ARCHITECTURAL & STRUCTURAL DRAWINGS OF

PROPOSED 03 STOREY BUILDING

South Regional

Customs Head Office,

Addu City, Maradhoo

For Customs Maldives

Sheet Index

Layout ID	Layout Name	Revision	Issued	Published	Remark
	Cover		☐	☒	
	Sheet Index		☐	☒	
A.1.01	Site Plan		☐	☒	
A.2.01	Ground Floor Plan		☐	☒	
A.2.02	First Floor Plan		☐	☒	
A.2.03	Second Floor Plan		☐	☒	
A.2.04	Roof Plan		☐	☒	
A.3.01	Section 1		☐	☒	
A.4.01	Elevation 1		☐	☒	
A.4.02	Elevation 2		☐	☒	
A.5.01	All Opening Schedule		☐	☒	
A.5.02	All Opening Schedule/ Ventilation Sc...		☐	☒	
B.1.01	Column Layout		☐	☒	
B.1.02	Foundation Plan		☐	☒	
B.2.01	First Floor Beam Plan		☐	☒	
B.2.02	Second Floor Beam Plan		☐	☒	
B.2.03	Roof Beam Plan		☐	☒	
B.3.1	First Floor Slab Plan		☐	☒	
B.3.2	Terrace Floor Slab Plan		☐	☒	
B.3.3	Roof Slab Plan		☐	☒	
C.1.1	Structural Details 01		☐	☒	
C.2.1	Details		☐	☒	
C.2.2	Structural Notes		☐	☒	

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client:

Customs Maldives

Page Name:

Sheet Index

29/12/2020

Architect: Mohamed Hassaan
Engineer: Ihsaan Waheed
Drawn By: Aishath Shadhny Afzal

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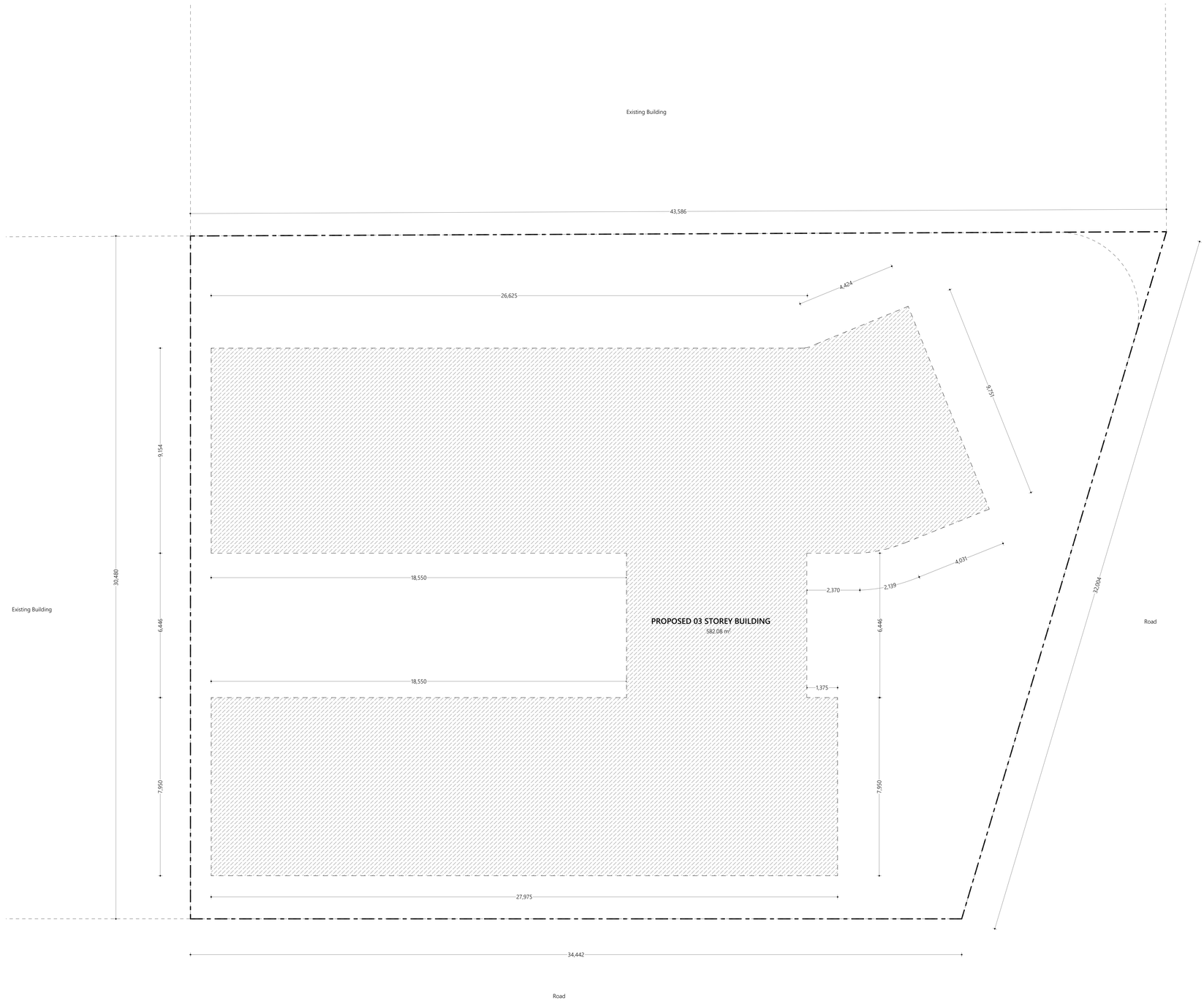
Page:



Site Plan
1:100

Building Information List

Plot Area :	1192.43
Footprint Area :	582.08
Built-up Area :	1652
Longest Length :	38.7
Width Coefficient :	15.15
Open Areas :	608.7
Building Height :	8.3
Road Width :	(width of road)

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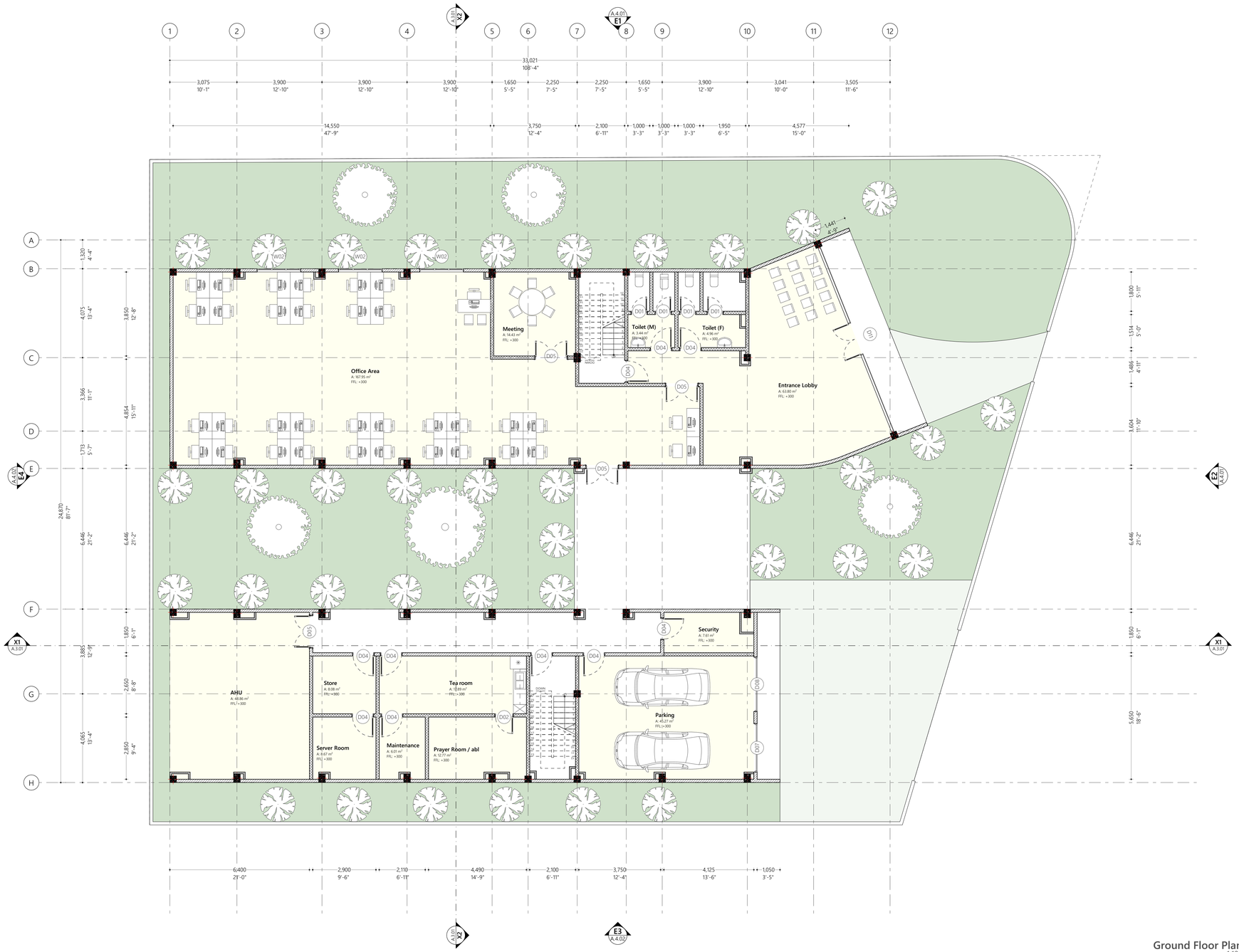
Page
A.1.01



Ground Floor Plan
1:100

Wall Legend	
2D Plan View	**Description**
	1200mm high 100mm thick RC balcony wall as per balcony detail
	150mm thick exterior masonry wall with 25mm plaster on exterior and 16mm plaster on interior finished with ground smooth and washable paint of selected color
	150mm thick interior masonry wall with 16mm plaster on both sides finished with ground smooth and washable paint of selected color

PROPOSED 03 STOREY BUILDING AT

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Client:
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Page Name:
Ground Floor Plan

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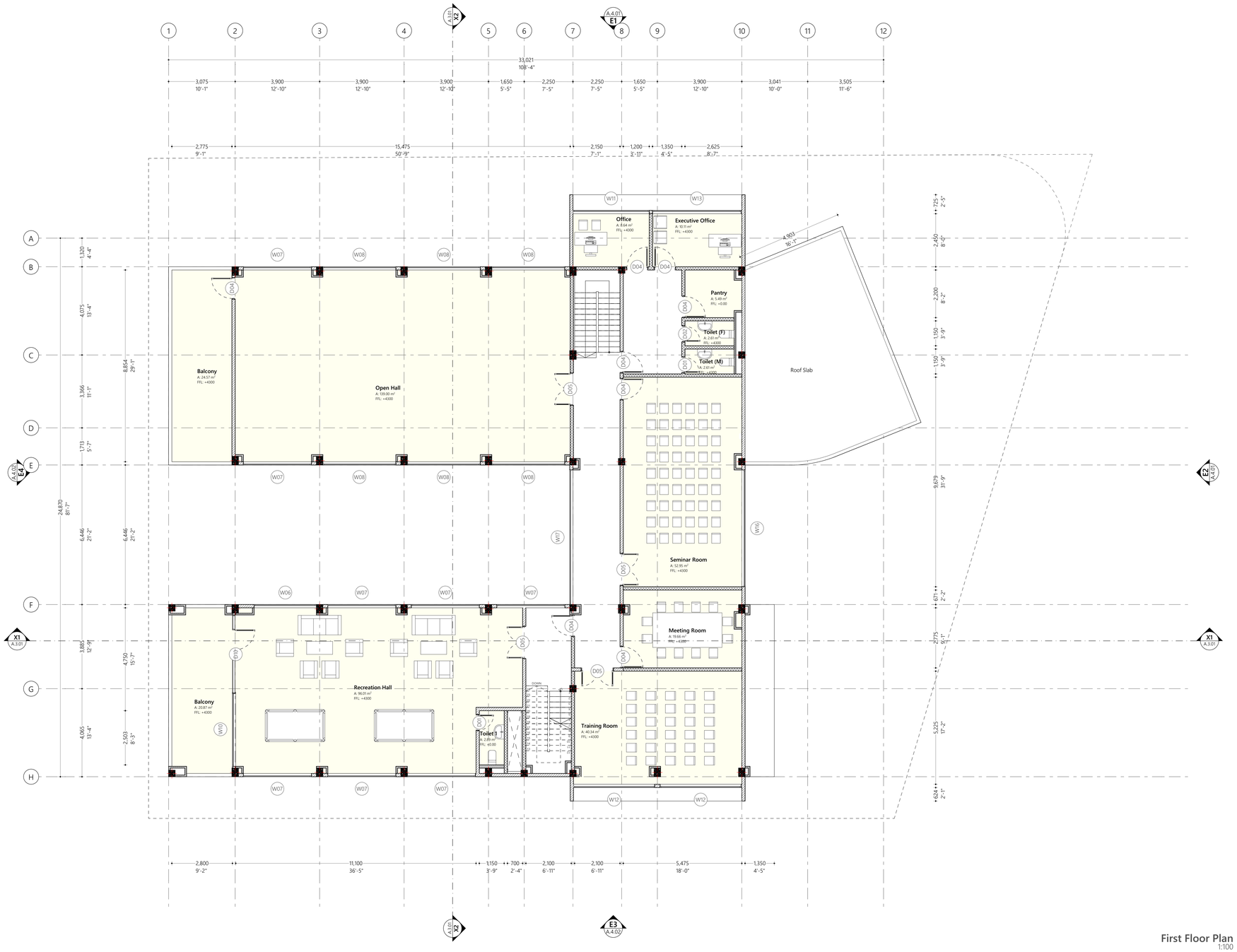
Rev.
01
02
03
04

Page
A.2.01



Wall Legend	
2D Plan View	**Description**
	1200mm high 100mm thick RC balcony wall as per balcony detail
	150mm thick exterior masonry wall with 25mm plaster on exterior and 16mm plaster on interior finished with ground smooth and washable paint of selected color
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Page Name

First Floor Plan

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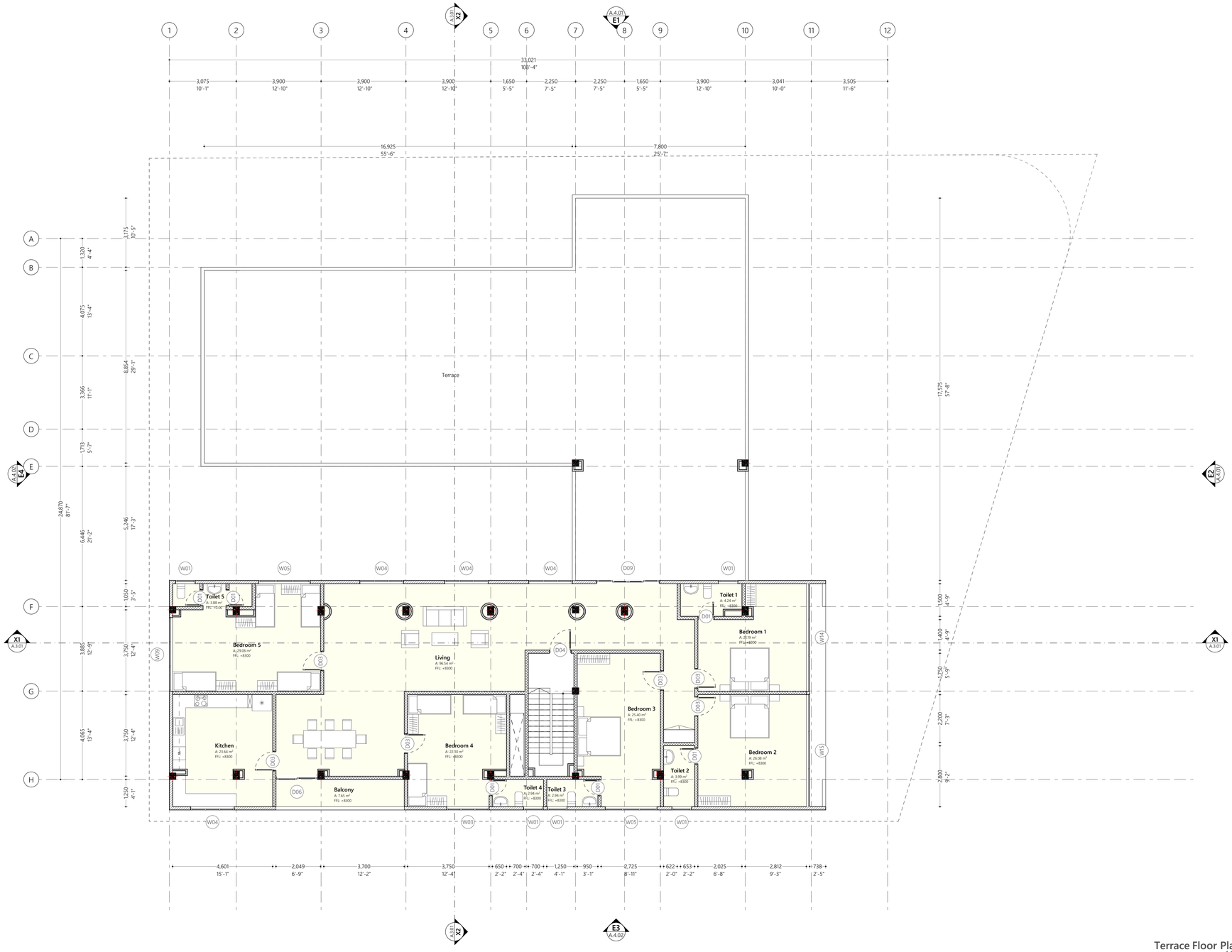
Rev.

Page

A.2.02



Terrace Floor Plan
1:100

Wall Legend	
2D Plan View	**Description**
	1200mm high 100mm thick RC balcony wall as per balcony detail
	150mm thick exterior masonry wall with 25mm plaster on exterior and 16mm plaster on interior finished with ground smooth and washable paint of selected color
	150mm thick interior masonry wall with 16mm plaster on both sides finished with ground smooth and washable paint of selected color

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Page Name:
Second Floor Plan

29/10/2020

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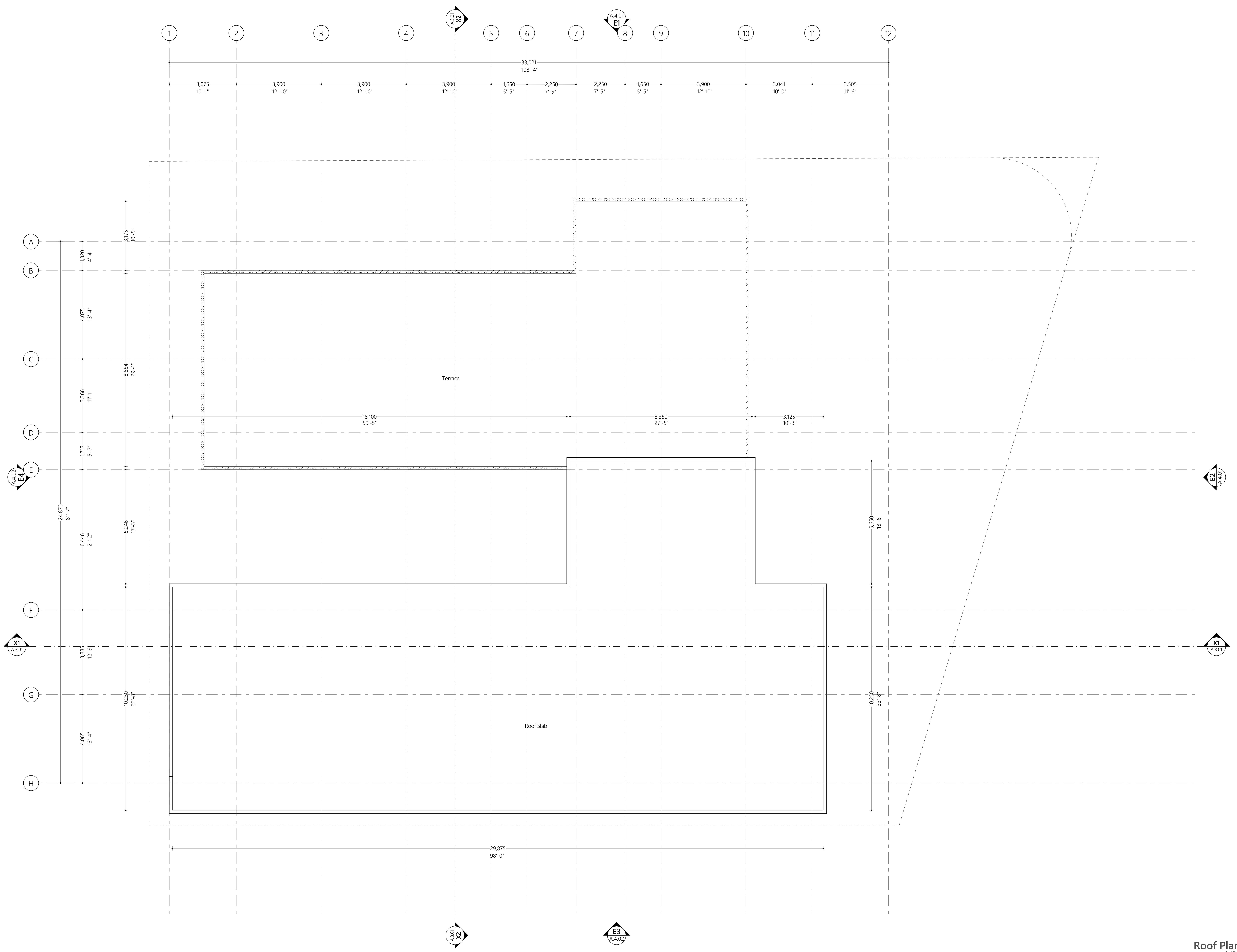
Rev.
Page
A.2.03



Roof Plan
1:100

Wall Legend	
2D Plan View	Description
	1200mm high 100mm thick RC balcony wall as per balcony detail
	150mm thick exterior masonry wall with 25mm plaster on exterior and 16mm plaster on interior finished with ground smooth and washable paint of selected color
	150mm thick interior masonry wall with 16mm plaster on both sides finished with ground smooth and washable paint of selected color

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Page Name:

Roof Plan

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Rev:

Page:
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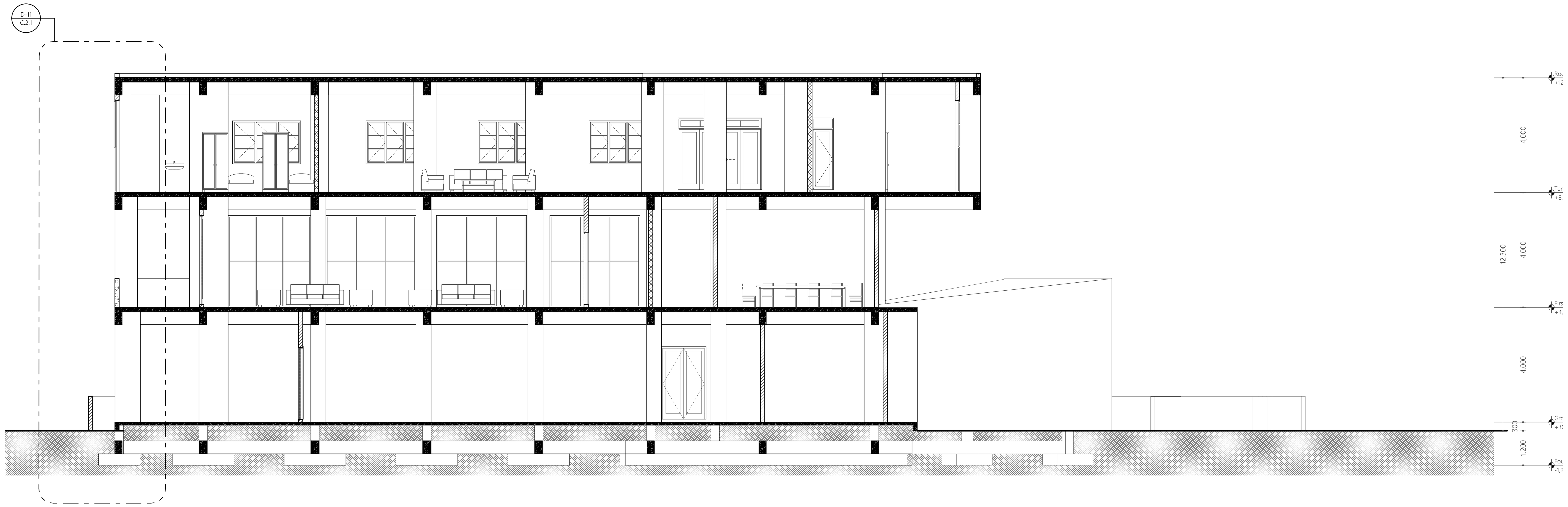

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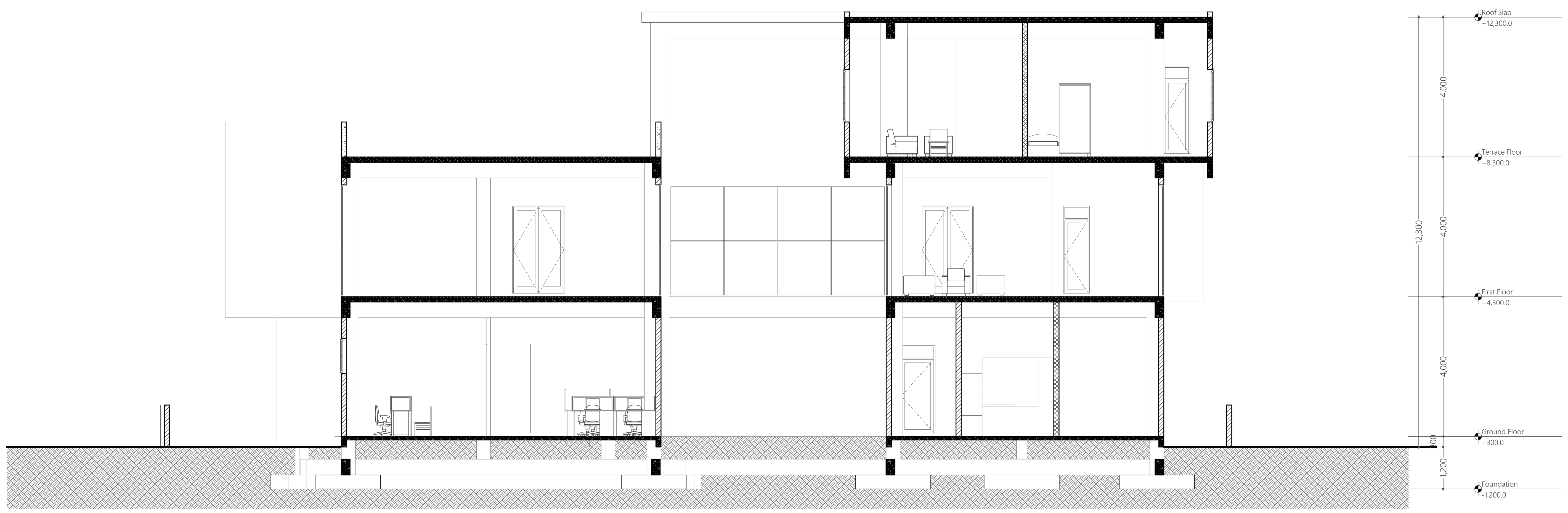

X2 Building Section
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Section 1

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Rev:	Page:
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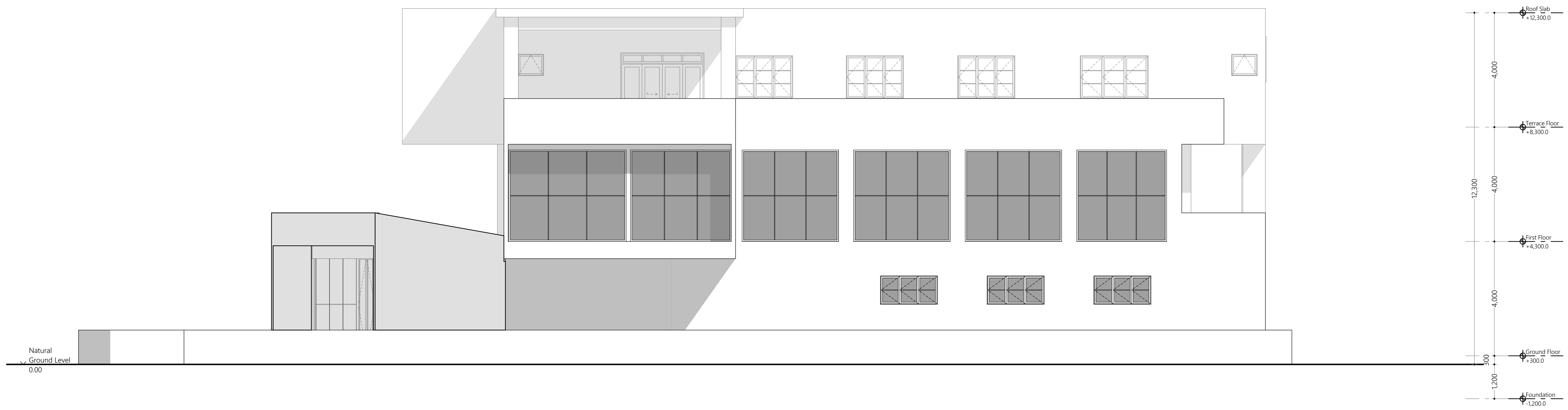

Elevation E1
1:100

Elevation E2
1:100

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Elevation 1

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Rev:	Page:
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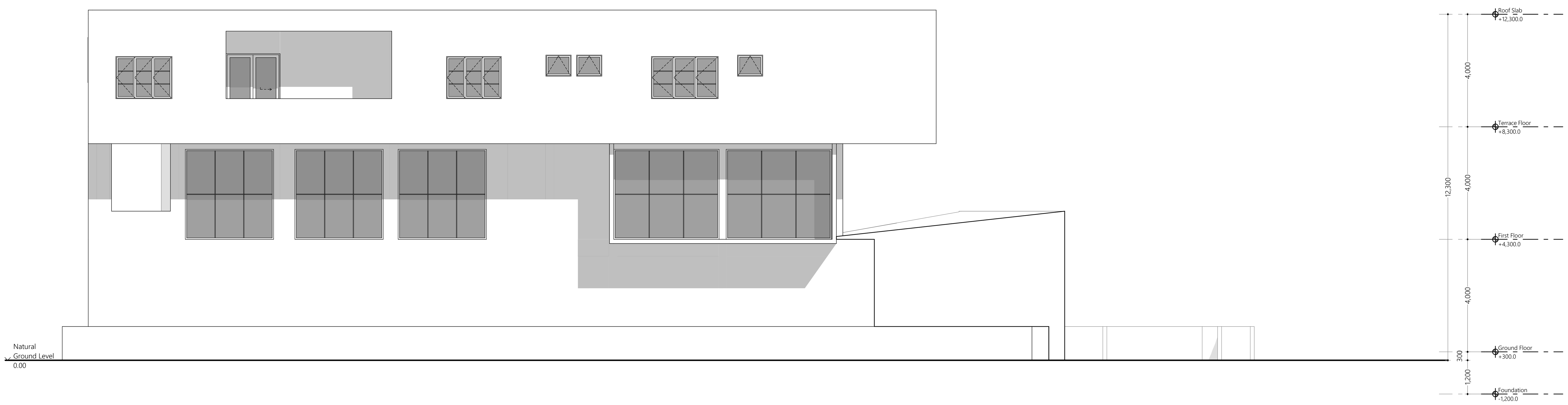

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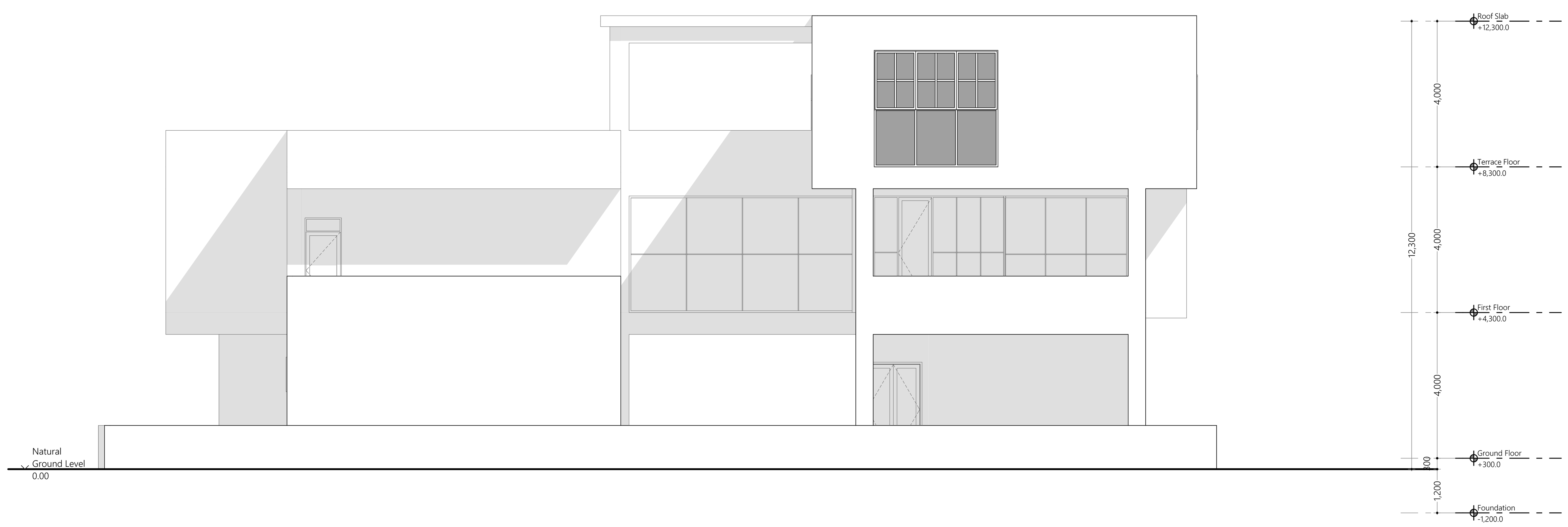

Elevation E4
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PROPOSED 03 STOREY BUILDING AT

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Elevation 2

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Rev:	Page:
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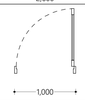
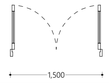
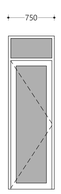
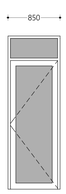
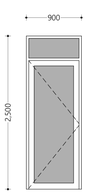
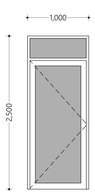
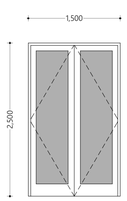
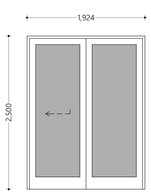
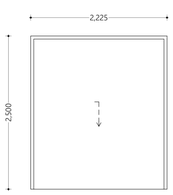
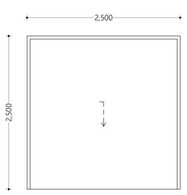
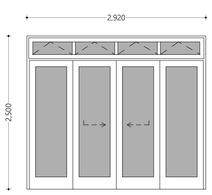
All Openings Schedule										
Element ID	D01	D02	D02	D03	D04	D05	D06	D07	D08	D09
Quantity	12	1	1	6	19	8	1	1	1	1
W x H Size	750×2,500	750×2,500	850×2,500	900×2,500	1,000×2,500	1,500×2,500	1,924×2,500	2,225×2,500	2,500×2,500	2,920×2,500
Sill height	100	100	100	100	100	100	100	100	100	100
Head height	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600
2D Symbol										
View from Side Opposite to Opening Side										
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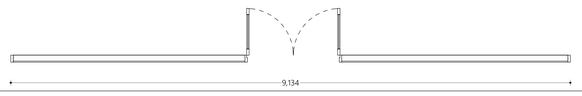
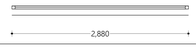
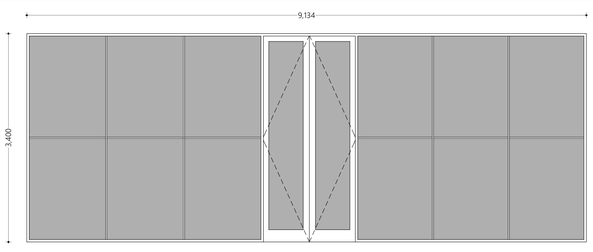
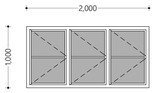
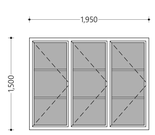
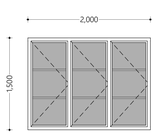
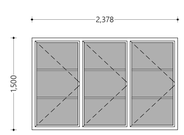
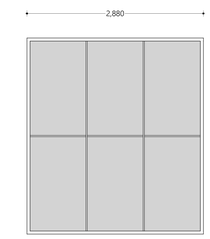
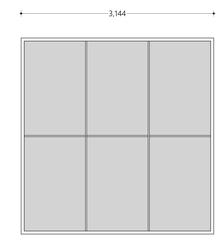
Door Leaf	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	Solid Core Timber Panel	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum
Window Sash	---	---	---	---	---	---	---	---	---	---
Glazing					01 Reflective Glass	01 Reflective Glass	01 Reflective Glass			01 Reflective Glass

All Openings Schedule									
Element ID	D11	W01	W02	W03	W04	W05	W06	W07
Quantity	1	2	2	1	4	2	1	8
W x H Size	9,134×3,400	900×750	2,000×1,000	1,950×1,500	2,000×1,500	2,378×1,500	2,880×3,200	3,144×3,200
Sill height	100	1,800	1,800	1,000	1,000	1,000	0	0
Head height	3,500	2,550	2,800	2,500	2,500	2,500	3,200	3,200
2D Symbol								
View from Side Opposite to Opening Side								
Frame	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum
Door Leaf	03 Powder Coated Aluminum	---	---	---	---	---	---	---
Window Sash	---	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum
Glazing	01 Reflective Glass	01 Reflective Glass	01 Reflective Glass	01 Reflective Glass	01 Reflective Glass	01 Reflective Glass	01 Clear Glass	01 Clear Glass

Door and Window Notes

Dimensions shown on DWG indicate effective openings of frame

All frame depths are 100mm
All door leaf thicknesses are 35mm
All window sash thickness are 25mm
All frame edges shal be trimmed 3mm
All wooden components should be wood stained finish
All aluminum components to be powder coated (min. 60 microns)

All aluminum panels should be of 6mm thick unless specified
All glazing should be of 6mm unless specified

External units must comply the following weather conditions:
Wind pressure: 200 kg/sqm
Water tightness: 25 kg/sqm

All external frames / wall joints must be sealed with silicon sealant and the wedges trimmed with 12X12mm hardwood beading fixed to frames by brass nails

Sealent shall be provided at all joints while fabrication

All hardware should be provided for the performance of al functions of the units
Hinges shall confirm to

1) Door size more than 700X1900mm
WD: 125mm X2 sets
SD: 150mm X3 sets

2) Door size less than 700X1900mm
WD: 100mm X2 sets
SD: 125mm X2 sets

Locks shall be cylinderical with master key sets
Door knobs shall be1000mm above FFL

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client:
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Page Name:
All Opening Schedule

29/12/2020

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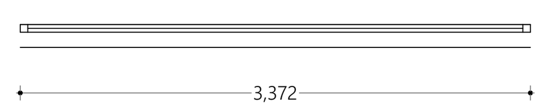
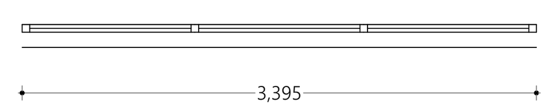
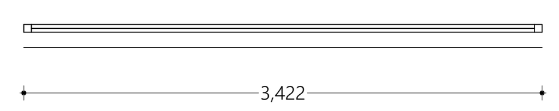
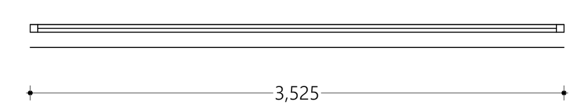
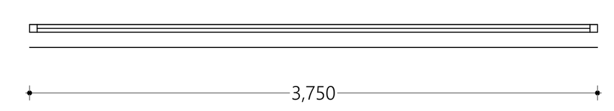
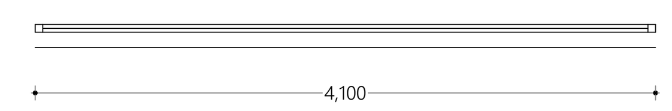
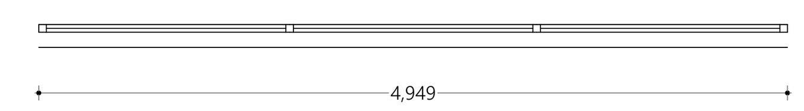
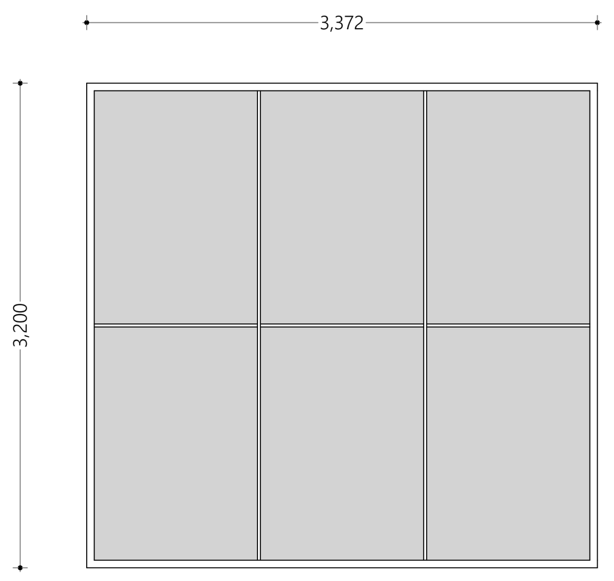
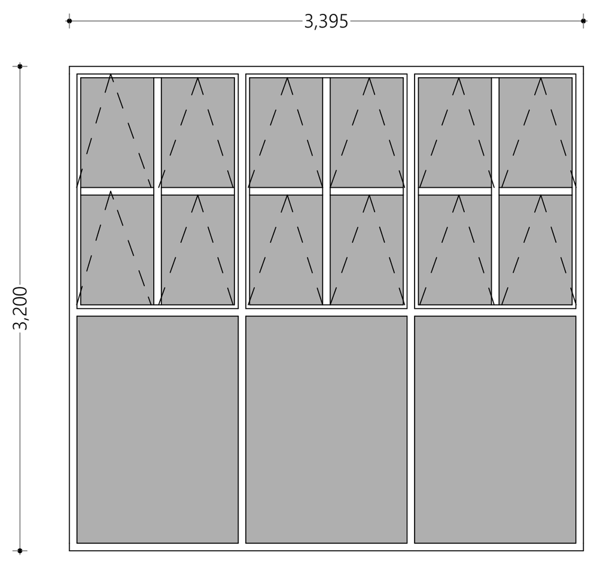
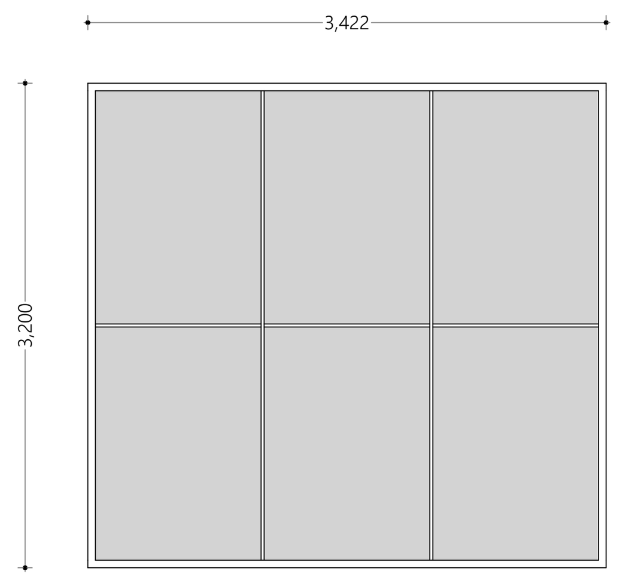
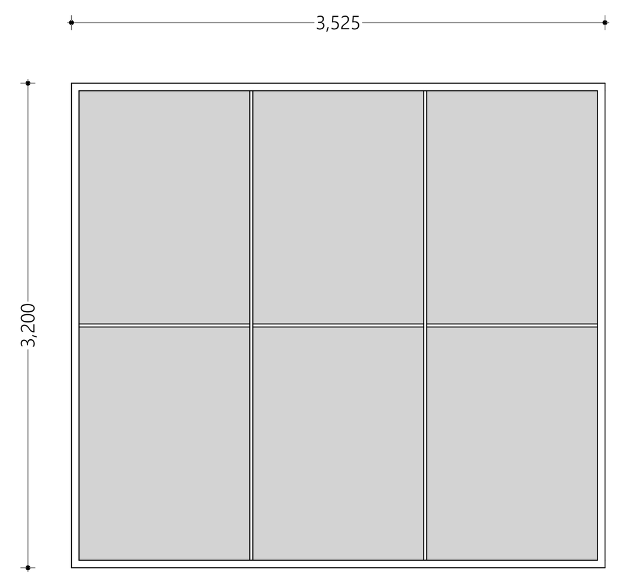
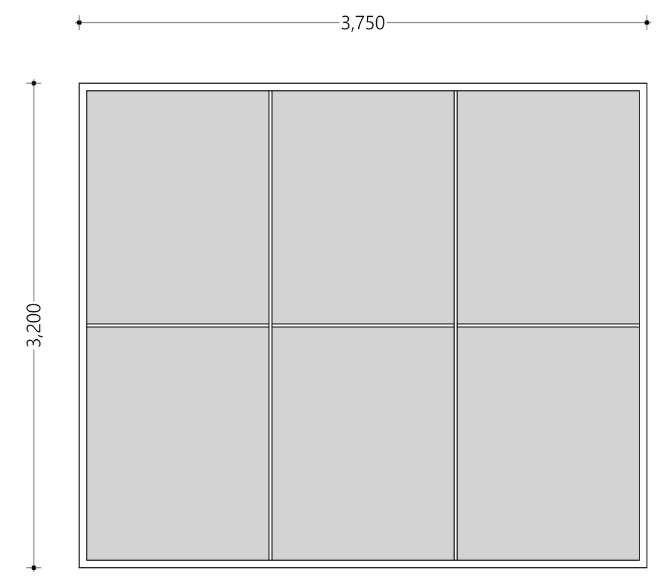
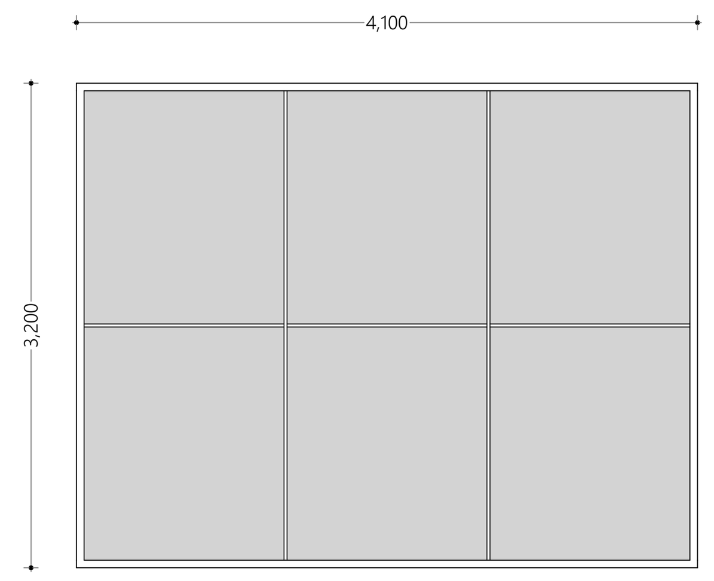
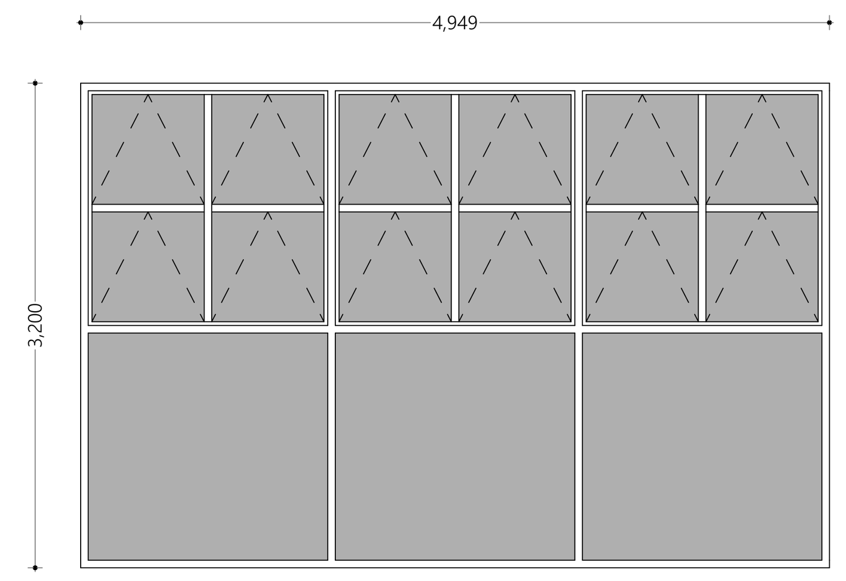
Page
A.5.01

All Openings Schedule

Element ID	W08	W09	W10	W11	W12	W13	W14
Quantity	6	1	1	1	2	1	1
W x H Size	3,372×3,200	3,395×3,200	3,422×3,200	3,525×3,200	3,750×3,200	4,100×3,200	4,949×3,200
Sill height	0	0	0	0	0	0	0
Head height	3,200	3,200	3,200	3,200	3,200	3,200	3,200
2D Symbol							
View from Side Opposite to Opening Side							
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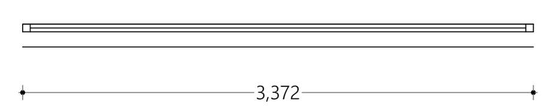
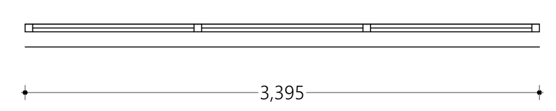
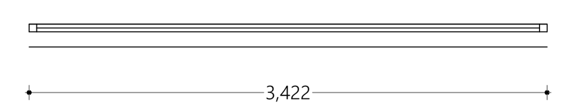
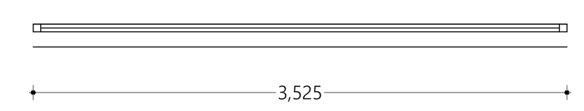
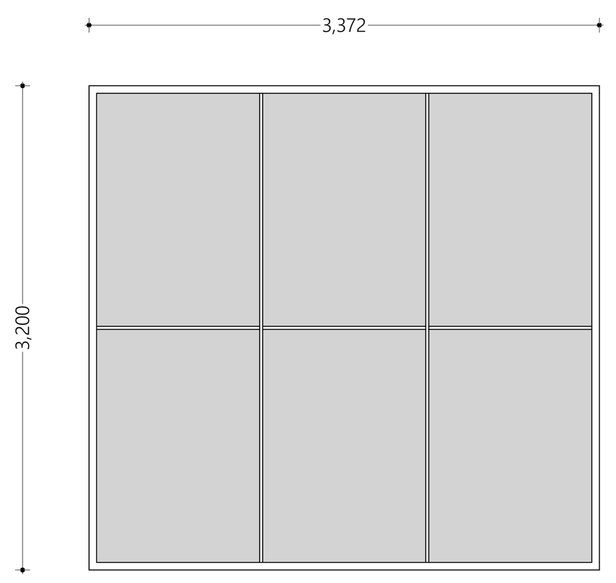
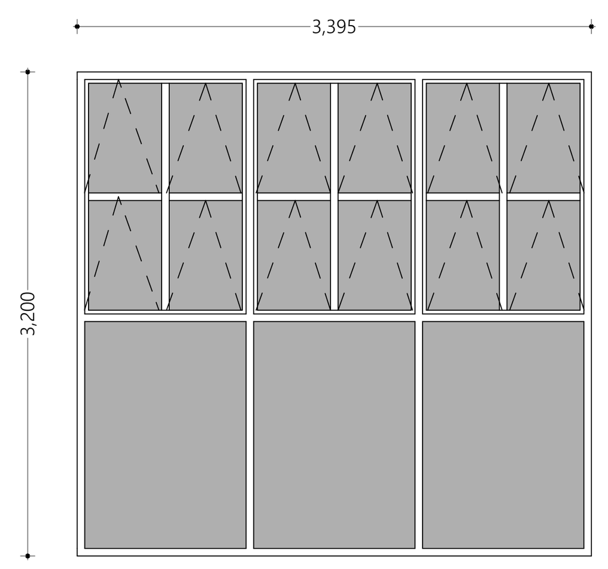
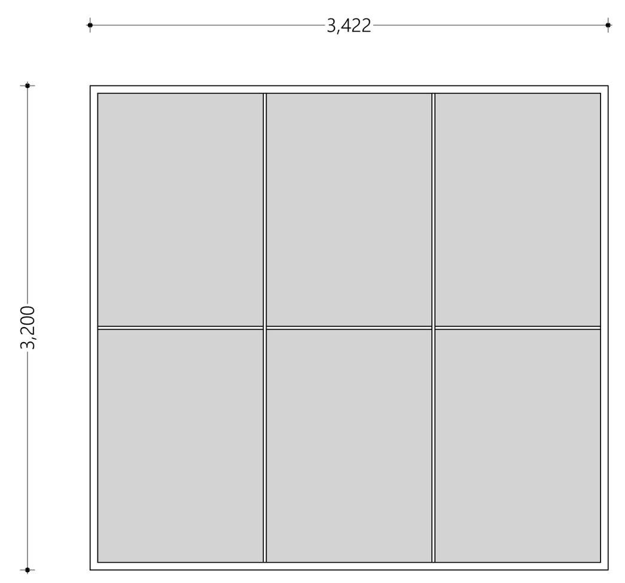
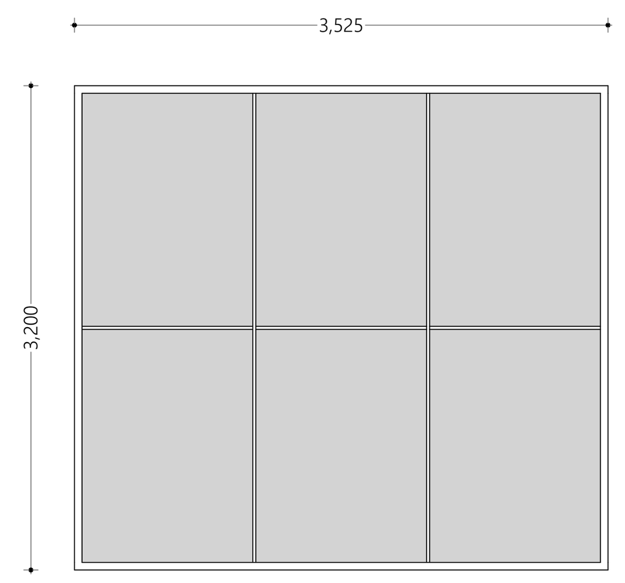
Door Leaf	---	---	---	---	---	---	---
Window Sash	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum
Glazing	01 Clear Glass	01 Reflective Glass	01 Clear Glass	01 Clear Glass	01 Clear Glass	01 Clear Glass	01 Reflective Glass

All Openings Schedule

Element ID	W08	W09	W10	W11
Quantity	6	1	1	1
W x H Size	3,372×3,200	3,395×3,200	3,422×3,200	3,525×3,200
Sill height	0	0	0	0
Head height	3,200	3,200	3,200	3,200
2D Symbol				
View from Side Opposite to Opening Side				
Frame	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum
Door Leaf	---	---	---	---
Window Sash	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum	03 Powder Coated Aluminum
Glazing	01 Clear Glass	01 Reflective Glass	01 Clear Glass	01 Clear Glass

CUSTOMS, VENTILATION SCHEDULE

Room Name	Room Area	Opening	Required Opening	Designed Opening	Opening %
Ground Floor					
Tea Room	17.89	MECHANICAL VENTILATION			
Prayer Room	12.77	MECHANICAL VENTILATION			
Maintenance	6.01	MECHANICAL VENTILATION			
Server Room	8.67	MECHANICAL VENTILATION			
Store	8.08	MECHANICAL VENTILATION			
AHU	47.74	MECHANICAL VENTILATION			
Security	6.93	MECHANICAL VENTILATION			
Toilet (F)	4.96	MECHANICAL VENTILATION			
Toilet (M)	3.44	MECHANICAL VENTILATION			
Meeting Room	14.43	MECHANICAL VENTILATION			
Office Area	167.95	MECHANICAL VENTILATION			
First Floor					
Office	8.64	MECHANICAL VENTILATION			
Executive Office	10.11	MECHANICAL VENTILATION			
Toilet (F)	2.61	MECHANICAL VENTILATION			
Toilet (M)	2.63	MECHANICAL VENTILATION			
Pantry	6.56	MECHANICAL VENTILATION			
Seminar Room	52.95	MECHANICAL VENTILATION			
Meeting Room	19.66	MECHANICAL VENTILATION			
Training Room	40.34	MECHANICAL VENTILATION			
Toilet 1	2.89	MECHANICAL VENTILATION			
Recreation Hall	96.01	MECHANICAL VENTILATION			
Seminar Room 2	139	MECHANICAL VENTILATION			
Terrace Floor					
Living Room	97.94	D4,D9,W4	9.794	12.77	13.04
Bedroom 1	19.66	W14	1.966	4.68	23.80
Toilet 1	4.27	W1	0.427	0.53	12.41
Bedroom 2	26.08	W15	2.608	7.08	27.15
Toilet 2	3.99	W1	0.399	0.53	13.28
Bedroom 3	25.4	W5	2.54	3.06	12.05
Toilet 3	2.94	W1	0.294	0.53	18.03
Bedroom 4	22.3	W3	2.23	2.46	11.03
Toilet 4	2.94	W1	0.294	0.53	18.03
Bedroom 5	29.06	W5,W14	2.906	7.74	26.63
Toilet 5	3.88	W1	0.388	0.53	13.66
Kitchen	23.64	W4	2.364	2.52	10.66

Ventilation Schedule

1:100

Door and Window Notes

Dimensions shown on DWG indicate effective openings of frame

All frame depths are 100mm
All door leaf thicknesses are 35mm
All window sash thickness are 25mm
All frame edges shal be trimmed 3mm
All wooden components should be wood stained finish
All aluminum components to be powder coated (min. 60 microns)

All aluminum panels should be of 6mm thick unless specified
All glazing should be of 6mm unless specified

External units must comply the following weather conditions:
Wind pressure: 200 kg/sqm
Water tightness: 25 kg/sqm

All external frames / wall joints must be sealed with silicon sealant and the wedges trimmed with 12X12mm hardwood beading fixed to frames by brass nails

Sealent shall be provided at all joints while fabrication

All hardware should be provided for the performance of al functions of the units
Hinges shall confirm to

1) Door size more than 700X1900mm
WD: 125mm X2 sets
SD: 150mm X3 sets

2) Door size less than 700X1900mm
WD: 100mm X2 sets
SD: 125mm X2 sets

Locks shall be cylinderical with master key sets
Door knobs shall be1000mm above FFL

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client:

Customs Maldives

Page Name:

All Opening Schedule/ Ventilation Schedule

29/12/2020

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Drawn By: Aishath Shadhny Afzal

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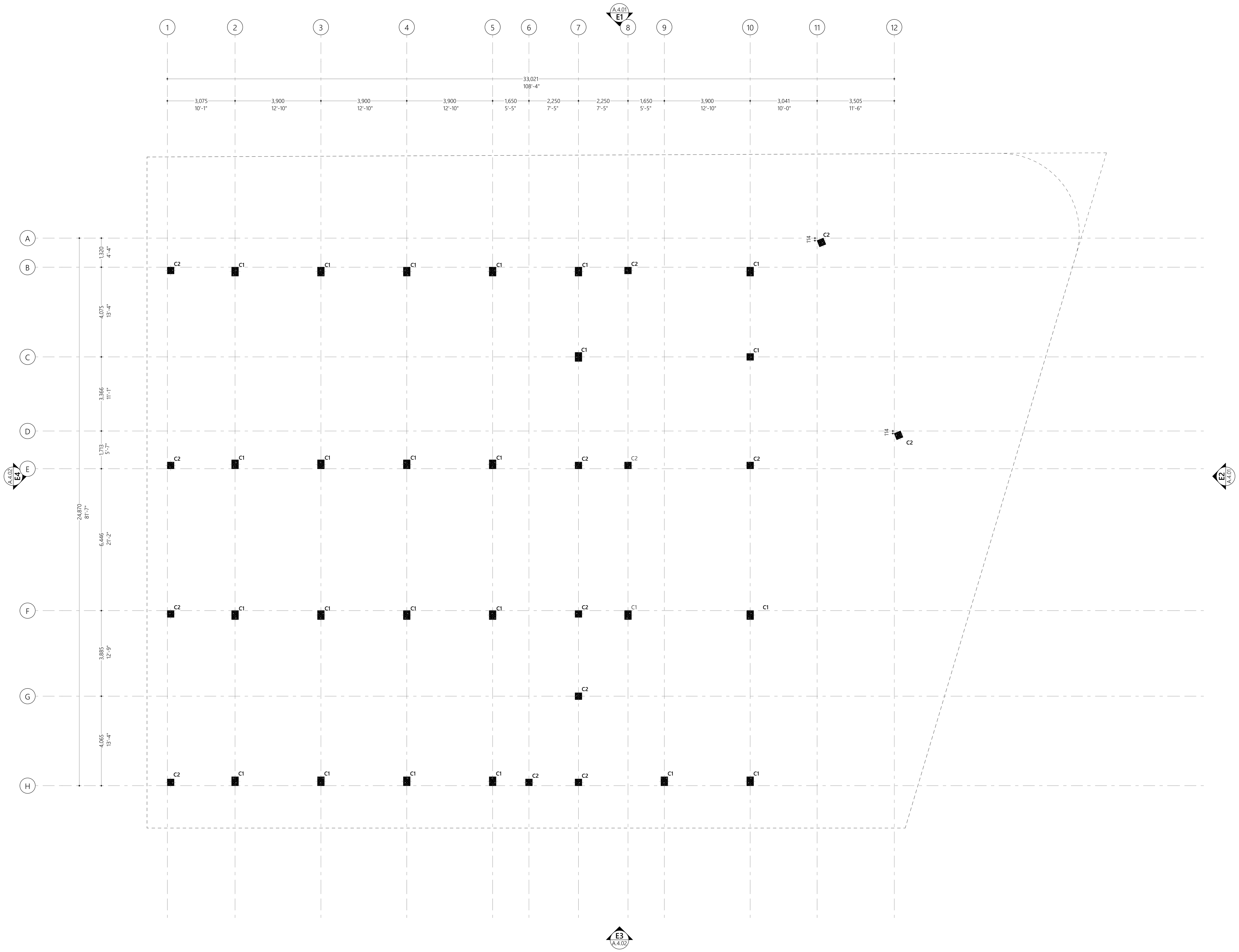

Column Layout
1:100

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client:

Customs Maldives

Page Name:

Column Layout

29/12/2020

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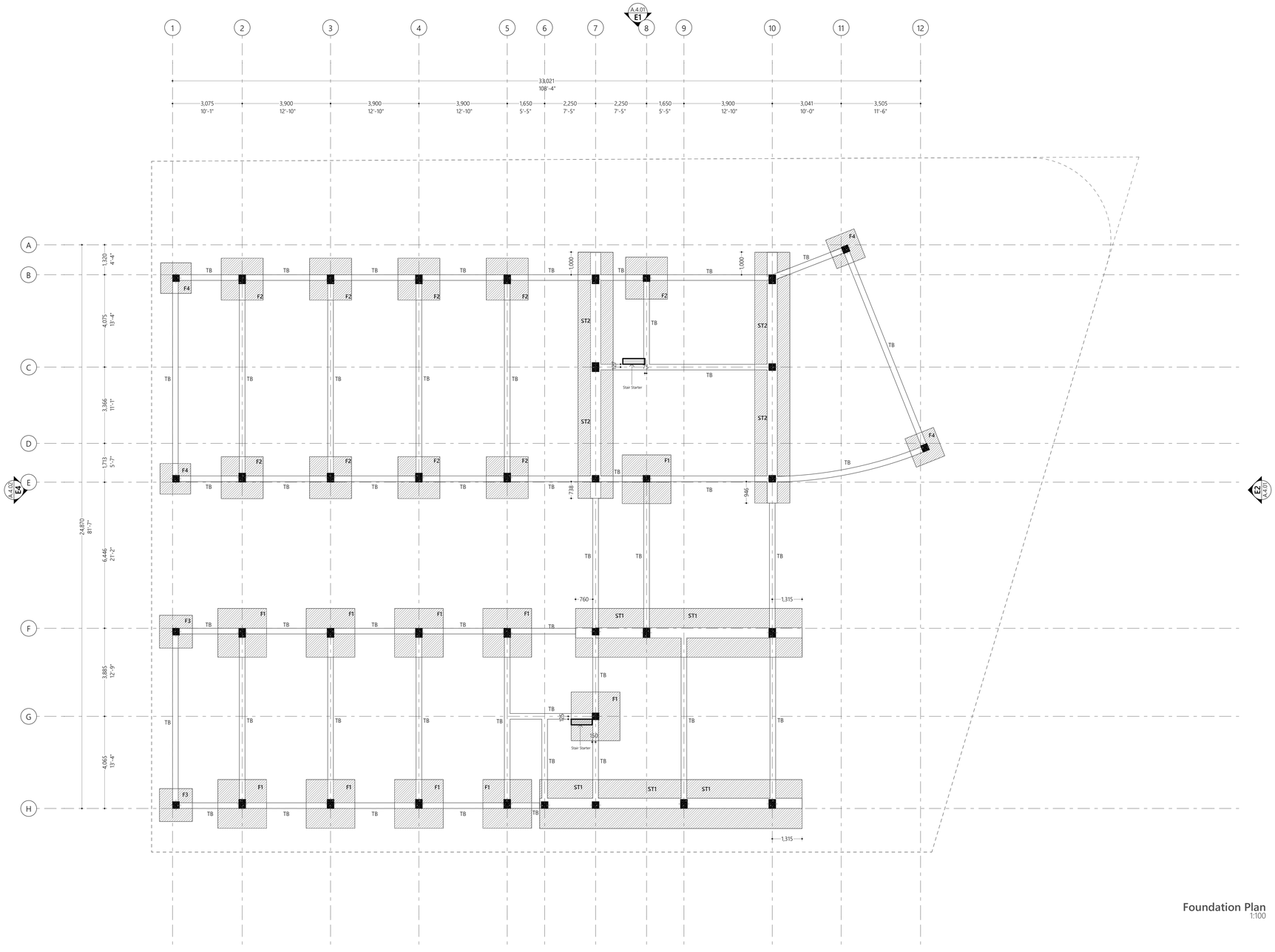

Foundation Plan
1:100

Foundation Details:

	Dimensions	Reinfrocement
F1	2150x2150x400	T12@125C/C B/W (B)
F2	1850x1850x400	T12@150C/C B/W (B)
F3	1450x1450x400	T12@150C/C B/W (B)
F4	1350X1350X400	T12@150C/C B/W (B)

Foundation Depth = 1200mm
Ground Slab = 100mm thick RC slab on fill reinforced with T10@200C/C (B/W)

All Footings are to be laid on top of 50mm thick lean concrete
Apply waterproofing to all substructure (below ground elements)
All below ground & terrace concrete works shall be done using waterproofing admixtures

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client:
Customs Maldives

Page Name:
Foundation Plan

29/12/2020

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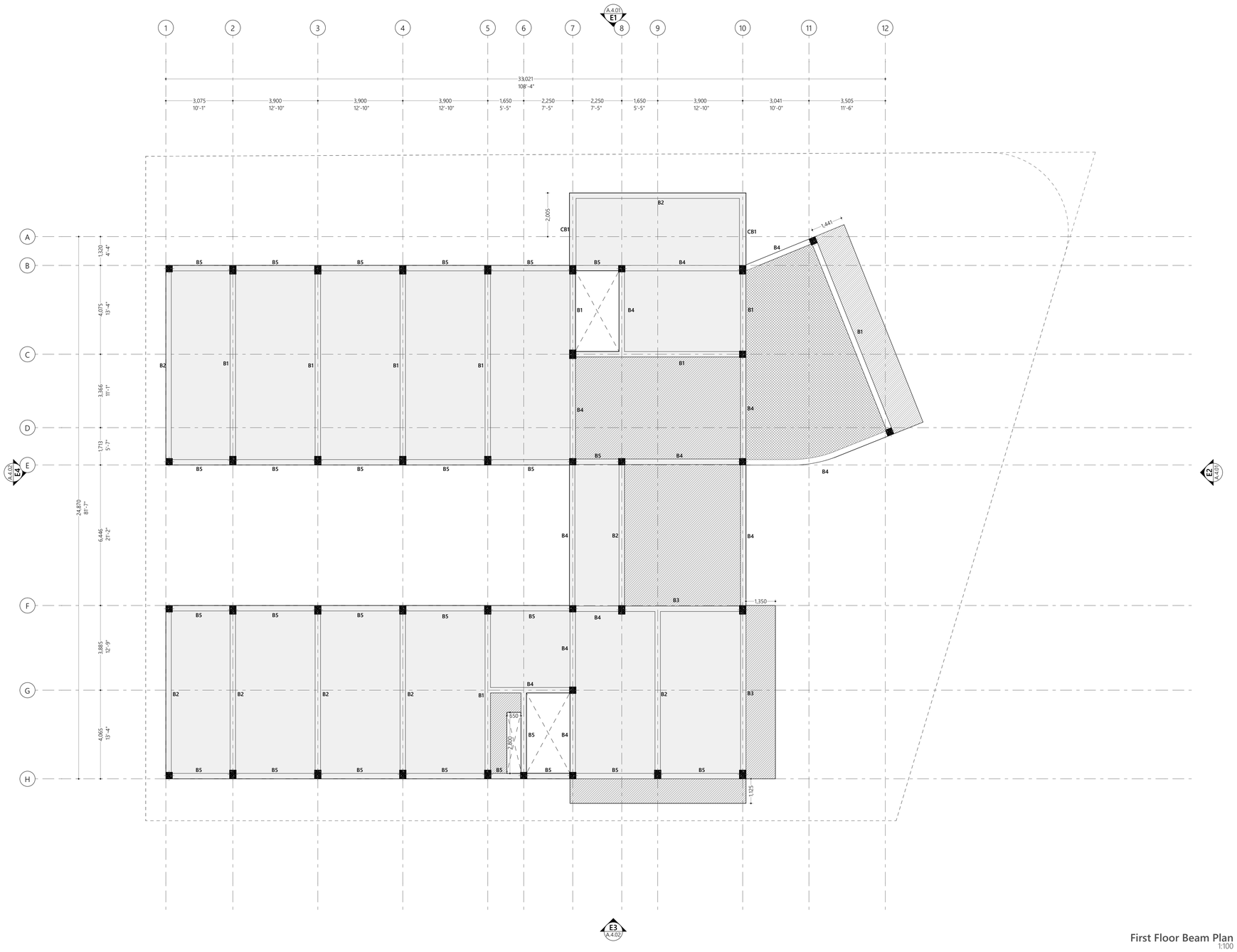

First Floor Beam Plan
1:100

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client:
Customs Maldives

Page Name:
First Floor Beam Plan

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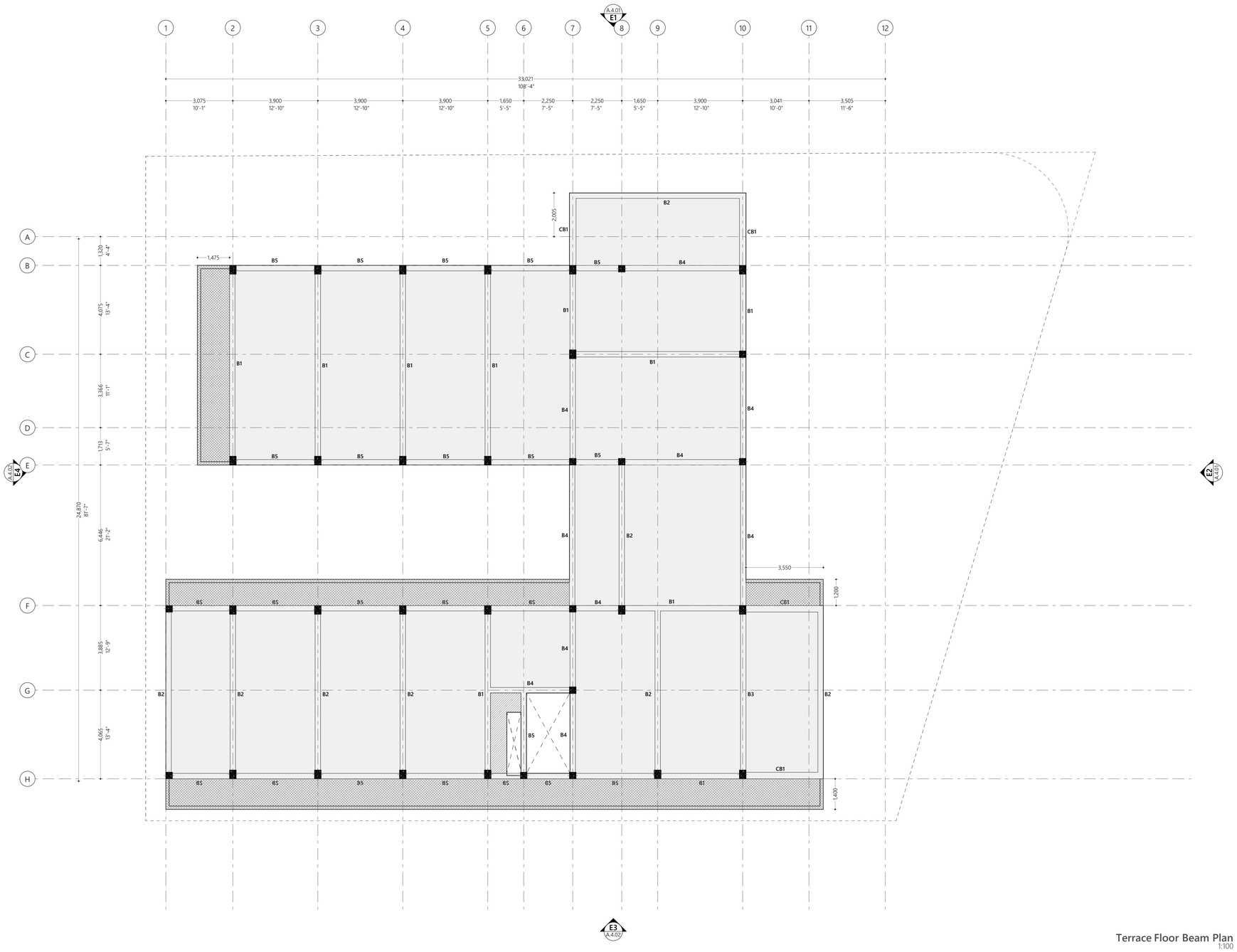

Terrace Floor Beam Plan
1:100

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

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Second Floor Beam Plan

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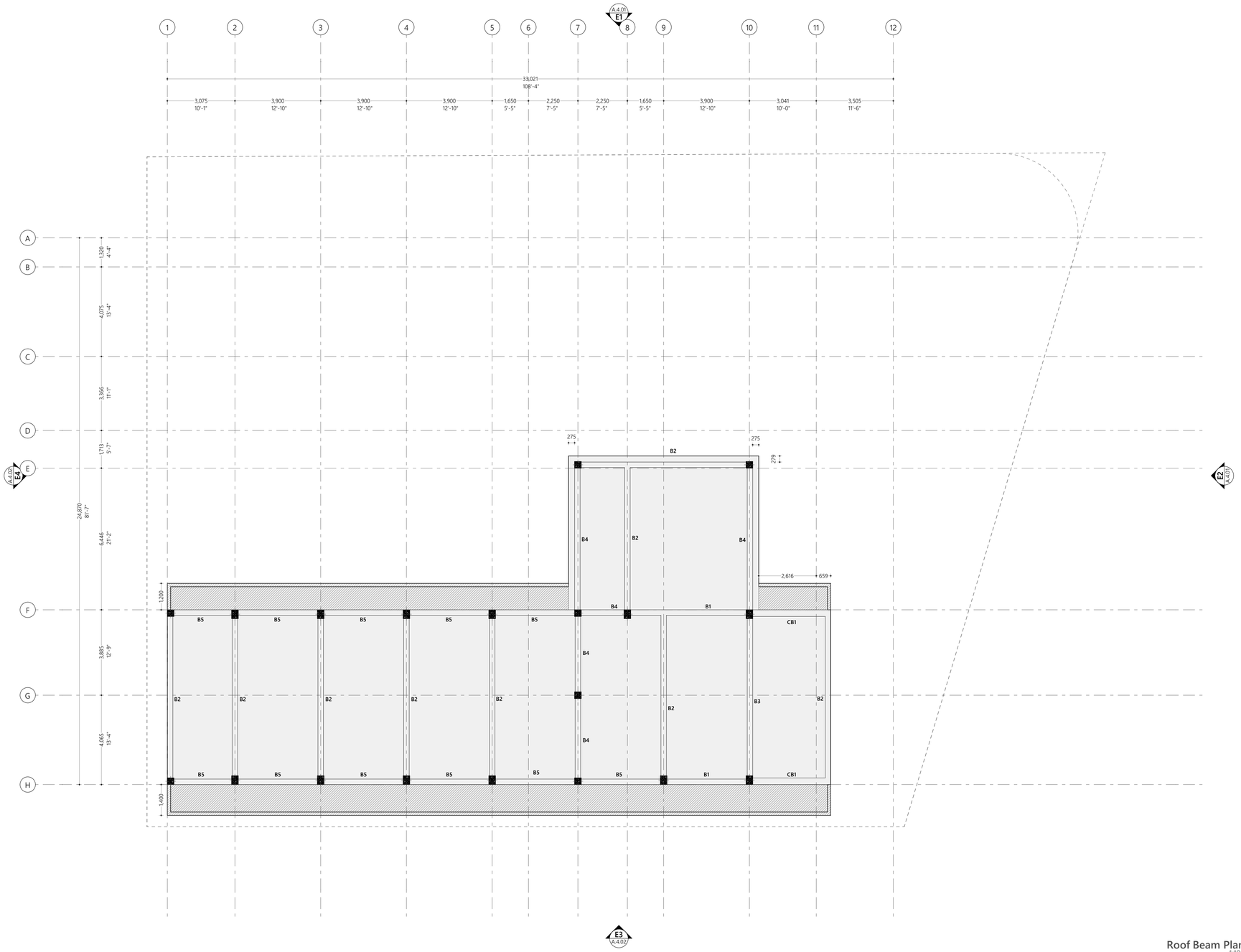

Roof Beam Plan
1:100

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

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Roof Beam Plan

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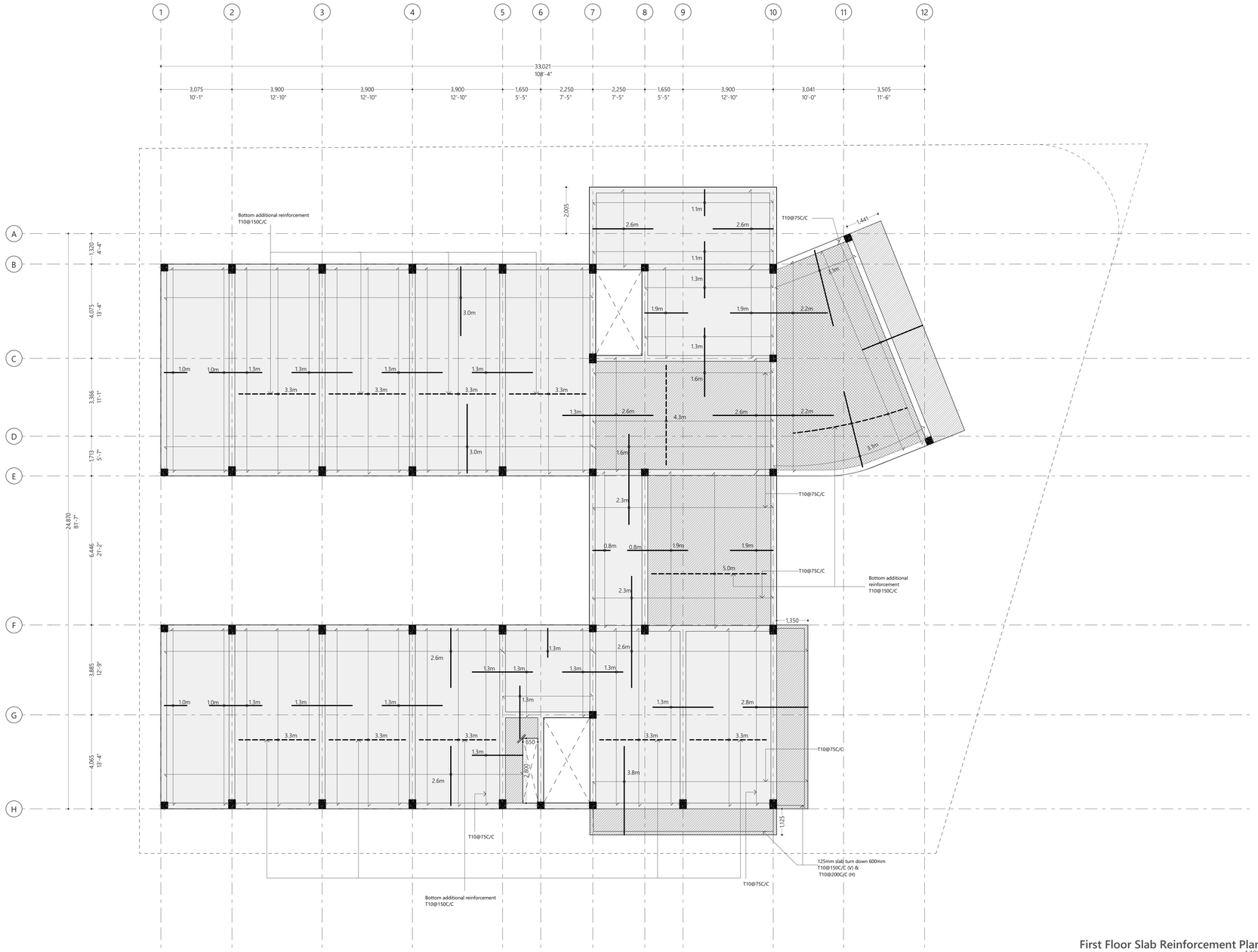

First Floor Slab Reinforcement Plan
1:100

Notes:

Slab thickness: 150mm
Shaded area slab thickness: 165mm
Shaded area slab thickness: 175mm

Bottom Reinforcement - T10@150 C/C B/W (not shown)
Bottom Additional Reinforcement - T10@150 C/C (as shown)
Top Reinf. - T10@150C/C (as shown, unless stated)
Top Dist. Steel - T10@150 C/C (not shown)
Corner Bars - 3T10@45C/C T&B as shown
Reinforcement discontinuous at voids
Provide 30mm cover

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client:
Customs Maldives

Page Name:
First Floor Slab Plan

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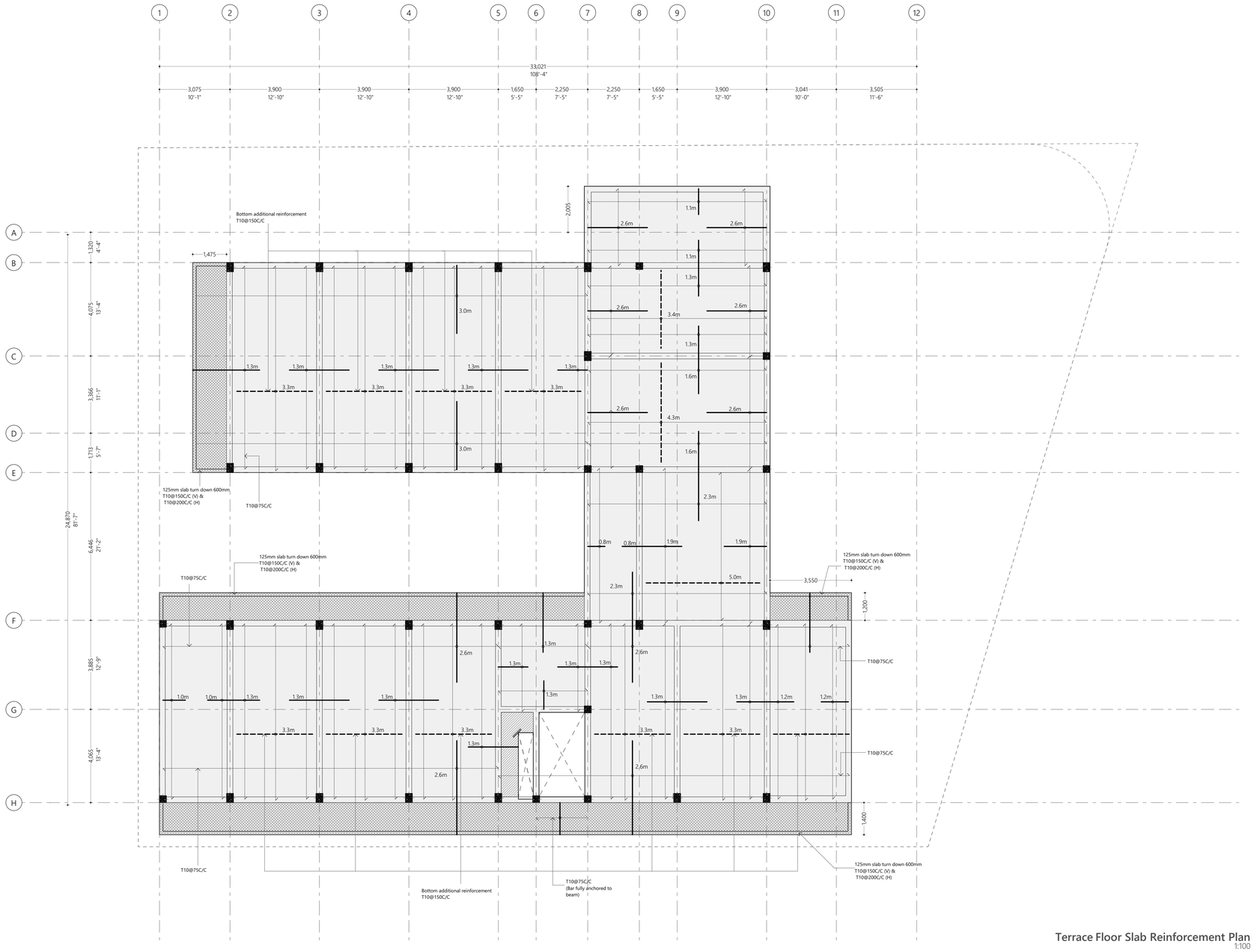

Terrace Floor Slab Reinforcement Plan
1:100

Notes:

Slab thickness: 150mm
Shaded area slab thickness: 165mm
Shaded area slab thickness: 185mm

Bottom Reinforcement - T10@150 C/C B/W (not shown)
Bottom Additional Reinforcement - T10@150 C/C (as shown)
Top Reinf. - T10@150C/C (as shown, unless stated)
Top Dist. Steel - T10@150 C/C (not shown)
Corner Bars - 3T10@45C/C T&B as shown
Reinforcement discontinuous at voids
Provide 30mm cover

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client:
Customs Maldives

Page Name:
Terrace Floor Slab Plan

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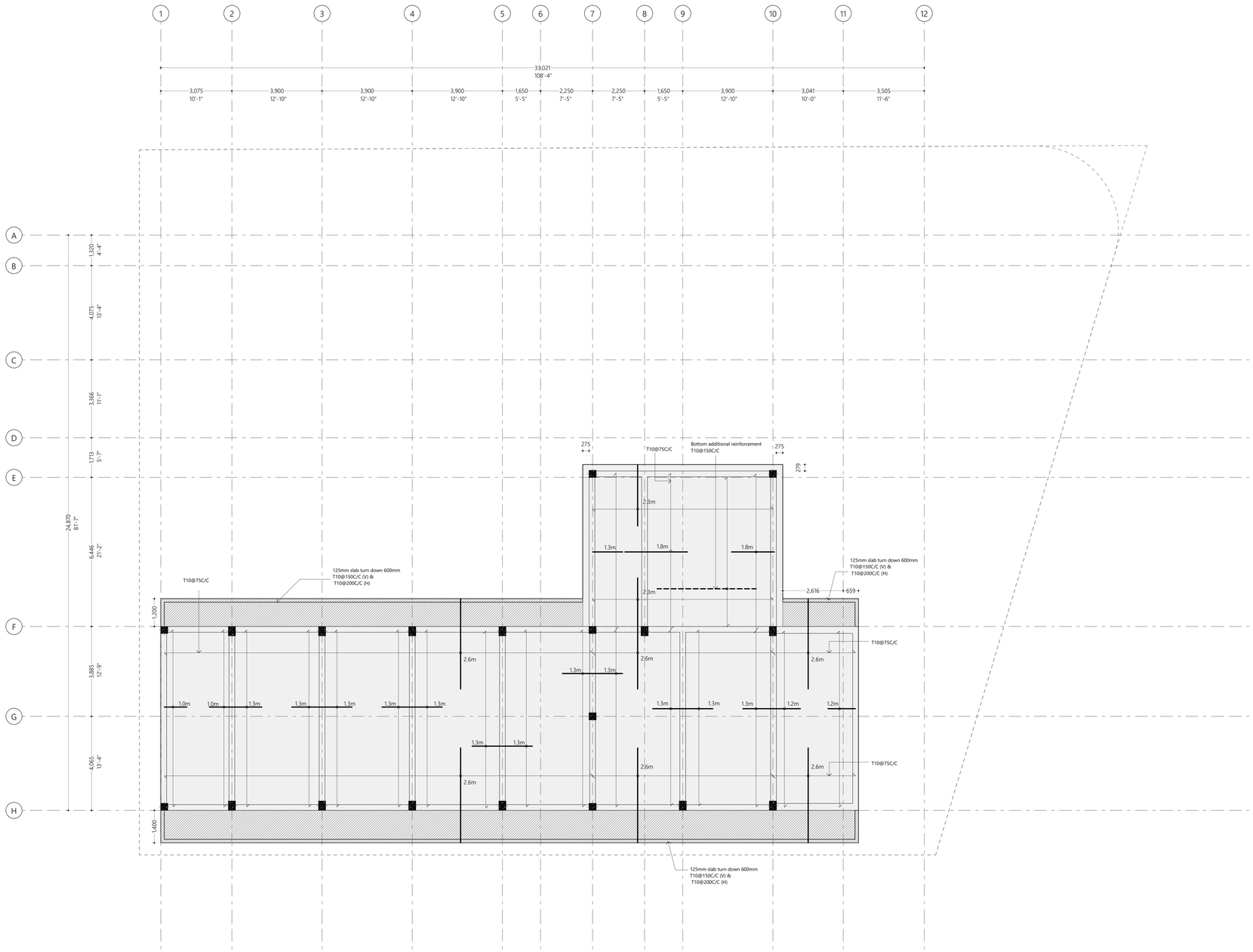

Notes:

Slab thickness: 150mm
Shaded area slab thickness: 160mm

Bottom Reinforcement - T10@150 C/C B/W (not shown)
Bottm Additional Reinforcement - T10@150 C/C (as shown)
Top Reinf. - T10@150C/C (as shown, unless stated)
Top Dist. Steel - T10@150 C/C (not shown)
Corner Bars - 3T10@45C/C T&B as shown
Reinforcement discontinuous at voids
Provide 30mm cover

Roof Slab Reinforcement Plan
1:100

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client
Customs Maldives

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Roof Slab Plan

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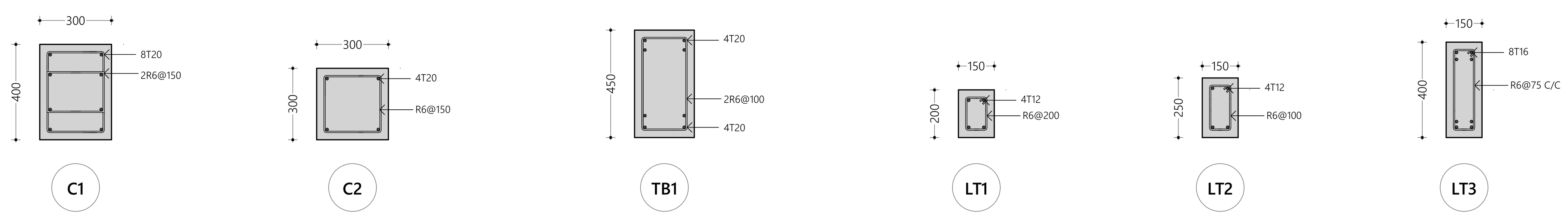


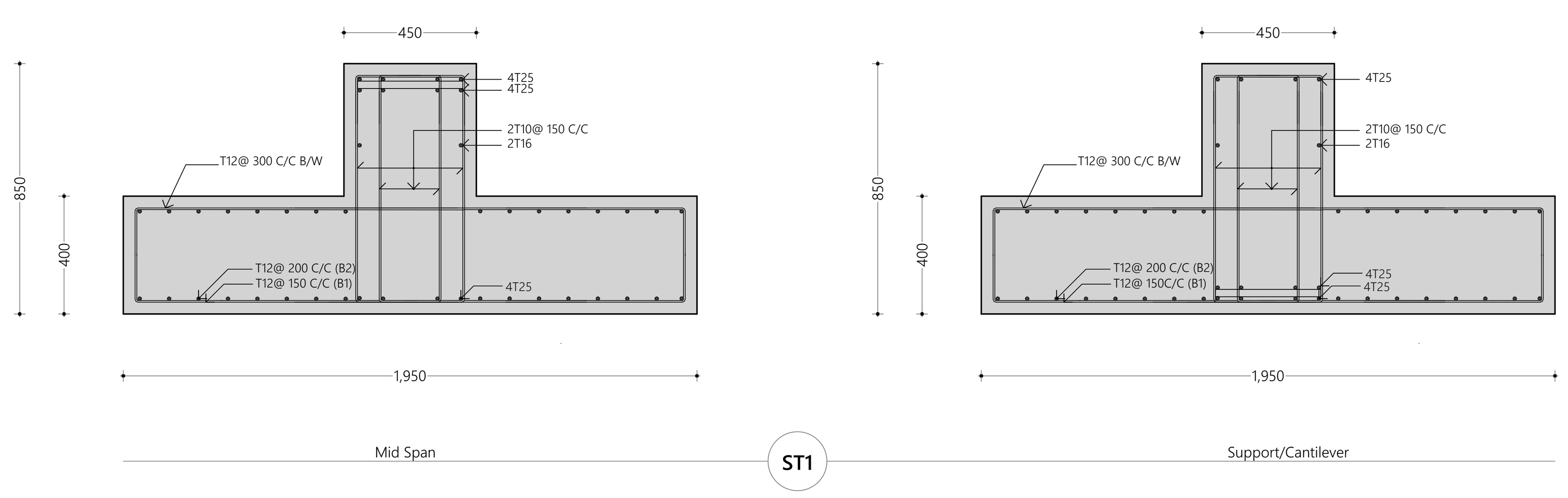
Column Detail
1:20

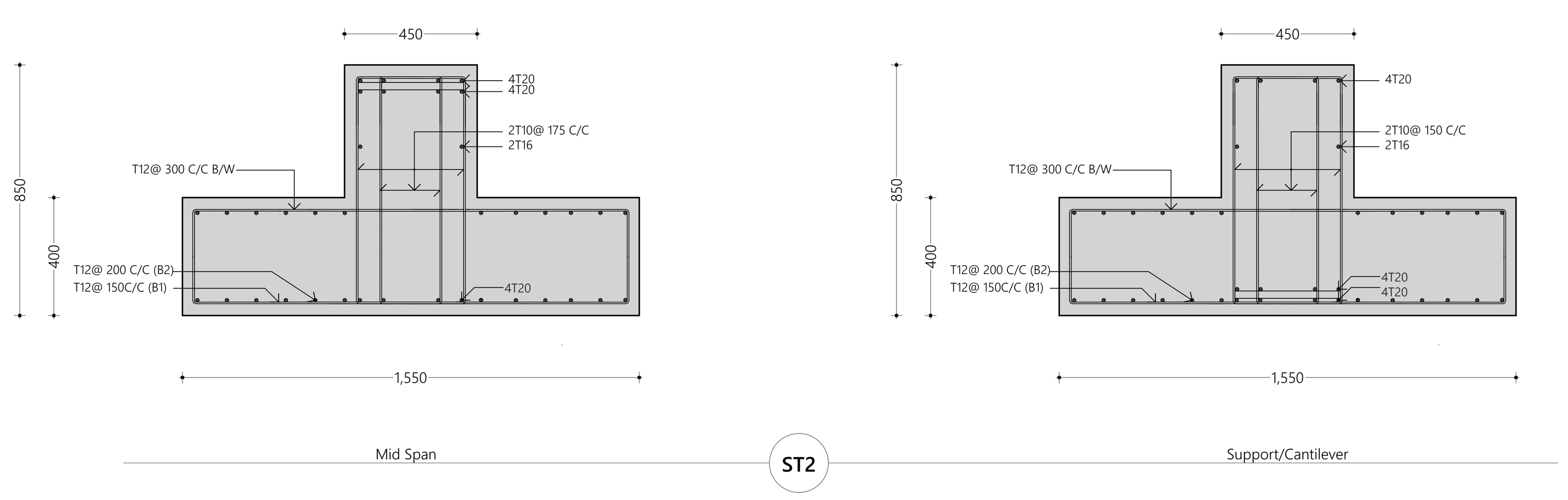
Tie Beam Details
1:20

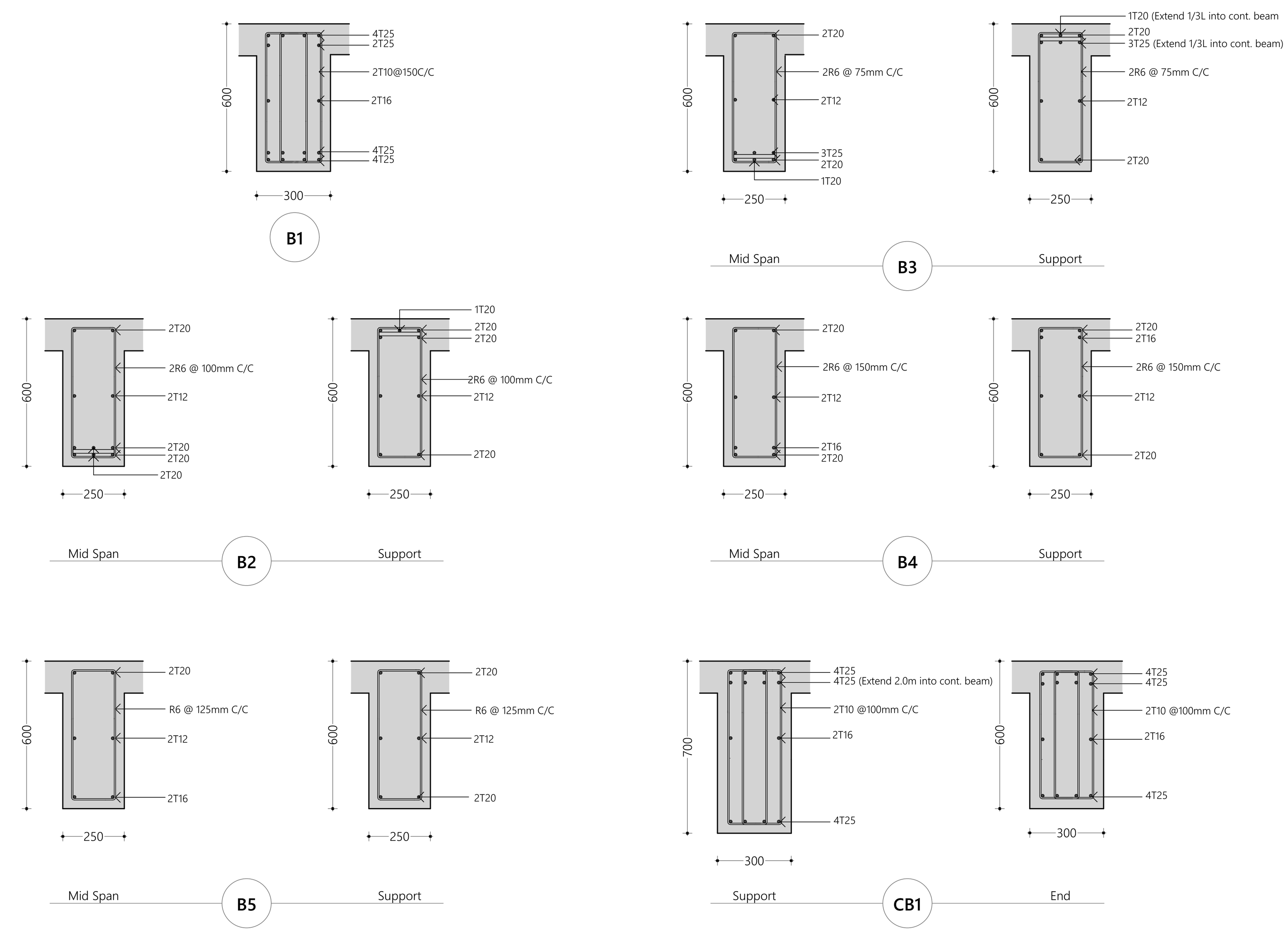
Lintels over all doors and windows (that does not rise to beam level) LT1 for windows <1.5m

Lintels over all doors and windows (that does not rise to beam level) LT1 for windows >1.5m & < 3.0m

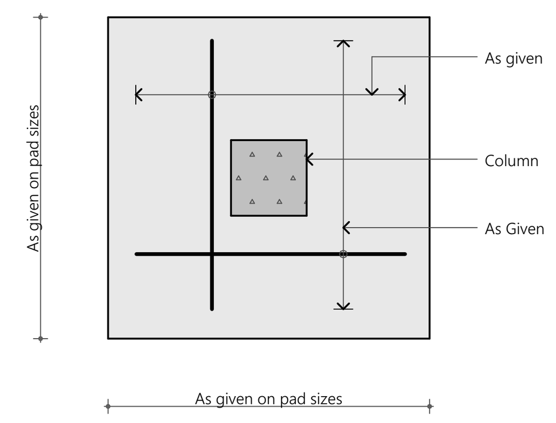
Lintels over all doors and windows (that does not rise to beam level) LT1 for windows >3.0m & < 6.0m



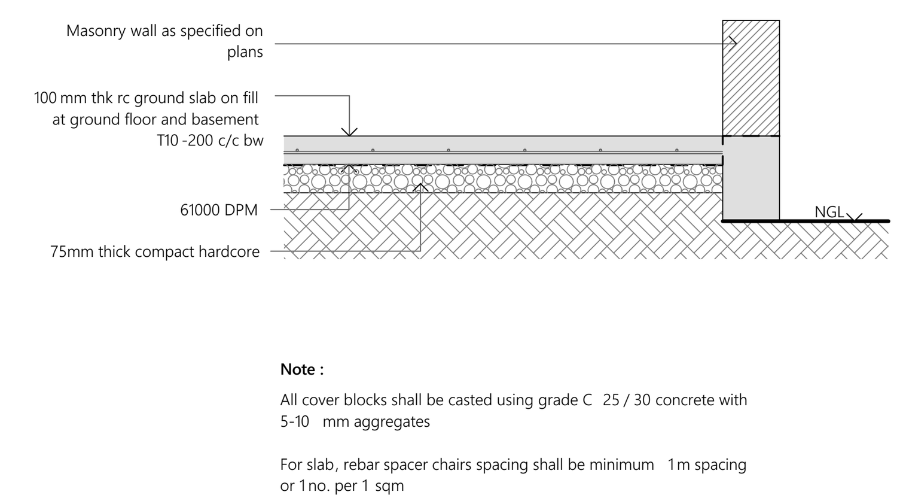




Beam Details
1:20



Plan View

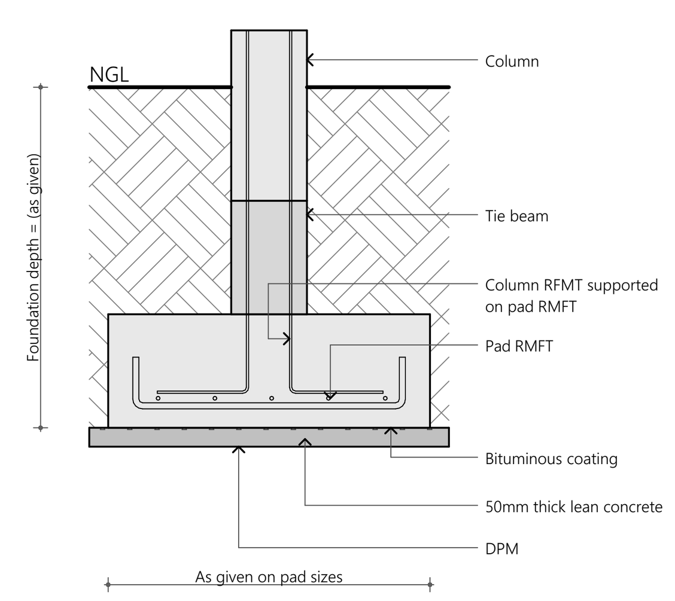


Note :

All cover blocks shall be casted using grade C 25 / 30 concrete with 5-10 mm aggregates

For slab, rebar spacer chairs spacing shall be minimum 1m spacing or 1no. per 1 sqm

Typical Ground Slab Construction Detail
1:20



Sectional View

Typical Footing Detail
1:20

Foundation Details:

	Dimensions	Reinfrocement
F1	2150x2150x400	T12@125C/C B/W (B)
F2	1850x1850x400	T12@150C/C B/W (B)
F3	1450x1450x400	T12@150C/C B/W (B)
F4	1350X1350X400	T12@150C/C B/W (B)

Foundation Depth = 1200mm
Ground Slab = 100mm thick RC slab on fill reinforced with T10@200C/C (B/W)

All Footings are to be laid on top of 50mm thick lean concrete
Apply waterproofing to all substructure (below ground elements)
All below ground & terrace concrete works shall be done using waterproofing admixtures

Notes:

Cover to foundations = 50mm
Cover to floor slabs =30mm
Cover to floor beams =35mm
Cover to columns = 40mm
Laps = 45Dia (Dia=Bar Diameter)
Mid bars = 0.85 x Span
Sup bars = 1/3 x Span
Concrete mix = 1:2:3 (C:S:A)
Lean concrete mix = 1:2:5

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

Client:

Customs Maldives

Page Name:

Structural Details 01

29/12/2020

Architect: Mohamed Hassaan
Engineer: Ihsaan Waheed
Drawn By: Aishath Shadhny Afzal

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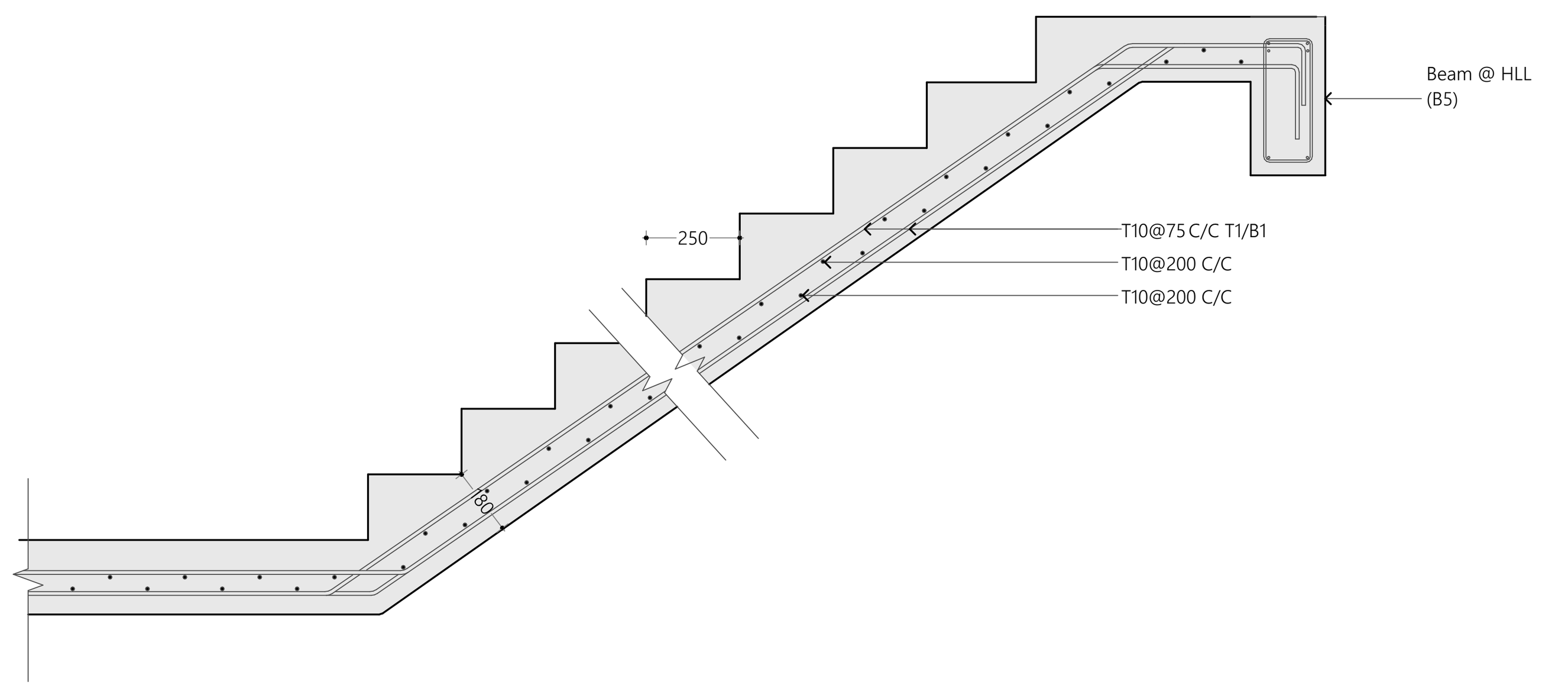
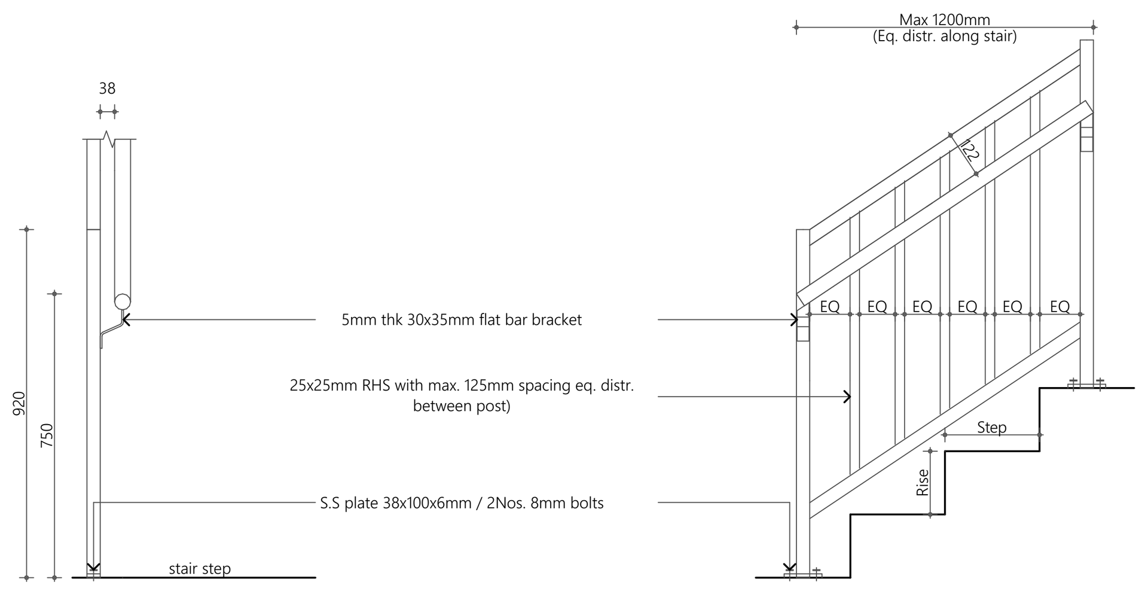
Rev: --- --- ---

Page: C.1.1



Staircase Reinforcement Detail
1:20

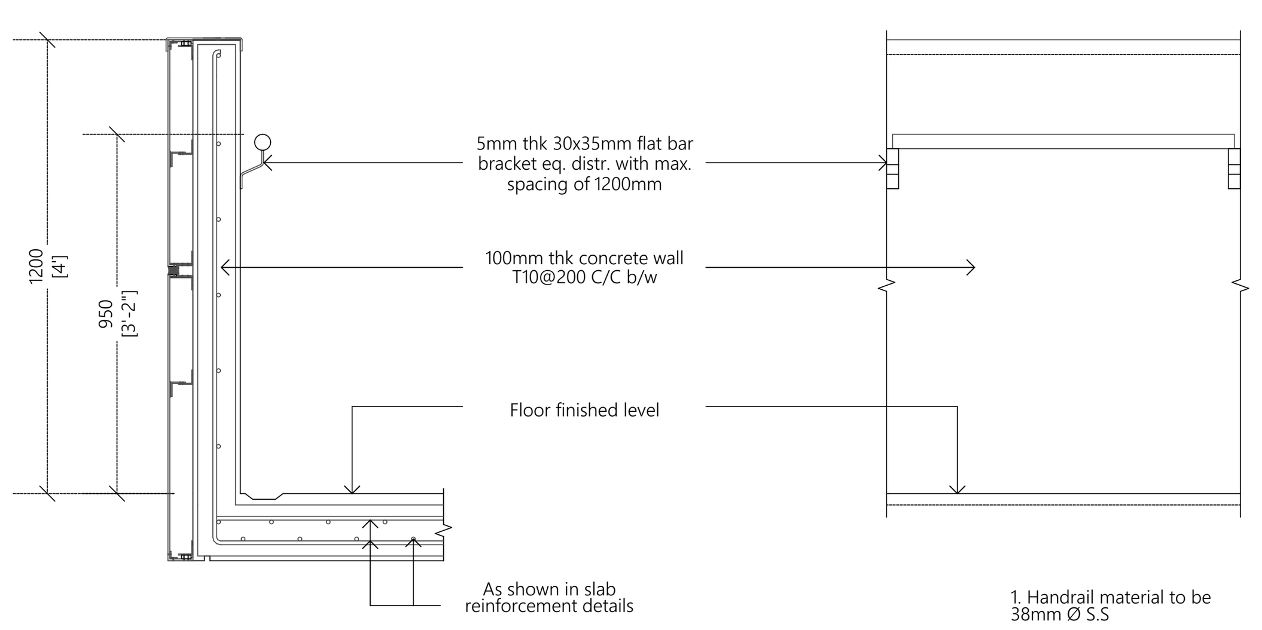


1. Post, top line and bottom line material to be 38X38mm RHS
2. Handrail material to be 38mm Ø S.S or varnished timber
3. Step: 250mm
4. Raise: 167mm

Staircase Railing Detail
1:20

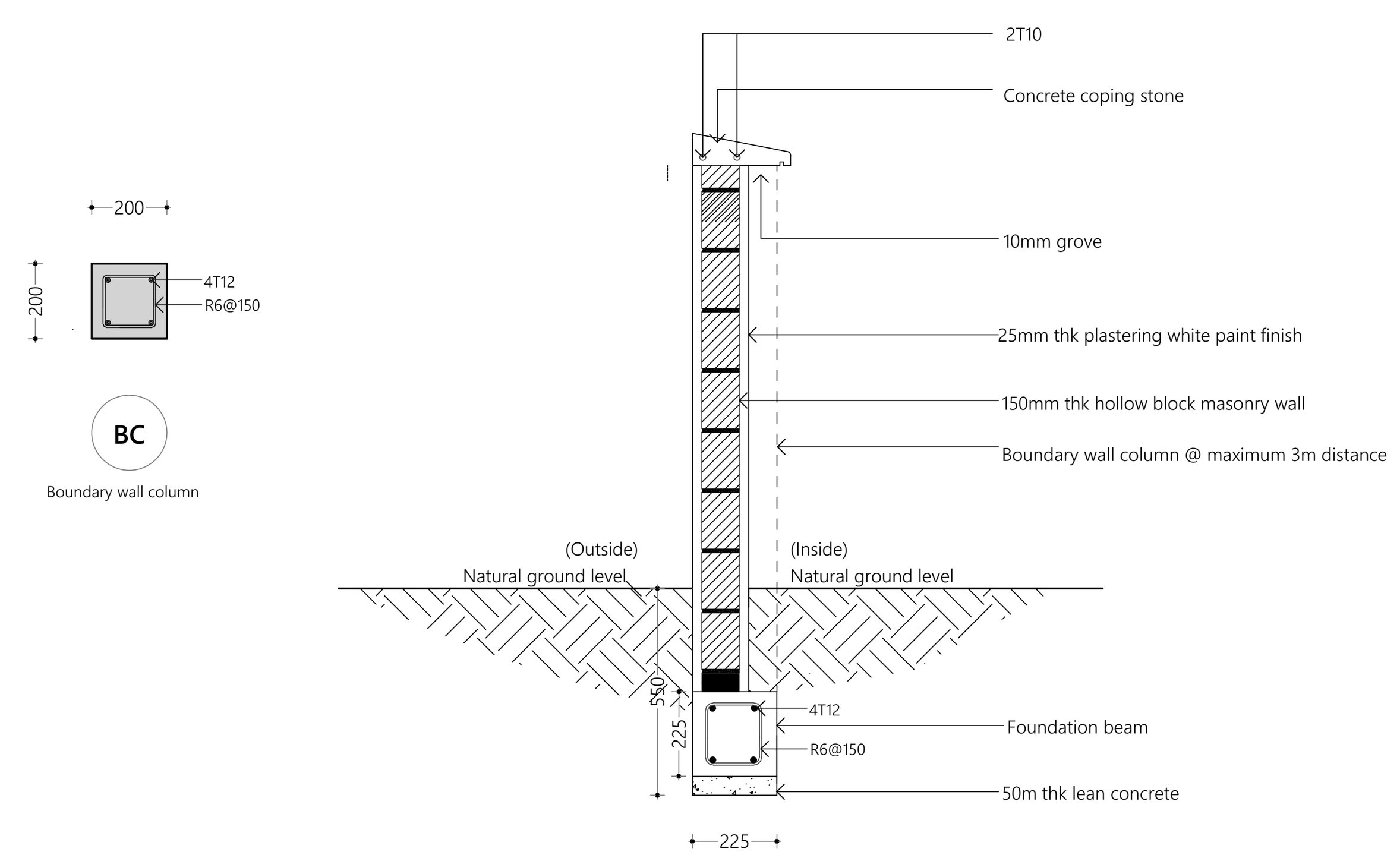
SECTIONAL VIEW

ELEVATION VIEW

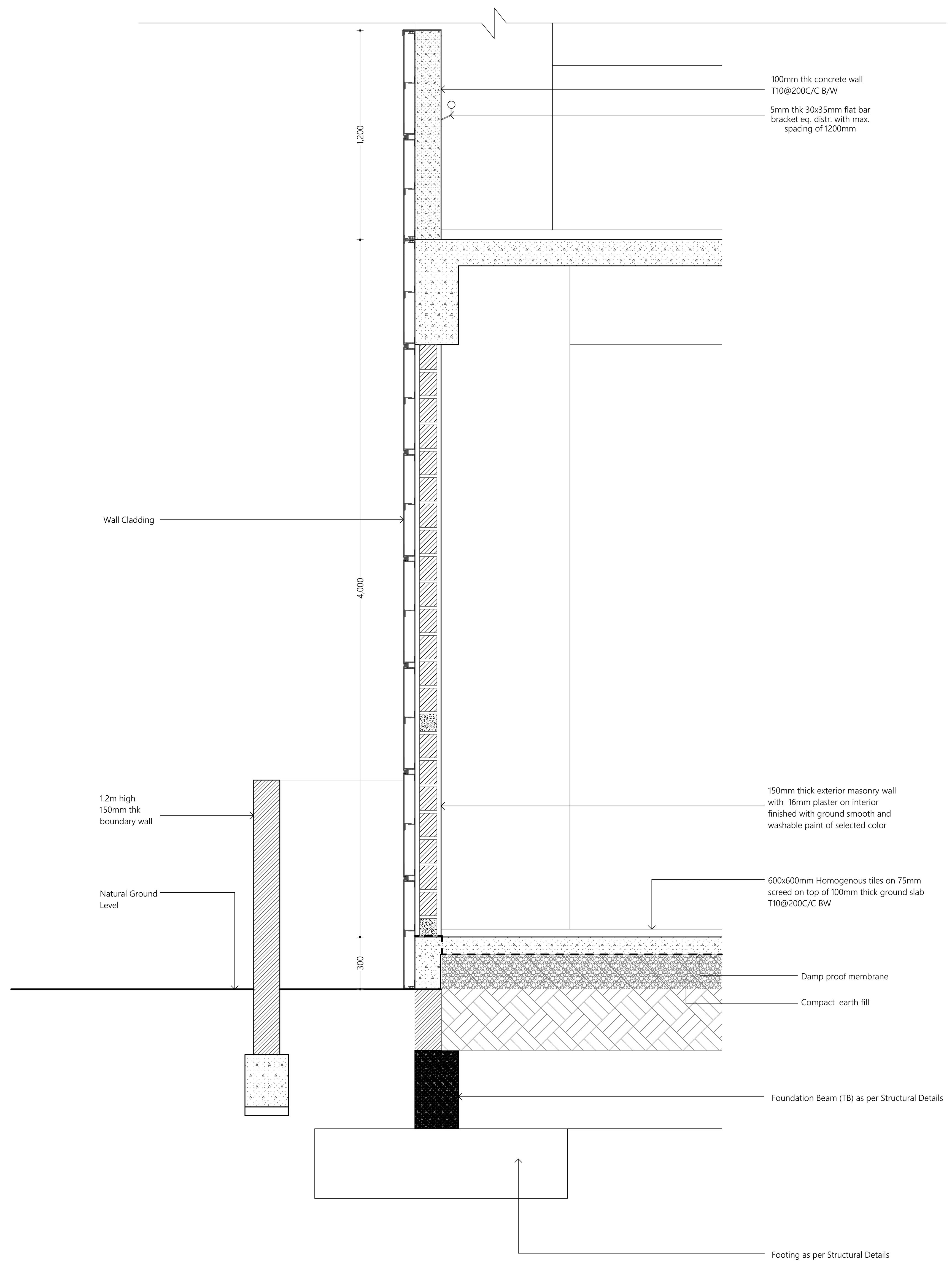


1. Handrail material to be 38mm Ø S.S

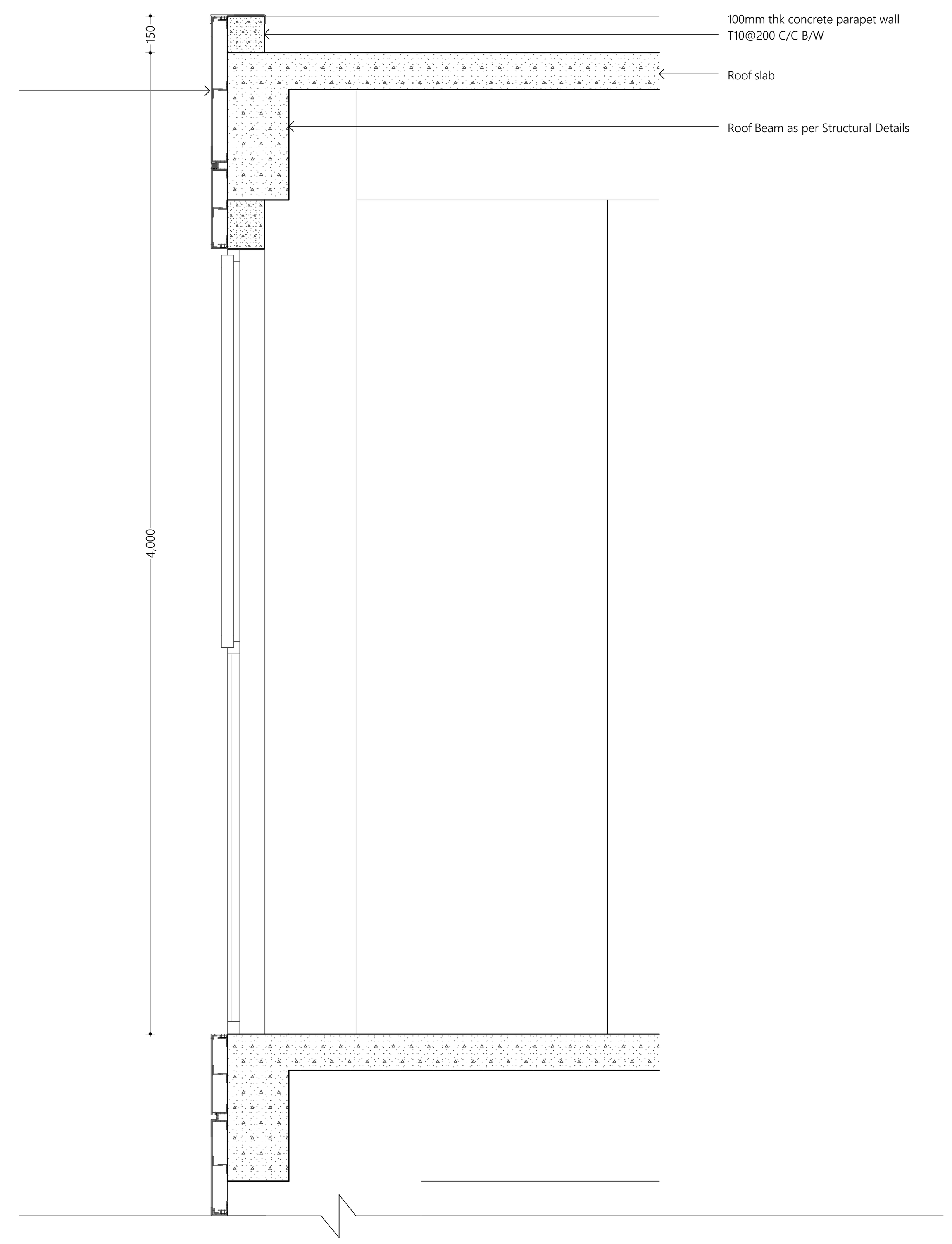
1.2m High RC Wall Detail
1:20

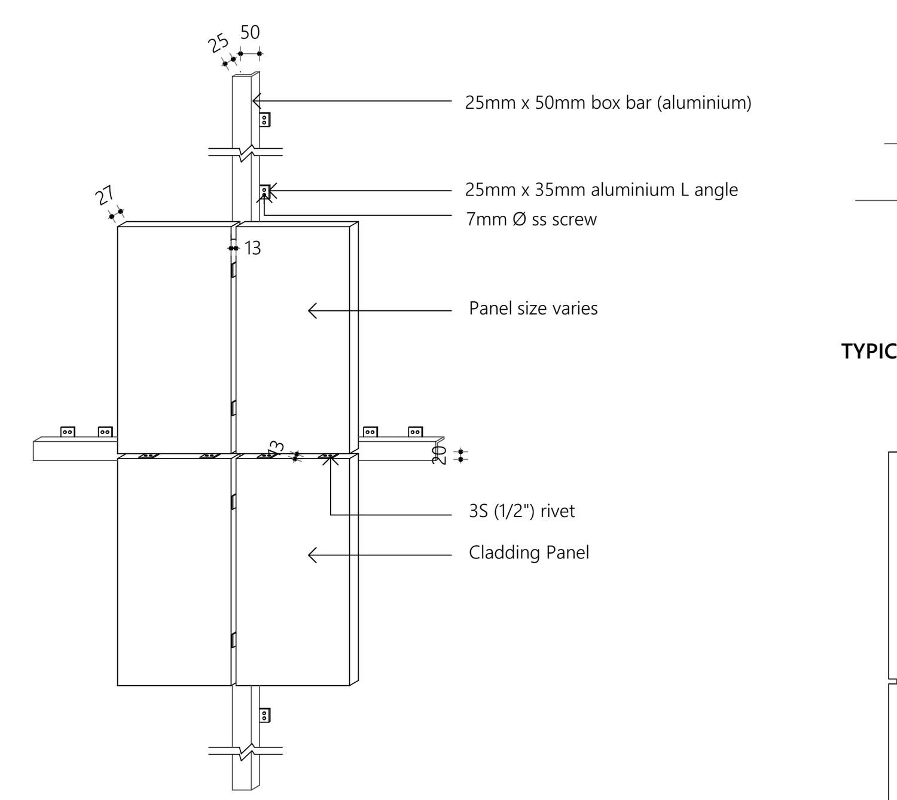


Boundary Wall Detail
1:20

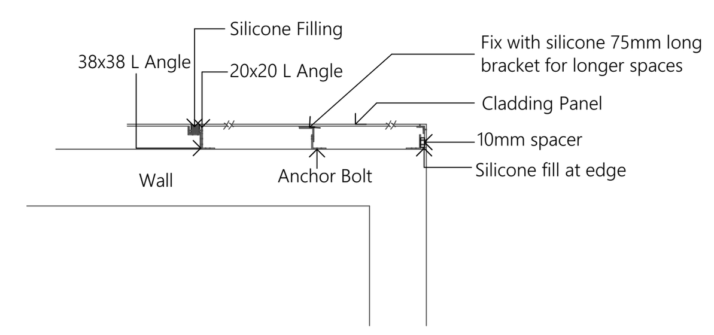


Detail
1:20

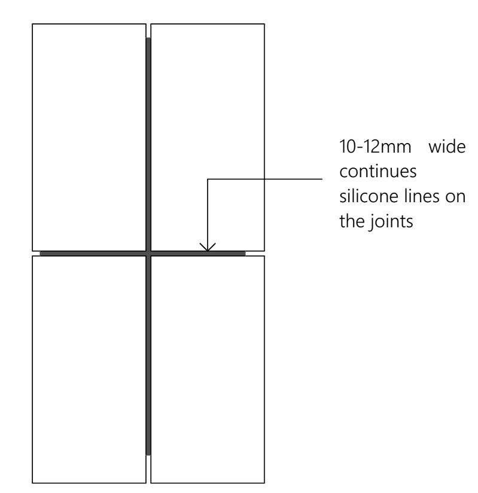




WALL CLADDING FIXING DETAIL



TYPICAL SECTION (including wall edge)



Cladding Detail
1:20

PROPOSED 03 STOREY BUILDING AT

South Regional Customs Head Office, Addu City, Maradhoo

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29/12/2020

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Rev: --- --- ---
Page: C.2.1

1. General notes

1.1. Do not scale the drawings. All dimensions shall be read from the drawing or computed. Elevations are in millimeters, distances and reinforcement bar sizes are in millimeters.

1.2. In the interpretation of these drawings, indicated dimensions shall govern and distances or sizes shall not be scaled for construction purposes.

1.3. The contractor shall coordinate with the ar, se, ee and other utility and equipment plans for the exact size, number and locations of all sleeves or openings through floor slabs, beams and walls. Any discrepancies or conflict in the setting out lines, levels, details, locations, sizes, reinforcement etc. Of the structural member shall be brought to the attention of the engineer prior to commencement of work.

1.4. All reinforced concrete work shall be done in accordance with the british structural code bs8110 or ec-en2 building code.

1.5. All structural steel work shall be done in accordance with the british structural code bs5950 parts 1to 9 and ec-en3 in so far as they do not conflict with the local building code requirements.

1.6. All slabs, beams and other structural elements which are not indicated, detailed, designated or inadvertently omitted but are necessary to be coordinated with architectural and other allied engineering plans as well as to complete the structural works in accordance with the intent of the plans and specifications shall be brought up during pre-bids/meetings/negotiations. It is understood that the contractor has provided and included all these items in his bid.

1.7. The contractor shall produce shop drawings and schedules as required for completion of the works and record drawings of the as-built and builder works for the consultant's approval.

1.8. Contractor shall do full coordination between structural, architectural and mep drawings in wet areas to allow for drainage pipes.

1.9. All discrepancies shall be brought to the attention of the consultant engineer proceeding with the work on site.

1.10. All materials to be used in conjunctions shall comply with the requirements of the specified codes, standards and ordinance of relevant building authorities unless noted otherwise in the project specification and/or drawings.

1.11. All dimensions and levels shown on the drawings shall be verified by the contractor. Any discrepancies shall be brought to consultant's attention prior to construction.

1.12. The contractor shall ensure that during construction, no part of the structure is overstressed by excessive construction loads until their completion. Temporary bracing and propping to be provided were required.

1.13. Once the excavation is done to a specified depth, the bearing capacity of the soil shall be confirmed by relevant test, if the value is less than the design bearing capacity the engineer is to be informed immediately.

1.14. The contractor shall submit a method statement for all elements of work and shall not proceed until consultant's written approval is given. The method statement shall provide the contractor's preferable options where such options are available.

1.15. The contractor shall comply with all requirements of the local regulations and requirements of all concerned authorities.

1.16. Quality of concrete finish for all non-plastered columns and beams is to be in accordance with - fair faced concrete as reflected on the architectural drawings and specifications.

1.17. Any structural requirements specified by relevant authorities, which are not covered in notes and specifications are assumed to be duly considered by the contractor.

1.18. All typical details and notes shown on drawings shall apply unless noted otherwise. Typical detail may not necessary be indicated on the plans but shall still apply as shown or described in the details where particular details are noted on the drawings the specified details shall be used.

1.19. The design life of the structure of this project shall maintain a minimum of 50 years life period. The primary structural components are to be designed and detailed to satisfy this requirement. Concrete mix supplier shall submit a life cycle analysis which reflect a 50 years design life without maintenance, inspection and repair requirement during this period.

2. Concrete

2.1. All concrete works shall conform to the bs8110 or ec-en, a grade of c25/30 indicates that concrete shall have a fcu compressive strength of 30n/mm2 established from test cubes at 28 days equivalent to a compressive strength of 25n/mm2 established from cylinder tests at 28 days.

concrete mix design shall comply with bs8500-1:2006 as follows:

Miz Number	1	2	3	4
Grade	C30/37	C25/30	C25/30	C16/30
Min cement content (kg/m³)	380	340	340	300
Cement Type	SRC	OPC	OPC	SRC
Max free W/C ratio	0.4	0.45	0.45	0.55
Slump	75 ± 25	75 ± 25	75 ± 25	100 ± 25
Aggregate	20	20	20	20

mix 1 - used in reinforced concrete works for structures at sea/exposed to sea, water retaining structures and tank structures.

mix 2 - used in reinforced concrete works for ground level and below (sub-structutre) or any reinforced concrete works in contact with soil or water.

mix 3 - used in reinforced concrete works above ground flr lvl (superstructure) for horizontal members (beams/slabs) and vertical members (columns/walls).

mix 4 - used for plain concrete blinding and mass fill.

2.2. Contractor shall implement a trial mix in accordance with the project specifications & authority requirements. Trial mix results shall be submitted for engineer's review & approval prior to commencing concreting.

2.3. Contractor shall submit the details of additives, plasticizers, micro silica, curing compounds, waterproofing agents, etc. Application should follow strictly the manufacturer recommendation. It is contractors responsibility to ensure that all constituents of concrete are compatible to each other.

2.4. Maximum percentage (by weight) of salt contents permissible in aggregates used for concrete, hollow blocks & hourdi blocks, etc, shall be as follows:

a) acid soluble chlorides in aggregate - (fine 0.03%, coarse 0.02%)

b) acid soluble sulphate in aggregate - (fine 0.3%, coarse 0.2%)

2.5. Concrete shall be cured by an approved means in accordance with the specifications.

2.6. Aggregates shall be from approved source and in accordance with the specifications.

2.7. Openings, sleeves:

a) no holes, sleeves or penetrations be placed vertically or horizontally through beams unless approved by the engineer.

b) no holes to be made in slabs unless approved by the engineer.

2.8. Construction joints:

a) the contractor shall submit to the engineer for approval a plan marked up showing the location of all construction joints

b) horizontal construction joints shall not be made in beams, unless approved by the consultant or engineers.

c) vertical construction joints may be located at midspan of slabs or beams after reviewed and approved by the engineers.

d) contractor shall submit shear friction and the additional required reinforcement calculation of construction joint at any location) for engineers review and approval.

3. Reinforcement

3.1. The reinforcement used in the reinforced concrete shall be round, deformed type 2 bars marked as (t) to indicate high yield strength of 460n/mm2 to bs4449 or type 500b to ec-en. The carbon equivalent of rebars should not exceed 0.51 for grade 460.

3.2. Reinforcement details shown are indicative. The contractor shall prepare detailed shop drawings & full bar schedules in accordance with the design drawings and shall be cut and bent in accordance with bs 8666 and aci 315-09 for the engineer's approval at least four weeks prior to commencement of reinforced concrete work and after coordinating with all concerned parties.

3.3. Lap lengths and anchorage lengths of reinforcement shall be as per bs 8110 and ec en. Additional lapping if required to be provided with engineer's approval. The minimum lap length of reinforcement shall be the maximum of (45 bar dia in general and 50 dia for tension) or the values of the table a.

Table a : schedule of lap splices

Bar dia	lap splices length (mm)
10	500
12	600
16	800
20	1000
25	1250

3.4. Spacer bars in beams shall be a minimum t25 or the size of bar if greater at 1000mm c/c; chairs in slabs shall be a minimum t12@1000mm c/c; and minimum ties in walls shall be t8@1000mm c/c.

3.5. Clear cover to reinforcement including links, stirrups, and ties shall be as follows:

A) structure in contact with ground
- Footings = 75mm
- Wall and column = 50mm
- Ground beam = 50mm
- Slab at ground level = 50mm

B) super structure
- Columns = 40mm
- Beams = 35mm
- Slabs = 30mm
- Walls = 40mm
- All concrete elements in contact with water/splash zone = 50mm

3.6. Reinforcement bars to be cut, bent or adjusted to clear all openings and interfering structures to suit at site to the approval of the consultant or engineer.

3.7. For holes in slabs up to 300x300 sq., reinforcement is to be cut and replacement bars fixed adjacent to the hole extending 50x bar diameter beyond the hole.

4. Fire resistance

4.1. All structural concrete members between units on boundaries are designed to maintain fire resistance of 2 hours.

5. Cracking

5.1. The cracking of the structural concrete in general is restricted to 0.30mm.

6. Earthwork & foundations

6.1. Foundation detail design is based on the assumed safe allowable bearing capacity has been taken as 150kpa. The actual requirement for the foundation design is to be verified based on final geotechnical report for the project.

6.2. Excavations for foundations down to formation level shall be carried out by mechanical means, except for the last 100mm of excavation which is to be carried out by manual methods and recommended by geotechnical consultant.

6.3. The formation level of foundation is to be inspected and approved by the geotechnical engineer before commencement of the work.

6.4. Engineering fill (unless specified otherwise as a higher quality material) shall be selected well graded granular material approved by the engineer with a minimum soaked cbr of 15% compacted not exceeding 250mm in layers to 95% maximum dry density as per geotechnical investigation report recommendations in accordance with the specification. However, a minimum cover of 250mm back fill material shall be provided at the top of foundations below the blinding to cast against.

6.5. Efficient site drainage during and after construction of the project should be provided by the contractor.

6.6. Site inspection by a qualified engineer should be carried out after completion of the excavation works and after preparation of the proposed foundation level to ensure that the contact surface is free from any loose/soft layer and properly prepared for the foundation.

7. Concrete workmanship

7.1. All concrete without plaster shall be fair finish unless noted otherwise.

7.2. All concrete surface to have plaster are to be hacked to have an adequate surface key.

7.3. All concrete is to be cured by an approved method-water pounding or curing compound.

7.4. All types of construction joints in concrete shall be at a specified locations and approved by the engineers.

7.5. All substructure concrete works shall be protected with water proofing as per standard details & specifications.

7.6. All concrete shall be compacted using a mechanical vibration process.

7.7. 25x25mm chamfers to external corners and edges shall be provided in accordance with specifications and directed by the engineer.

8. Structural steel

8.1. All structural steel works shall be in accordance with bs 5950 parts 1 to 9 or ec-en3.

8.2. Maximum dimension of holes shall be in accordance with bs 5950 : part 1 : 2000 table 35, unless indicated otherwise.

8.3. The contractor shall provide whatever temporary ties or bracing necessary for a safe and proper erection of the steel structures.

8.4. Welding shall comply with bs en 1011-1: 2009, bs en 1011-2 : 2001 and bs bs en 1011-8 : 2004.

8.5. Contractor shall do a detailed design for aluminum shades and to submit full design calculations and detailed shop drawings for all steel sections and connections to the engineer for approval prior to commencement of fabrication.

8.6. All rolled products and plates shall conform to bs en 10025-2. Cold form welded structural hollow sections shall conform to bs en 10219-1. Hot finish hollow sections shall conform to bs 10210-1 unless noted otherwise on drawings.

8.7. All connections shall be made with minimum 2nos. Galvanized grade 8.8 to bs 3692 with a minimum diameter of 20mm and minimum yield strength of 627mpa and minimum ultimate strength of 765mpa and electrodes to bsd 639, unless noted otherwise.

8.8. Unless noted otherwise on the drawings, all connections shall be in accordance with the following minimum requirements:

A) all welds shall be at least 6mm continuous fillet welds all around.

B) all structural bolted connections should be galvanized minimum 85 micron and with a minimum of 2 bolts per connection. Purlin bolts shall be in accordance with the suppliers recommendations.

C) all gusset plates shall be at least 4mm thick.

D) all cap plates shall be at least 4mm thick.

E) all base plates shall be at leat 4mm thick.

8.9. As minimum all structural steel members shall be shot blasted to sa 2.5, galvanized, primed & painted as below unless noted otherwise:

A) hot galvanization (dft 200micron)

B) primer coat to contain 2 coats of zinc rich epoxy primer (dftc75n)

C) top coat to contain 2 coats of polyurethane enamel paint (dft 125 micron)

8.10. All structural steel work shall be corrosion protected in accordance with the structural specifications.

8.11. All steel should conform to the following:

A) shs, rhs and chs sections bsen 10210 s275 fy=275mpa

B) all angles and channels u.n.o bsen 10025 s275 fy=275mpa

8.12. All steel columns to be central on grids or equally spaced between grids unless noted otherwise.

8.13. All steel beams to be central on grids or equally spaced between grids unless noted otherwise.

8.14. All steel dimensions are to center line of section unless noted otherwise.

8.15. All bracing is to be set out on the centroids of bracing members and on the center line of beams and columns unless noted otherwise.

8.16. Where bracing is shown offset from center of members the contractor shall design and provide all necessary stiffeners.

8.17. Contractor to provide all leader railing as required to support free edges not trimmed with cold formed or mild steel workTo be provided in accordance with architect's drawings .

8.18. Location of any connections, splices not shown in the drawings shall be submitted with design for engineer's approval. No splices shall be made unless shown in the drawings and as approved by the engineers.

8.19. Contractor shall do a full coordination between architecture and structural drawings for the steel support for shade elements, locations and sizing connections with structural concrete elements and sections. Care shall be taken to prevent dissimilar metal corrosion.

9. Masonry blocks

9.1. Design and construction of all blocks shall comply with bs 5628 : parts 1.2 & 3 : 1992 or en-ec6. The contractor shall submit a construction method statement prior to commencing the works.

9.2. Wall ties in accordance with bs 1248 - cp 121 part 1.73.

9.3. All block wall joints to manufacturers specifications.

9.4. All block work walls are to be considered as non-load bearing partitions unless noted otherwise in drawings.

9.5. Block walls shall be reinforced horizontally and vertically as per manufacturers requirements.

9.6. Masonry wall mechanical properties
- young's modulus = 3.5e+006 kn/m2
- poisson's ratio = 0.25
- density = 20kn/m3
- min.compressive strength= 3.5 mpa

10. Design & loading

10.1. Consultant design

design and construction of reinforced concrete structural members, shall be in accordance with bs8110 & ec-en2 and the structural steel members to bs 5950 & ec-en3.

10.2. Contractor design

the contractor is responsible for the design of all temporary works. (shoring for excavation, signage... Etc) and the following items of permanent secondary works. (subjected to engineers review and approval)

a) precast concrete elements

b) architectural facade and support steelwork

c) non load bearing feature columns

d) all secondary steel works

e) structural steelwork connections

f) structural support for mep services

g) shade structures

h) balustrade and crash barrier

i) structural glass

j) interior signage

the design of the primary structure is considering the interfaces with these structures) loading reactions, opening...etc.) And were detailed to accommodate these elements into the design.

the contractor shall submit a full detail design for the wall and boundary wall foundation, also the contractor to do

full coordination between the structural foundation for villas (including the water tanks, and the boundary wall for clashes, the contractor shall produce shop drawings for

the boundary walls for engineer's approval.

10.3. Loading

a) superimposed (dead loads & live loads) as per bs 6399 or en-ec1.

b) self-weight & densities as per bs 648 or en-ec1.

c) wind loads as per bs 6399 or en-ec1 (mean wind speed = 25m/s).

11. Timber

11.1. All timbers shall be in accordance with bs 5268 or ec-en5

11.2. All timber members sizes are indicative. Contractor shall coordinate with supplier and submit detail designs for all prefab timber structure for approval.

Notes:

1. First stirrups location shall be s/2 from the face of the column/ support.

2. Place one b bar in each bottom corner and one t bar in each top corner of the stirrup cage.

3. Condition shown is at columns. Where beams and girder intersect, use typical interior girder section.

4. All bottom bars and top bars shall be placed in one layer unless two layers are noted in the beam schedule. Where to layers are noted provide 25 mm clear between layers. If two layers are noted place bar b1 above bar b and bar t above t1.

5. Length of exterior top bars are given only when straight bar occurs otherwise hooked bars are required.

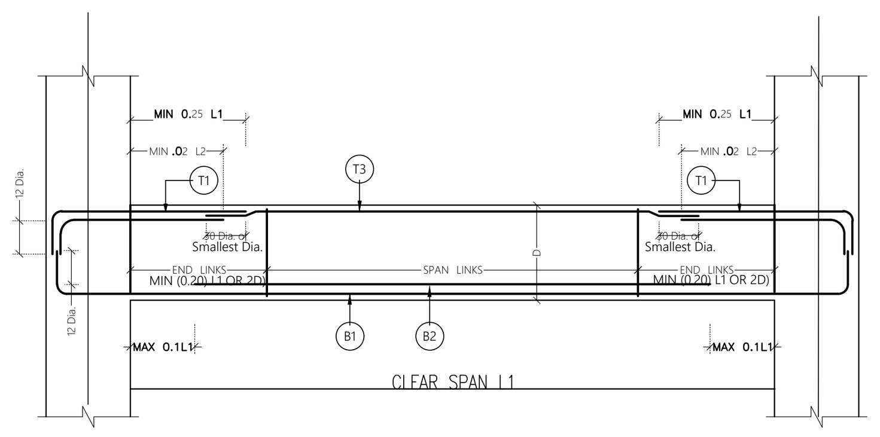
6. Where a member is supported by a column, but has another member running perpendicular to it at the same column, the first stirrup spacing shall start from the face of the column and not from the face of the transverse beam.

7. Top & bottom reinforcement lapping of both main rebars can be ignored if the main rebars at left and right side of lapping location are identical.

8. For 'column width less or equal 2m l*="column width'/2. For 'column width' greater than 2m, l*=1m

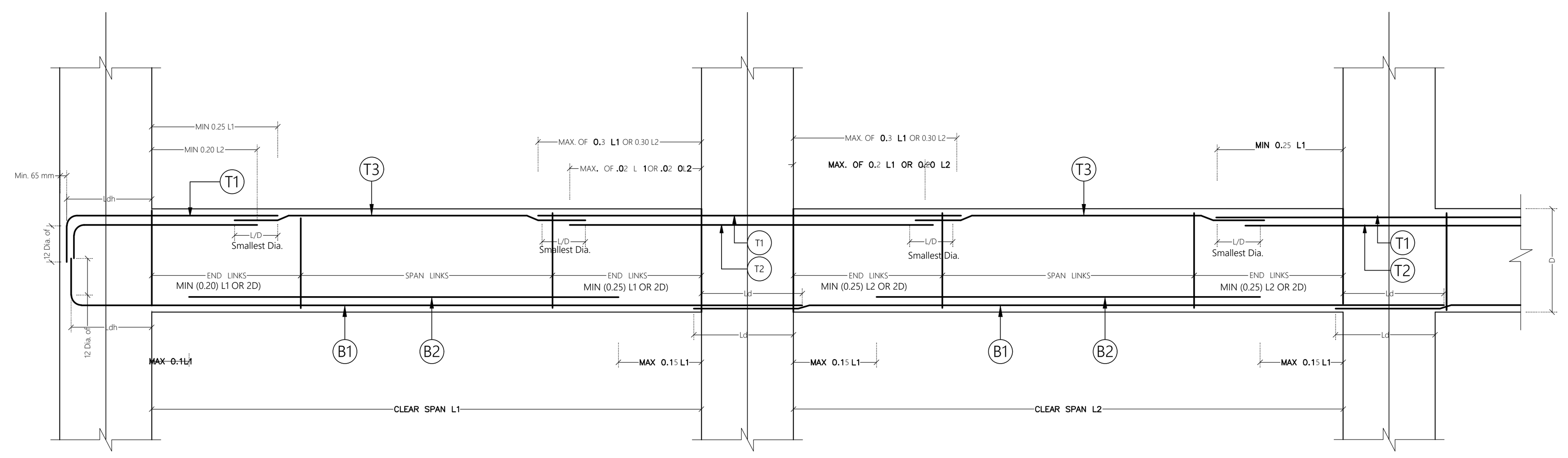
Supplementary abbreviations:

B1 - continuous bottom bars.
B2 - additional bottom bars
CE - cantilevered end
D - depth of member, mm
EE - each end
EF - each face
FL - full length
EW - each way
H - aci standard hook
ITB - interior top bar
LE - left end
LG - length
P - paired stirrups
RE - right end
REM - remainder
S - side bars
T1 - top bars at internal supports
T2 - top bars at mid-span
T3 - top bars at end support
W - width of member, mm



SIMPLE BEAM DETAILS

NTS



CONTINUOUS BEAM DETAILS

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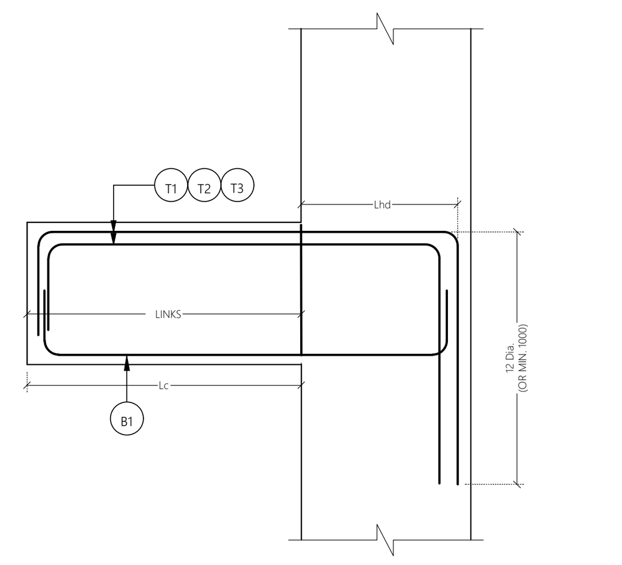
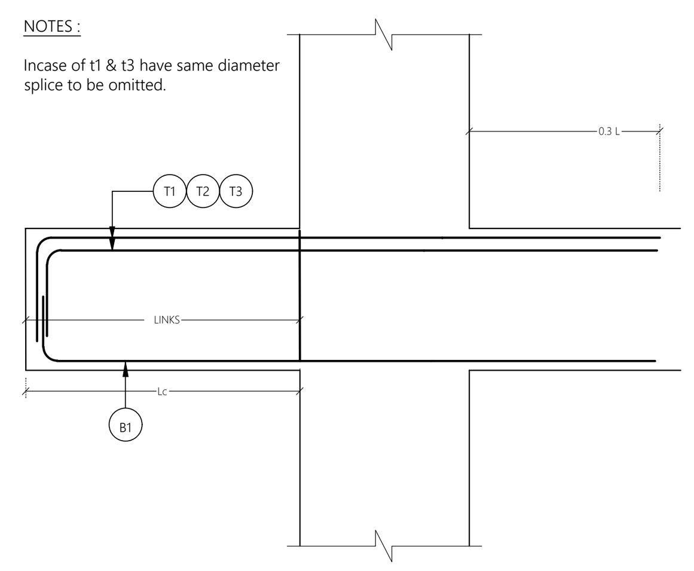


TYPICAL CANTELEVER BEAM FROM COLUMN

NTS

NOTES :

Incase of t1 & t3 have same diameter splice to be omitted.



TYPICAL CANTELEVER BEAM CONTINUOUS

NTS

Structural Notes
1:100

Structural Notes
1:100

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Rev:

Page:
C.2.2