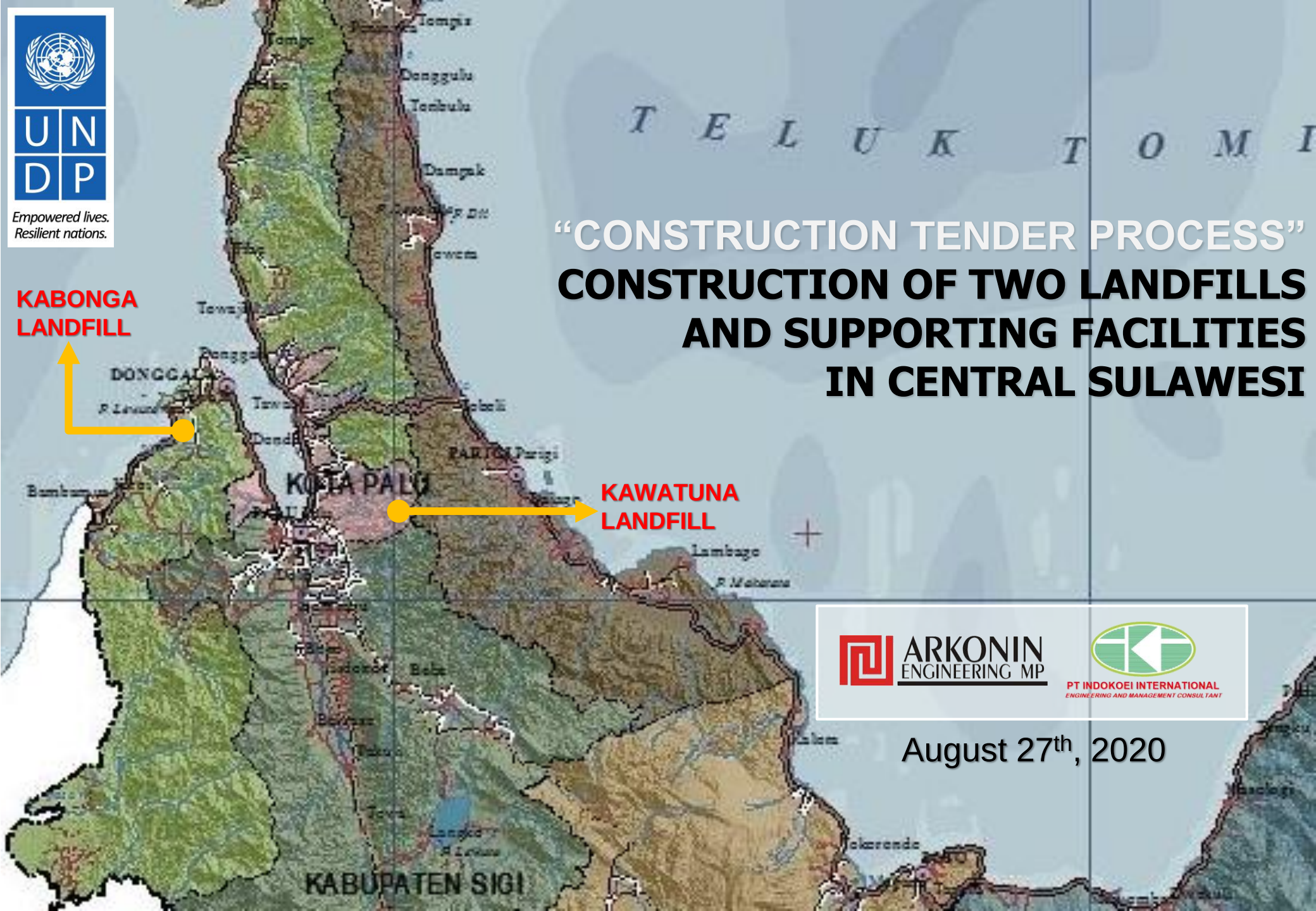


UNDP
Empowered lives.
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"CONSTRUCTION TENDER PROCESS"
CONSTRUCTION OF TWO LANDFILLS AND SUPPORTING FACILITIES IN CENTRAL SULAWESI

ARKONIN ENGINEERING MP

PT INDOKOEI INTERNATIONAL
ENGINEERING AND MANAGEMENT CONSULTANT

August 27th, 2020

SCOPE OF WORKS

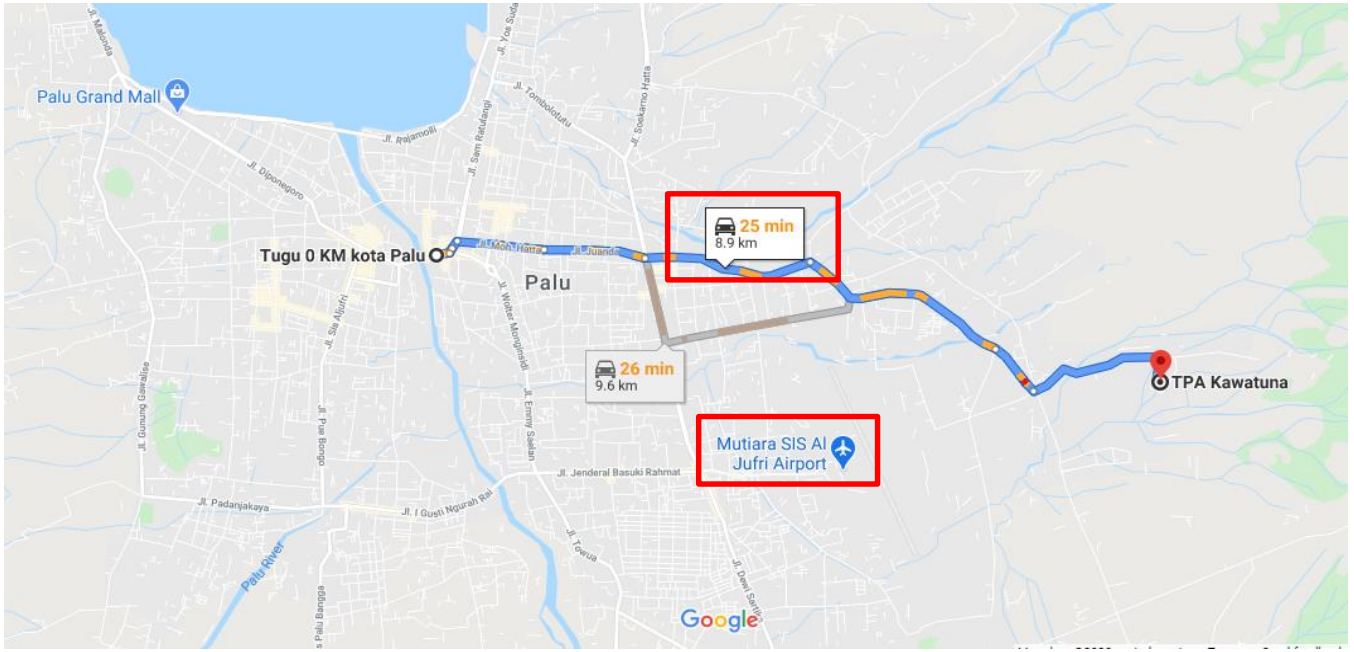
KAWATUNA LANDFILL		KABONGA LANDFILL	
I	GENERAL PREPARATION	I	GENERAL PREPARATION
II	RECONSTRUCTION OF LEACHATE TREATMENT PLANT (LTP)	II	REHABILITATION LEACHATE COLLECTION SYSTEM
III	REHABILITATION OF CELL 2 LEACHATE COLLECTION SYSTEM	III	RESHAPING, CAPPING & CLOSURE OF CELL EXISTING
IV	RESHAPING, CAPPING & CLOSURE OF CELL 2	IV	DESIGN OF NEW CELL + LEACHATE COLLECTION SYSTEM + LANDFILL GAS COLLECTION SYSTEM
V	CONSTRUCTION OF CELL 3 + LEACHATE COLLECTION SYSTEM	V	SITE DRAINAGE
VI	LANDFILL GAS COLLECTION SYSTEM	VI	INTERNAL ACCESS ROAD
VII	SITE DRAINAGE	VII	PERIMETER FENCE & BUFFER ZONE
VIII	INTERNAL ACCESS ROAD	VIII	MATERIAL RECOVERY FACILITY
IX	PERIMETER FENCE AND BUFFER ZONE	IX	RECONSTRUCTION OF LEACHATE TREATMENT PLANT
X	OPERATIONAL OFFICE	X	GENERAL ELECTRICAL
XI	MECHANICAL WORKSHOP	XI	POWER UPGRADE
XII	SECURITY POST		
XIII	MATERIAL RECOVERY FACILITY		
XIV	WATER SUPPLY SYSTEM 2000 L		
XV	GENERAL ELECTRICAL		
XVI	POWER UPGRADE		

I. GENERAL PREPARATION

	PREPARATION WORKS
1	Project Board Installation / Project Nameplate
2	Temporary Office with Plastering Floor (Direction Keet)
3	Temporary Guard Post (Wood Construction)
4	Temporary Equipment Warehouse
5	Temporary Worker's Place *(Bedeng)*
6	Water
7	Electricity
8	Administration and Documentation
9	Reporting (Shop Drawing, As Built Drawing)
10	Occupational Health and Safety (OHS) Procurement
11	HSE Monitoring (Including Ambient Air, Vibration, Surface Water and Groundwater)

CONSTRUCTION OF
KAWATUNA LANDFILL

LOCATION OF KAWATUNA LANDFILL

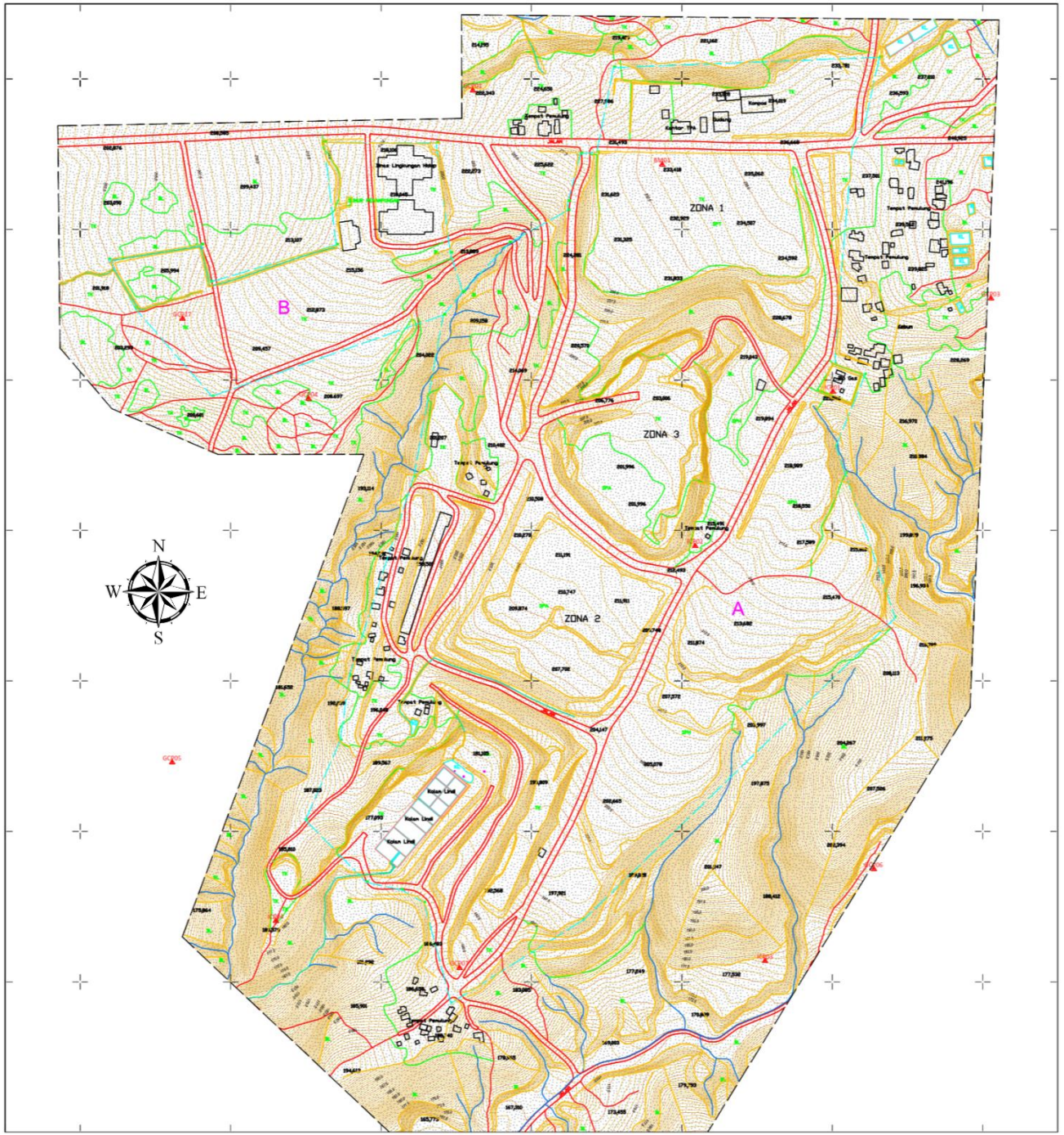


± 2 hours 55 minutes flight
Soekarno Hatta - Mutiara SIS Aljufri Airport





Situation and Contour Map of Kawatuna Landfill

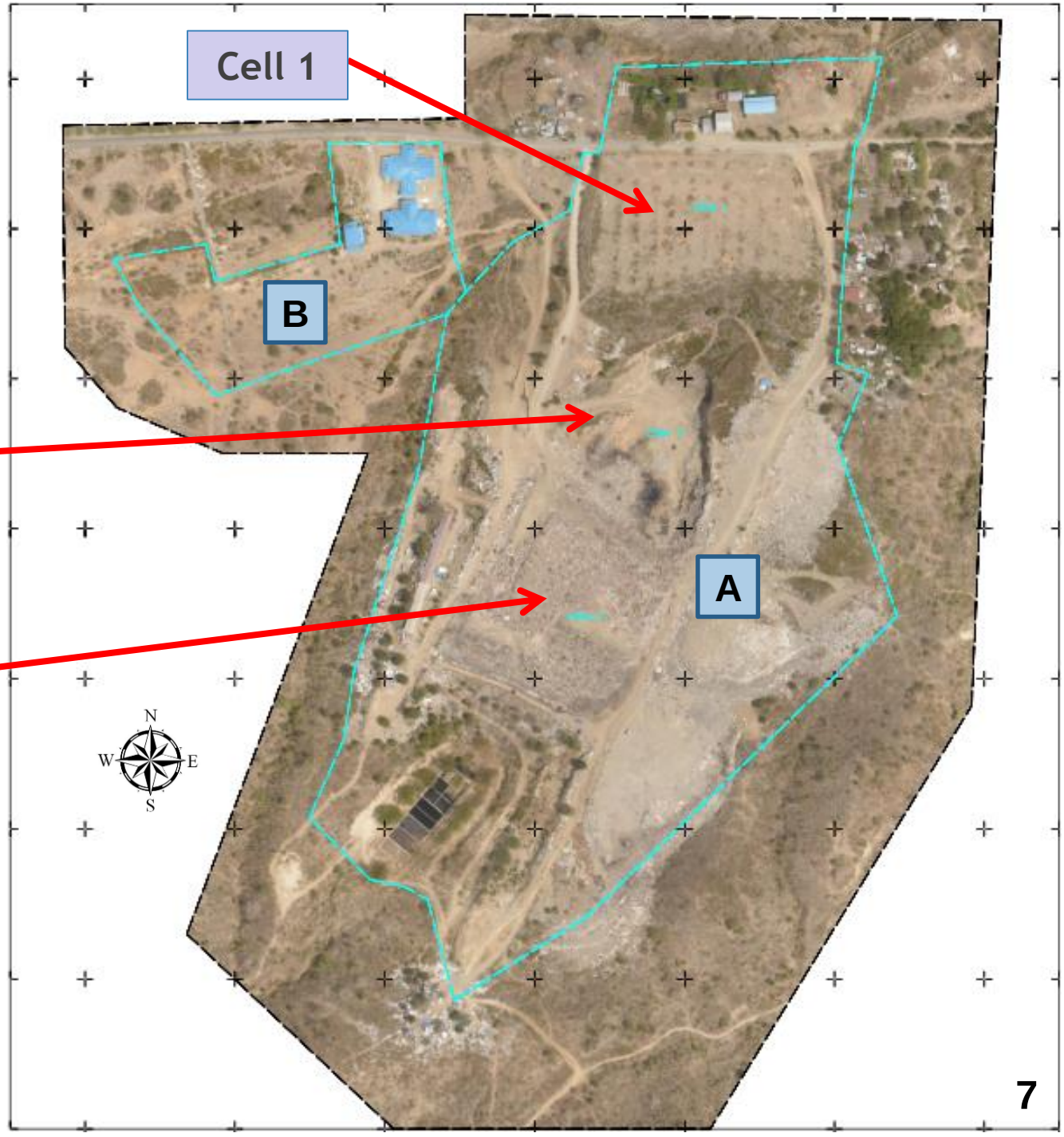


LEGENDA :

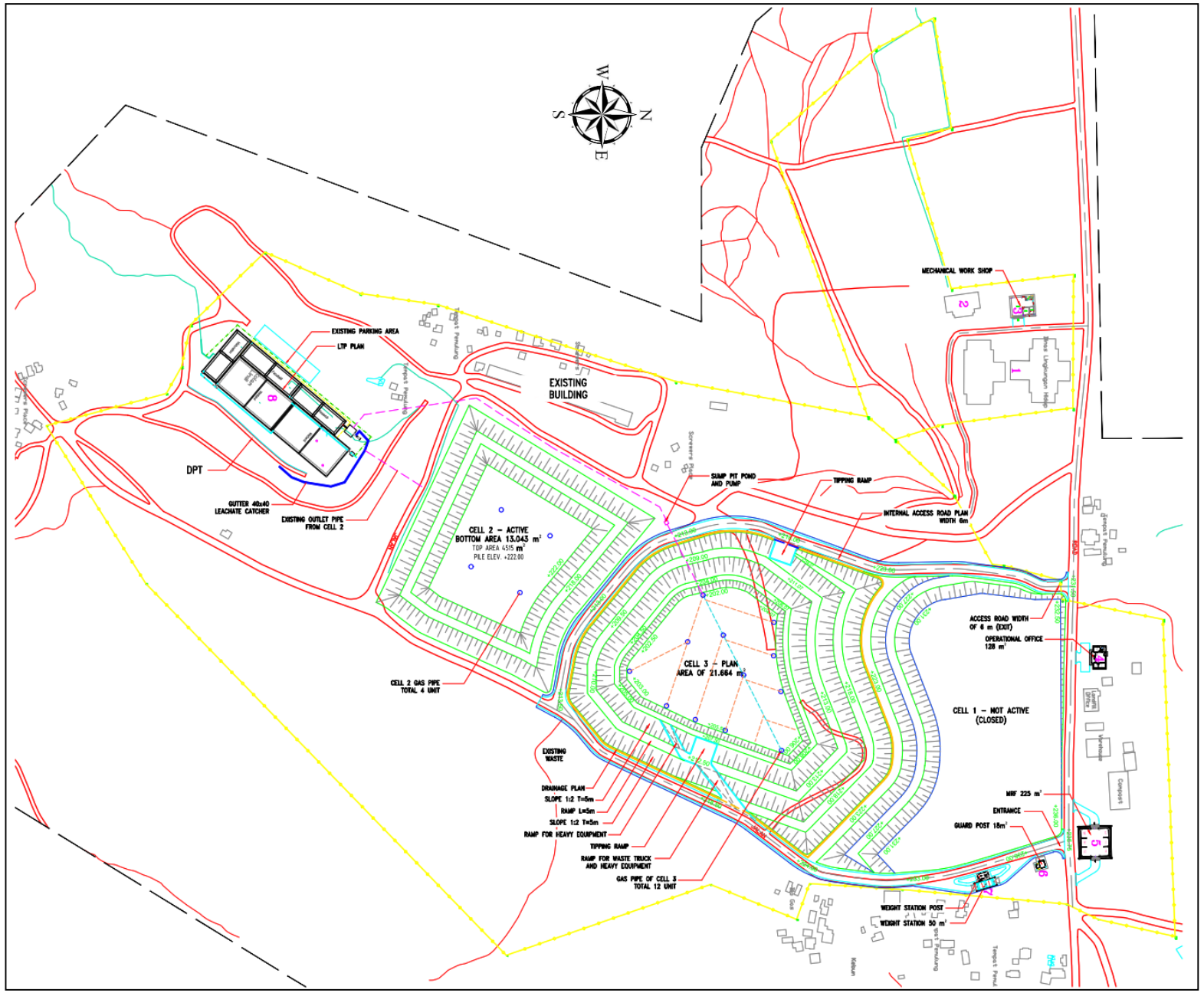
- Batas Pemetaan
- Batas TPA
- Jalan
- Pipa Resapan
- Sungai(a),Anak Sungai(b)
- Saluran(c),Arah Sungai(d)
- KL — Kolam
- AR — Rawa
- Titik Kontrol Referensi
- Titik Kontrol GPS
- . 25.5 — Titik Tinggi
- 17.50 — Garis Tinggi
- Rumah / Gedung
- Batas Vegetasi
- SW — Sawah
- LD — Ladang
- TK — Tanah Kosong
- KB — Kebun
- PH — Pohon
- BL — Belukar
- TM — Taman
- TPU — Pemakaman
- SPH — Sampah
- SPA — Sampah Aktif
- SPT — Sampah Tidak Aktif

Kawatuna Landfill Boundary

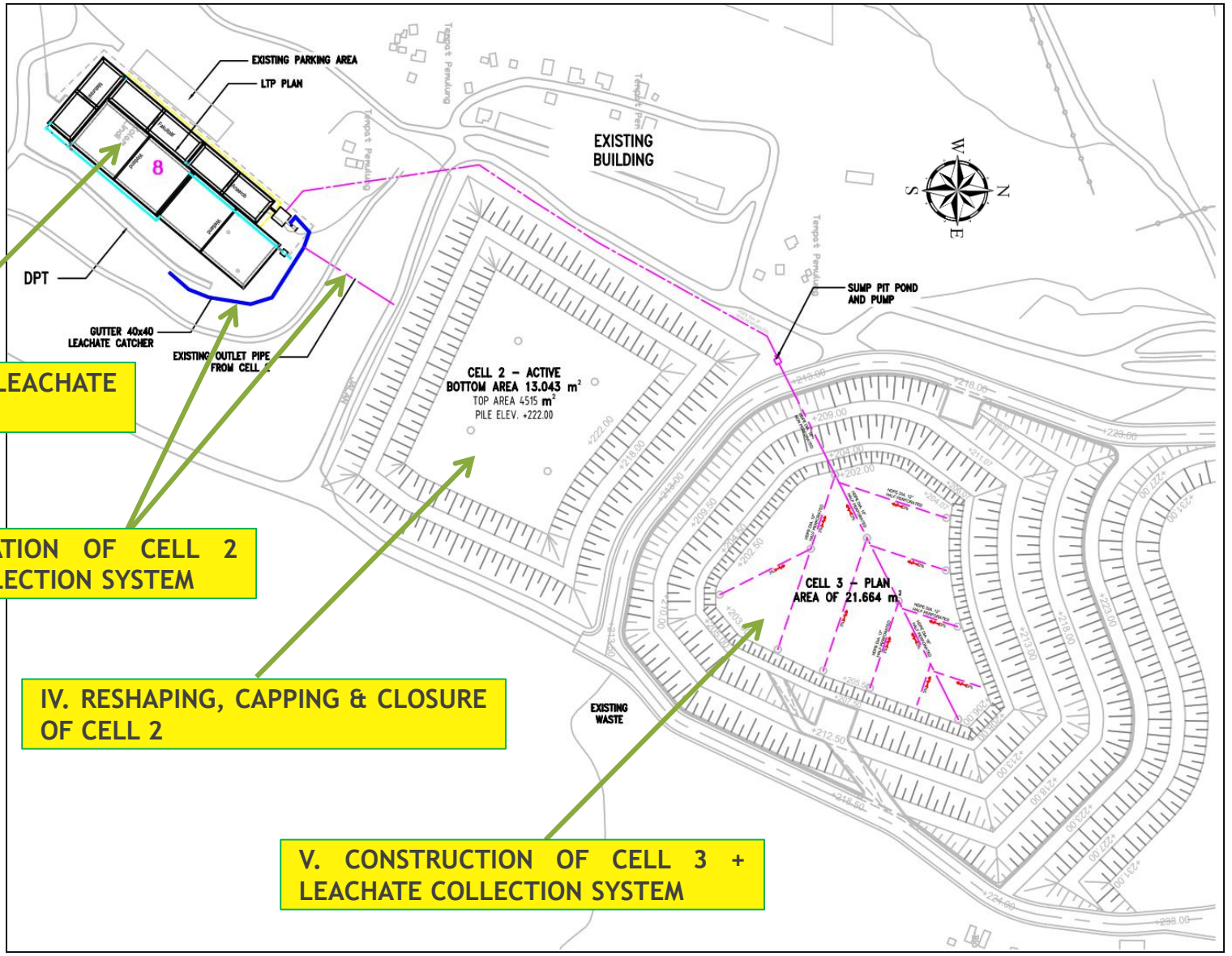
- **Area A 14,81 Ha**
  - Cell 1 - 1,550 Ha
  - Cell 2 – 1,304 Ha
  - Cell 3 - 2,166 Ha
- **Area B 1,94 Ha**



SITE PLAN OF KAWATUNA LANDFILL



WORK ITEM II, III, IV AND V



II. RECONSTRUCTION OF LEACHATE TREATMENT PLANT (LTP)

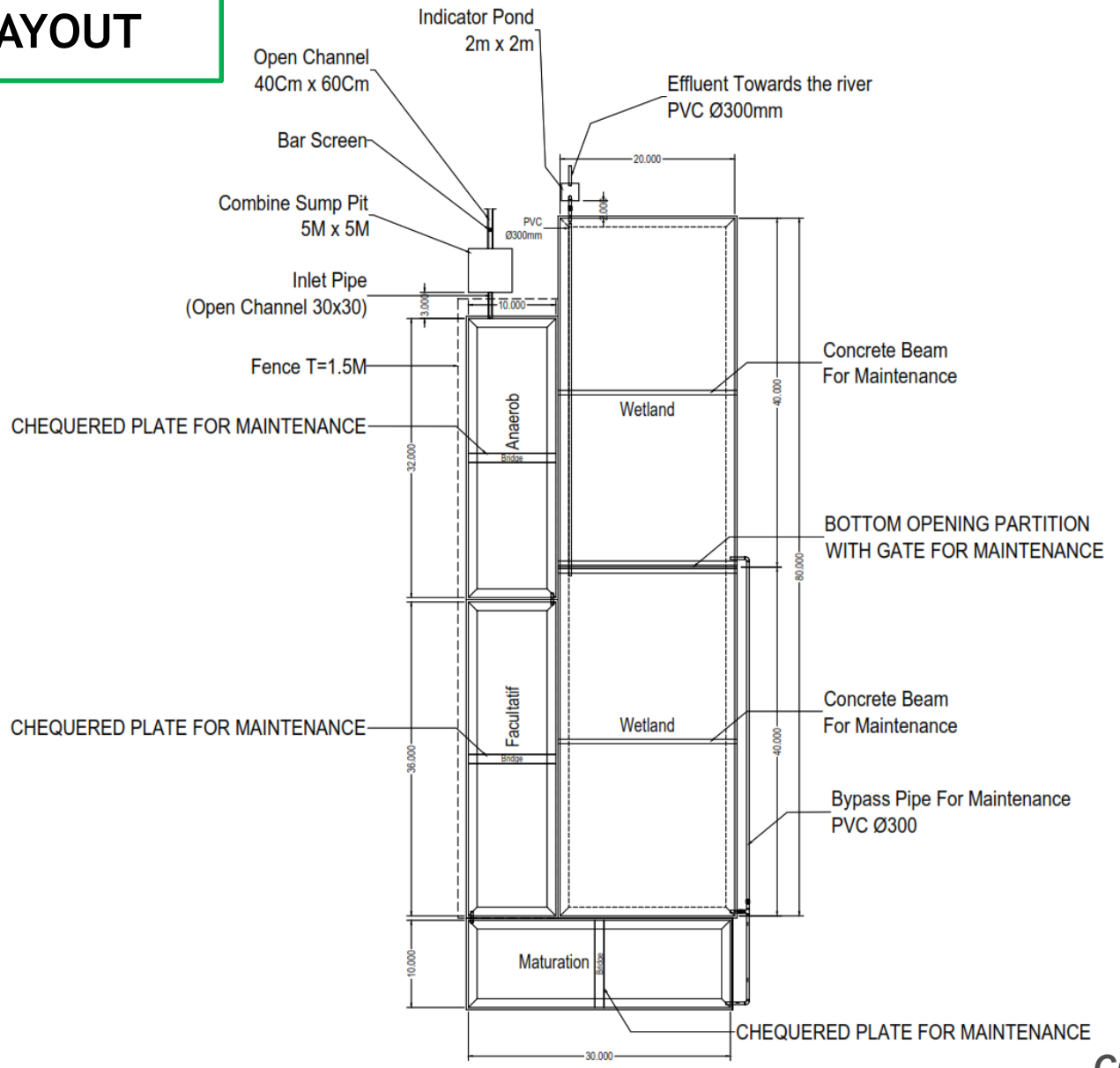
III. REHABILITATION OF CELL 2 LEACHATE COLLECTION SYSTEM

IV. RESHAPING, CAPPING & CLOSURE OF CELL 2

V. CONSTRUCTION OF CELL 3 + LEACHATE COLLECTION SYSTEM

II. RECONSTRUCTION OF LEACHATE TREATMENT PLANT (LTP)

LAYOUT



CONTINUED …

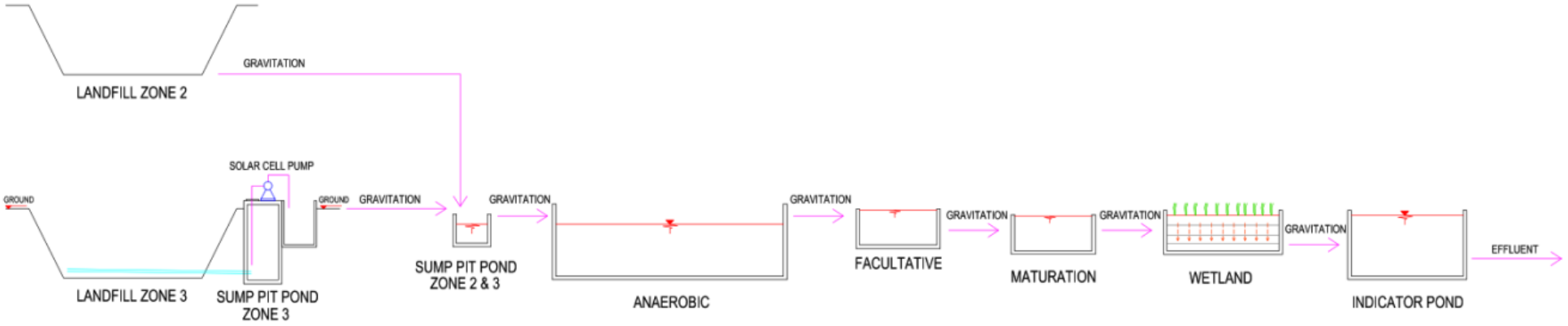
II. RECONSTRUCTION OF LEACHATE TREATMENT PLANT (LTP)

a. Construction of sump pit for LTP.

b. Demolition of existing LTP.

c. Construction of new LTP (Anaerobic pond, facultative pond, maturation pond, wetland and indicator pond).

FLOW DIAGRAM



III. REHABILITATION OF CELL 2 LEACHATE COLLECTION SYSTEM

a. Procurement and installation of HDPE Pipe; 16 inch.

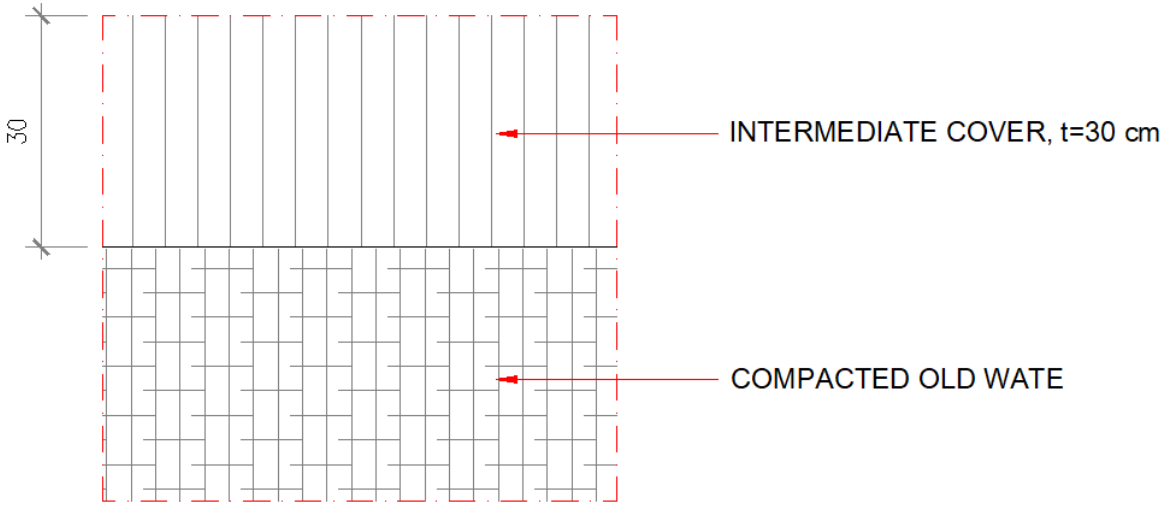
b. Construction of gutter 40x40.

IV. RESHAPING, CAPPING & CLOSURE OF CELL 2

Cover soil of Cell 2, consists of:

a. Compacted old waste.

b. Intermediate cover; t = 30 cm.



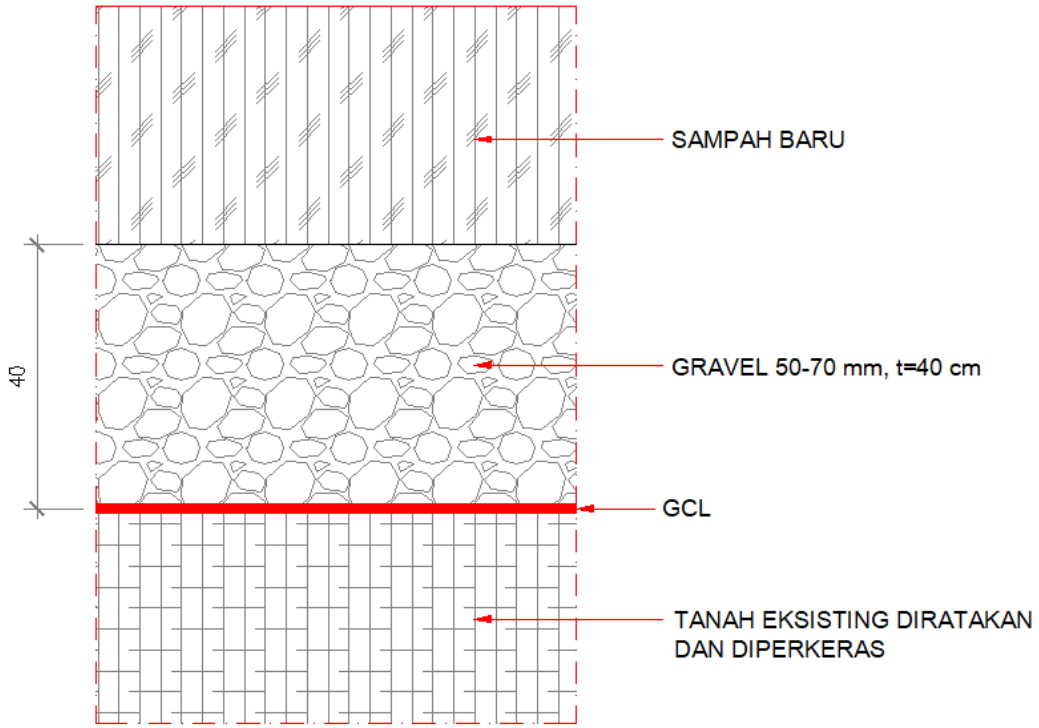
V. CONSTRUCTION OF CELL 3 + LEACHATE COLLECTION SYSTEM

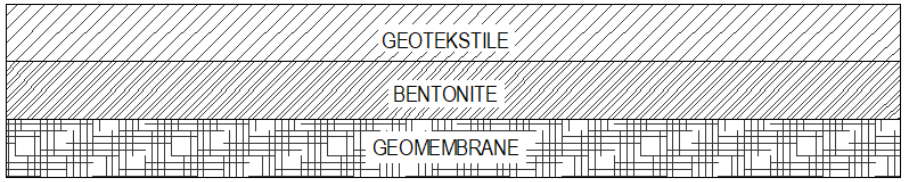
Base layer of Cell 3, consists of:

a. Compaction and leveling of existing land.

b. Procurement and installation of GCL (*Geosynthetic Clay Liner*).

c. Spreading gravel (50-70 cm); t = 40 cm.





Detail of GCL

CONTINUED ...

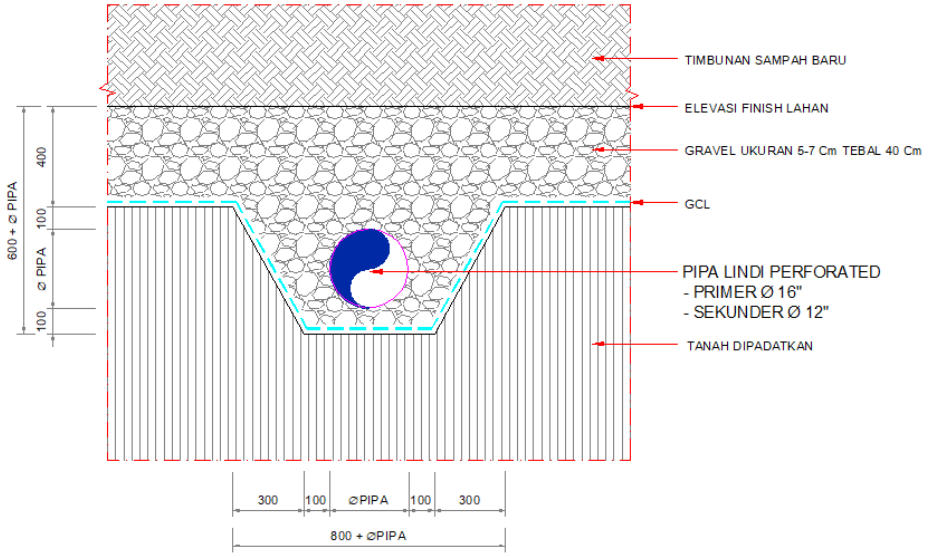
V. CONSTRUCTION OF CELL 3 + LEACHATE COLLECTION SYSTEM

a. Installation of leachate pipe:
   - Type: HDPE
   - Minimum pipe strenght PN 10.
   - Secondary pipe diameter: 12 inch
   - Primary pipe diameter: 16 inch

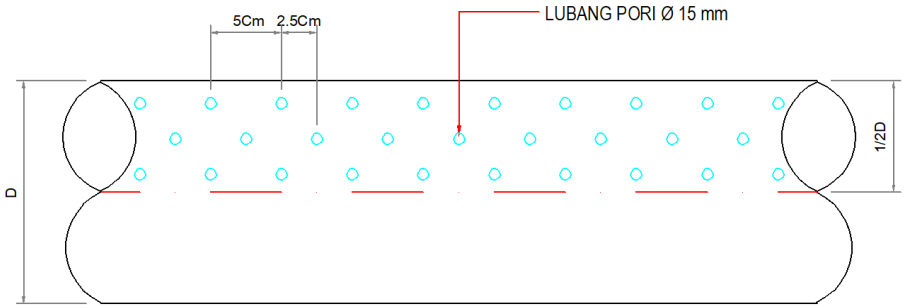
b. Construction of sump pit Cell 3.

c. Procurement and pump installation.

d. Procurement and solar cell installation.



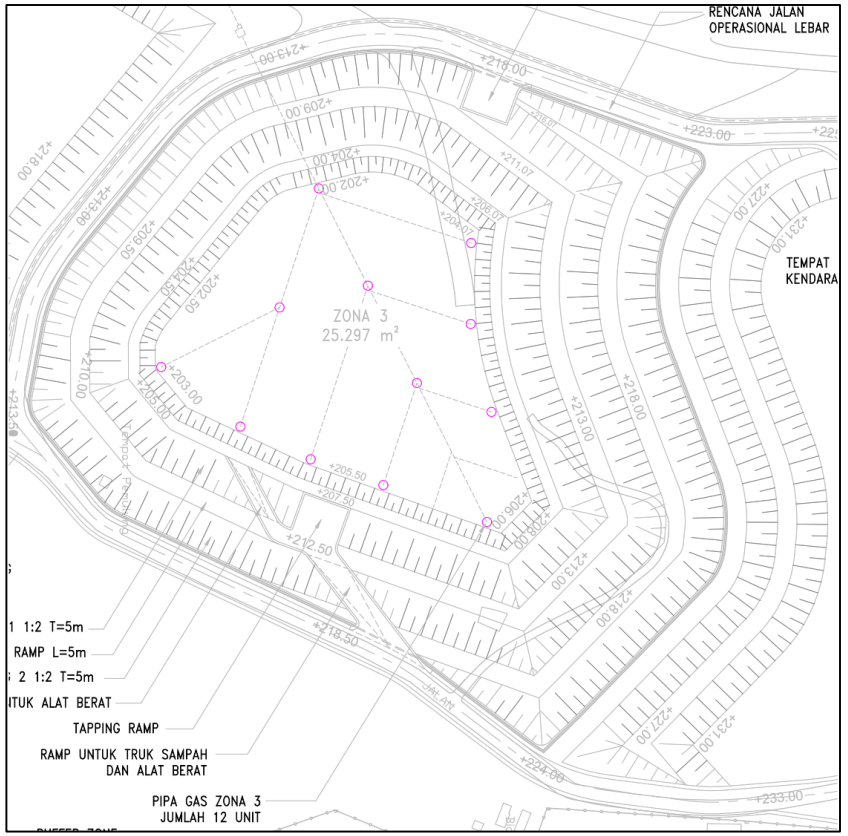
DETAIL PENANAMAN PIPA LINDI
NTS



TAMPAK SAMPING PIPA LINDI BERLUBANG
NTS

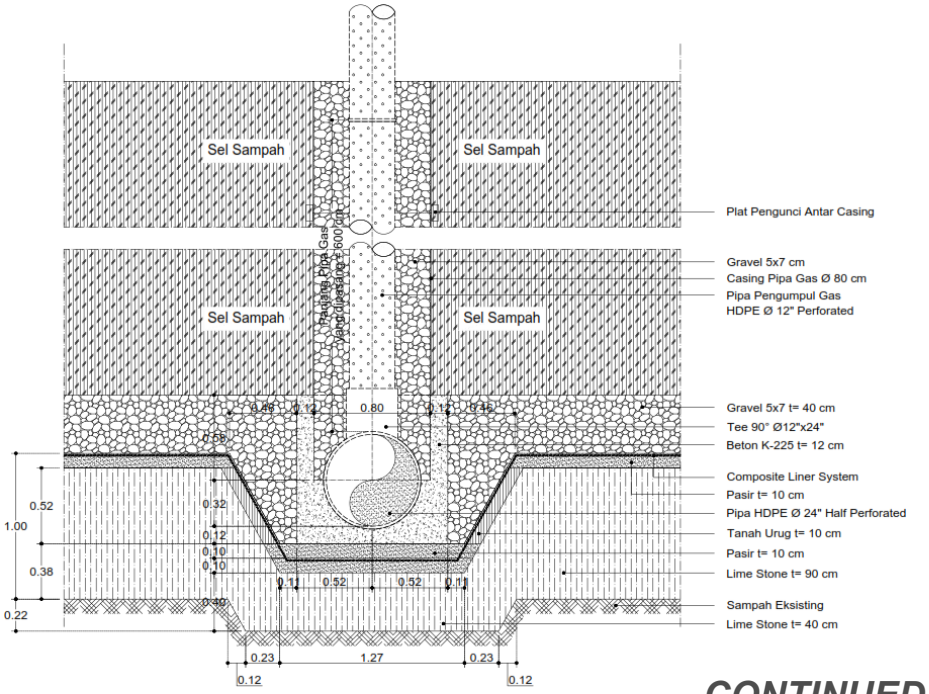
VI. LANDFILL GAS COLLECTION SYSTEM

Cell 3 (New Zone)



Procurement and installation of vertical gas pipe on Cell 3:

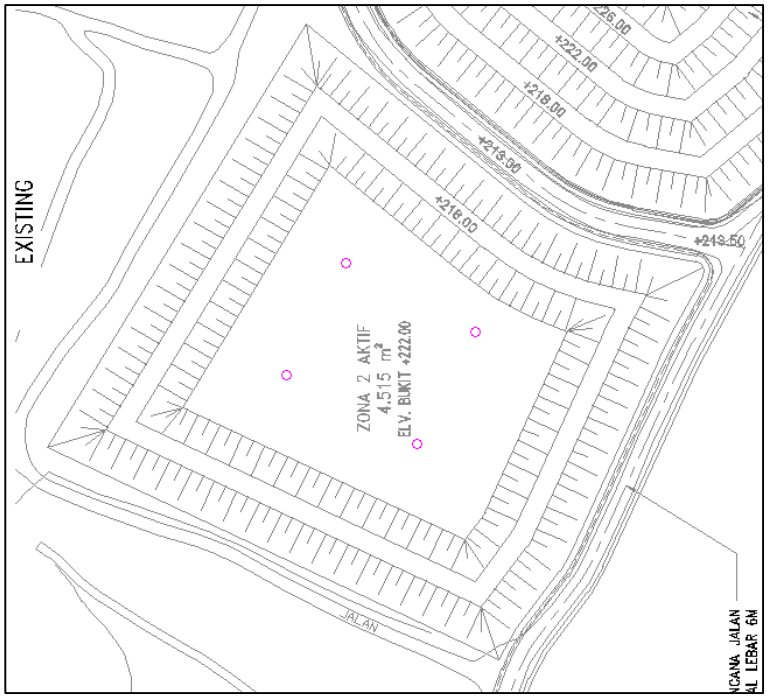
- Perforated HDPE pipe diameter = 12 inch.
- Pipe hole diameter = 50 mm.
- Thickness of plate = min 0,8 mm.
- Gas pipe casing diameter = 800 mm.
- Gravel filling between casing and pipe = diameter 50 - 70 mm.
- Pipe strength = min PN 16.



CONTINUED ...

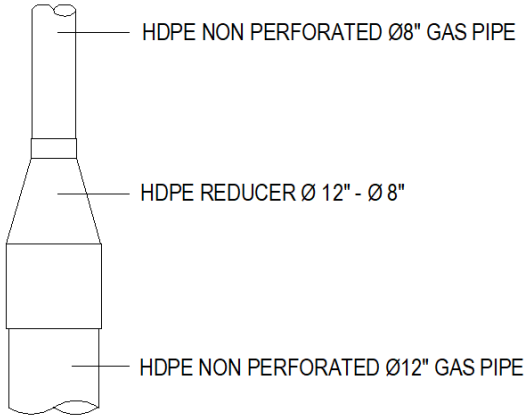
VI. LANDFILL GAS COLLECTION SYSTEM

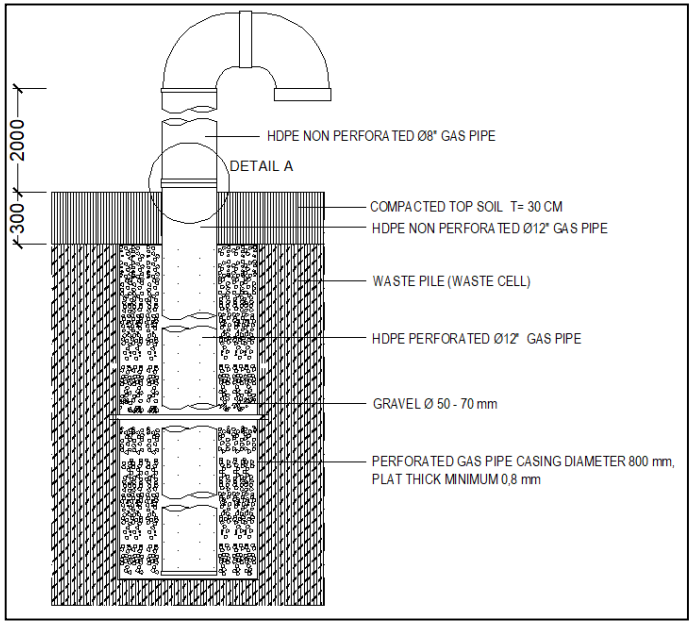
Cell 2 (Existing Zone)



Procurement and installation of vertical gas pipe on Cell 2:

- Perforated and non perforated HDPE pipe diameter = 12 inch.
- Non perforated HDPE pipe diameter = 8 inch.
- Pipe hole diameter = 50 mm.
- Thickness of plate = min 0,8 mm.
- Gas pipe casing diameter = 800 mm.
- Gravel filling between casing and pipe = dia. 50-70 mm.
- Pipe strength = min PN 16.

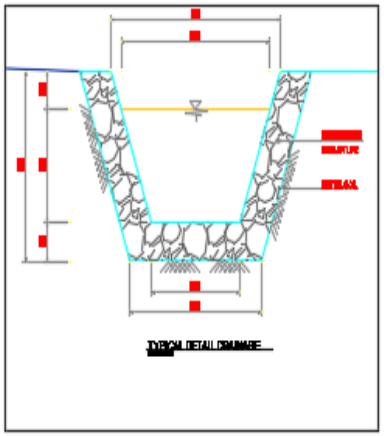


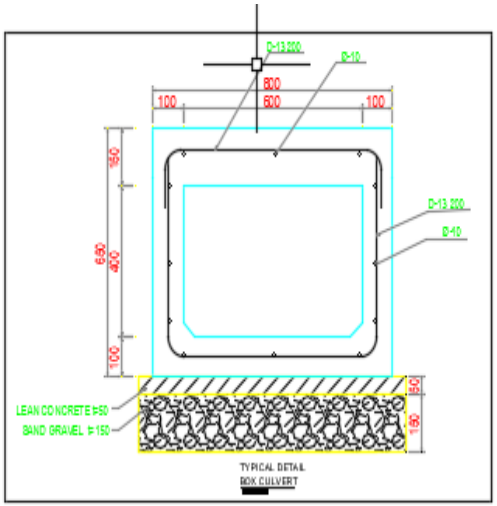


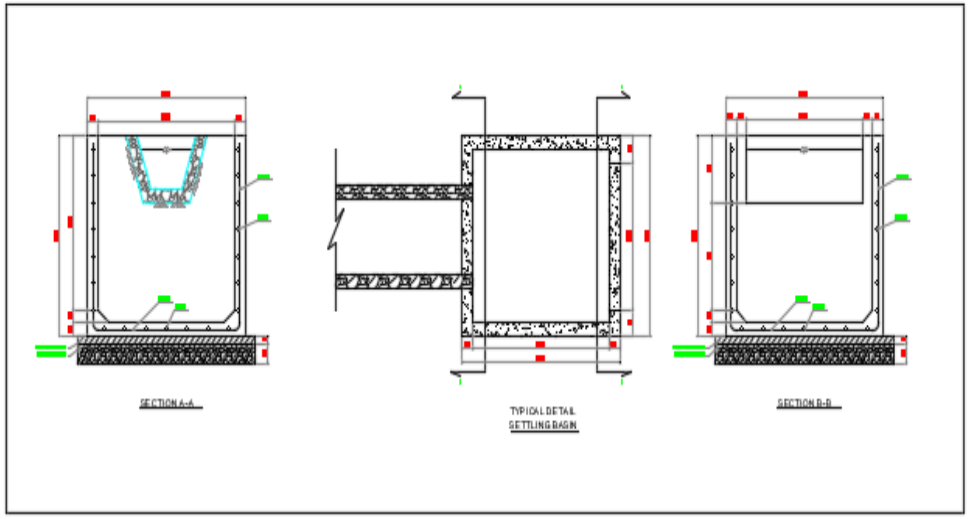
VII. SITE DRAINAGE

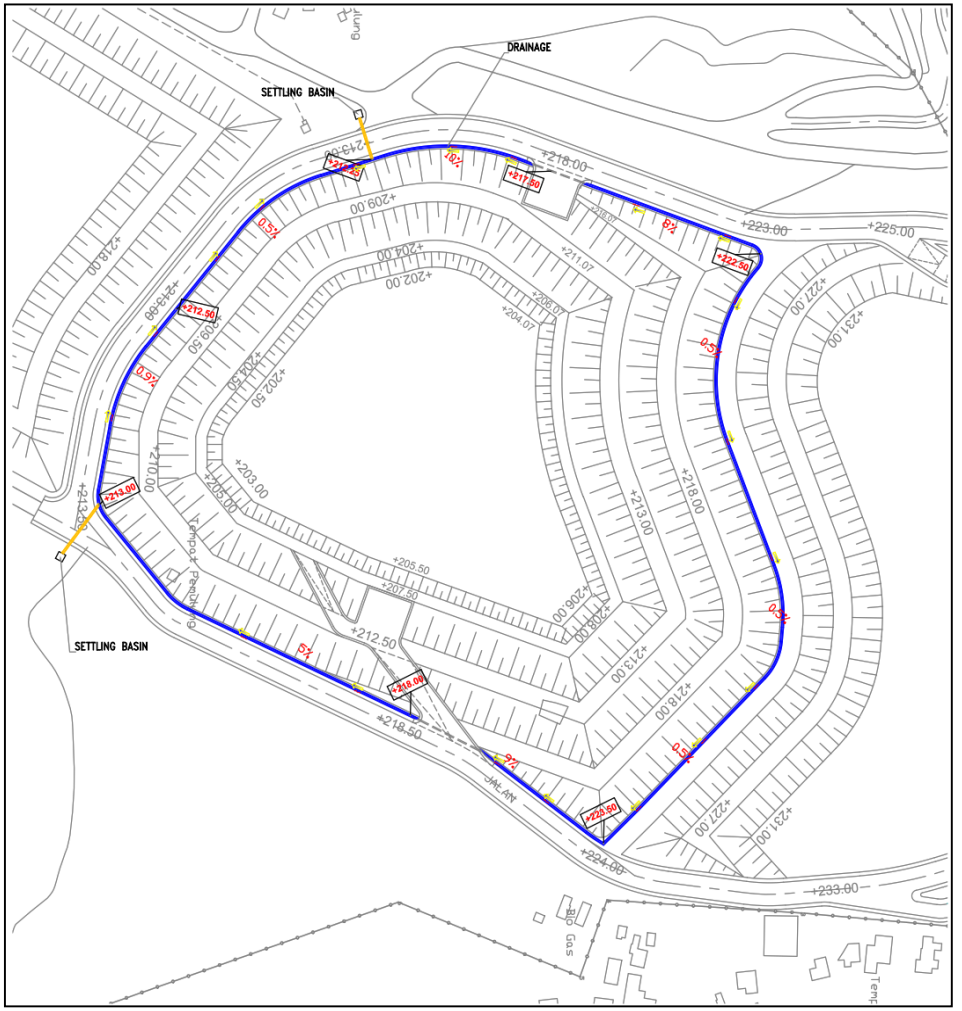
▶ LAYOUT DAN DETAIL

Length : 539 m
Type : River Stone





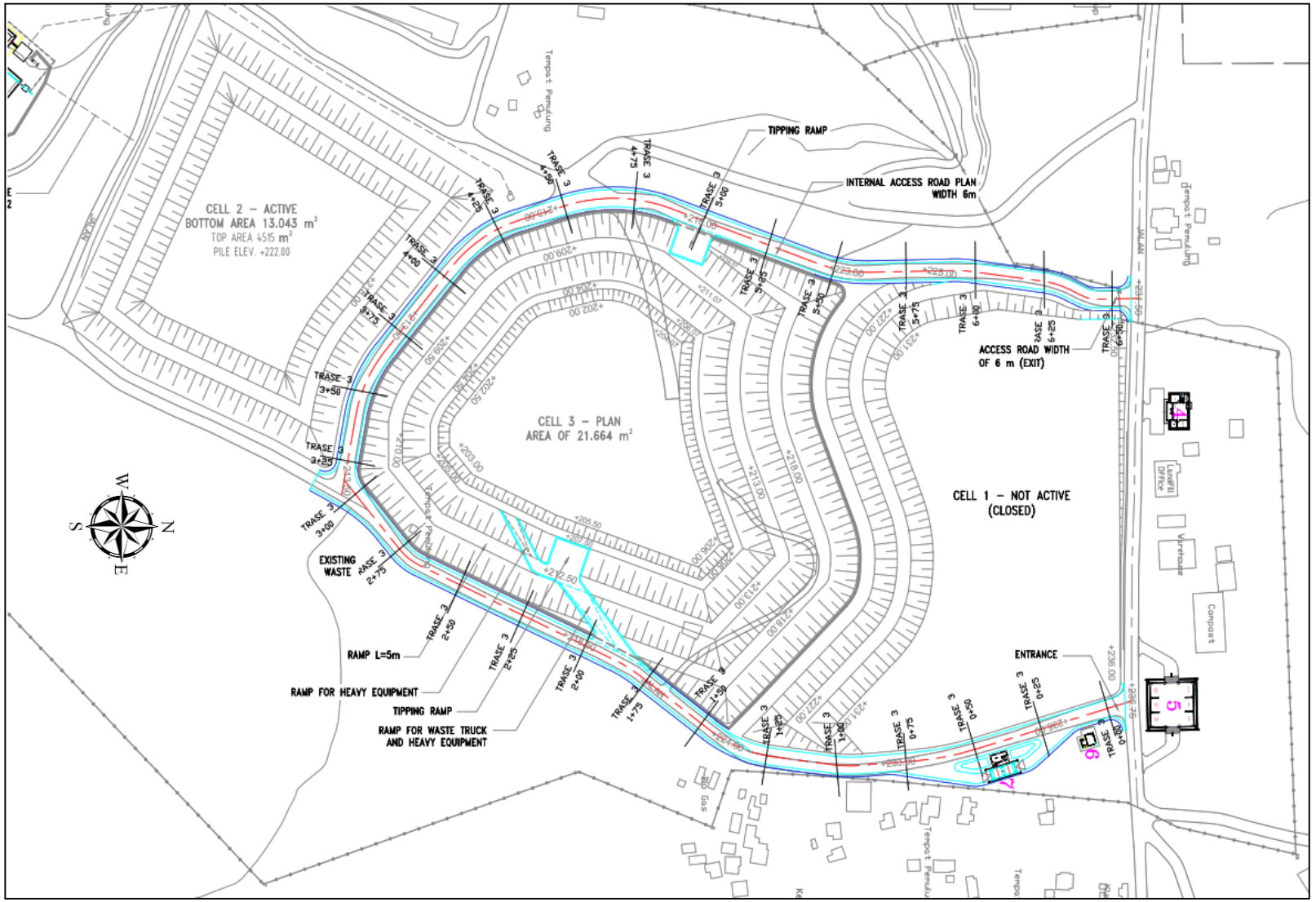




VIII. INTERNAL ACCESS ROAD

▶ LAYOUT

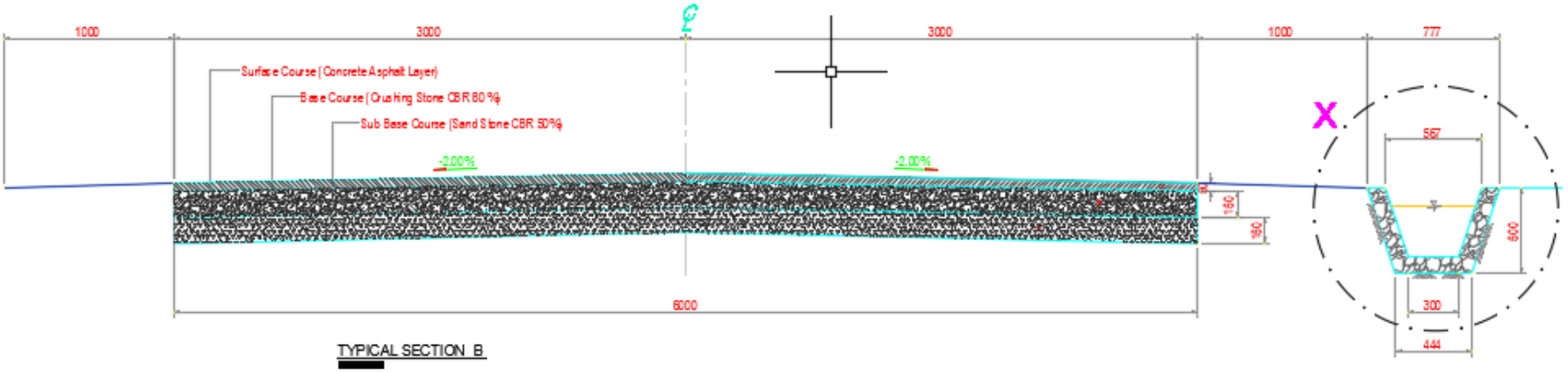
Length : 1.120 m
Width : 6 m
Type : Asphalt



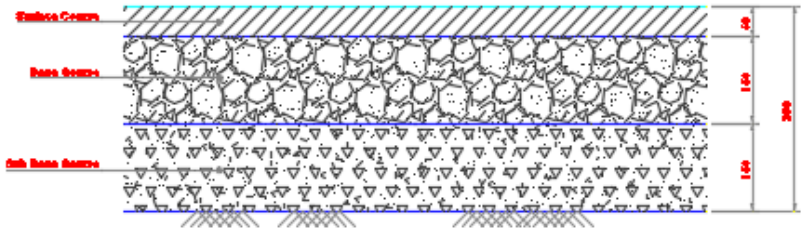
CONTINUED ...

VIII. INTERNAL ACCESS ROAD

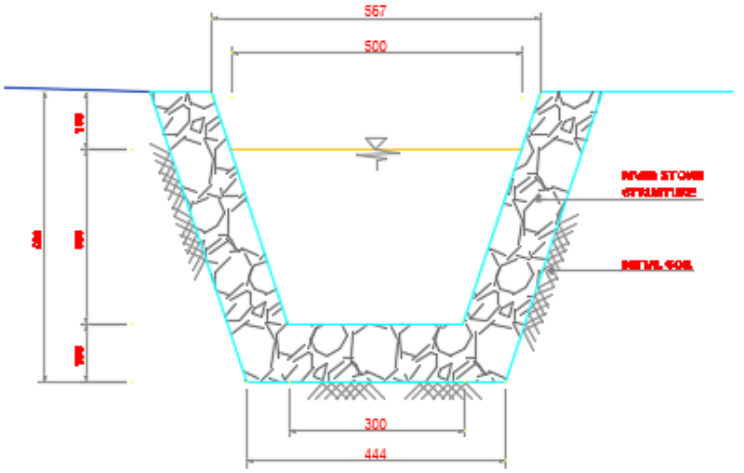
▶ CROSS CUT



TYPICAL SECTION B



TYPICAL SECTION DETAIL



DETAIL X

IX. PERIMETER FENCE AND BUFFER ZONE

▶ PERIMETER FENCE

- Length of barbed wire: 2.262 m.

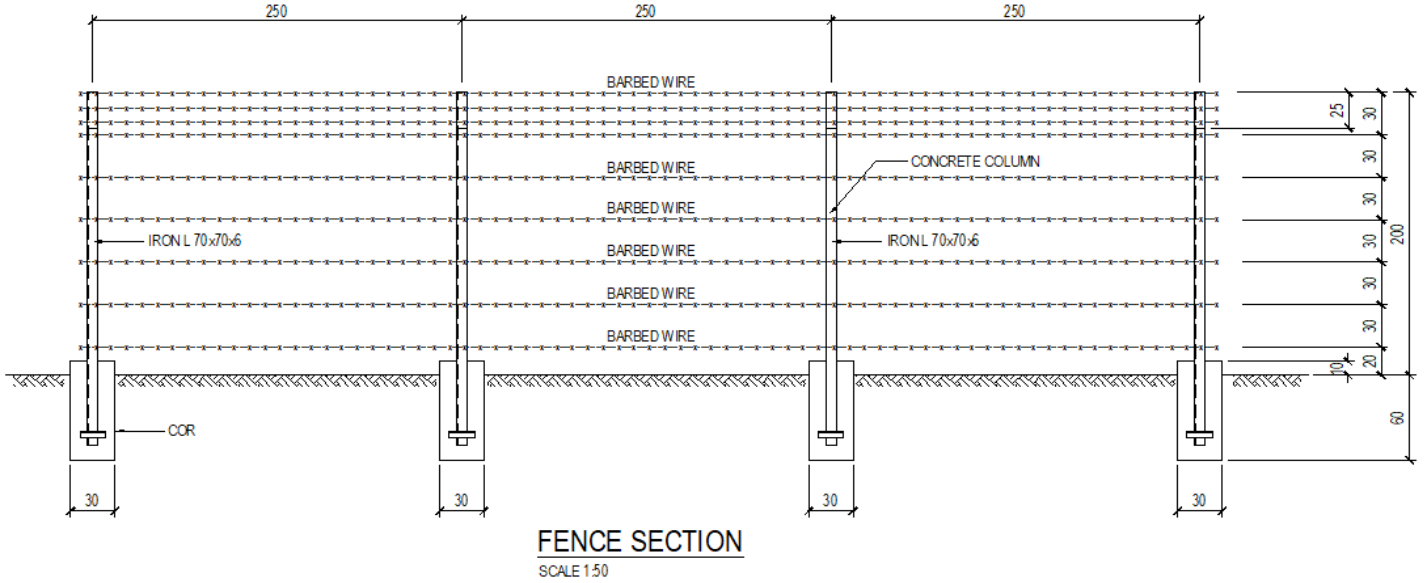
▶ BUFFER ZONE

Buffer zone planting:

- Japanese Bamboo (*Pseudosasa japonica)*;
- Manohara Tree.



Manohara Tree



FENCE SECTION

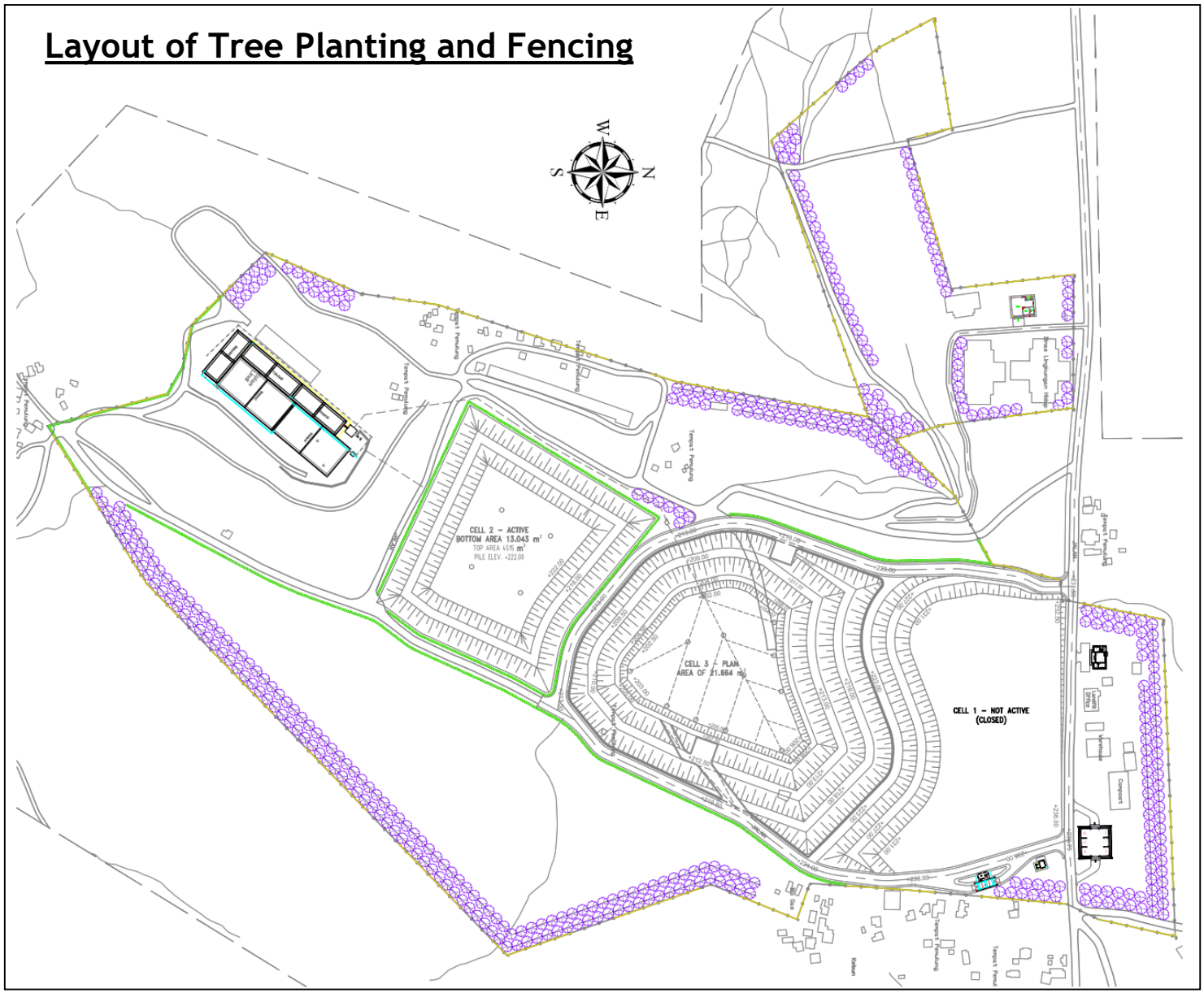
SCALE 1:50



Pseudosasa japonica

CONTINUED ...

IX. PERIMETER FENCE AND BUFFER ZONE



Manohara Tree

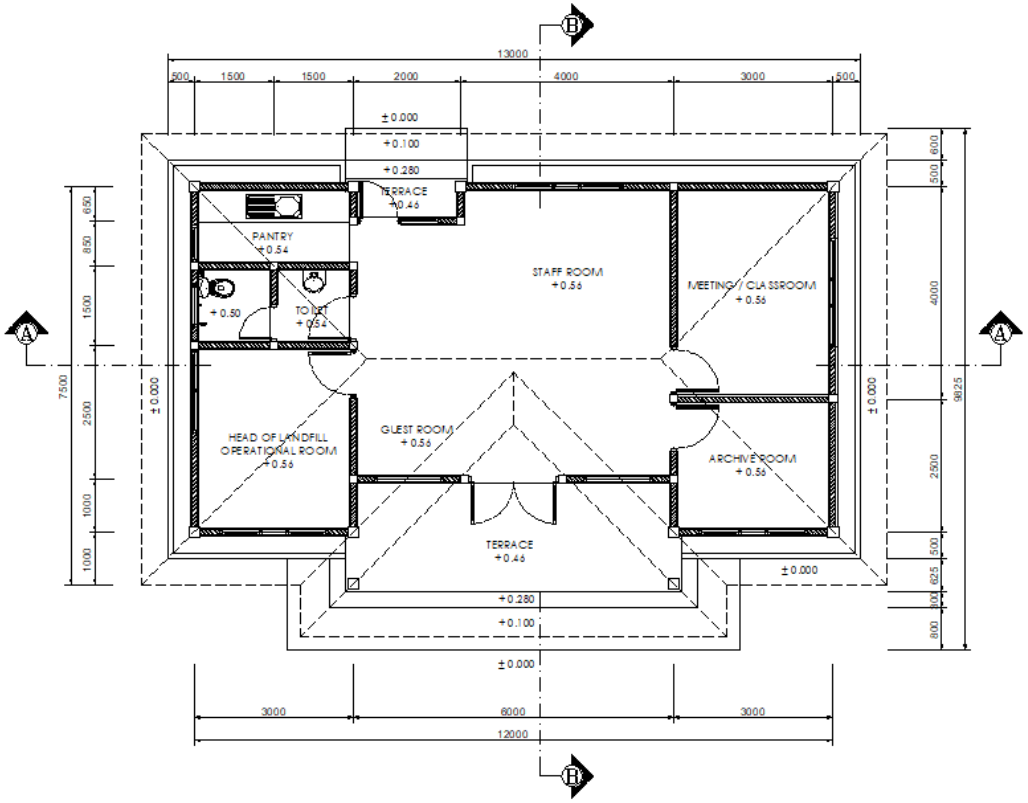
Pseudosasa japonica

Fence

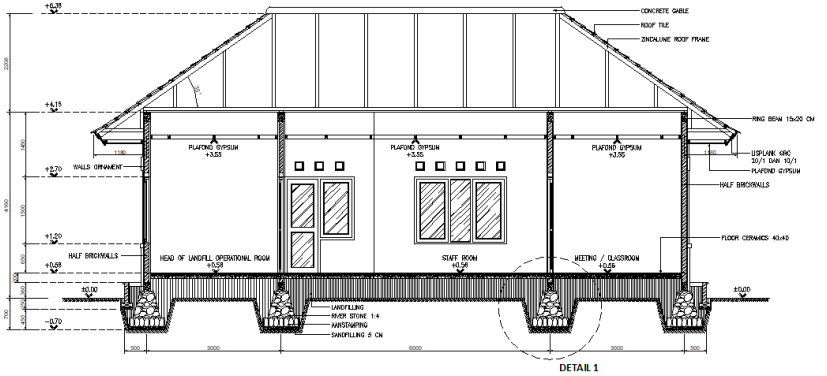
X. OPERATIONAL OFFICE

▶ OPERATIONAL OFFICE

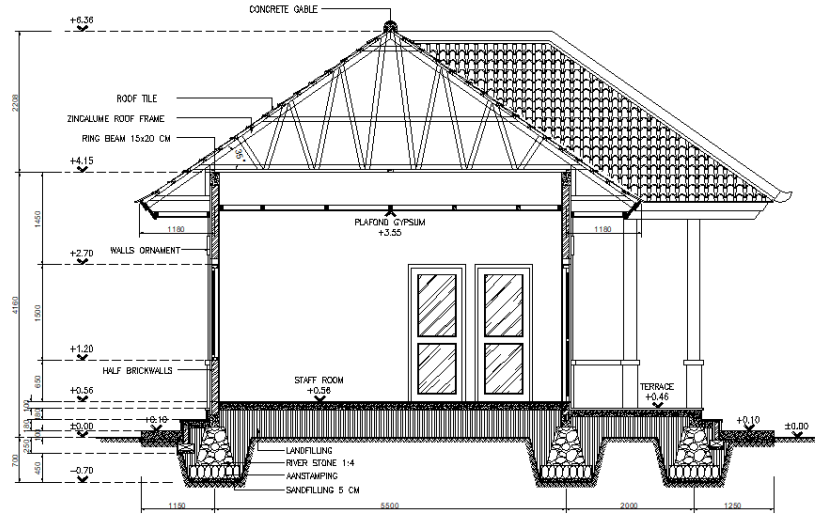
Length : 13 m
Width : 10 m
Height : ± 4,5 m
Area : 128 m2



OPERATIONAL OFFICE FLOOR PLAN
SKALA 1 : 75



SECTION A-A
SCALE 1 : 75

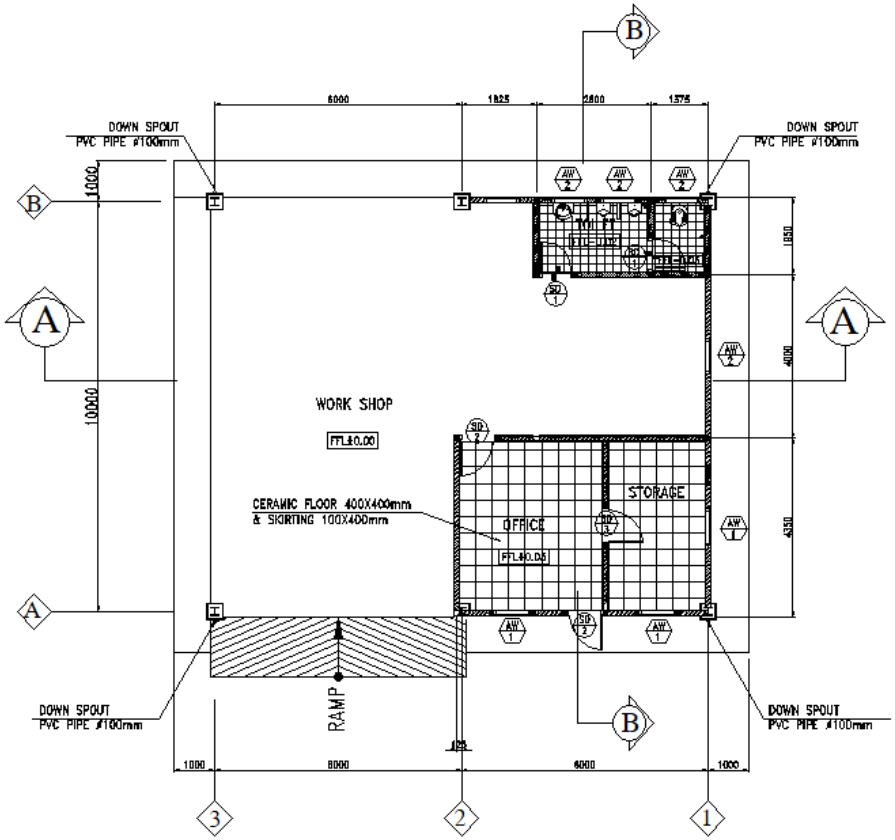


SECTION B-B
SCALE 1 : 75

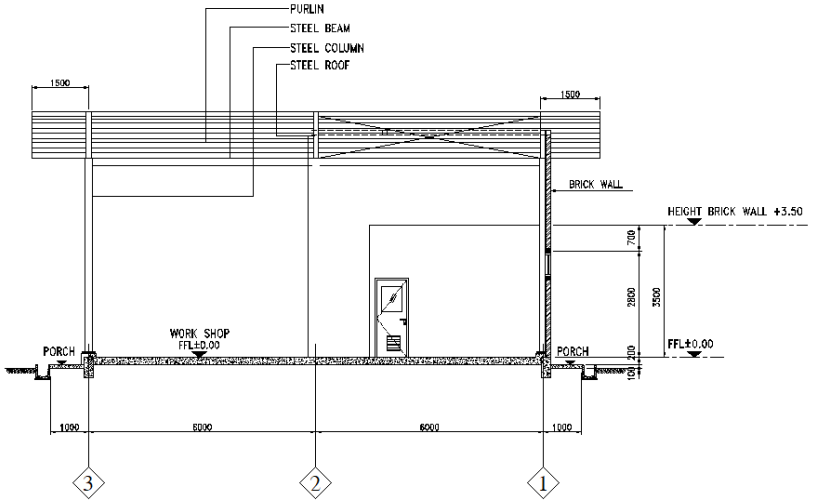
XI. MECHANICAL WORKSHOP

▶ MECHANICAL WORKSHOP

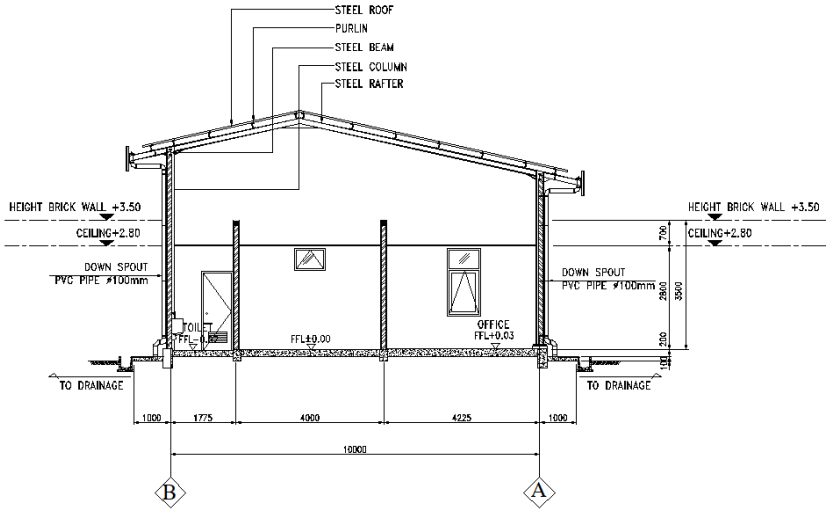
Length : 12 m
Width : 10 m
Height : ± 5 m
Area : 120 m2



PLAN VIEW
SCALE 1:75



SECTION A - A
SCALE 1:75

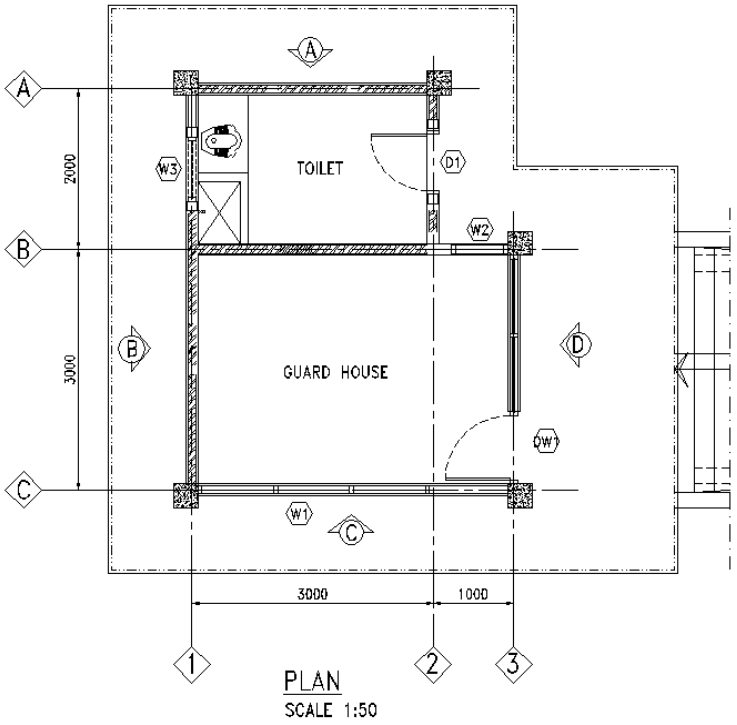


SECTION B - B
SCALE 1:75

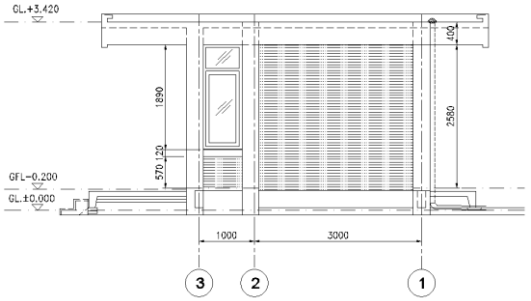
XII. SECURITY POST

▶ SECURITY POST

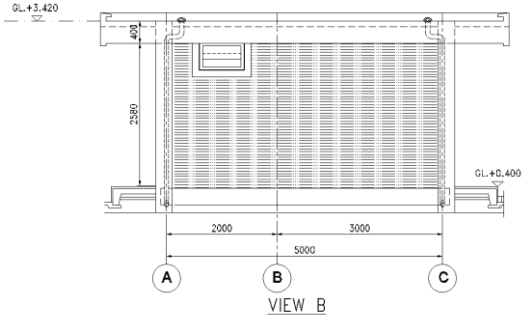
Length : 5 m
Width : 4 m
Height : ± 3 m
Area : 18 m2



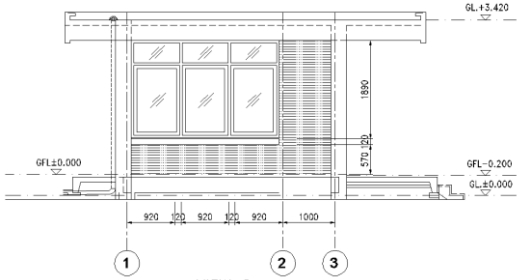
PLAN
SCALE 1:50



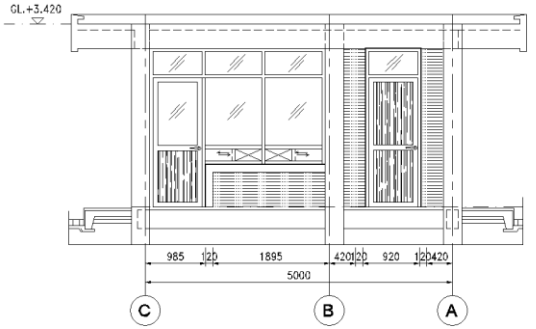
VIEW A
SCALE 1:50



VIEW B
SCALE 1:50



VIEW C
SCALE 1:50

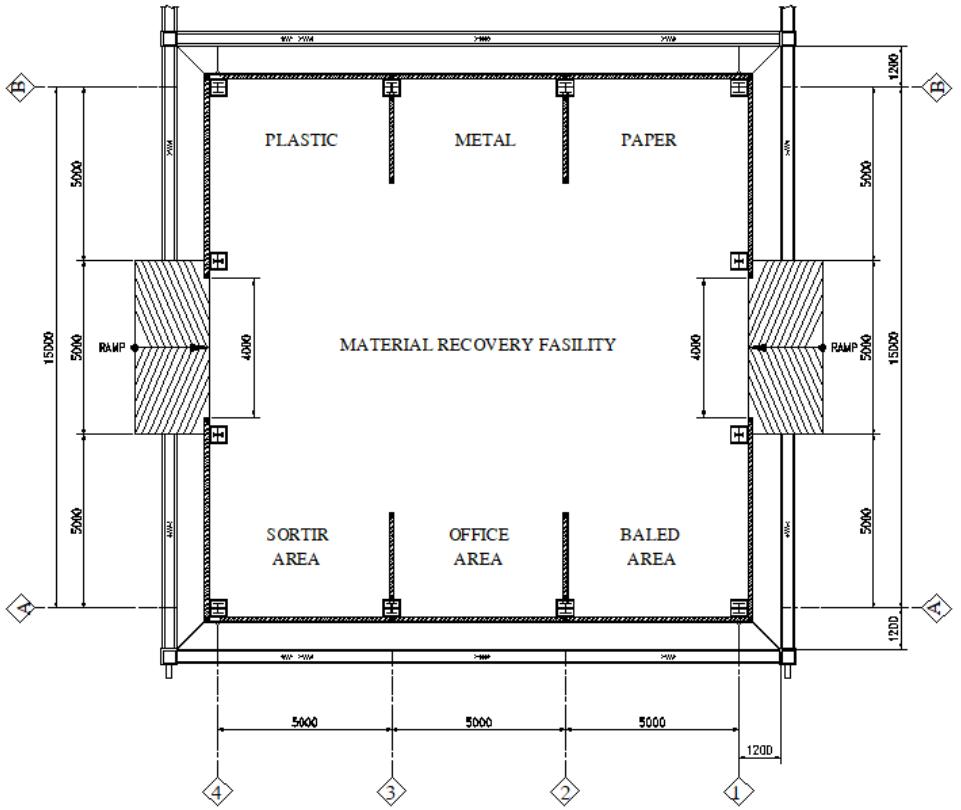


VIEW D
SCALE 1:50

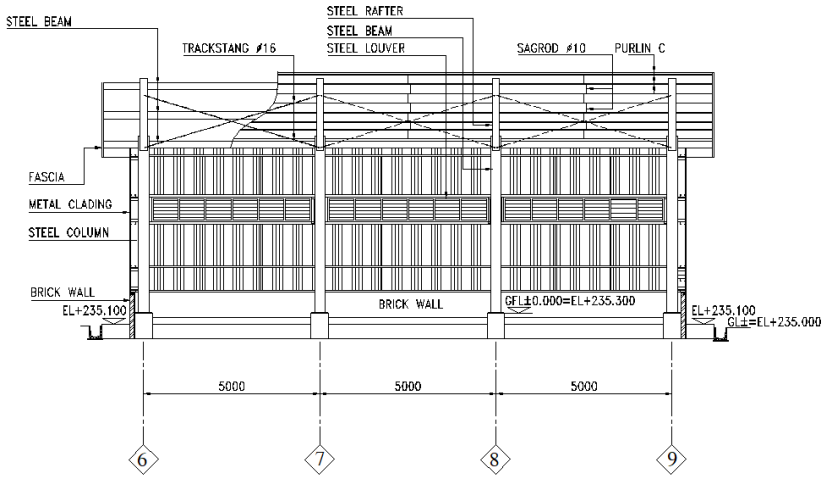
XIII. MATERIAL RECOVERY FACILITY

▶ MATERIAL RECOVERY FACILITY

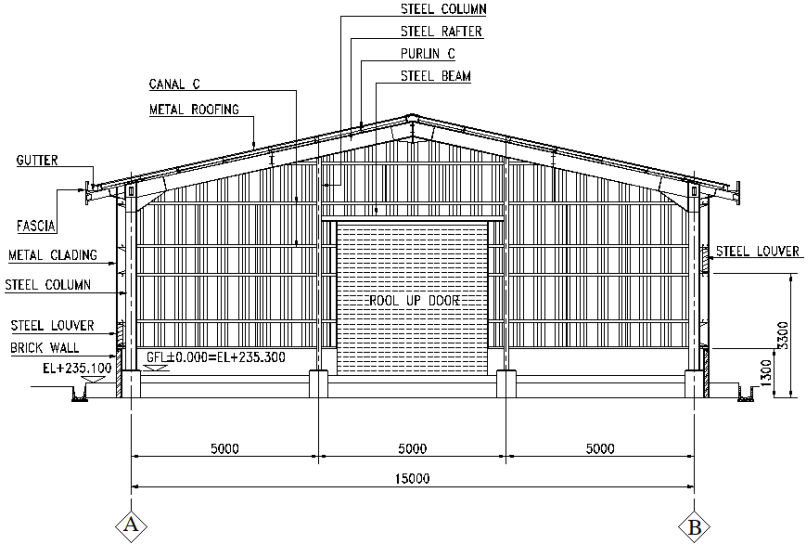
Length : 15 m
Width : 15 m
Height : ± 7 m
Area : 225 m2



PLAN VIEW
SCALE 1:100



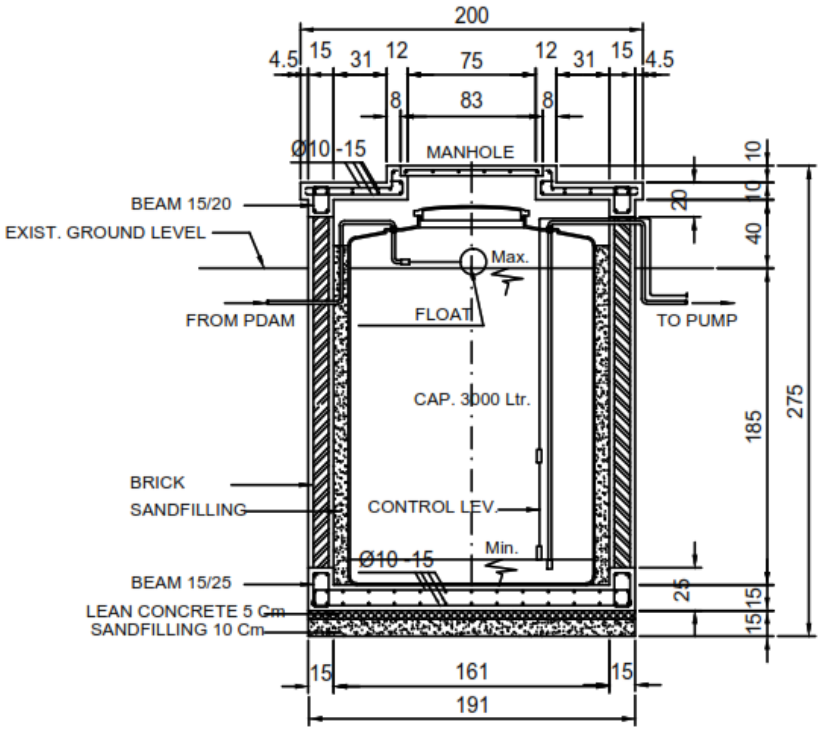
SECTION A-A
SCALE 1:100

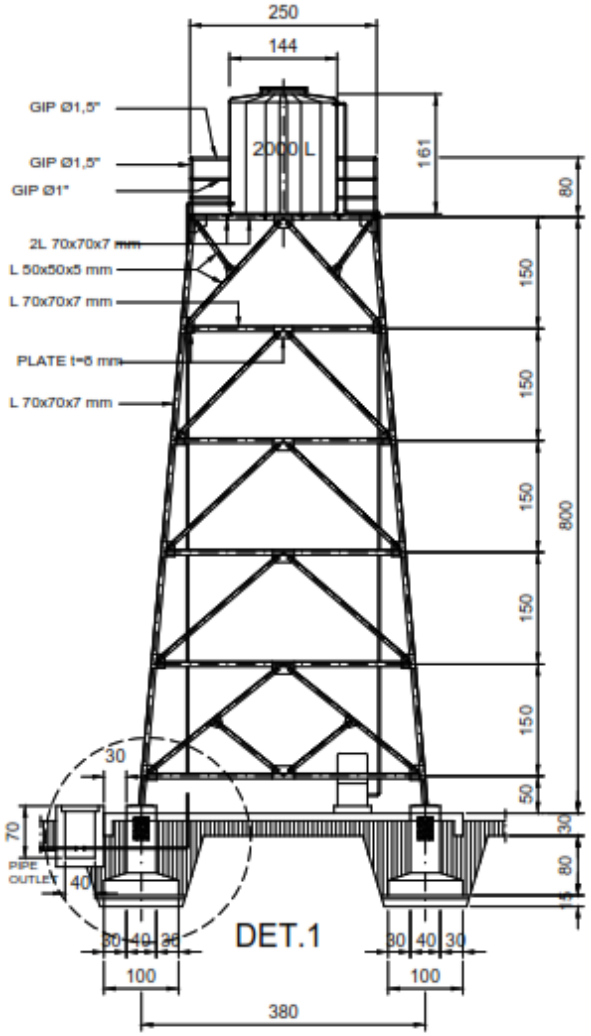


SECTION B-B
SCALE 1:100

XIV. WATER SUPPLY SYSTEM 2000 L

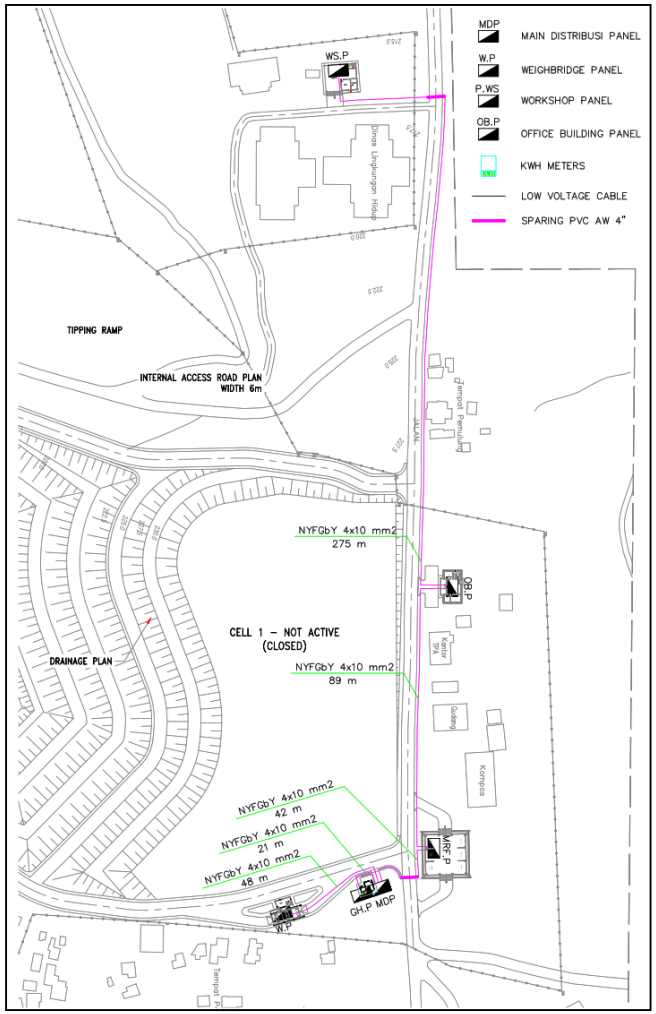
- Height of water tower: 8 m.
- Volume of water tower tank: 2000 L.
- Volume of underground water tank: 3000 L.
- Connection to PDAM water supply network for mechanical workshop.

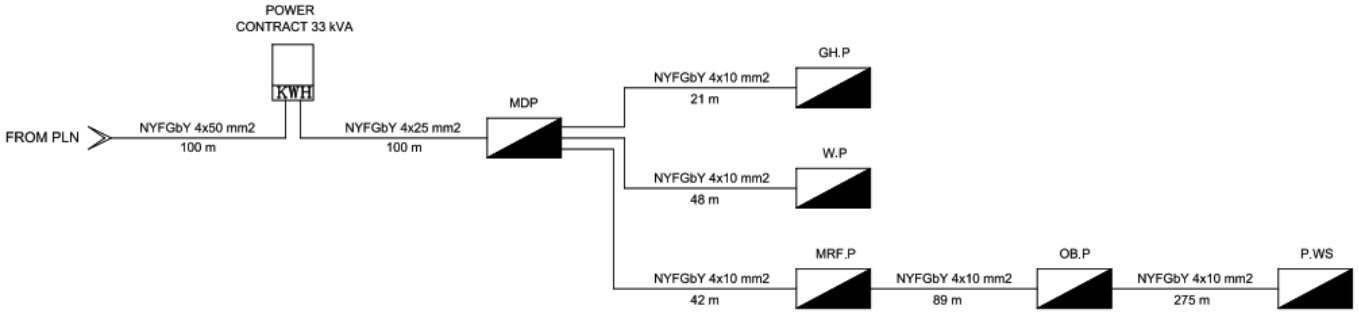


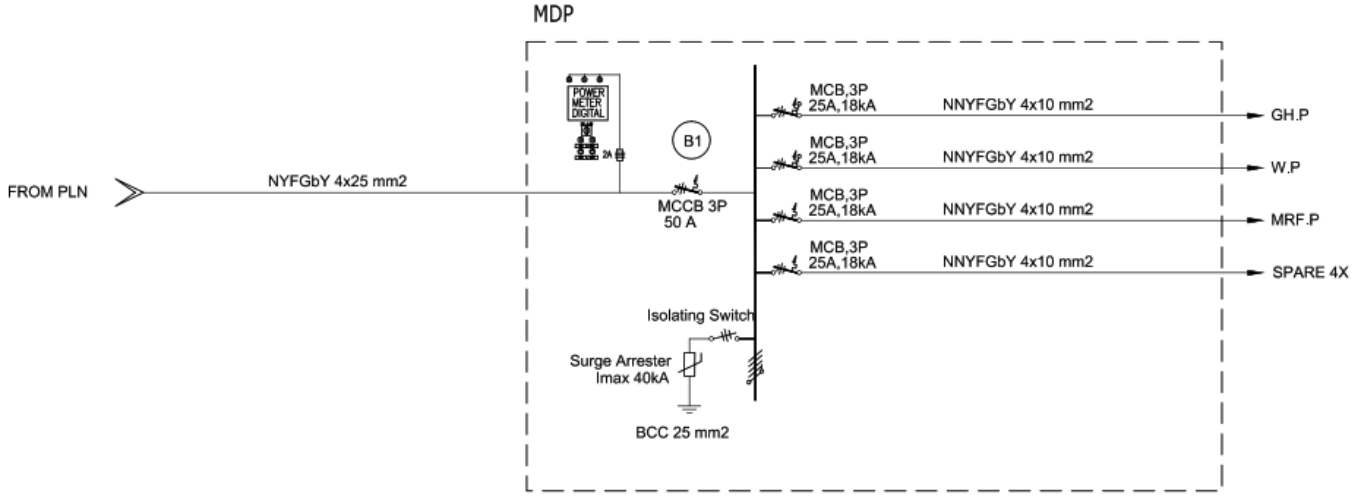


XV. GENERAL ELECTRICAL

▶ LAYOUT OF ELECTRICAL NETWORK AND SCHEMATIC OF LOW VOLTAGE NETWORK



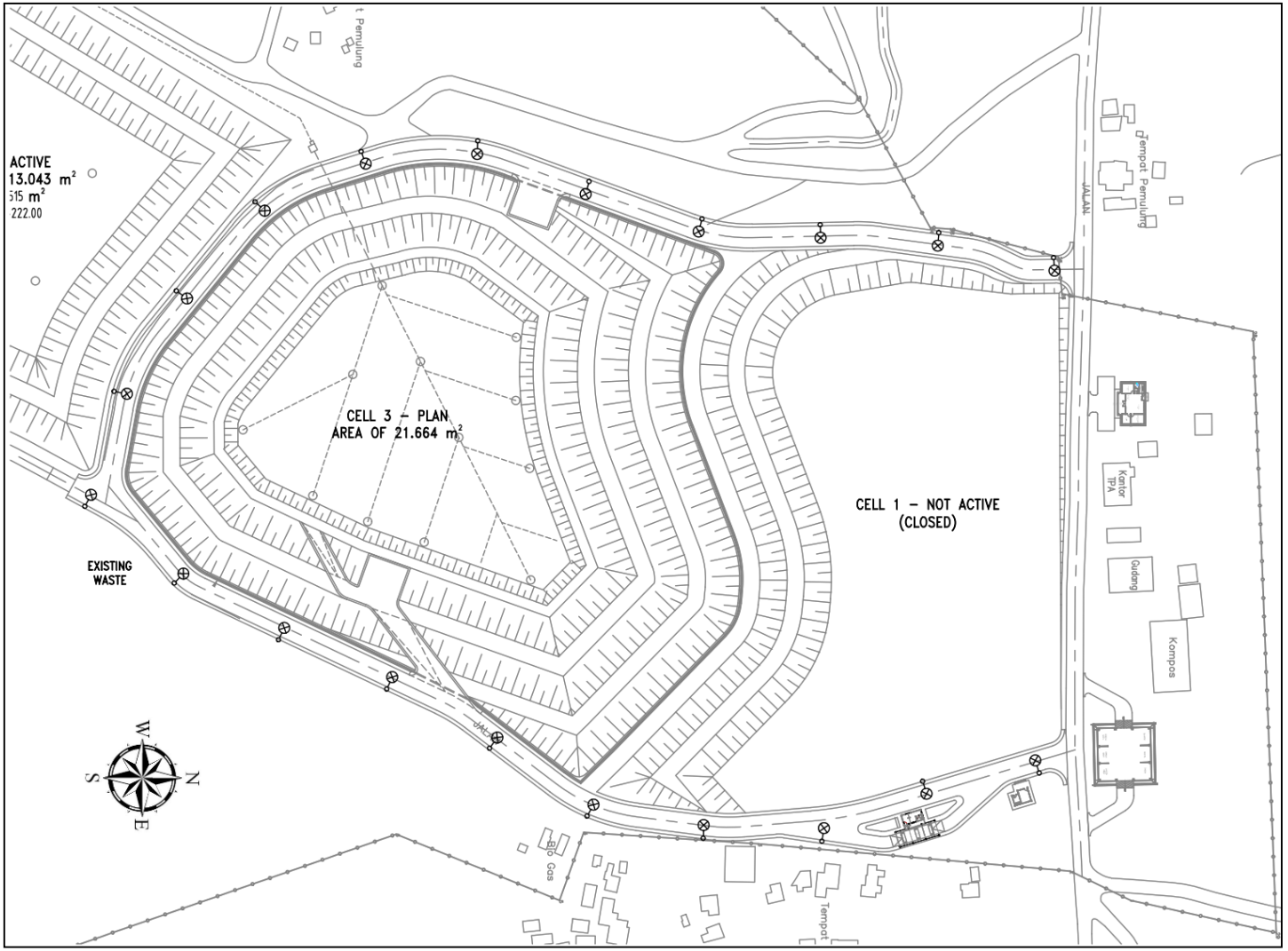


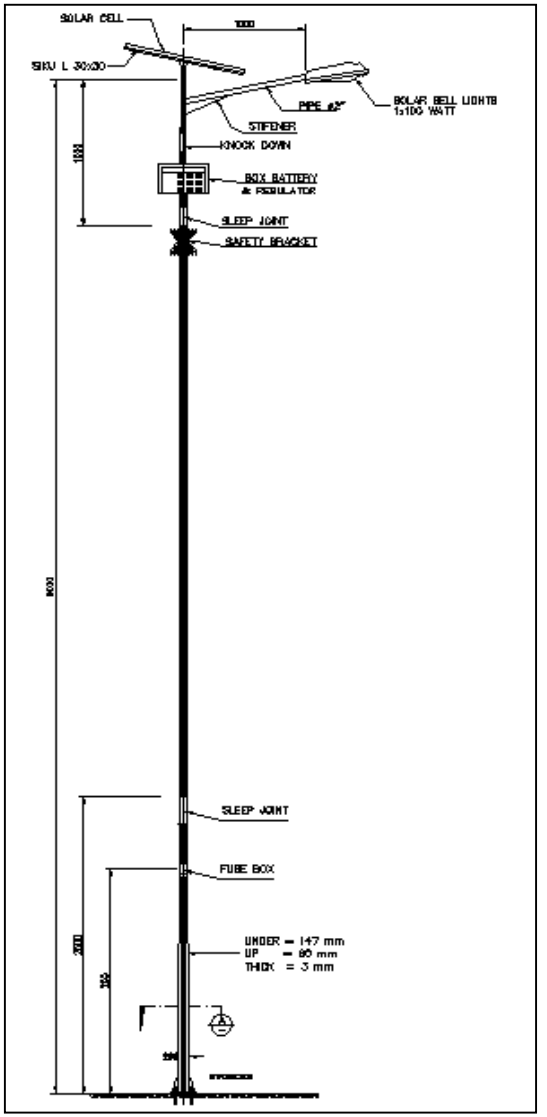


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XV. GENERAL ELECTRICAL

▶ LAYOUT DAN DETAIL OF STREET LIGHTING

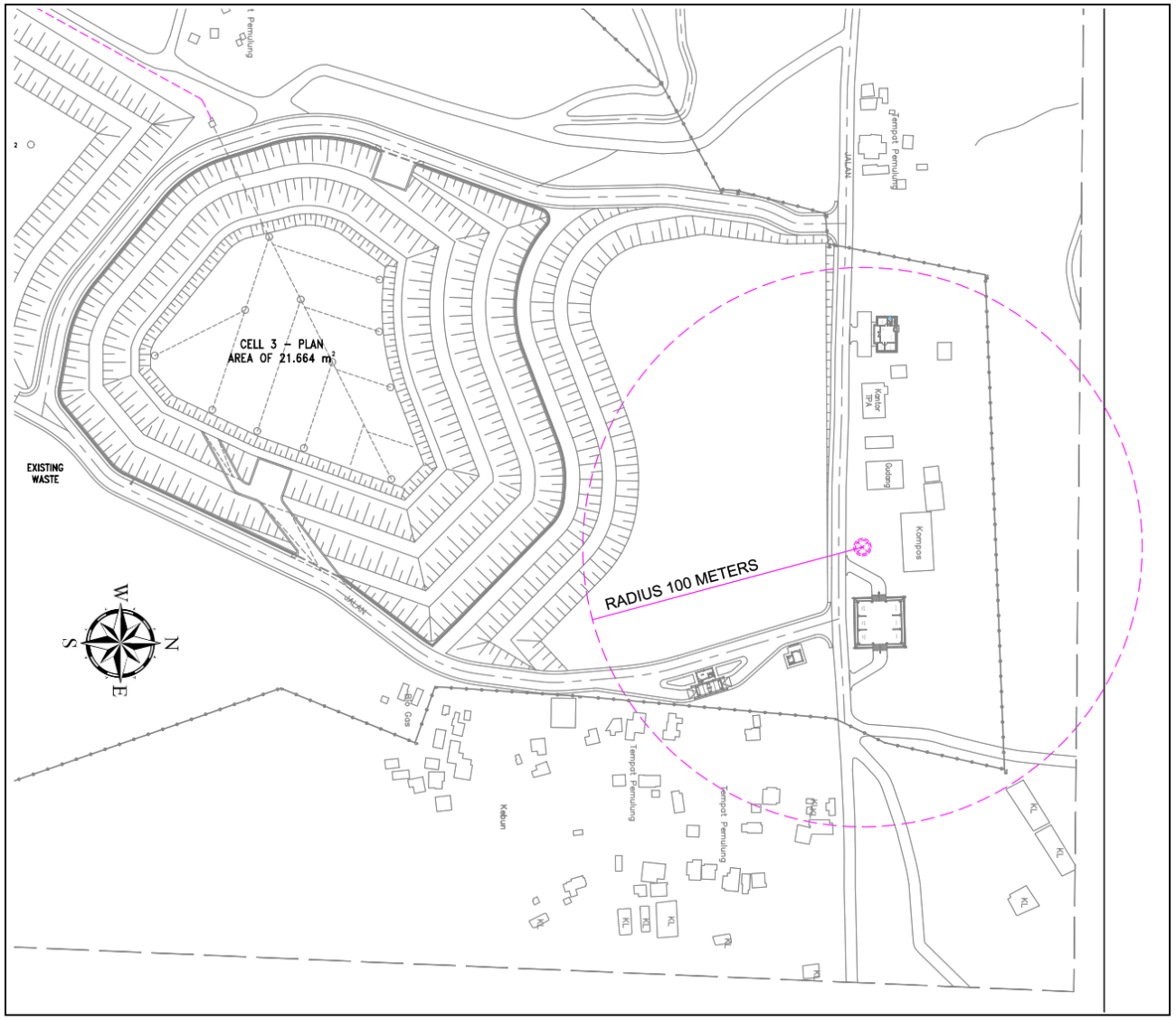


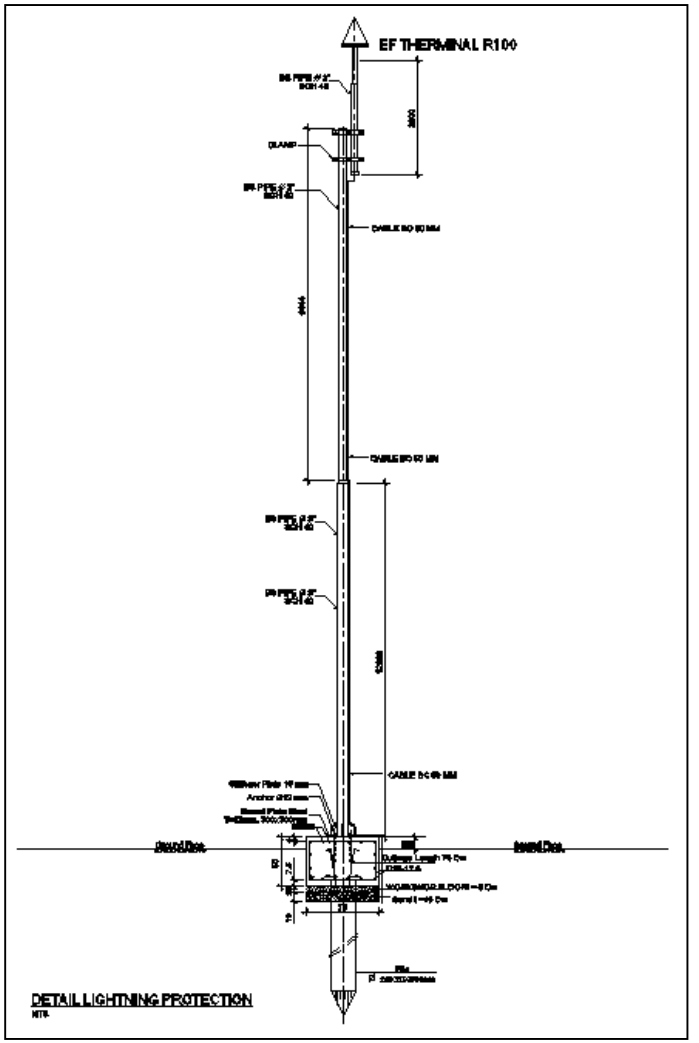


CONTINUED ...

XV. GENERAL ELECTRICAL

▶ LAYOUT DAN DETAIL OF LIGHTNING ROD





XVI. POWER UPGRADE

▶ ELECTRICAL POWER REQUIREMENT

No.	Load Name	Panel	Power (KVA)	Connected load		Operation					
				Qty	Total Power (kVA)	Load factor	Total Power (kVA)	Continue (C)		Intermitten (I)	
								Qty	Total Power (kVA)	Qty	Total Power (kVA)
	ITEM ELEKTRIKAL										
1	Operational Office	P.BK	11,71	1	11,71	0,80	9,37	0,6	5,62	0,4	3,75
2	Guard House	P.GH	2,94	1	2,94	0,80	2,35	0,6	1,41	0,4	0,94
3	Weighbridge	P.JT	4,05	1	4,05	0,80	3,24	0,6	1,94	0,4	1,30
4	Material Recovery Fasility (MRF)	P.MRF	5,50	1	5,50	0,80	4,40	0,6	2,64	0,4	1,76
5	Mechanical Workshop	P.WS	9,56	1	9,56	0,80	7,65	0,6	4,59	0,4	3,06
						Total Daya		(kVA)	**16,21**		**10,80**
						Total power (C+I)		(kVA)	**27,01**		
						Spare	20%		**5,40**		
						Grand Total		(kVA)	**32,41**		
						Daya PLN		(kVA)	**33,00**		

CONSTRUCTION OF
KABONGA LANDFILL

LOCATION OF KABONGA LANDFILL

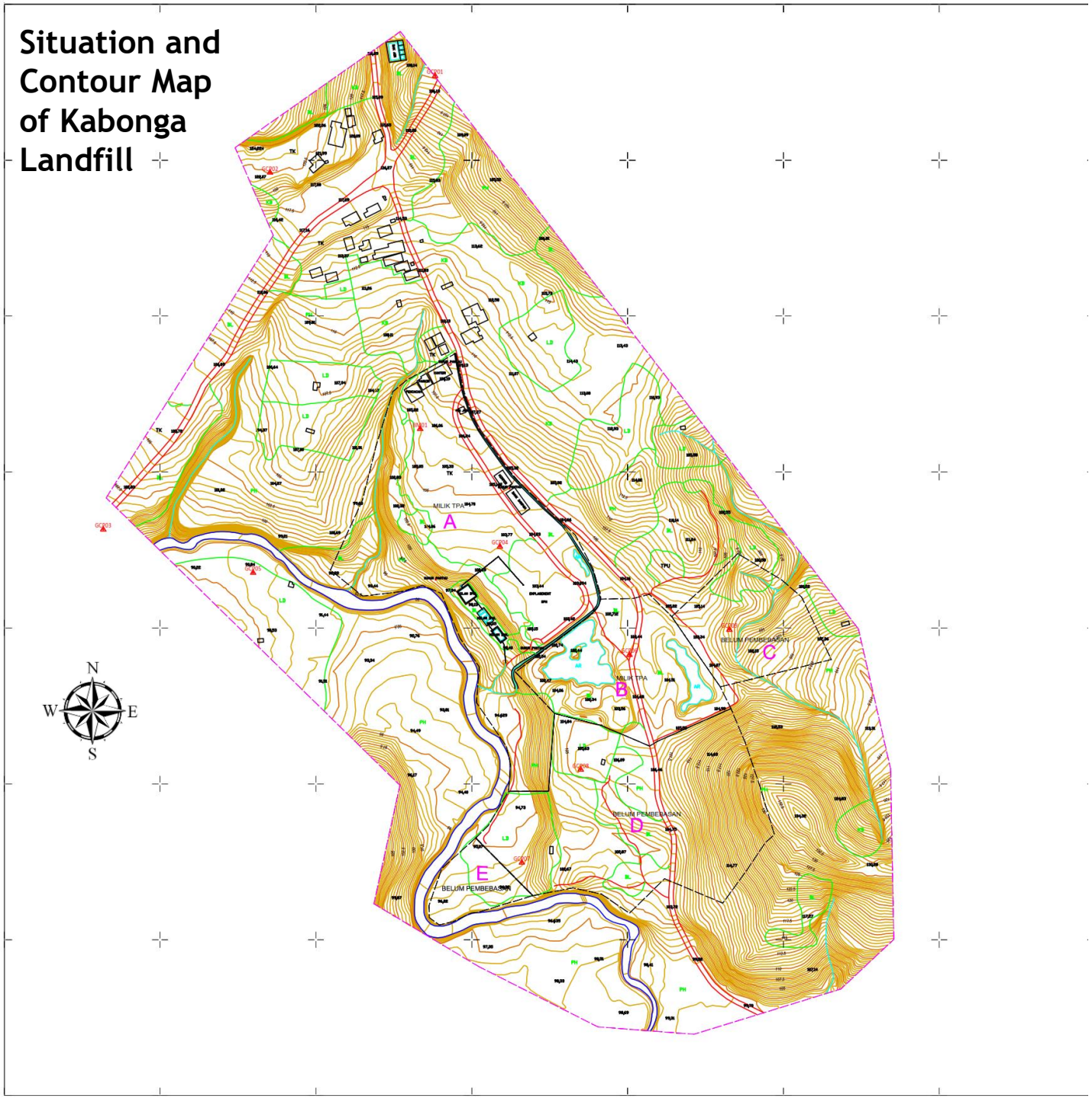


± 2 hours 55 minutes flight
Soekarno Hatta - Mutiara SIS Aljufri Airport





Situation and Contour Map of Kabonga Landfill



LEGENDA :

- Batas Pemetaan
- Batas TPA
- Jalan
- Pipa Resapan
- Sungai(a),Anak Sungai(b
- Saluran(c),Arah Sungai(
- KL — Kolam
- AR — Rawa
- Titik Kontrol Referensi
- Titik Kontrol GPS
- . 25.5 — Titik Tinggi
- 17.50 — Garis Tinggi
- Rumah / Gedung
- Batas Vegetasi
- SW — Sawah
- LD — Ladang
- TK — Tanah Kosong
- KB — Kebun
- PH — Pohon
- BL — Belukar
- TM — Taman
- TPU — Pemakaman
- SPH — Sampah
- SPA — Sampah Aktif
- SPT — Sampah Tidak Aktif

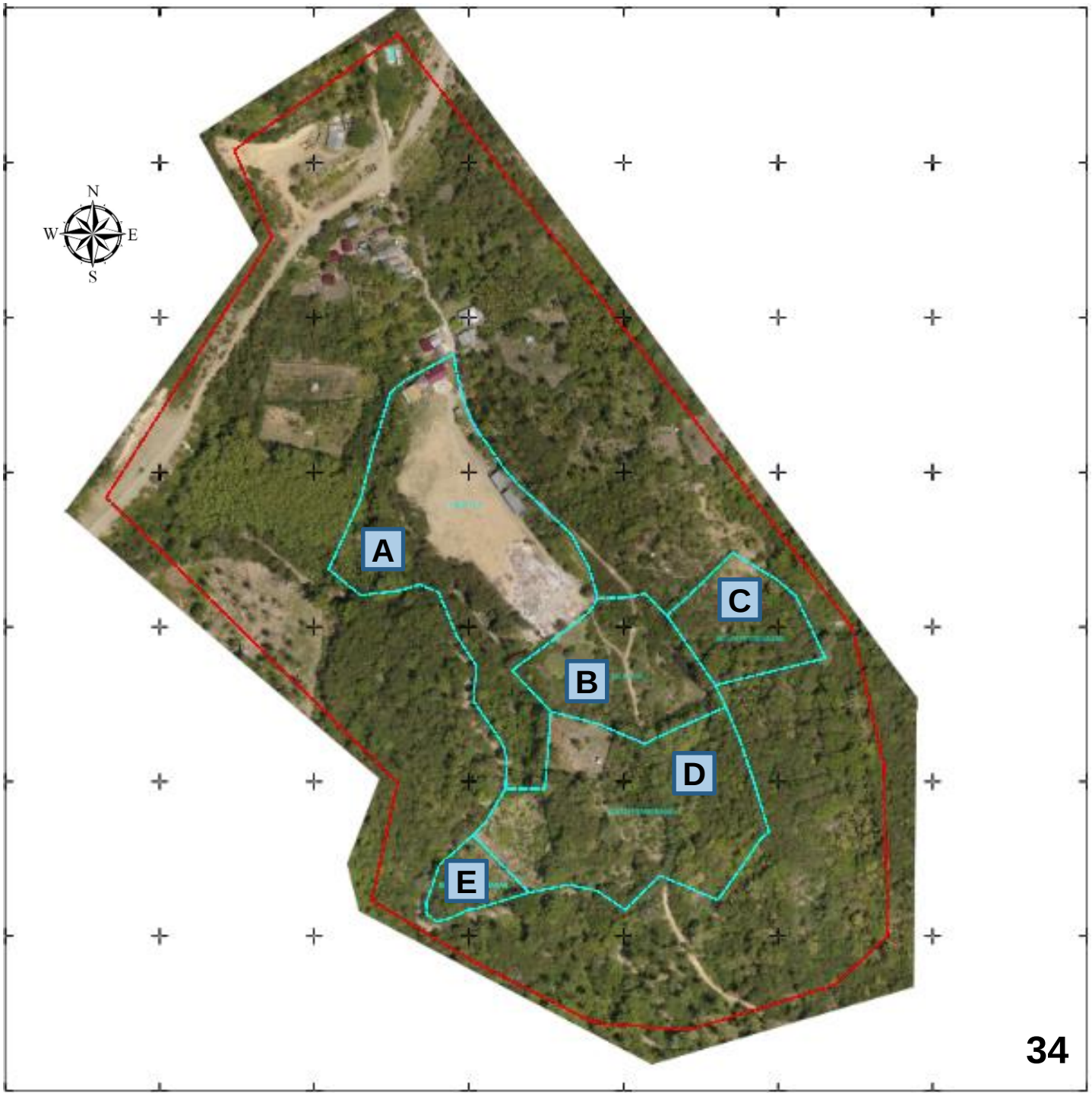
Kabonga Landfill Boundary

Will be constructed:

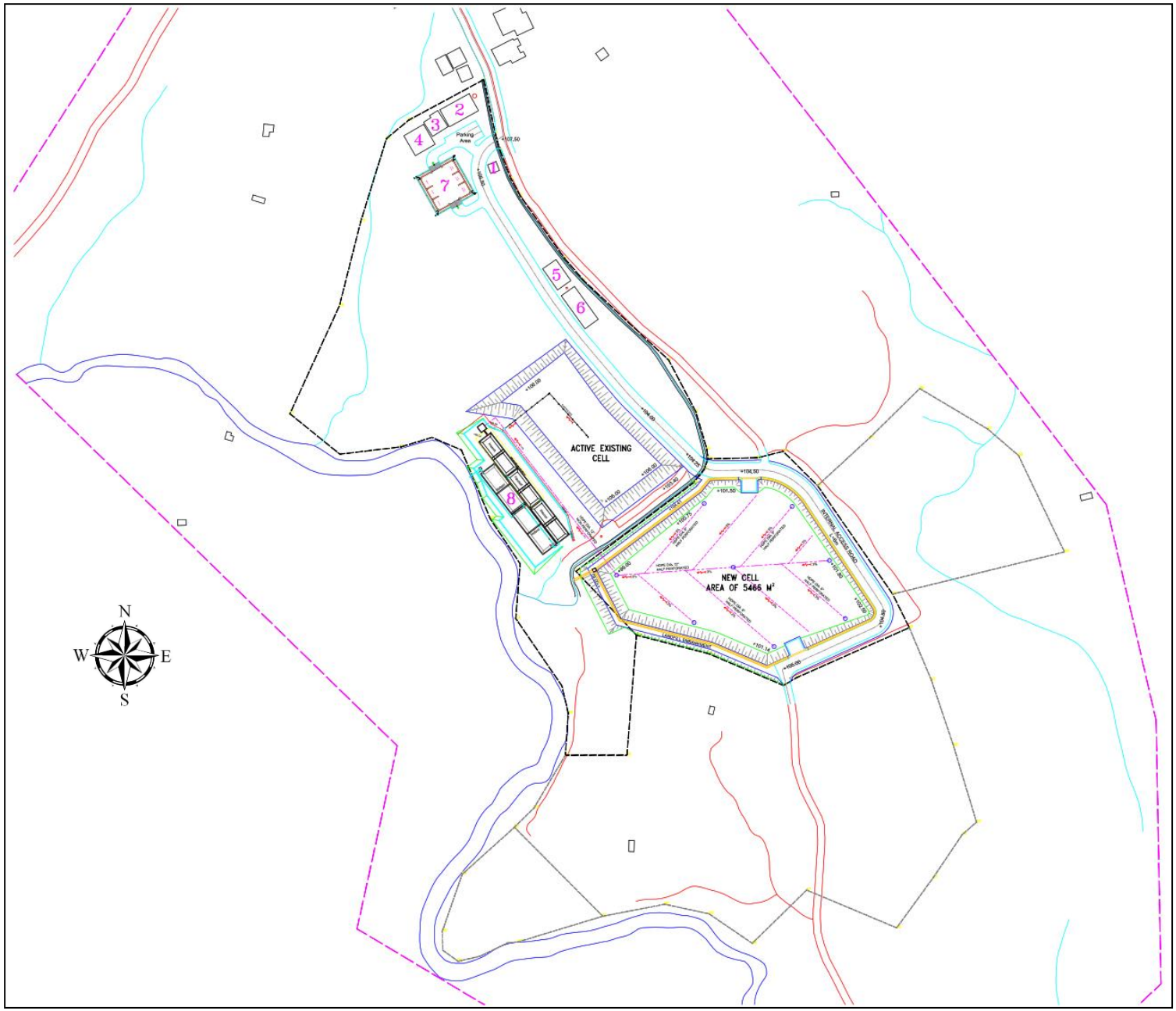
- Area A : 2,06 Ha
- Area B : 0,79 Ha

Not constructed:

- Area C : 0,51 Ha
- Area D : 1,62 Ha
- Area E : 0,20 Ha



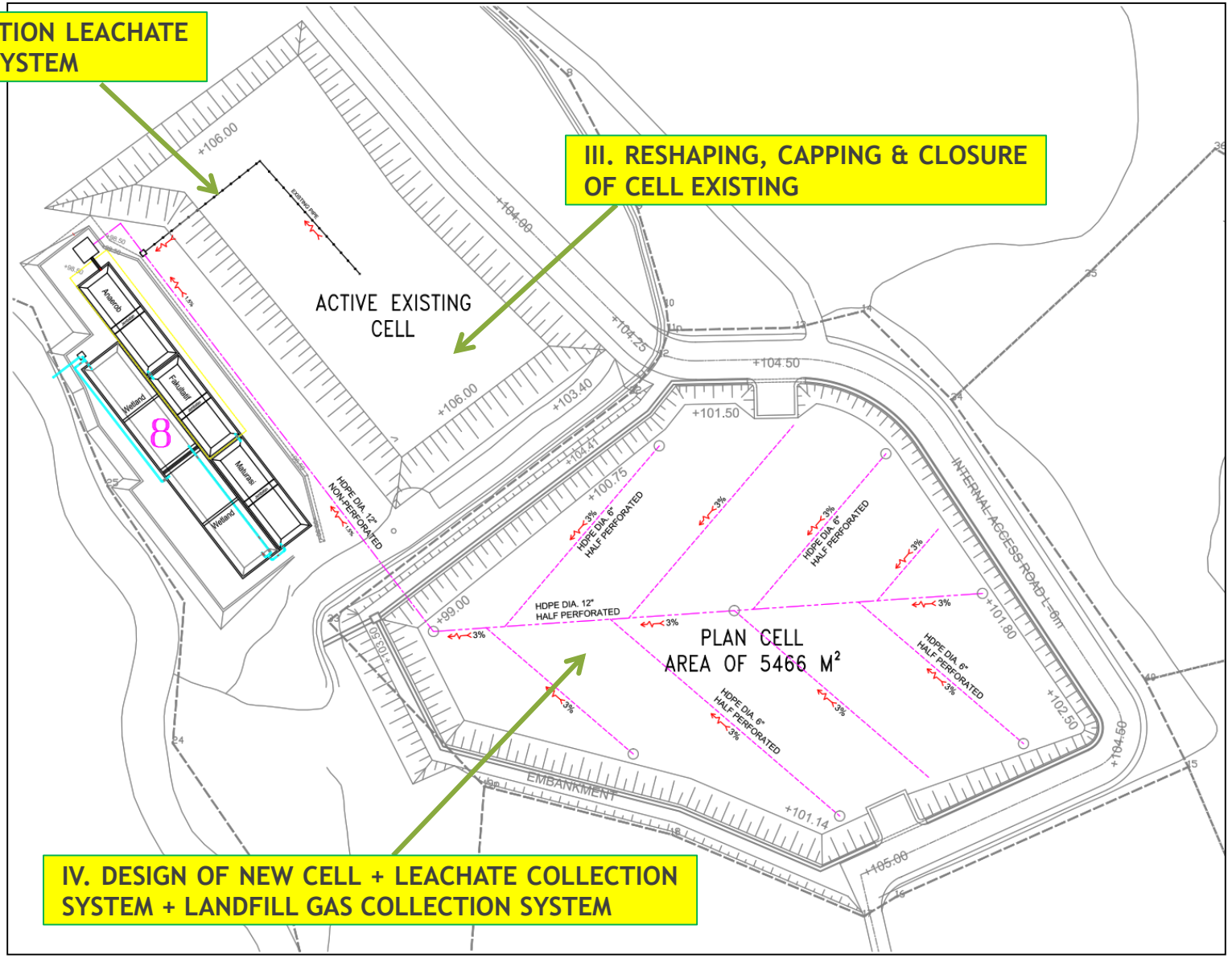
SITE PLAN OF KABONGA LANDFILL



WORK ITEM II, III AND IV

II. REHABILITATION LEACHATE COLLECTION SYSTEM

III. RESHAPING, CAPPING & CLOSURE OF CELL EXISTING



IV. DESIGN OF NEW CELL + LEACHATE COLLECTION SYSTEM + LANDFILL GAS COLLECTION SYSTEM

II. REHABILITATION LEACHATE COLLECTION SYSTEM

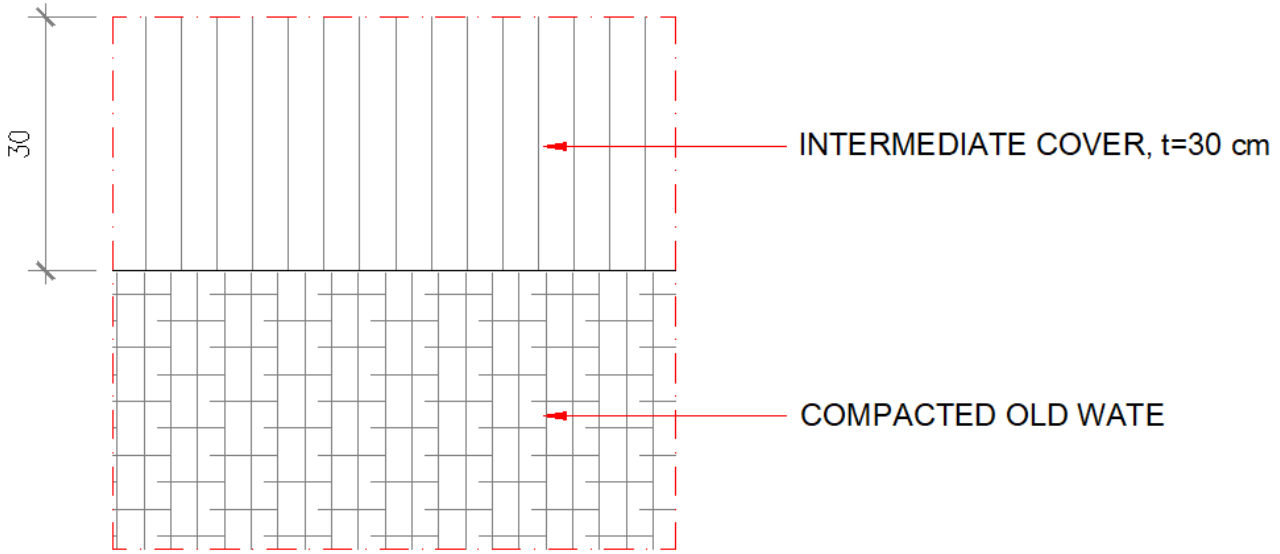
- Procurement and installation of HDPE Pipe; 8 inch.

III. RESHAPING, CAPPING & CLOSURE OF CELL EXISTING

Cover soil of existing cell, consists of:

a. Compacted old waste.

b. Intermediate cover; t = 30 cm.



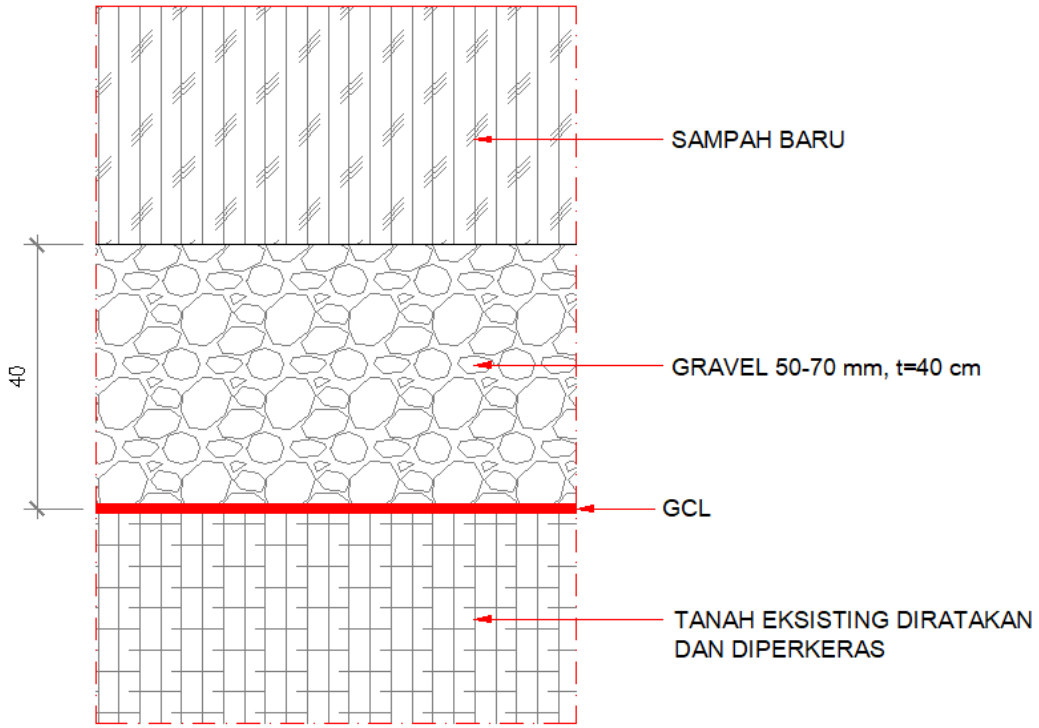
IV. DESIGN OF NEW CELL + LEACHATE COLLECTION SYSTEM + LANDFILL GAS COLLECTION SYSTEM

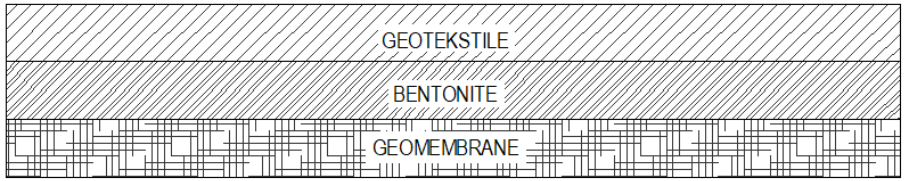
Base layer of new cell, consists of:

a. Compaction and leveling of existing land.

b. Procurement and installation of GCL (*Geosynthetic Clay Liner*).

c. Spreading gravel (50-70 cm); t = 40 cm.





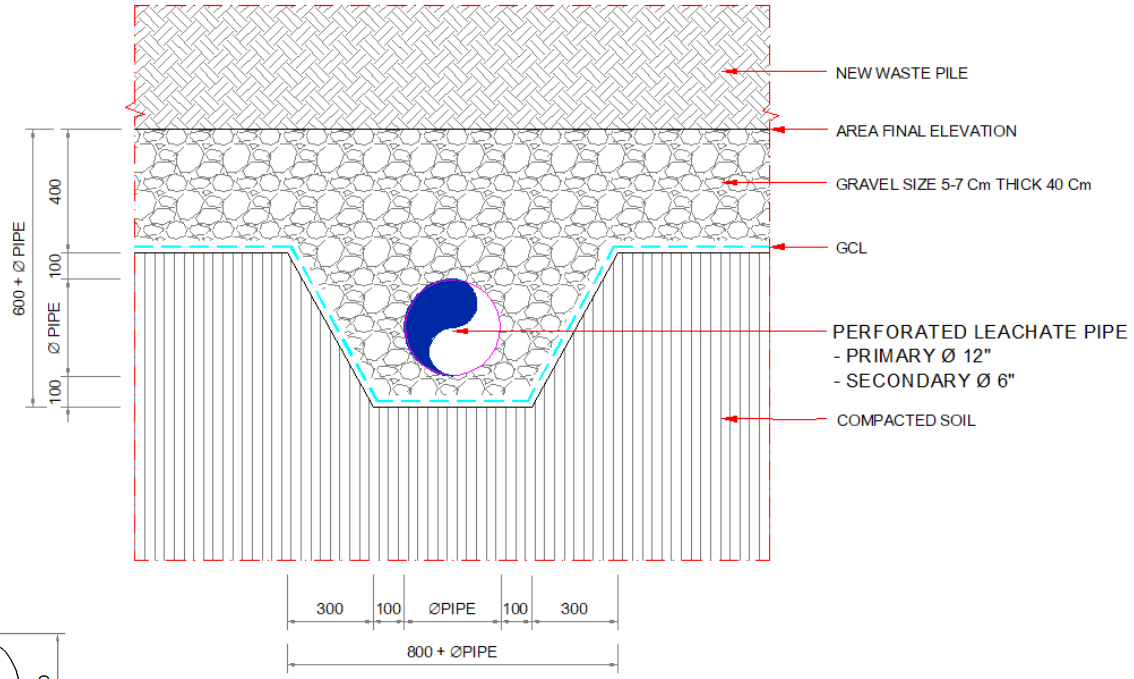
Detail of GCL

CONTINUED ...

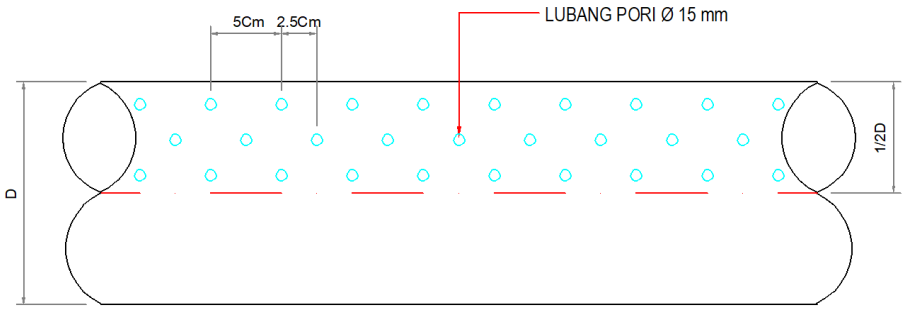
IV. DESIGN OF NEW CELL + LEACHATE COLLECTION SYSTEM + LANDFILL GAS COLLECTION SYSTEM

Installation of leachate pipe:

- Type: HDPE
- Minimum pipe strenght PN 10.
- Secondary pipe diameter: 6 inch
- Primary pipe diameter: 12 inch



DETAIL PENANAMAN PIPA LINDI
NTS



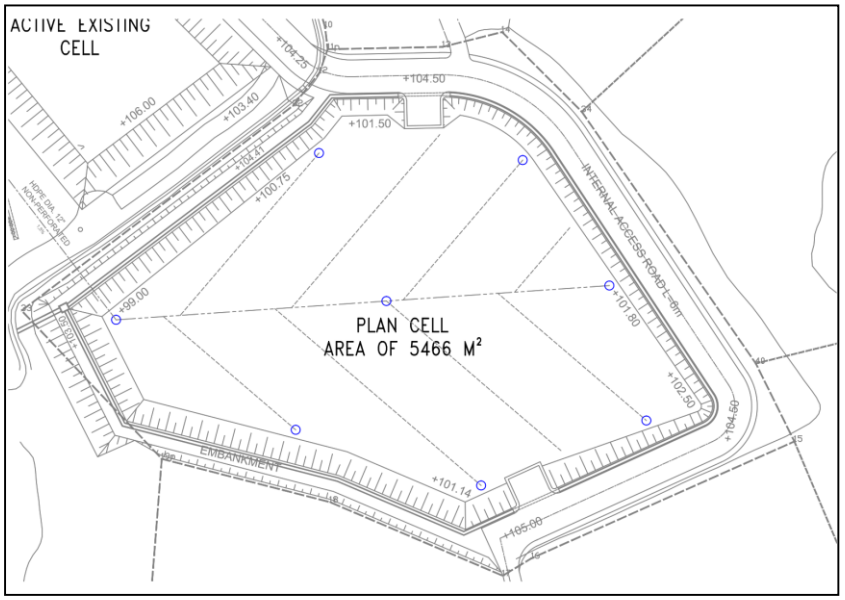
TAMPAK SAMPING PIPA LINDI BERLUBANG
NTS

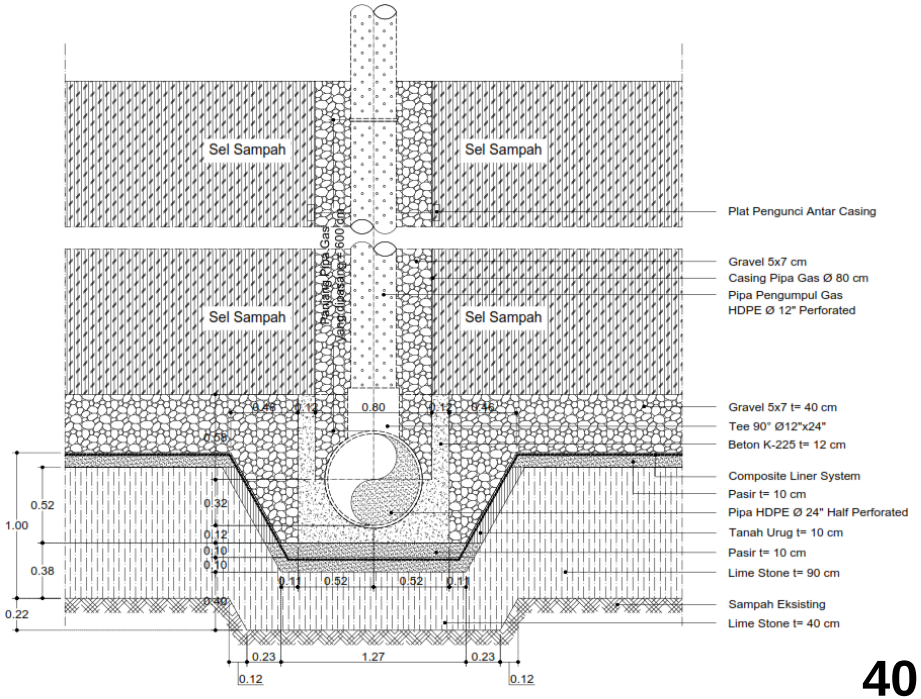
CONTINUED ...

IV. DESIGN OF NEW CELL + LEACHATE COLLECTION SYSTEM + LANDFILL GAS COLLECTION SYSTEM

Procurement and installation of vertical gas pipe on new cell:

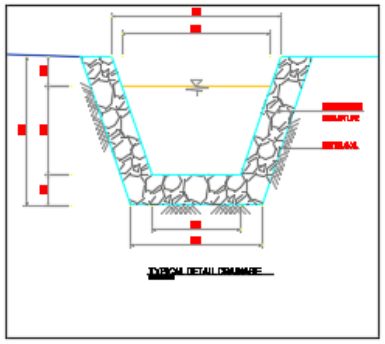
- Ventilation gas pipe connection to leachate pipe.
- Perforated HDPE pipe diameter = 12 inch and 6 inch.
- Pipe hole diameter = 50 mm.
- Thickness of plate = min 0,8 mm.
- Gas pipe casing diameter = 800 mm.
- Gravel filling between casing and pipe = diameter 50 - 70 mm.
- Pipe strength = min PN 16.

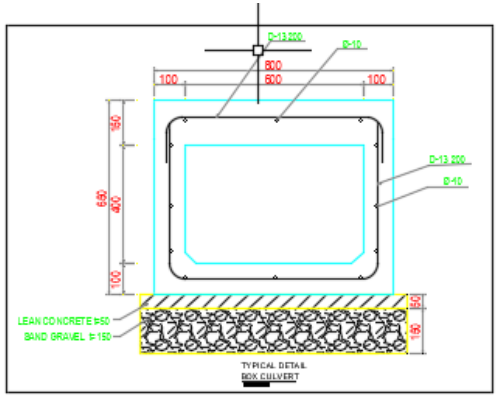


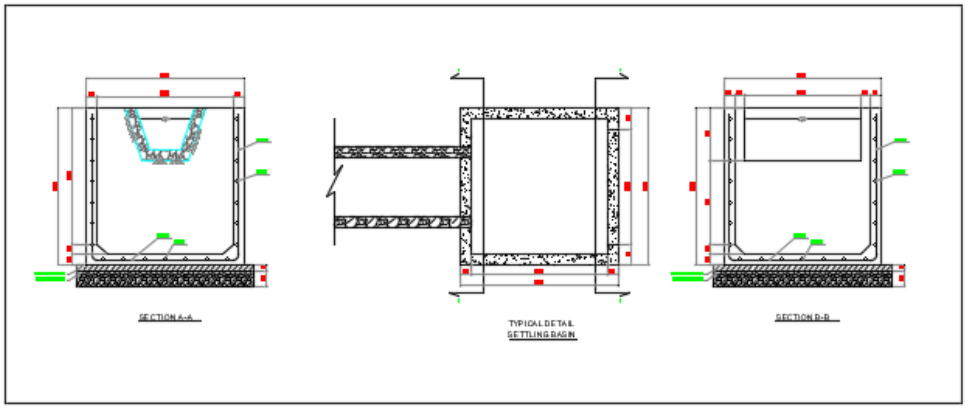


V. SITE DRAINAGE

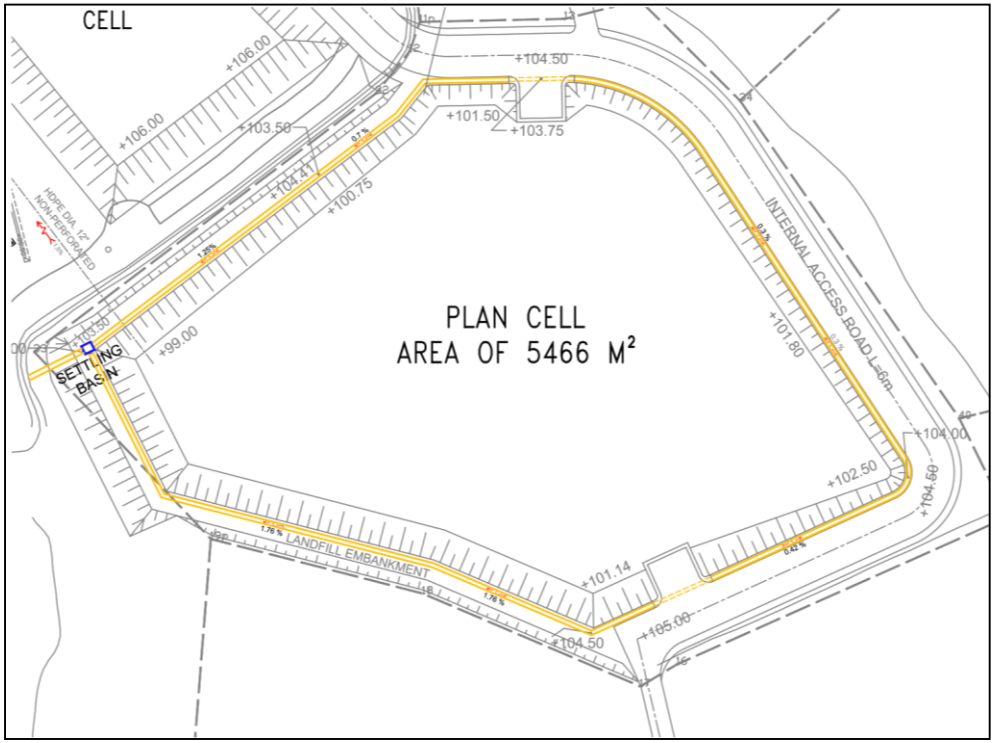
▶ LAYOUT DAN DETAIL





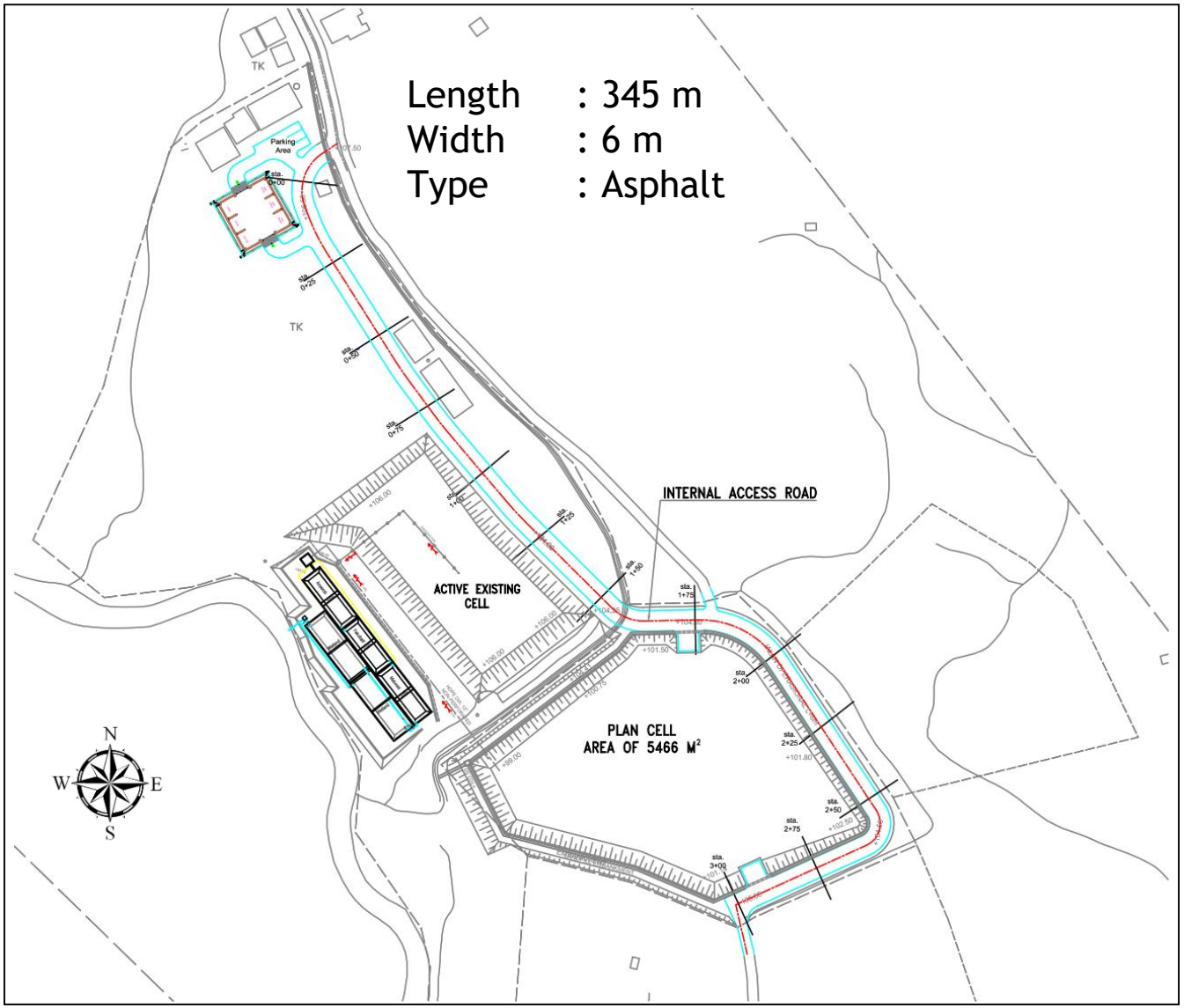


Length : 293 m
Type : River Stone



VI. INTERNAL ACCESS ROAD

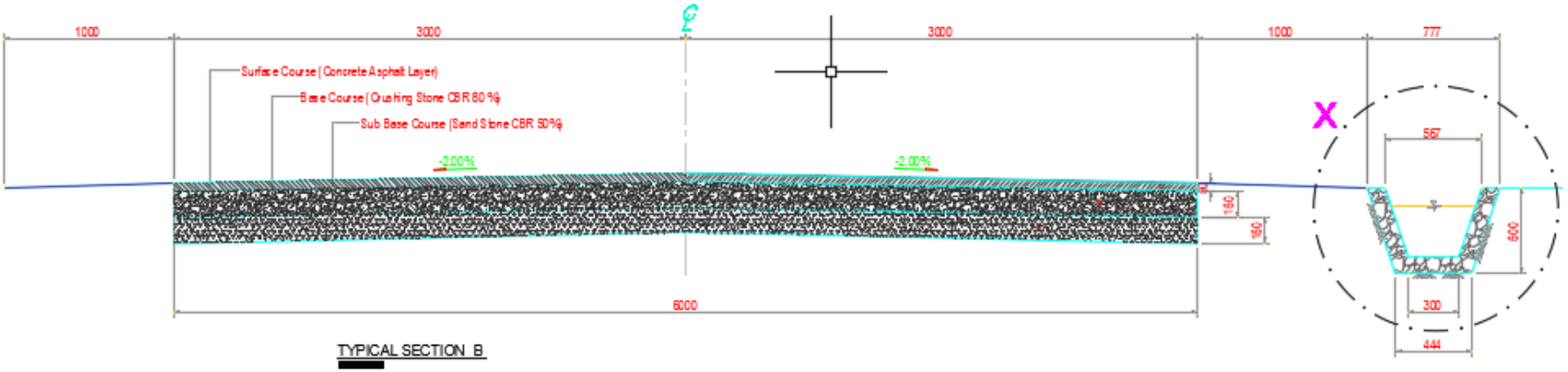
▶ LAYOUT



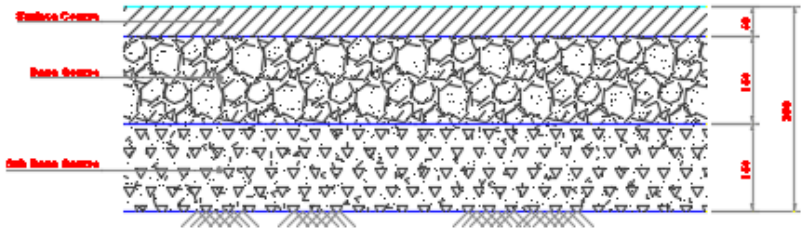
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VI. INTERNAL ACCESS ROAD

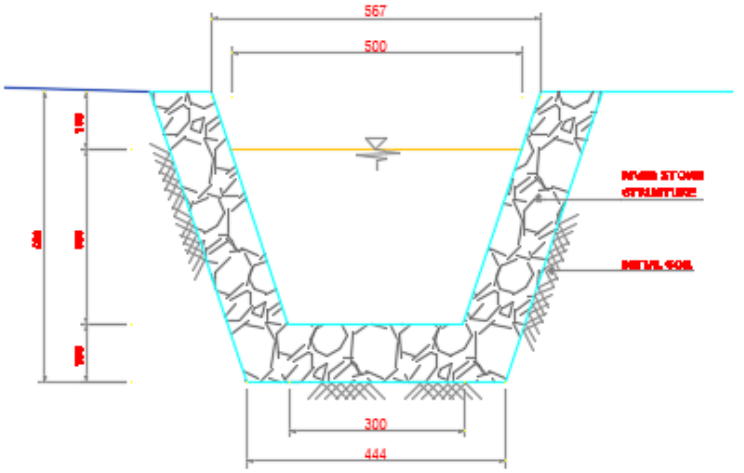
▶ CROSS CUT



TYPICAL SECTION B



TYPICAL SECTION DETAIL



DETAIL X

VII. PERIMETER FENCE & BUFFER ZONE

- **FENCE**
  - Length of concrete panel fence: 697 m.

- **BUFFER ZONE**

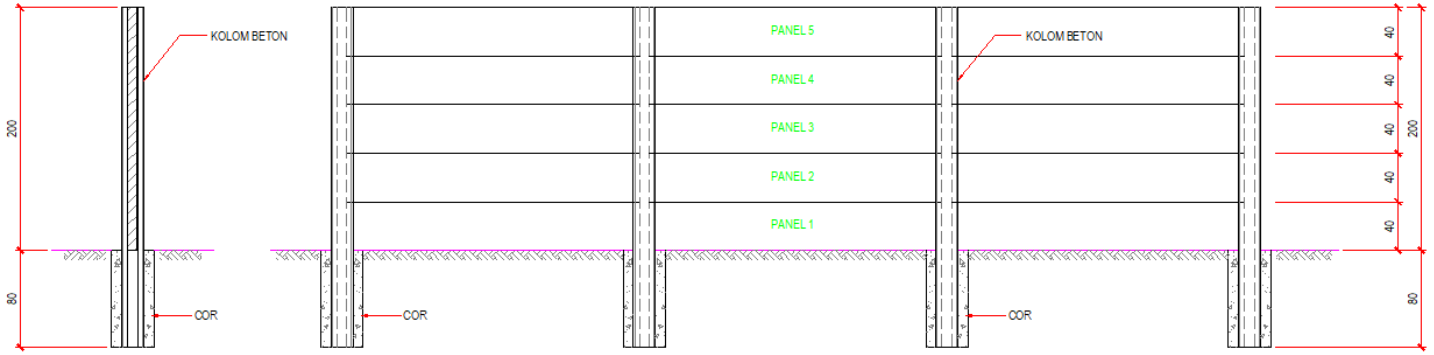
  Buffer zone planting:

  1) Japanese bamboo (*Pseudosasa japonica*);

  2) Manohara Tree.



Manohara Tree

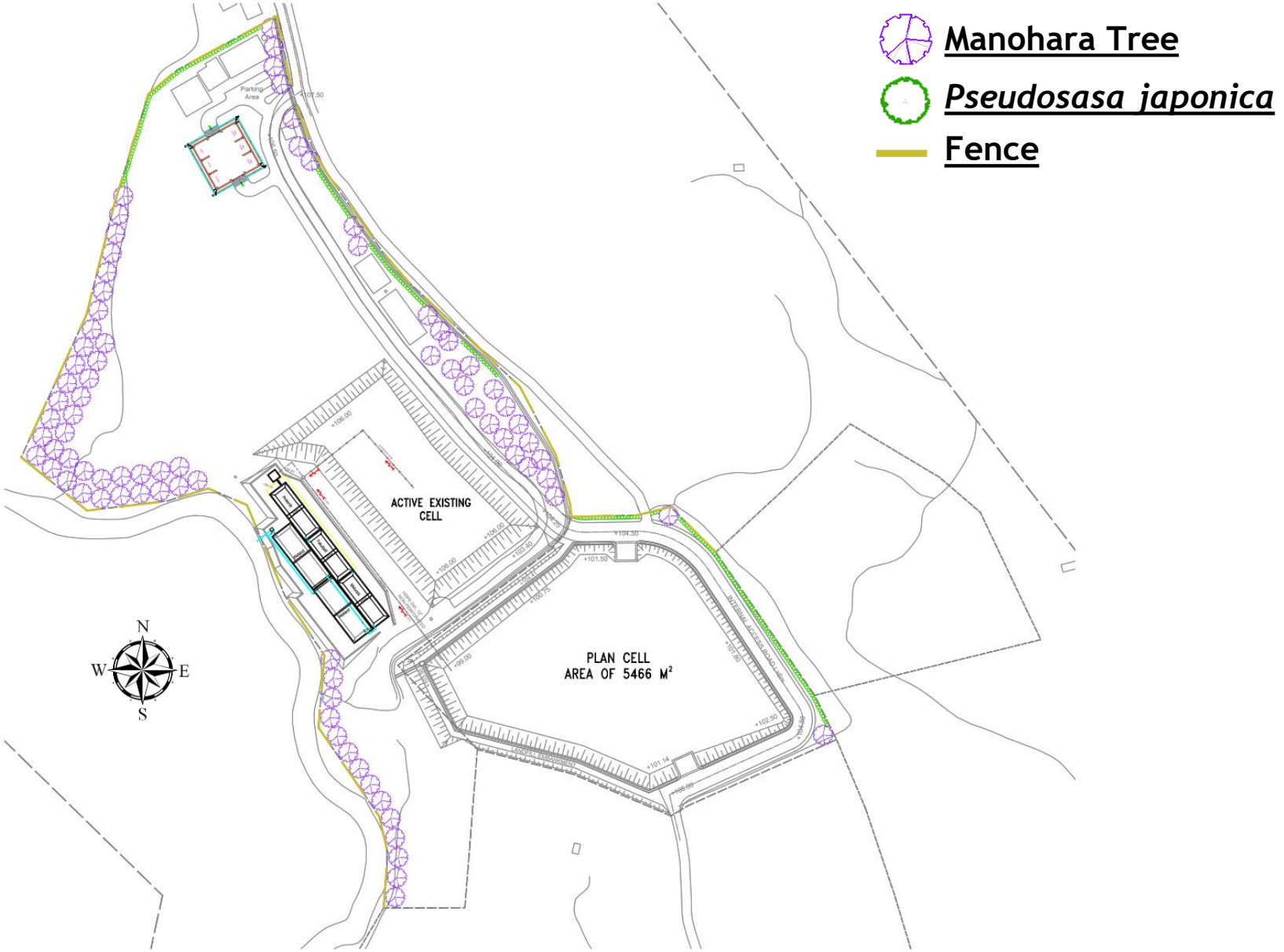




Pseudosasa japonica

CONTINUED ...

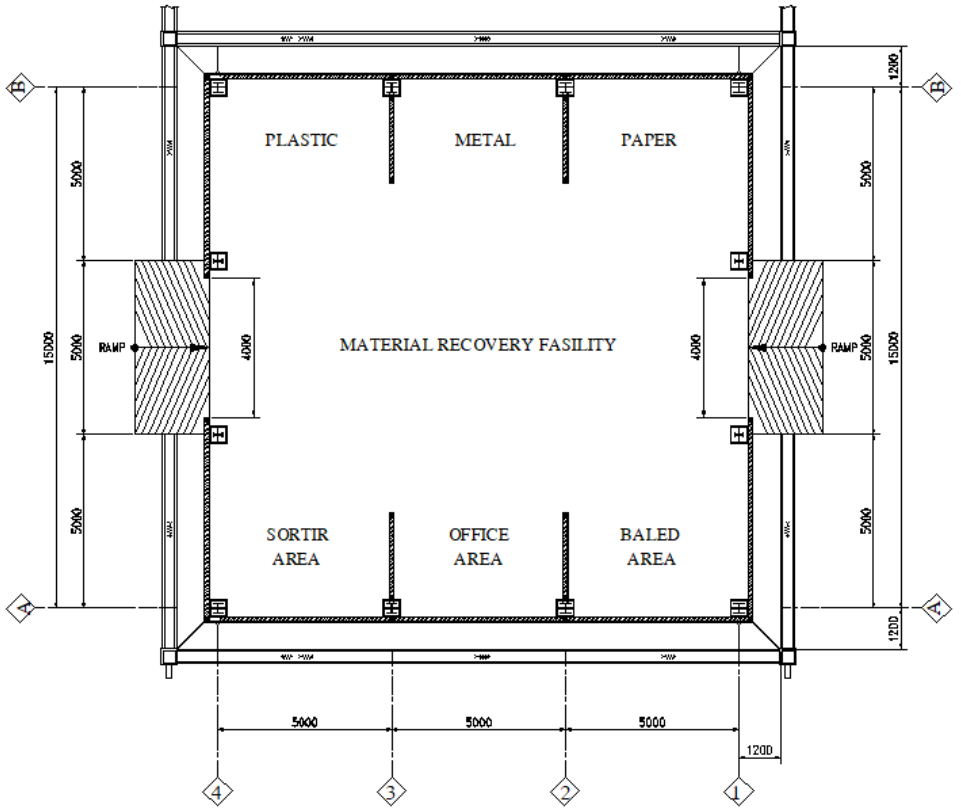
VII. PERIMETER FENCE & BUFFER ZONE



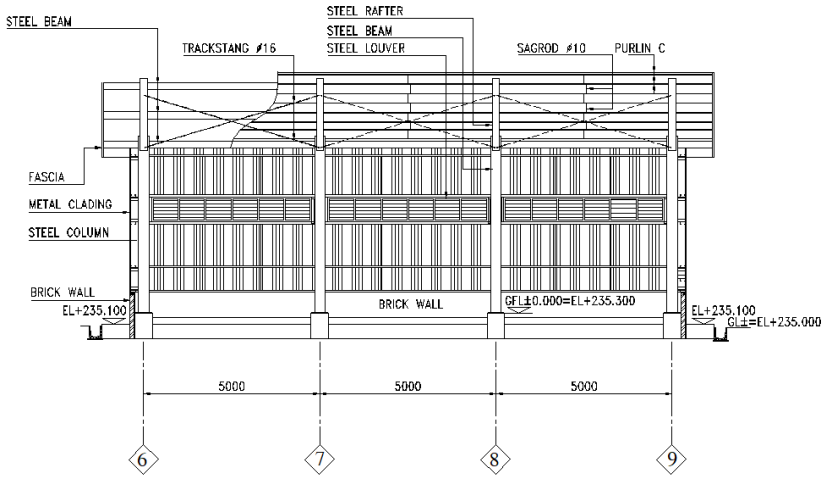
VIII. MATERIAL RECOVERY FACILITY

▶ MATERIAL RECOVERY FACILITY

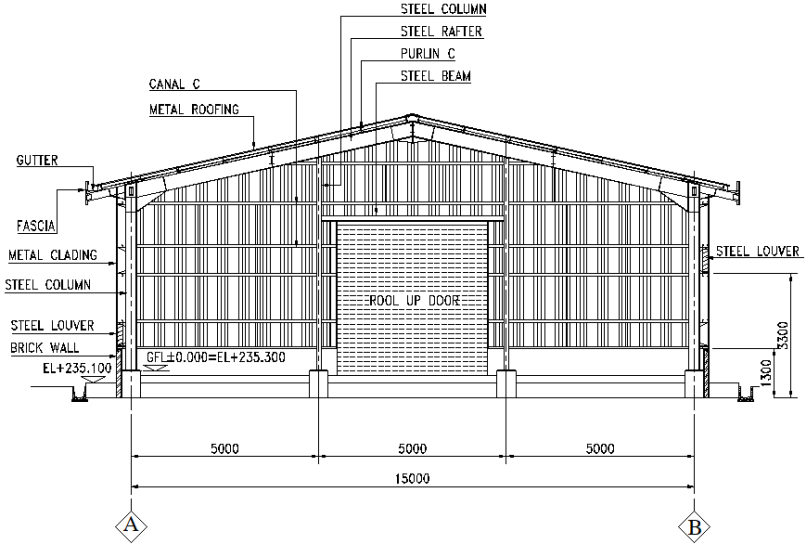
Length : 15 m
Width : 15 m
Height : ± 7 m
Area : 225 m2



PLAN VIEW
SCALE 1:100



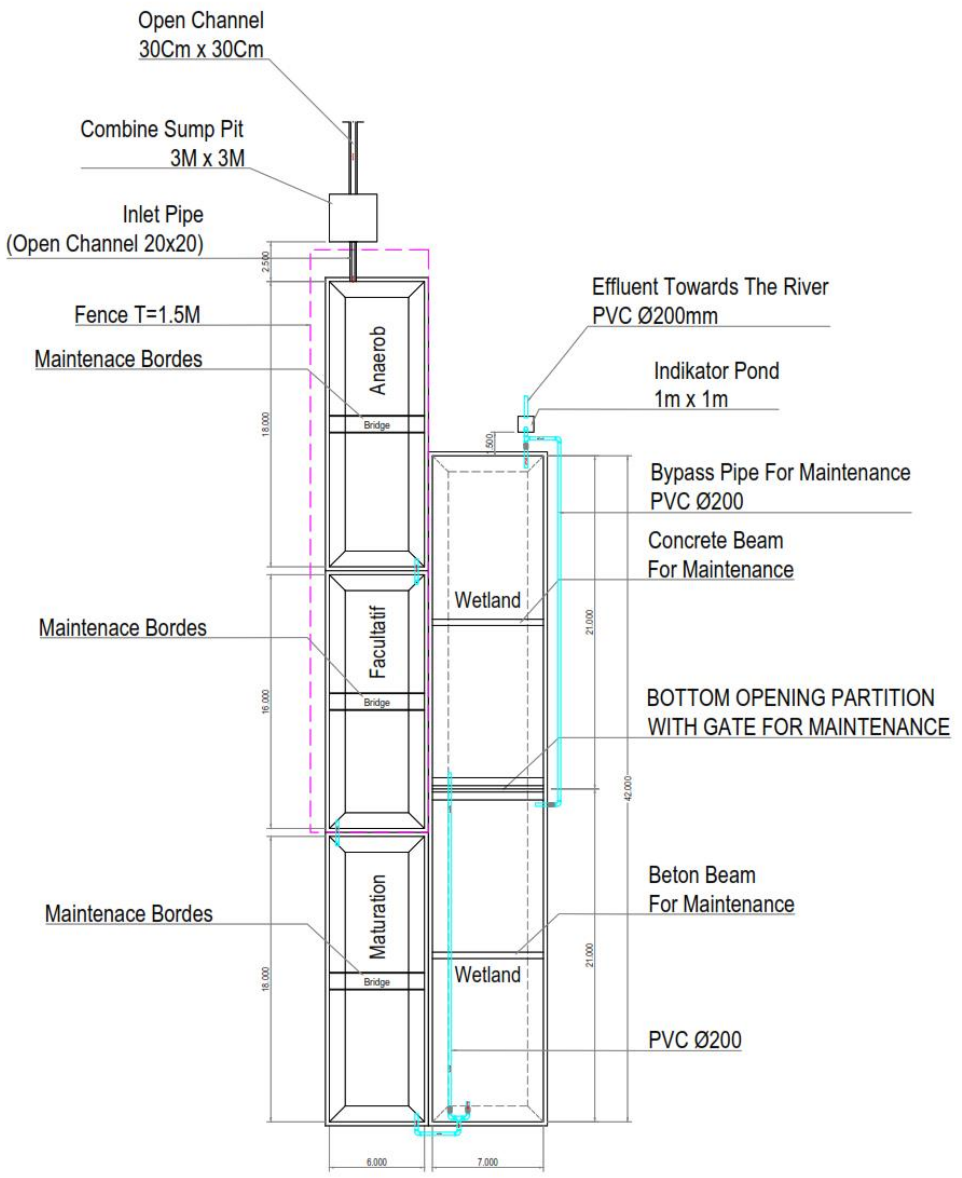
SECTION A-A
SCALE 1:100



SECTION B-B
SCALE 1:100

IX. RECONSTRUCTION OF LEACHATE TREATMENT PLANT

LAYOUT

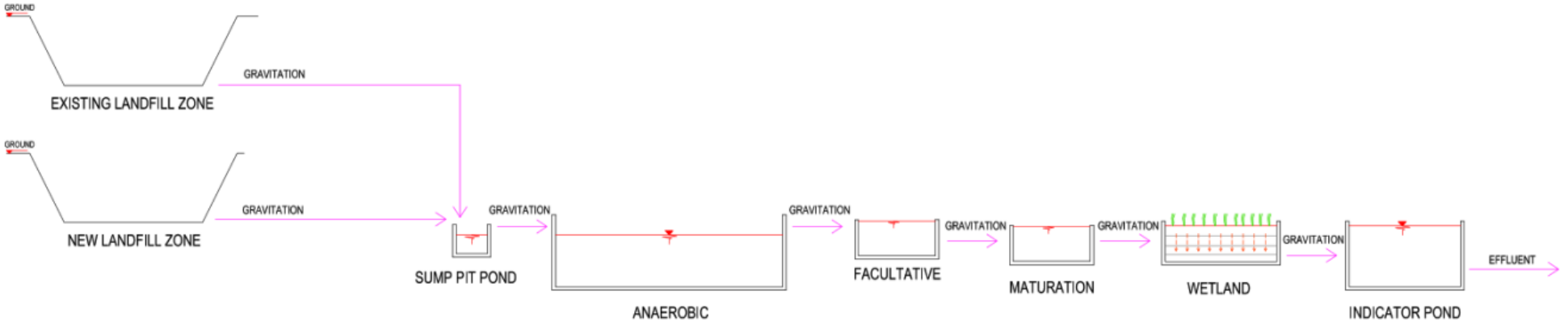


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IX. RECONSTRUCTION OF LEACHATE TREATMENT PLANT

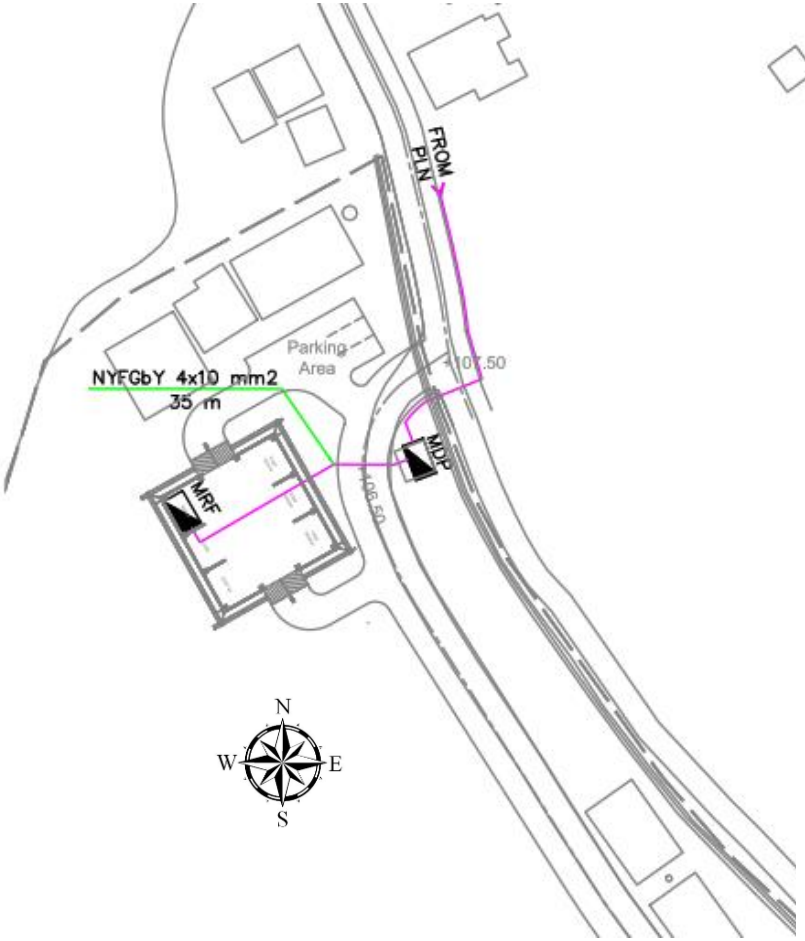
a. Construction of sump pit for LTP.
b. Demolition of existing LTP.
c. Construction of new LTP (Anaerobic pond, facultative pond, maturation pond, wetland and indicator pond).

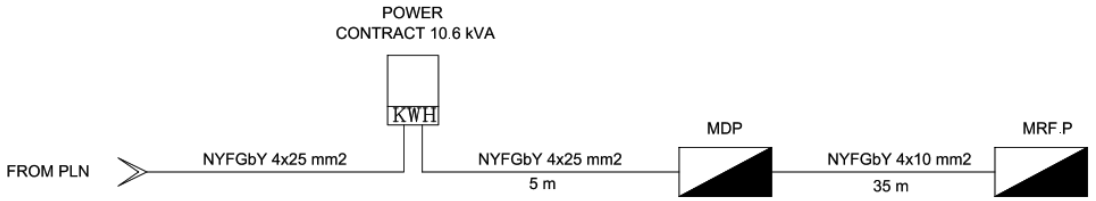
FLOW DIAGRAM

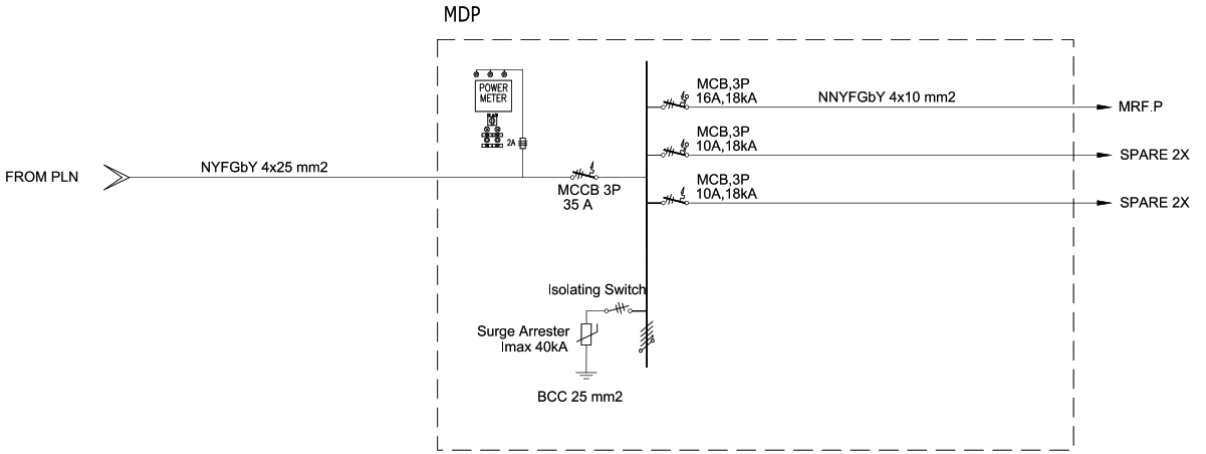


X. GENERAL ELECTRICAL

▶ LAYOUT OF ELECTRICAL NETWORK AND SCHEMATIC OF LOW VOLTAGE NETWORK

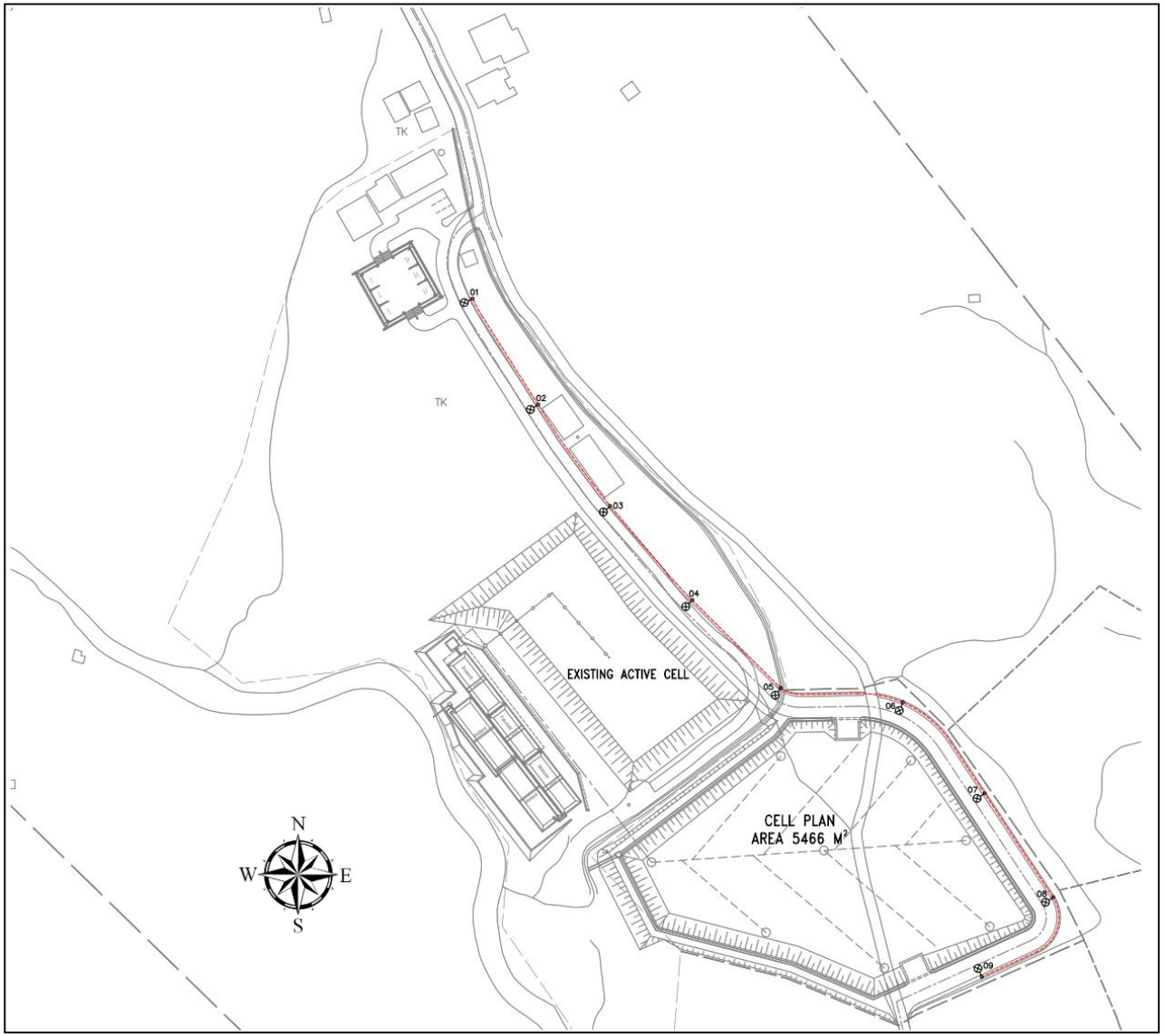


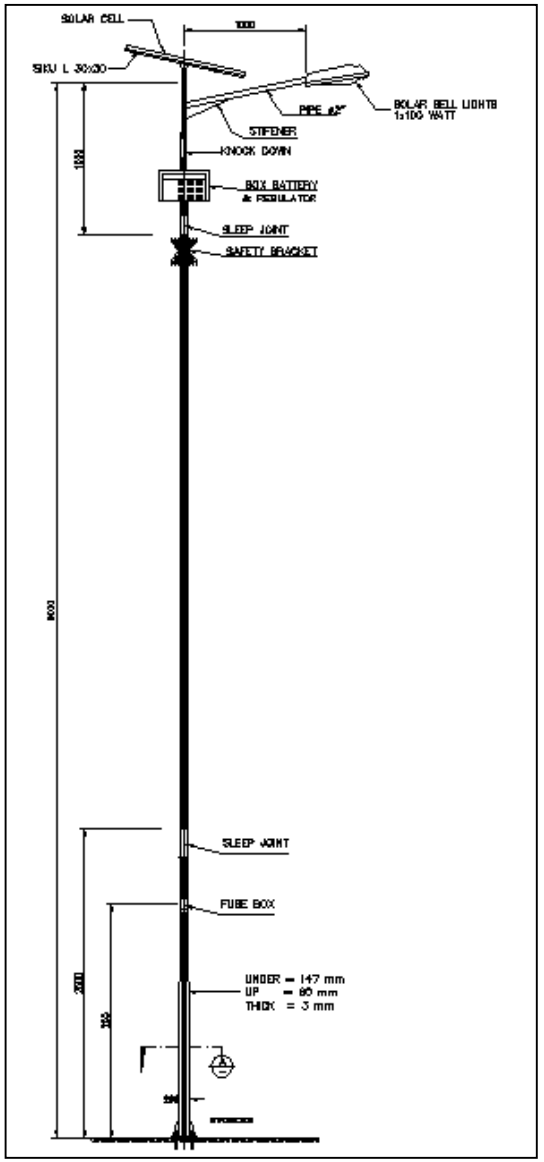




X. GENERAL ELECTRICAL

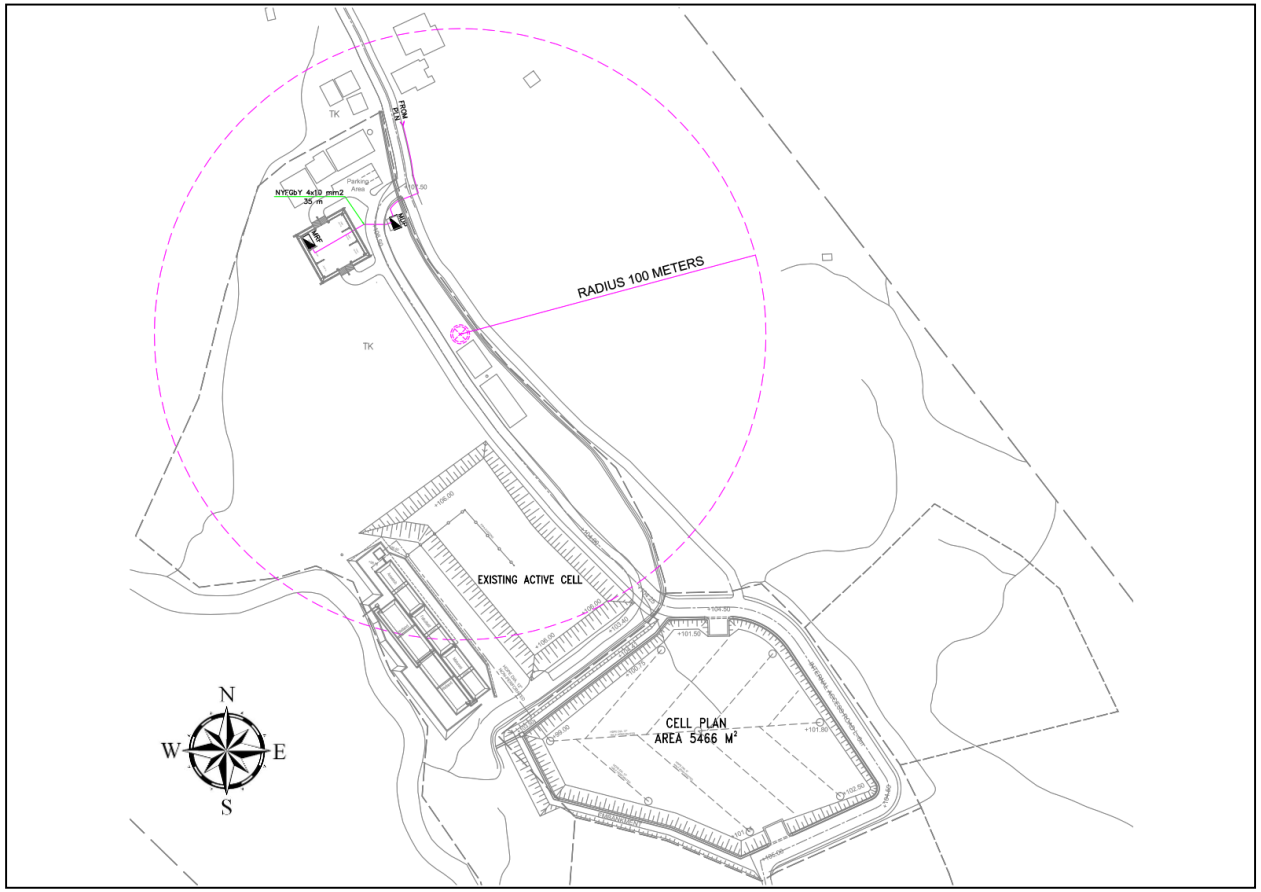
▶ LAYOUT DAN DETAIL OF STREET LIGHTING

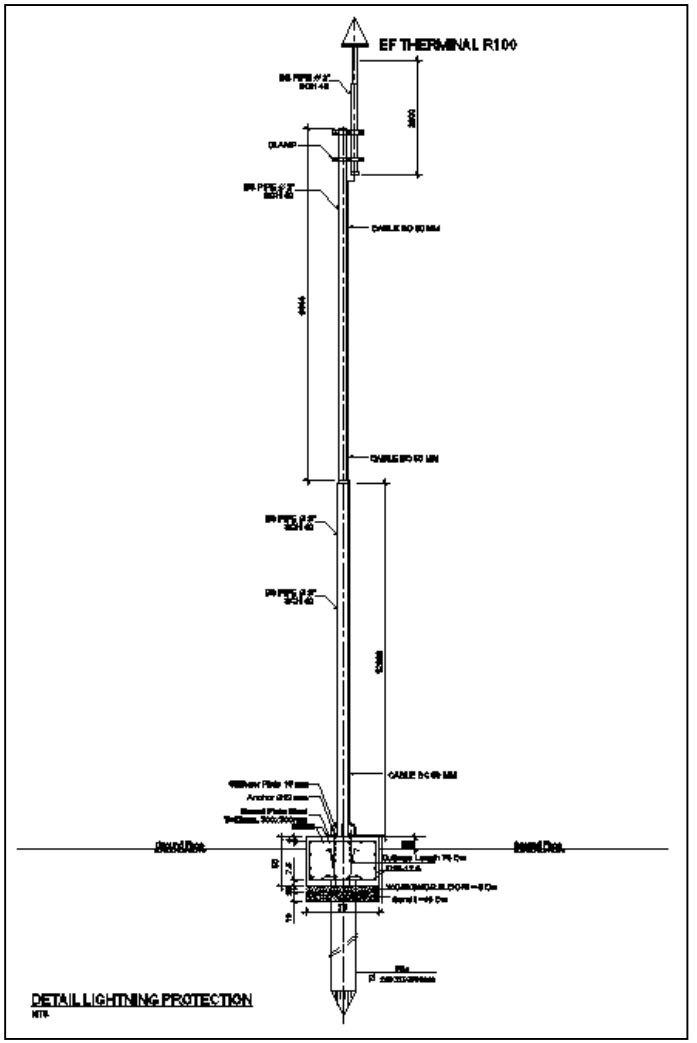




X. GENERAL ELECTRICAL

▶ LAYOUT DAN DETAIL OF LIGHTNING ROD





XI. POWER UPGRADE

▶ ELECTRICAL POWER REQUIREMENT

No.	Load Name	Panel	Power (KVA)	Connected load		Operation					
				Qty	Total Power (kVA)	Load factor	Total Power (kVA)	Continue (C)		Intermitten (I)	
								Qty	Total Power (kVA)	Qty	Total Power (kVA)
	ITEM ELEKTRIKAL										
1	Material Recovery Fasility	P.MRF	5,50	1	5,50	0,80	4,40	0,6	2,64	0,4	1,76
						Total Daya			(kVA)	**2,64**	**1,76**
						Total power (C+I)			(kVA)	**4,40**	
						Spare	20%			**0,88**	
						Grand Total			(kVA)	**5,28**	
						Daya PLN			(kVA)	**10,60**	

- STAGES OF CONSTRUCTION
- STAFF AND EQUIPMENT REQUIREMENT

STAGES OF CONSTRUCTION

STAGE OF THE REHABILITATION IMPLEMENTATION PLAN
KAWATUNA LANDFILL, PALU CITY AND KABONGA LANDFILL, DONGGALA DISTRICT

I Preparation Work
- 1.1 Project Board Installation / Project Nameplate
- 1.2 Temporary Office with Plastering Floor (Direction Keet)
- 1.3 Temporary Guard Post (Wood Construction)
- 1.4 Temporary Equipment Warehouse
- 1.5 Temporary Worker's Place (Bedeng)
- 1.6 Water
- 1.7 Electricity
- 1.8 Administration and Documentation
- 1.9 Reporting (Shop Drawing, As Built Drawing)
- 1.10 Occupational Health and Safety (OHS) Procurement
- 1.11 HSE Monitoring (Including Ambient Air, Vibration, Surface Water and Groundwater)

II Land Formation
- 2.1 Land Smoothing Infrastructure Facility Area
- 2.2 Making Temporary Emplasement

III Construction of New Cell + Leachate Collection System + Landfill Gas Collection System
- 3.1 Excavation and Pile Zone / Cell Landfill (excavated land stored in Stockpile Area)
- 3.2 Manufacture of Landfill Zone Base Liner (GCL Installation)
- 3.3 Installation of Leachate Collection System
- 3.4 Gas Ventilation Installation

IV Construction of Internal Access Road and Site Drainage
- 4.1 Excavation & Dump Drainage & Internal Access Roads
- 4.2 Drainage Channel Installation
- 4.3 Constructing Internal Access Roads

V Rehabilitation of Leachate Treatment Plant
- 5.1 Demolish existing buildings
- 5.2 Constructing LTP Inspection Road
- 5.3 LTP embankments and stockpiles
- 5.4 LTP Construction

VI Reshaping, Capping & Closure of Cell Existing
- 6.1 Waste hill formation
- 6.2 Filling of Cover Soil (Fertile Soil)
- 6.3 Gas Ventilation Installation (Kawatuna Only)

MAIN PRIORITY WORK FOR MINIMUM LANDFILL OPERATION

VII Operational Office (Kawatuna Only)
VIII Mechanical Workshop (Kawatuna Only)
IX Security Post (Kawatuna Only)
X Material Recovery Facility
XI Water Supply System 2000 L (Kawatuna Only)
XII General Electrical
XIII Power Upgrade
XIV Perimeter Fence and Buffer Zone

SUPPORTING WORKS TO MAXIMUM LANDFILL OPERATIONS

Main Expertise & professional	Particular Experience & Qualifications	Minimum Years of Experience	Minimum experience (year in similar position)	QTY
Project Manager	Minimum Bachelor Degree in Civil Engineering, Architect, Environmental Engineering, or relevant field. Shall have advance certificate of expertise (SKA Ahli Utama) in Project Management or similar/ equivalent. CV shall be attached.	12	7	1
Site Manager	Minimum Bachelor Degree in Civil Engineering, Architect, Environmental Engineering, or relevant field. Shall have intermediate certificate of expertise (SKA Ahli Madya) in Building Engineering or similar/ equivalent. CV shall be attached.	10	5	2
QA/QC Manager	Minimum Bachelor Degree in Civil Engineering, Architect, Environmental Engineering, or relevant field. Shall have intermediate certificate of expertise (SKA Ahli Madya) in Quality Management System or similar/equivalent. CV shall be attached	8	4	1
Landfill Expert	Minimum Bachelor Degree in Civil Engineering, Sanitation or Environmental Engineering or relevant field. Shall have intermediate certificate of expertise (SKA Ahli Madya) in Sanitation and Waste Engineering or similar/equivalent. CV shall be attached.	7	4	1

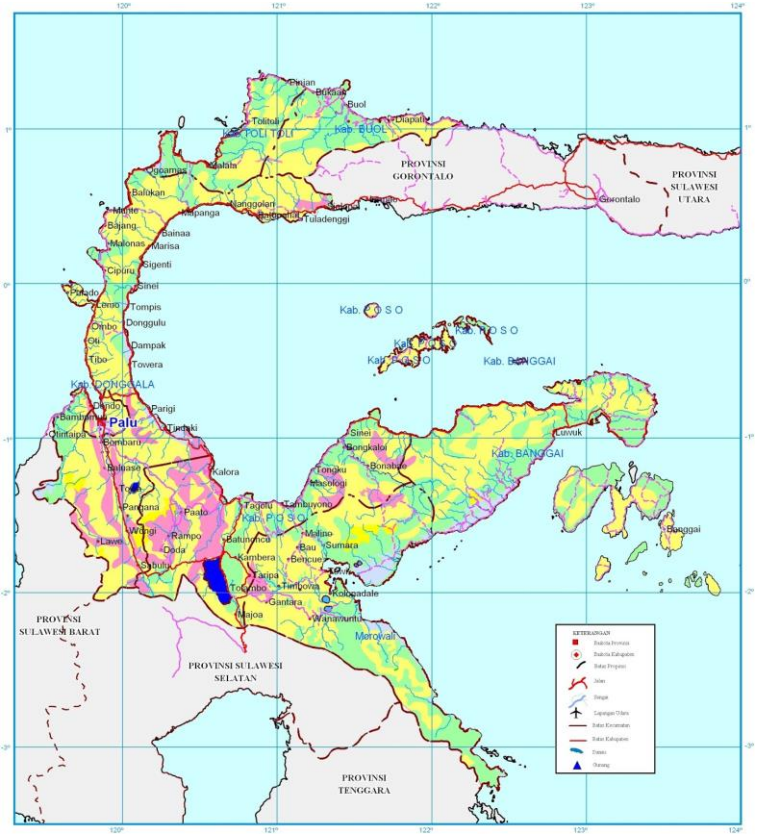
Main Expertise & professional	Particular Experience & Qualifications	Minimum Years of Experience	Minimum experience (year in similar position)	QTY
Building Supervisor	Minimum Bachelor Degree in Architect, Civil engineering or relevant field. Should have intermediate certificate of expertise (SKA Ahli Madya) in Building Structure or similar/equivalent. CV shall be attached	7	5	1
Mechanical and Electrical Engineer	Minimum Bachelor Degree in Electrical Engineering, Mechanical Engineering, or relevant field. Shall have intermediate certificate of expertise (SKA Ahli Madya) in Electrical Engineer or Mechanical Engineer or similar/equivalent. CV shall be attached.	7	5	1
Safety Officer	Minimum Bachelor Degree in Engineering, Public Health or relevant field. Shall have be certificate of expertise (SKA Ahli Muda or equivalent) in Construction OHS or similar/equivalent. CV shall be attached	7	4	1
Quantity Engineer (QE)	Minimum Diploma in Civil Engineering, Architect, or relevant field. CV shall be attached	5	3	1
Draftsman	Minimum Diploma in Civil Engineering, Architect, or relevant field. Understanding and experience in AutoCAD and drawing. CV shall be attached.	5	3	2
Surveyor	Minimum Diploma in Science Civil Engineering, Architect or relevant field. Understanding Survey & Topographic. CV shall be attached.	5	3	2
Logistic	Minimum Diploma in business administration, management, or relevant field. CV shall be attached	5	3	1

STAFF REQUIREMENT

EQUIPMENT REQUIREMENT

No	Equipment/ Specification	Minimum Quantity (Unit)
1	Excavator; PC200 or equivalent	2
2	Bulldozer; D6 or equivalent	1
3	Bulldozer; D4/D5 or equivalent	1
4	Vibro Roller; Different size/type	2
5	Dump Truck; PS 220 or equivalent	5
6	Dump Truck; PS 120 or equivalent	4
7	Flat Bed Truck; PS 220 or equivalent	1
8	Concrete Vibrator	4
9	Concrete mixer on site	4
10	Stamper	2
11	Measuring Tools; Theodolite & Level	2
12	Motor Grader	1
13	Asphalt Mixing Plant (AMP)	1
14	Asphalt Finisher	1
15	Tandem Roller	1
16	Pneumatic Tire Roller	1
17	Air Compressor	1
18	Water Tank (Truck)	1

THANK YOU


Kab. POLI TOLI
Kab. BUOL
PROVINSI GORONTALO
PROVINSI SULAWESI UTARA
Kab. DONGGALA
Palu
Kab. PO S O
Kab. BANGGAI
PROVINSI SULAWESI BARAT
PROVINSI SULAWESI SELATAN
PROVINSI TENGGARA