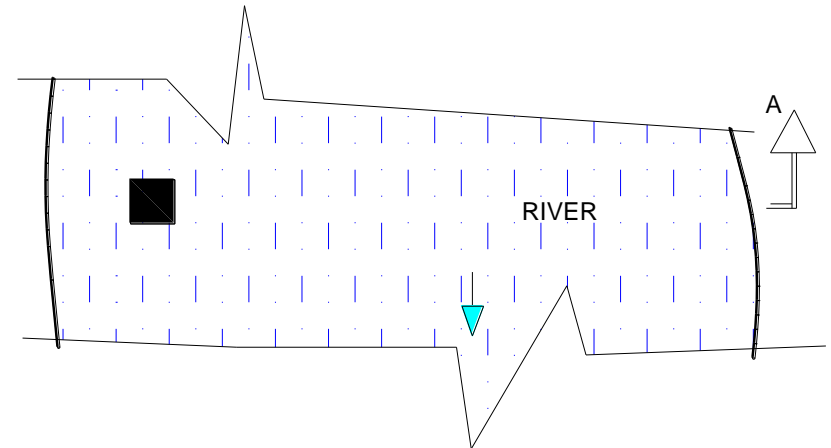
LEGEND		
PH: Protective House on top of stilling well		
IP: Inlet Pipe		
PG: Pillar Gauges		
BM: Bench Marks		
PROJECT: PROPOSED GAUGING STATION AT RIVER PAGER, KITGUM		
CLIENT: MINISTRY OF WATER AND ENVIRONMENT Directorate of Water Resources Management		
TITLE: GENERAL WORKING DRAWINGS		
Drawing Scale: NTS		
Drawn: WRM&A	Sheet no: 003	Project no: IWRMD-01/Feb/2018
Notes: All dimensions are in millimeters Min.depth of excavation for stilling well: 6m		



SECTION A-A



PLAN OF RIVER CHANNEL AND PILLAR GAUGES



PROJECT PROPOSED GAUGING STATION AT RIVER PAGER KITGUM	TITLE GENERAL WORKING DRAWINGS	Drawing Scale NTS	NOTES The following will be determined on site with the approval of the supervising Engineer. 1. The reduced levels at each pillar gauge 2. The distances between pillars gauges 3. The depth of excavation is up to firm ground, not less than 1m or according to site conditions
CLIENT MINISTRY OF WATER AND ENVIRONMENT Directorate of Water Resources Management	Project no: IWRMD-01/Feb/2018	Drawn WRM&A	

SPECIFIC DRAWINGS

FOR

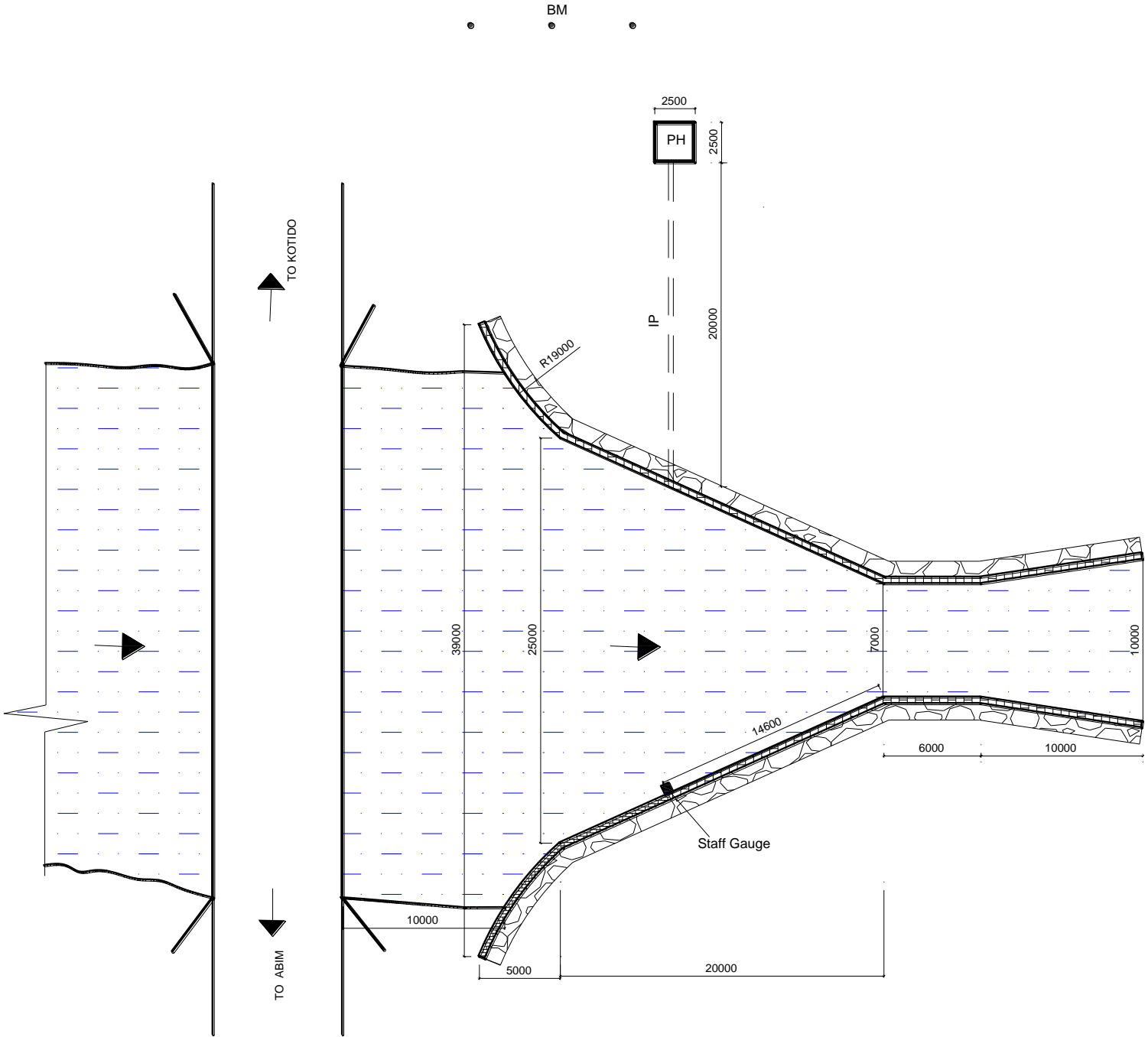
DIGITAL WATER LEVEL RECORDING STATION

ON

RIVER LONGIRO

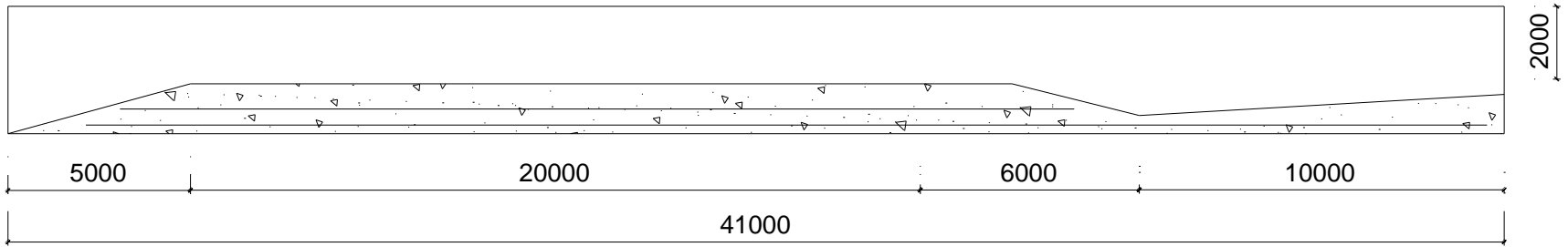
1.SITE PLAN

2.SECTION THROUGH VENTURI FLUME (PARSHAL)



SITE PLAN

LEGEND		
PH: Protective House on top of stilling well		
IP: Inlet Pipe		
BM: Bench Marks		
PROJECT: PROPOSED GAUGING STATION AT RIVER LONGIRO, KOTIDO		
CLIENT: MINISTRY OF WATER AND ENVIRONMENT Directorate of Water Resources Management		
TITLE: GENERAL WORKING DRAWINGS WITH VENTURI FLUME		
Drawing Scale: NTS		
Drawn: WRM&A	Sheet no: 004	Project no: IWRMD-01/Feb/2018
Notes: All dimensions are in millimeters Provision for two staff gauges to be made on flume		



SECTION THROUGH FLUME

SPECIFIC DRAWINGS

FOR

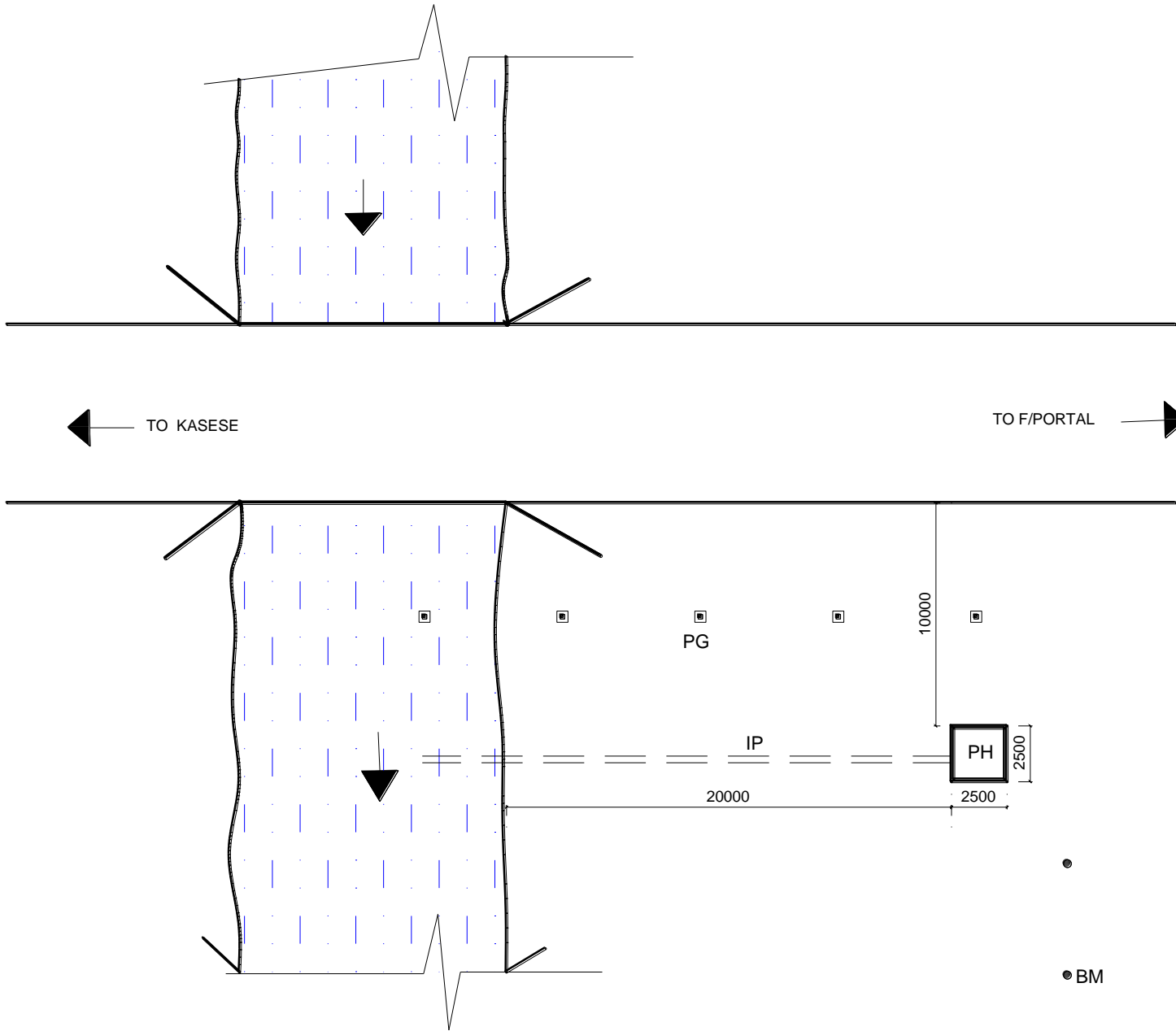
DIGITAL WATER LEVEL RECORDING STATION

ON

RIVER NYAMWAMBA

1.SITE PLAN

2.SECTION THROUGH PILLAR GAUGES

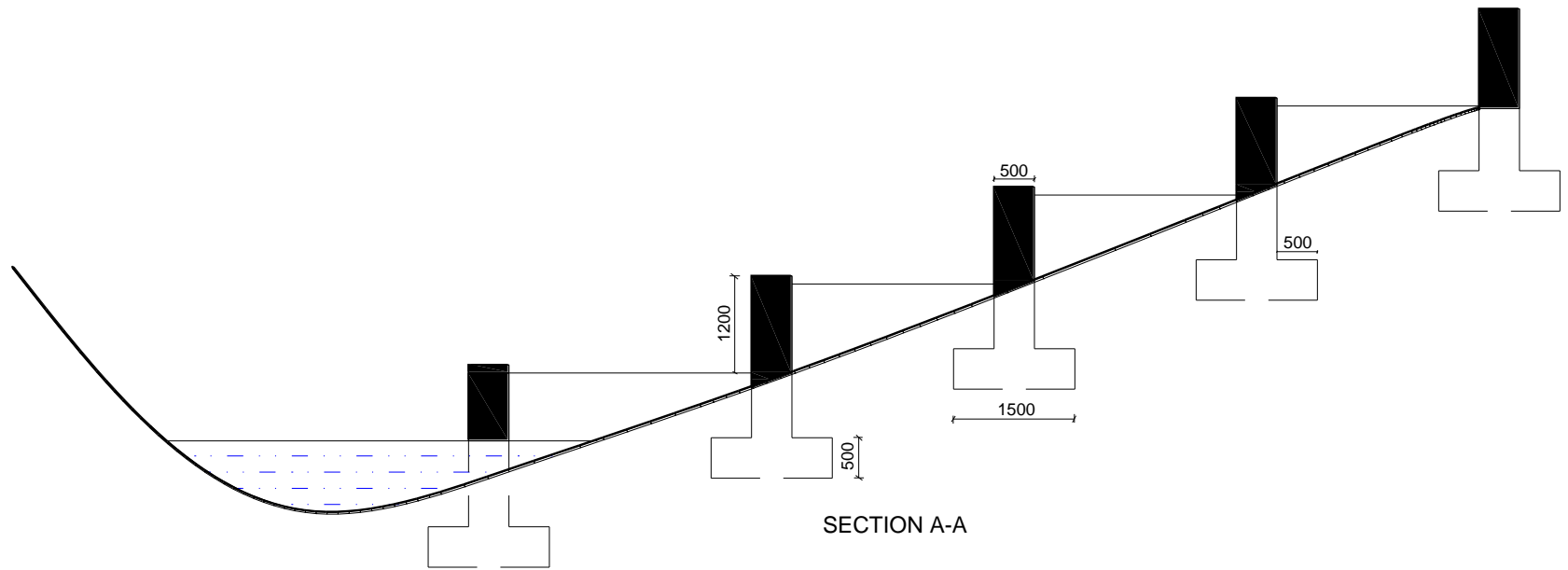


← TO KASESE

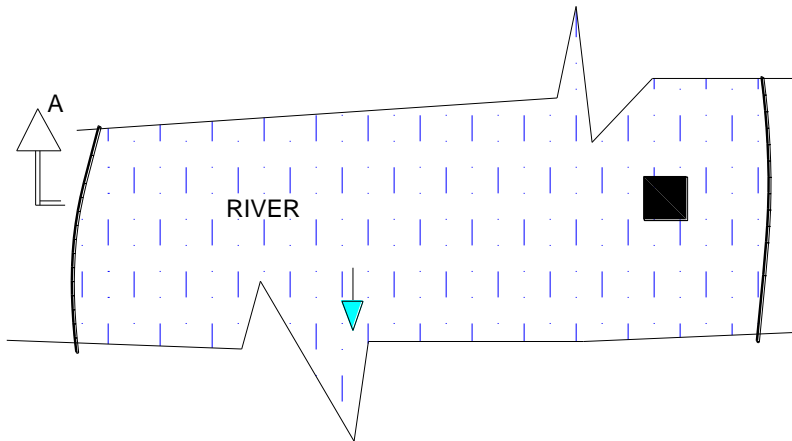
TO F/PORTAL →

LEGEND		
PH: Protective House on top of stilling well		
IP: Inlet Pipe		
PG: Pillar Gauges		
BM: Bench Marks		
PROJECT: PROPOSED GAUGING STATION AT RIVER NYAMWAMBA		
CLIENT: MINISTRY OF WATER AND ENVIRONMENT Directorate of Water Resources Management		
TITLE: GENERAL WORKING DRAWINGS		
Drawing Scale: NTS		
Drawn: WRM&A	Sheet no: 005	Project no: IWRMD-01/Feb/2018
Notes: All dimensions are in millimeters Min.depth of excavation for stilling well: 6m		

SITE PLAN



SECTION A-A



PLAN OF RIVER CHANNEL AND PILLAR GAUGES

PROJECT PROPOSED GAUGING STATION AT RIVER NYAMWAMBA	TITLE GENERAL WORKING DRAWINGS	Drawing Scale NTS	NOTES The following will be determined on site with the approval of the supervising Engineer. 1. The reduced levels at each pillar gauge 2. The distances between pillars gauges 3. The depth of excavation is up to firm ground, not less than 1m or according to site conditions
CLIENT MINISTRY OF WATER AND ENVIRONMENT Directorate of Water Resources Management	Project no: IWRMD-01/Feb/2018	Drawn WRM&A	

DETAILED DRAWINGS

FOR

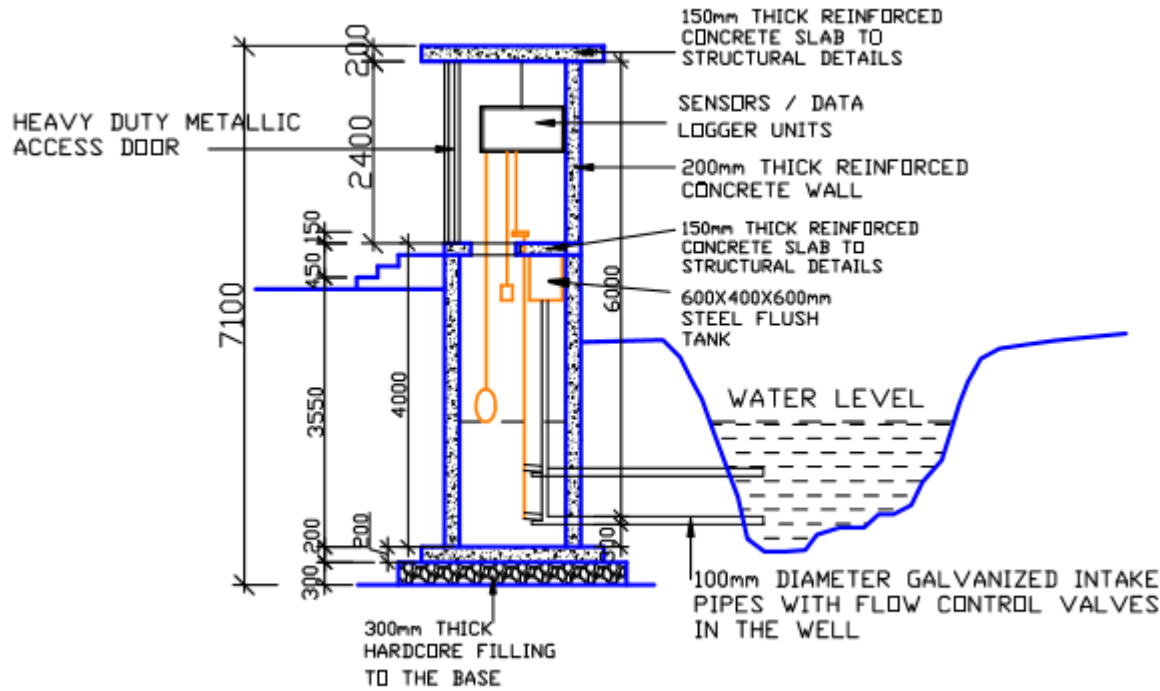
DIGITAL WATER LEVEL RECORDING STATIONS

1. STILLING WELL

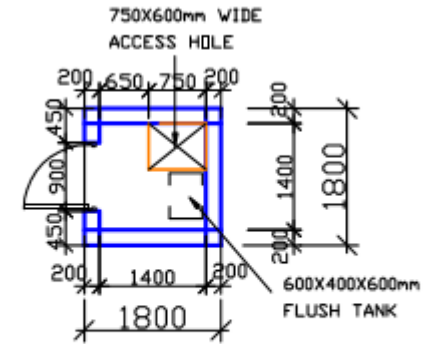
2. STRUCTURAL

3. BENCH MARKS

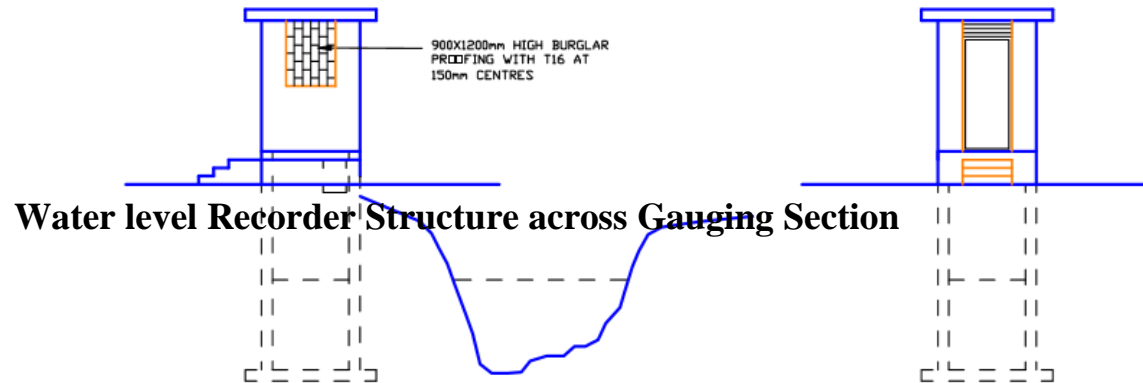
Stilling Well Details (Automatic Water Level Recorders)



STILLING WELL SECTION



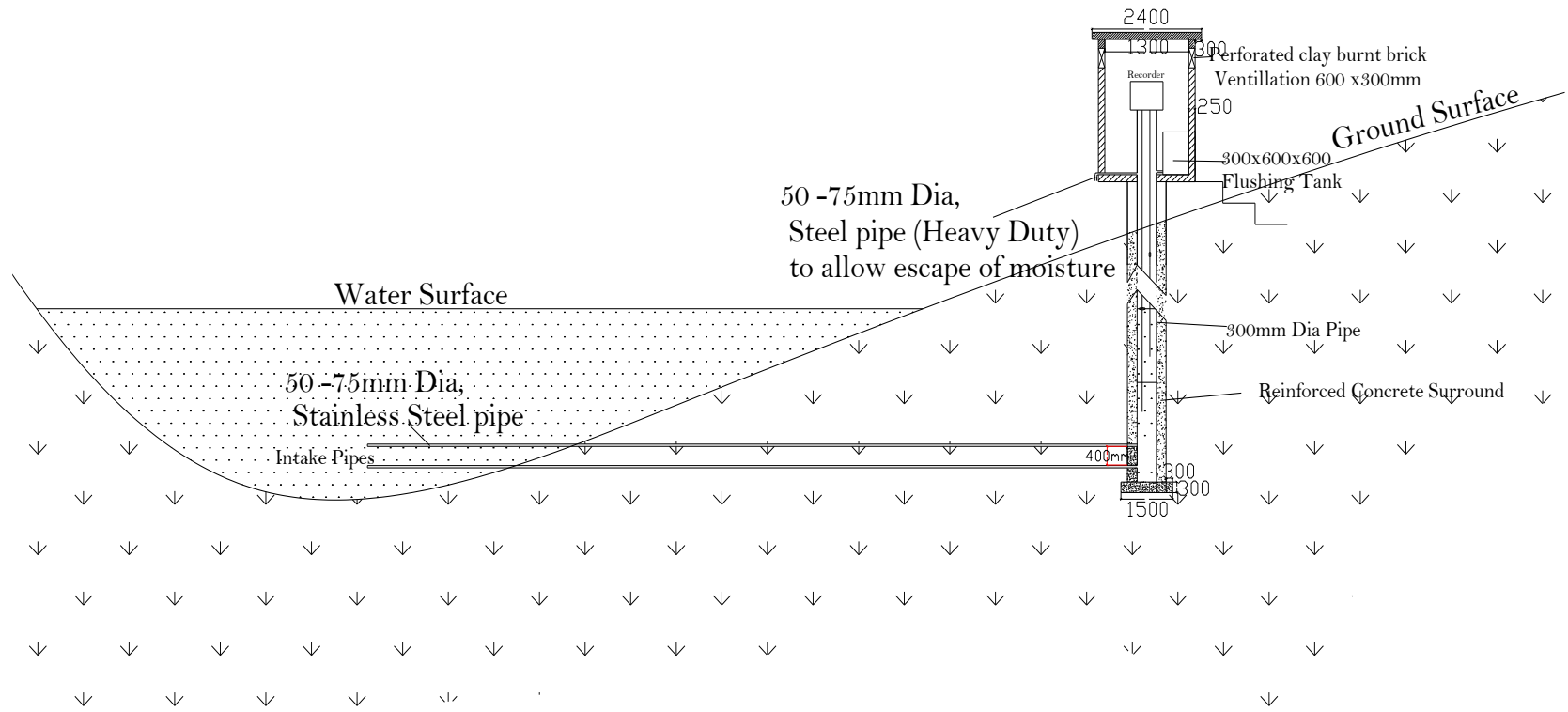
STILLING WELL PLAN



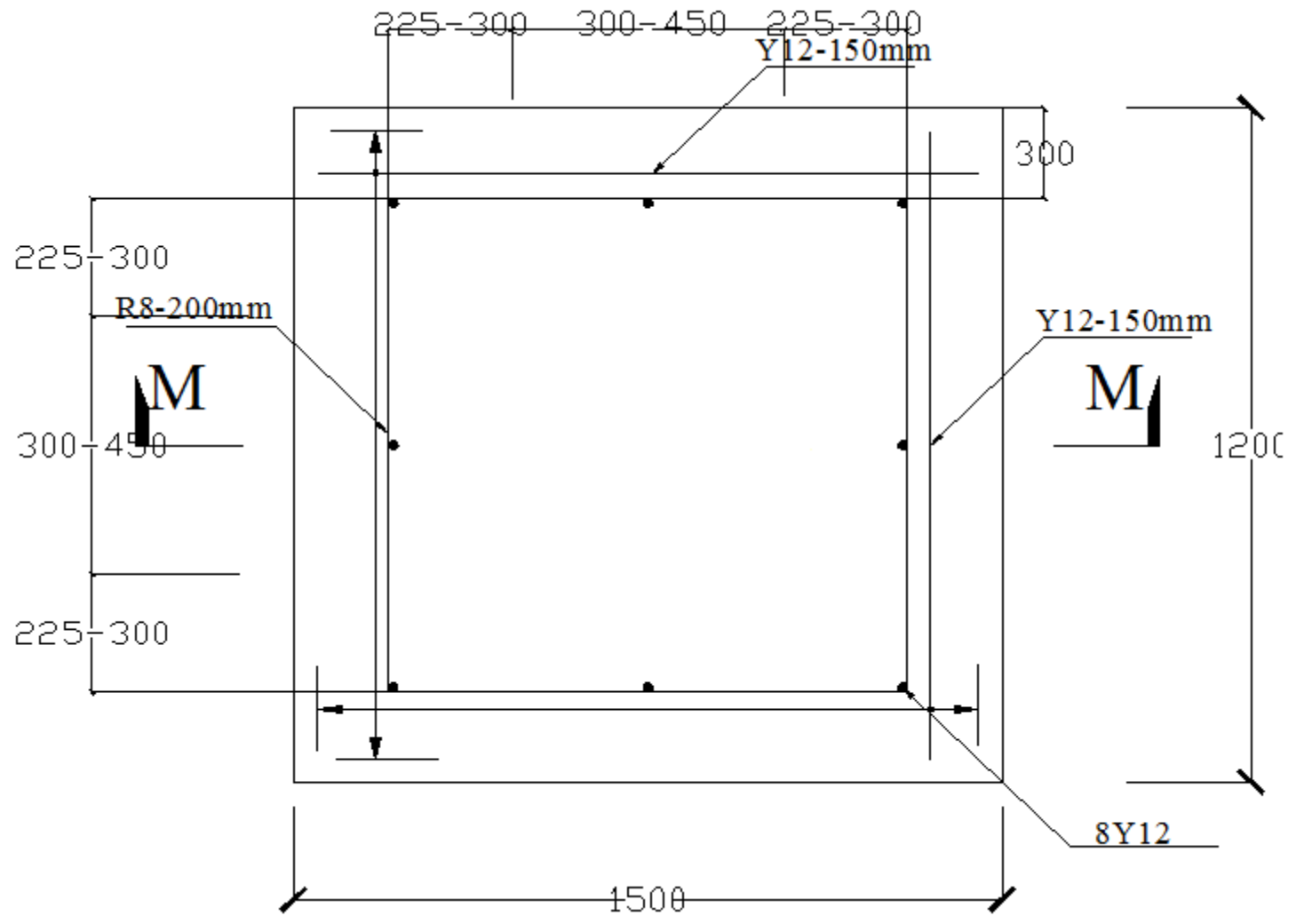
SIDE ELEVATION

DOOR SIDE ELEVATION

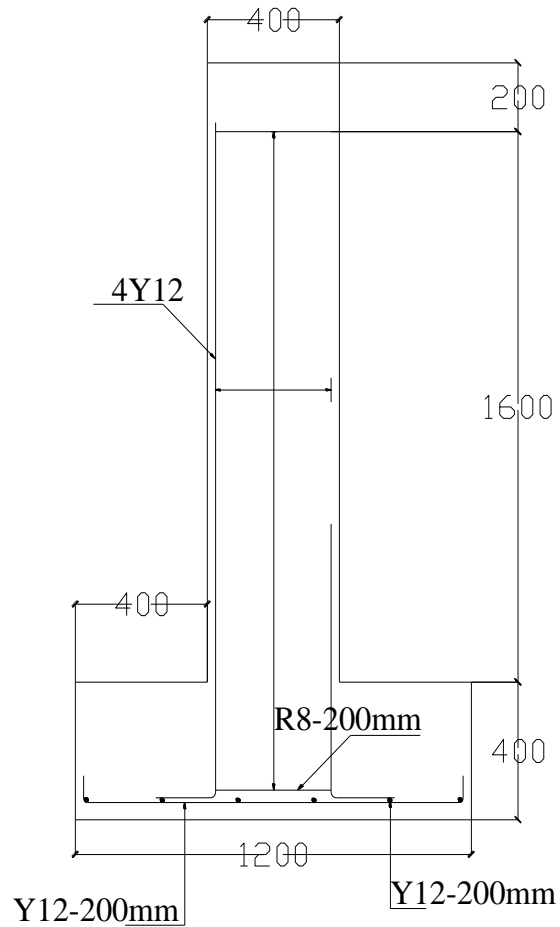
Water level Recorder Structure across Gauging Section



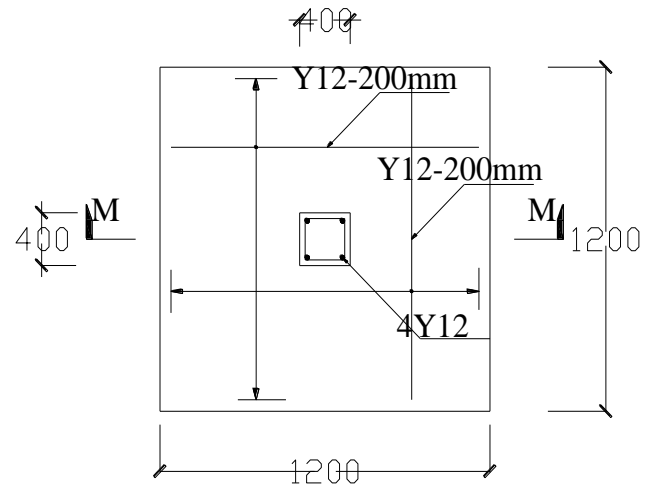
AUTOMATIC WATER LEVEL RECORDER
SECTION M - M



Arrangement of plan and section of typical pillar gauge

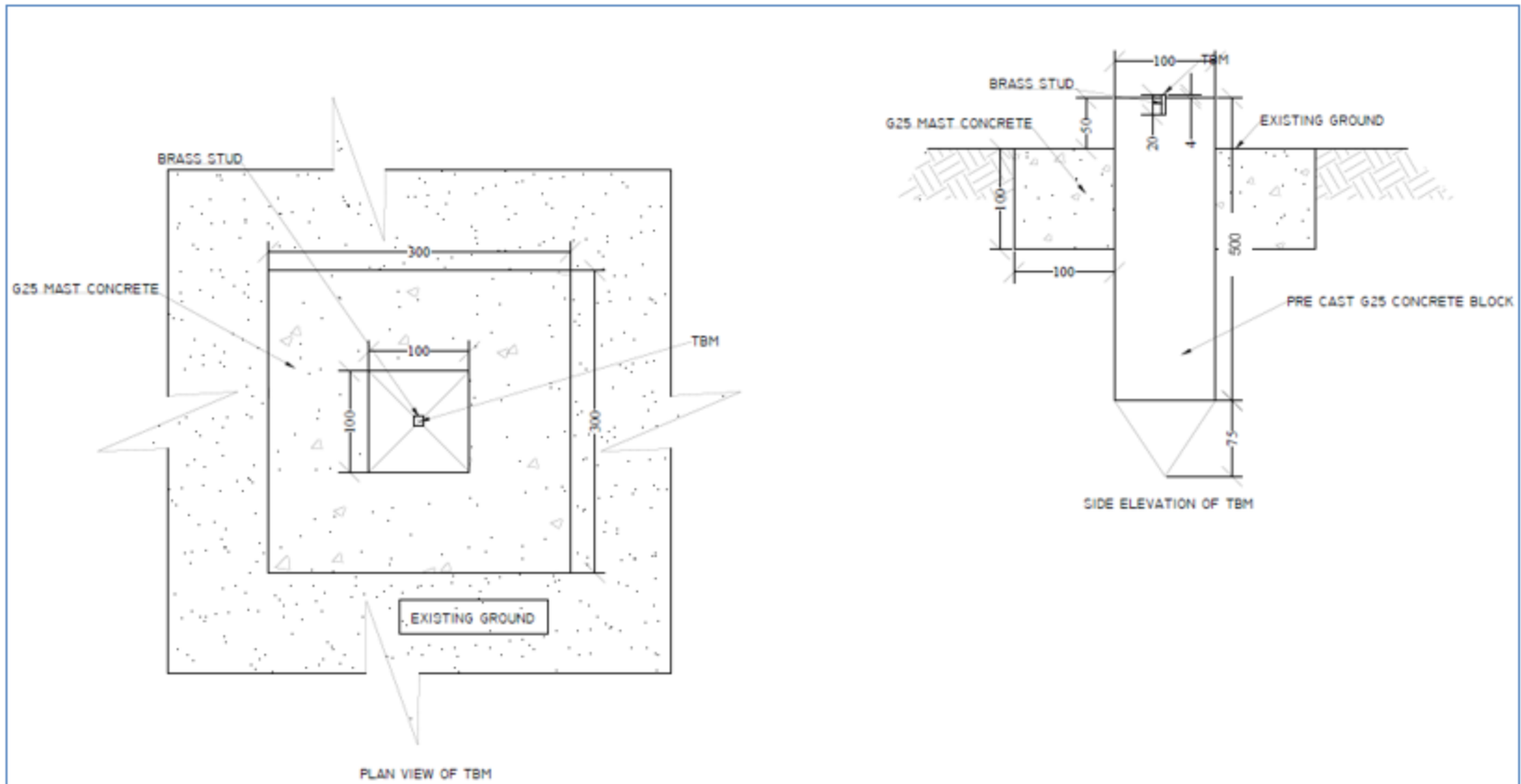


SECTIONAL ELEVATION OF
REINFORCED CONCRETE PILLAR :M-M



PLAN OF REINFORCED CONCRETE PILLAR

Benchmark Drawings



SPECIFIC DRAWINGS

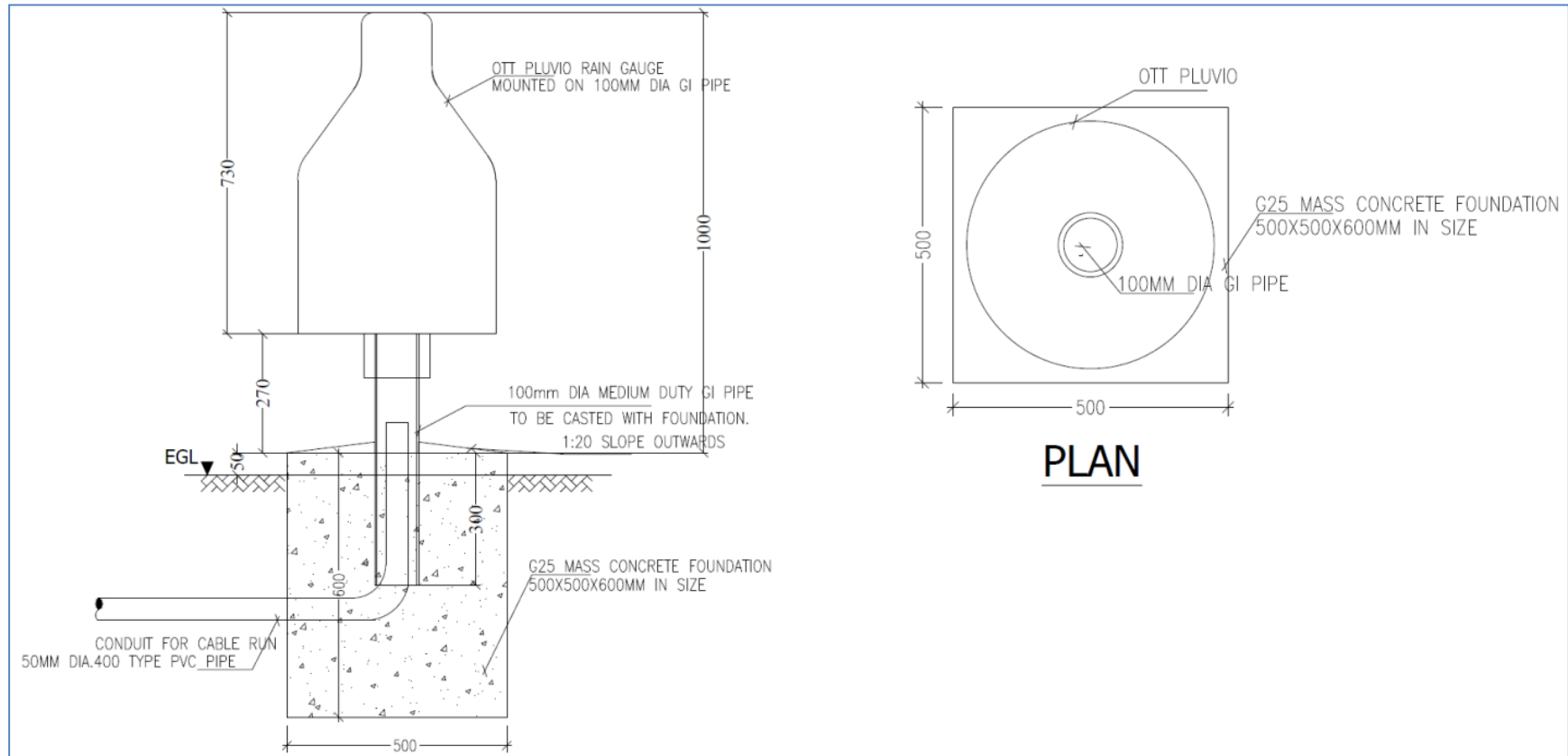
FOR

AUTOMATIC WEATHER STATIONS

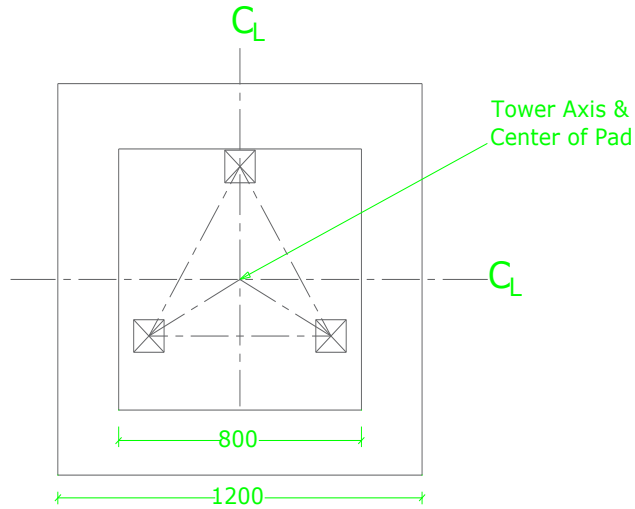
1. RAIN GAUGE

2. TOWERS AND INSPECTION PITS

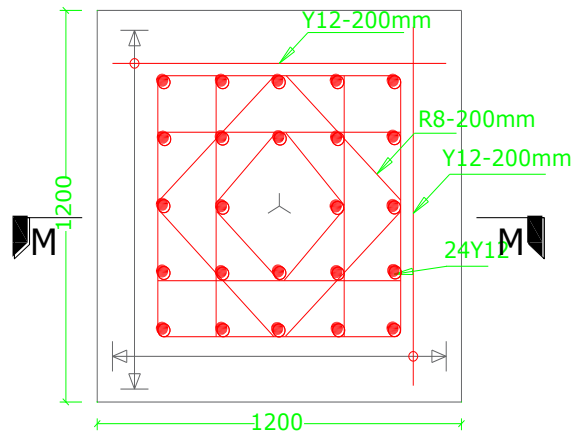
Drawing of foundation for tipping bucket or auto-accumulation rain gauge



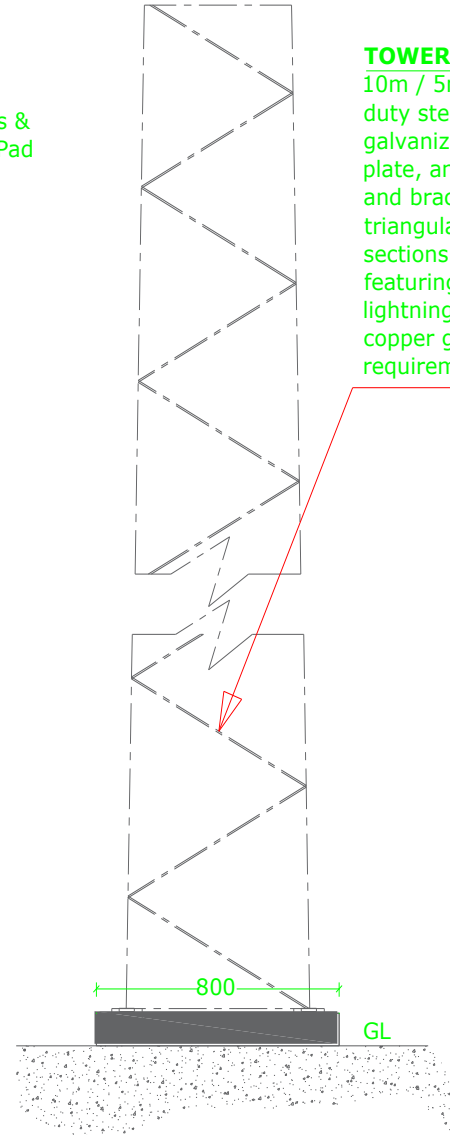
Towers and Inspection Pits



**PLAN VIEW
TOWER BASES**



**PLAN
REINFORCED CONCRETE COLUMN
STUMP AND FOOTING**



TOWER ELEVATION DETAILS

TOWER NOTES:

10m / 5m towers made of lightweight or medium duty steel lattice towers constructed of hot dip galvanized steel, self-supporting on concrete base plate, and triangular in shape with steel tubal legs and bracing. Supplied in 2.5m sections of triangular fully welded prefabricated lattice sections with tubular legs and solid round bracings featuring bolted site flange joints. Supplied with lightning arrestors, copper ground wire, and copper ground rods according to grounding requirements for lightning protection.

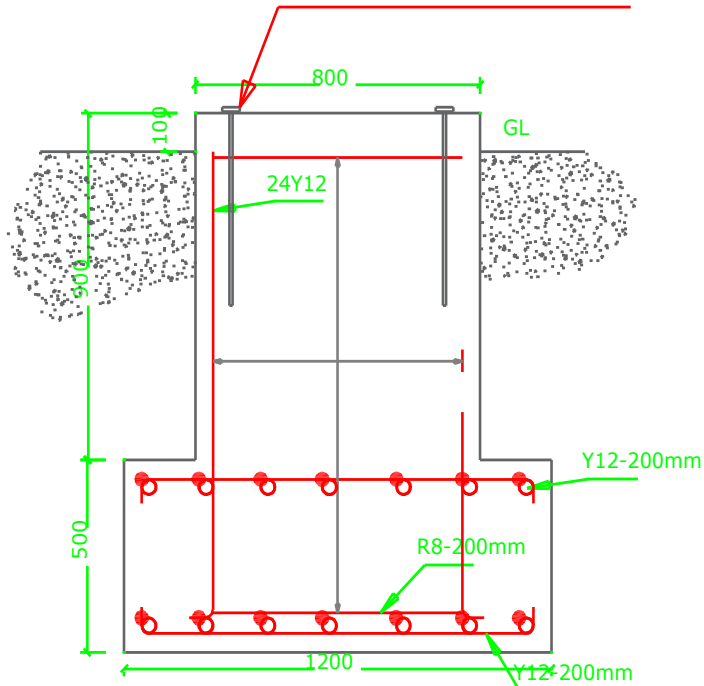
TOWER DETAILS

10m TOWER:
AUTOMATIC WEATHER STATIONS

5m TOWER:
HYDROMETRIC AND AUTOMATIC RAIN GAUGES

ALL DIMENSIONS ARE IN mm

Anchor bolts of mild steel with a 12mm dia. and 600mm in length cast with the column stump to a depth of 500mm.

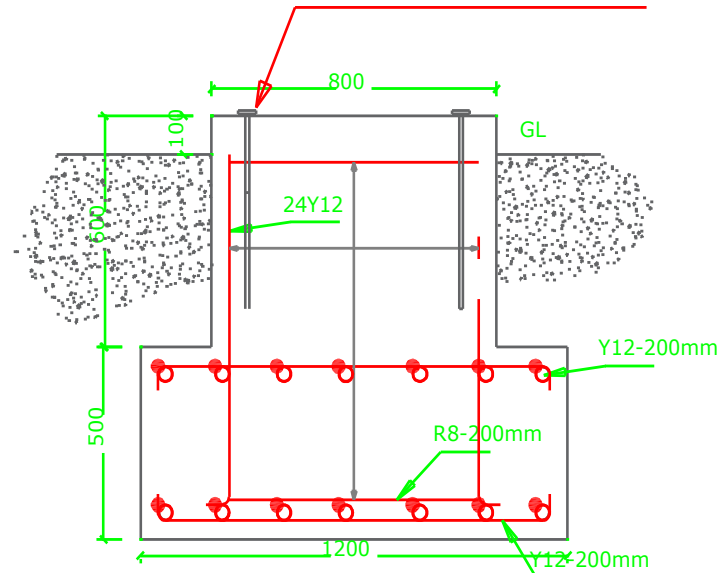


FOUNDATION NOTES:

1200x1200x500mm thick reinforced concrete footing with a column stump of 800x800x900mm of reinforced concrete cast on well compacted gravel.. A 90 degree 60 mm I.D. Schedule 40 heavy wall Rigid PVC nonmetallic conduit cast with the foundation for the cable run.

SECTION M-M
FOUNDATION DETAILS FOR 10m TOWER

Anchor bolts of mild steel with a 12mm dia. and 600mm in length cast with the column stump to a depth of 500mm.

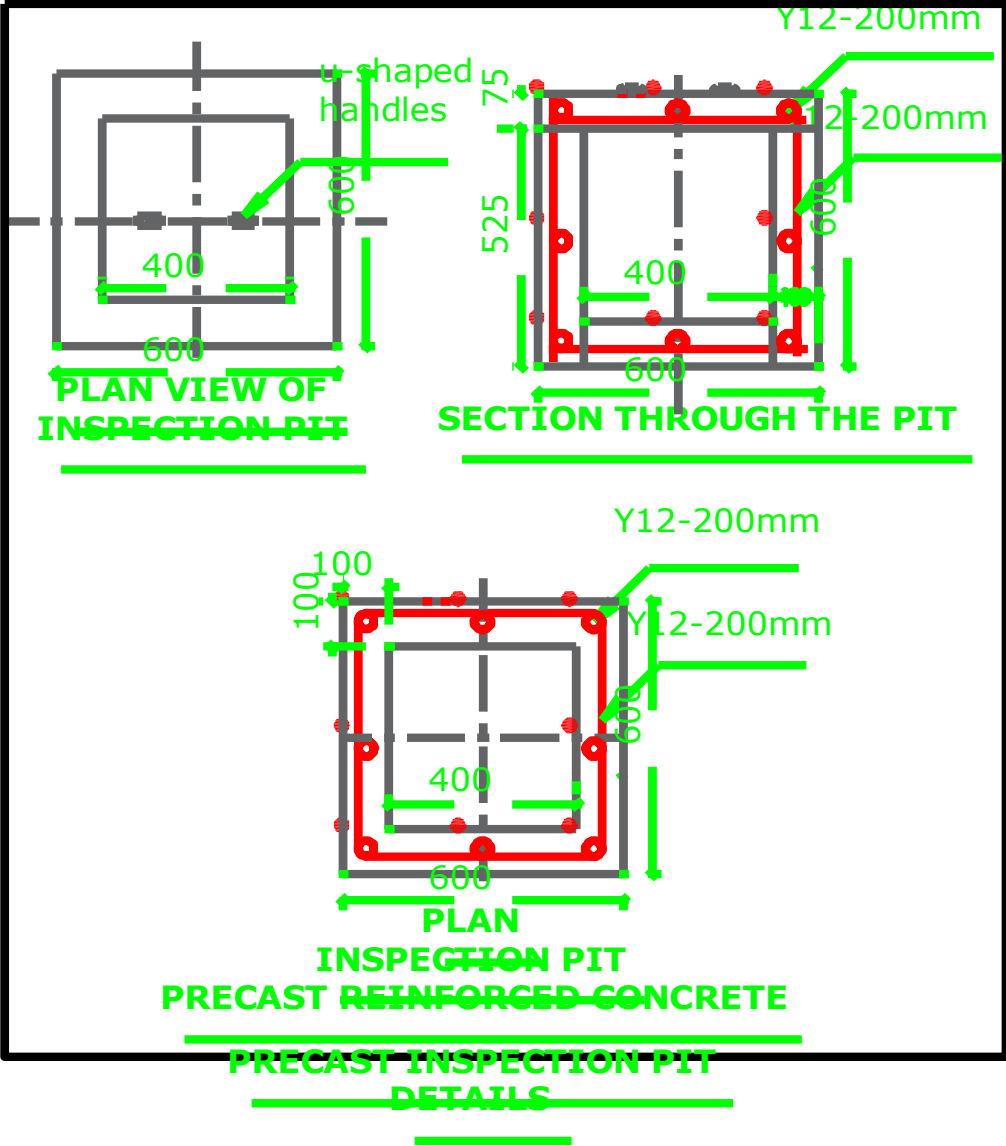


FOUNDATION NOTES:

1200x1200x500mm thick reinforced concrete footing with a column stump of 800x800x600mm of reinforced concrete cast on well compacted gravel. A 90 degree 60 mm I.D. Schedule 40 heavy wall Rigid PVC nonmetallic conduit cast with the foundation for the cable run.

SECTION M-M
FOUNDATION DETAILS FOR 5m TOWER

Inspection Pit Details

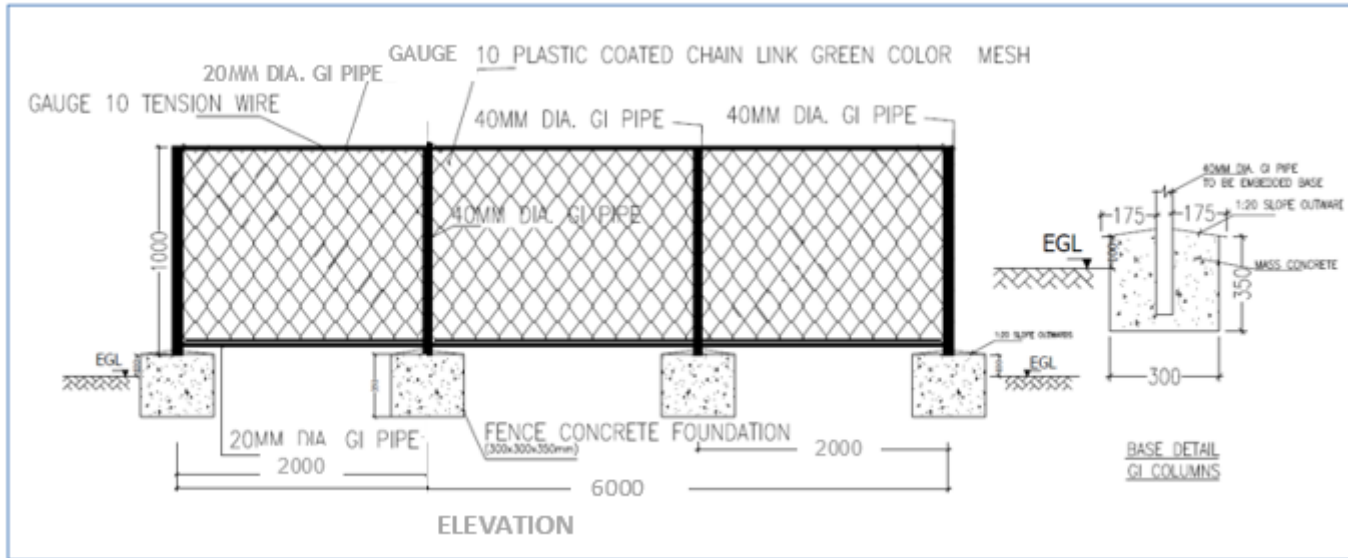


SPECIFIC DRAWINGS

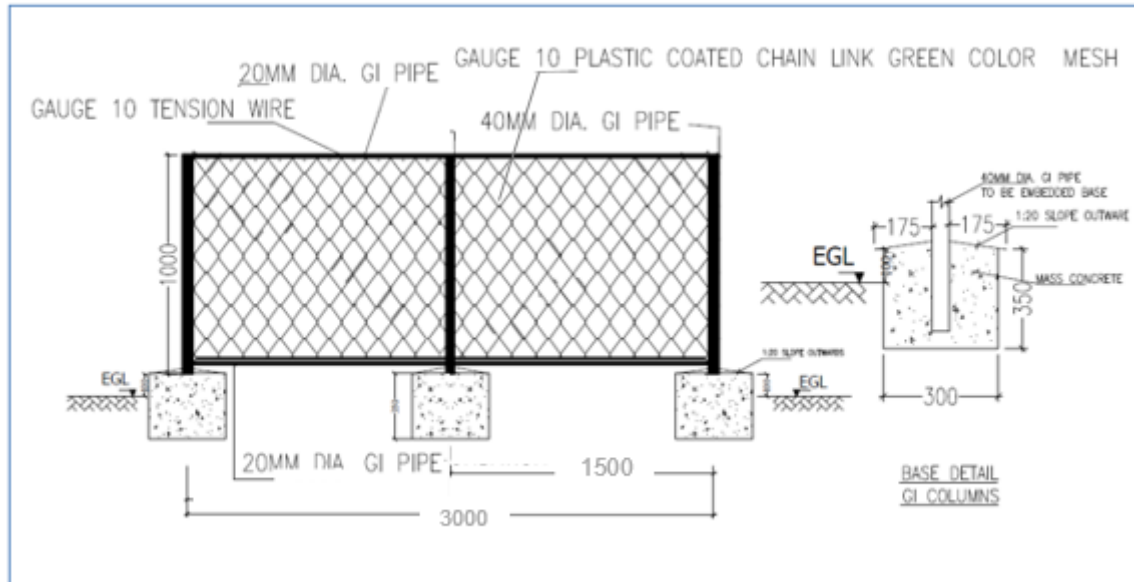
OF FENCE FOR

1. DIGITAL WATER LEVEL RECORDING STATIONS
2. GROUNDWATER MONITORING STATIONS
3. AUTOMATIC WEATHER STATIONS

Drawing of fencing and foundations for weather, Surface water and groundwater stations



Drawing of fencing and foundations for Automatic Rain gauge stations



SPECIFIC DRAWINGS

FOR

GROUND WATER LEVEL RECORDING STATION

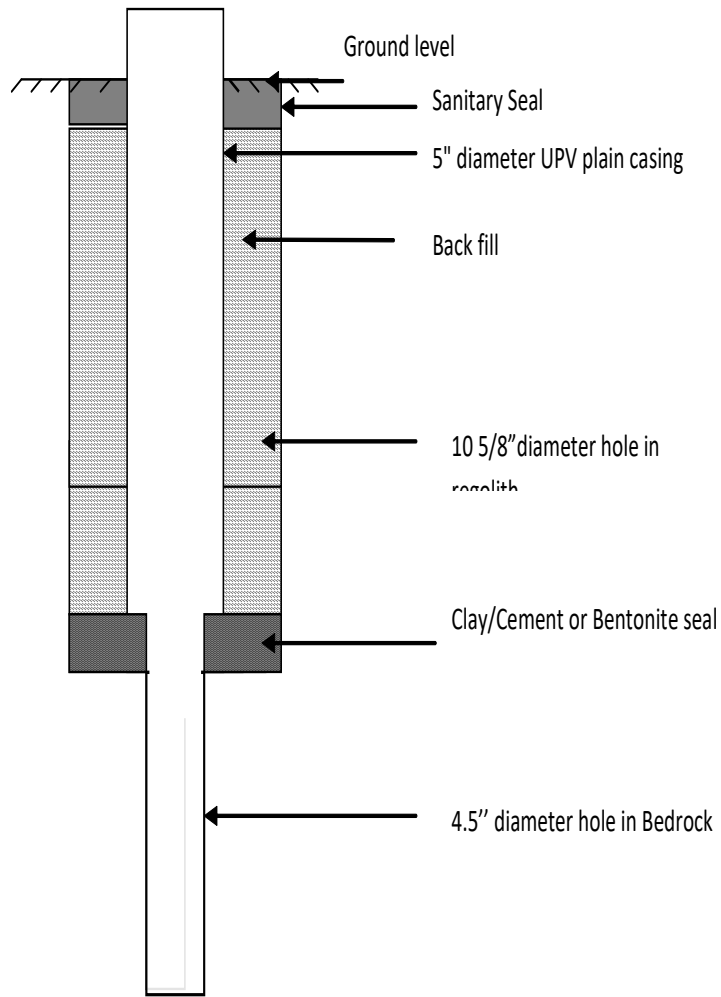
1. AQUIFERS

2. MONITORING WELL

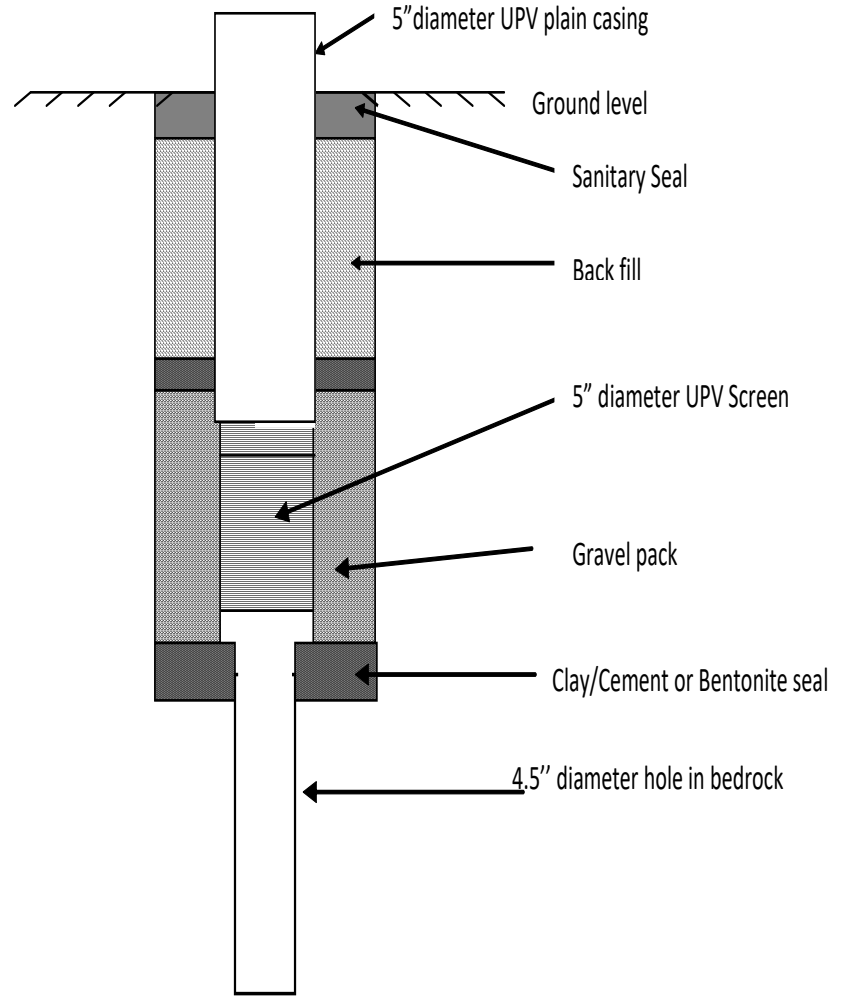
3. GROUNDWATER OBSERVATION HOUSE

Groundwater Monitoring Well Designs to be Fitted With Data Loggers

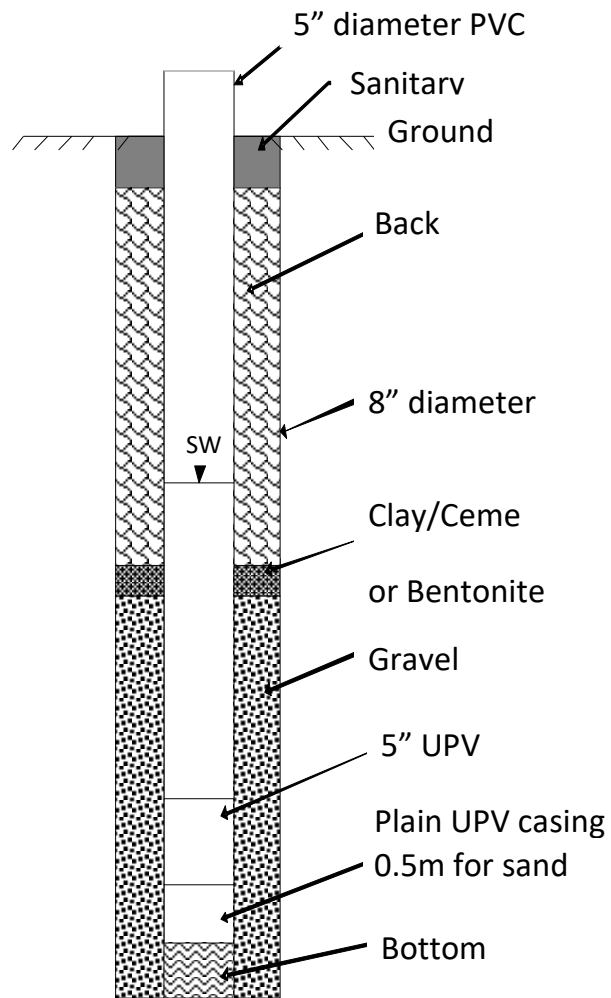
Fractured aquifer



Fractured/Regolith aquifer



Monitoring Well Design



Drawings for Groundwater Observation House

