



Sama' Al-Madinah for Engineering Consulting

Do you have an industrial project?

Do you have any problems in construction stage?

Do you need foundation design for your
Production Line?

Never hesitate to contact us

Email: Info@Samaalmadinah.net

Mobiles: 00966560287569 / 00966500552138 / 00966503808745





Sama' Al-Madinah for Engineering Consulting

سماء المدينة للاستشارات الهندسية

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Substructures Design of Industrial Projects, Warehouses, & Production Line Foundations

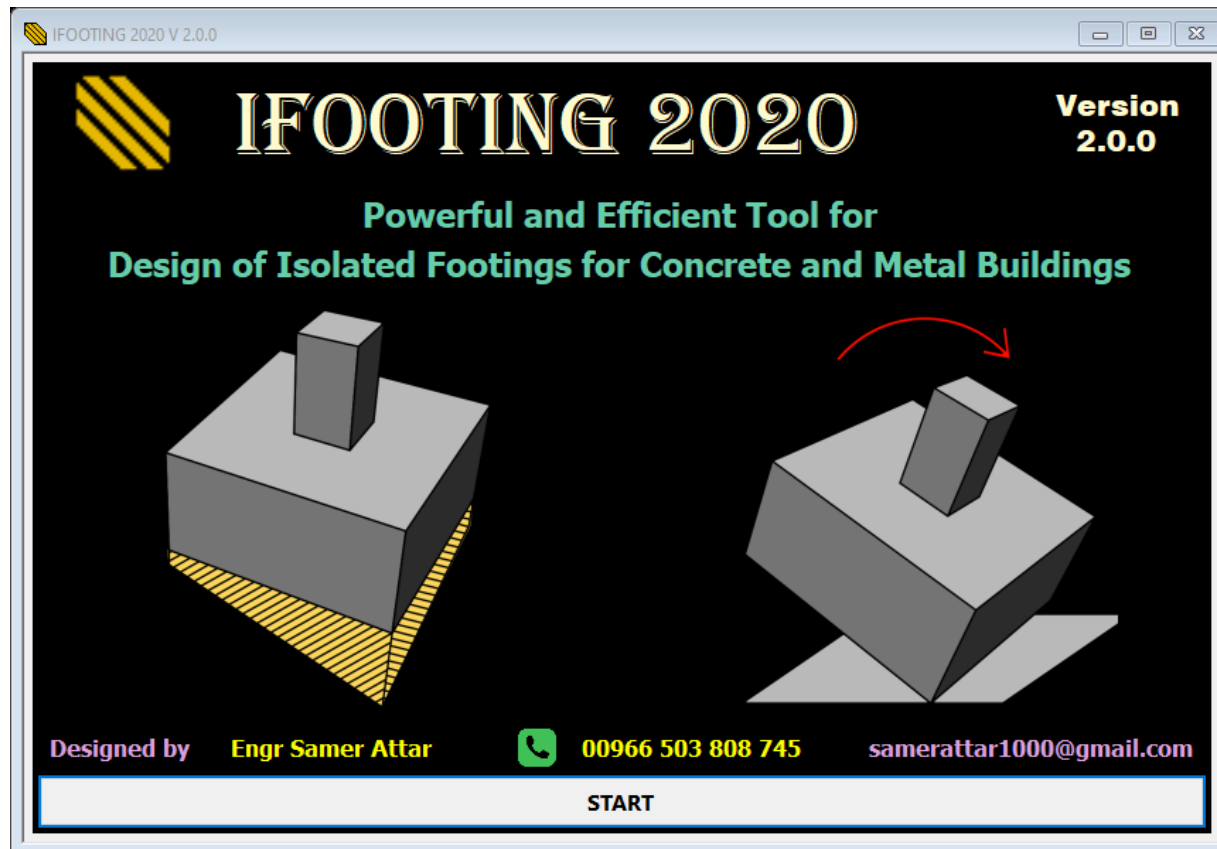
Provide the 3th Party services for contractors



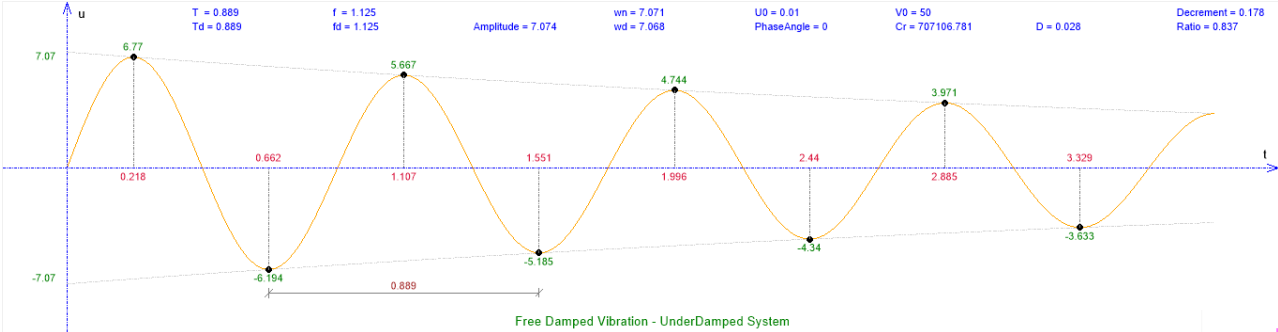
تقديم استشارات وحلول للمشاكل التي تواجه المقاولين أثناء مرحلة التنفيذ

خدمات مميزة وسريعة في كل ما يخص المشاريع الصناعية من تصاميم
إنشائية للبنية التحتية من الأساسات حتى خطوط الإنتاج

Development of specialized programs in this field that facilitate and accelerate the design process & enable value engineering for them.



Design of Machine Foundation



Machine Foundation 1

Units: ☒ Metric Unit ☐ Imperial Unit

Job Description

CrossSection Data	Symbol	Unit	Value	Helper
Footing dimension in X direction	Lx	m	6.096	- = Ly +
Footing dimension in Y direction	Ly	m	4.572	- = Lx +
Footing Thickness	Lz	m	1.0668	- = Lx +
Effective embedded depth	he	m	0.9144	= 0
Concrete density	γ_c	KN/m^3	24	
Soil density	γ_s	KN/m^3	18.86	
Soil shear modulus	G	N/m^2	68947574.4	
Soil poisson ratio.	ν		0.45	
Soil type			Cohesive	
Material damping	β_m		0.05	
Machine operation speed	ω_o	rpm	350	
Machine weight	ω_m	KN	135	
Rotar weight	ω_r	KN	40.5	
Machine CG coordinate	x_m	m	1	
Machine CG coordinate	y_m	m	1	
Machine CG coordinate	z_m	m	1	
Machine dynamic forces :				
	P	KN	0	
	Hx	KN	0	
	Hy	KN	0	
	Mx	KN.m	0	
	My	KN.m	0	
	Mz	KN.m	0	
Maximum damping ratio	Dv_max		0	
Maximum damping ratio	Du_max		0	
Maximum damping ratio	Drx_max		0	
Maximum damping ratio	Dry_max		0	
Maximum damping ratio	Dt_max		0	

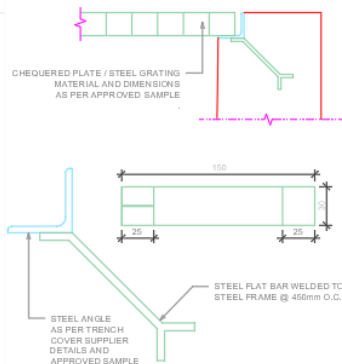
Impedance Method

- ☐ Suresh Arya Reference
- ☒ ACI 351.3R-18 - Method 1
- ☐ ACI 351.3R-18 - Method 2
- ☐ ACI 351.3R-18 - Method 3
- ☐ Use equations of circular foundation if possible

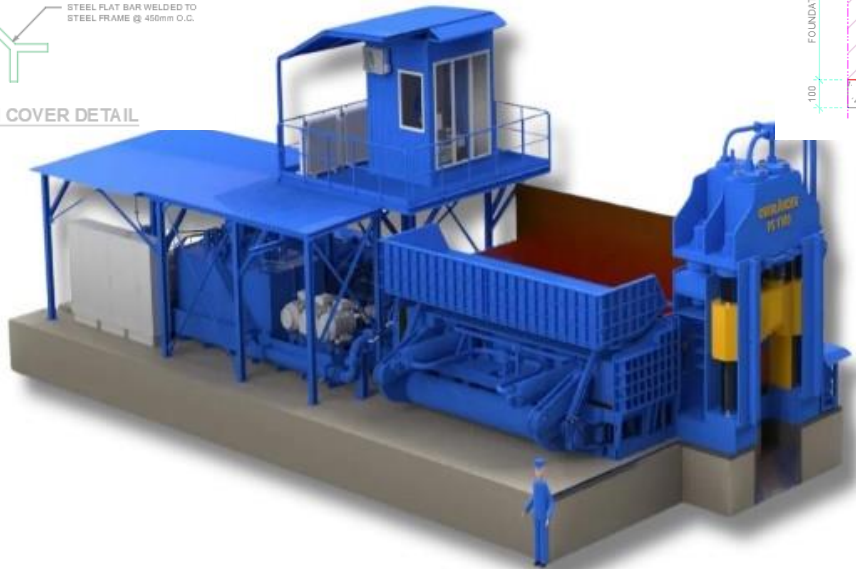
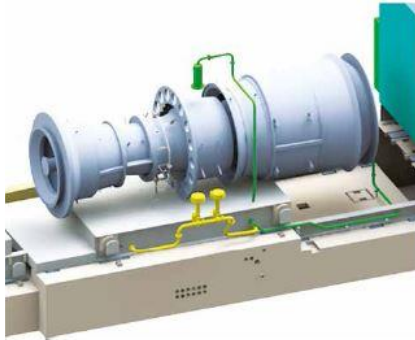
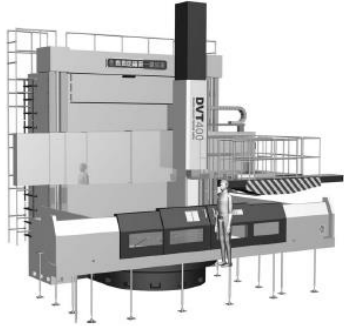
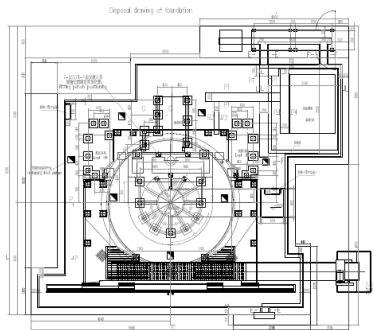
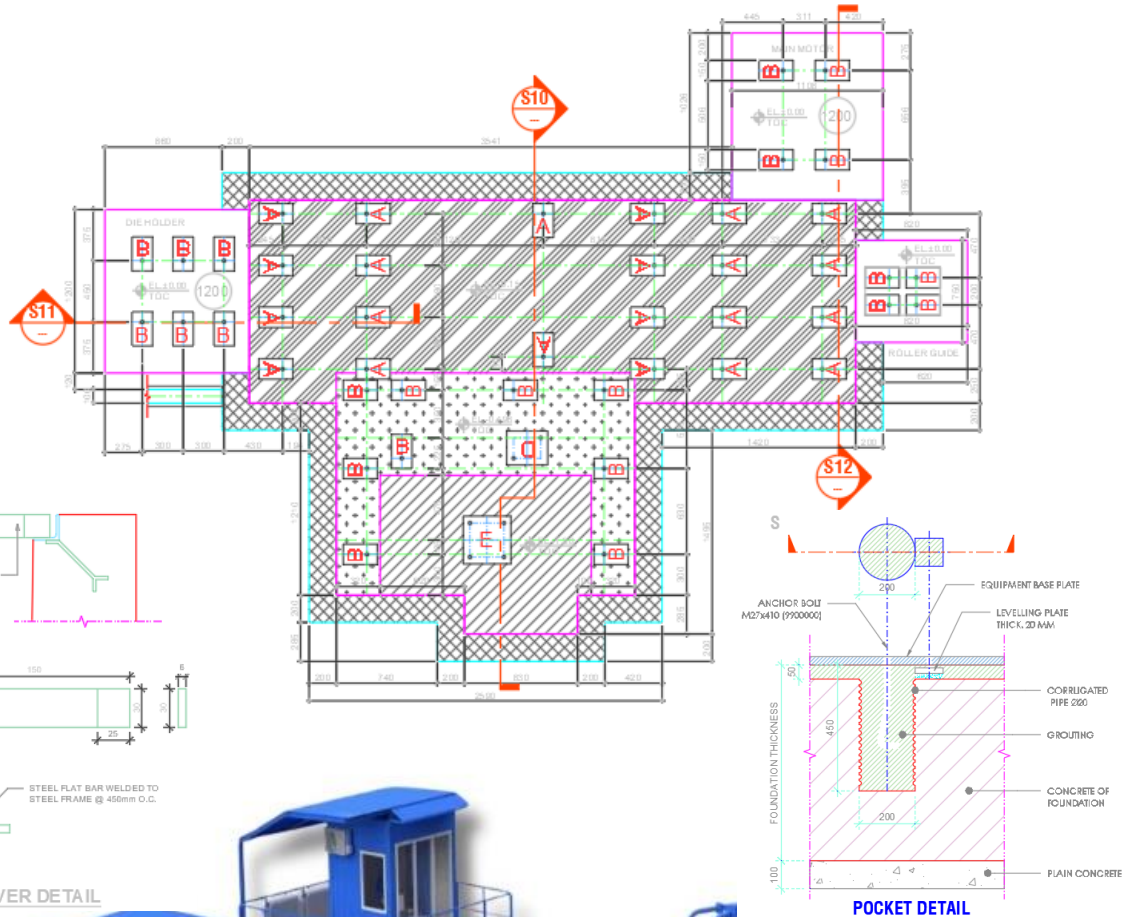
Other Options

- ☒ Consider the common C.G. at bottom of footing
- ☒ Rotating Mass Excitation
- ☐ Constant Force Excitation

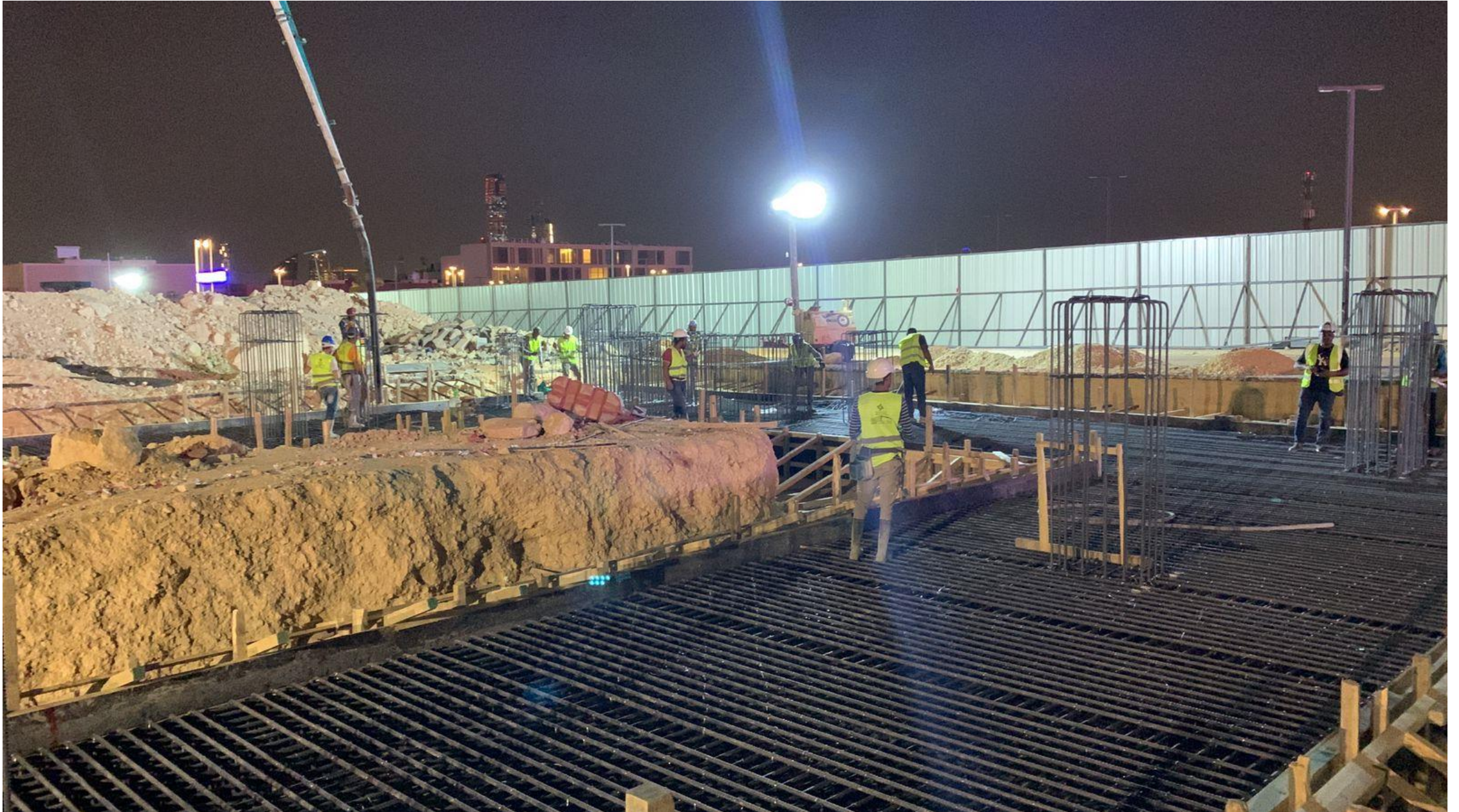
Property	K	C	ω_n	ω_o/ω_n	Damping Ratio	Amplitude
Vertical	1.506389E+009	30299352	131.96	0.28	1.327	0
Horizontal	1.243234E+009	24110462	119.88	0.31	1.162	0
Rocking X	2.051975E+009	19741996	103.7	0.35	0.499	0
Rocking Y	2.547571E+009	28844542	88.63	0.41	0.502	0
Torsion	1.549852E+010	100416744	189.31	0.19	0.613	0



TRENCH COVER DETAIL



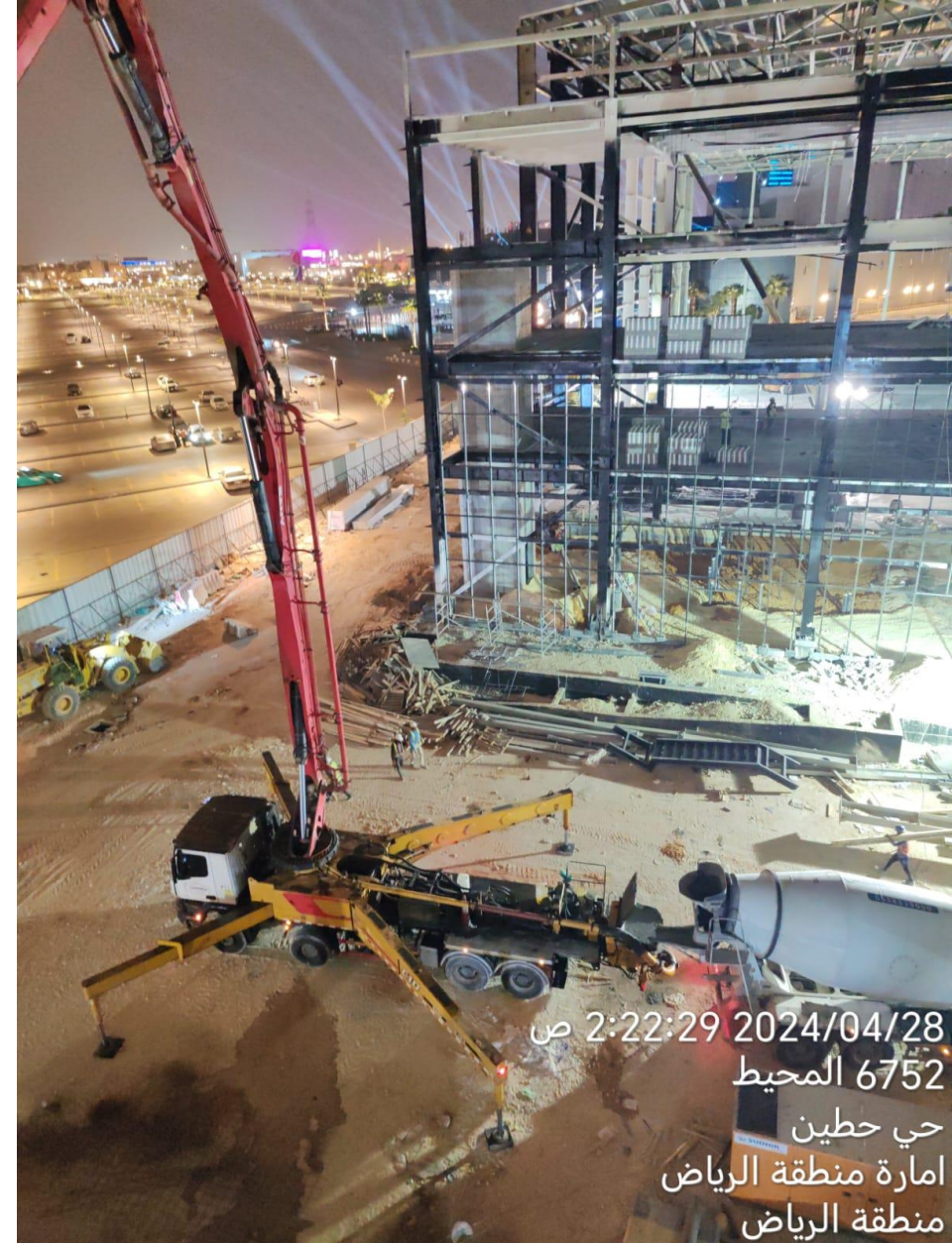
Design of PEB FOUNDATIONS



Design of PEB FOUNDATIONS



Design of PEB FOUNDATIONS



Design of PEB FOUNDATIONS



Design of PEB FOUNDATIONS

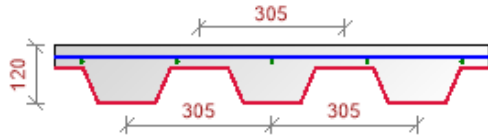


Design of Deck Slab Floor

Property	Symbol	Unit	Value
Deck slab name			Deck_120
Total slab thickness	H	mm	120
Deck rib height	Hd	mm	75
Deck rib pitch	bf	mm	305
Rib width at bottom	bw1	mm	120
Rib width at top	bw2	mm	185
Diameter bars in strong direction	Ds	mm	8
Spacing of bars in strong direction	Ss	mm	200
Diameter bars in weak direction	Dw	mm	8
Spacing of bars in weak direction	Sw	mm	200
Clear cover of bars in weak direction	c'	mm	20
Specified compression Strength of Concrete	fc'	MPa	40
Specified yield strength of flexural reinforcement	fy	MPa	420

As = Ø8@200 = 251.33 mm² (in strong direction)

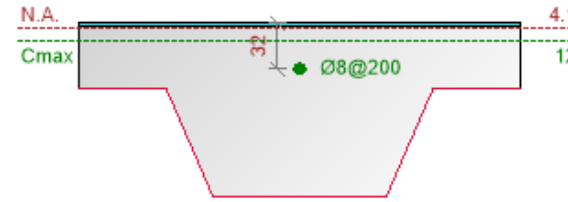
As = Ø8@200 = 251.33 mm² (in weak direction)



Rib Section

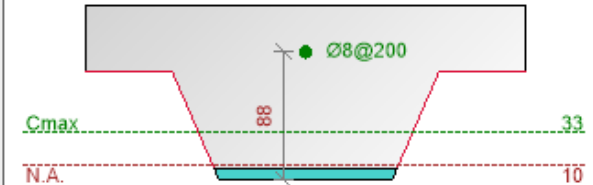


Strong Direction - Positive Moment (d = 32 c = 4.06)
Steel strain $\epsilon_s = 0.02063$



Max Positive Moment (Singly) $Mu+ = 0.882 \text{ KN.m / rib}$

Strong Direction - Negative Moment (d = 88 c = 10.05)
Steel strain $\epsilon_s = 0.02328$



Max Negative Moment (Singly) $Mu- = 2.439 \text{ KN.m / rib}$

Weak Direction - Positive Moment (d = 24 c = 4.06)
Steel strain $\epsilon_s = 0.01472$



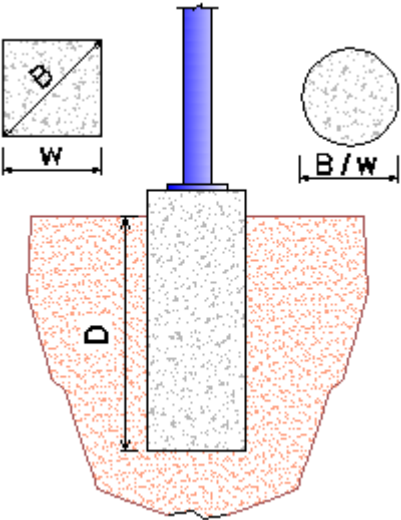
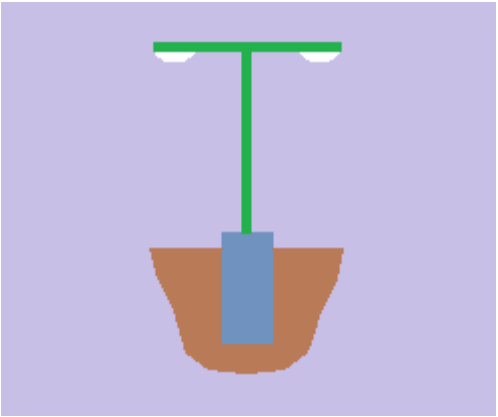
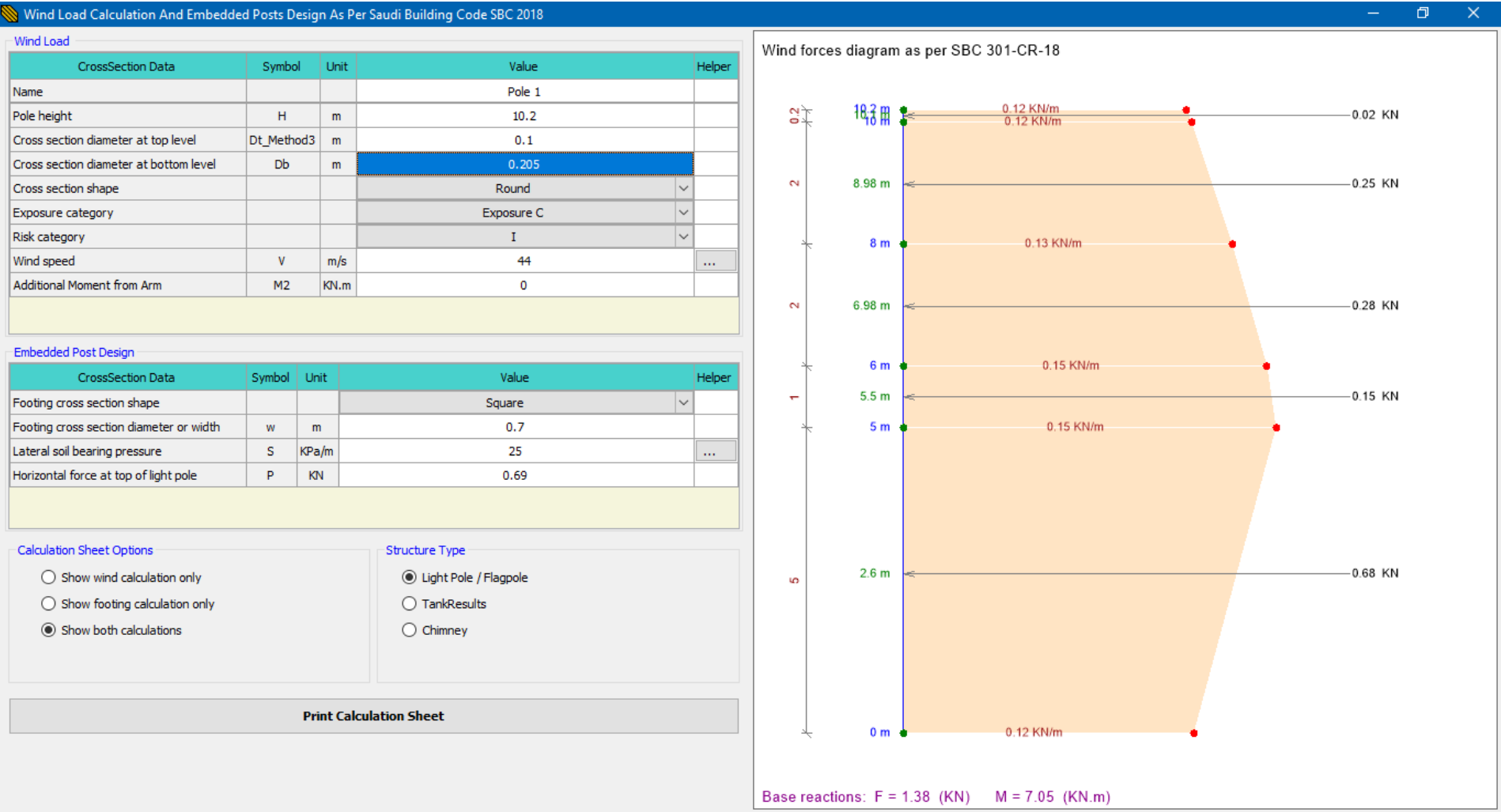
Max Positive Moment (Singly) $Mu+ = 2.133 \text{ KN.m / m}$

Weak Direction - Negative Moment (d = 21 c = 4.06)
Steel strain $\epsilon_s = 0.01251$



Max Negative Moment (Singly) $Mu- = 1.848 \text{ KN.m / m}$

Design of Light Pole Foundation



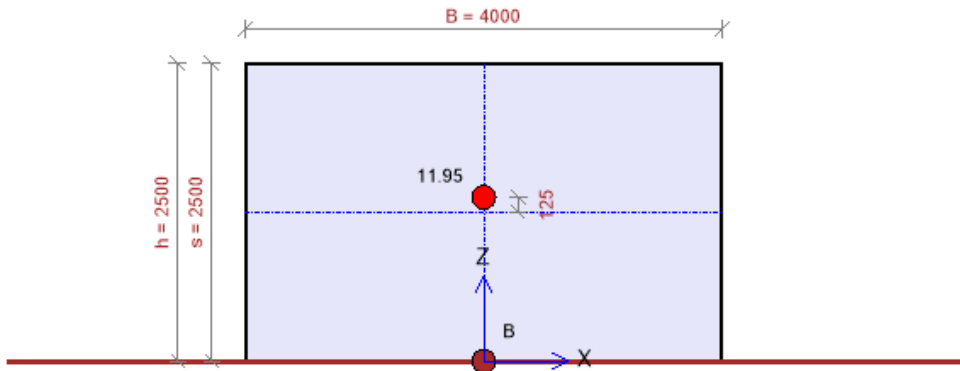
Design of Boundary Wall Foundation

CrossSection Data	Symbol	Unit	Value	Helper
Horizontal dimension of sign	B	m	4	
Vertical dimension of sign	S	m	2.5	
Height of the sign	h	m	2.5	
Exposure category			Exposure C	▼
Risk category			I	▼
Wind speed	V	m/s	47	...

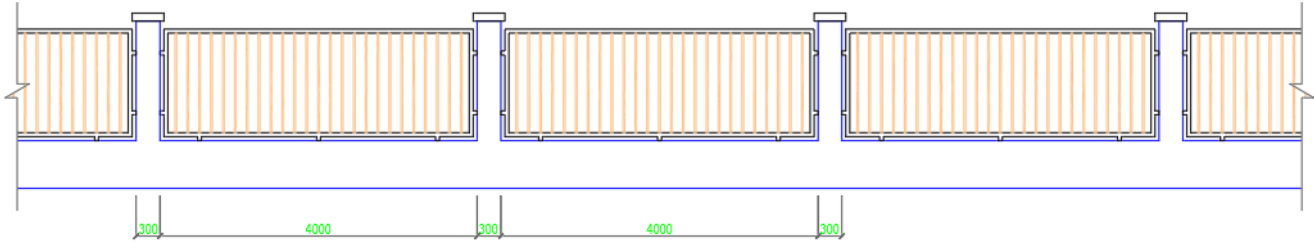
Clearance ratio, $s/h = 1$
Aspect ratio, $B/s = 1.6 < 2$
CASE C no need to be considered
 $F = 11.95 \text{ KN}$
 $e_y = 0.05 h = 125 \text{ mm}$

Reactions at point B:

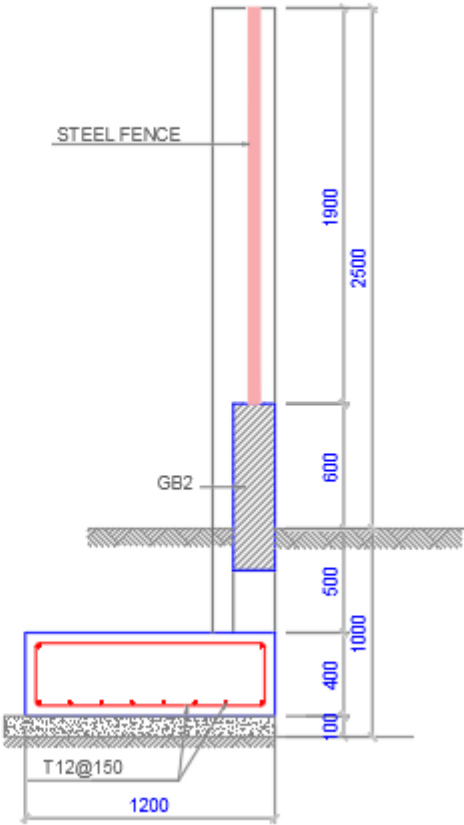
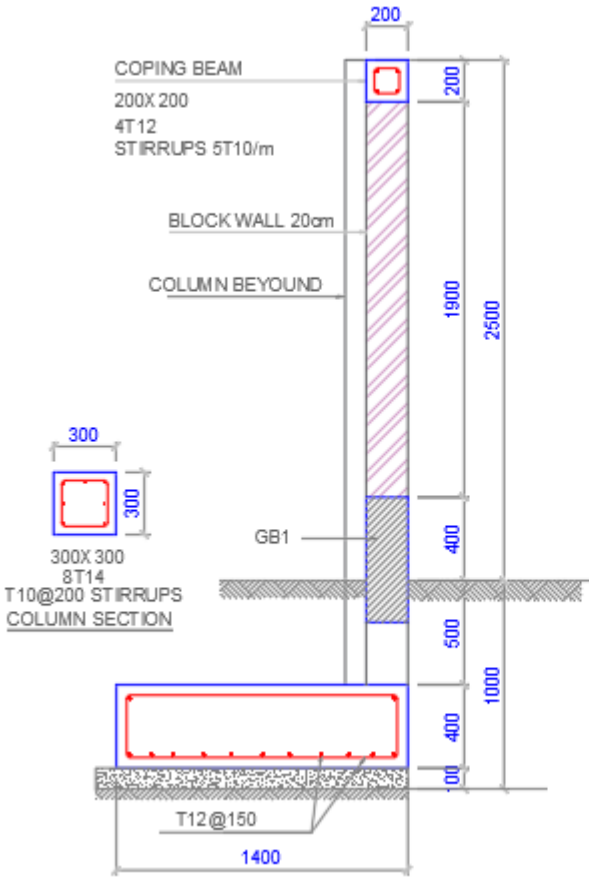
$F_y = 11.95 \text{ KN}$
 $M_x = 16.43 \text{ KN.m}$



Wind Load CASE A



FENCE WITH STREET



Design of Retaining Walls

Geometry Soil Surcharge Loads Other Loads Options

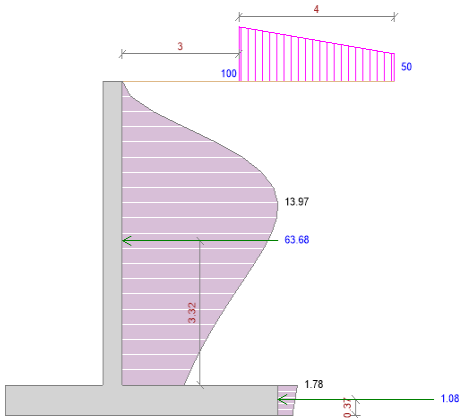
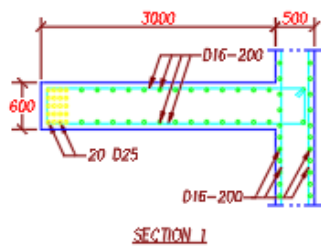
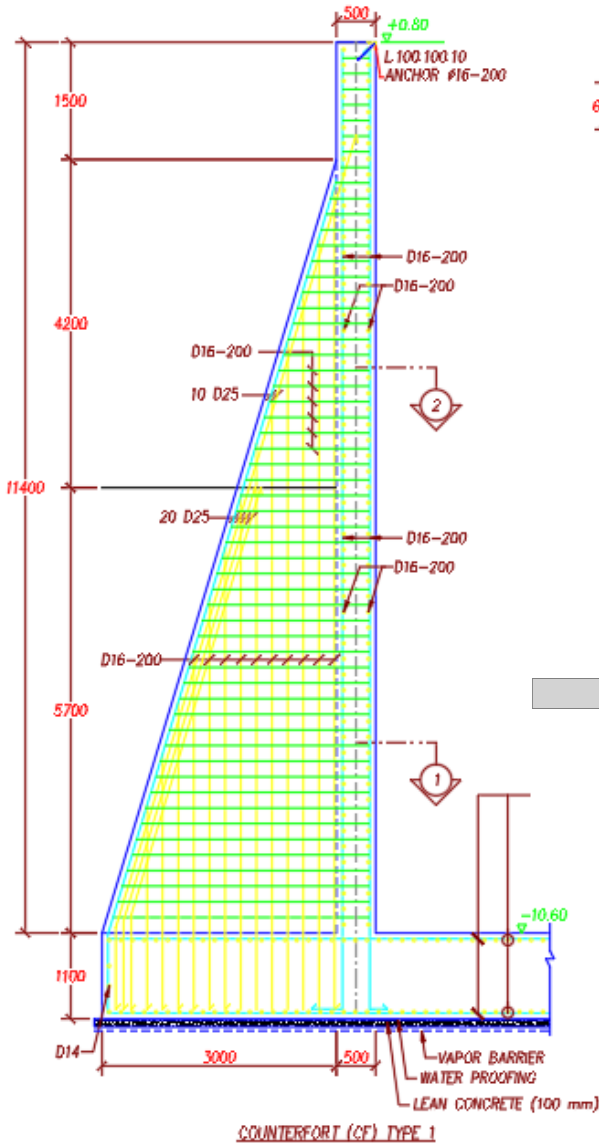
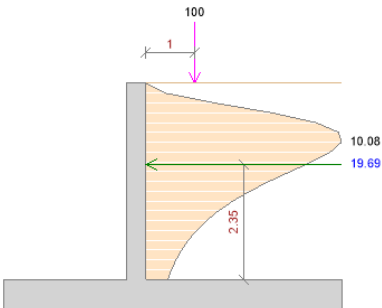
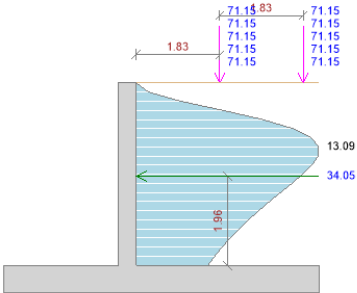
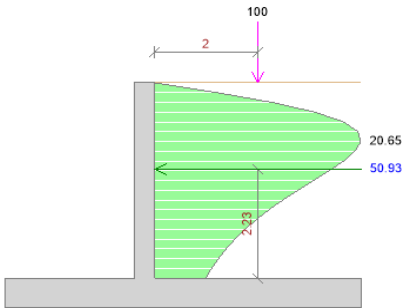
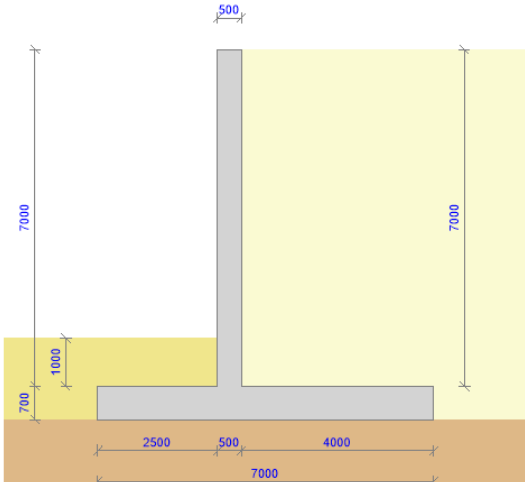
Wall Name RW_1

Property	Symbol	Unit	Value	Help
Stem thickness	T	mm	500	- +
Wall height	H	mm	7000	- +
Toe width	BT	mm	2500	- +
Heel width	BH	mm	4000	- +
Footing Thickness	HF	mm	700	- +
Concrete density	γ_c	kN/m ³	25	
Concrete compression Strength	f_c'	MPa	30	
Steel yield Strength	f_y	MPa	420	
Centroid cover for footing reinforcement	DCf	mm	70	
Centroid cover for wall reinforcement	DCw	mm	50	
Footing friction constant	μ		0.5	...
Base soil friction angle	ϕ	°	30	
Friction angle	δ	°	15	
Base soil density	γ_s	kN/m ³	18	
Soil cohesion	C	kN/m ²	0	
Base soil bearing capacity	σ_s	kN/m ²	250	

☐ Tapered wall

☐ Key

$K_a = 0.301$
 $K_p = 4.977$



Design of Pedestals

Reinforced Concrete Column Design As Per ACI 318-14 Code

File

Input

External Loads

ULS Load Combinations

Design Report

Column Capacity

Interaction Diagram

Summary of Results

Bending Around X				Bending Around Y			
Story Type		Sway (Unbraced)	...		Sway (Unbraced)	...	
Unsupported Length (m)	Lux	3	...	Luy	3	...	
Effective Length Factor	Kx	2	...	Ky	2	...	
Transverse loads applied between supports		<input type="checkbox"/>	...		<input type="checkbox"/>	...	

Property	Symbol	Unit	Value
Shape of section			Rectangular
Column Name			P12
Section dimension in X direction	Bx	mm	1500
Section dimension in Y direction	By	mm	1000
Clear cover of main bars	d'	mm	50
Number of bars in X direction	rx		11
Number of bars in Y direction	ry		8
Diameter of bars	Φ	mm	25
Compression Strength of Concrete	fc'	MPa	35
Yield strength of main bars	fy	MPa	420
Modulus of elasticity of steel	Es	MPa	200000
Transverse reinforcement shape			Ties
Concrete density		Kg/m³	2400

Method of Calculation (E_I)_{eff}

☐ ACI 318M-14 (6.6.4.4.4a)

☒ ACI 318M-14 (6.6.4.4.4b)

☐ ACI 318M-14 (6.6.4.4.4c)

Options

☐ Compute E_c based on W_c value

As = 16689.7

Ac = 1500000

p = 0.011

As = 34Φ25

1500

1000

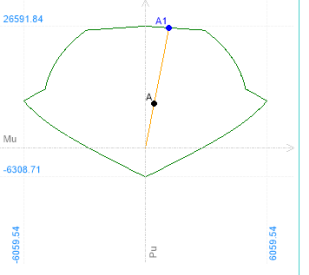
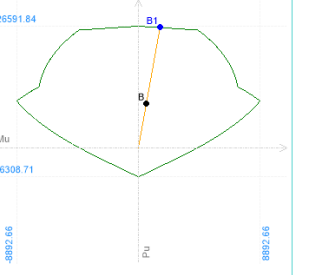
X

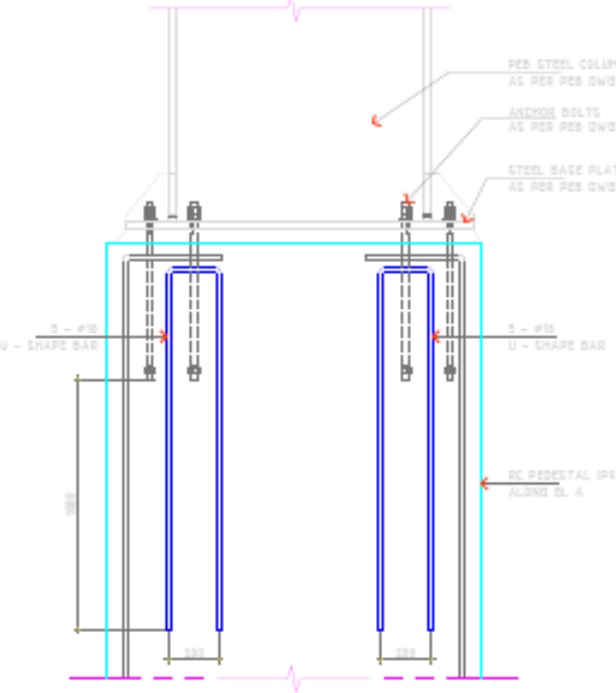
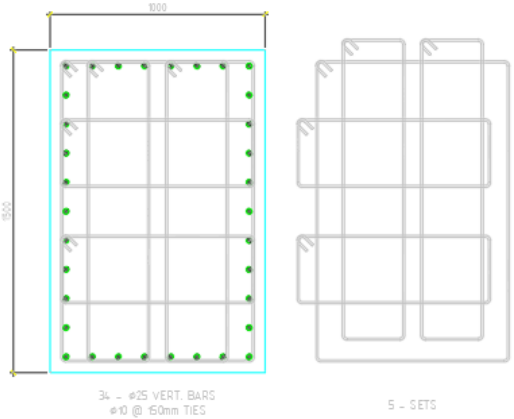
Y

Clear cover = 50

Clear Sx = 112.5

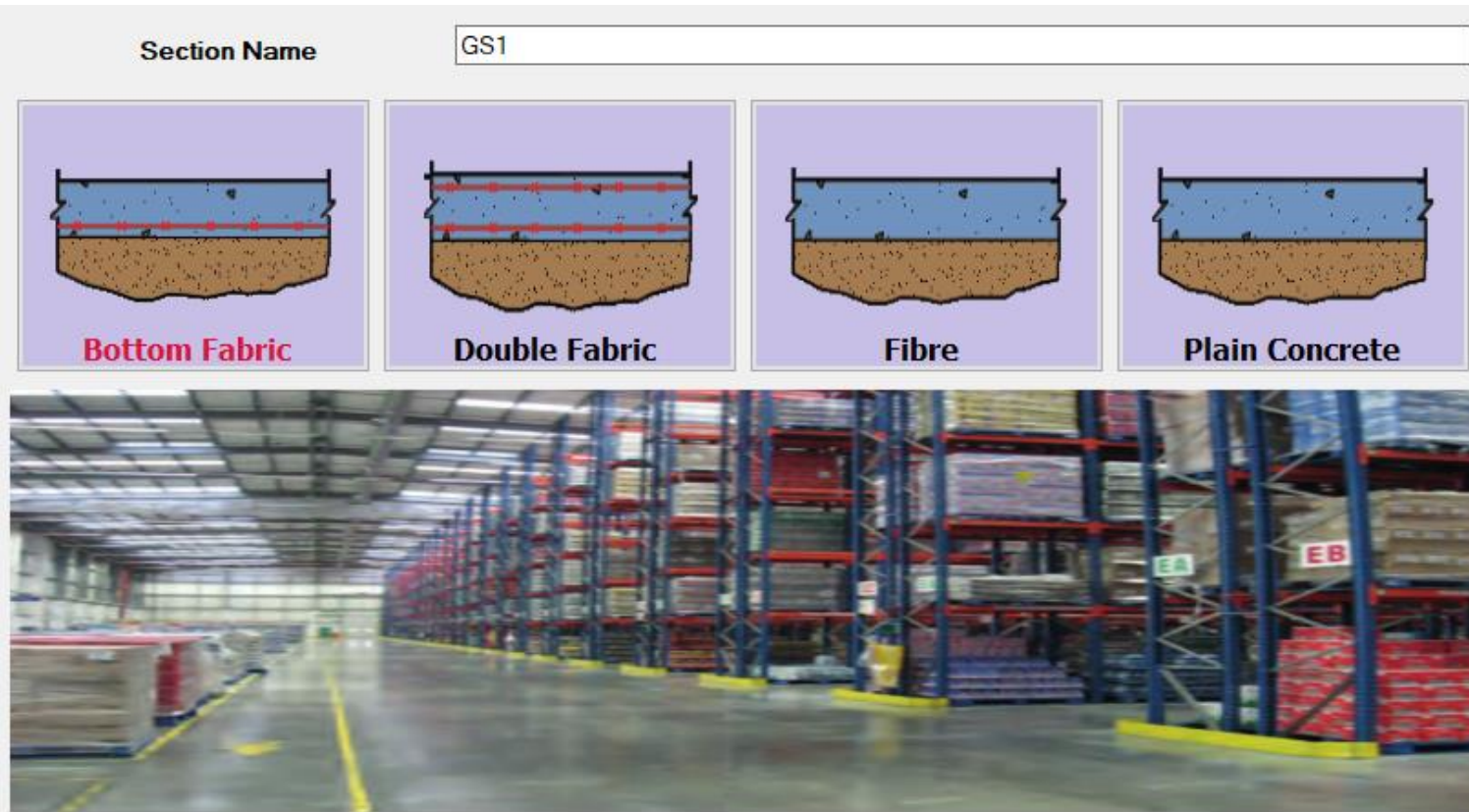
Clear Sy = 100

Property	Reference	Unit	Symbol	Formula	Value	Symbol	Formula	Value
Bottom Section					26591.84			26591.84
				Interaction Diagram - Bending Around X			Interaction Diagram - Bending Around Y	
Bresler Reciprocal Load Method:				$\phi P_n \approx \frac{1}{\frac{1}{\phi P_{ox}} + \frac{1}{\phi P_{oy}} - \frac{1}{\phi P_o}}$				
From Interaction Diagram → ϕP_o		kN	ϕP_o	Maximum axial load strength of the column with no applied moments	26591.84			
From Point A1 → ϕP_{ox}		kN	ϕP_{ox}	Maximum uniaxial load strength of the column with a moment of $\phi M_{nx} = \phi P_n e_y$	26285.03			
From Point B1 → ϕP_{oy}		kN	ϕP_{oy}	Maximum uniaxial load strength of the column with a moment of $\phi M_{ny} = \phi P_n e_x$	26370.68			

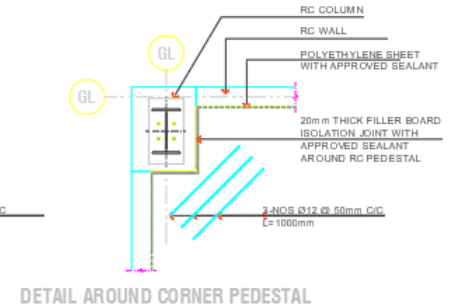
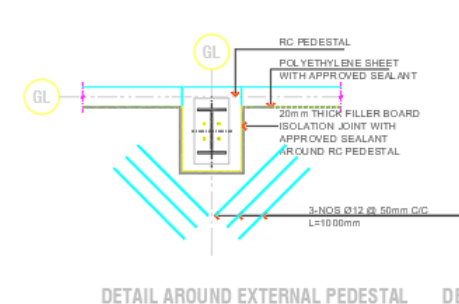
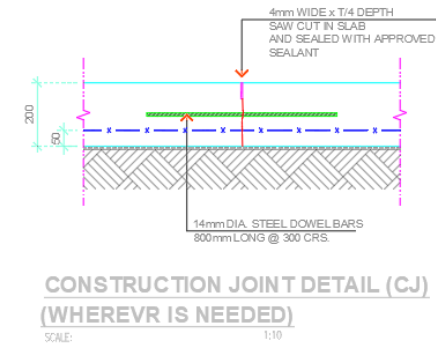


SUPPLEMENTARY REINFORCEMENT WITH MARK #

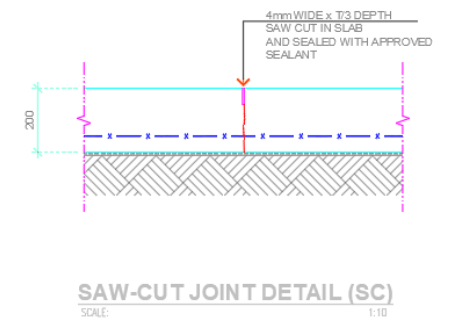
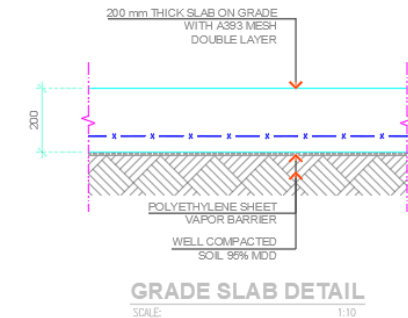
Design of Grade Slab as per TR34 4th Edition



Property	Unit	Symbol	Value	
Design slab thickness	mm	H	175	✓
Characteristic compressive concrete cube strength at 28 days	MPa	f_{cu}	40	✓
Modulus of subgrade reaction	KN/m ² /m	k	50000	✓
Yield strength of reinforcement	MPa	f_{yk}	500	✓
Bottom Fabric reinforcement			A193	✓
Bottom cover of reinforcement steel	mm	cb	50	✓
Include the reinforcement in punching		?	<input type="checkbox"/>	



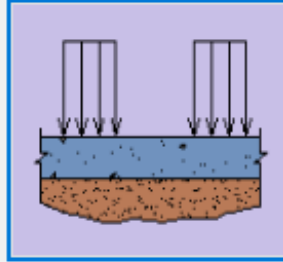
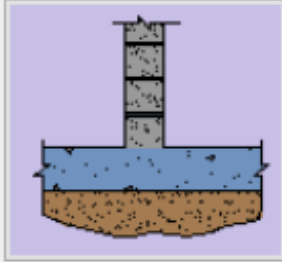
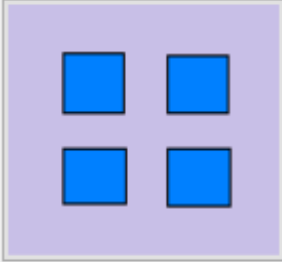
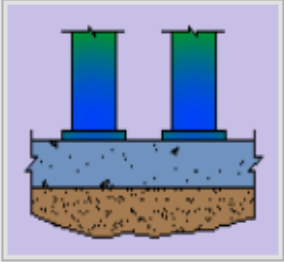
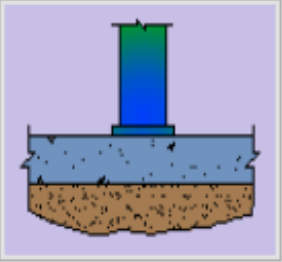
5 ADDITIONAL TOP REINFORCEMENT AROUND PEDESTAL



Design of Grade Slab as per TR34 4th Edition

Adding Load

Select Load Case



Single Point Load

Dual Point Loads

Quadruple Point Loads

Line Load

Uniformly Distributed Load

List of Design Load

Delete Load

Modify

Check All Loads In The List

☒ Show Result in Default Order

Show Grade Slab Properties

Back

Uniformly Distributed Loads

Uniformly Distributed Load Name


UDL # 1

Unfactored Uniformly Distributed Load

W


0

kN/m2



$\frac{\pi}{2\lambda}$

= 1.64 m



$\frac{\pi}{\lambda}$

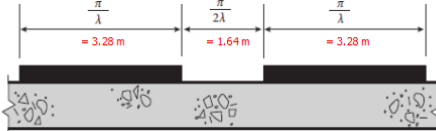
= 3.28 m

$\frac{\pi}{2\lambda}$

= 1.64 m

$\frac{\pi}{\lambda}$

= 3.28 m



This case gives maximum positive (sagging) moment

This case gives maximum negative (hogging) moment

Cancel

Add Load

Show Result

Dual Point Loads

Dual Point Loads Name

DualLoad # 1

Location of Load

☒ Internal
☐ Near Edge
☐ Near Joint

Lx

y

x

y

x

Lx

y

x

y

x

Effective base plate dimensions

x

100

mm

y

125

mm

Lx

300

mm

Calc x and y

Type of Single load

☒ Racking Leg
☐ Mezzanine Column
☐ Other

Unfactored Racking Leg Load

Racking leg load

90

kN

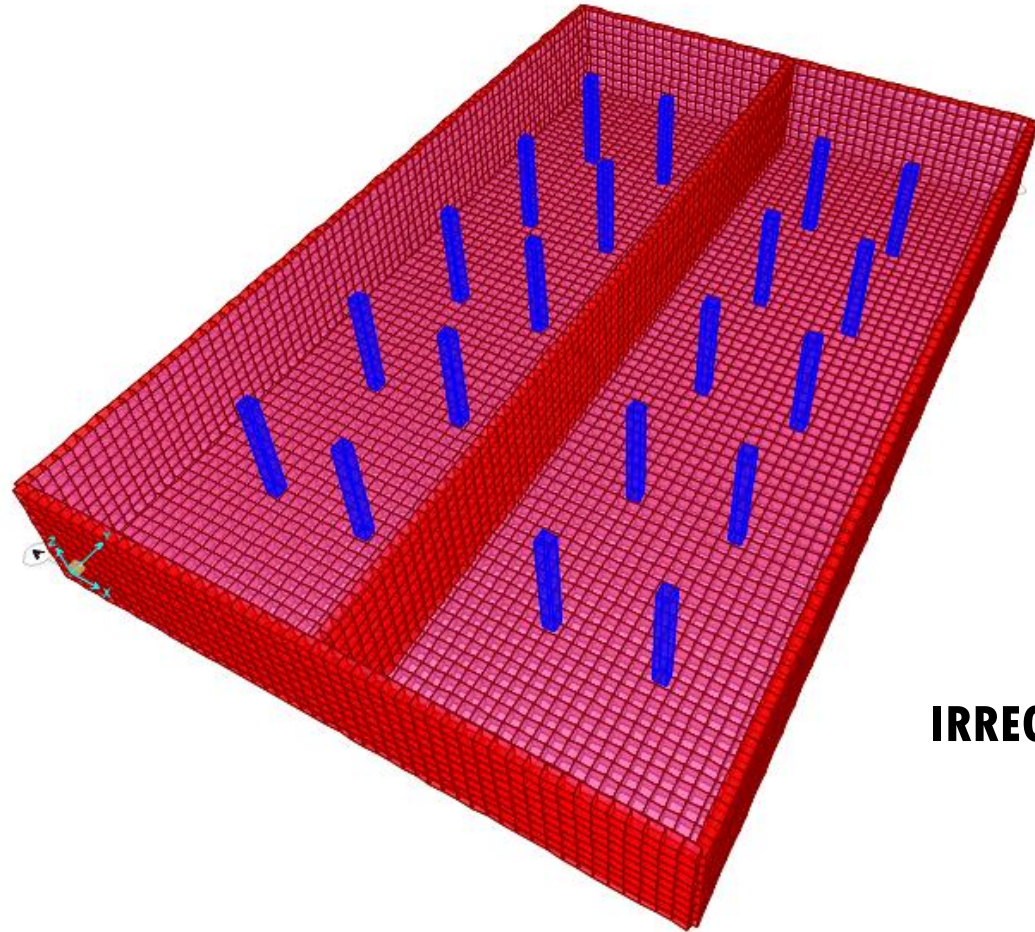
Errors List

Cancel

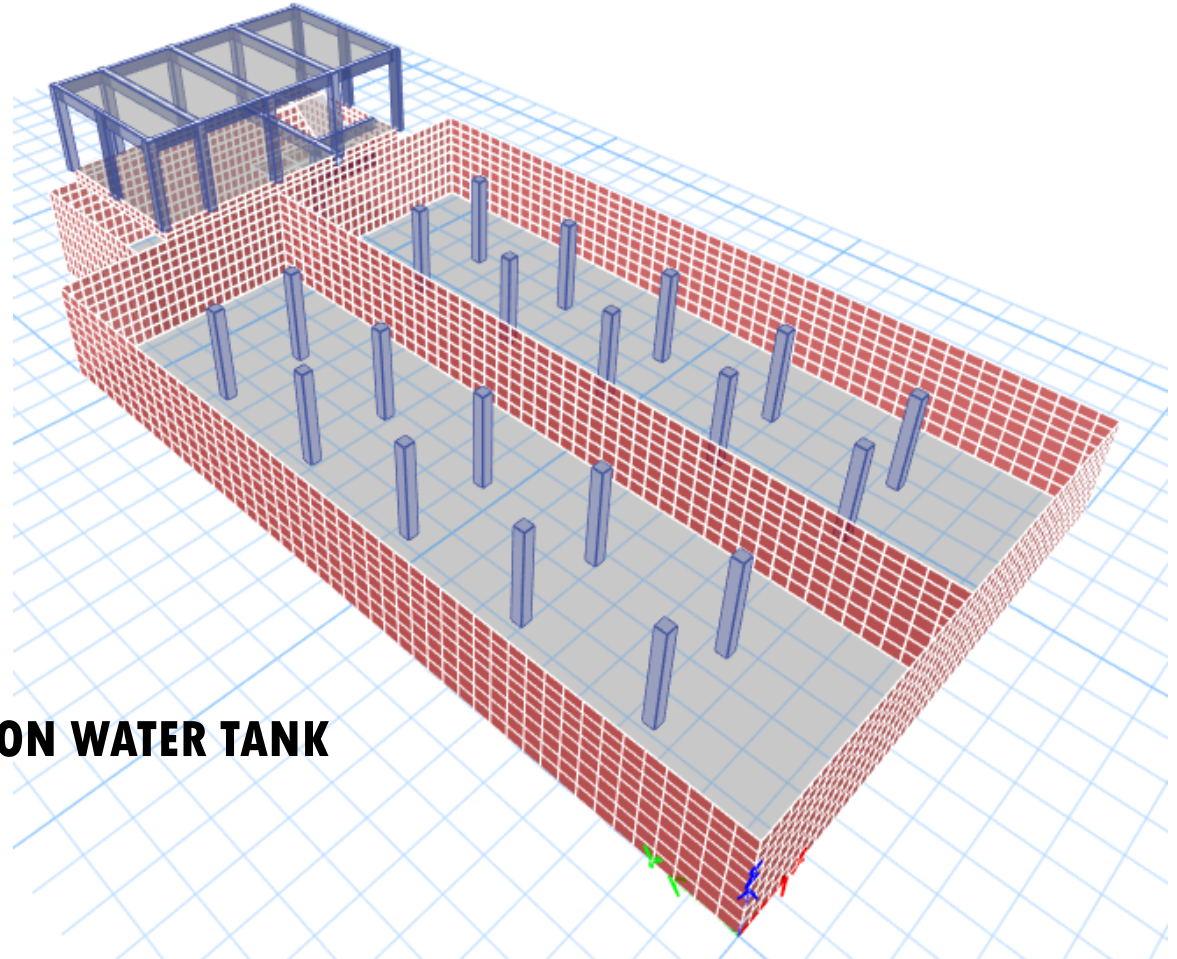
Add Load

Show Result

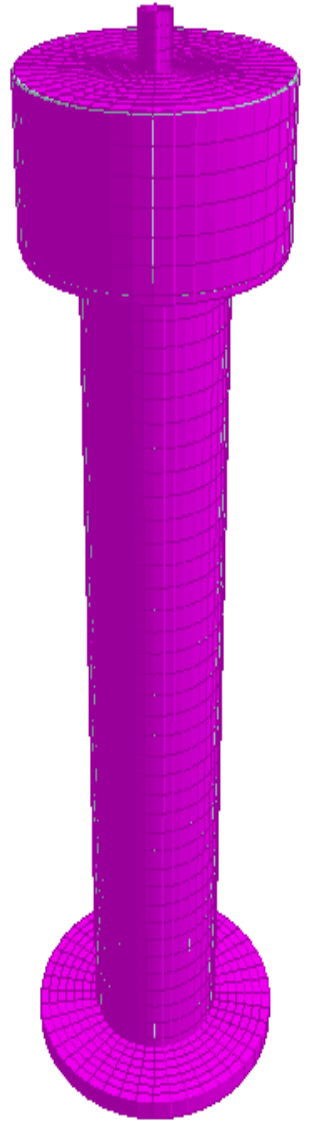
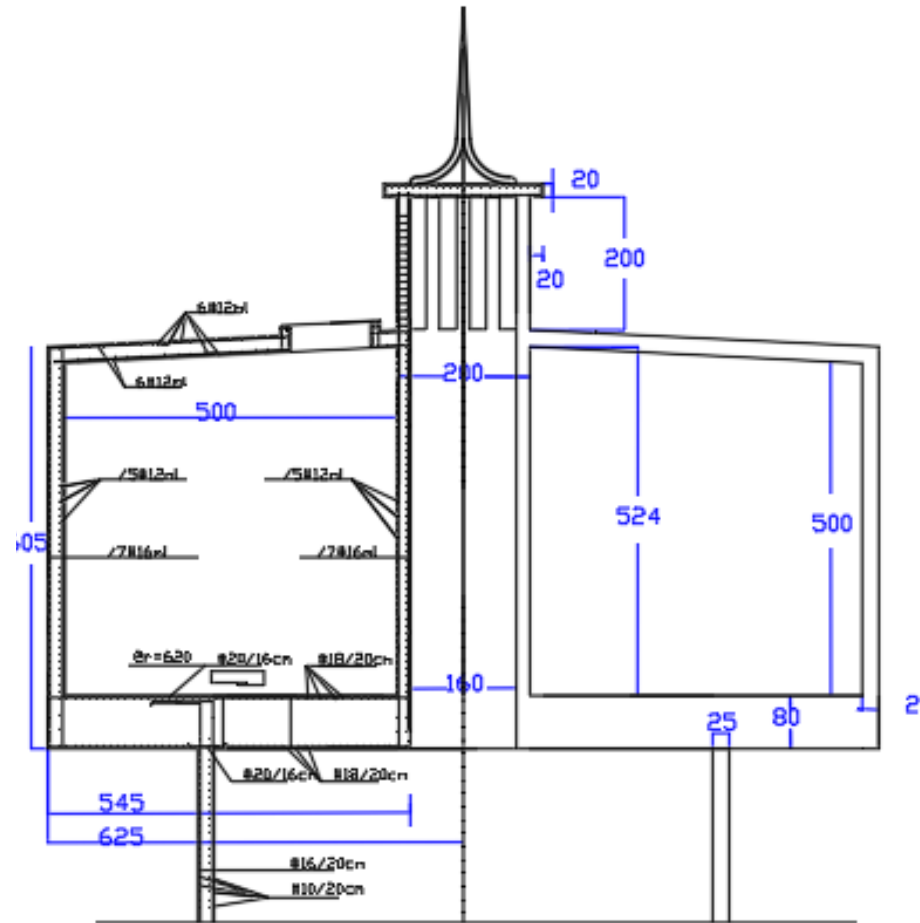
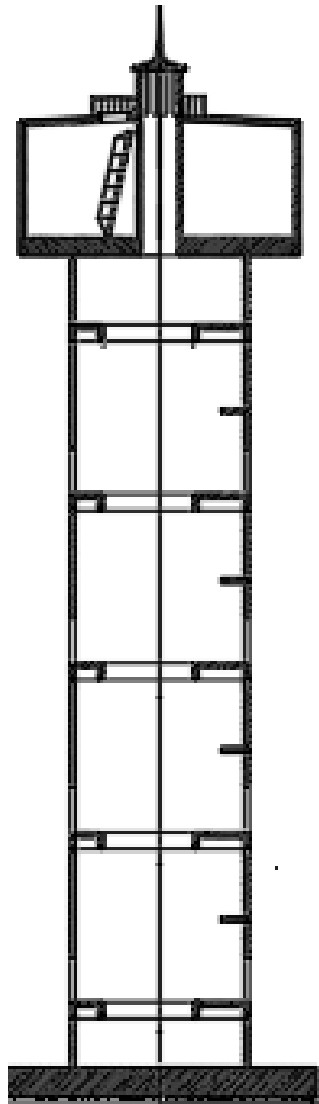
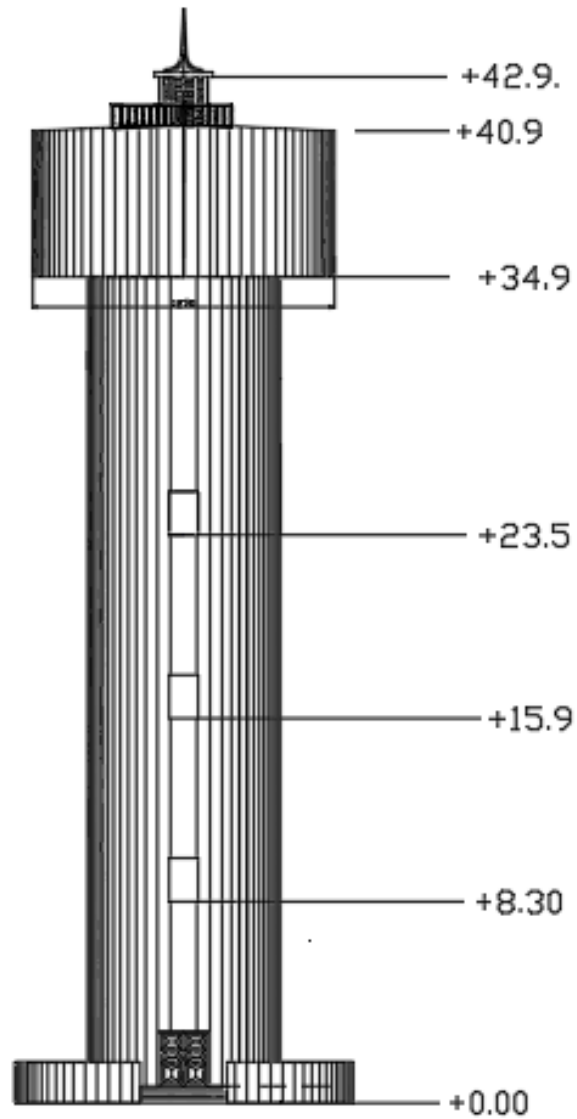
Design of Underground Water Tank



IRREGATION WATER TANK



Design of Elevated Water Tank



Design of Chimney Foundation

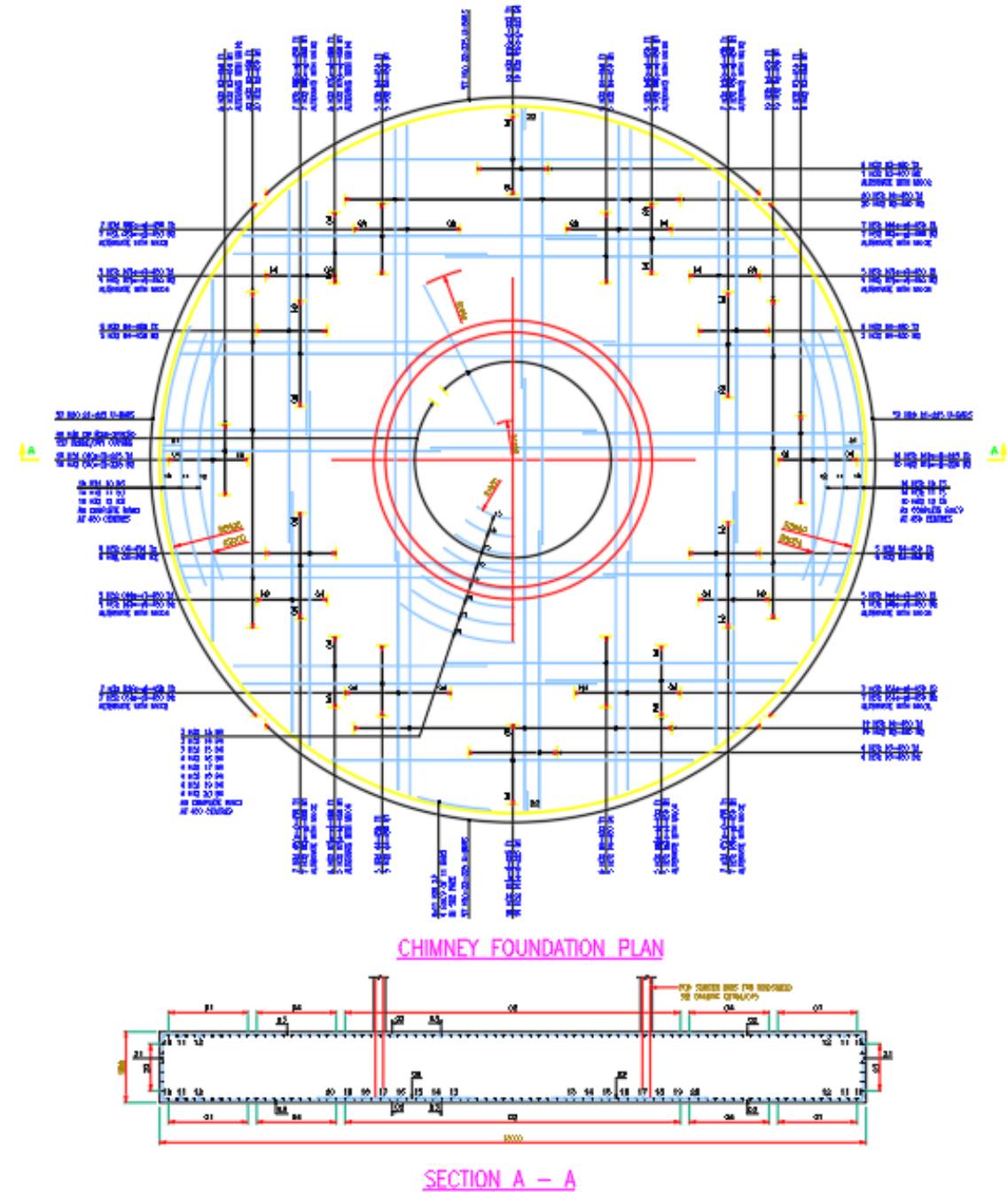
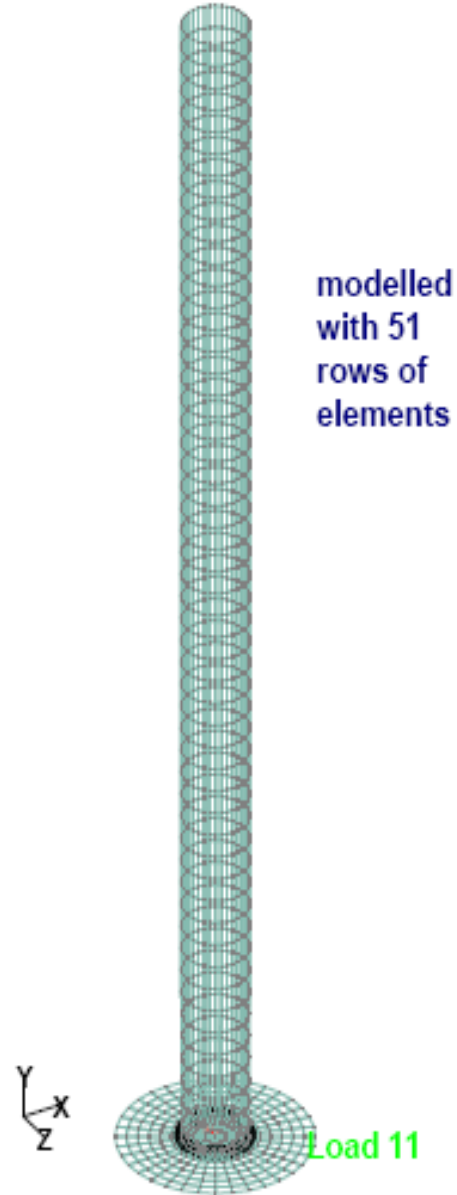
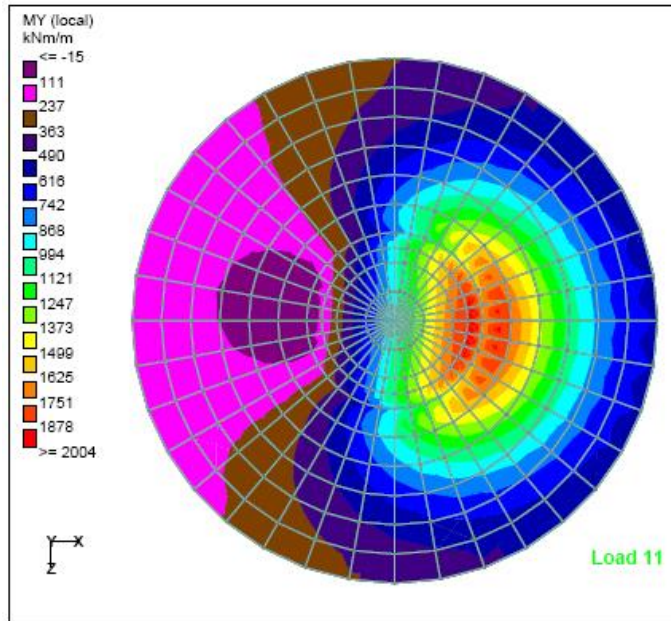
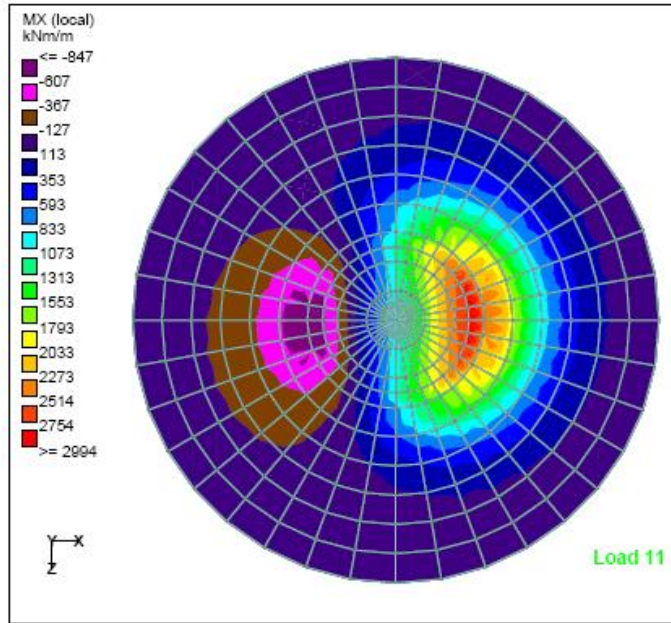


Figure 1 is a detailed architectural plan of a 1000 sq ft office building. The plan shows a rectangular building with a central corridor and several rooms. The rooms are labeled with numbers and names: 101 (RECEPTION), 102 (OFFICE), 103 (OFFICE), 104 (OFFICE), 105 (OFFICE), 106 (OFFICE), 107 (OFFICE), 108 (OFFICE), 109 (OFFICE), 110 (OFFICE), 111 (OFFICE), 112 (OFFICE), 113 (OFFICE), 114 (OFFICE), 115 (OFFICE), 116 (OFFICE), 117 (OFFICE), 118 (OFFICE), 119 (OFFICE), 120 (OFFICE), 121 (OFFICE), 122 (OFFICE), 123 (OFFICE), 124 (OFFICE), 125 (OFFICE), 126 (OFFICE), 127 (OFFICE), 128 (OFFICE), 129 (OFFICE), 130 (OFFICE), 131 (OFFICE), 132 (OFFICE), 133 (OFFICE), 134 (OFFICE), 135 (OFFICE), 136 (OFFICE), 137 (OFFICE), 138 (OFFICE), 139 (OFFICE), 140 (OFFICE), 141 (OFFICE), 142 (OFFICE), 143 (OFFICE), 144 (OFFICE), 145 (OFFICE), 146 (OFFICE), 147 (OFFICE), 148 (OFFICE), 149 (OFFICE), 150 (OFFICE), 151 (OFFICE), 152 (OFFICE), 153 (OFFICE), 154 (OFFICE), 155 (OFFICE), 156 (OFFICE), 157 (OFFICE), 158 (OFFICE), 159 (OFFICE), 160 (OFFICE), 161 (OFFICE), 162 (OFFICE), 163 (OFFICE), 164 (OFFICE), 165 (OFFICE), 166 (OFFICE), 167 (OFFICE), 168 (OFFICE), 169 (OFFICE), 170 (OFFICE), 171 (OFFICE), 172 (OFFICE), 173 (OFFICE), 174 (OFFICE), 175 (OFFICE), 176 (OFFICE), 177 (OFFICE), 178 (OFFICE), 179 (OFFICE), 180 (OFFICE), 181 (OFFICE), 182 (OFFICE), 183 (OFFICE), 184 (OFFICE), 185 (OFFICE), 186 (OFFICE), 187 (OFFICE), 188 (OFFICE), 189 (OFFICE), 190 (OFFICE), 191 (OFFICE), 192 (OFFICE), 193 (OFFICE), 194 (OFFICE), 195 (OFFICE), 196 (OFFICE), 197 (OFFICE), 198 (OFFICE), 199 (OFFICE), 200 (OFFICE). The plan also shows a north arrow and a scale bar.

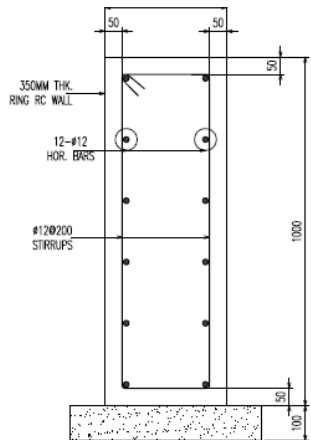
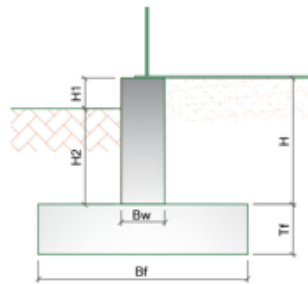
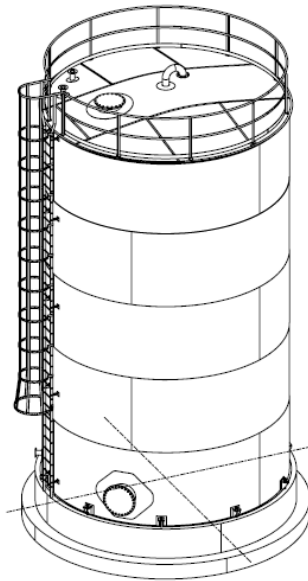


Diagram Description: This cross-section diagram illustrates the structural details of a retaining wall and its foundation. The wall is shown with a ring RC wall, anchor bolts, and an isolation joint. The foundation consists of a lean concrete slab, vapour barrier, well compacted soil, and soil improvement. Elevation markers and dimensions are provided for reference.

Labels and Dimensions:

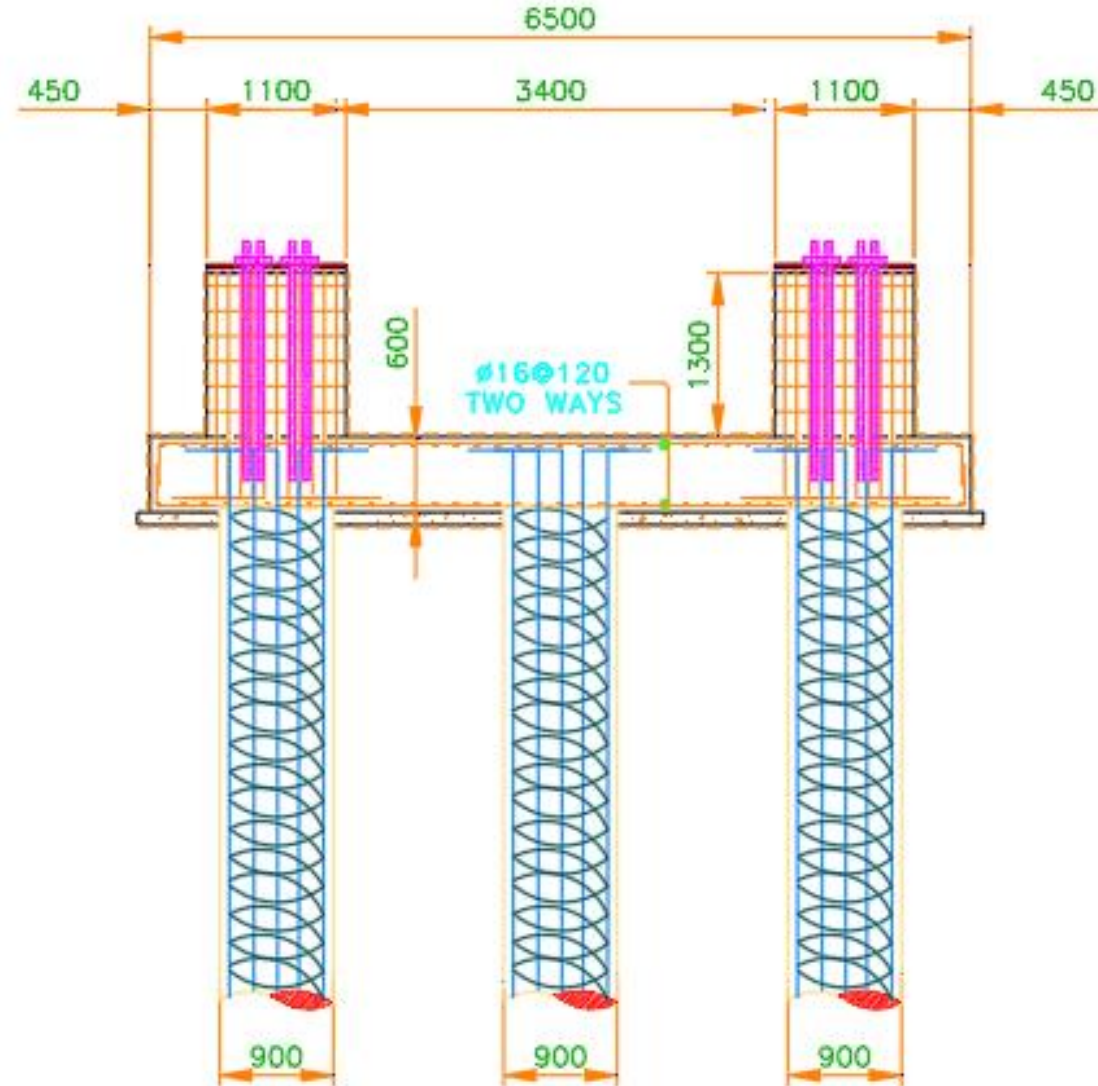
- Top Labels:** SURFACE OF SILO, 500, 175, 175, 100, 75, 250, 300, 100, 1250.
- Left Elevation Markers:**
 - EL.+5.25 TO 5.35M T.O. R.C. WALL
 - EL.+5.00 TO 5.10M S.F.L.
 - EL.+4.43M N.G.L.
 - EL.+4.15M B.O.L.C.
 - EL.+4.00M B.O.SOIL IMPROVEMENT
- Internal Labels:**
 - ANCHOR BOLTS #25MM
 - RING RC WALL 350MM THK. X 1000MM DEPTH
 - MASTIC SEALANT
 - ISOLATION JOINT
 - 125MM THK. GRADE SLAB
 - SOIL IMPROVEMENT
 - BITUMINOUS PAINT
 - LEAN CONCRETE 100MM
 - VAPOUR BARRIER 300 MICRON
 - WELL COMPACTED SOIL (95 %)
- Dimensions:**
 - Vertical dimensions: 250, 125, 1000, 625, 100, 150.
 - Horizontal dimensions: 100, 350, 100.

The diagram illustrates a cross-section of a bridge pier with the following details:

- Dimensions:**
 - Overall width: 4350 mm.
 - Top slab width: 500 mm on each side of the central core.
 - Core width: 175 mm.
 - Core offset from centerline: 100 mm.
 - Core height: 280 mm.
 - Soil improvement height: 250 mm.
- Structural Components:**
 - 350MM THK. RING RC WALL
 - MASTIC SEALANT
 - ISOLATION JOINT
 - SLAB ON GRADE 125MM THK.
 - ANCHOR BOLTS $\varnothing 25\text{MM}$ (8 NOS.)
 - SLAB ON GRADE 125MM THK.
 - SOIL IMPROVEMENT
 - BRICKWORK
 - CONCRETE
 - W.D. COMPACTED SOIL (1:1.5)
- Elevations:**
 - EL.+5.00 TO 5.10M S.F.L.
 - EL.+4.43M N.G.L.
 - EL.+4.00M B.O.SOIL IMPROVEMENT
 - EL.+5.20 TO 5.35M T.O. R.C. WALL
 - EL.+5.00 TO 5.10M S.F.L.
 - EL.+4.43M N.G.L.
 - EL.+4.15M B.O.L.C.

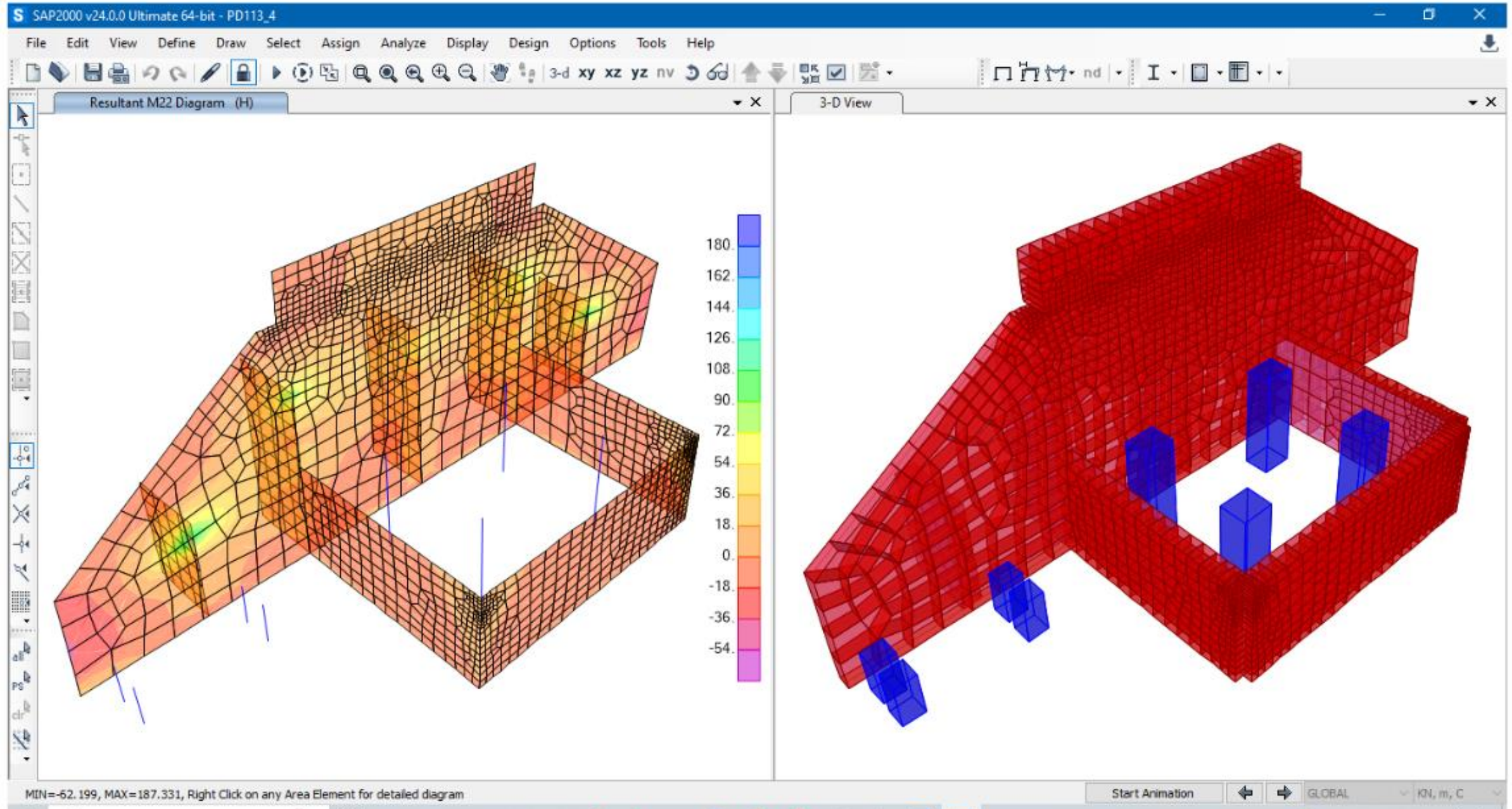
S1 **SECTION OF TK-1**
SCALE: 1:30MTS.

Design of Steel Tower Foundation

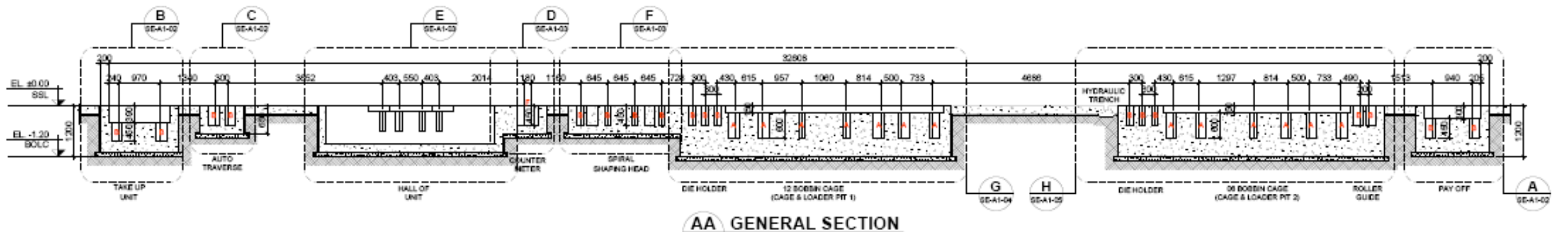
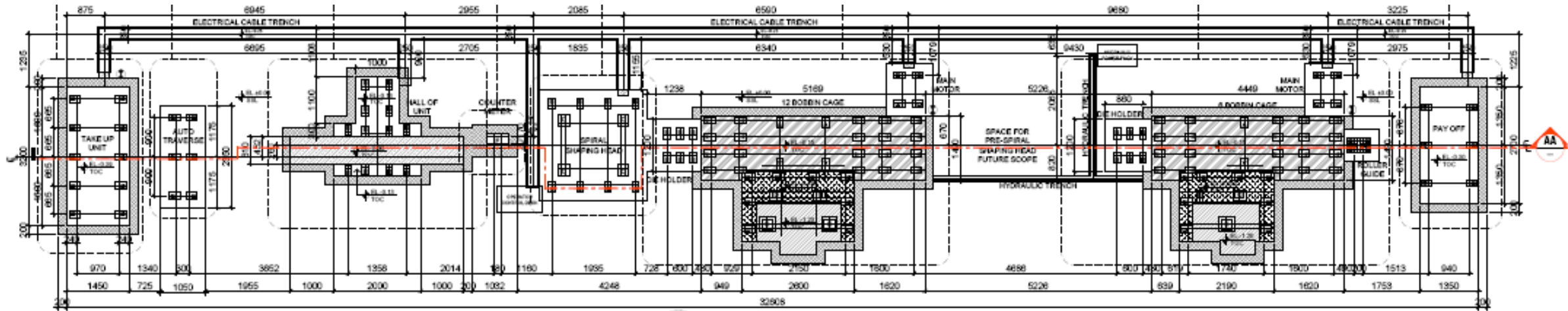
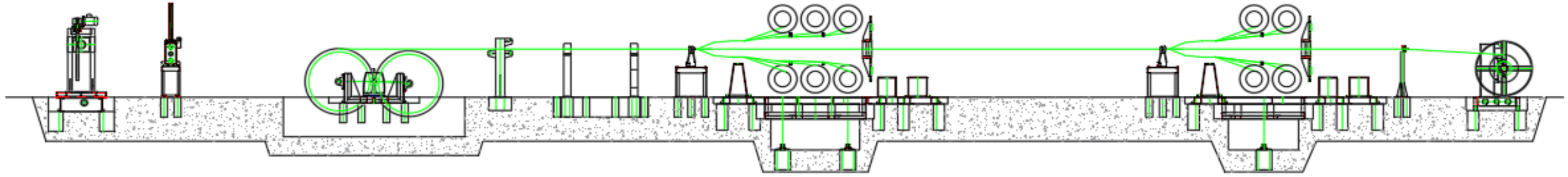


RADAR TOWER FOUNDATION

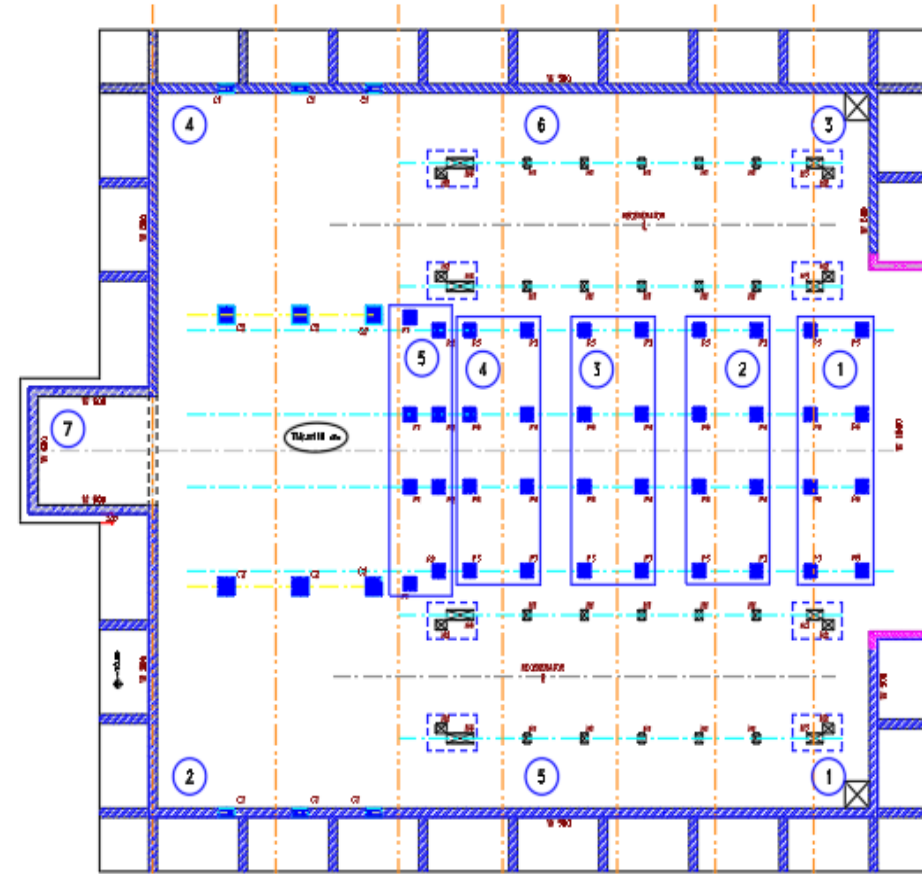
Design of Production Line Foundation



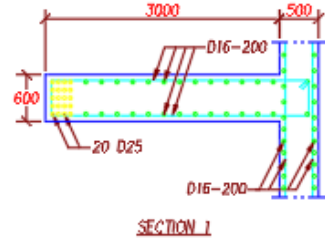
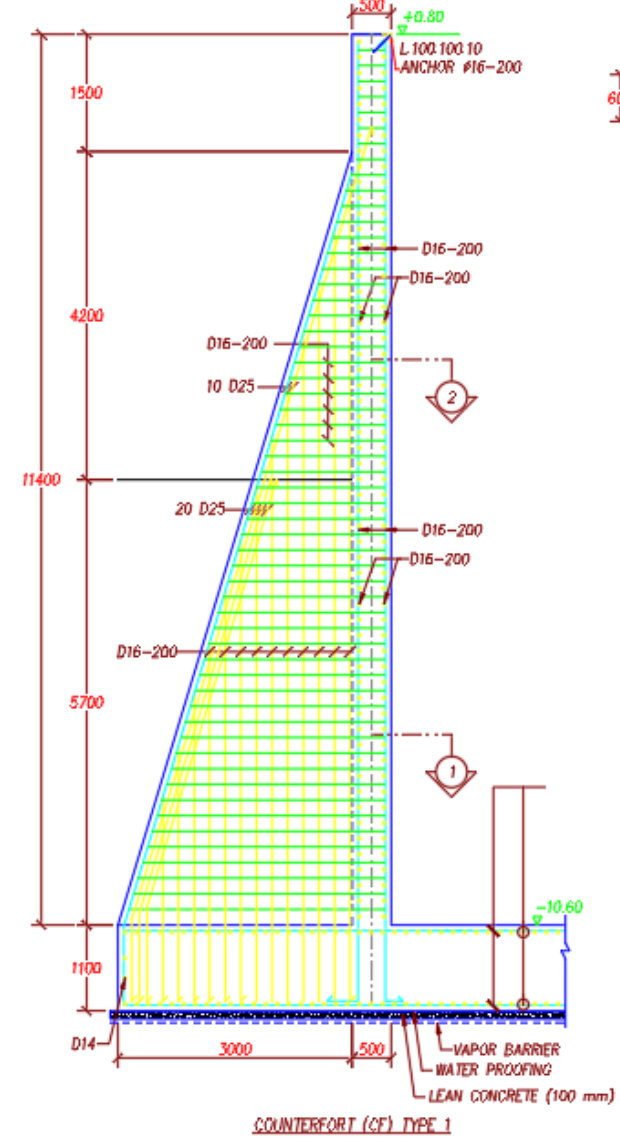
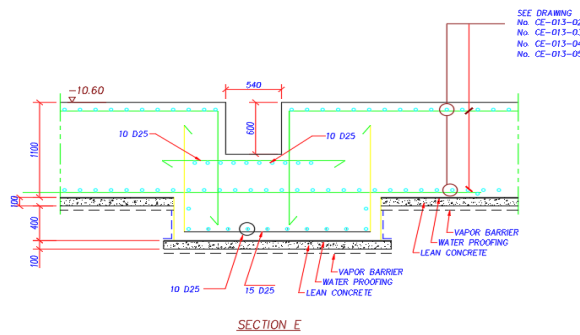
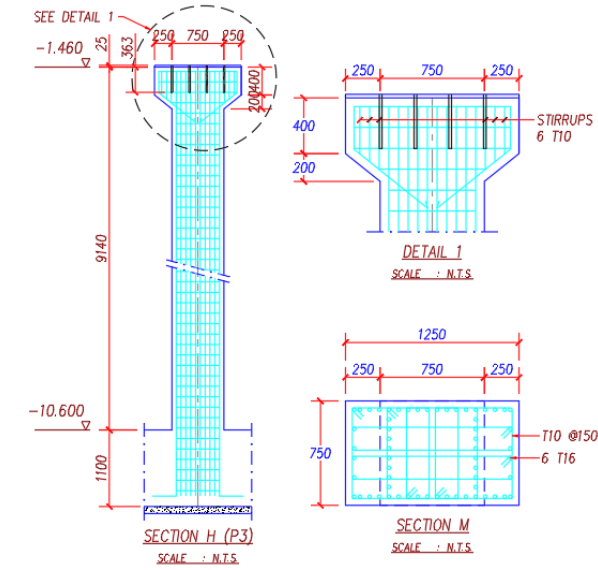
Design of Production Line Foundation



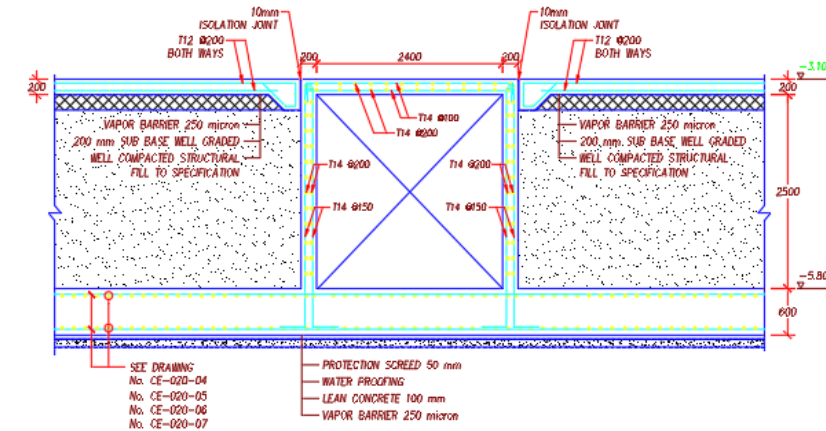
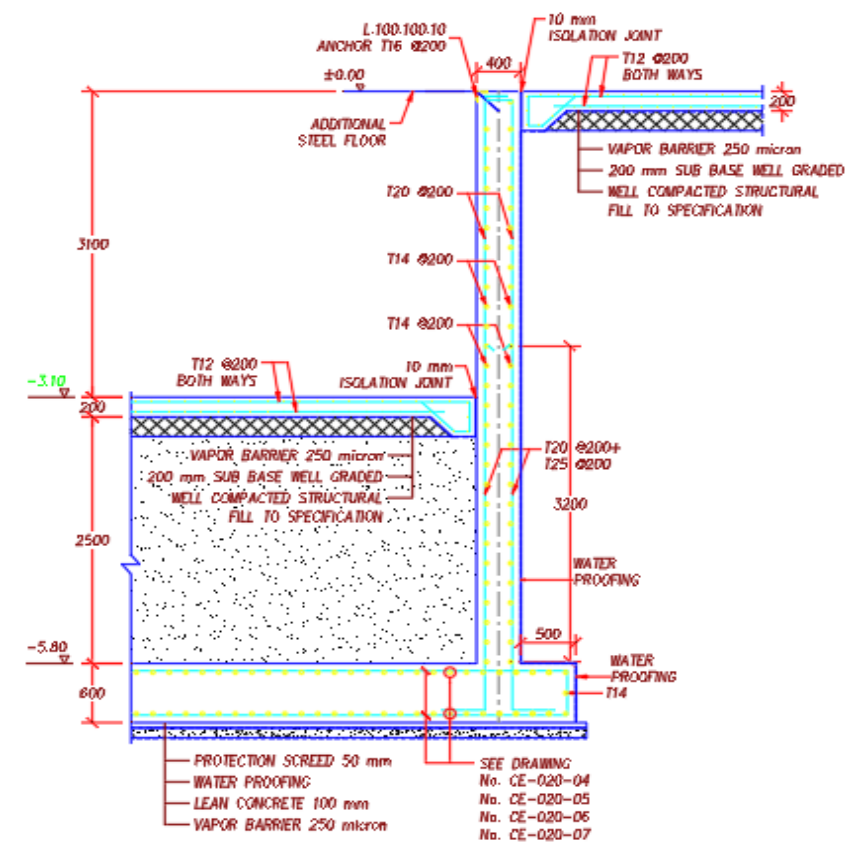
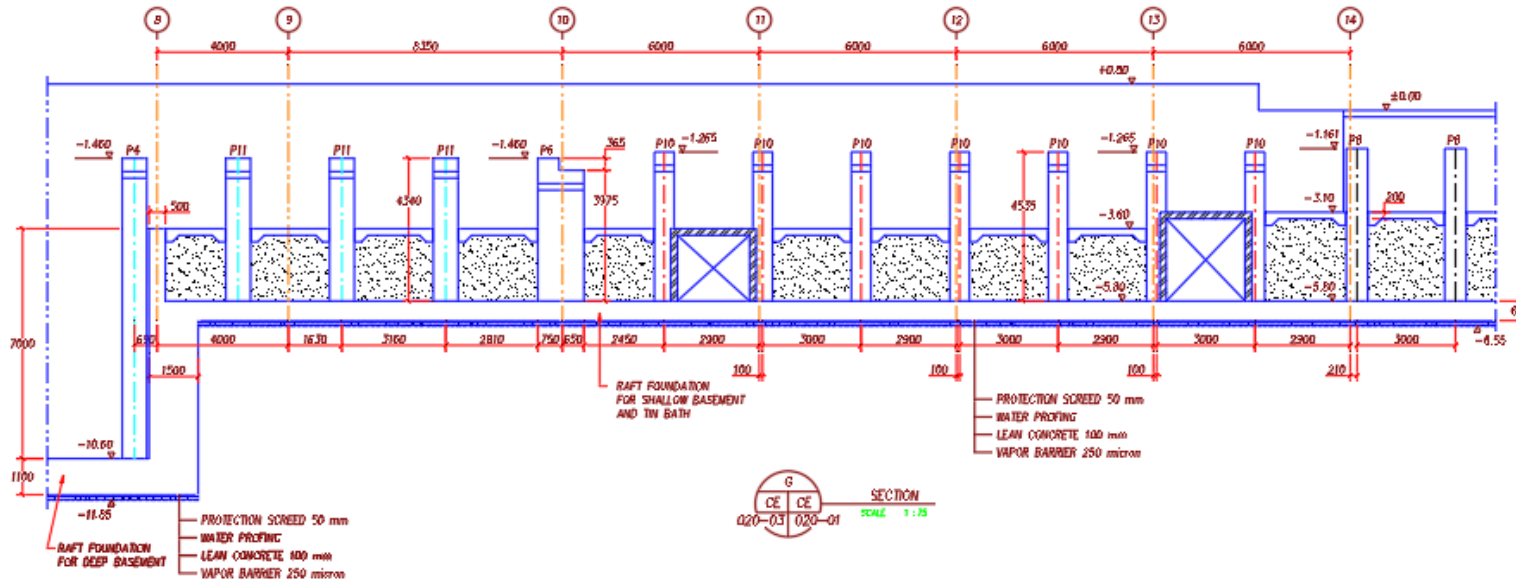
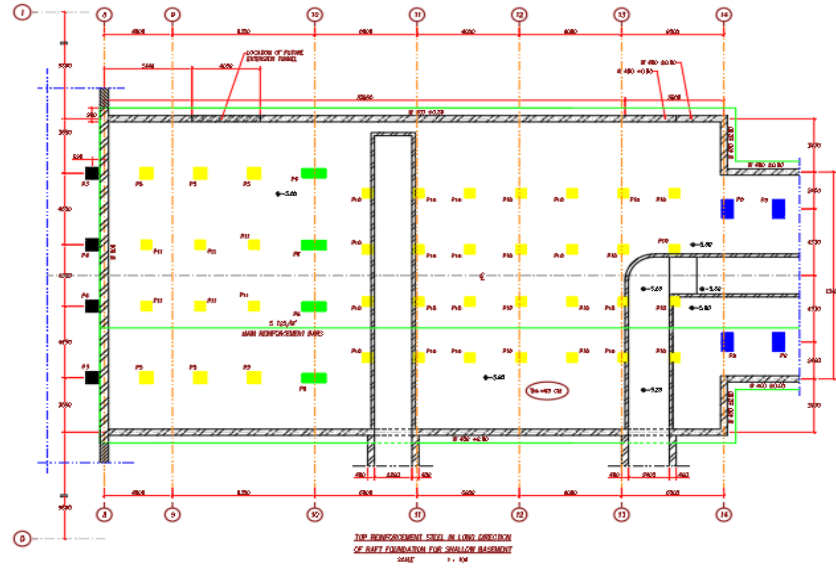
Design of Production Line Foundation



DEEP BASEMENT WALL & PIER SEQUENCE (UPPER)

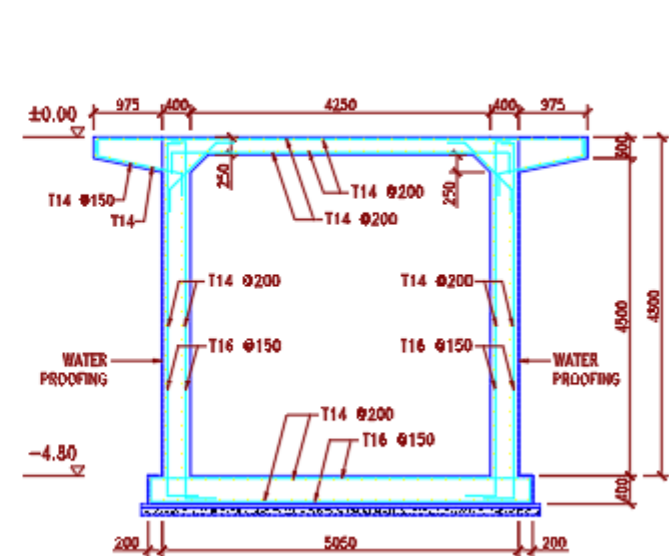
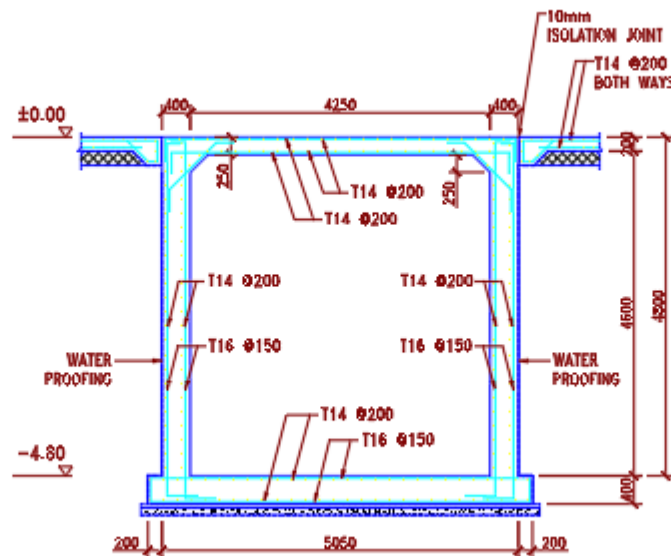


Design of Production Line Foundation

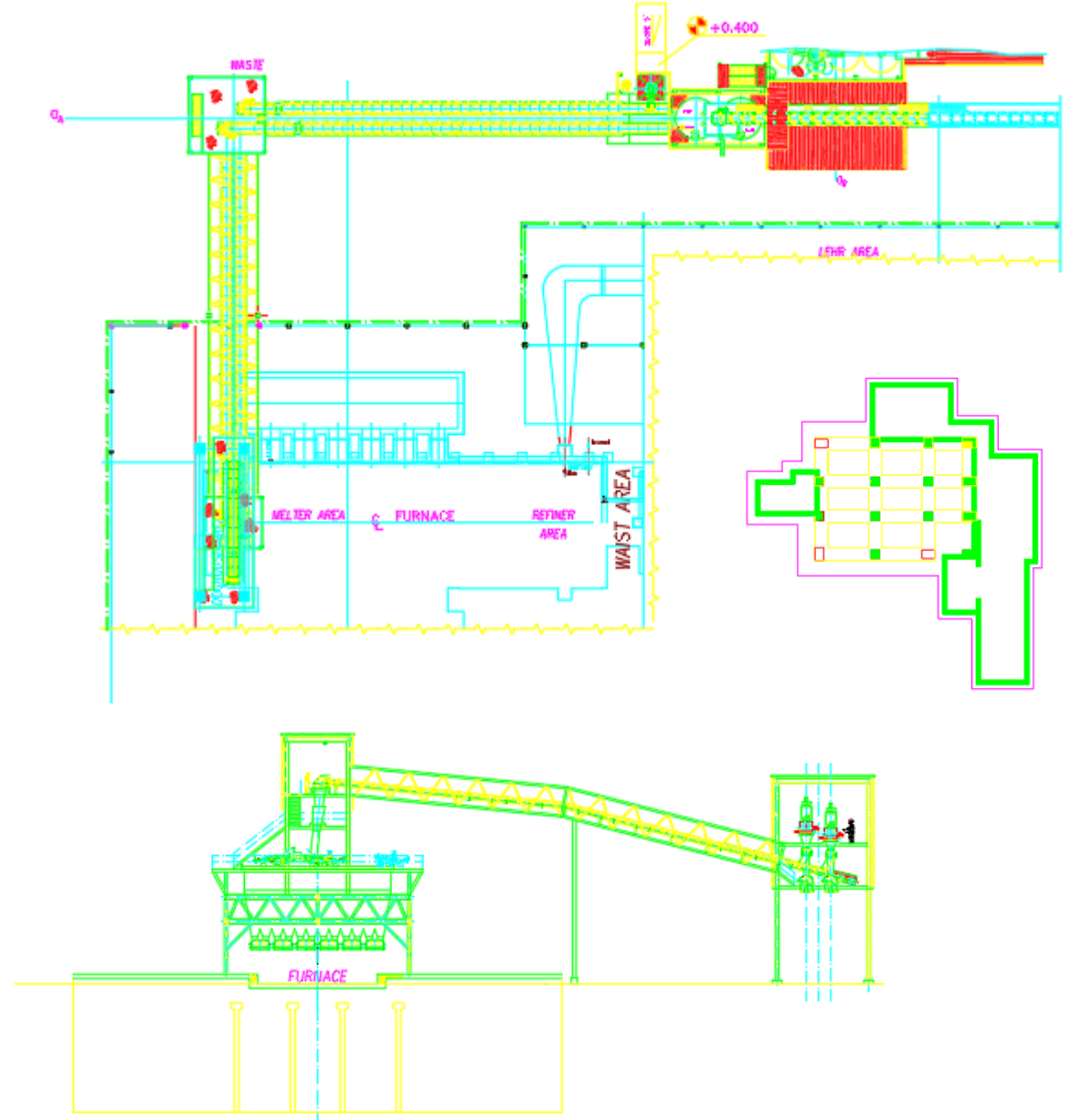
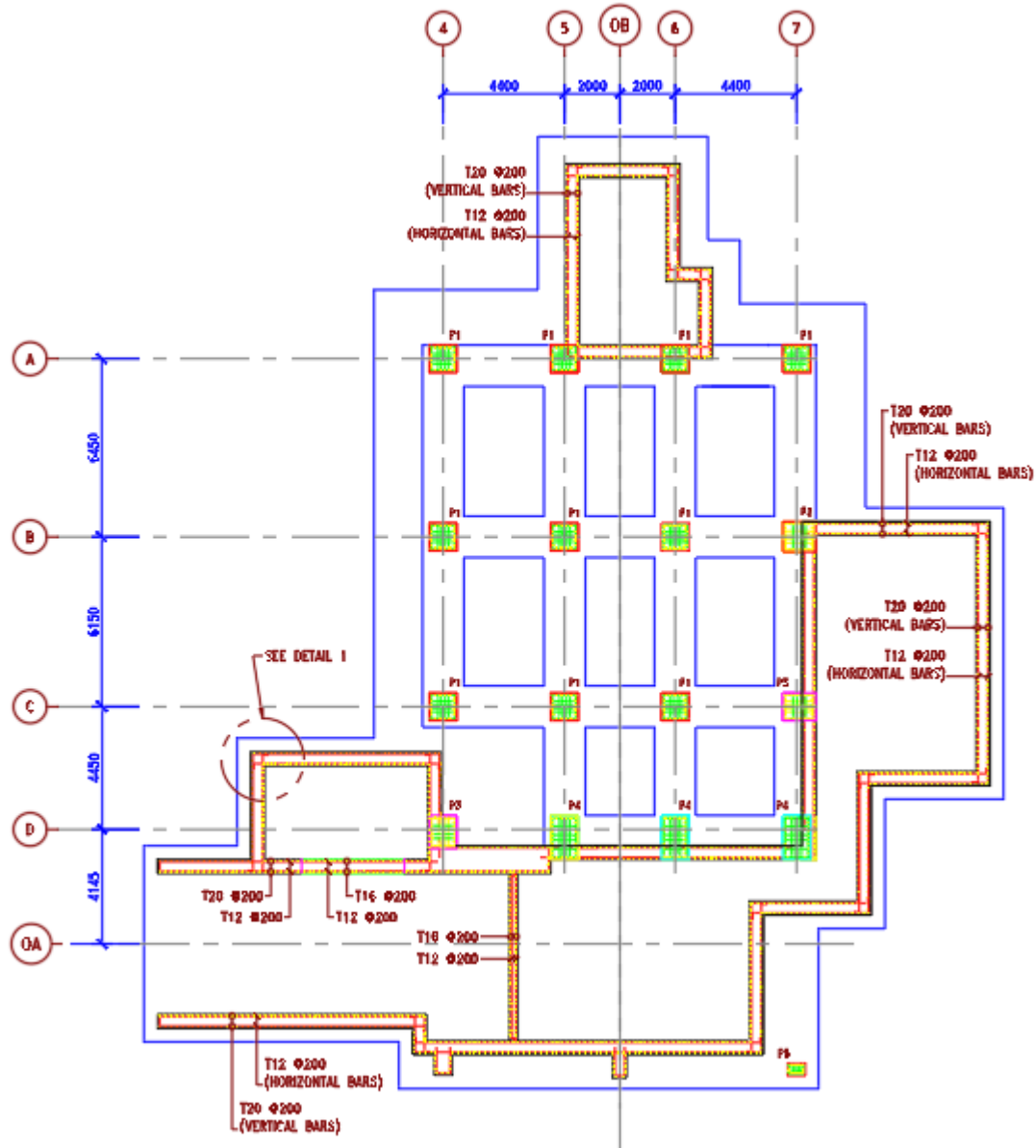


The diagrams show the cross-section of a rectangular water tank with the following details:

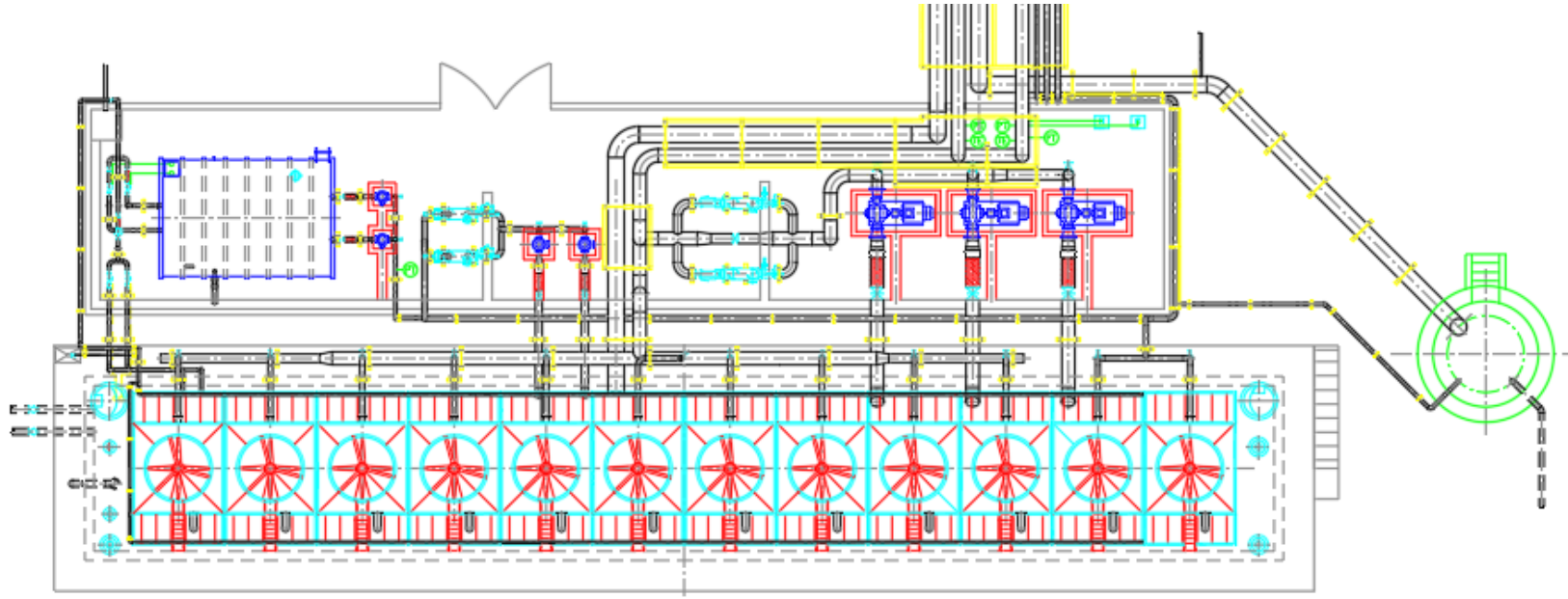
- Dimensions:**
 - Overall width: 5650 mm
 - Overall height: 4500 mm
 - Base thickness: 400 mm
 - Top slab thickness: 200 mm
 - Internal width: 5050 mm
 - Internal height: 4100 mm
- Reinforcement:**
 - Top slab: T14 ϕ 200
 - Bottom slab: T14 ϕ 200
 - Vertical walls: T14 ϕ 200
 - Horizontal walls: T16 ϕ 150
 - Internal vertical walls: T25 ϕ 150
- Isolation Joints:** 10mm ISOLATION JOINT at the top of the walls.
- Water Proofing:** Indicated on the exterior walls and base.
- Labels:** L100.100.10 AROUND, L200.200.20, T14 ϕ 200 BOTH WAYS, T14 ϕ 150, T16 ϕ 150, T25 ϕ 150, T14 ϕ 200, T16 ϕ 150, T25 ϕ 150, WATER PROOFING, 10mm ISOLATION JOINT, T14 ϕ 200 BOTH WAYS.



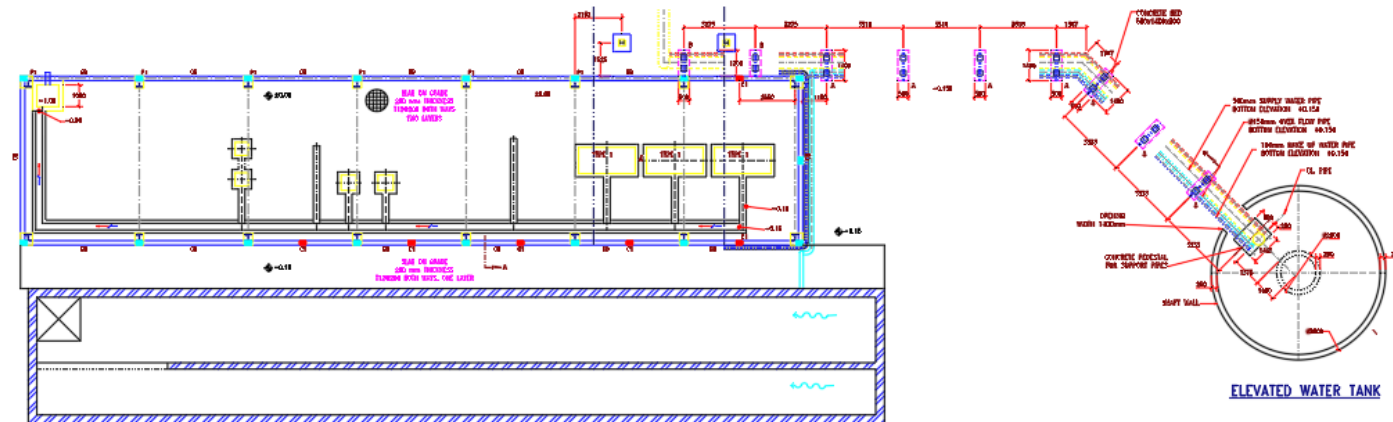
Design of Production Line Foundation



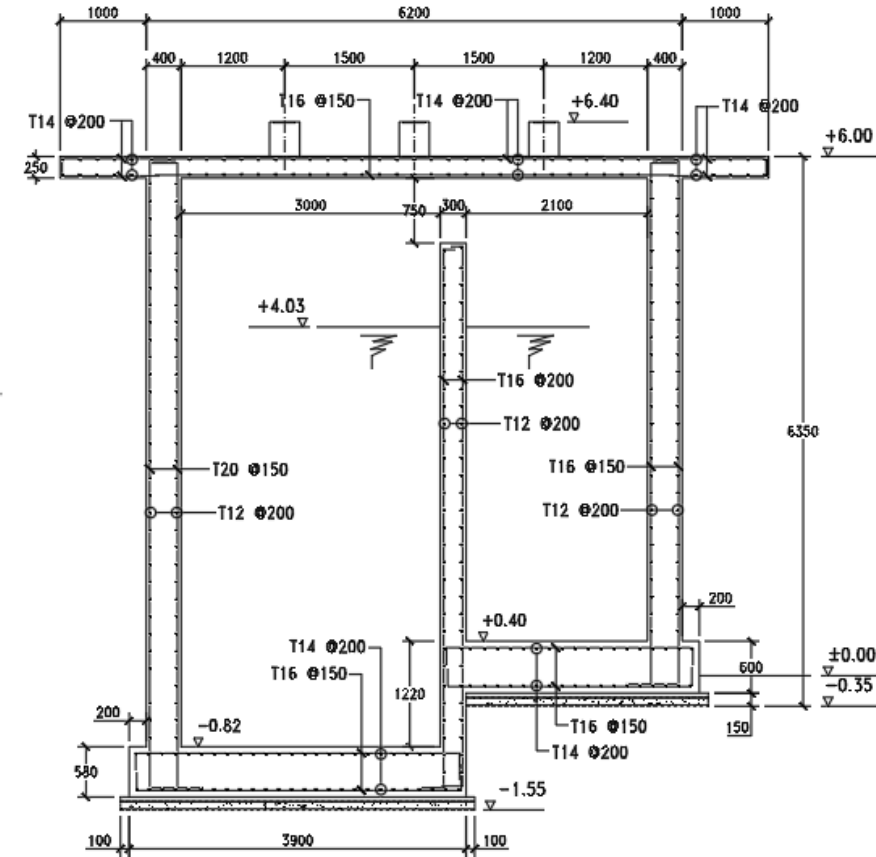
Design of Production Line Foundation



A COOLING WATER PIPES, COOLING TOWER & PUMPS LAYOUT PLAN
GP-424-01 SCALE 1:100



ELEVATED WATER TANK



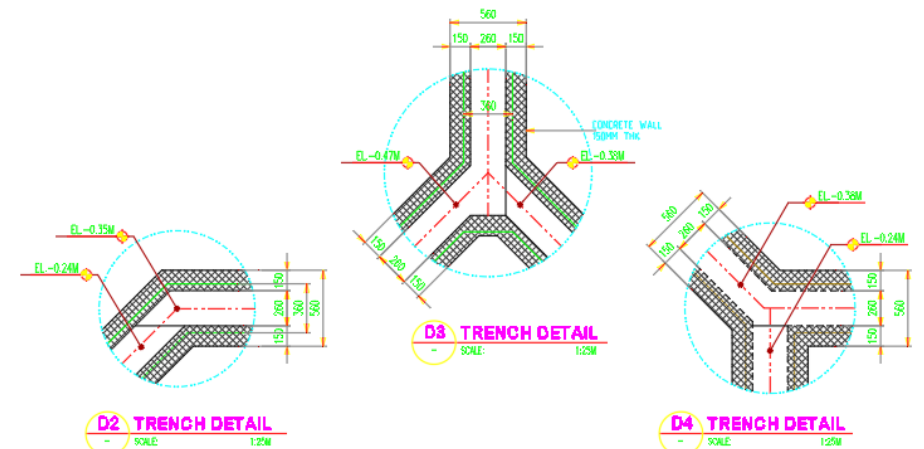
The image displays two architectural drawings for a building foundation and floor plan.

Top Drawing (Plan View): This drawing shows the layout of the building's floor and foundation. It includes a grid of columns and beams. Key features include:

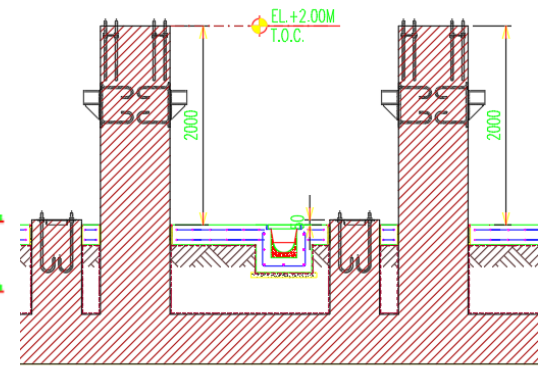
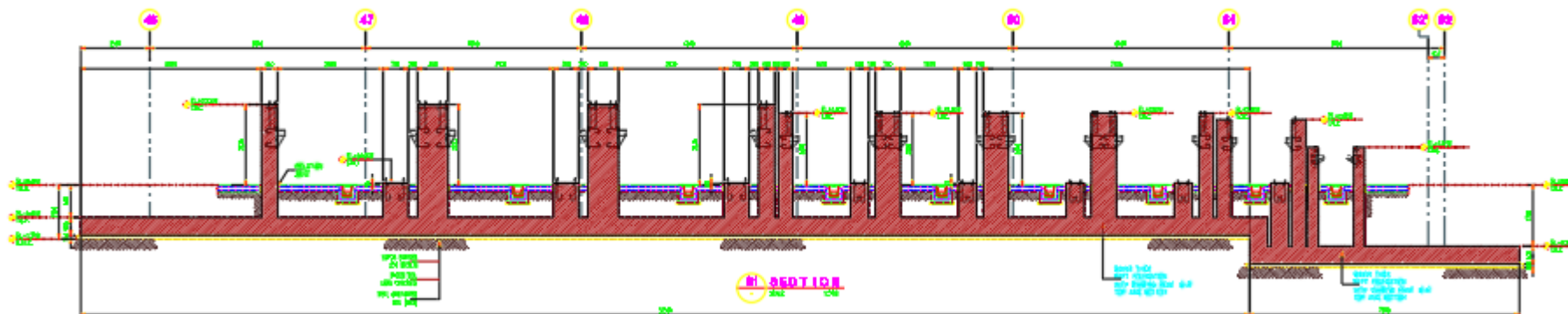
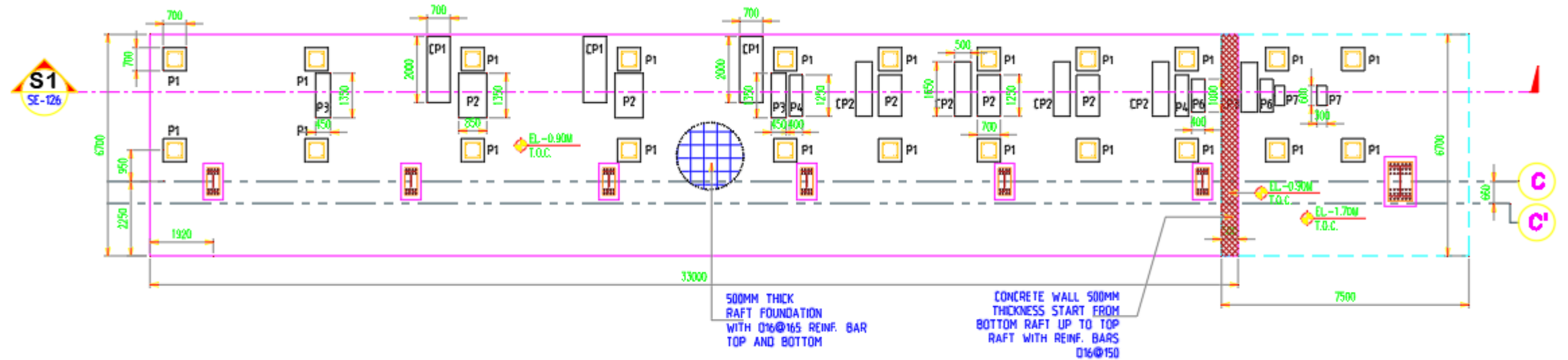
- Columns:** Represented by small squares with crosshairs, arranged in a grid.
- Beams:** Represented by lines connecting the columns.
- Annotations:**
 - S1:** Marked at specific locations.
 - ISOLATION JOINT (TYR):** Indicated along the beams.
 - WATER STOPPING WELL SEE DETAIL-01:** A specific detail callout.
 - SEE DETAIL-02, 03, 04:** Other detail callouts.
- Dimensions:** Various numerical values are provided for column spacing and beam lengths.

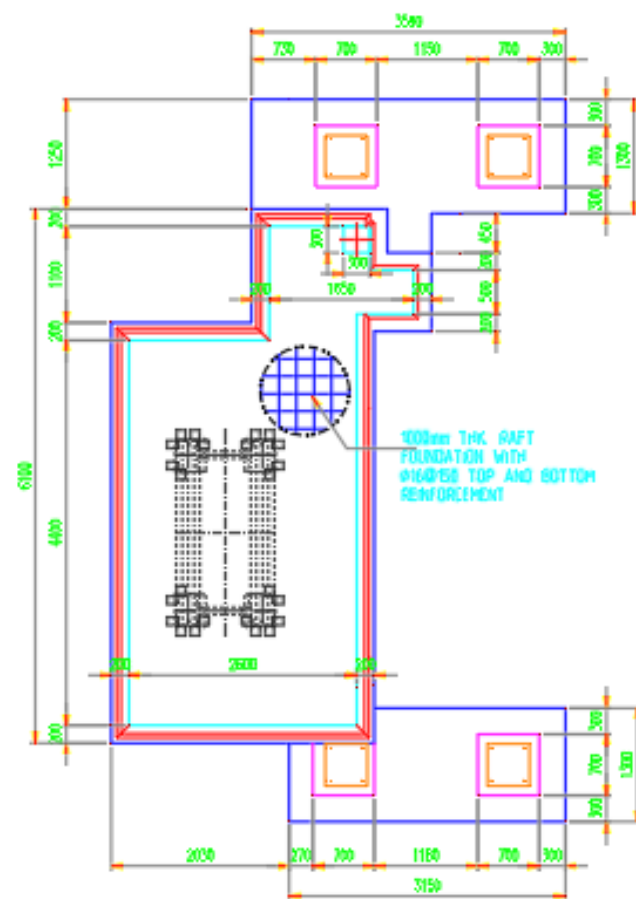
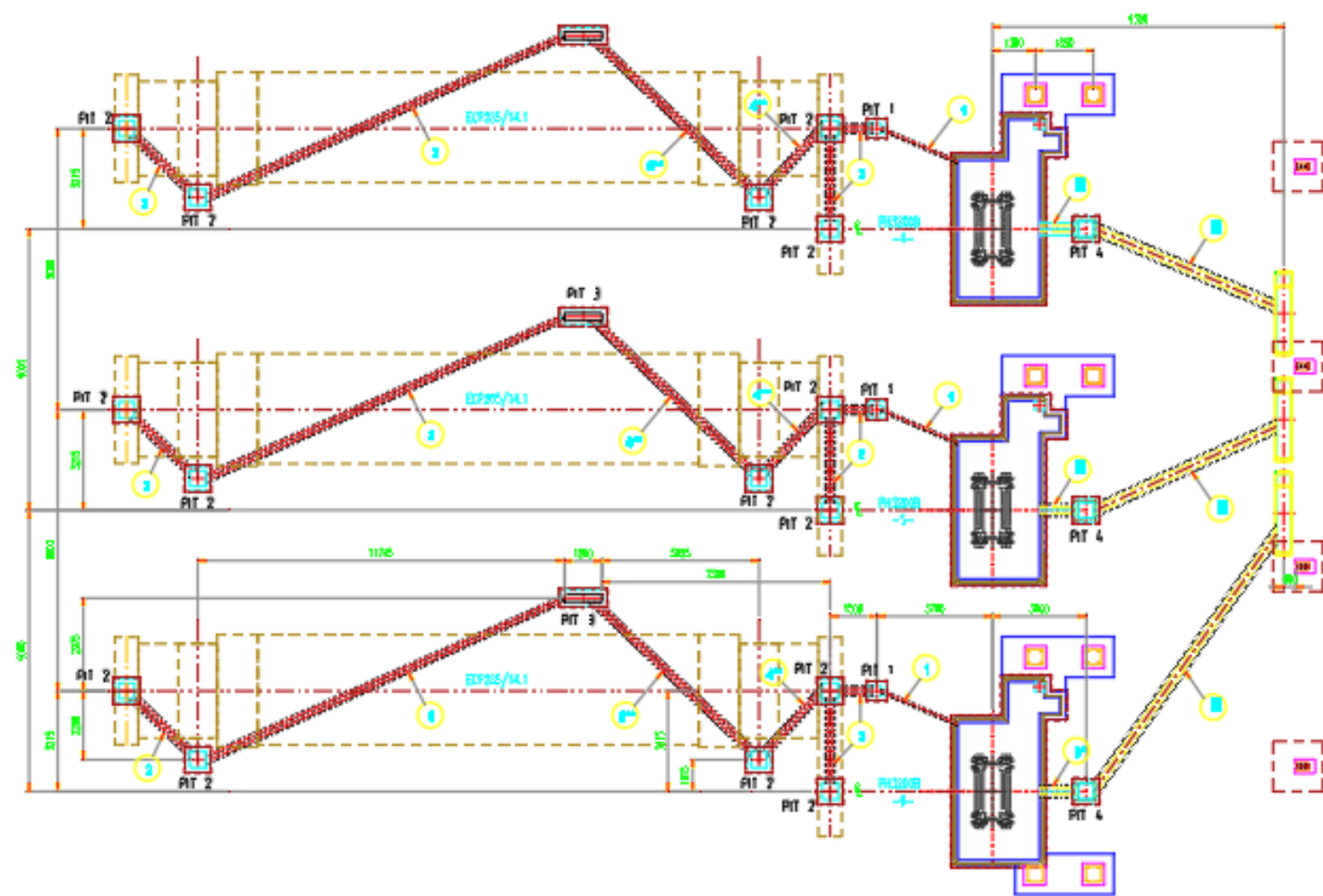
Bottom Drawing (S3 SECTION): This is a cross-section of the foundation, showing the relationship between the building structure and the ground.

- Structure:** Shows the foundation walls, beams, and the building floor above.
- Dimensions:** Vertical dimensions indicate the height of the foundation walls and the depth of the foundation below the ground level.
- Material Specifications:**
 - WALLS:** 250 MCM.
 - FLOOR TOP:** LEAN CONCRETE.
 - WELL COMPACTED:** 200 MCM.
- Ground Level:** Indicated by a dashed line.
- Section Label:** S3 SECTION.
- Scale:** 1:500.



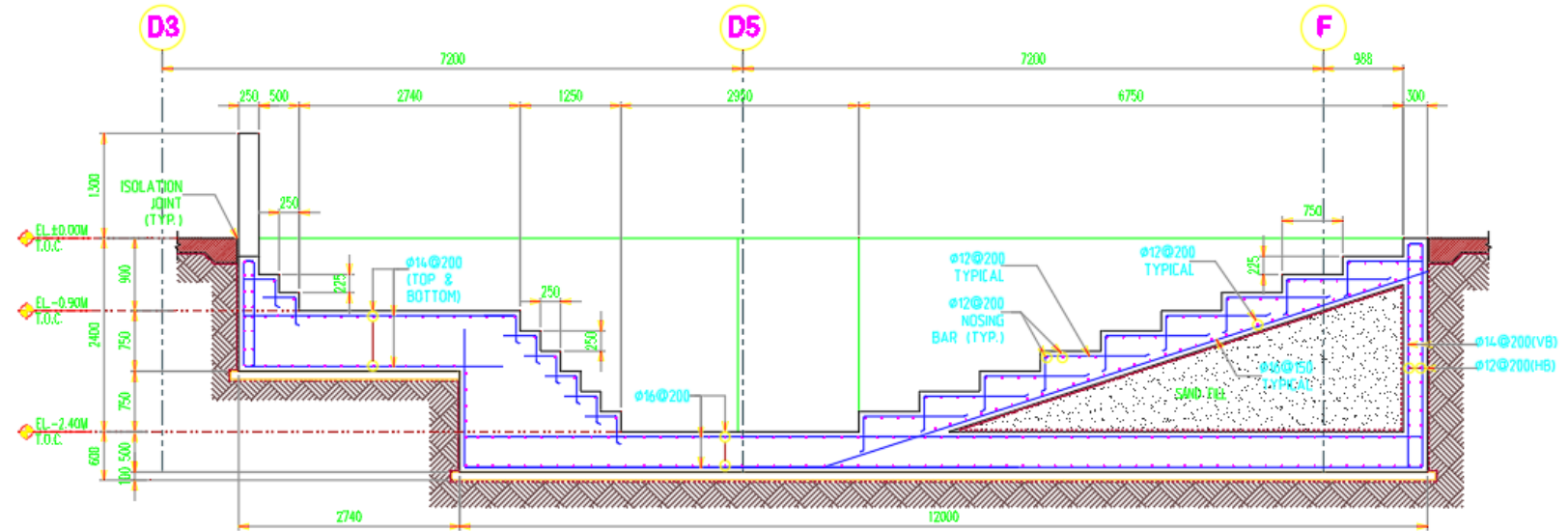
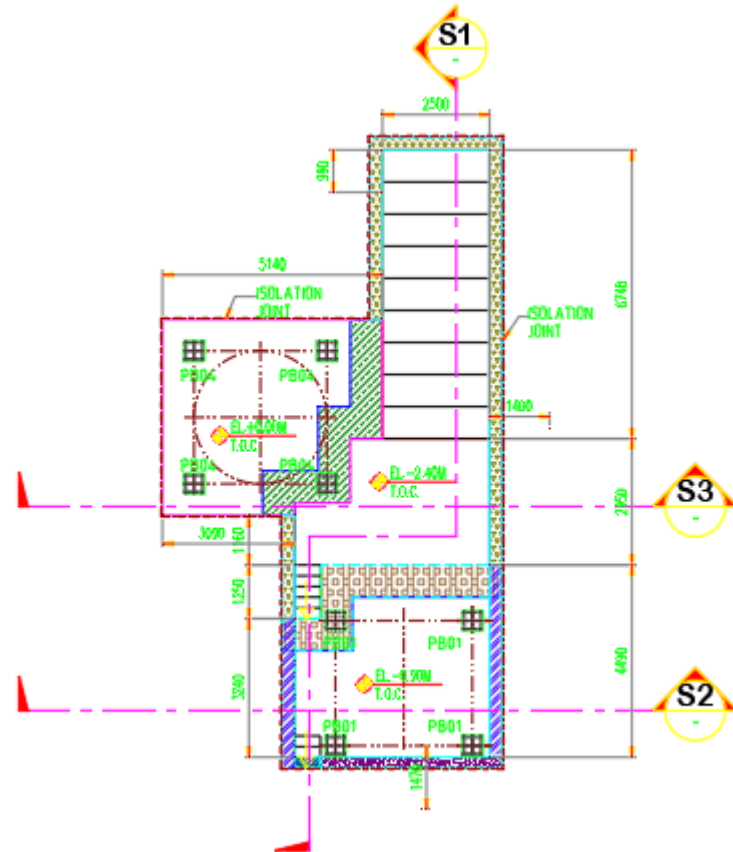
Design of Production Line Foundation



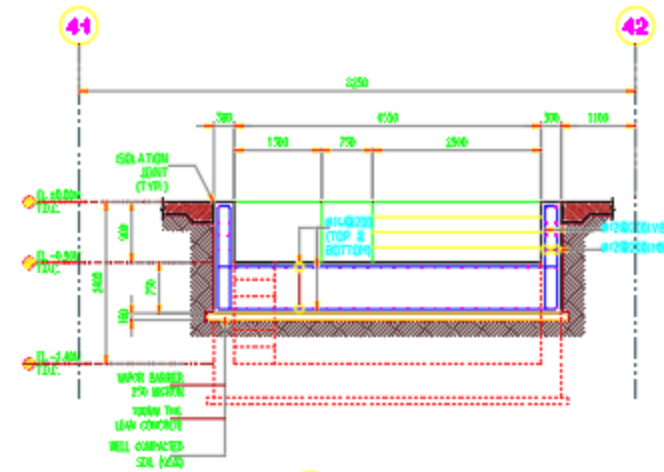


A4 RAFT FOUNDATION PLAN
SCALE 1:500

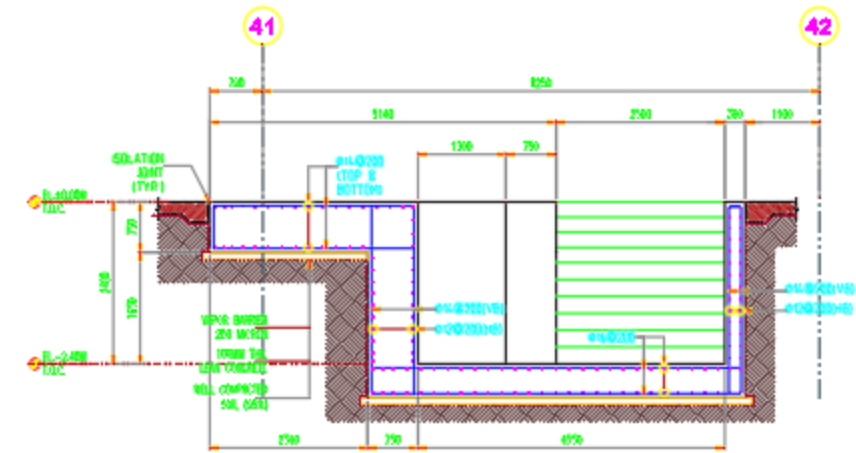
Design of Production Line Foundation



S1 SECTION
- SCALE: 1:50M

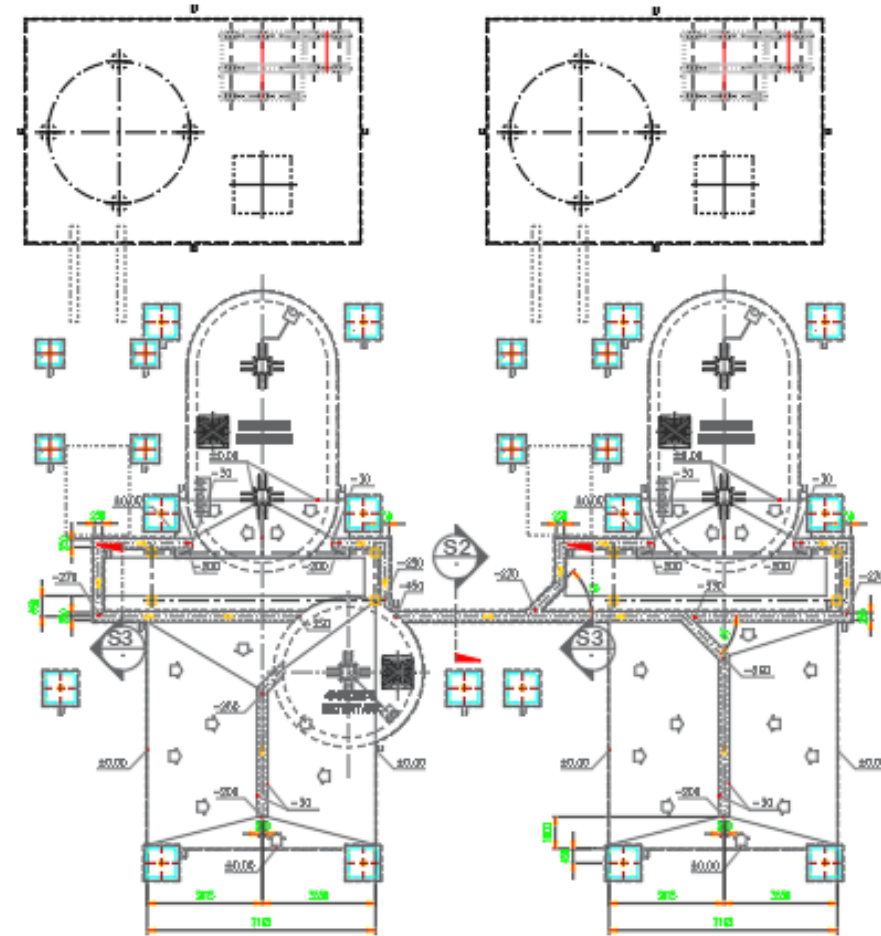
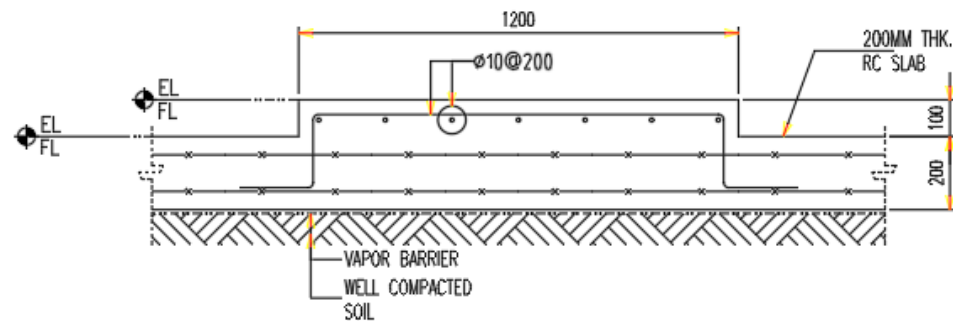
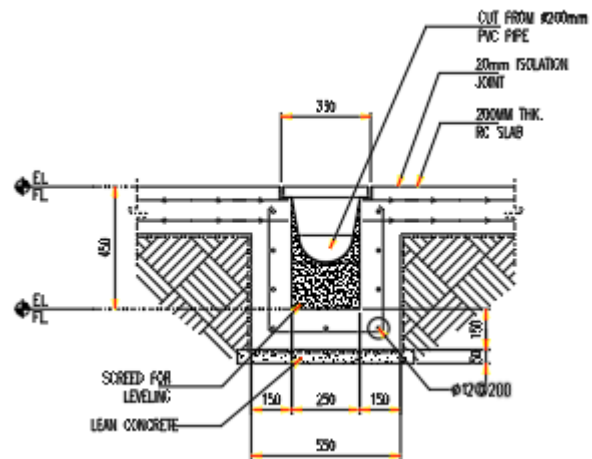
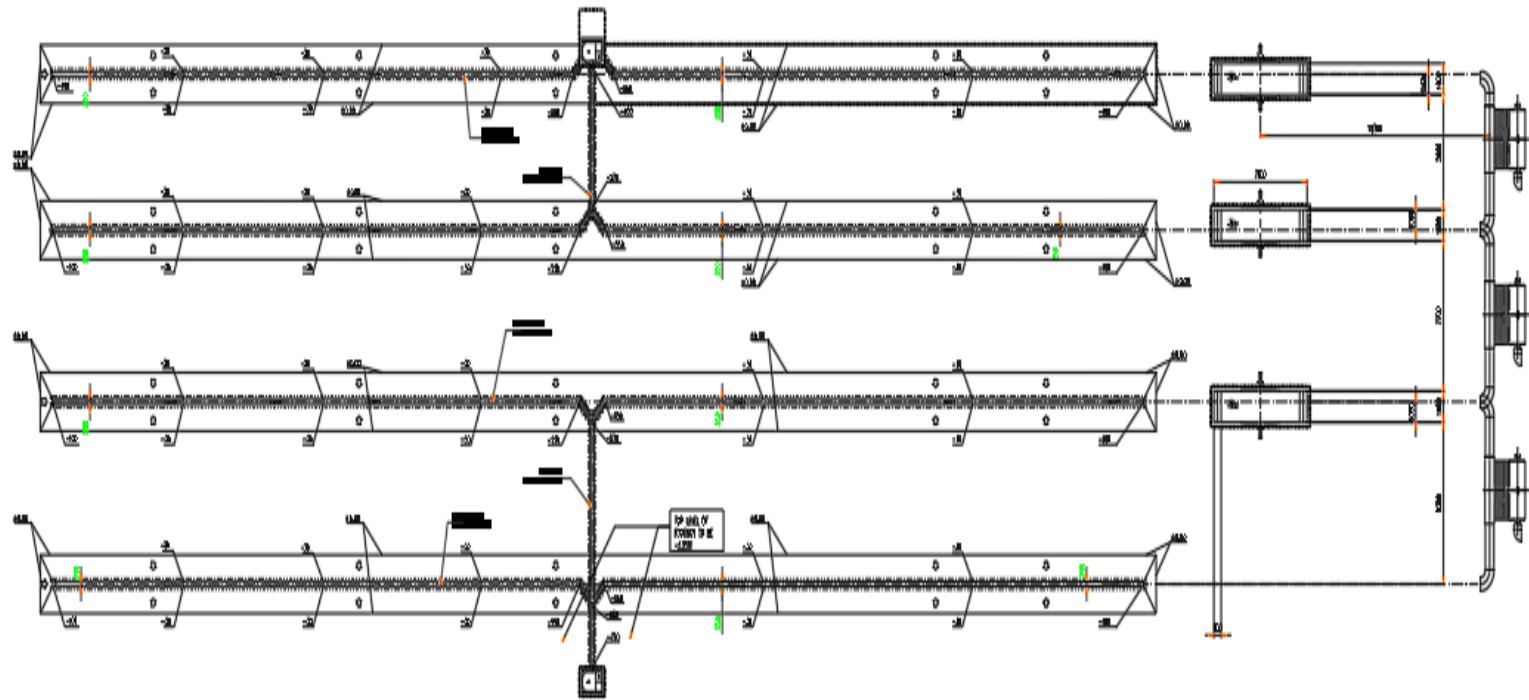


82 SECTION
SCALE 1:50M

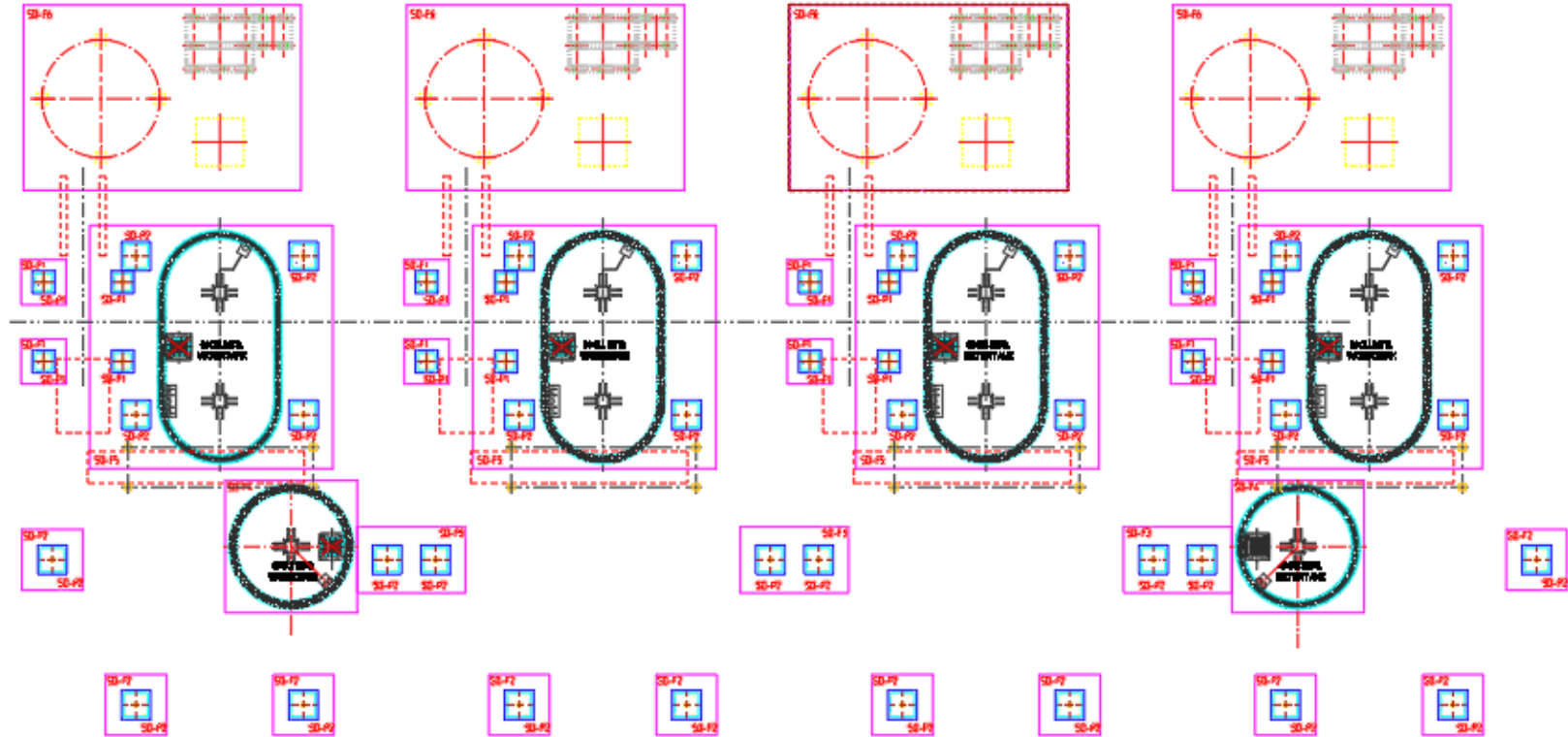
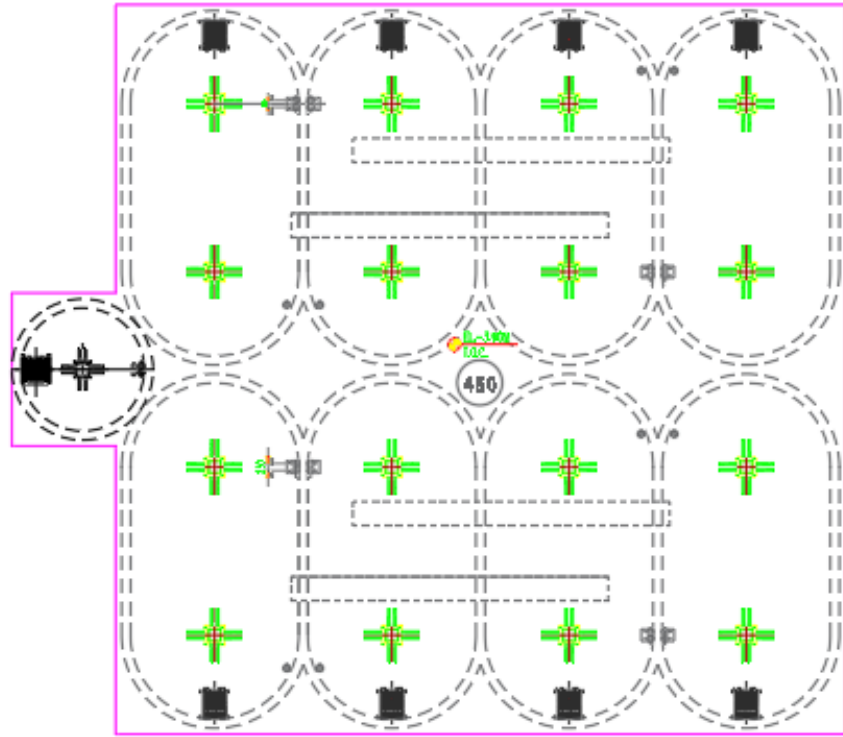


58 SECTION

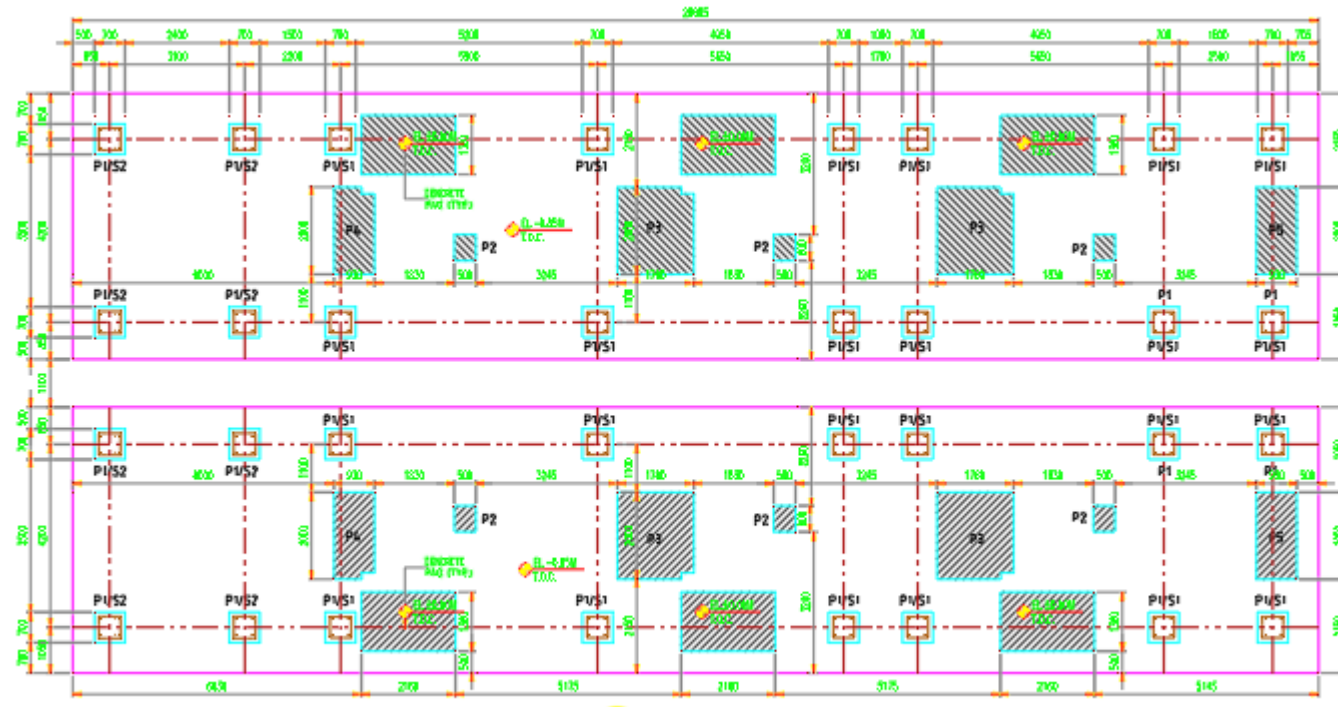
Design of Production Line Foundation



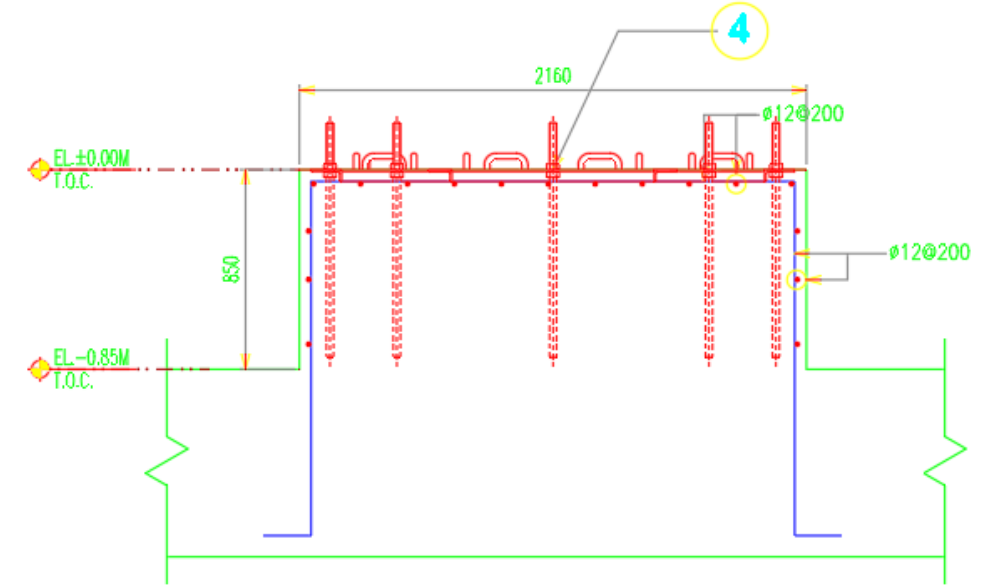
Design of Production Line Foundation



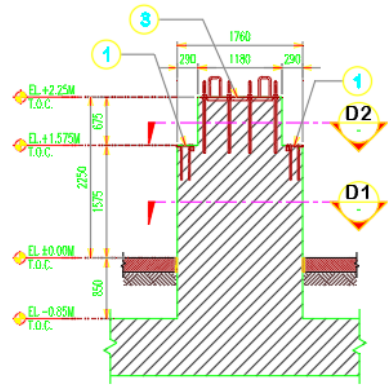
Design of Production Line Foundation



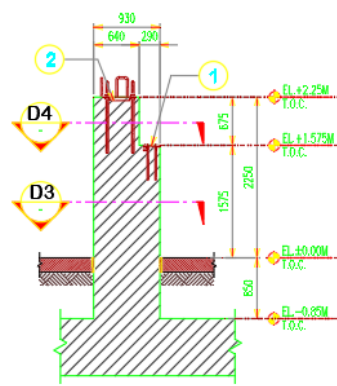
D PEDESTAL LAYOUT
SCALE: 1:50M



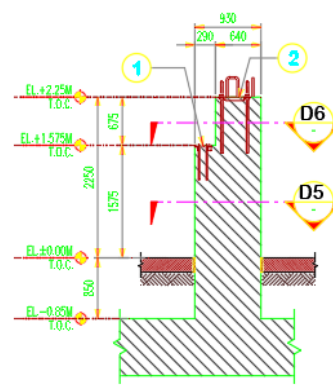
S4 SECTION
SCALE: 1:25M



S1 SECTION
SCALE: 1:50M

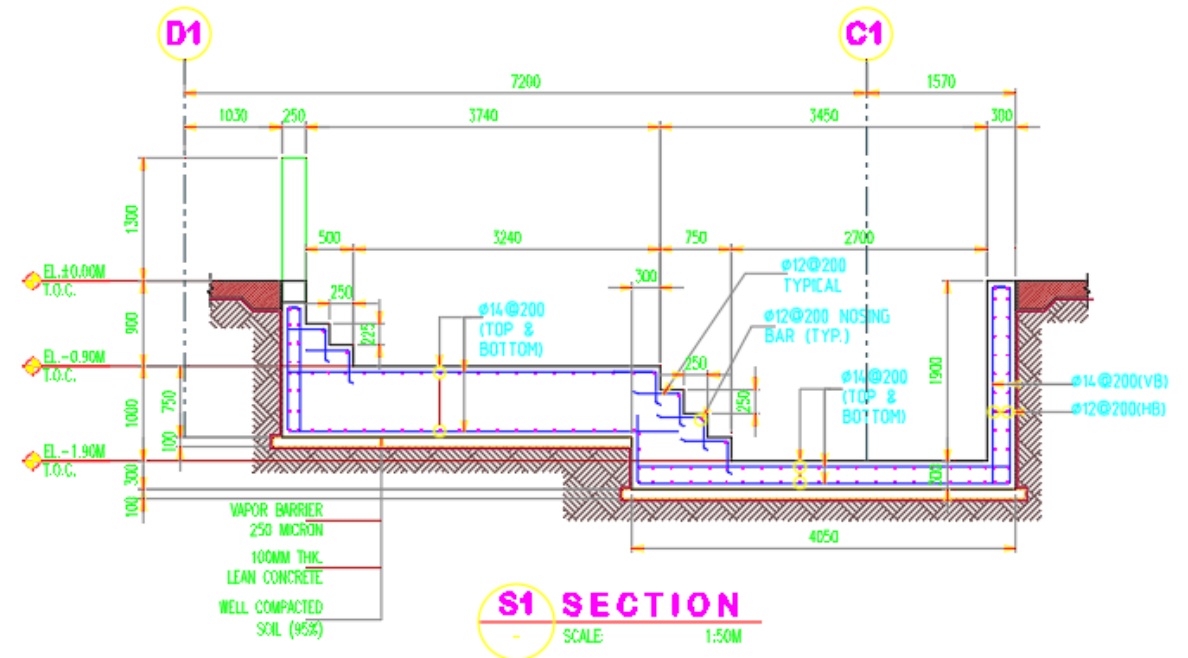
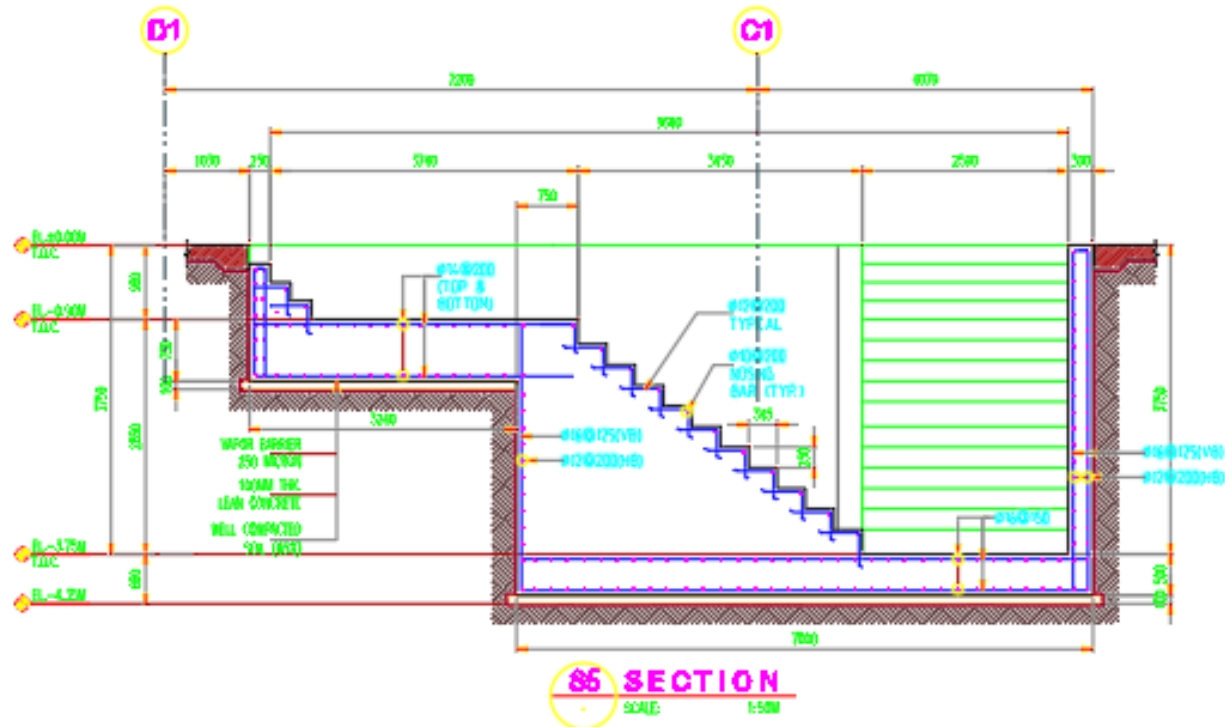
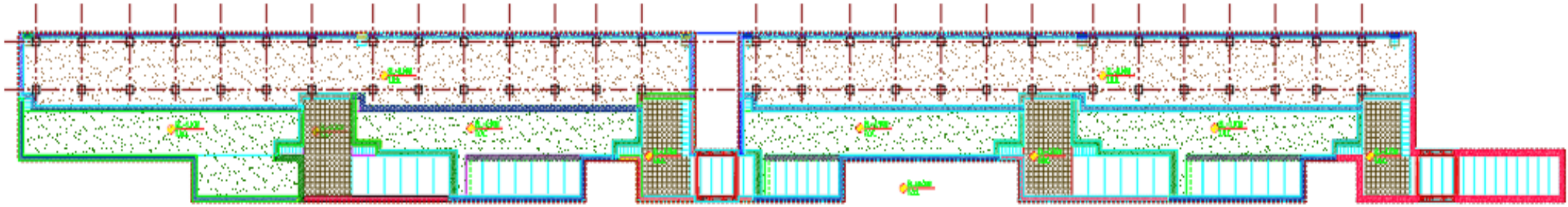


S2 SECTION
SCALE: 1:50M

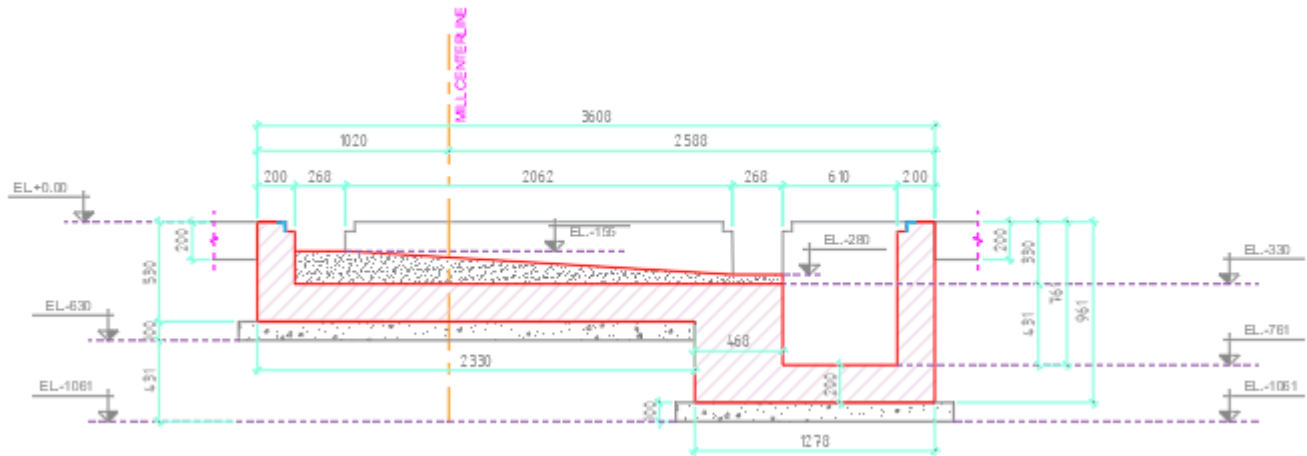
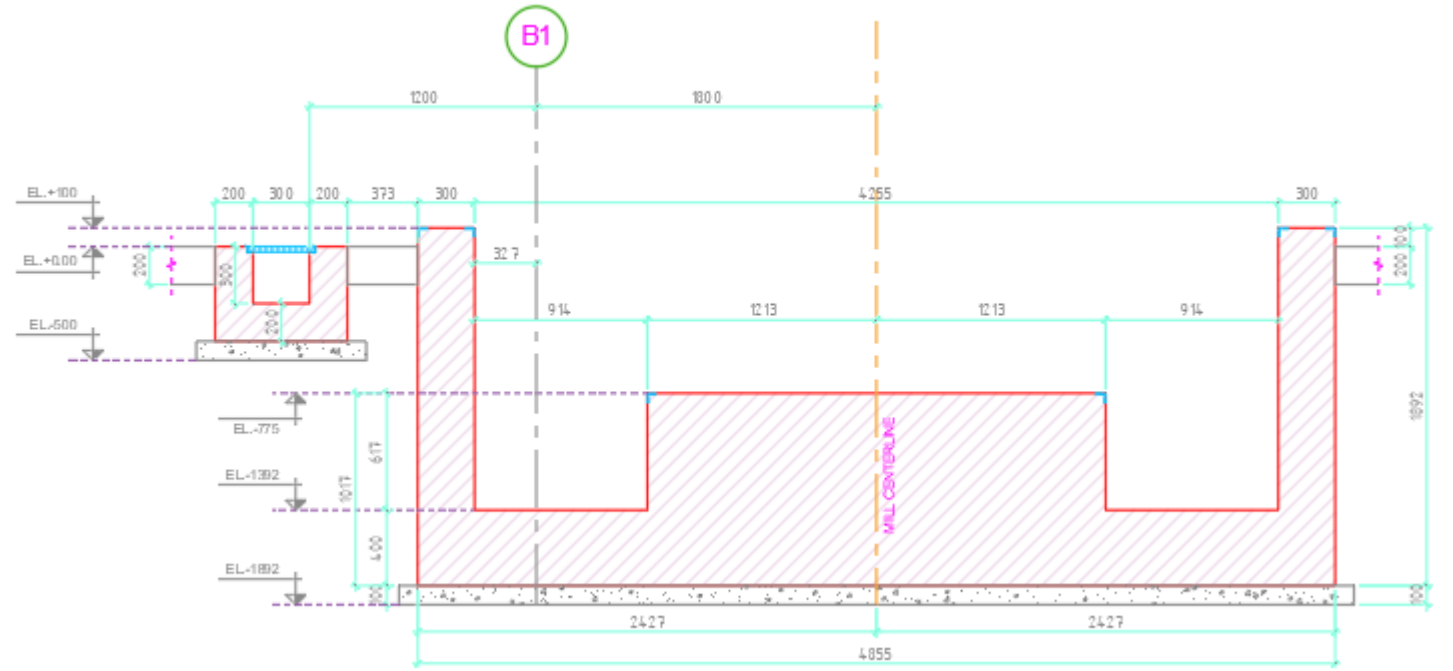
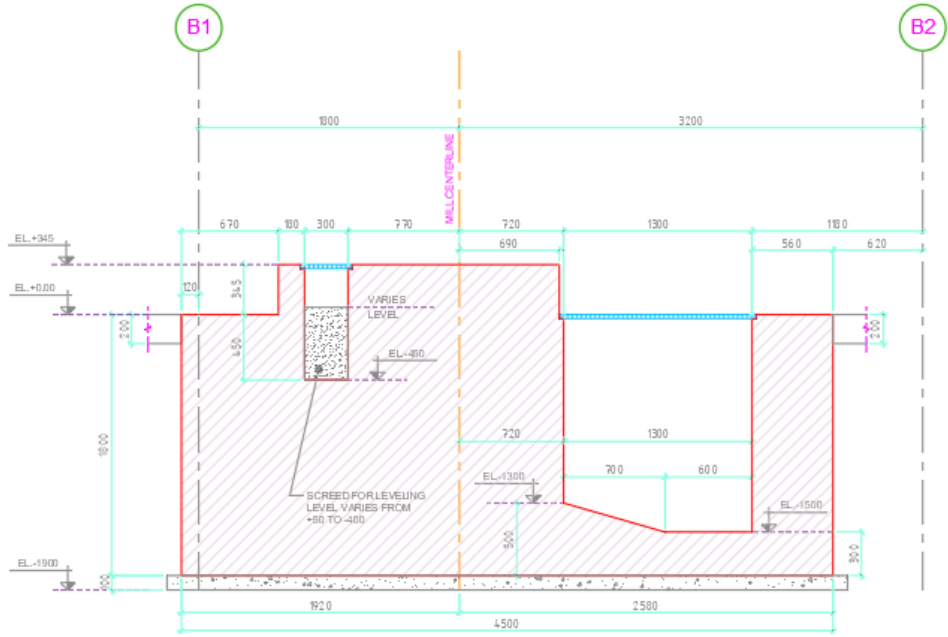


S3 SECTION
SCALE: 1:50M

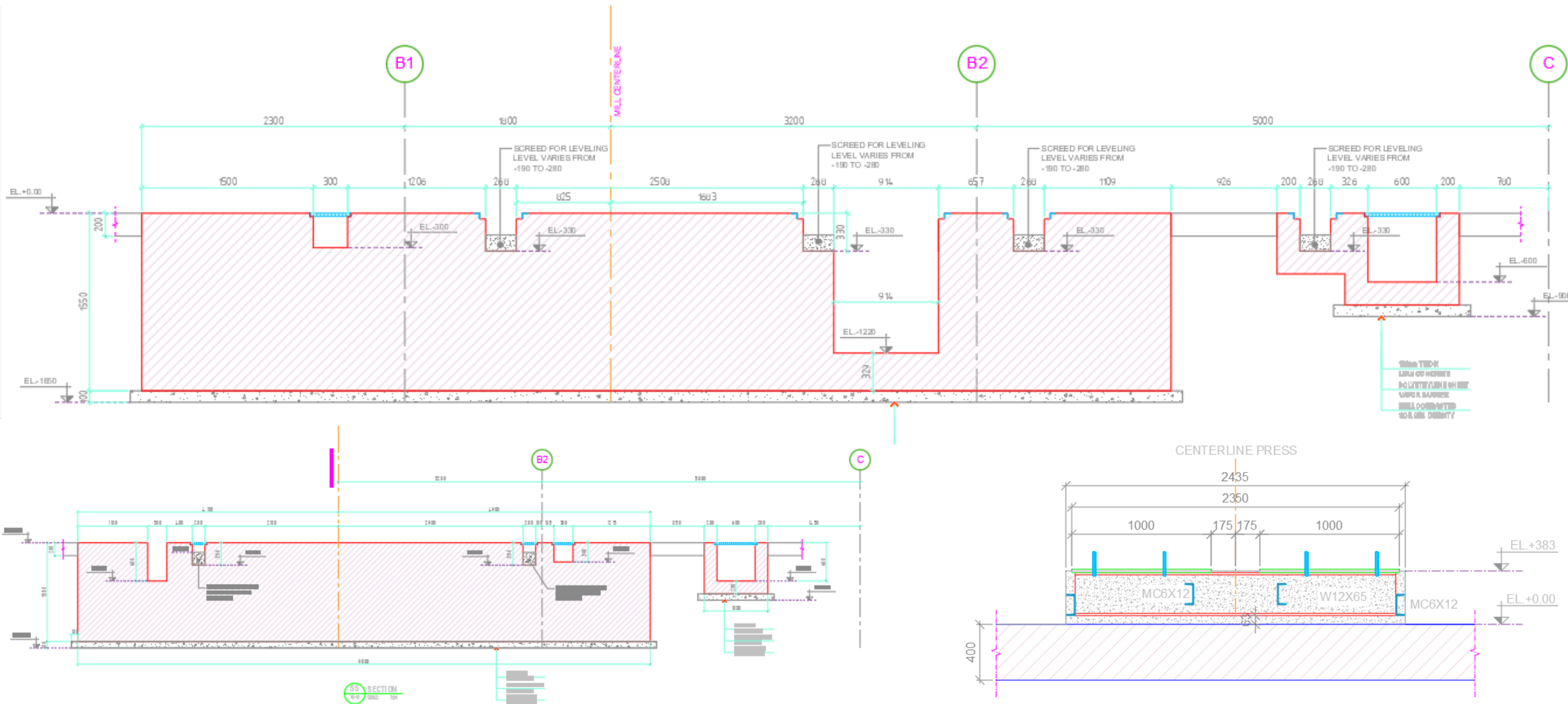
Design of Production Line Foundation



Design of Production Line Foundation

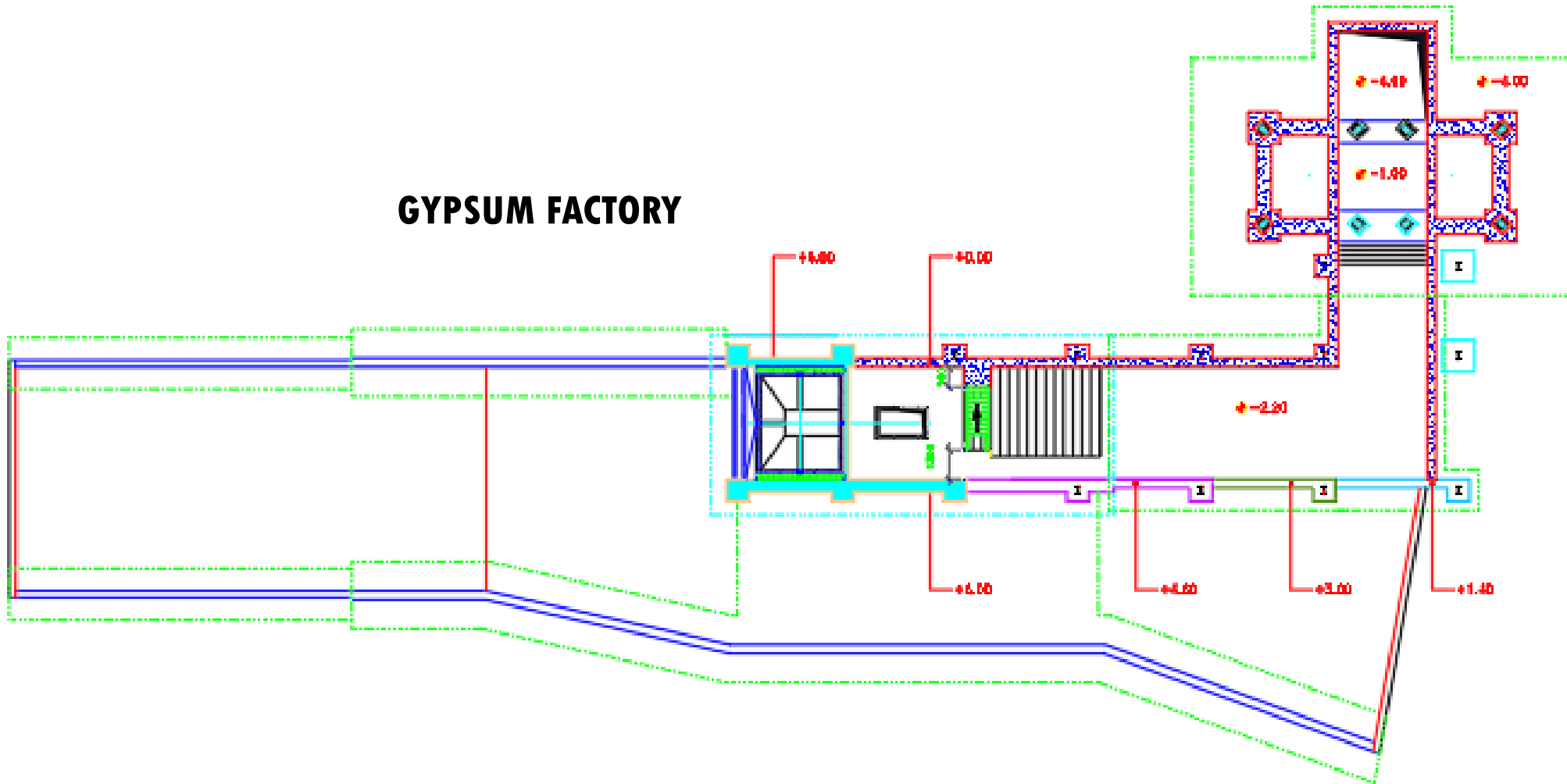


Design of Production Line Foundation

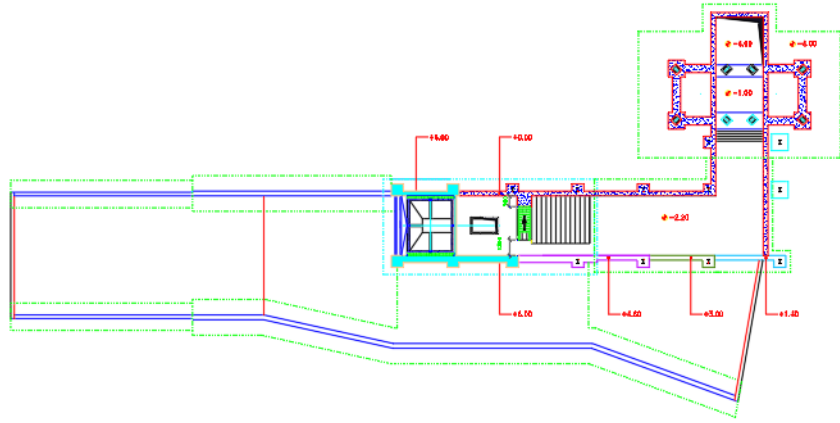


Design of Production Line Foundation

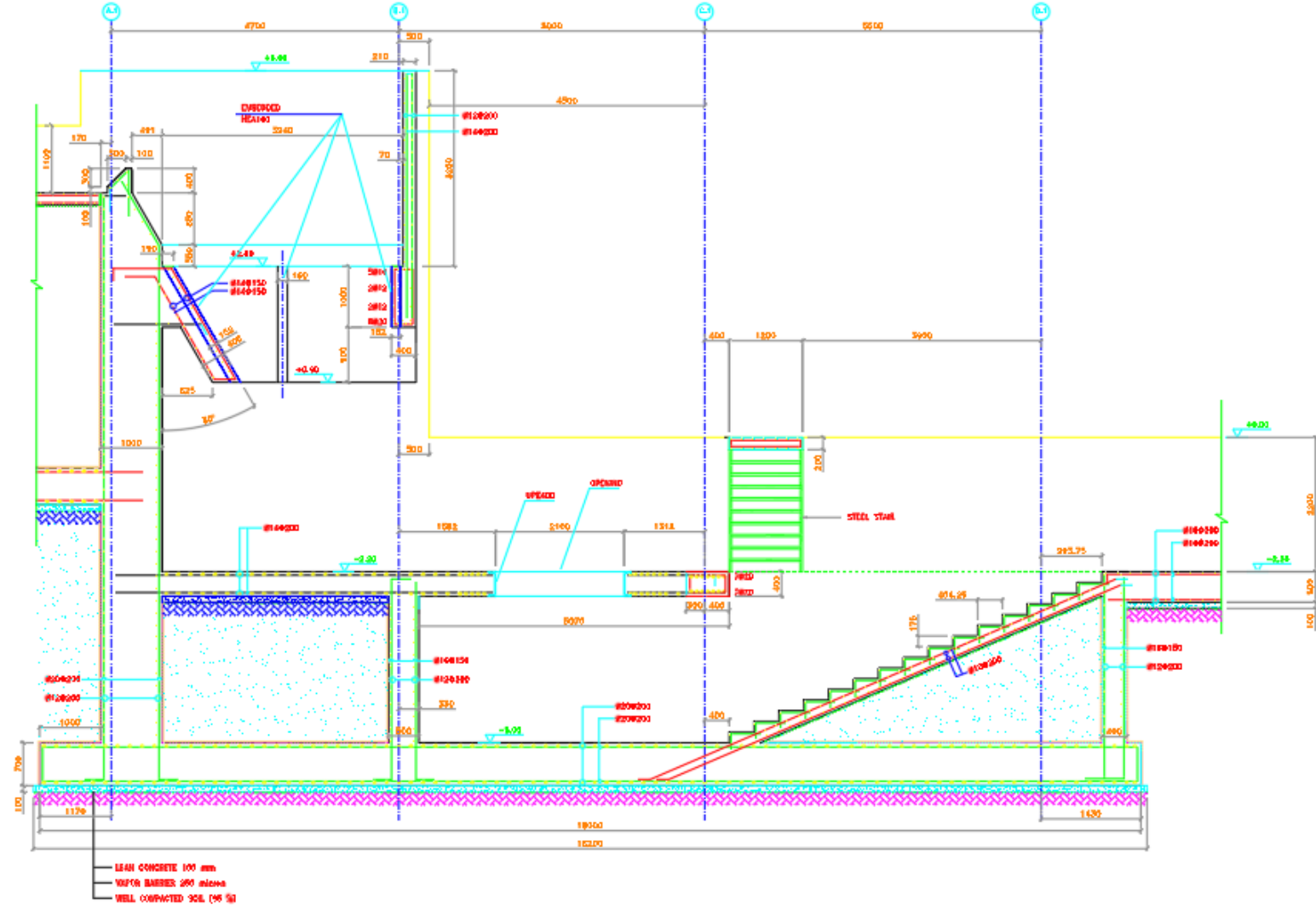
GYPSUM FACTORY



Design of Production Line Foundation



GYPSUM FACTORY

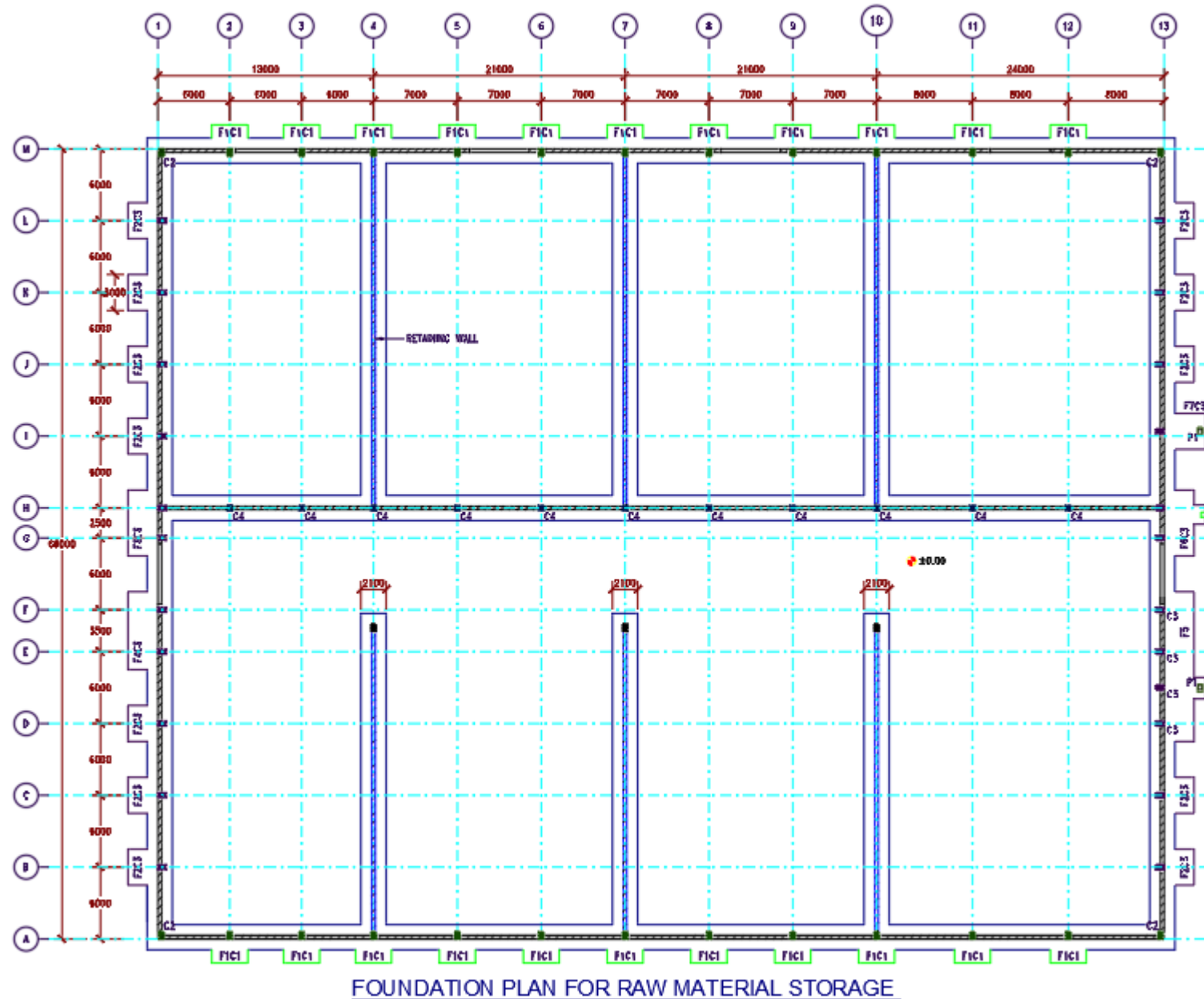


[illegible]

The architectural floor plan illustrates a building layout with various rooms and structural elements. Key features include:

- Structural Details:** Reinforced concrete columns (e.g., #25@200, #12@200) and beams (e.g., #25@150, #12@200) are shown. A central staircase is labeled "CURBED REINFORCED".
- Dimensions:** Overall dimensions are 5000 units by 8000 units. Room dimensions vary, with some rooms being 1000 units wide and others 1500 units wide.
- Material Specifications:**
 - LEAN CONCRETE 100 mm
 - VAPOR BARRIER 250 micron
 - WELL COMPACTED SOIL (85 %)
- Levels and Elevation:** Elevation markers include +4.00, +3.10, +0.00, -0.30, and -1.00.
- Room Layout:** The plan shows a large central room, a staircase, and several smaller rooms and corridors.

RAW MATEIAL



Design of Production Line Foundation



Design of Production Line Foundation



Design of Production Line Foundation



Design of Production Line Foundation



Design of Production Line Foundation



Design of Production Line Foundation



Design of Production Line Foundation



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Design of Production Line Foundation



Design of Production Line Foundation



Design of Commercial Projects



Design of Commercial Projects



Design of Commercial Projects



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