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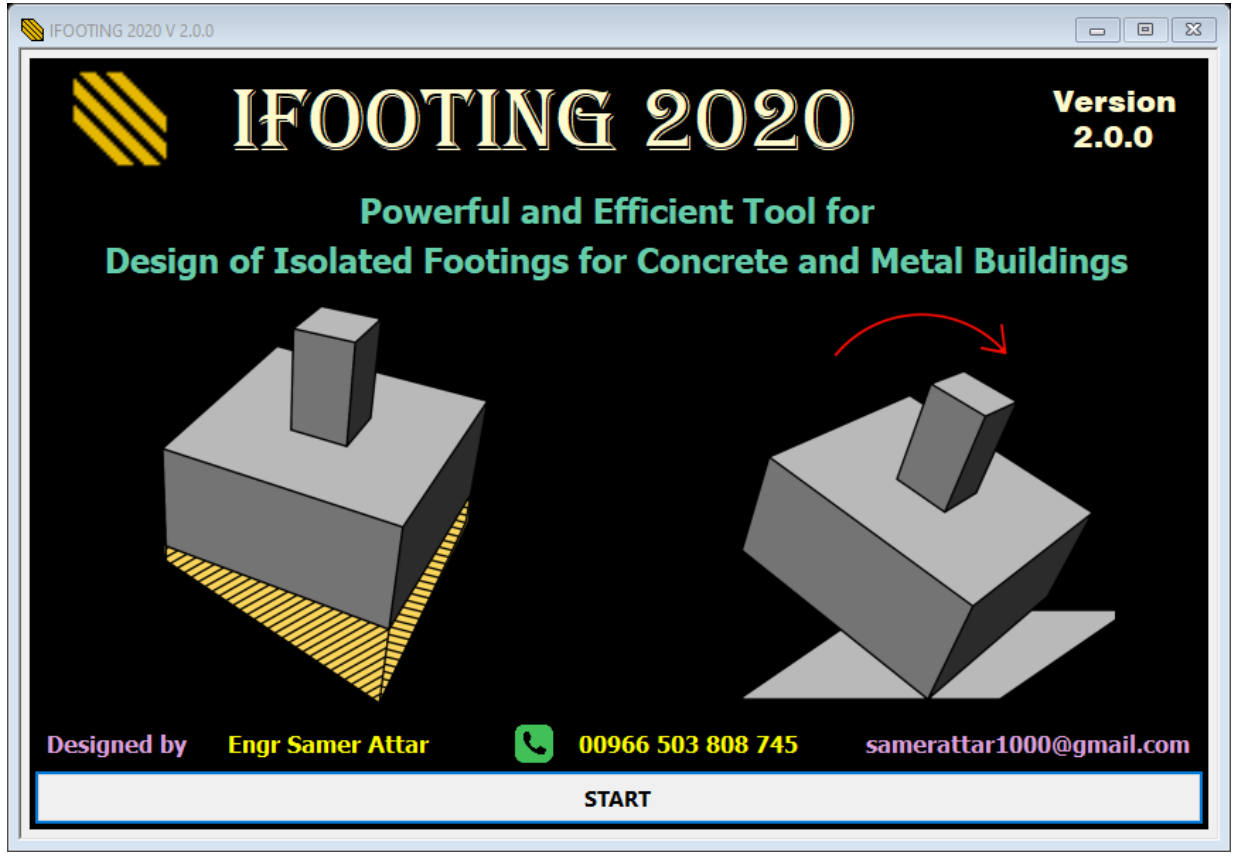
Substructures Design of Industrial Projects, Warehouses, & Production Line Foundations

Provide the 3th Party services for contractors

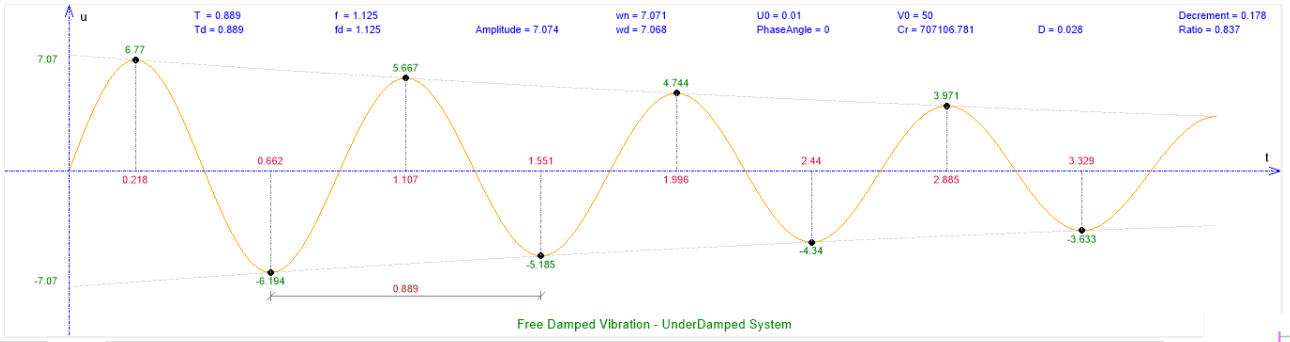
تقديم استشارات وحلول للمشاكل التي تواجه المقاولين أثناء مرحلة التنفيذ

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 | Job Description

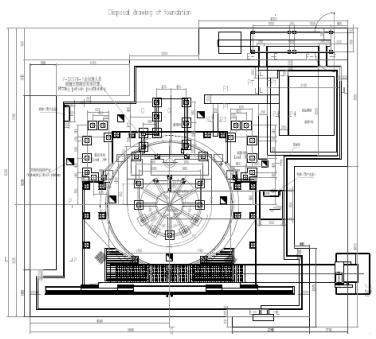
Units: (•) Metric Unit ( ) Imperial Unit

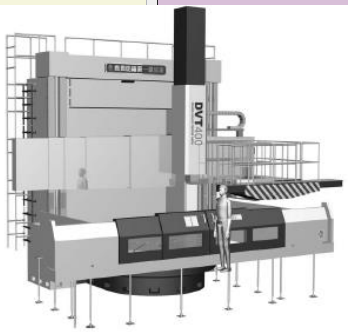
CrossSection Data	Symbol	Unit	Value	Helper
Footing dimension in X direction	Lx	m	6.096	- = Ly +
Footing dimension in Y direction	Ly	m	4.572	- = Lx +
Footing Thickness	Lz	m	1.0668	- +
Effective embedded depth	he	m	0.9144	= 0
Concrete density	γc	KN/m³	24	
Soil density	γs	KN/m³	18.86	
Soil shear modulus	G	N/m²	68947574.4	
Soil poisson ratio.	v		0.45	
Soil type			Cohesive	
Material damping	βm		0.05	
Machine operation speed	Wo	rpm	350	
Machine weight	Wm	KN	135	
Rotar weight	Wr	KN	40.5	
Machine CG coordinate	Xm	m	1	
Machine CG coordinate	Ym	m	1	
Machine CG coordinate	Zm	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	

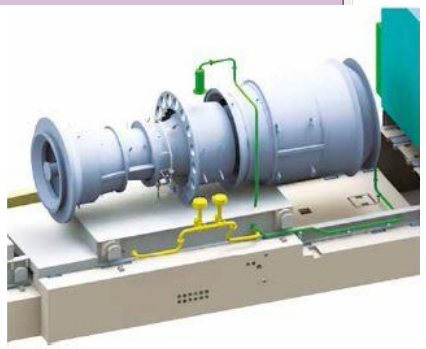
Impedance Method
- ( ) Suresh Arya Reference
- (•) ACI 351.3R-18 - Method 1
- ( ) ACI 351.3R-18 - Method 2
- ( ) ACI 351.3R-18 - Method 3
- [ ] Use equations of circular foundation if possible

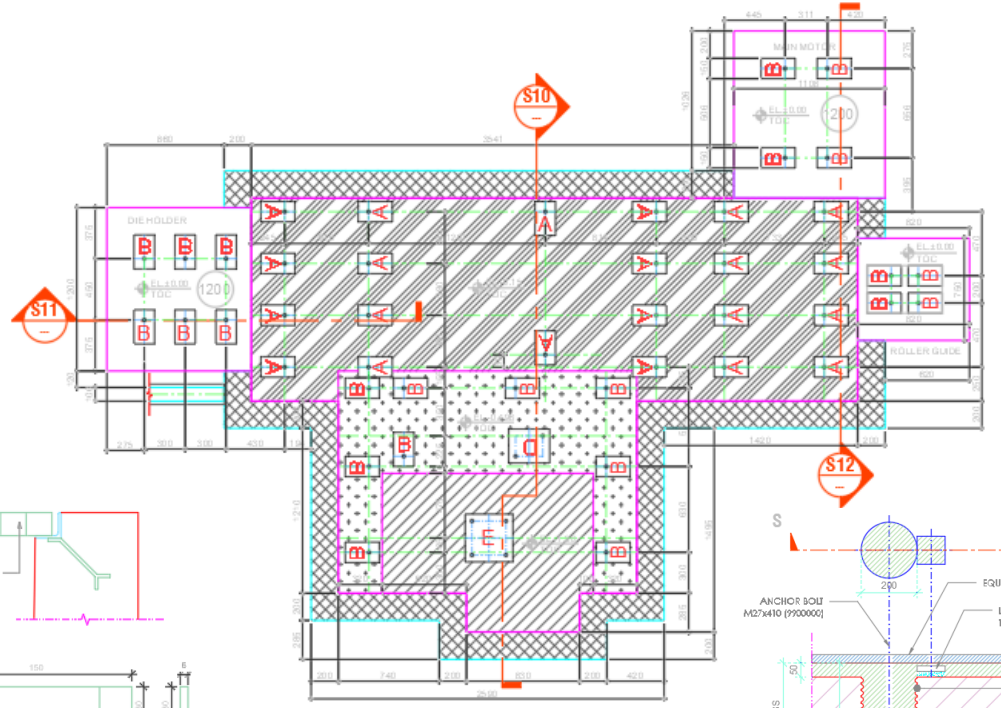
Other Options
- [x] Consider the common C.G. at bottom of footing
- (•) Rotating Mass Excitation
- ( ) Constant Force Excitation

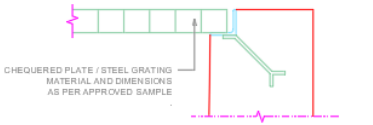
Property	K	C	wn	wo/wn	Damping Ratio	Amplitude
Vertical	1.506389E+009	30299352	131.96	0.28	1.327	0
Horizontal	1.243234E+009	24110462	119.88	0.31	1.162	0
Rocking X	2.051975E+009	19741596	103.7	0.35	0.499	0
Rocking Y	2.547571E+009	28844542	88.63	0.41	0.502	0
Torsion	1.549852E+010	100416744	189.31	0.19	0.613	0

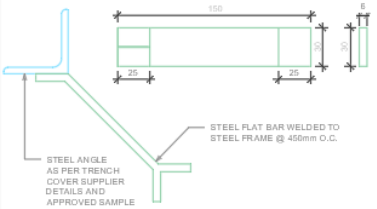




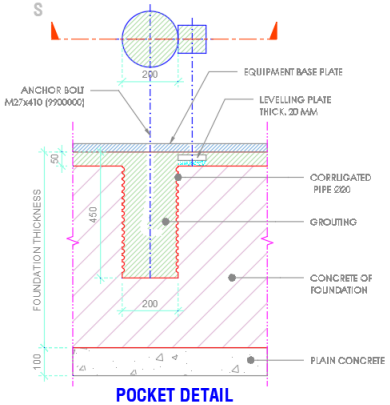




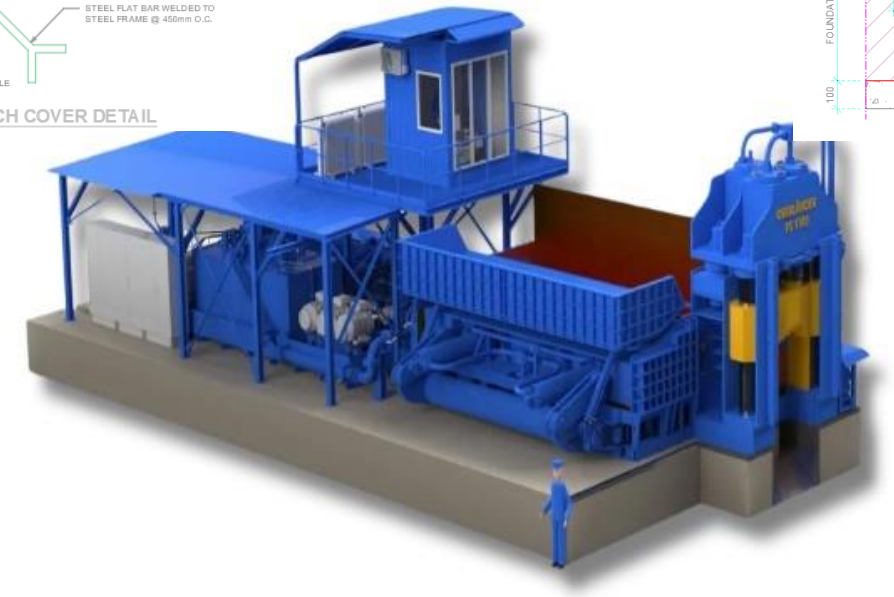




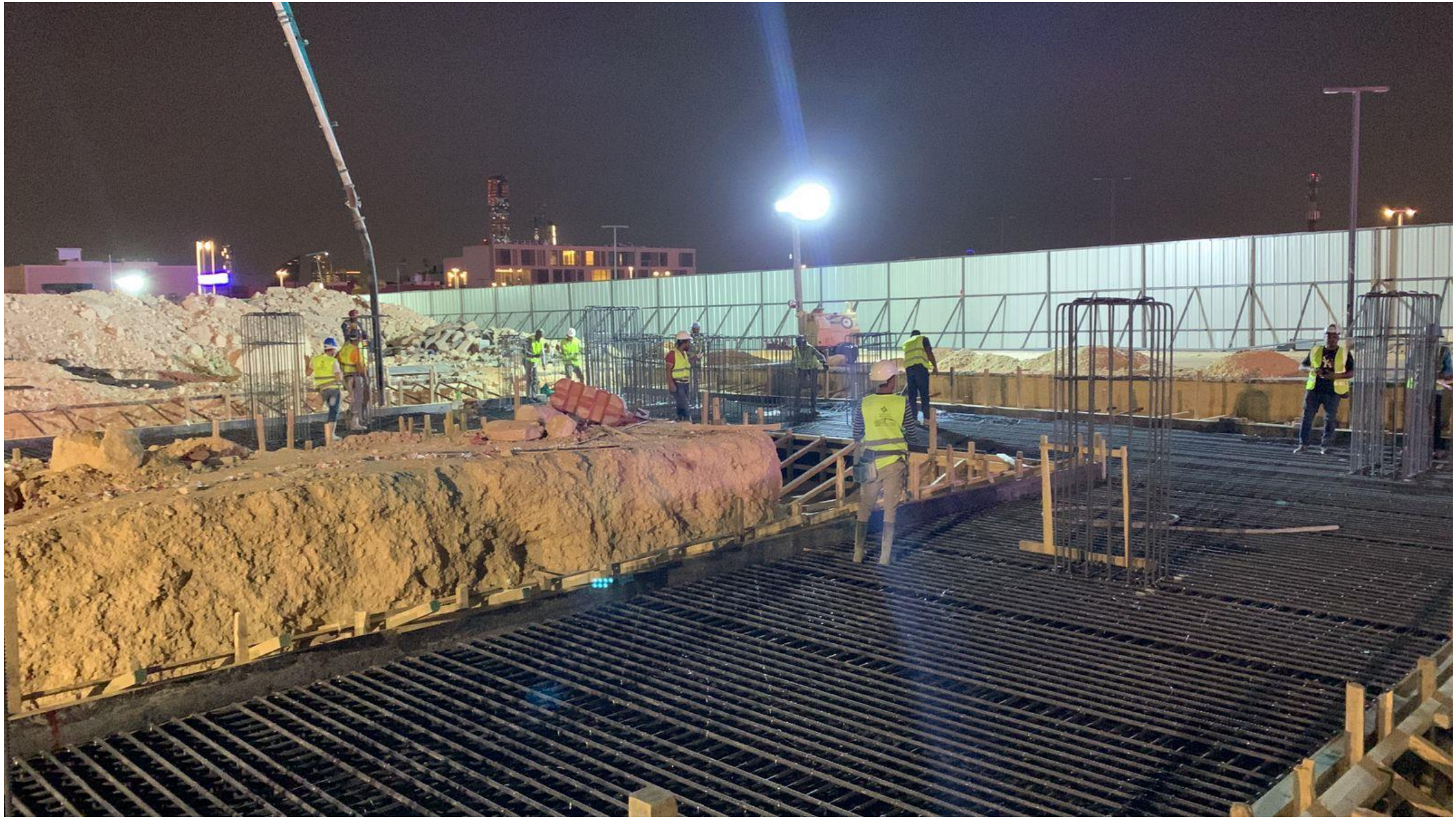
TRENCH COVER DETAIL



POCKET DETAIL

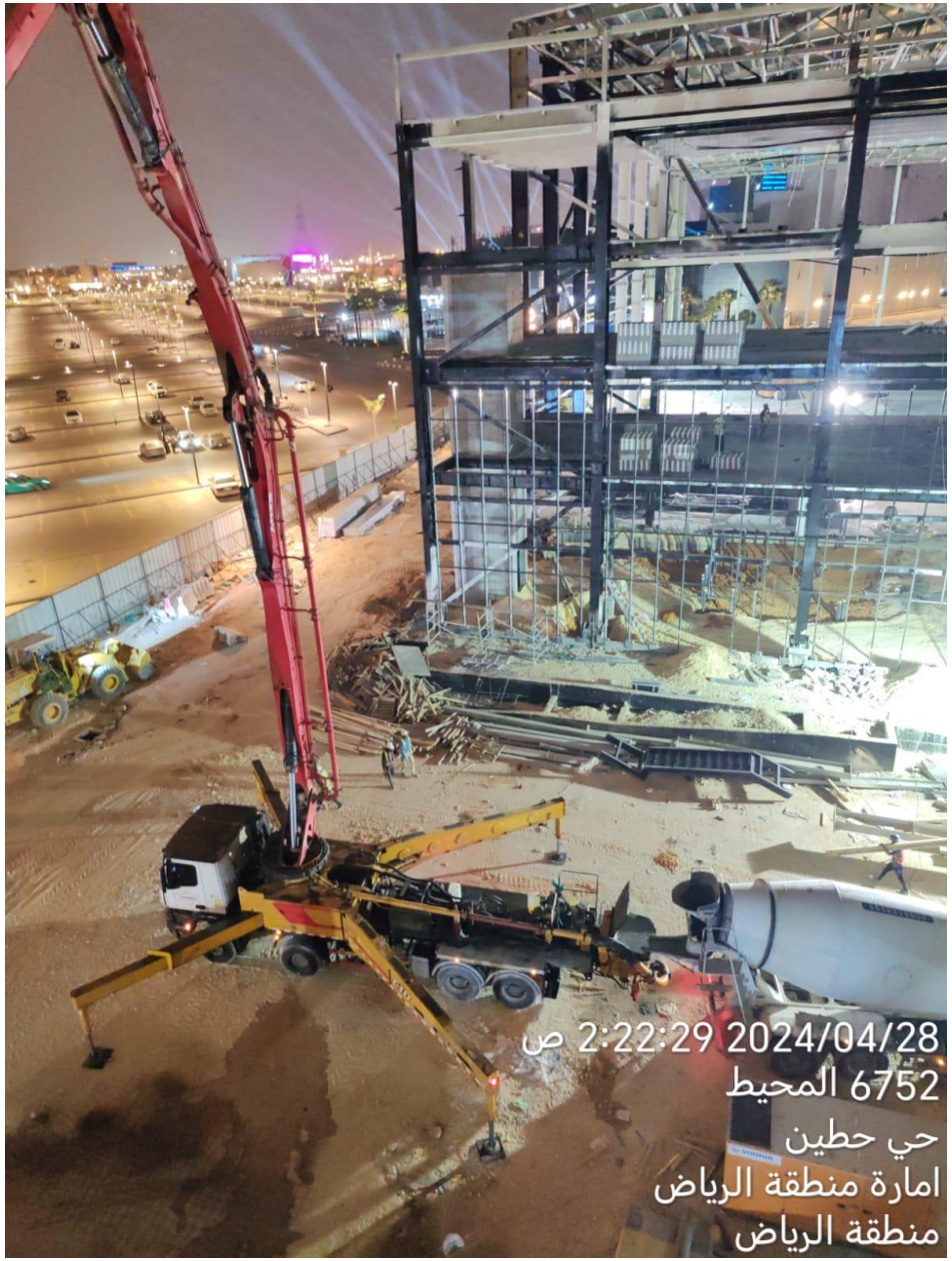


Design of PEB FOUNDATIONS



Design of PEB FOUNDATIONS

Design of PEB FOUNDATIONS



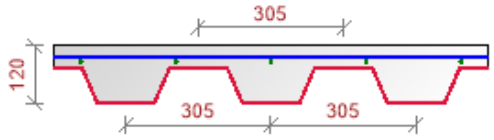
Design of PEB FOUNDATIONS

Design of PEB FOUNDATIONS

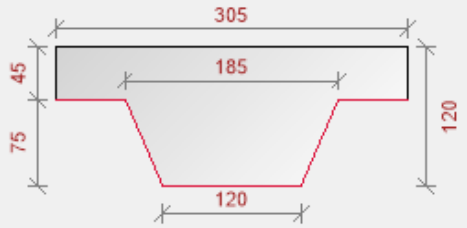
Design of Deck Slab Floor

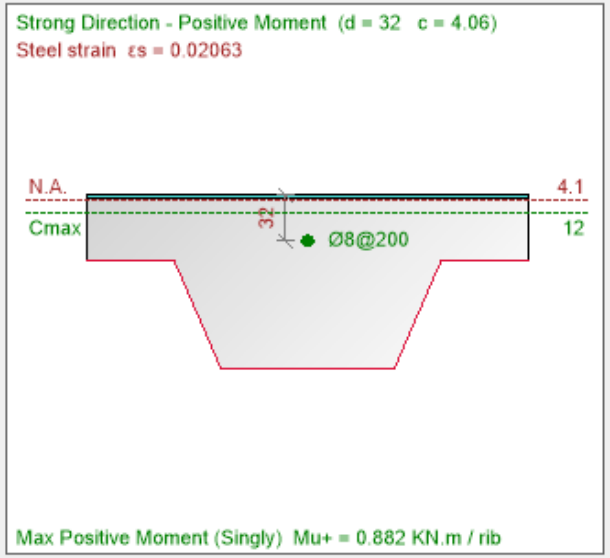
Property	Symbol	Unit	Value
Dick slab name			Deck_120
Total slab thickness	H	mm	120
Deck rib height	Hd	mm	75
Dick rib pitch	bf	mm	305
Rib width at bottom	bw1	mm	120
Rib width at top	bw2	mm	185
Diameter bars in strong direction	Ds	mm	8
Spacing of bars in strong direction	Ss	mm	200
Diameter bars in weak 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

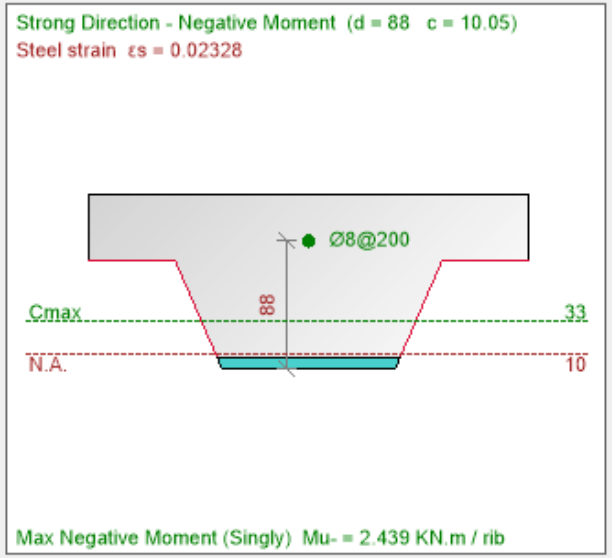
As = Ø8@200 = 251.33 mm² (in strong direction)
As = Ø8@200 = 251.33 mm² (in weak direction)

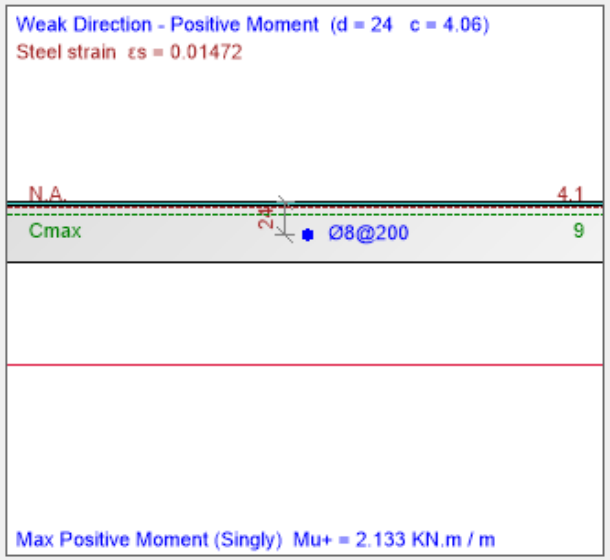


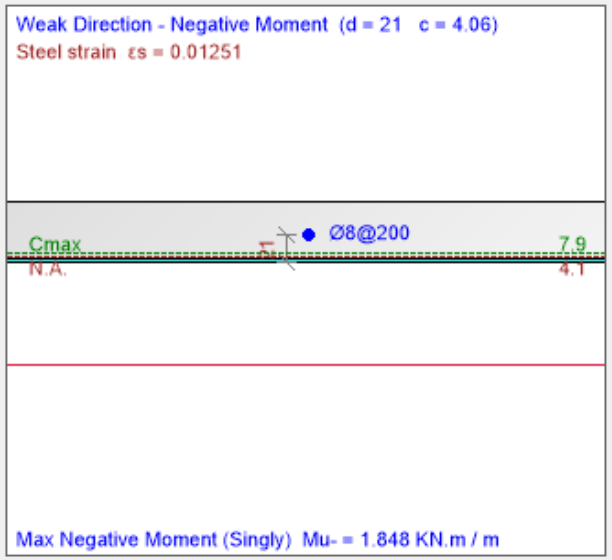
Rib Section











Design of Light Pole Foundation

Wind Load Calculation And Embedded Posts Design As Per Saudi Building Code SBC 2018

Wind Load

CrossSection Data	Symbol	Unit	Value	Helper
Name			Pole 1	
Pole height	H	m	10.2	
Cross section diameter at top level	Dt_Method3	m	0.1	
Cross section diameter at bottom level	Db	m	0.205	
Cross section shape			Round	
Exposure category			Exposure C	
Risk category			I	
Wind speed	V	m/s	44	...
Additional Moment from Arm	M2	KN.m	0	

Embedded Post Design

CrossSection Data	Symbol	Unit	Value	Helper
Footing cross section shape			Square	
Footing cross section diameter or width	w	m	0.7	
Lateral soil bearing pressure	S	KPa/m	25	...
Horizontal force at top of light pole	P	KN	0.69	

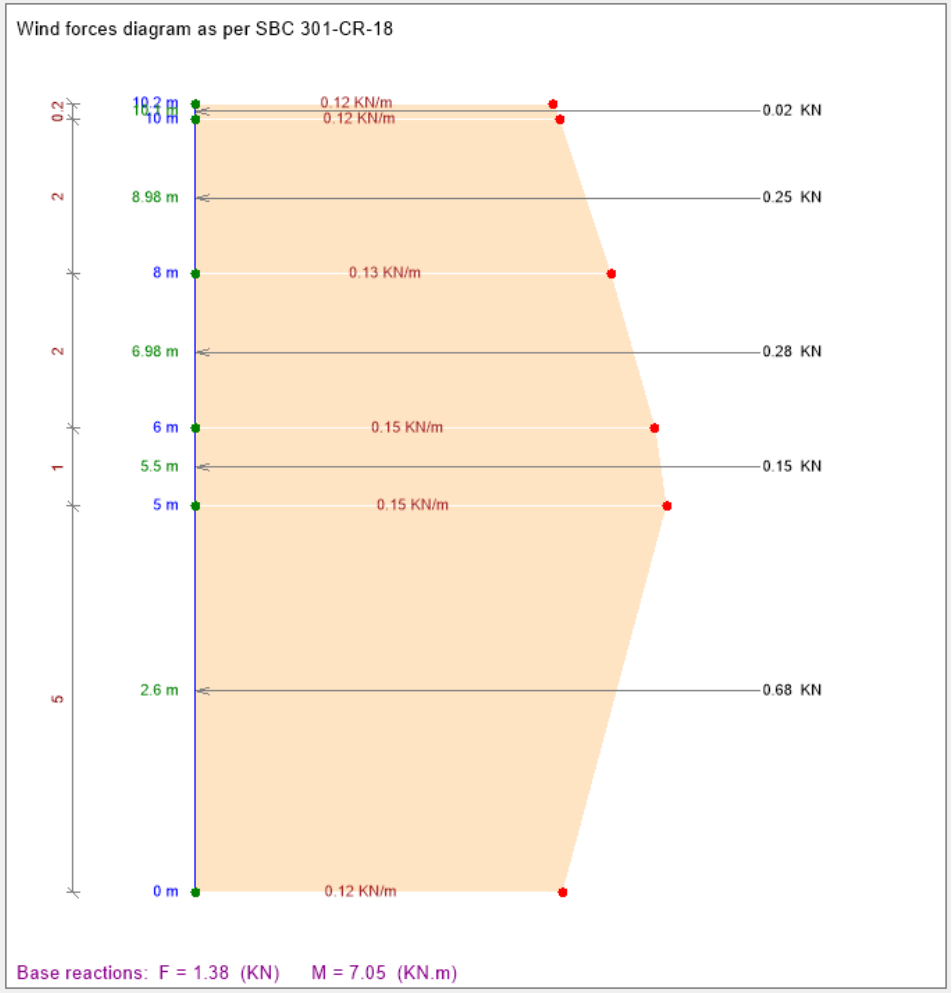
Calculation Sheet Options

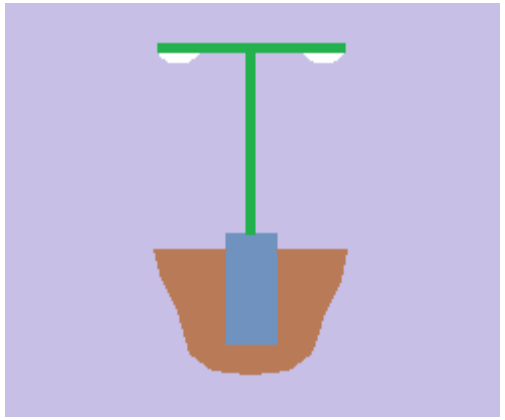
- ○ Show wind calculation only
- ○ Show footing calculation only
- ◉ Show both calculations

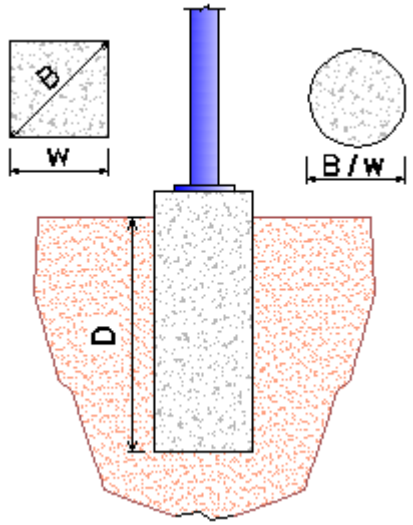
Structure Type

- ◉ Light Pole / Flagpole
- ○ TankResults
- ○ Chimney

Print Calculation Sheet

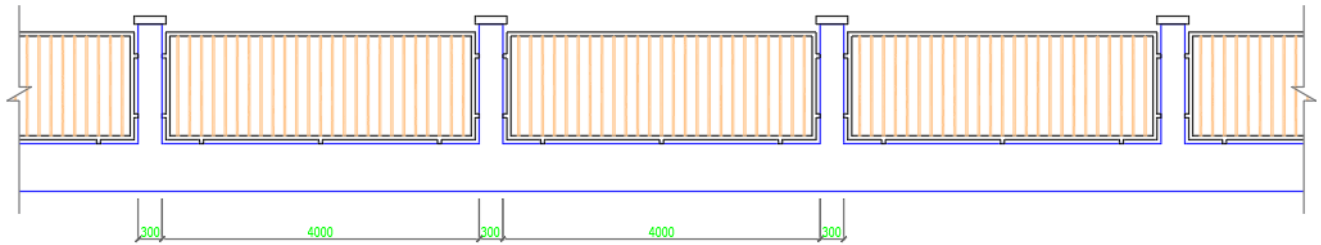






Design of Boundary Wall Foundation

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	...

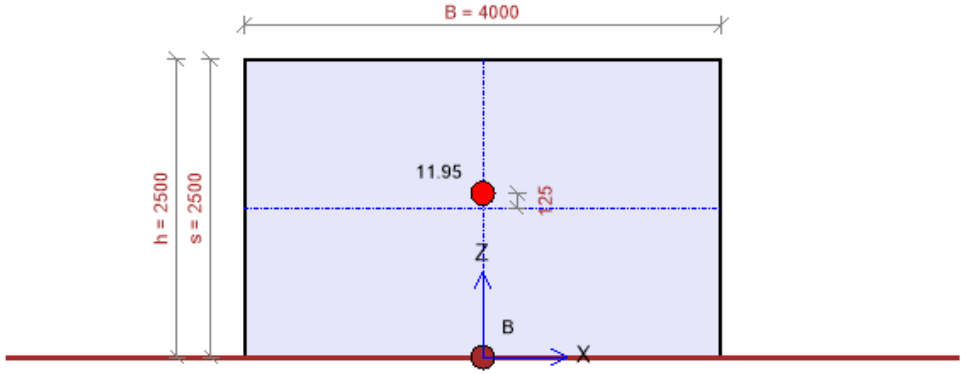


FENCE WITH STREET

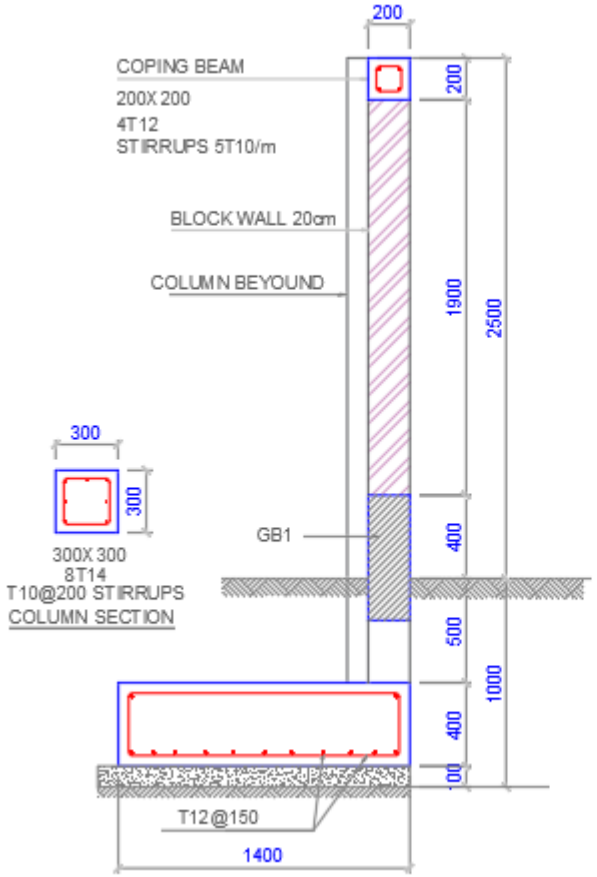
Clearance ratio, s/h = 1
Aspect ratio, B/s = 1.6 < 2
CASE C no need to be considered
F = 11.95 KN
ey = 0.05 h = 125 mm

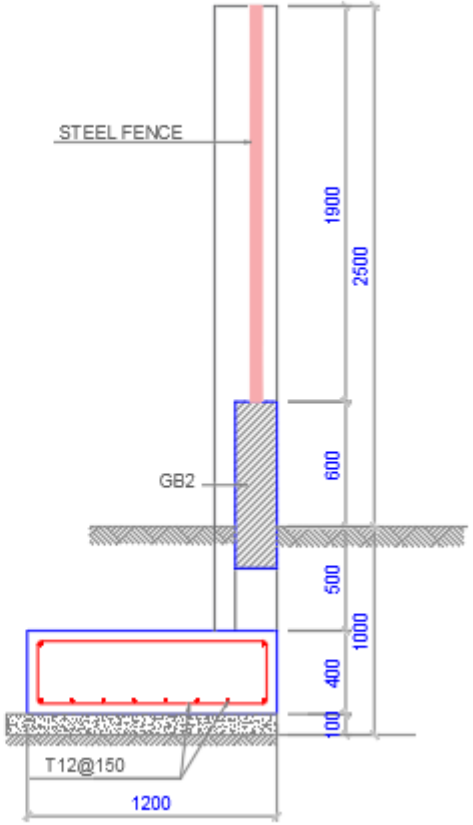
Reactions at point B:

Fy = 11.95 KN
Mx = 16.43 KN.m



Wind Load CASE A





Design of Retaining Walls

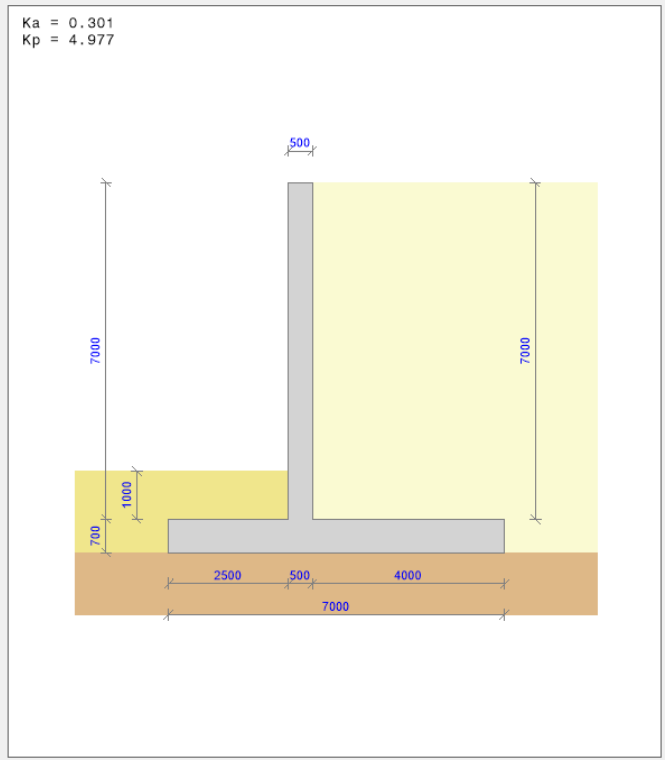
Geometry | Soil | Surcharge Loads | Other Loads | Options

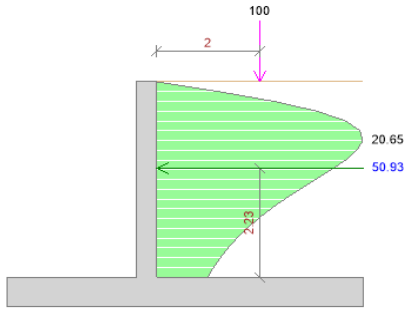
Wall Name: RW_1

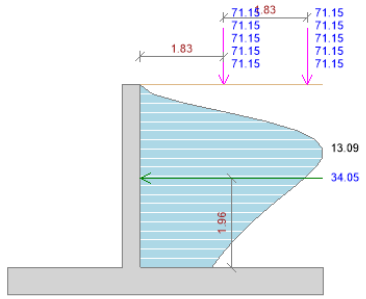
Property	Symbol	Unit	Value	Help
Stem thickness	T	mm	500	- +
Wall height	H	mm	7000	- +
Toe width	BT	mm	2500	- +
Heel width	BH	mm	4000	- +
Footing Thickness	HF	mm	700	- +
Concrete density	γc	KN/m3	25	
Concrete compression Strength	fc'	MPa	30	
Steel yield Strength	fy	MPa	420	
Centroid cover for footing 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	γs	KN/m3	18	
Soil cohesion	C	KN/m2	0	
Base soil bearing capacity	σs	KN/m2	250	

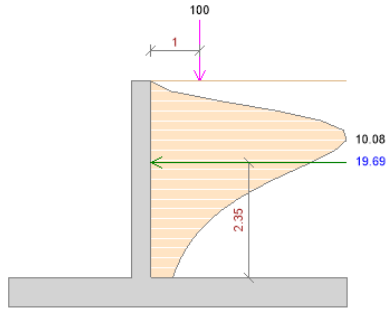
☐ Tapered wall

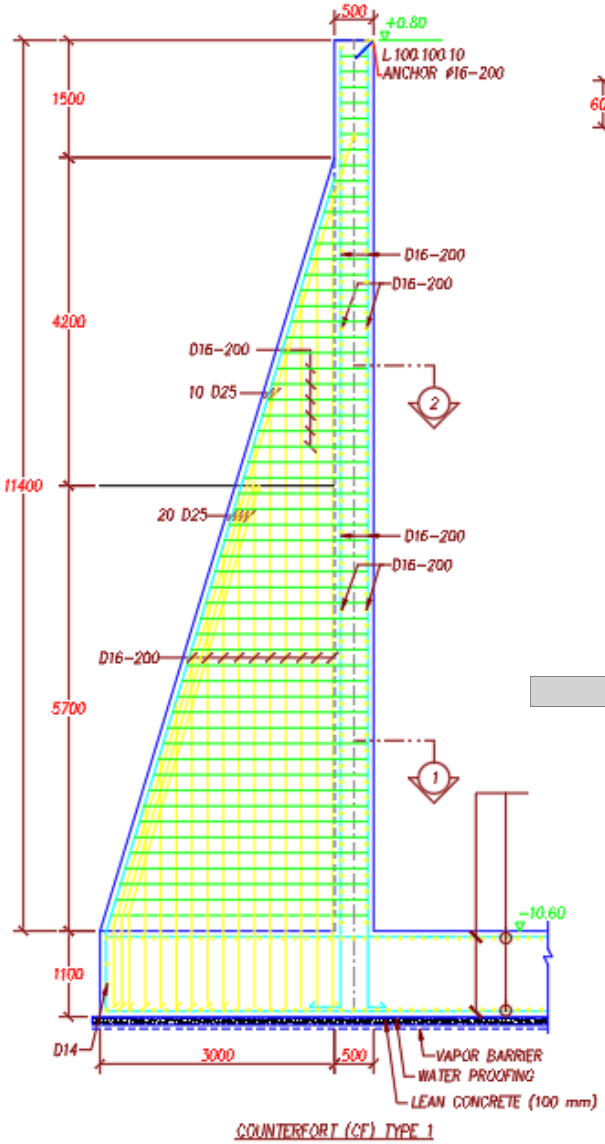
☐ Key

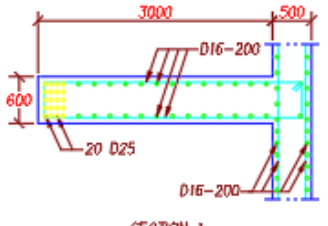


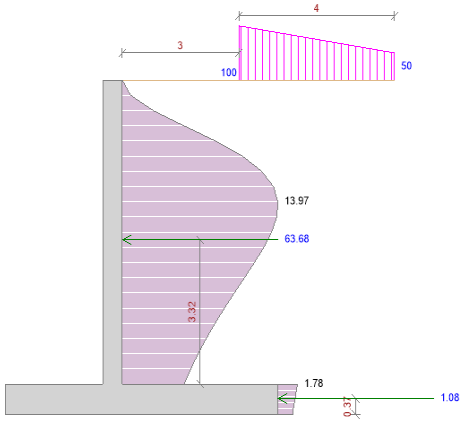












Design of Pedestals

Reinforced Concrete Column Design As Per ACI 318-14 Code

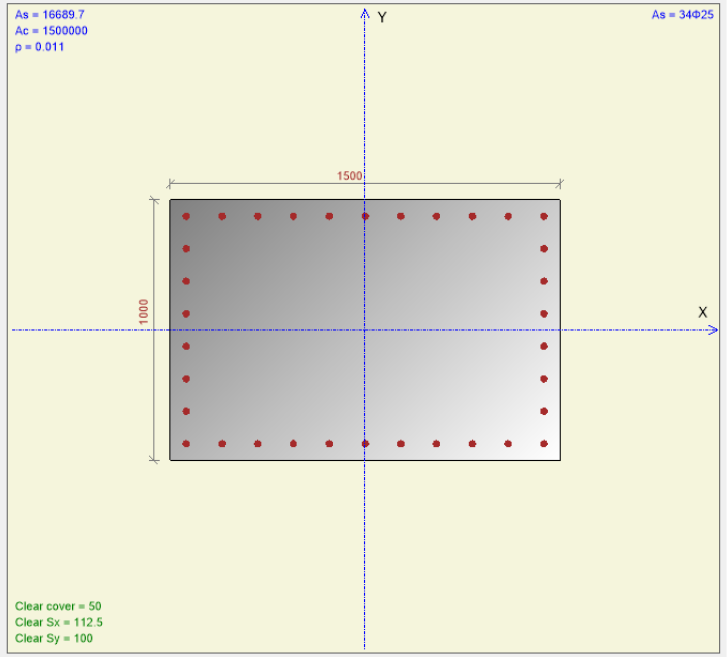
File | Input | External Loads | ULS Load Combinations | Design Report | Column Capacity | Interaction Diagram | Summary of Results

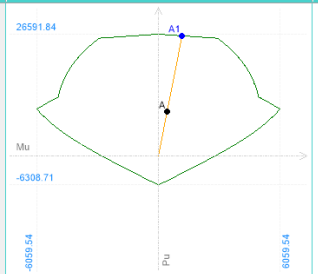
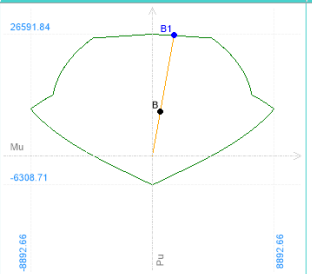
		Bending Around X			Bending Around Y	
Story Type		Sway (Unbraced)	...		Sway (Unbraced)	...
Unsupported Length (m)	Lux	3	...	Luy	3	...
Effective Lenght Factor	Kx	2	...	Ky	2	...
Transverse loads applied between supports		☐	...		☐	...

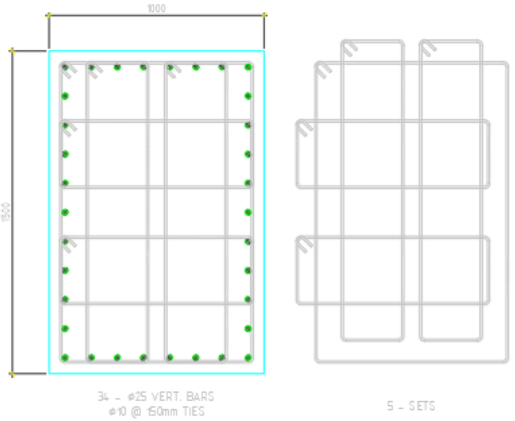
Property	Symbol	Unit	Value
Shape of section			Rectangular
Column Name			P12
Section dimension in X direction	Bx	mm	1500
Section dimension in Y direction	By	mm	1000
Clear cover of main bars	d'	mm	50
Number of bars in X direction	nx		11
Number of bars in Y direction	ny		8
Diameter of bars	Φ	mm	25
Compression 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

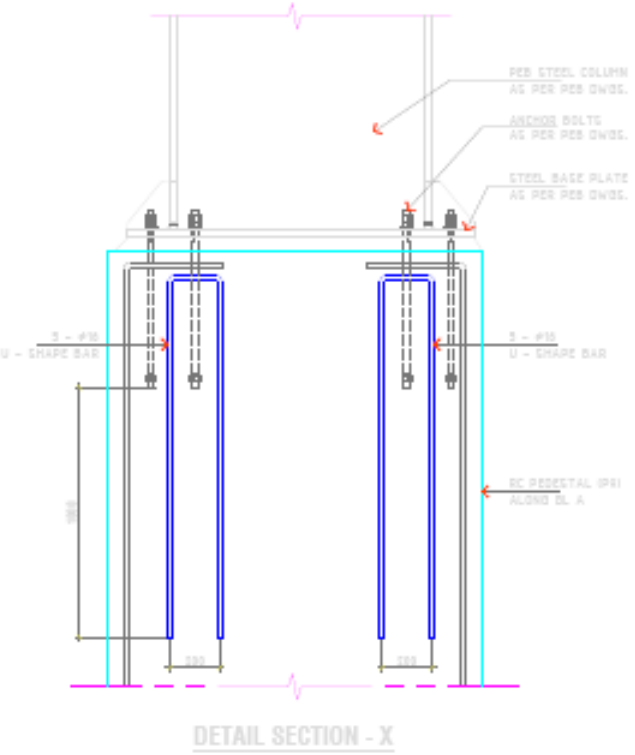
Meothod of Calculation (EI)eff
- ACI 318M-14 (6.6.4.4.4a)
- ACI 318M-14 (6.6.4.4.4b)
- ACI 318M-14 (6.6.4.4.4c)

Options
- ☐ Compute Ec based on Wc value



Property	Reference	Unit	Symbol	Formula	Value	Symbol	Formula	Value
Bottom Section				 Interaction Diagram - Bending Around X			 Interaction Diagram - Bending Around Y	
Bresler Reciprocal Load Method:				$\emptyset P_n \approx \frac{1}{\frac{1}{\emptyset P_{ox}} + \frac{1}{\emptyset P_{oy}} - \frac{1}{\emptyset P_o}}$				
From Interaction Diagram → ØPo		KN	ØPo	Maximum axial load strength of the column with no applied moments	26591.84			
From Point A1 → ØPox		KN	ØPox	Maximum uniaxial load strength of the column with a moment of ØMnx = ØPn ey	26285.03			
From Point B1 → ØPoy		KN	ØPoy	Maximum uniaxial load strength of the column with a moment of ØMny = ØPn ex	26370.68			



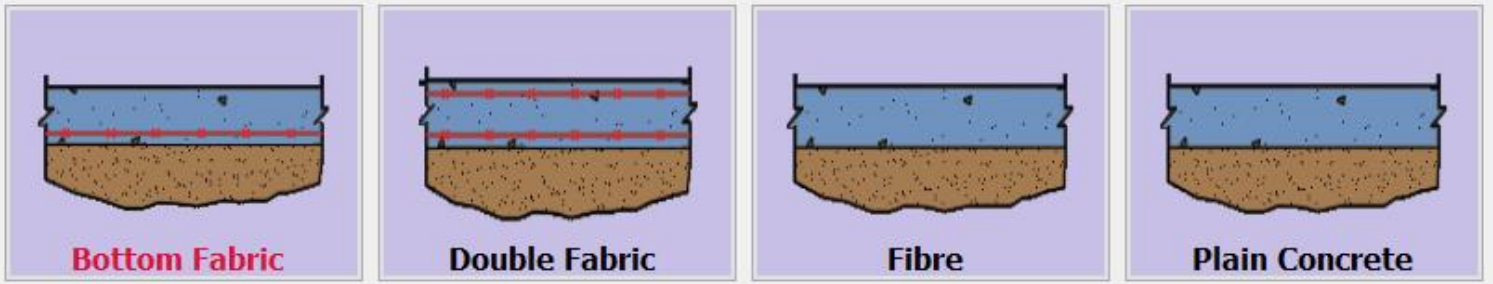


SUPPLEMENTARY REINFORCEMENT WITH MARK #

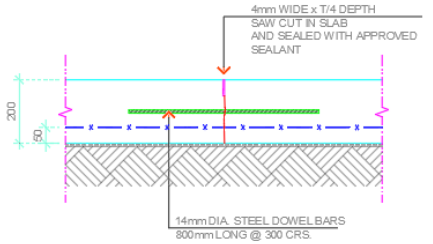
P12

Design of Grade Slab as per TR34 4th Edition

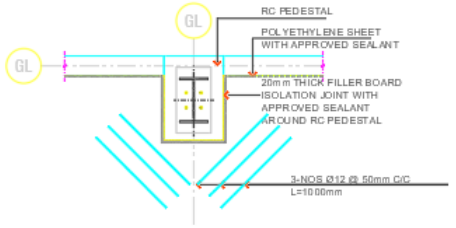
Section Name GS1

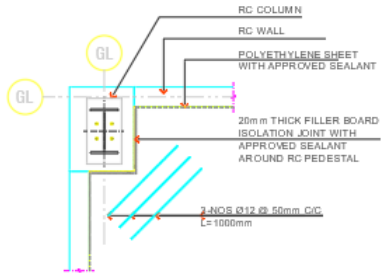


Property	Unit	Symbol	Value
Design slab thickness	mm	H	175
Characteristic compressive concrete cube strength at 28 days	MPa	fcu	40
Modulus of subgrade reaction	KN/m2/m	k	50000
Yield strength of reinforcement	MPa	fyk	500
Bottom Fabric reinforcement			A193
Bottom cover of reinforcement steel	mm	cb	50
Include the reinforcement in punching		?	☐



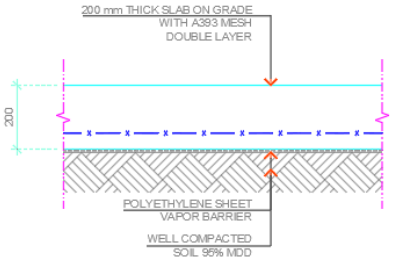
CONSTRUCTION JOINT DETAIL (CJ)
(WHEREVR IS NEEDED)



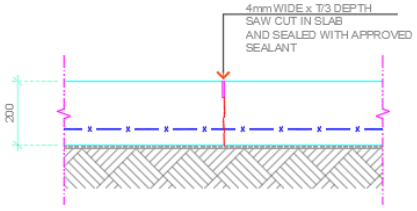


DETAIL AROUND EXTERNAL PEDESTAL DETAIL AROUND CORNER PEDESTAL

5 ADDITIONAL TOP REINFORCEMENT AROUND PEDESTAL

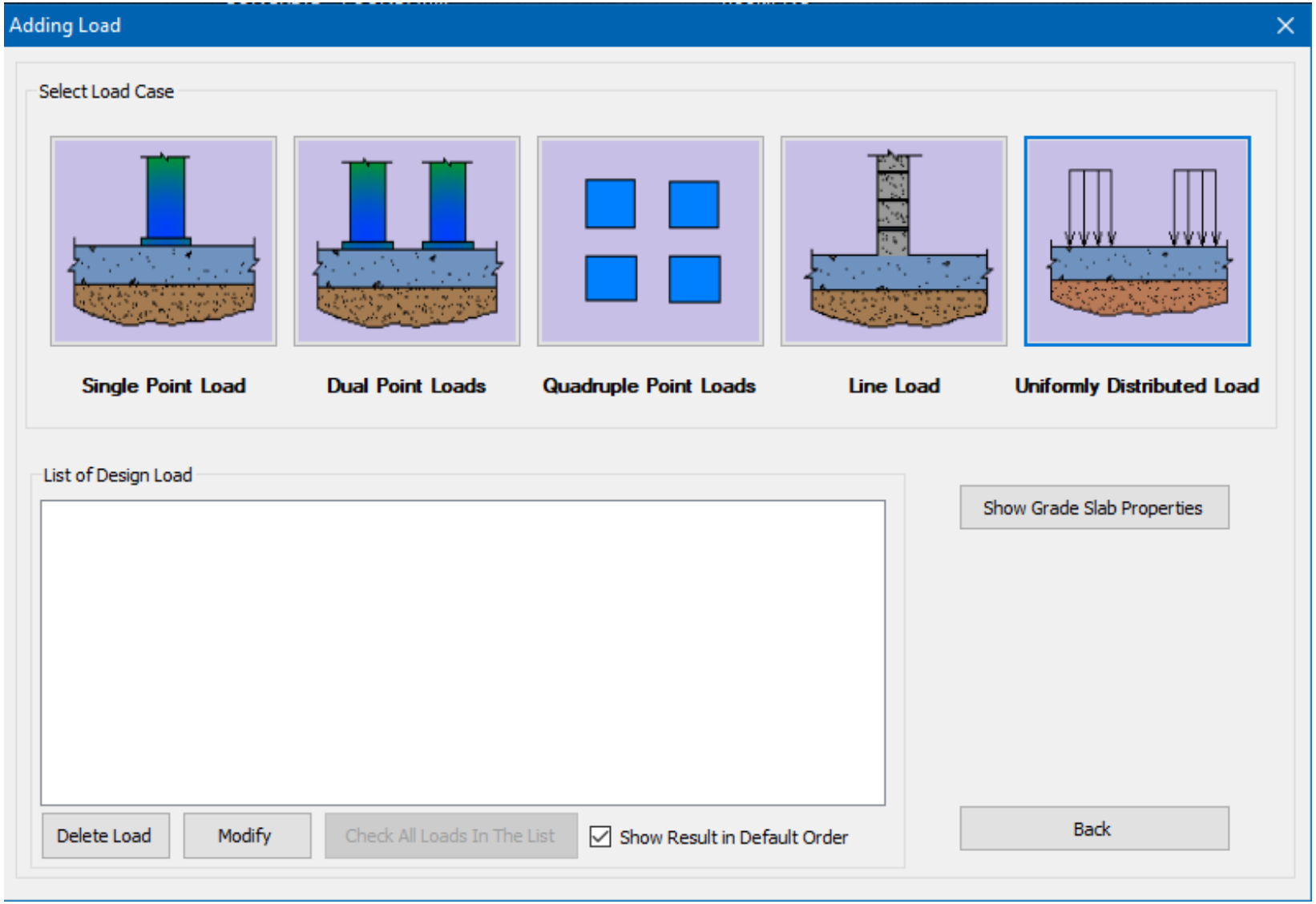


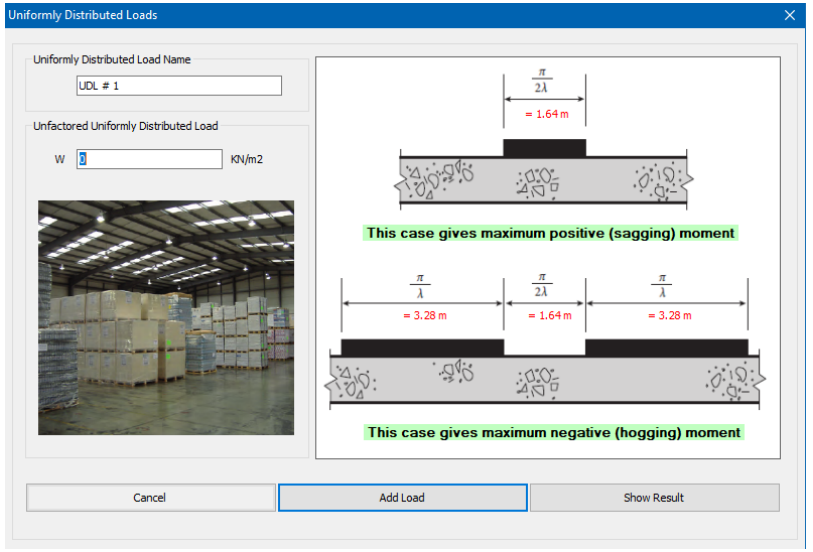
GRADE SLAB DETAIL

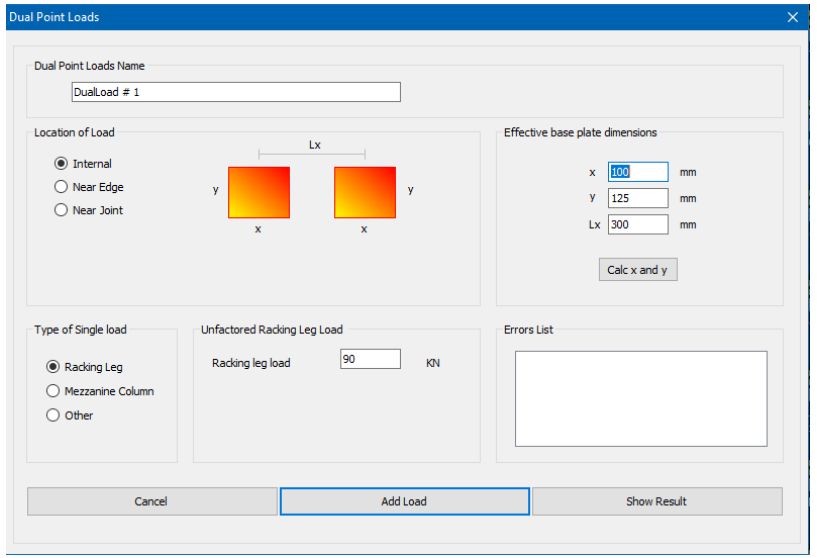


SAW-CUT JOINT DETAIL (SC)

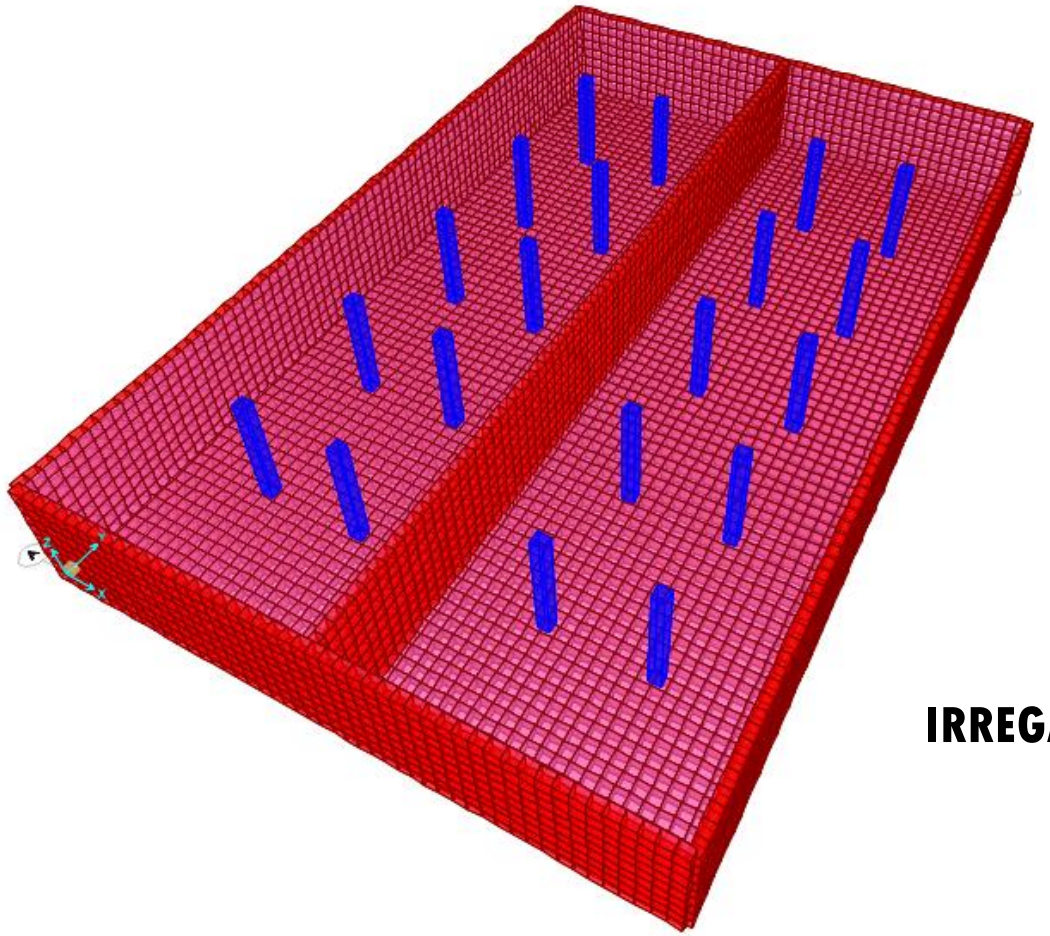
Design of Grade Slab as per TR34 4th Edition

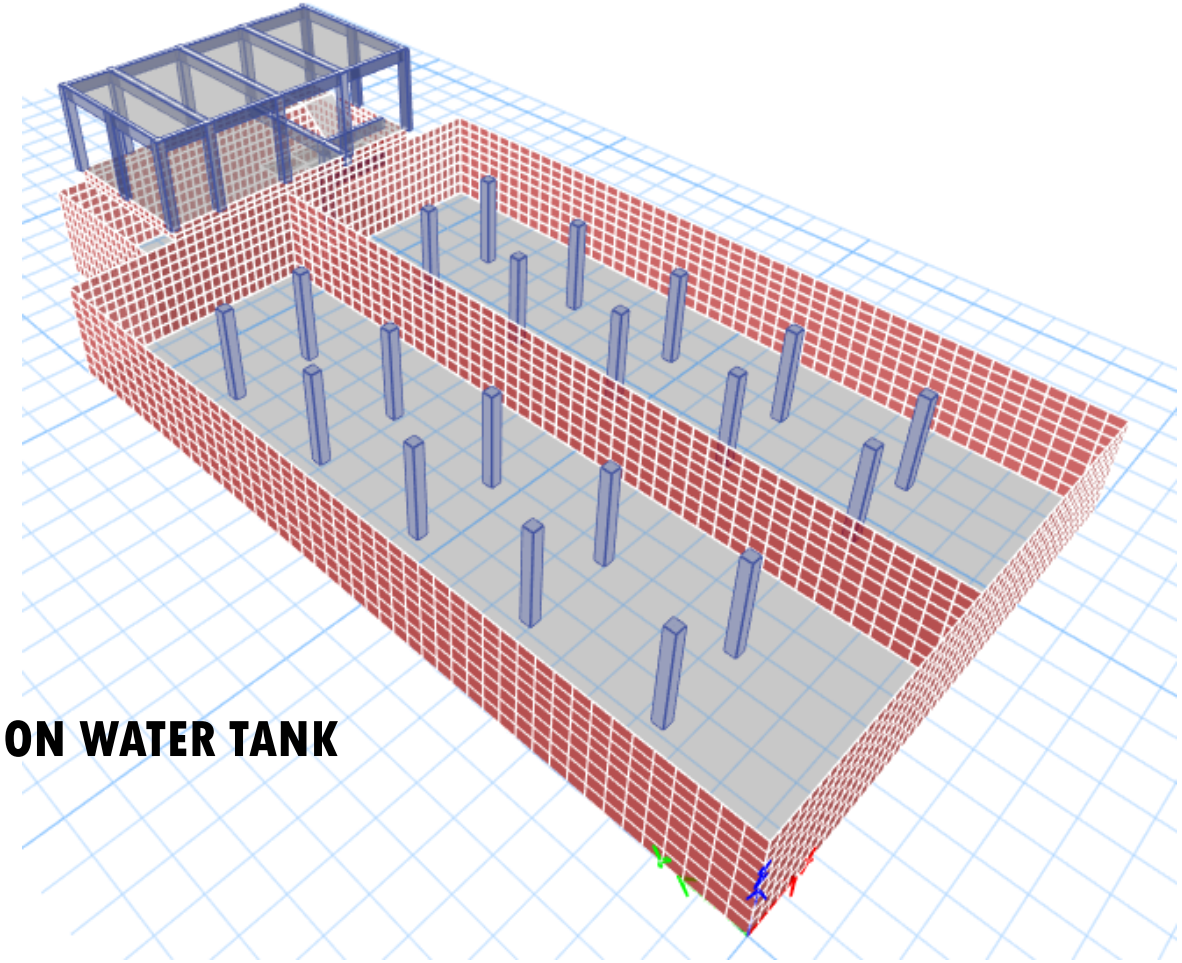






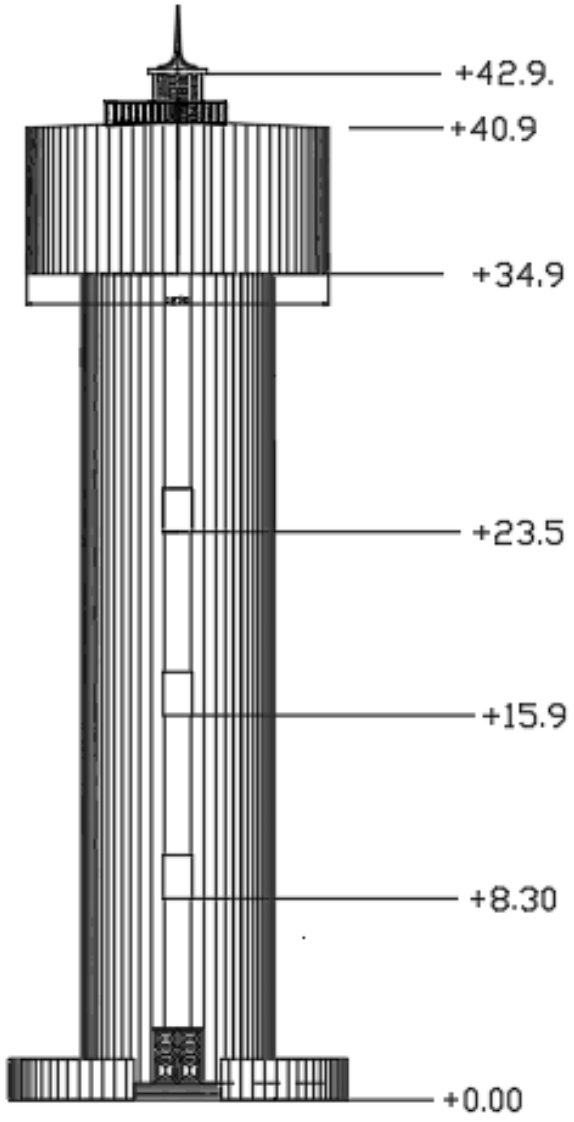
Design of Underground Water Tank

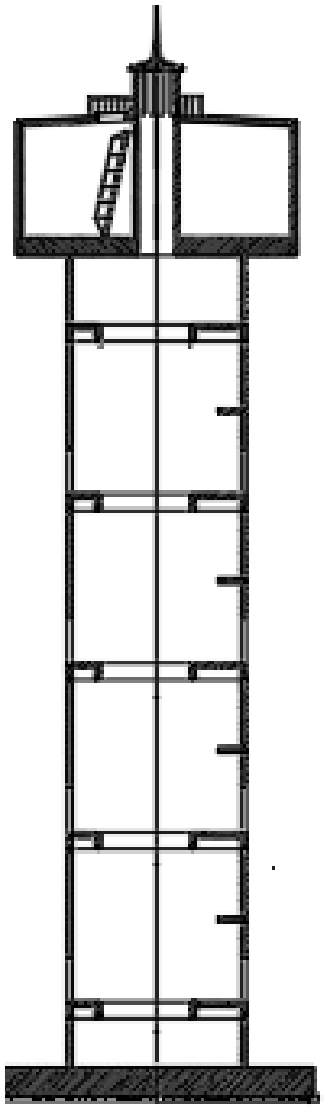


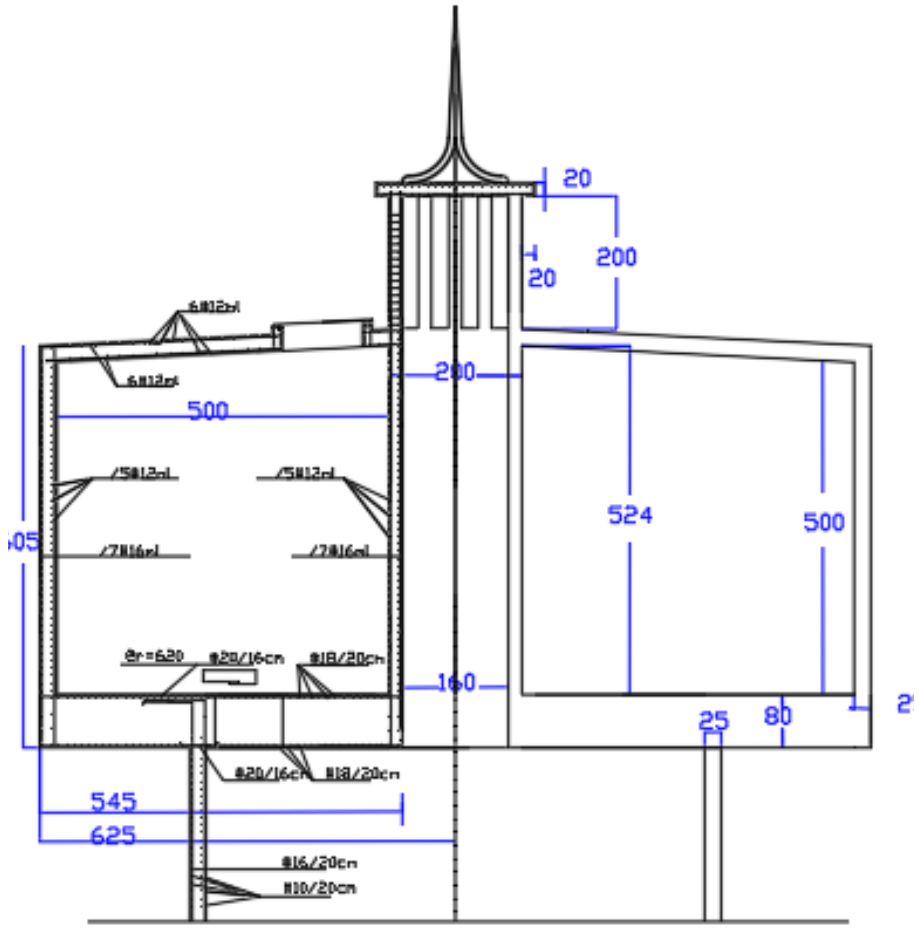


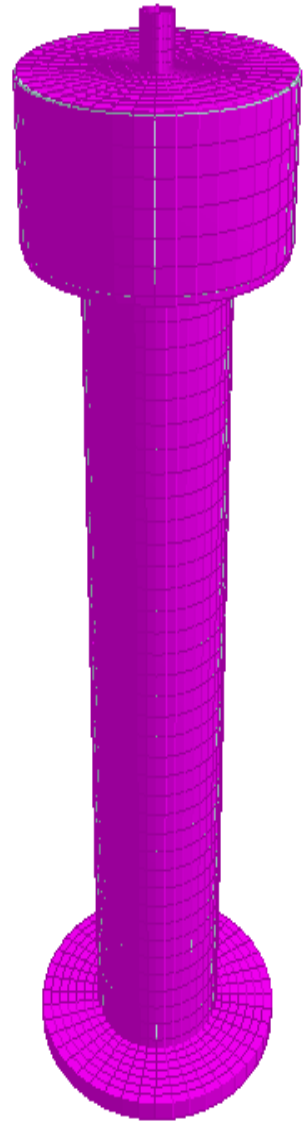
IRREGATION WATER TANK

Design of Elevated Water Tank

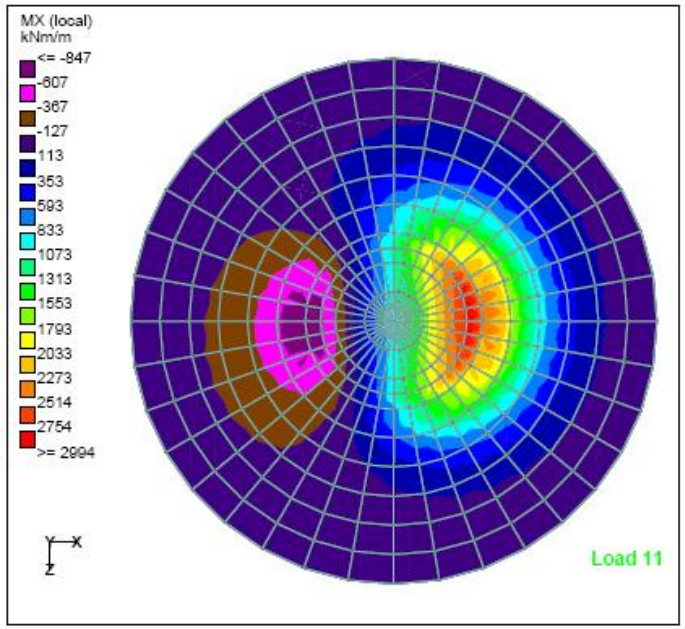


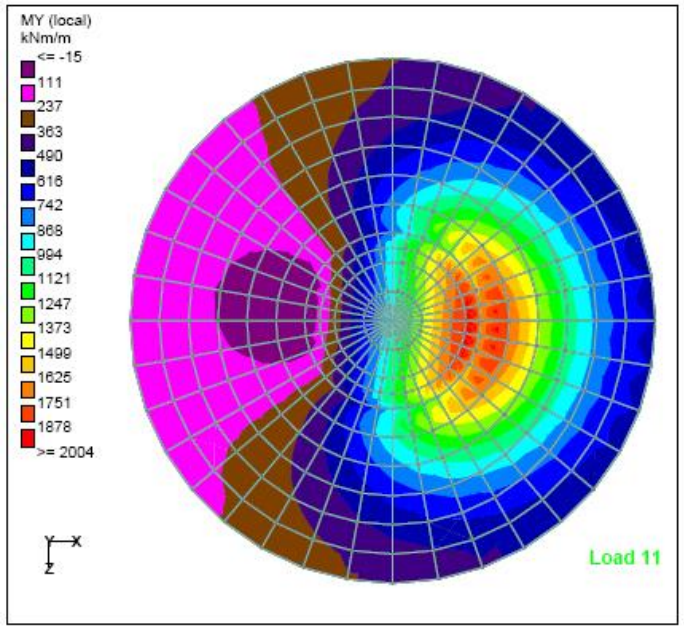


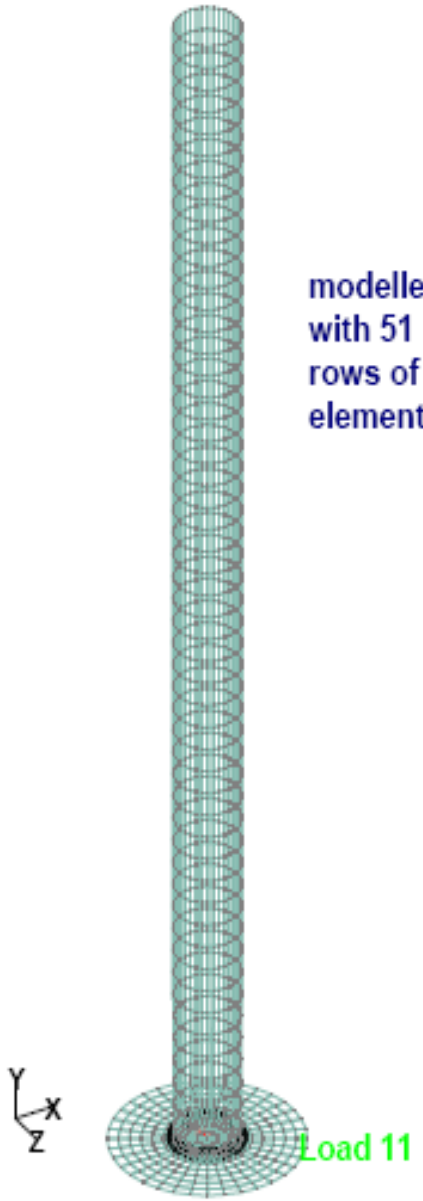




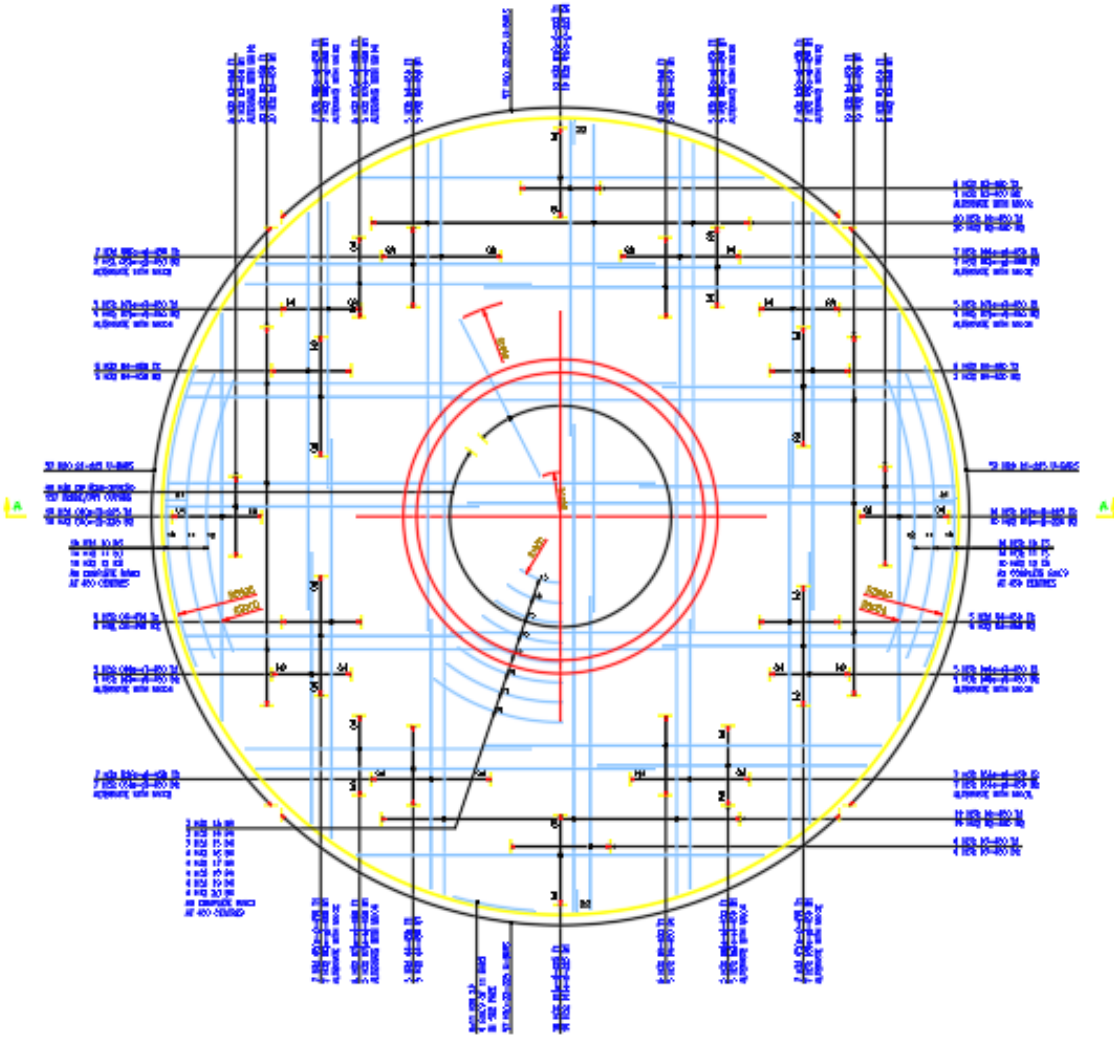
Design of Chimney Foundation



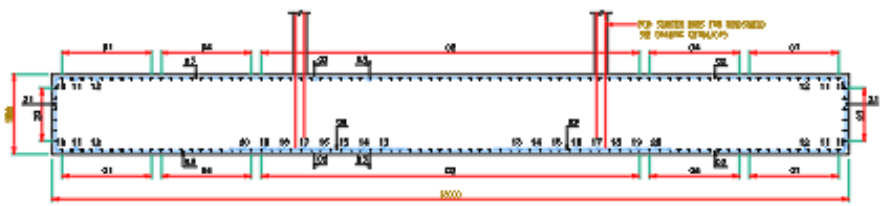




modelled with 51 rows of elements

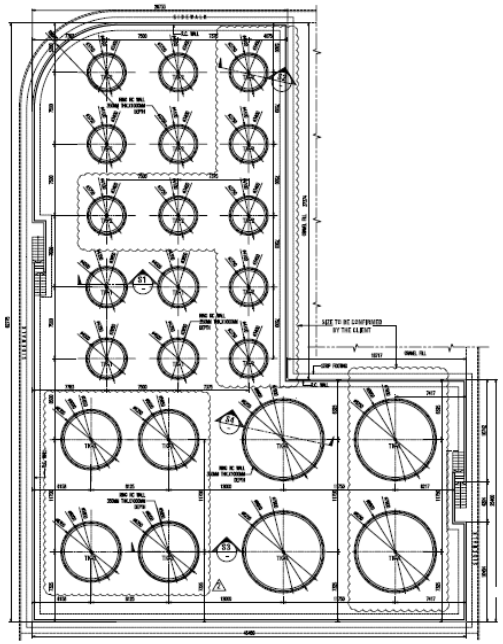


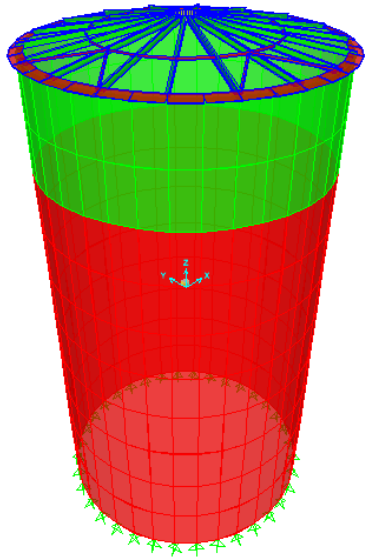
CHIMNEY FOUNDATION PLAN

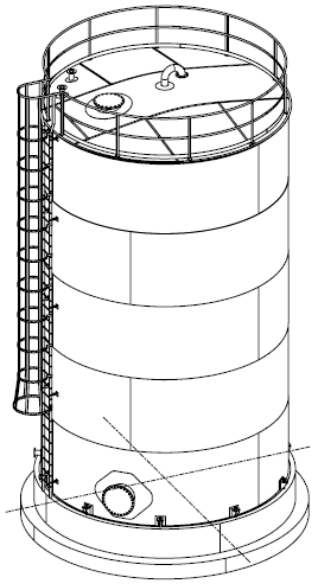


SECTION A – A

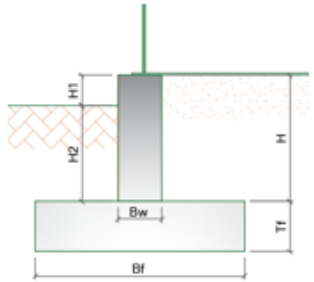
Design of Tank Farm Foundation

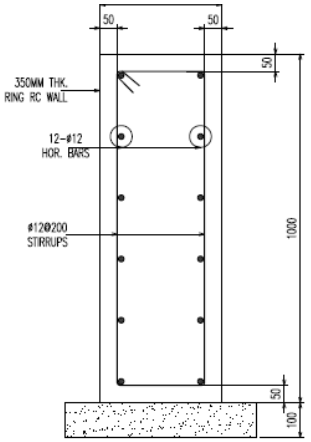




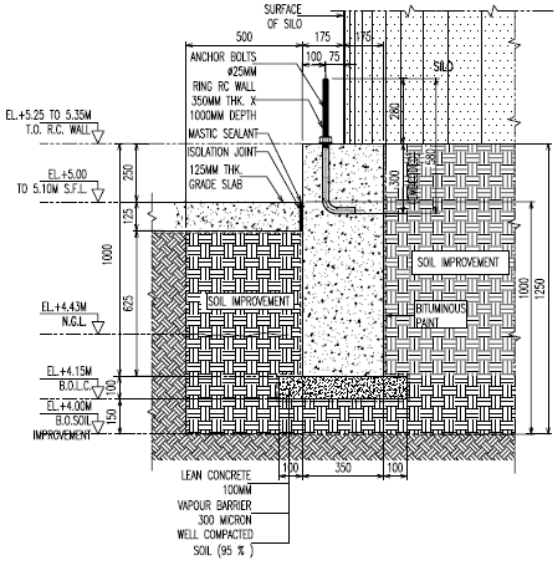


Tank Foundation Design as per API 650 - 2020		Fire Tank	
Steel Tank Input:			
Tank Dia	D	18.15	m
Ringwall Input:			
Width of Ringwall	Bw	0.3	m
Height of Ringwall	H	0.6	m
Projection	H1	0.6	m
Annular Strip Footing Input:			
Width of Annular Strip Footing	Bf	0.3	m
Thickness of Annular Strip Footing	Tf	0	m
Note: If there is no Strip Footing under Ringwall then put Bf = Brw and Tf = 0			
Material Specifications Input:			
Reinforcement Steel Strength	Fy	420	MPa
Concrete Strength	Fc'	30	MPa
Density of concrete	$\gamma_{Concrete}$	24.00	KN/m³
Density of Soil	γ_{s}	18.00	KN/m³
Soil Properties Input:			
Angle of Internal Friction	ϕ	30	
Coefficient of friction	μ	0.40	
Soil Bearing Capacity	SBC	150	KPa
Safty Factors:			
Minimum Safety Factor Against Overturning	SFo	2	
Minimum Safety Factor Against Sliding	SFs	1.5	

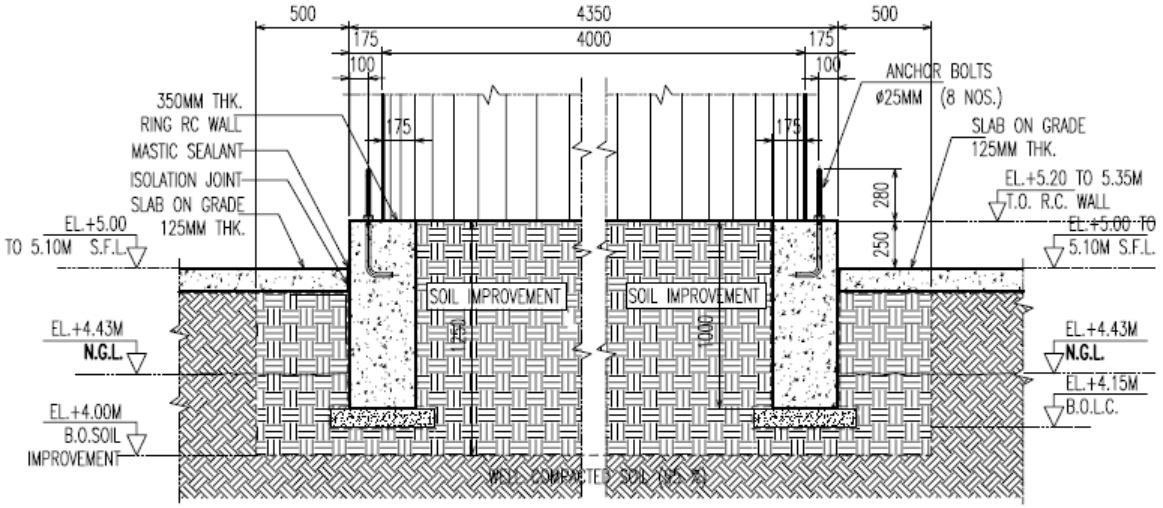




2 REINFORCEMENT DETAIL OF RING RC WALL
SCALE: 1:30 MTS.

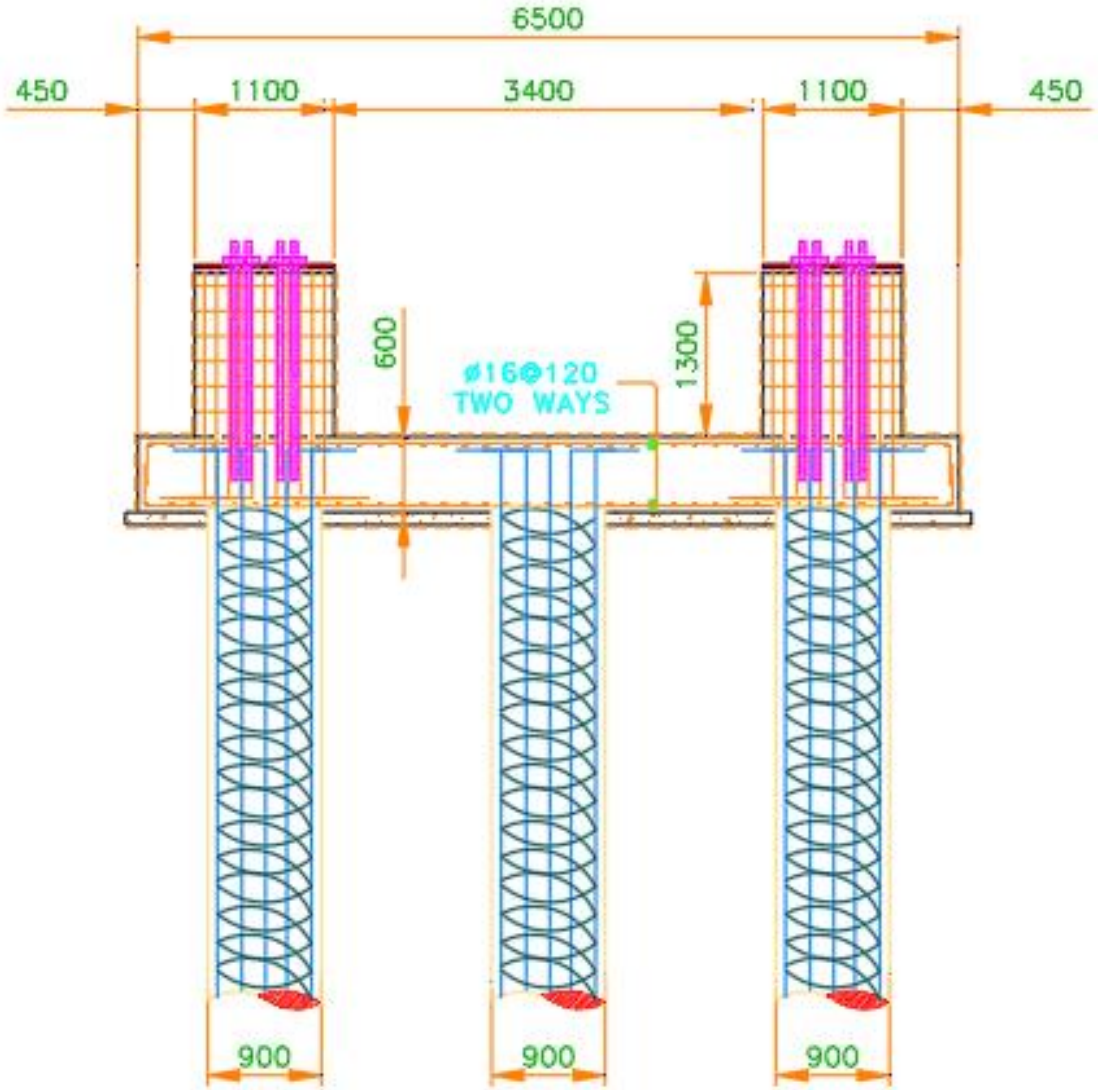


3 TYP.ENLARGE SECTION OF RING RC WALL
SCALE: 1:15 MTS.



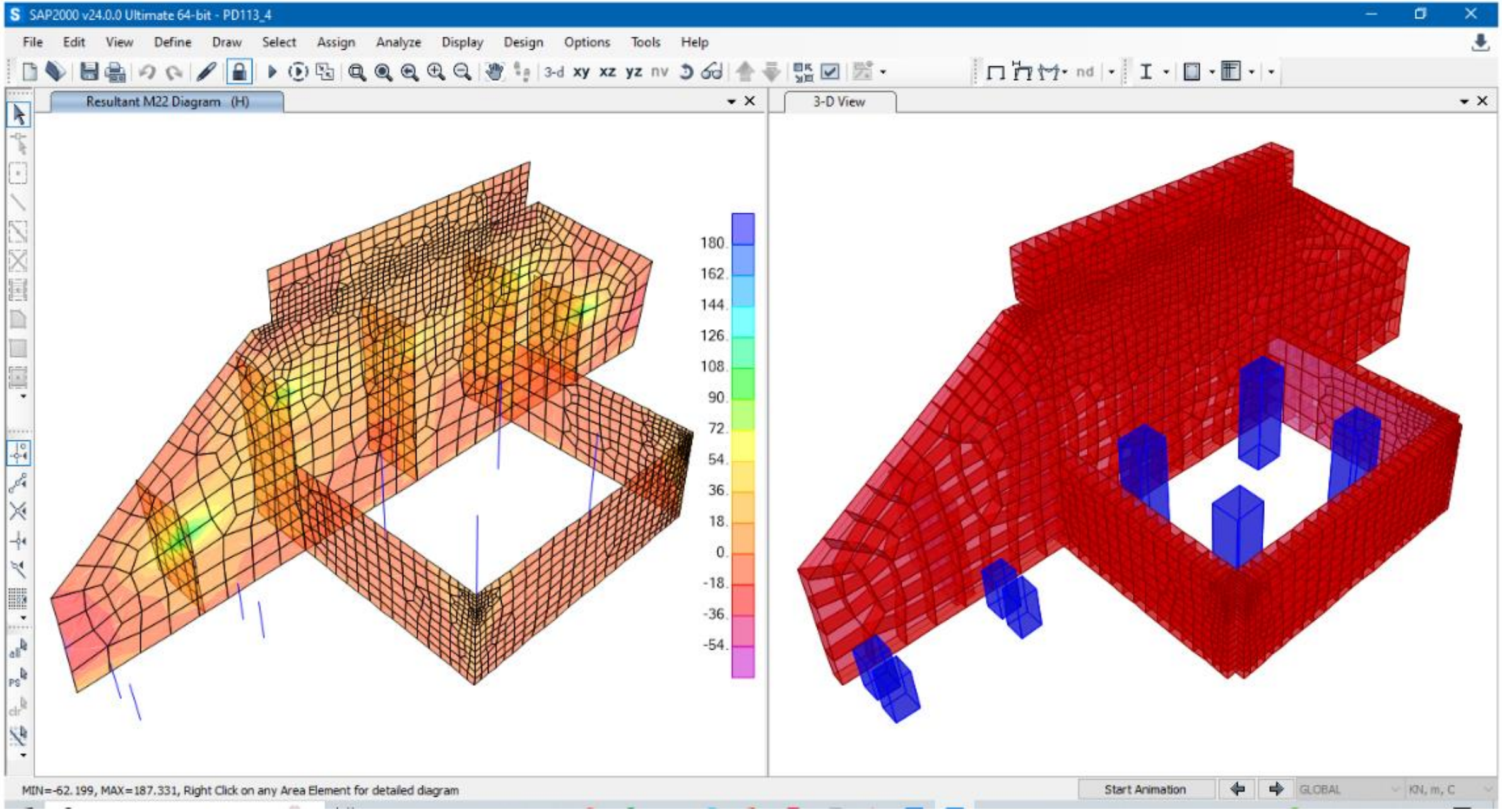
S1 SECTION OF TK-1
SCALE: 1:30MTS.

Design of Steel Tower Foundation

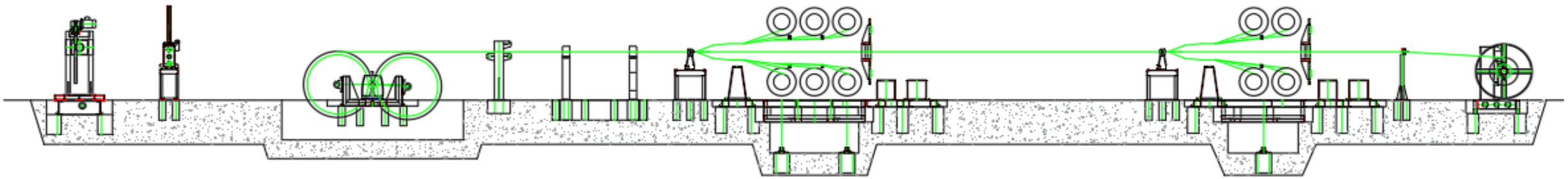


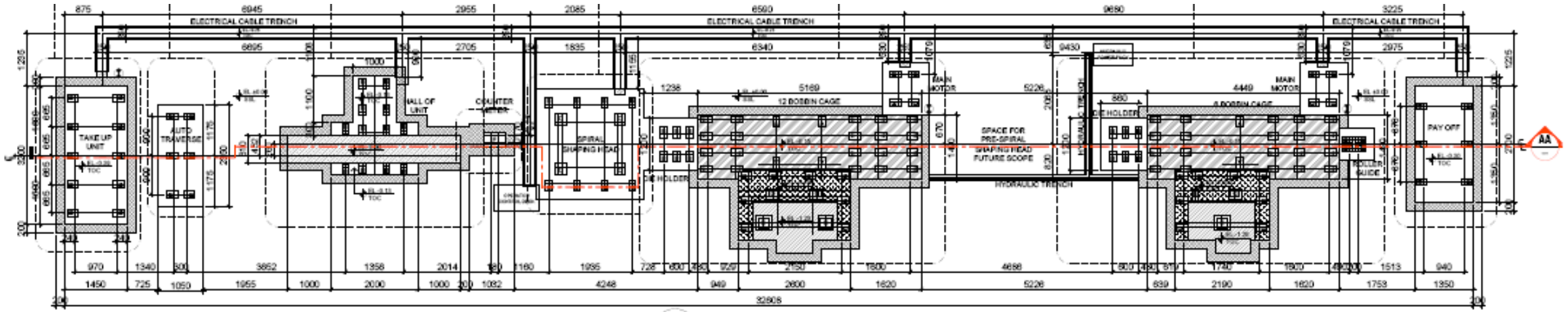
RADAR TOWER FOUNDATION

Design of Production Line Foundation



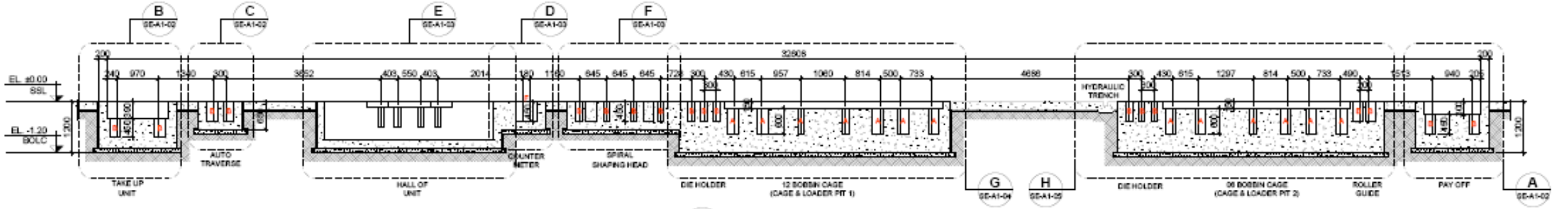
Design of Production Line Foundation





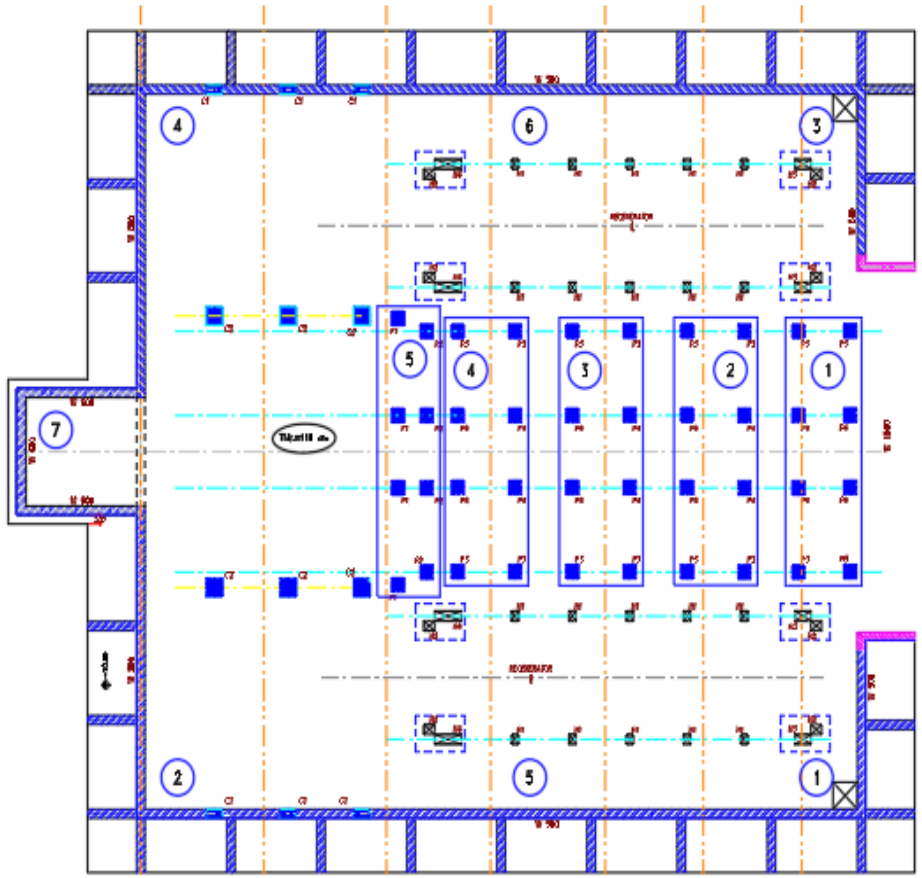
1 GENERAL LAYOUT

SCALE 1:60

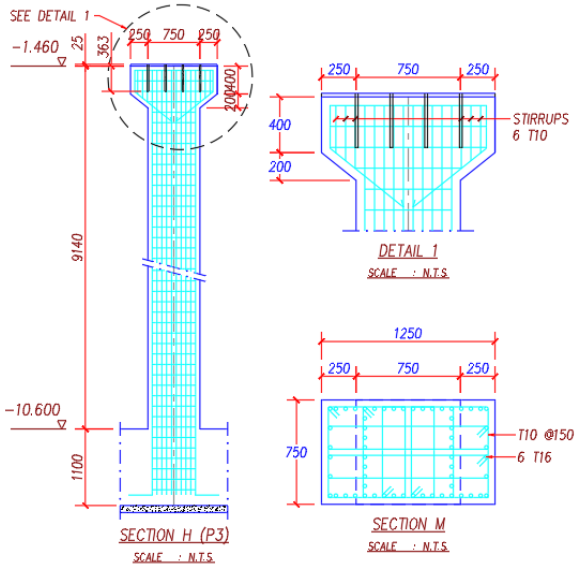


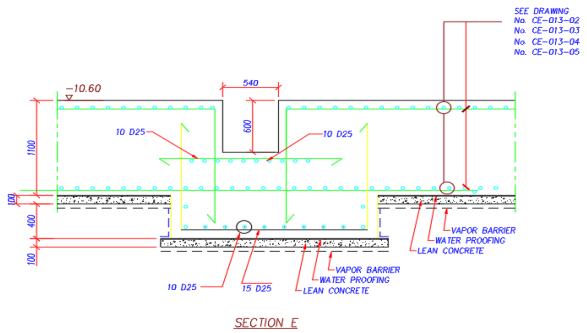
AA GENERAL SECTION

Design of Production Line Foundation

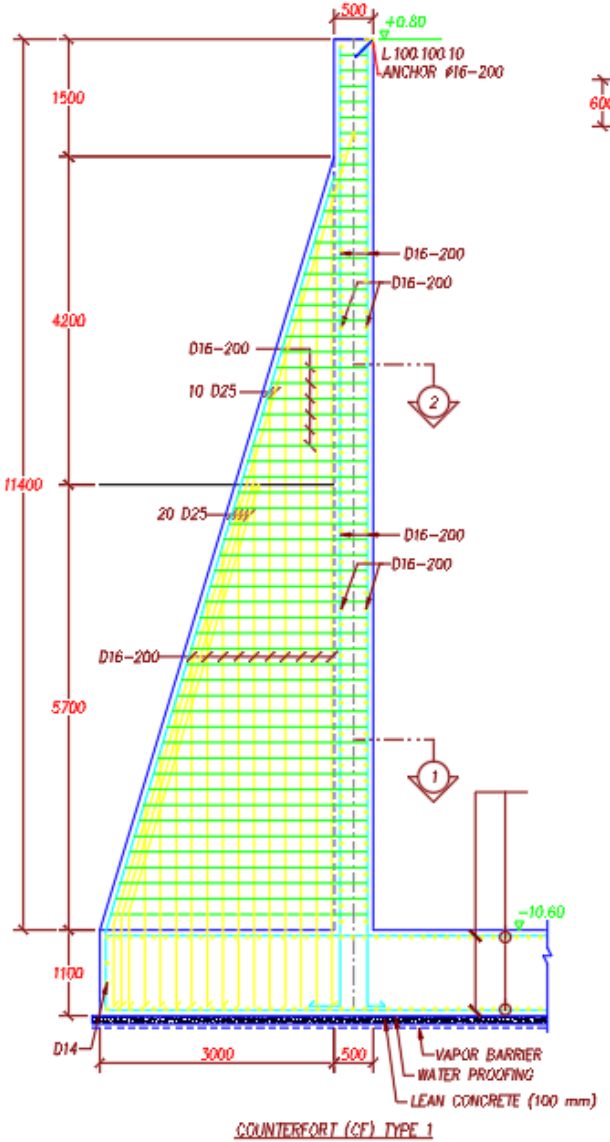


DEEP BASEMENT WALL & PIER SEQUENCE (UPPER)

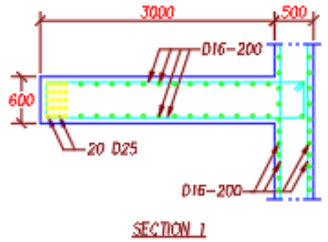




SECTION E

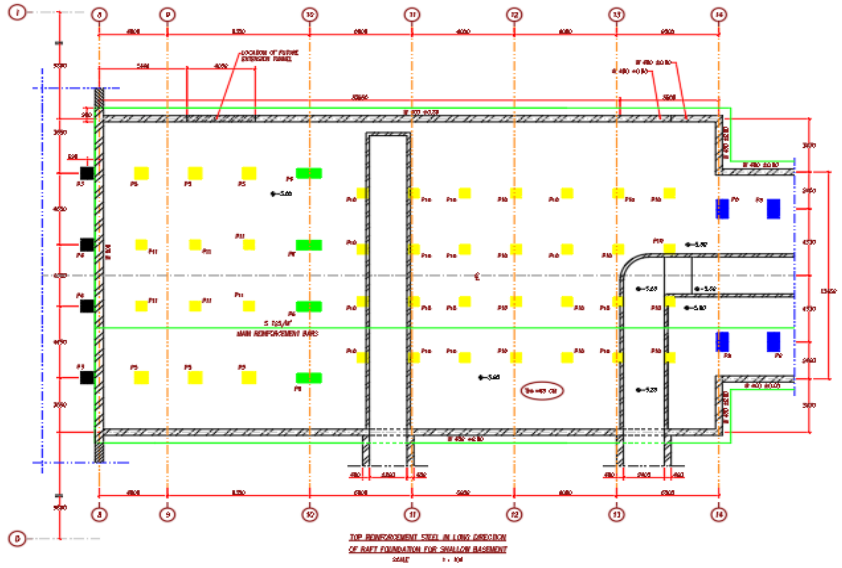


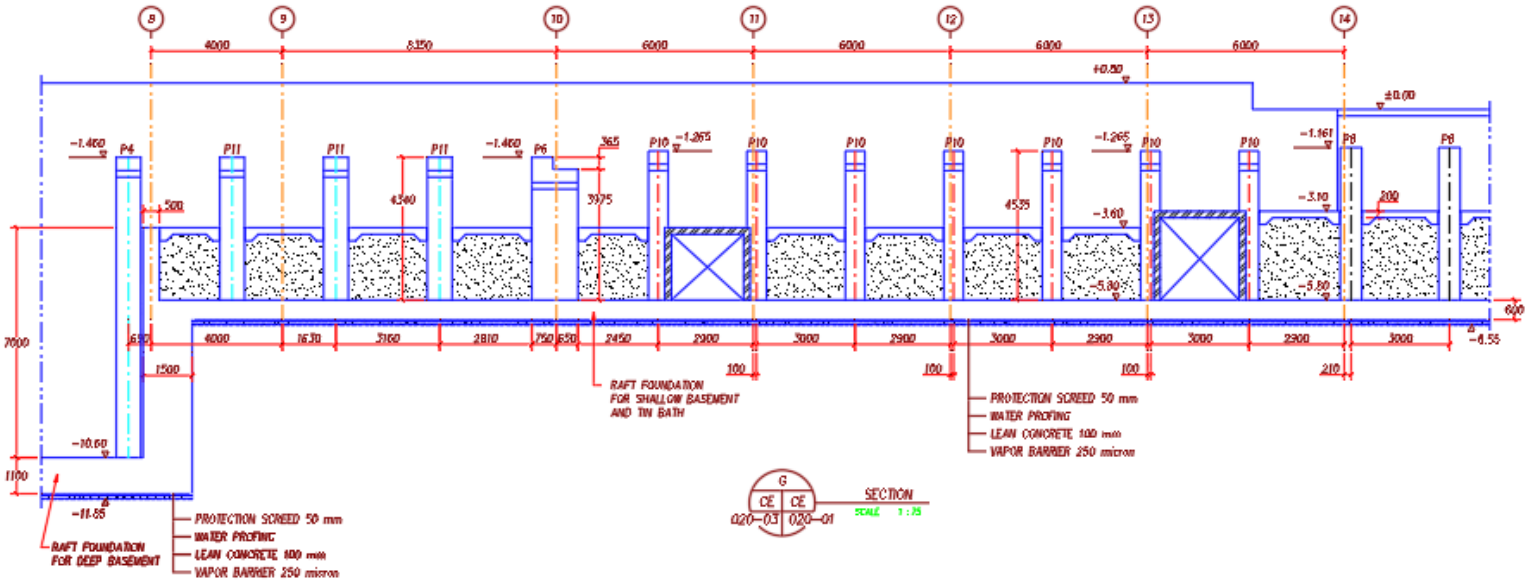
COUNTERFORT (CF) TYPE 1

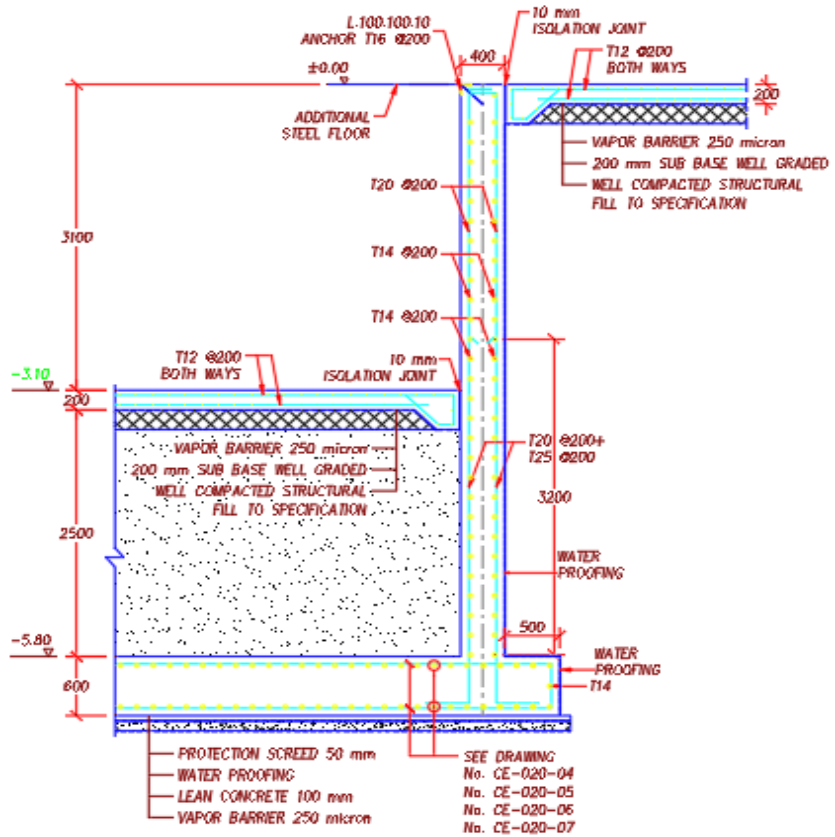


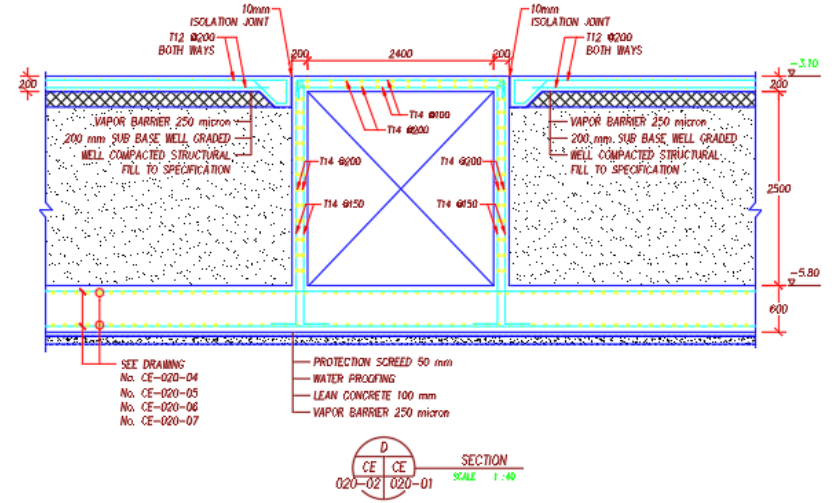
SECTION 1

Design of Production Line Foundation

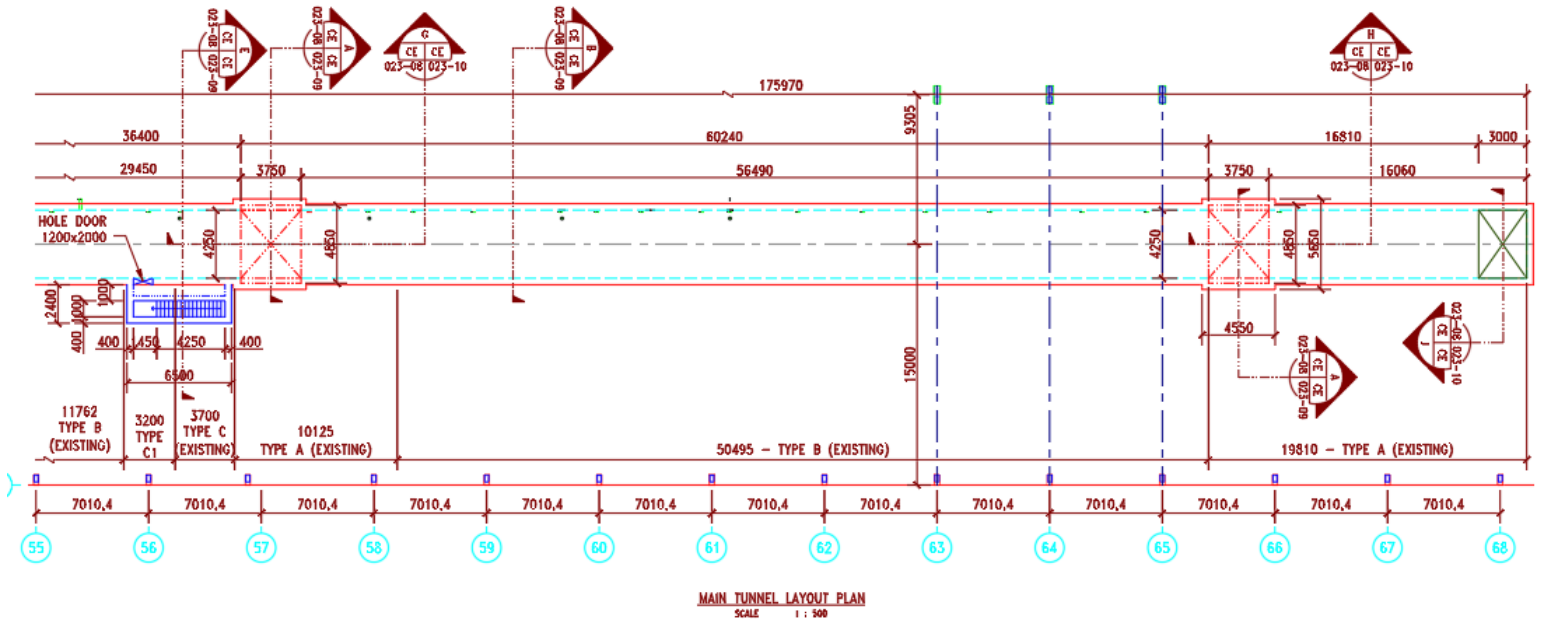




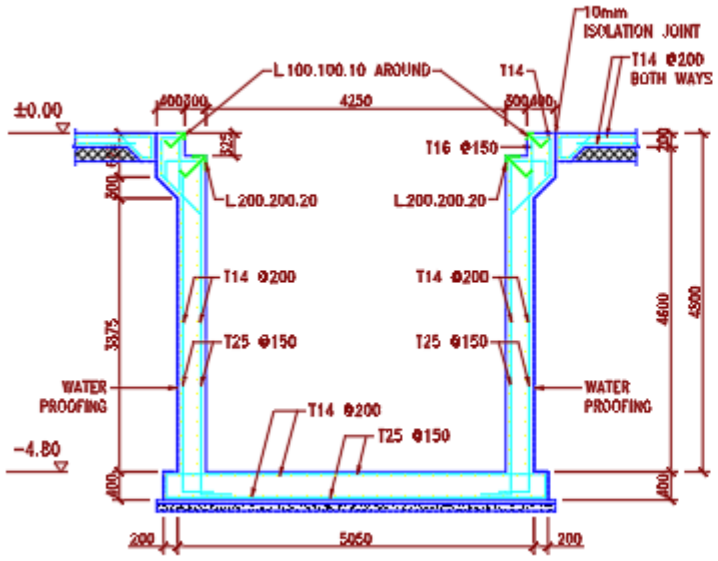


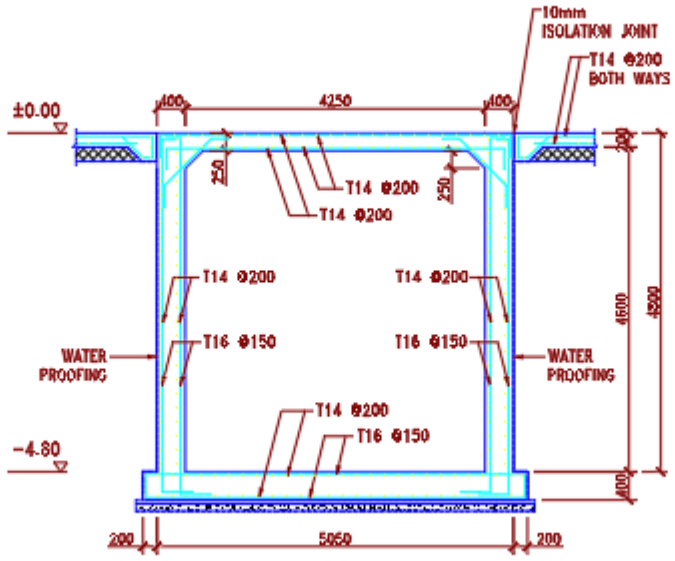


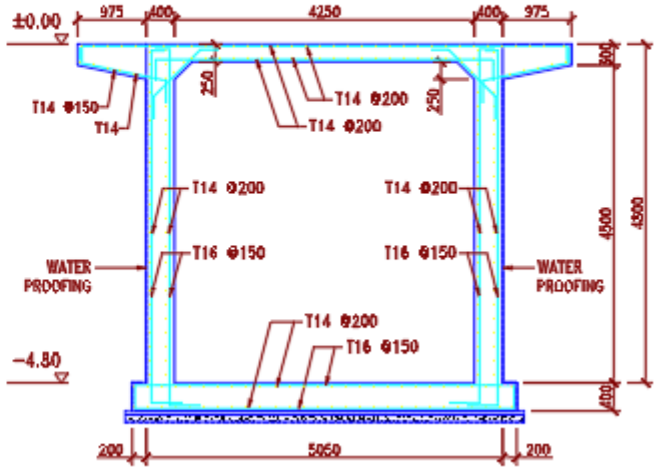
Design of Production Line Foundation



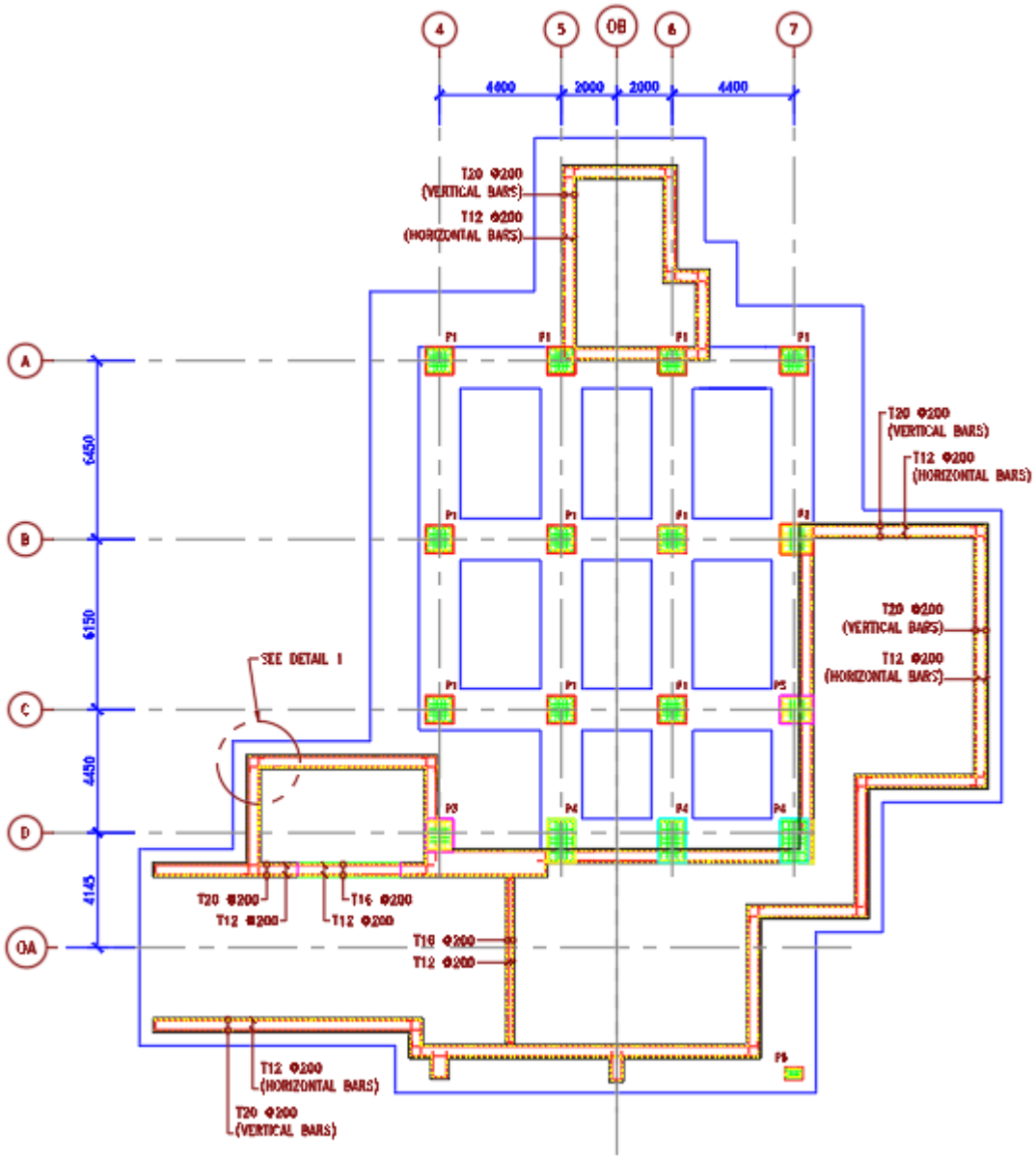
MAIN TUNNEL LAYOUT PLAN
SCALE 1 : 500

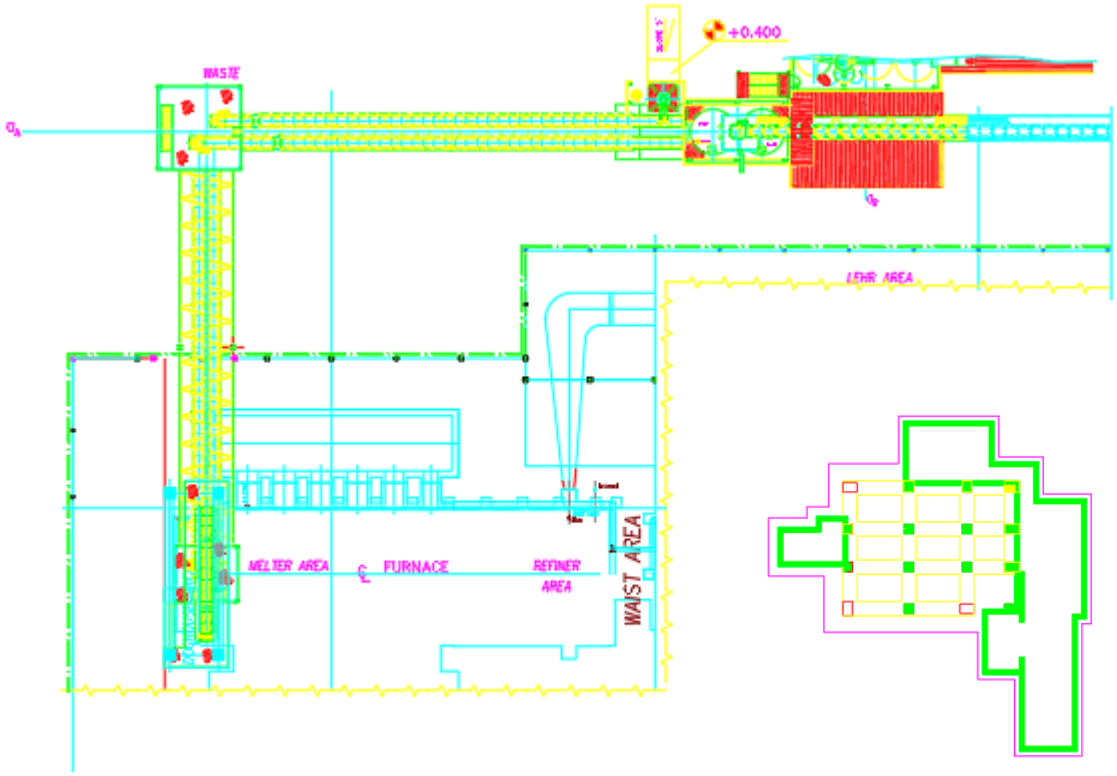


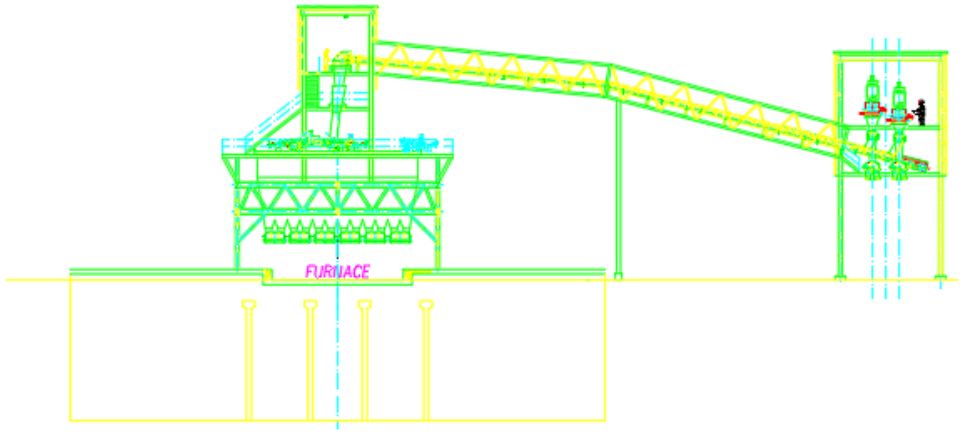




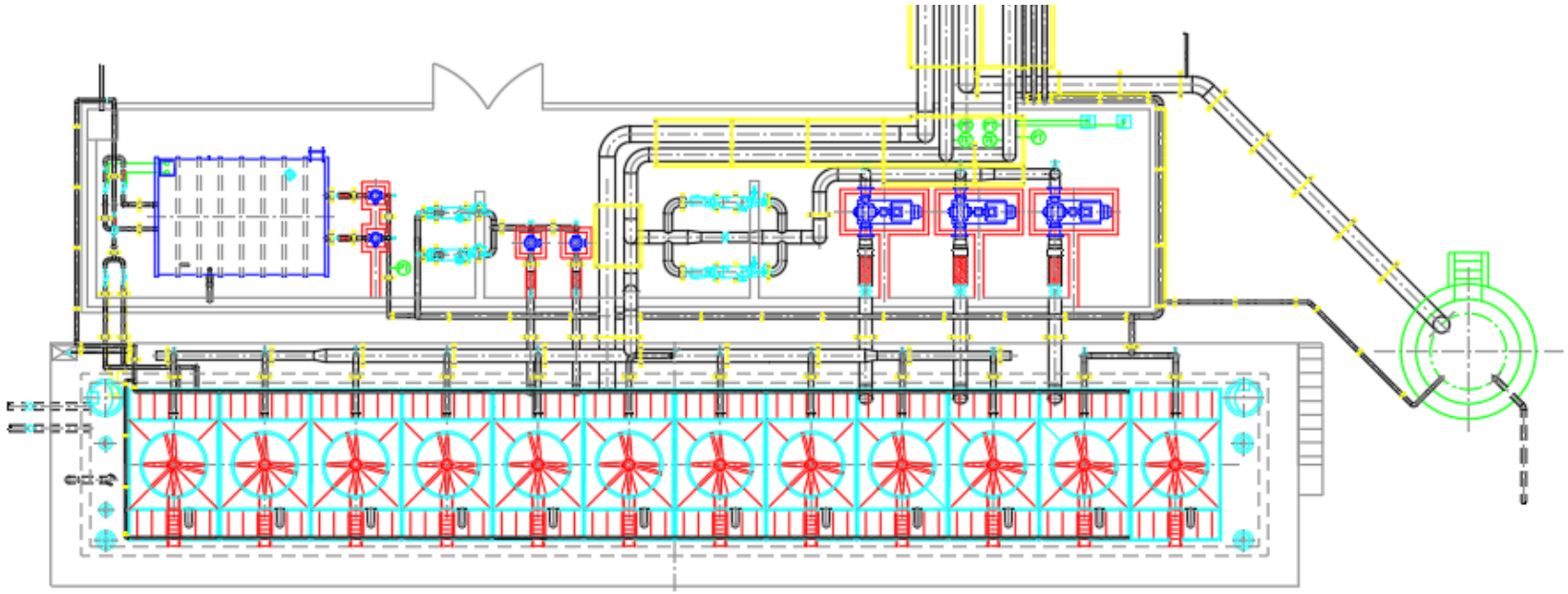
Design of Production Line Foundation





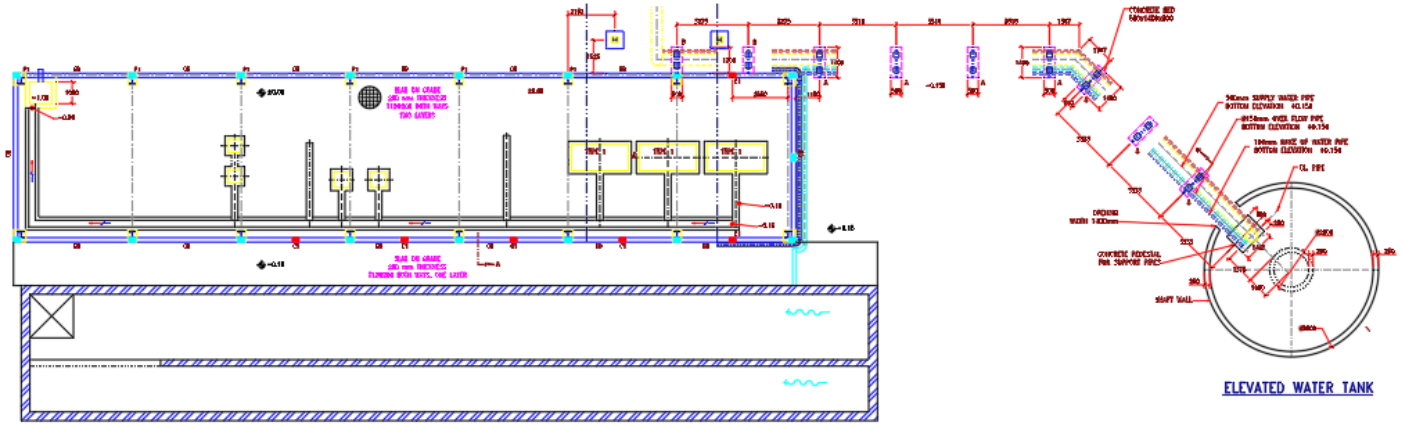


Design of Production Line Foundation

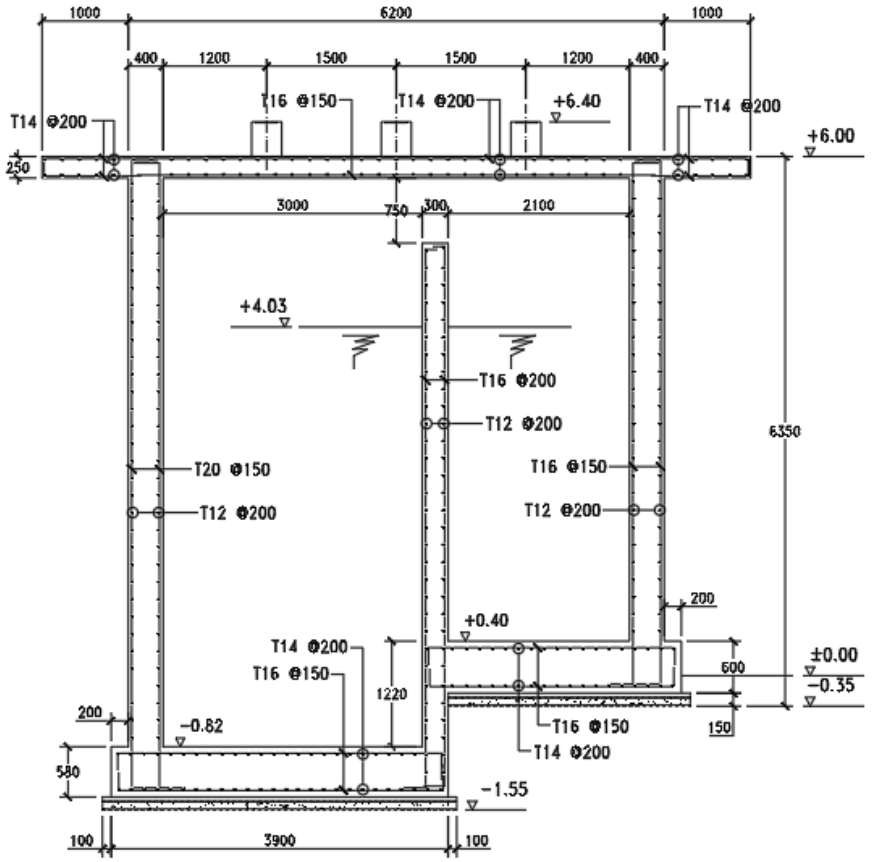


A COOLING WATER PIPES, COOLING TOWER & PUMPS LAYOUT PLAN

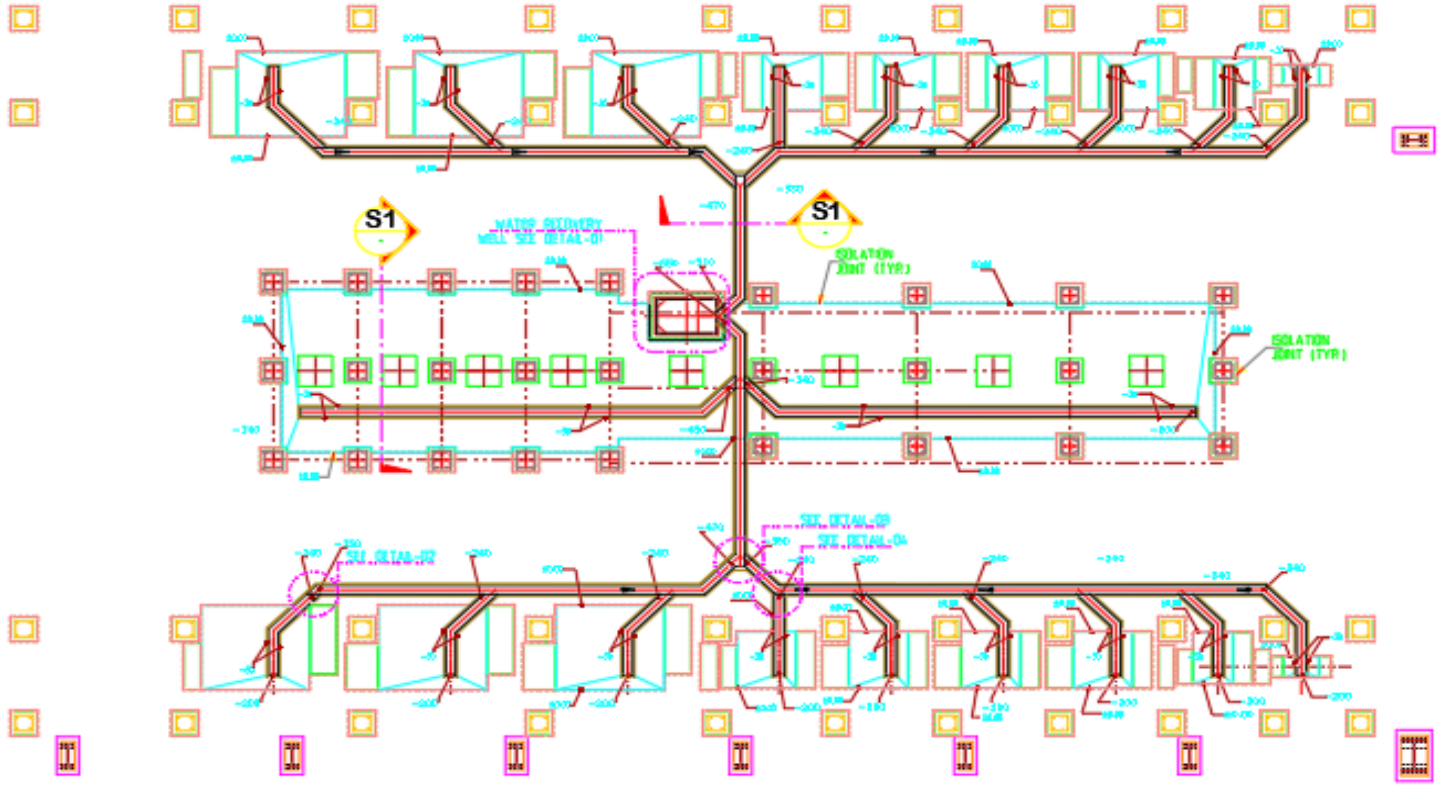
SCALE 1:100

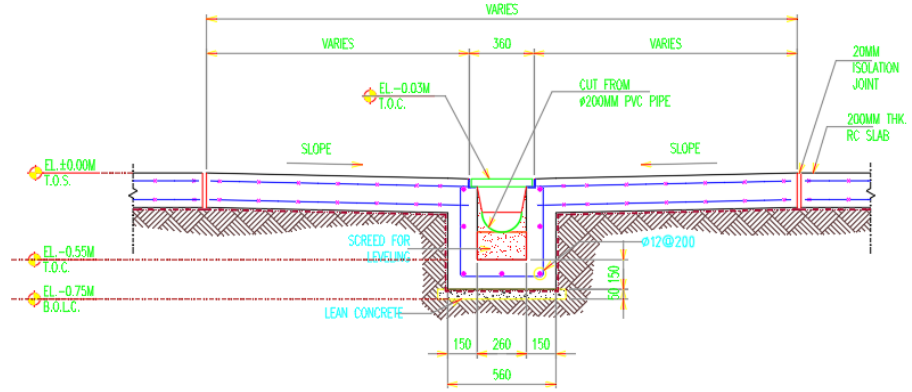


ELEVATED WATER TANK

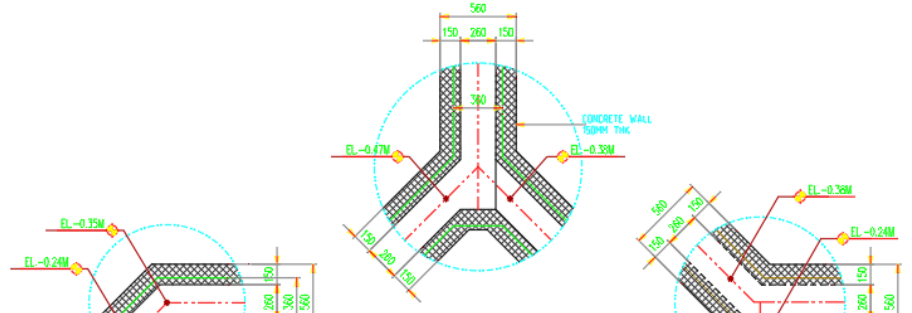


Design of Production Line Foundation





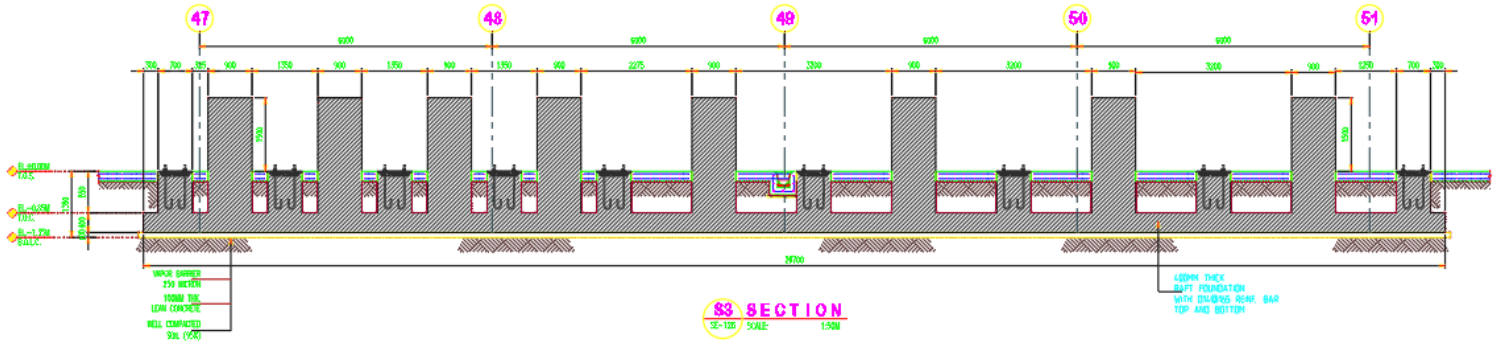
S1 SECTION
SCALE: NTS



D2 TRENCH DETAIL
SCALE: 1:25M

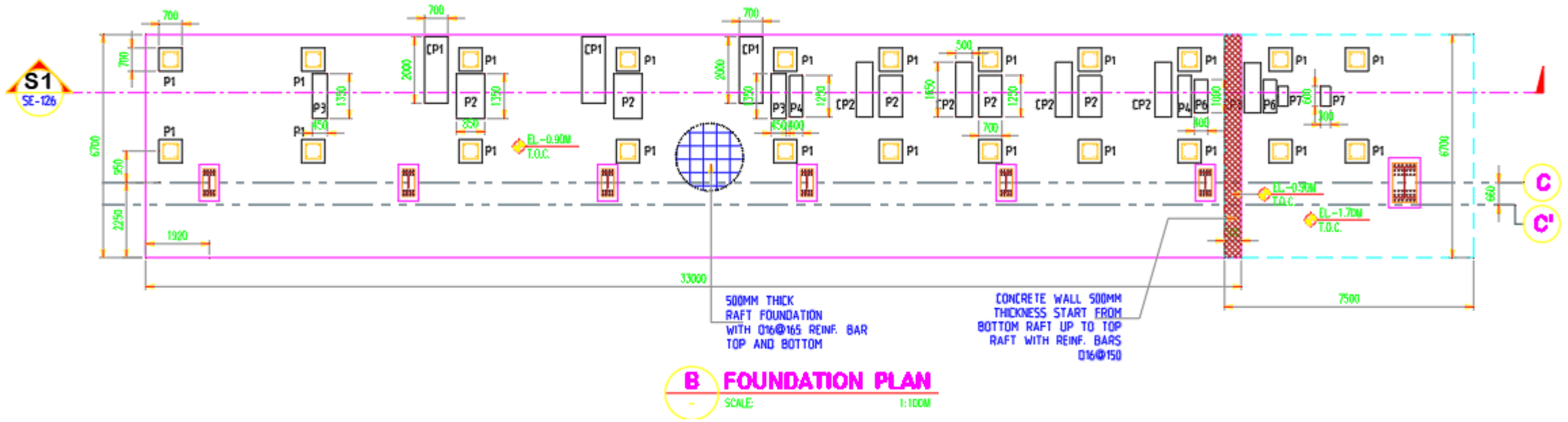
D3 TRENCH DETAIL
SCALE: 1:25M

D4 TRENCH DETAIL
SCALE: 1:25M

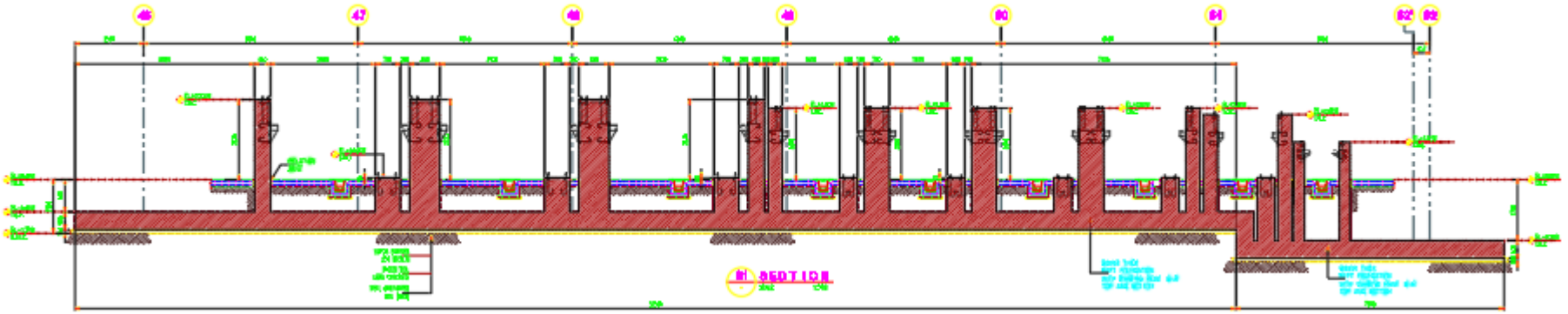


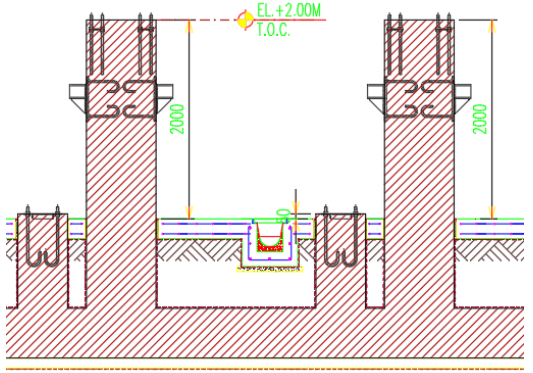
S3 SECTION
SCALE: 1:50M

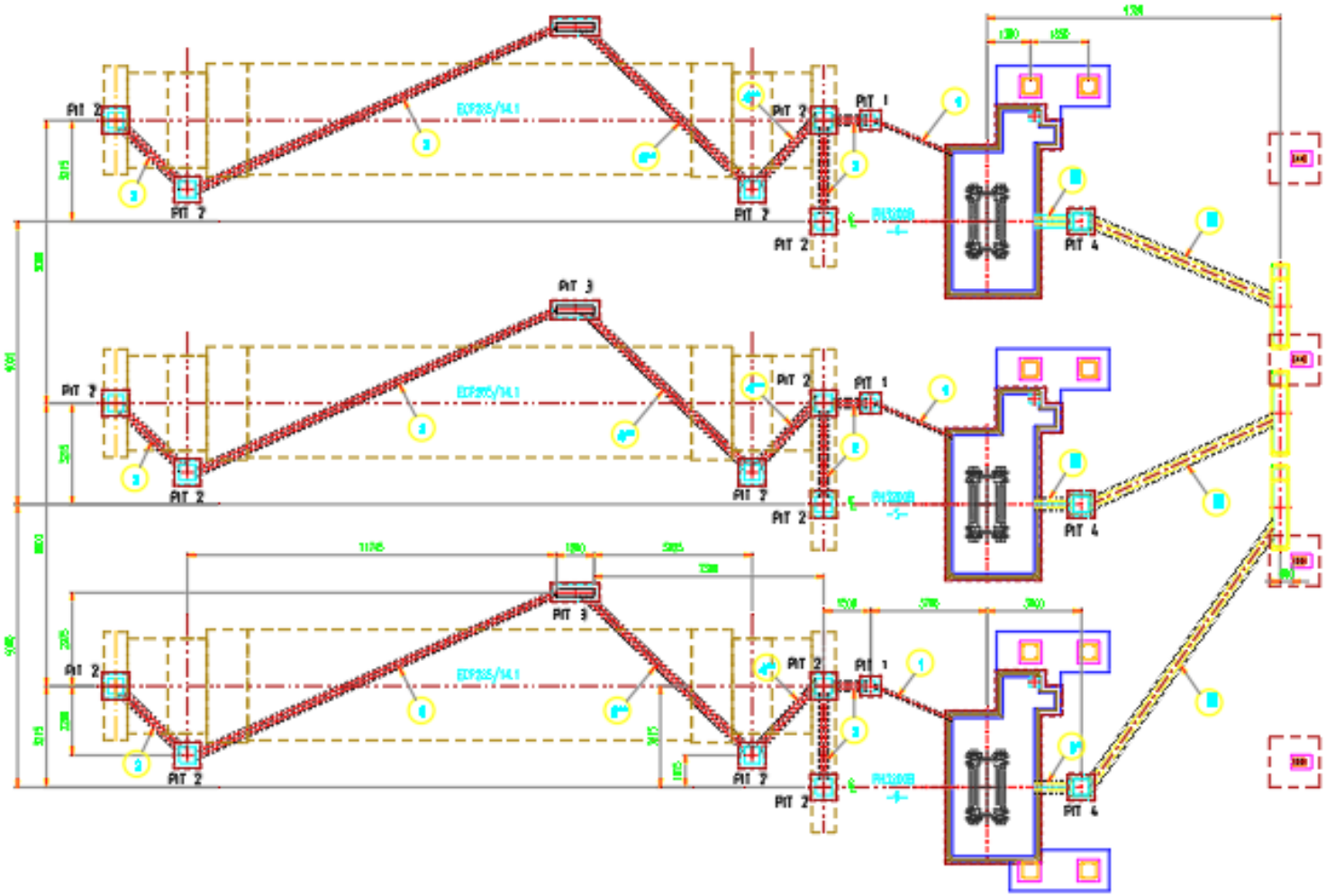
Design of Production Line Foundation

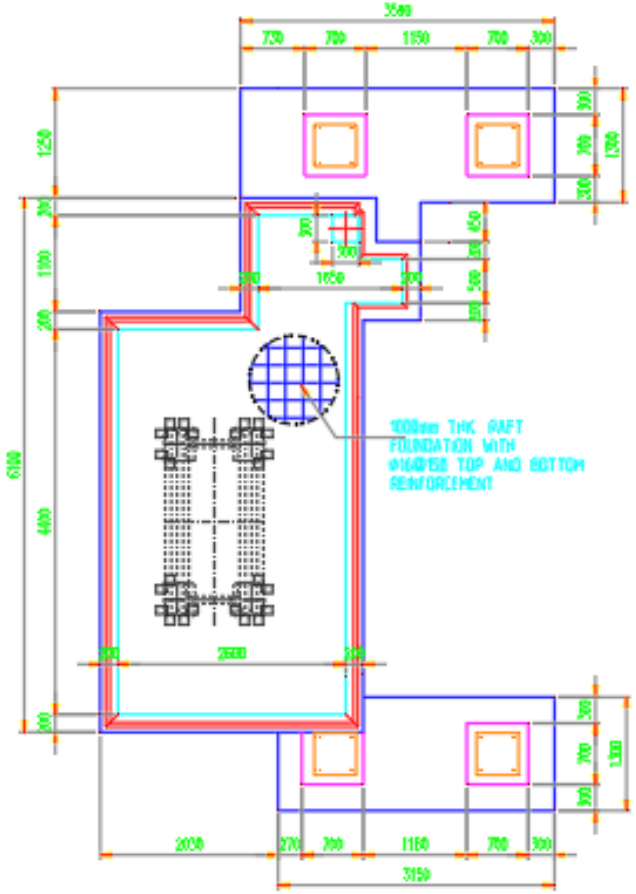


B FOUNDATION PLAN
SCALE: 1:100M





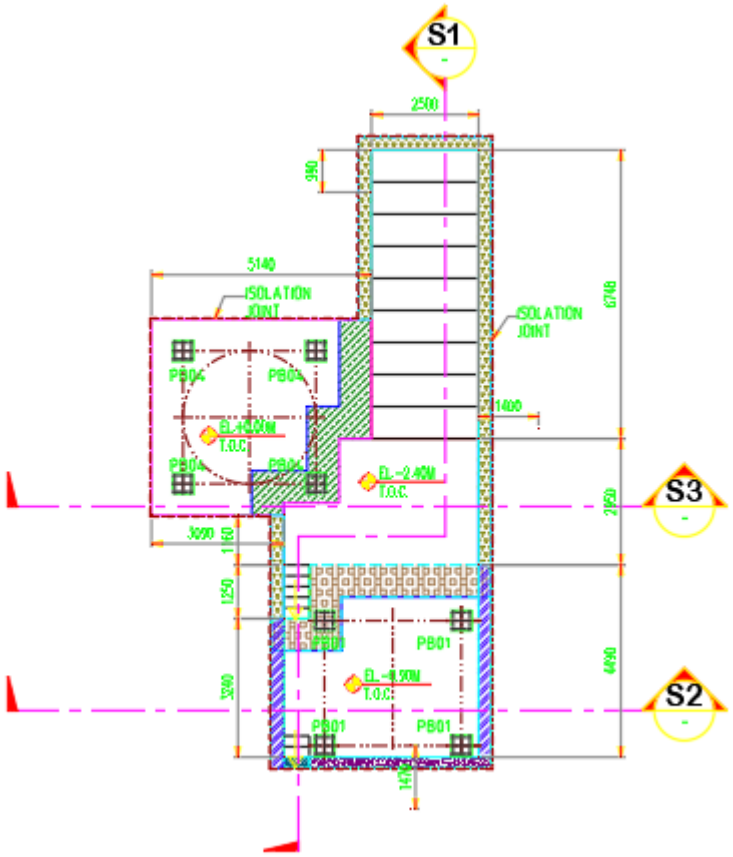


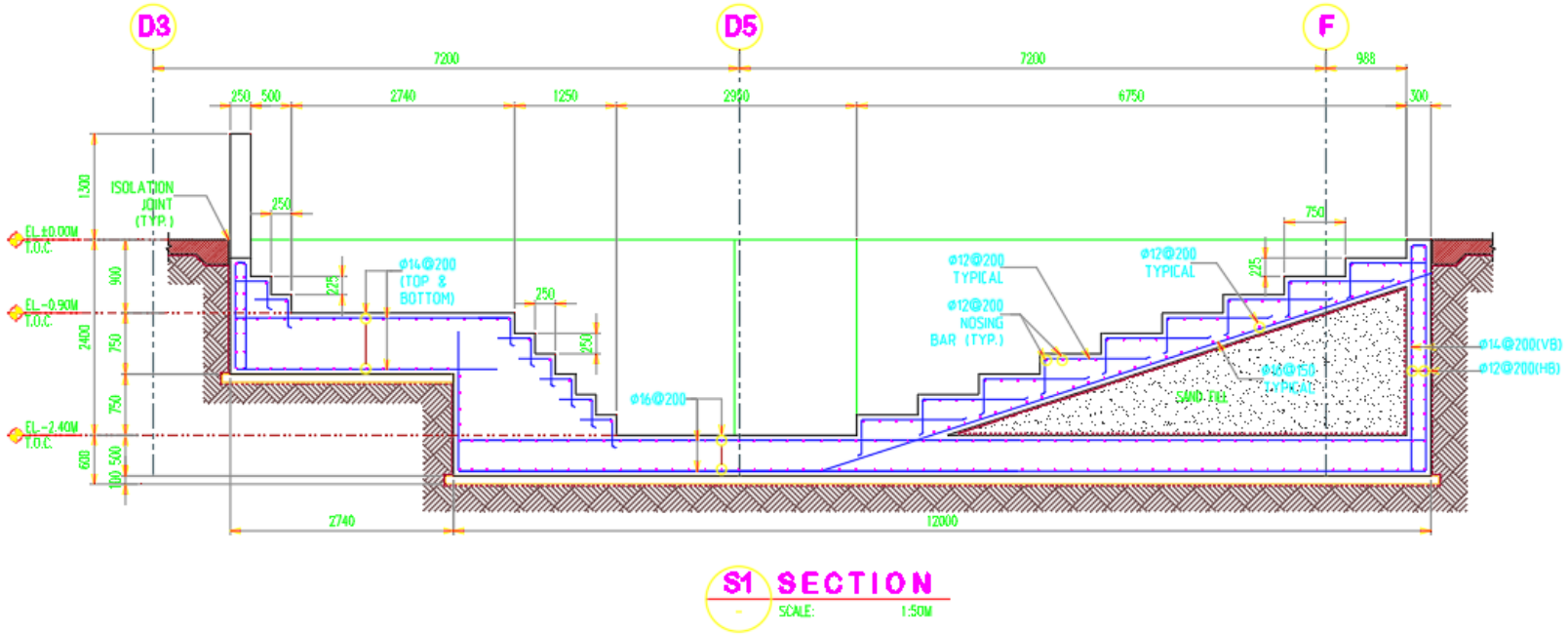


A4 RAFT FOUNDATION-PLAN

SCALE 1:20

Design of Production Line Foundation





S1 SECTION
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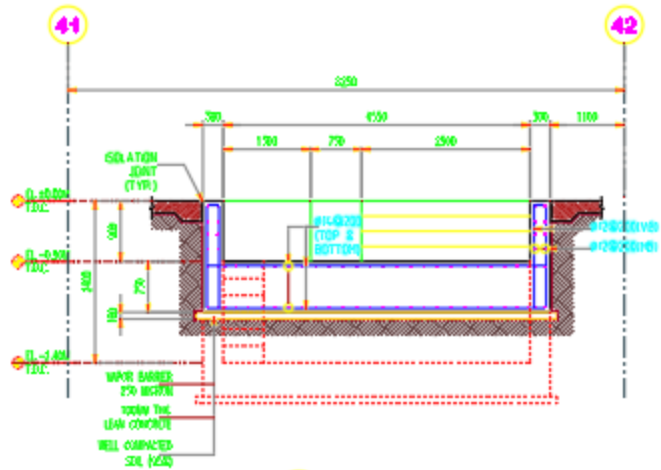

S2 SECTION
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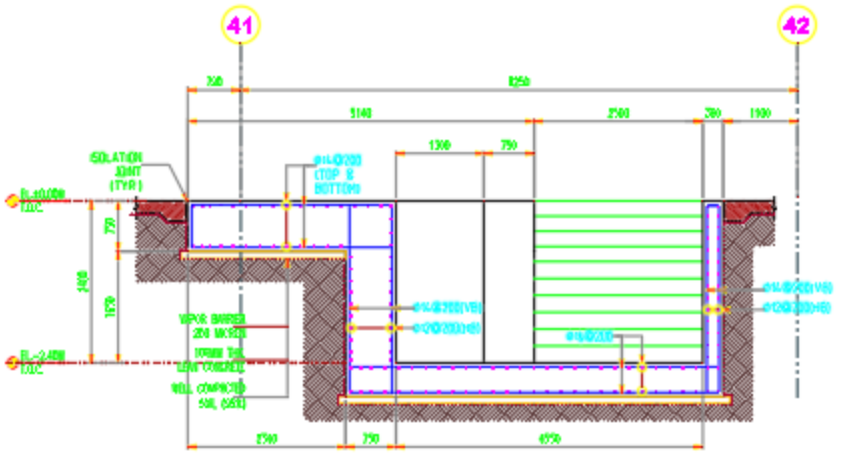
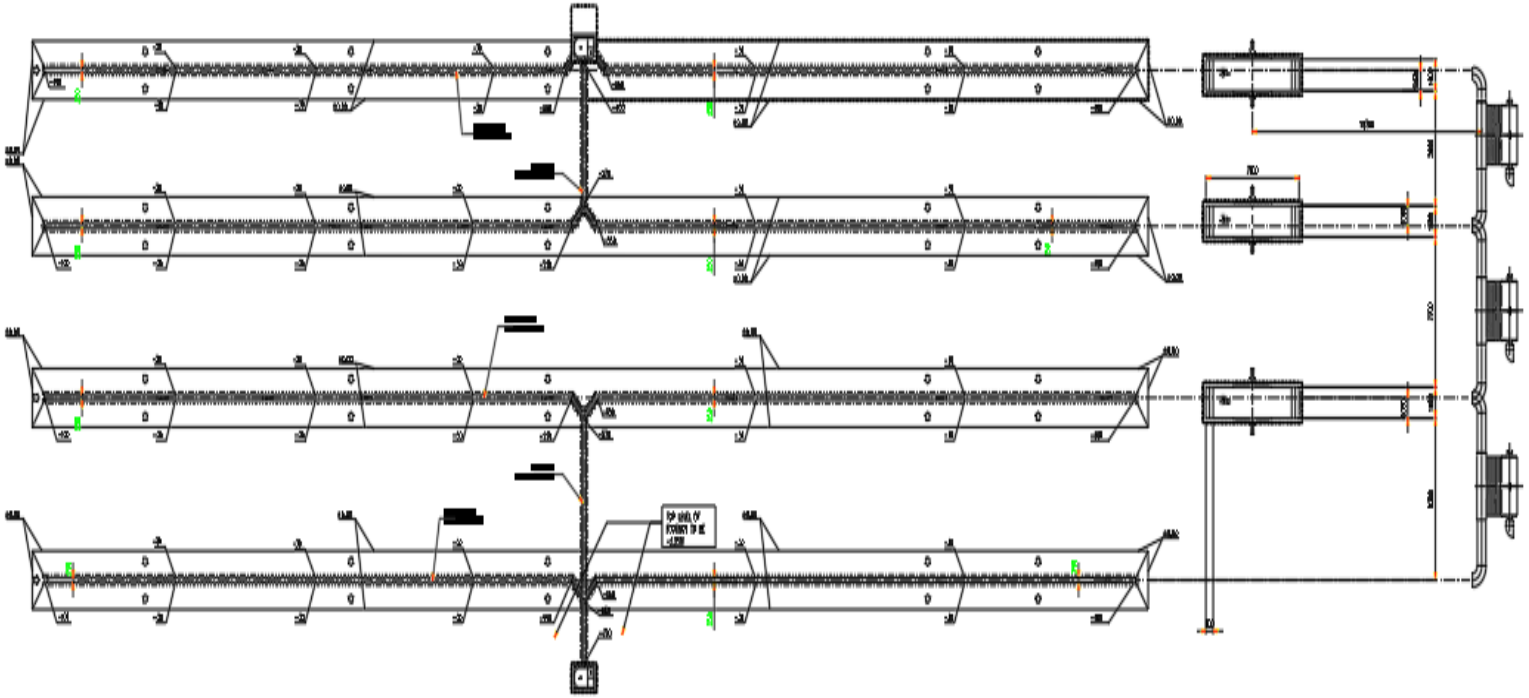
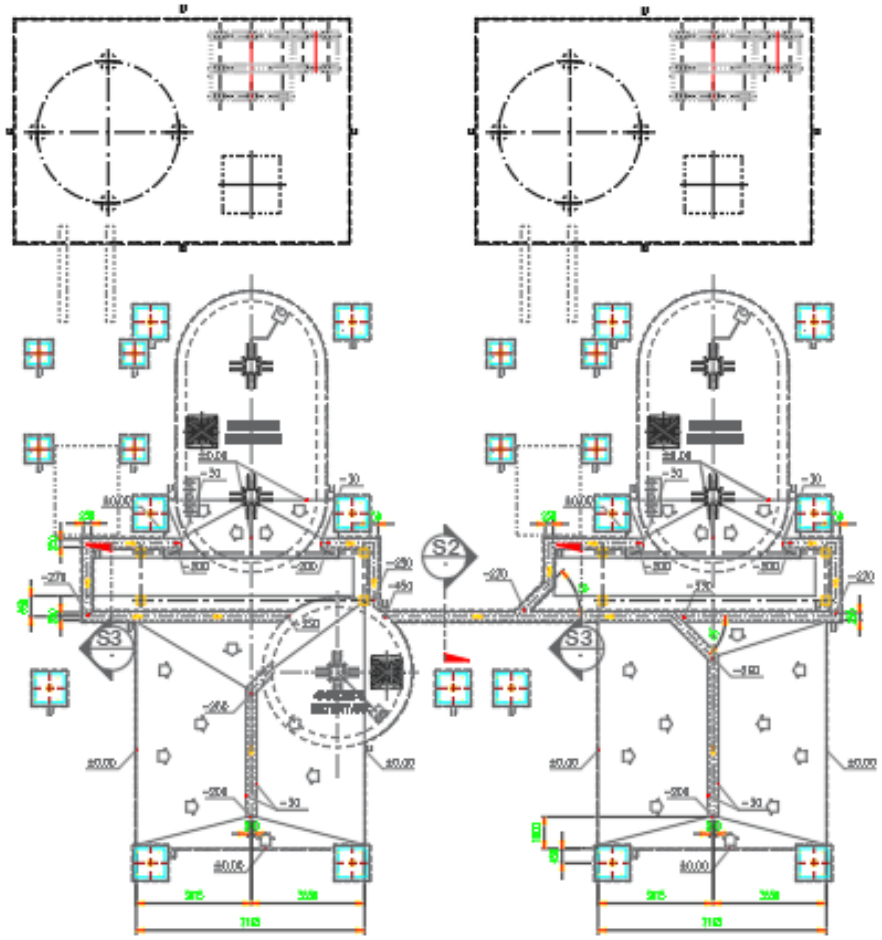
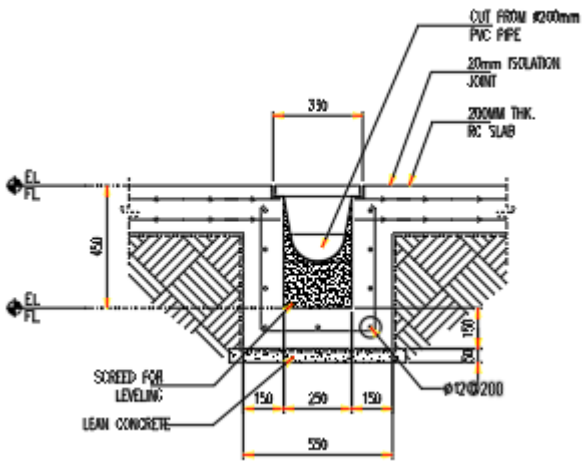


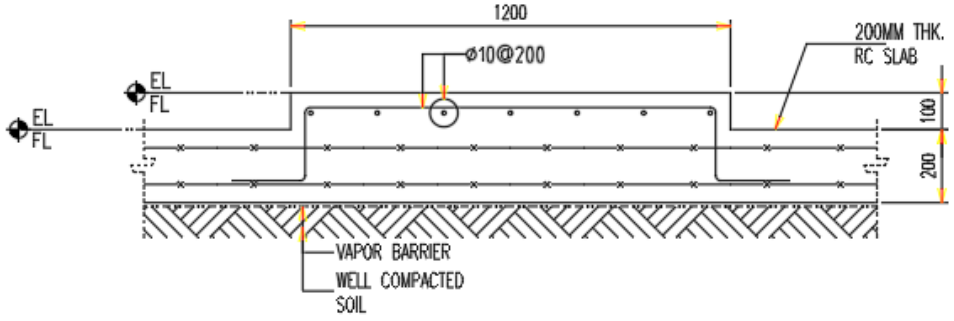
S3 SECTION
SCALE: 1:50M

Design of Production Line Foundation

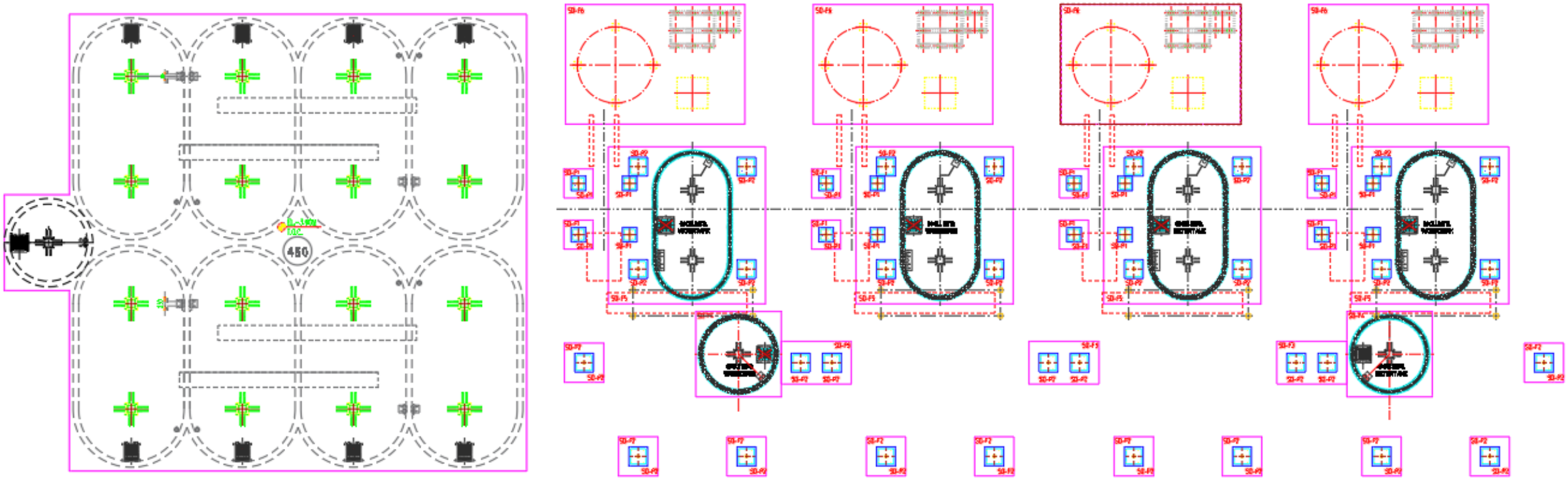




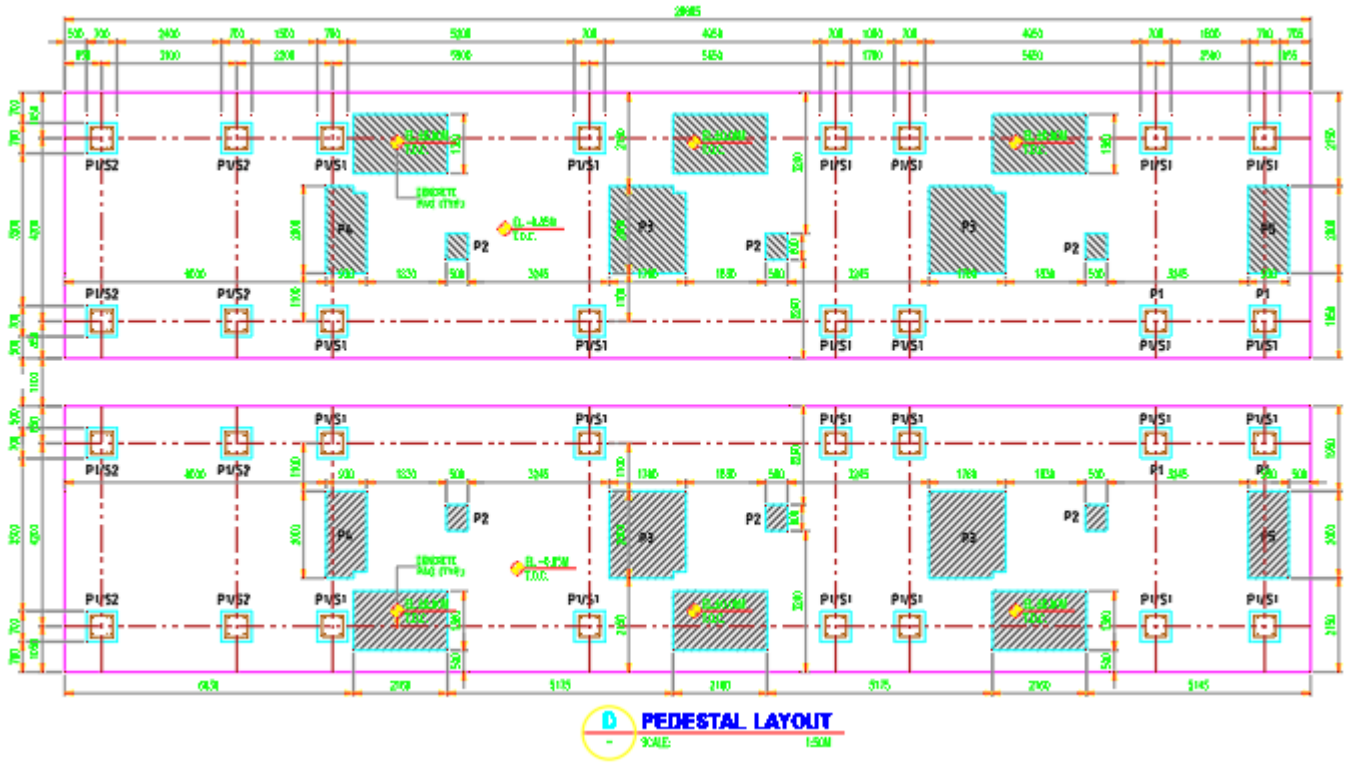




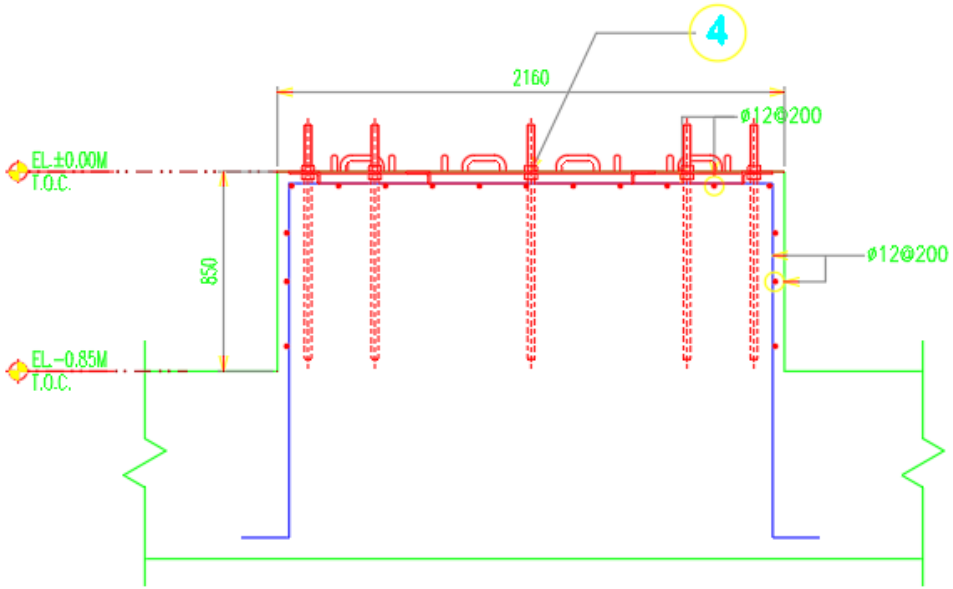
Design of Production Line Foundation



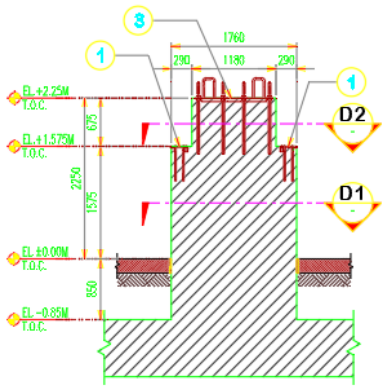
Design of Production Line Foundation



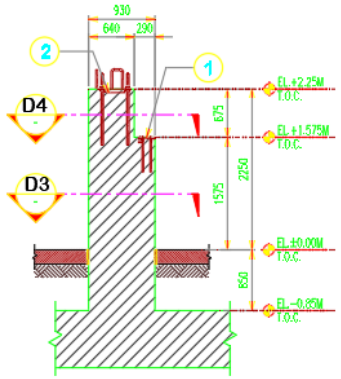
D PEDESTAL LAYOUT
SCALE: 1:50M



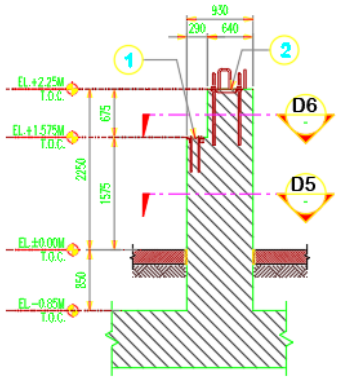
S4 SECTION
SCALE: 1:25M



S1 SECTION
SCALE: 1:50M

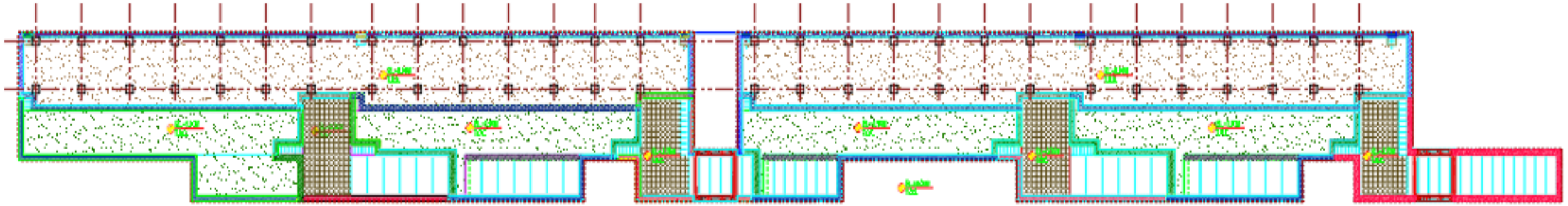


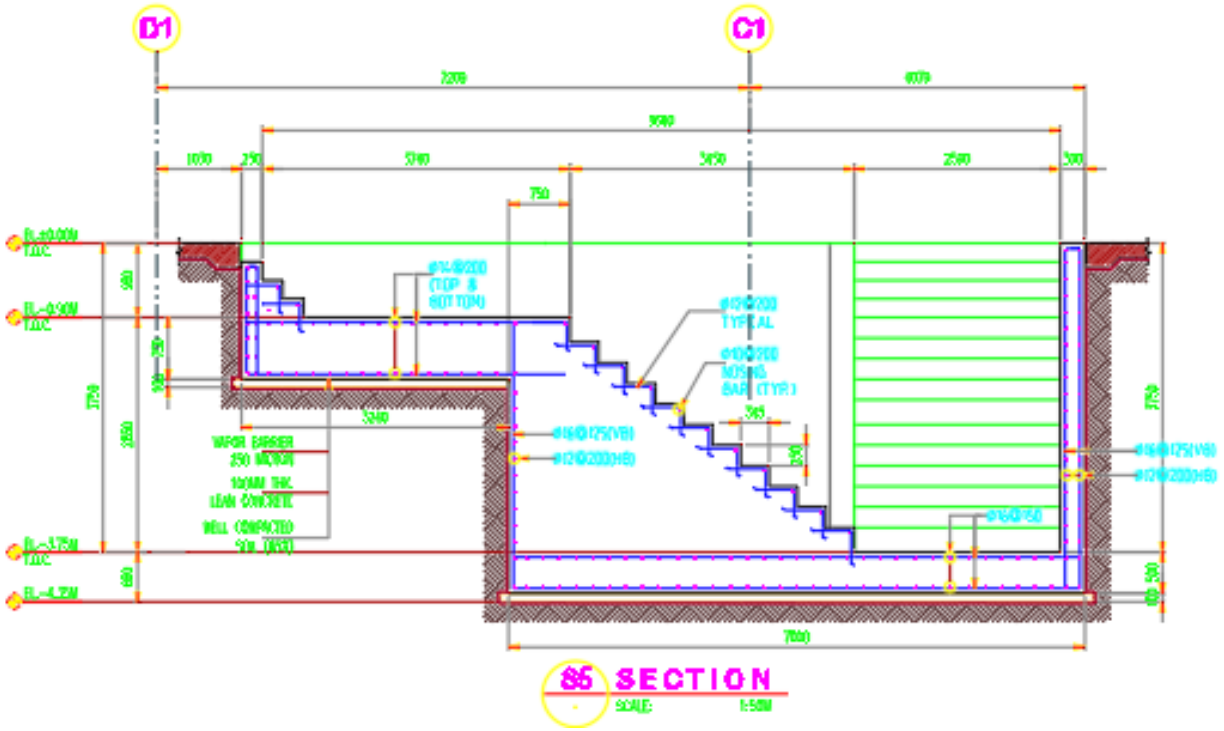
S2 SECTION
SCALE: 1:50M

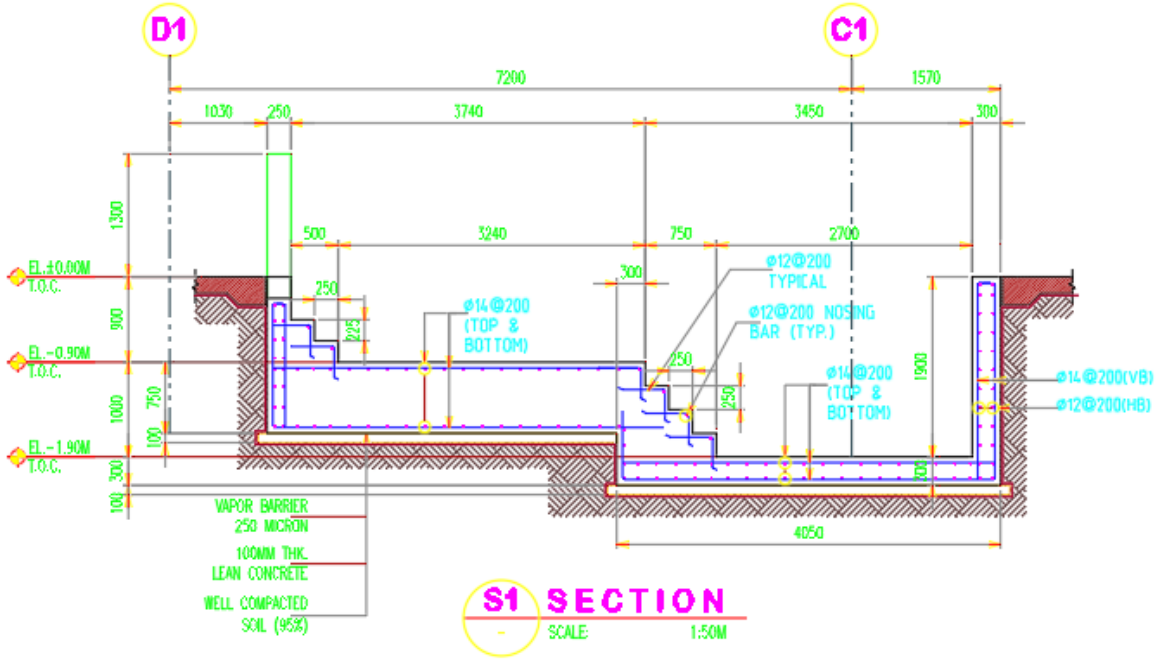


S3 SECTION
SCALE: 1:50M

Design of Production Line Foundation







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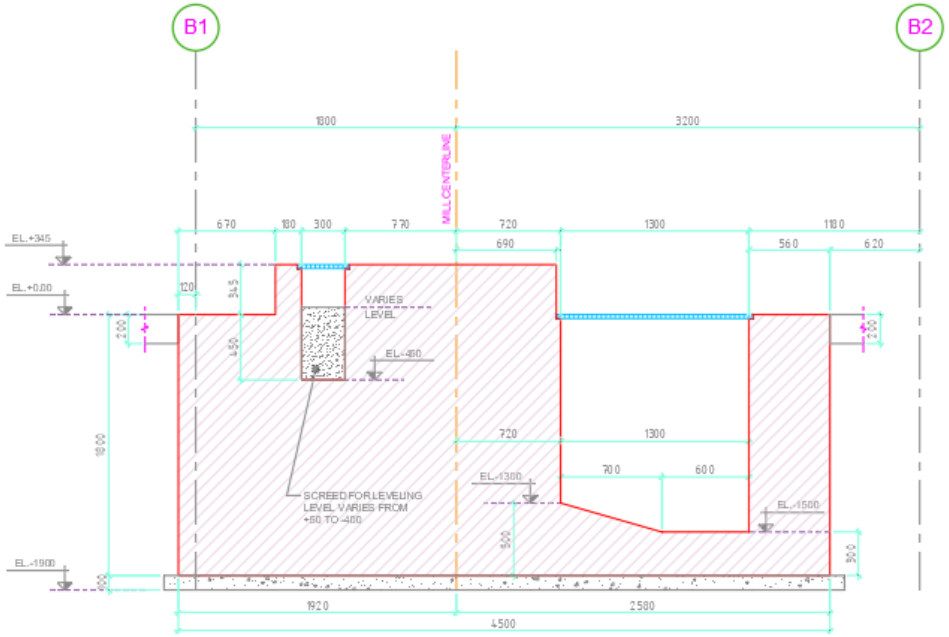

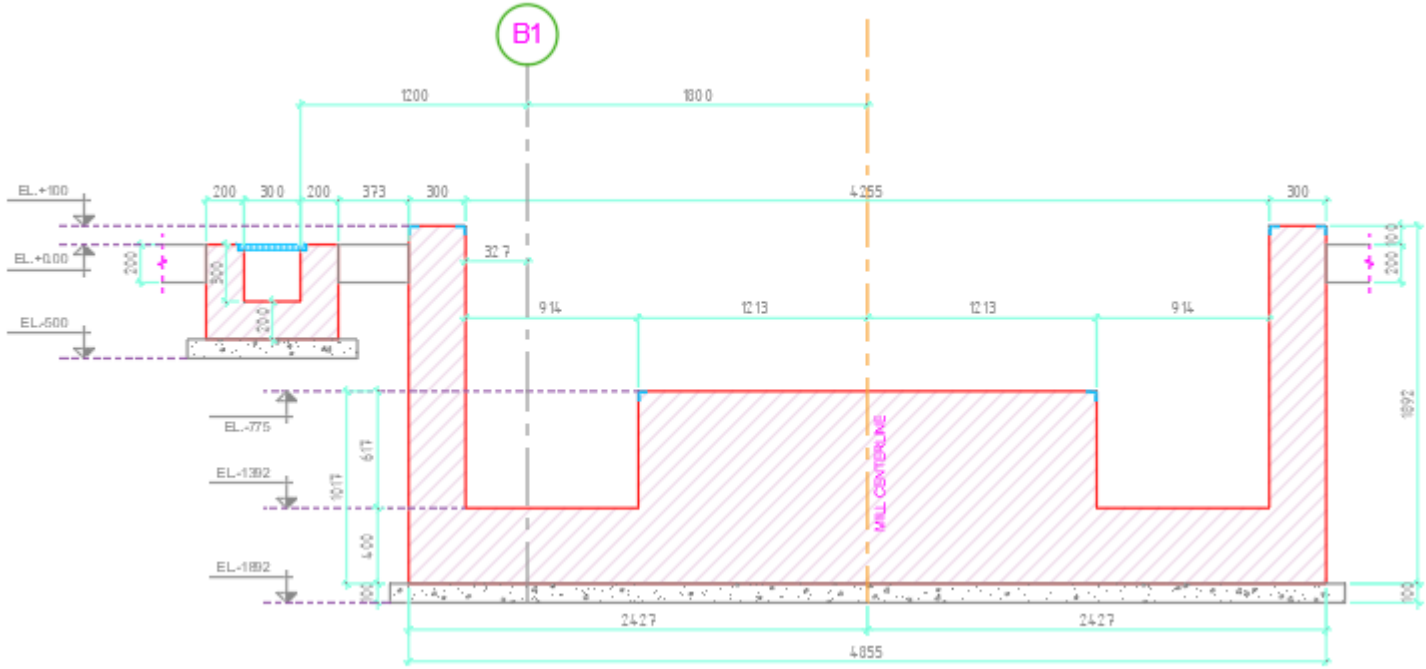

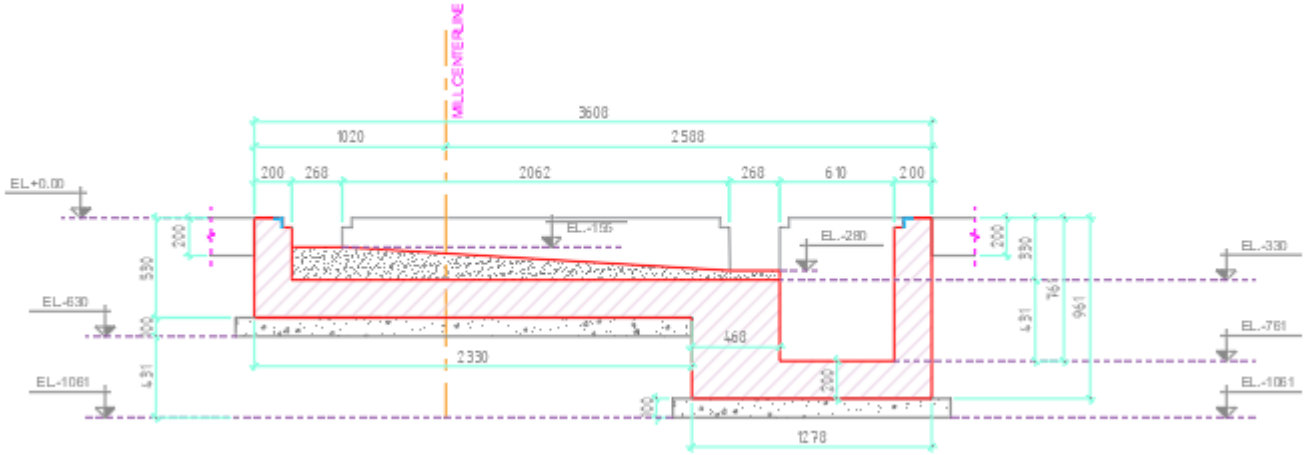

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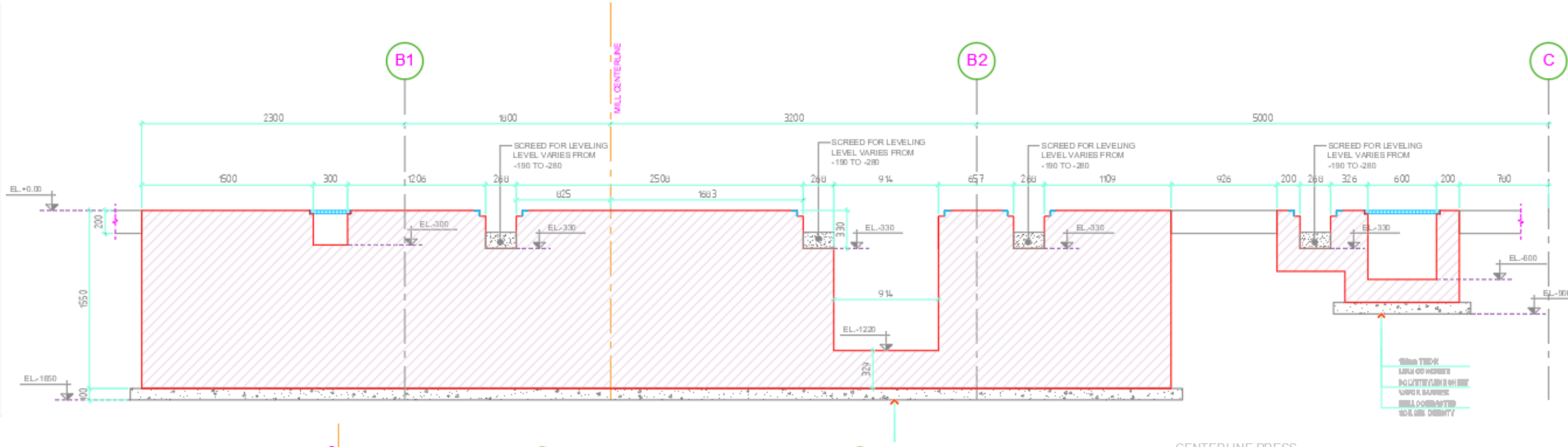

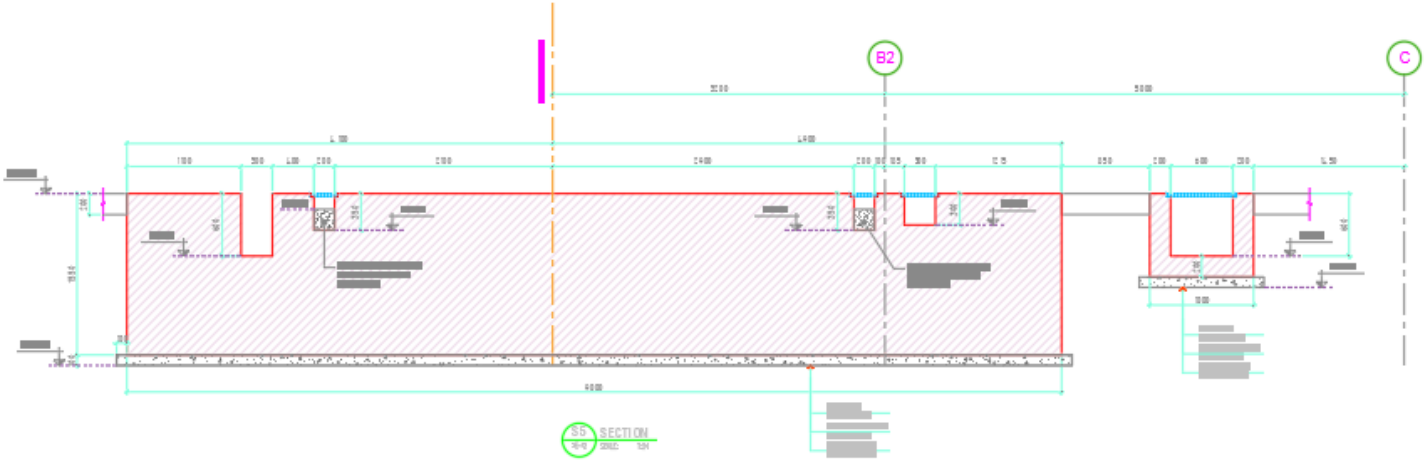

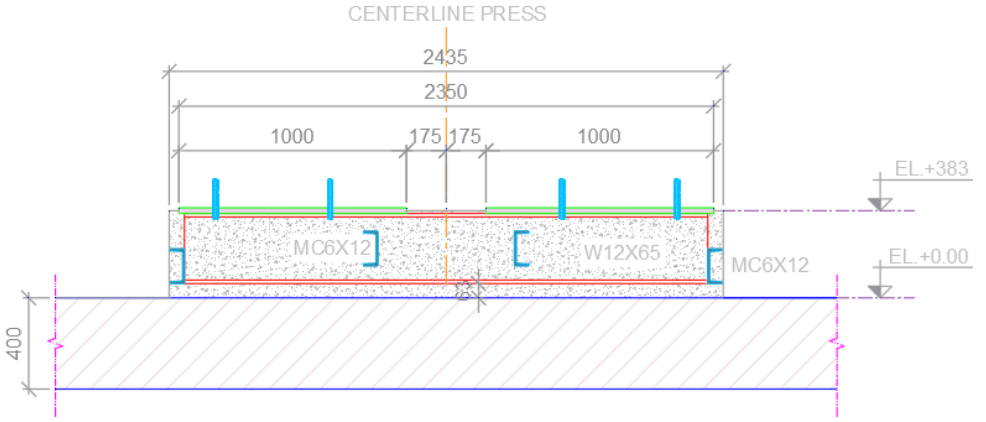

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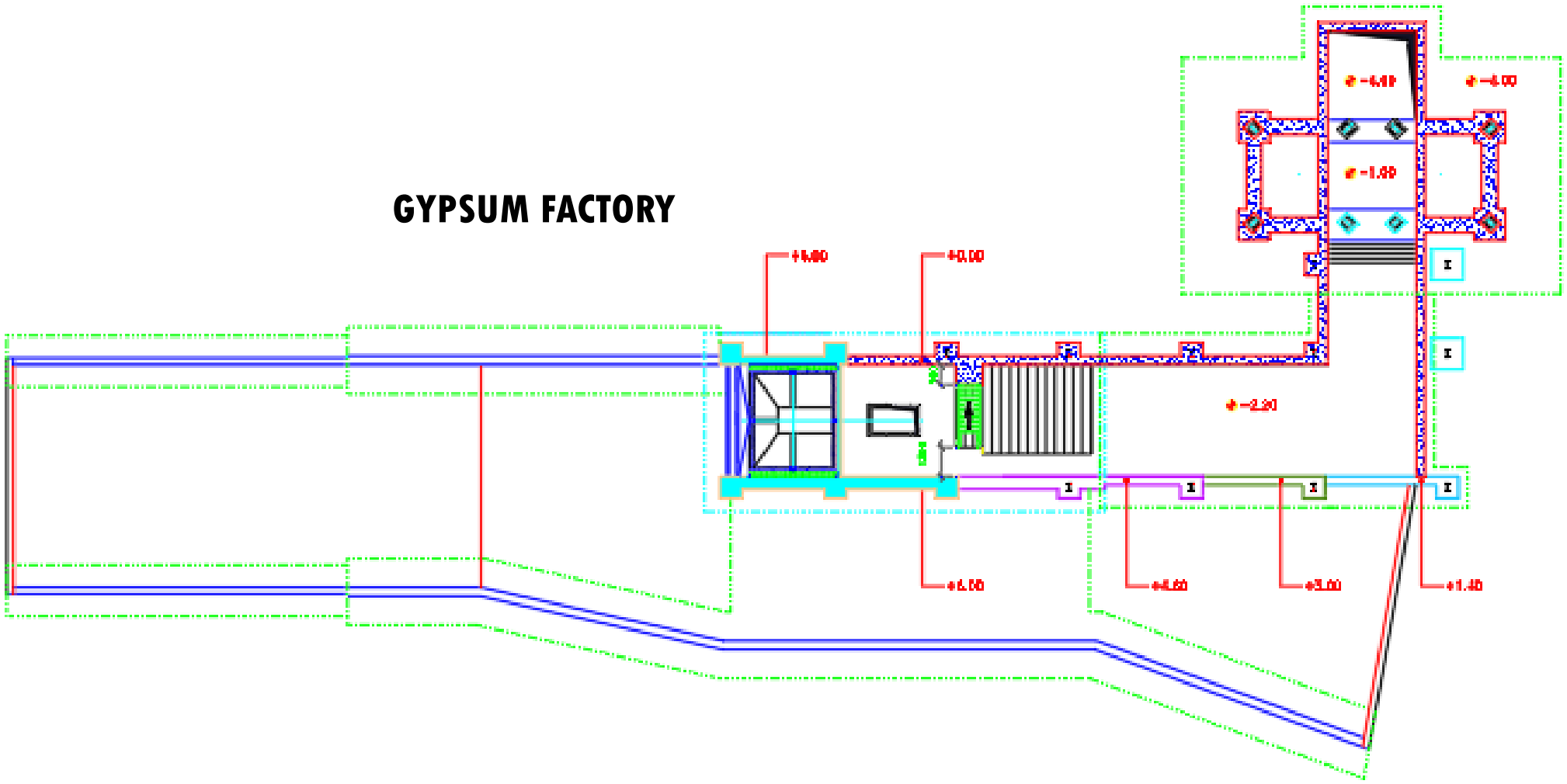
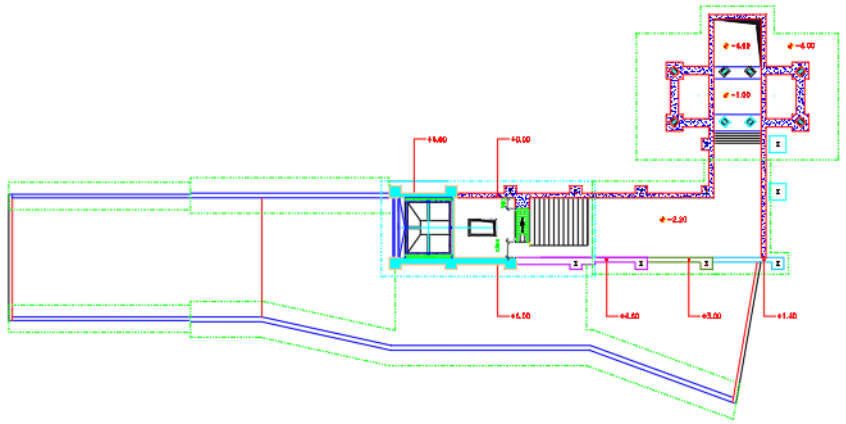
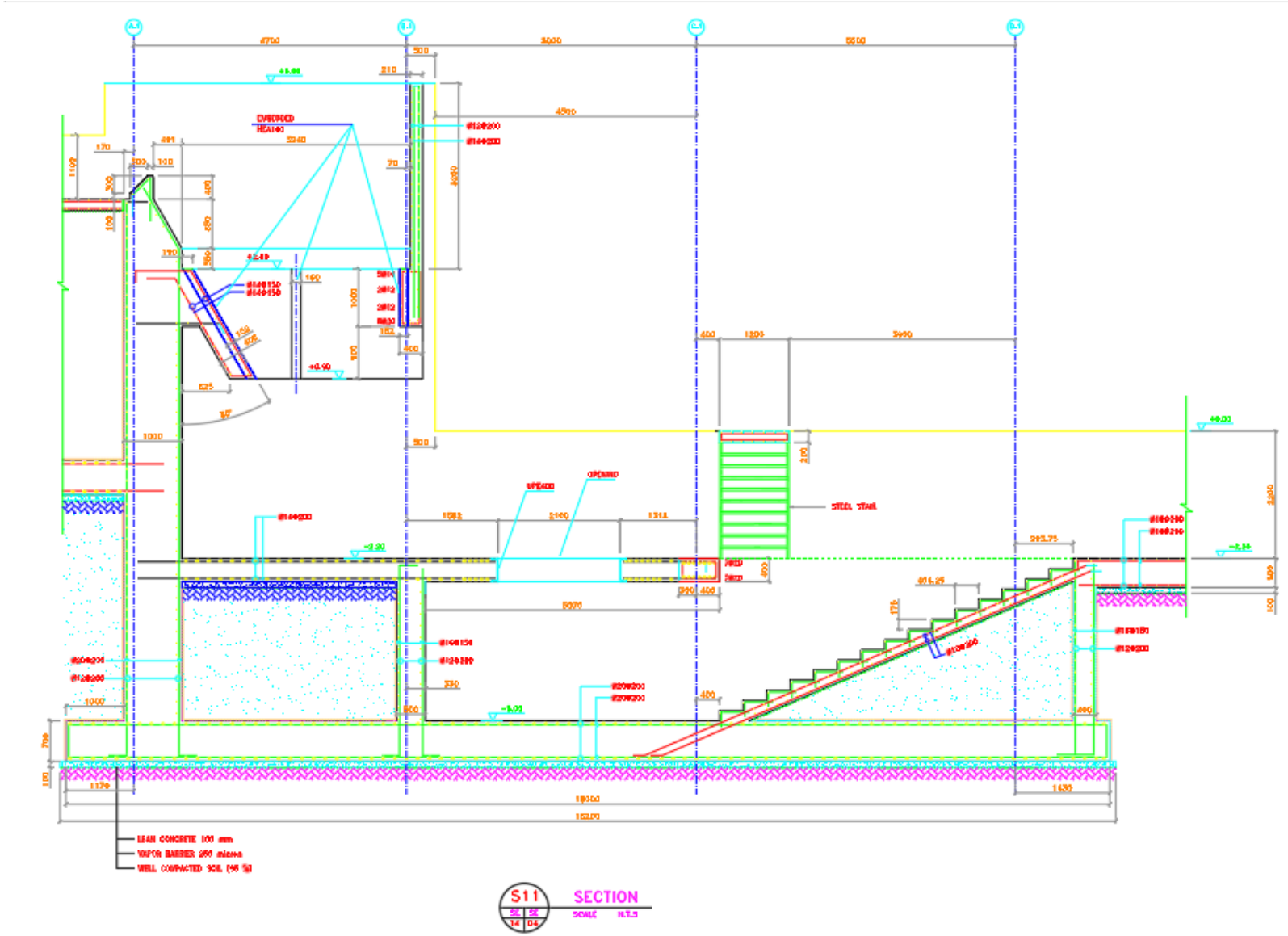


Design of Production Line Foundation



GYPSUM FACTORY



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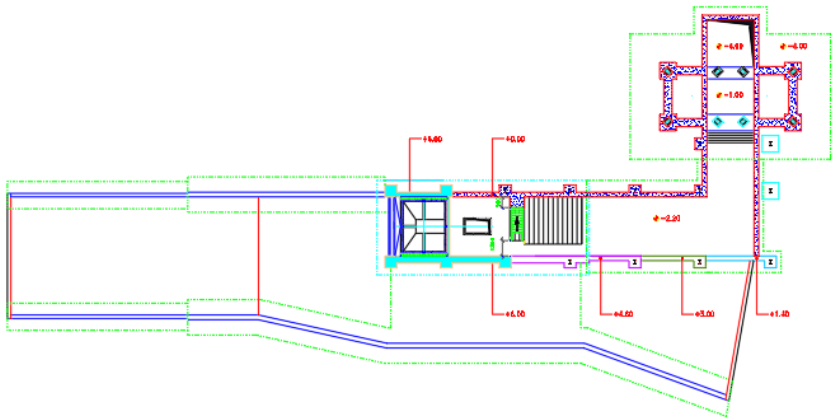

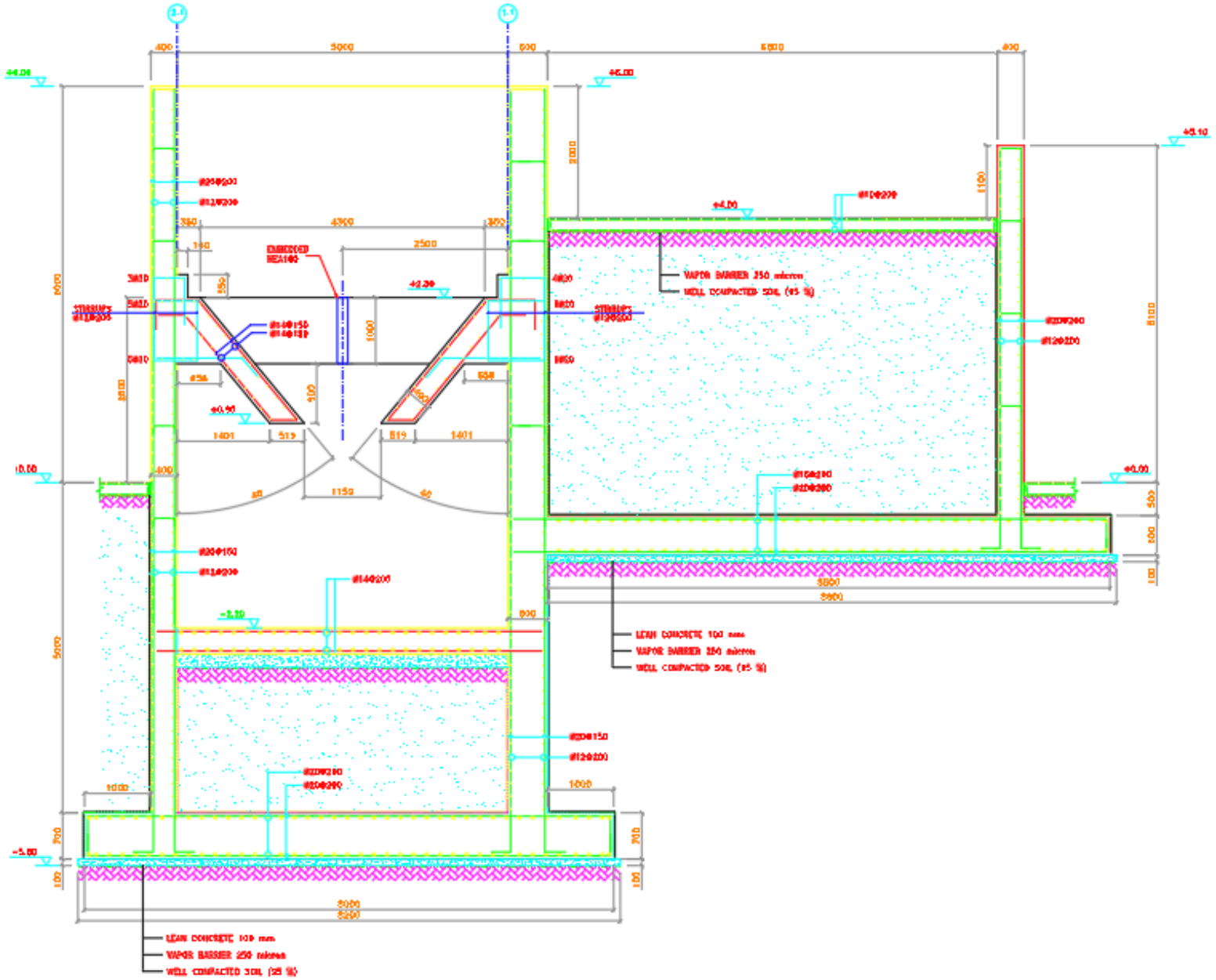

GYPSUM FACTORY

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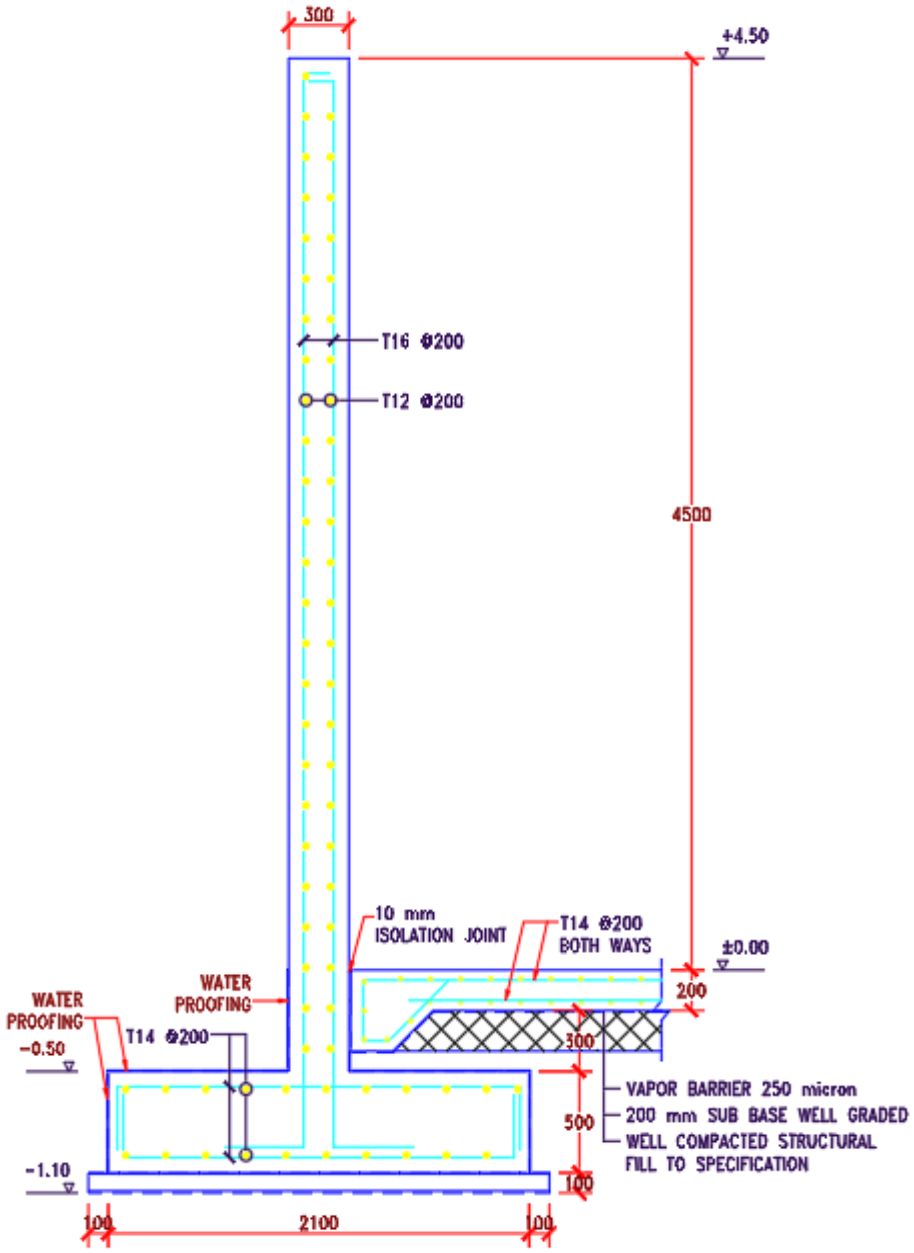
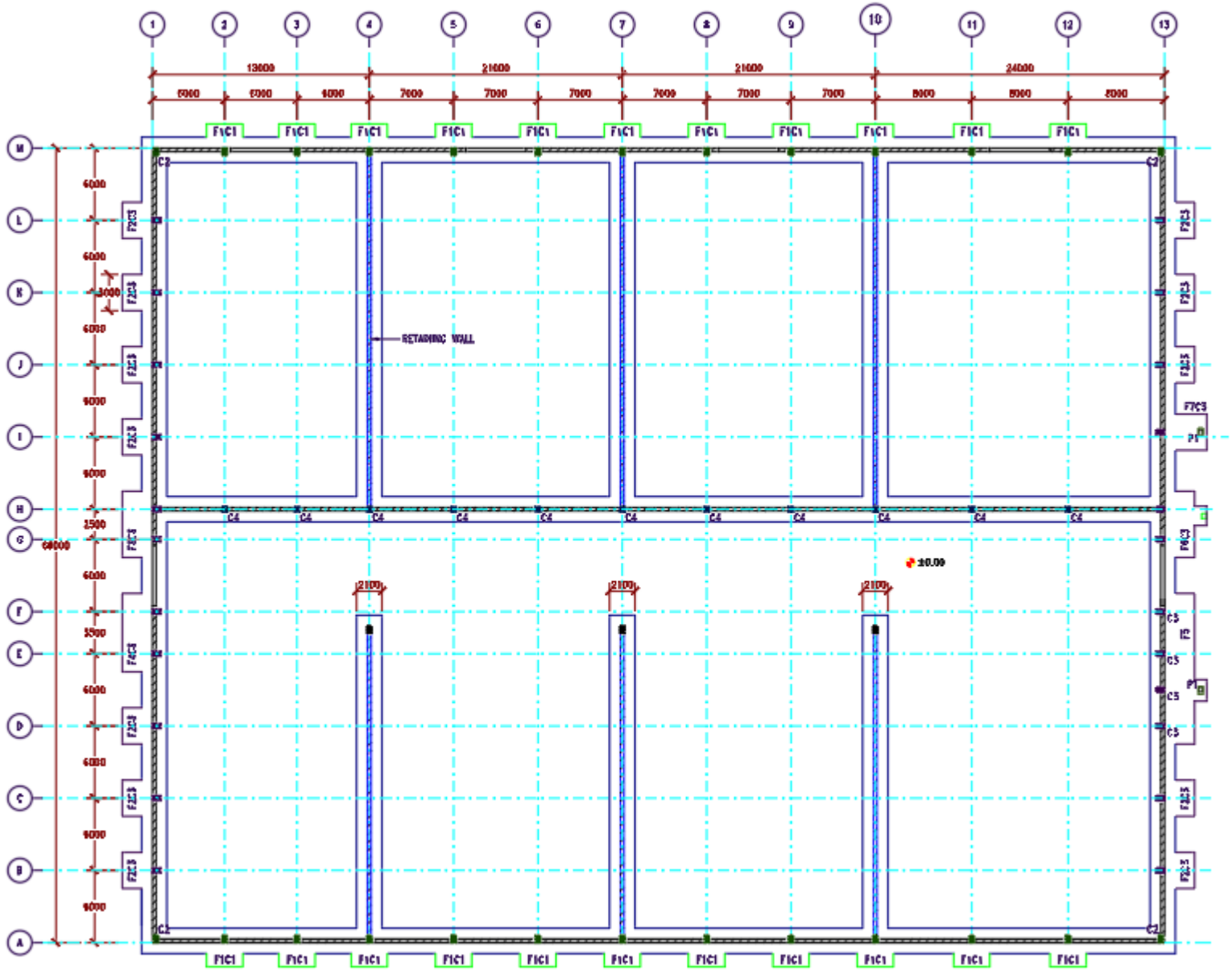
RAW MATEIAL





FOUNDATION PLAN FOR RAW MATERIAL STORAGE

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Design of Commercial Projects

Design of Commercial Projects

Design of Commercial Projects

Design of Commercial Projects

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