

ARCHITECTURAL & STRUCTURAL DRAWINGS OF

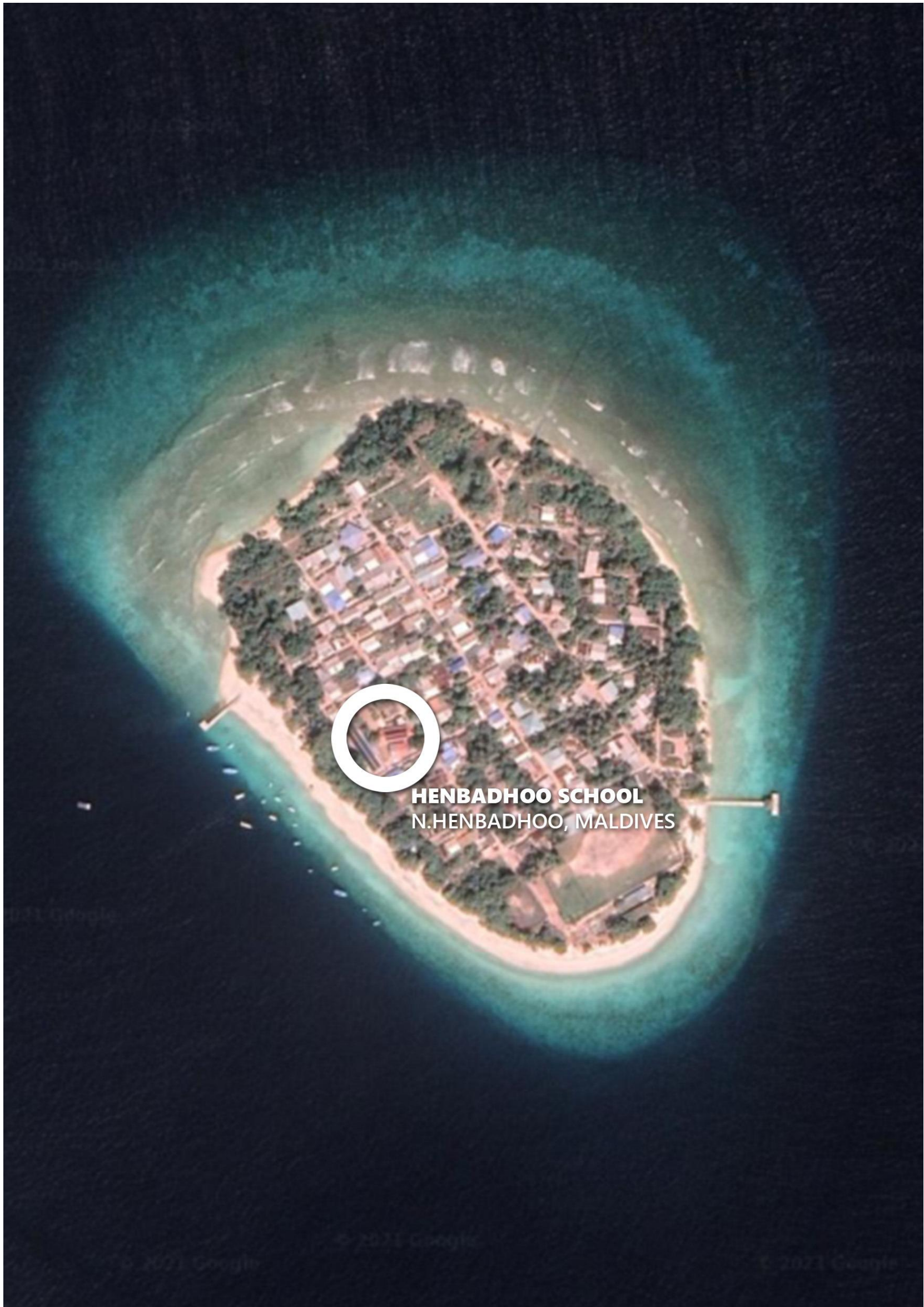
PROPOSED 03 STOREY BUILDING

**N.Henbadhoo School,**

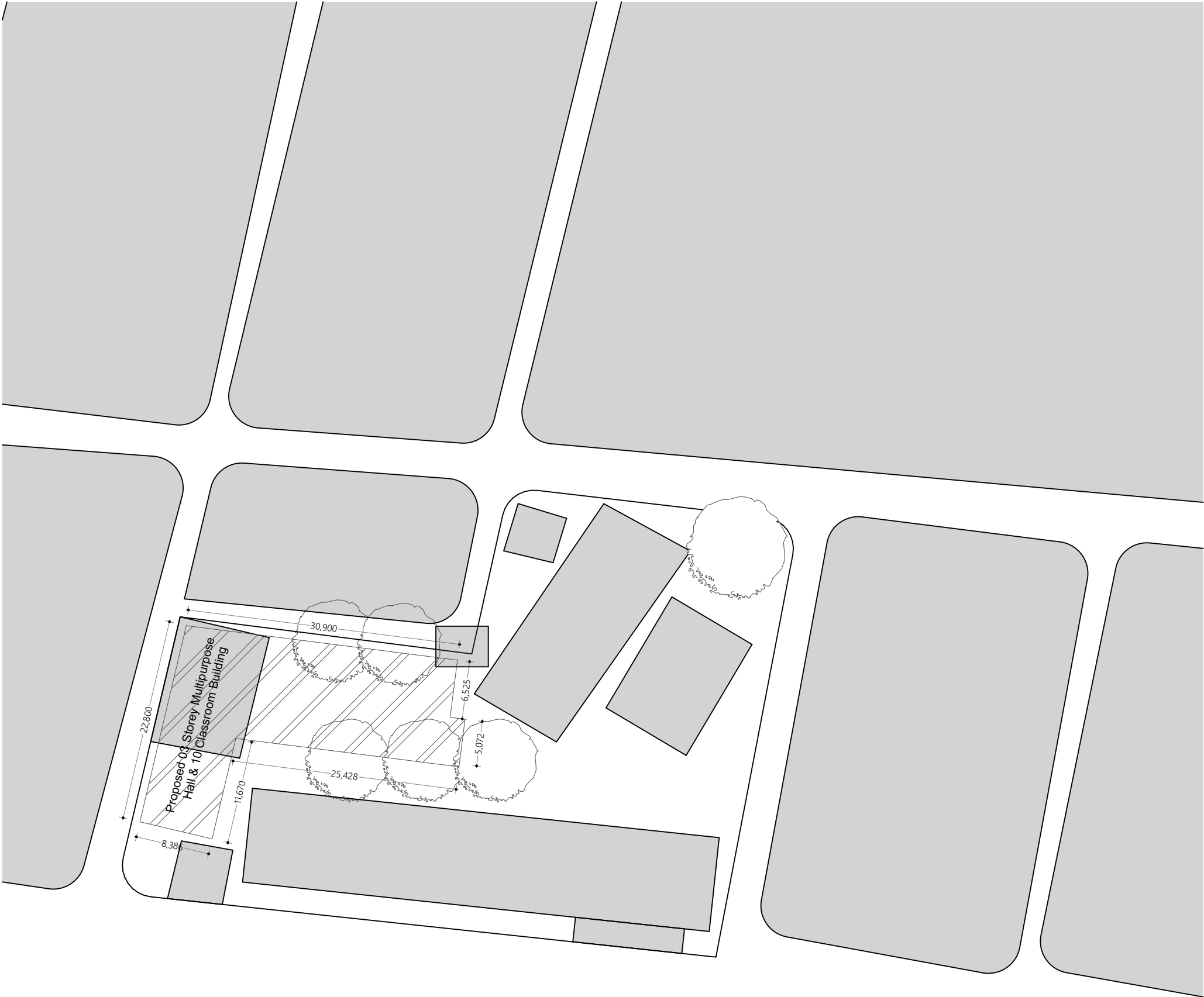
**Multipurpose Hall and**

**10 Classroom**

For Ministry of Education, Maldives



Location Plan  
1:67.68



Site Plan  
1:500

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo School, Multipurpose Hall and 10 Classroom**

Client: Ministry of Education, Maldives

Page Name: Site Plan

4/29/2021

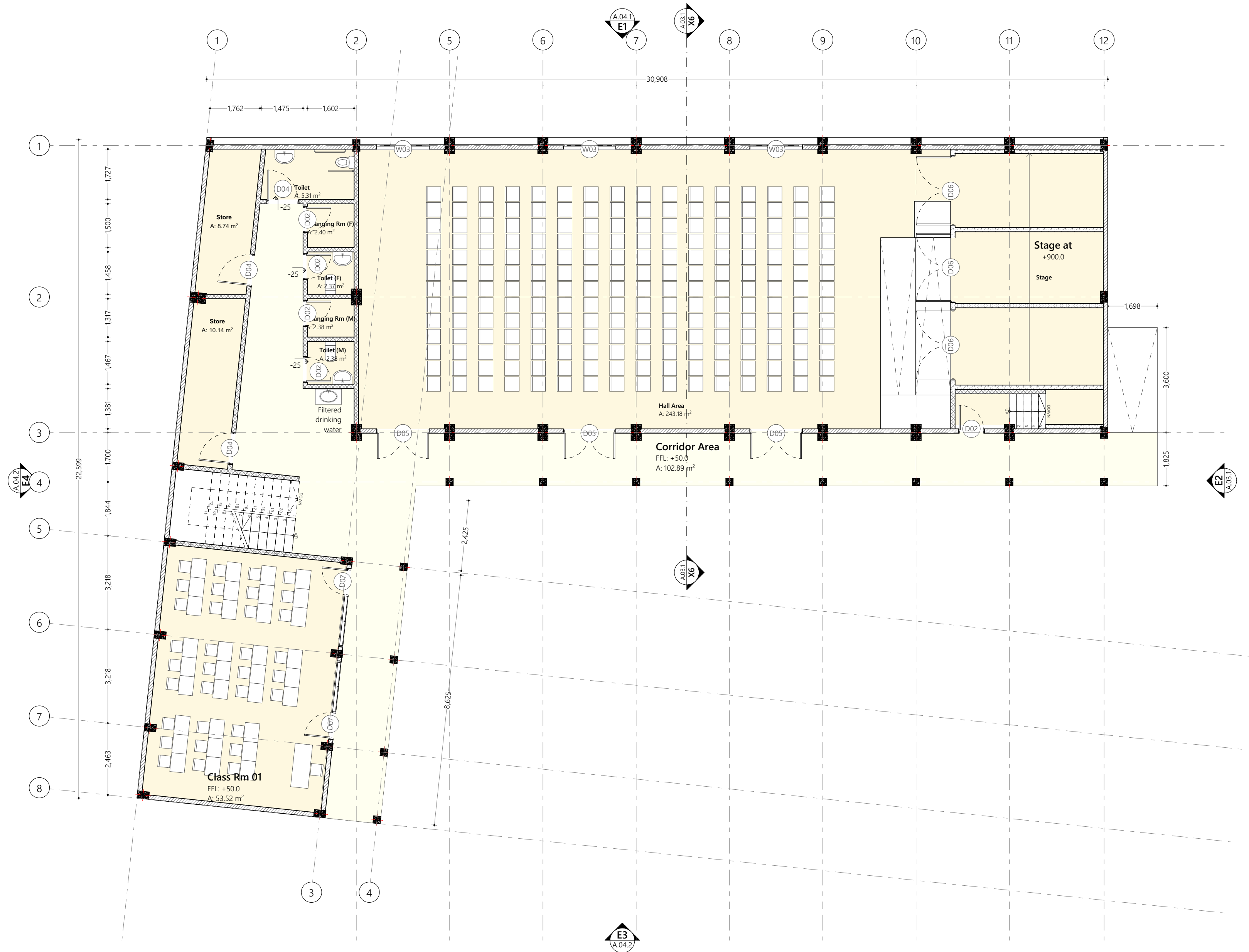
Architect: Mohamed Hassan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadriyya Atzal

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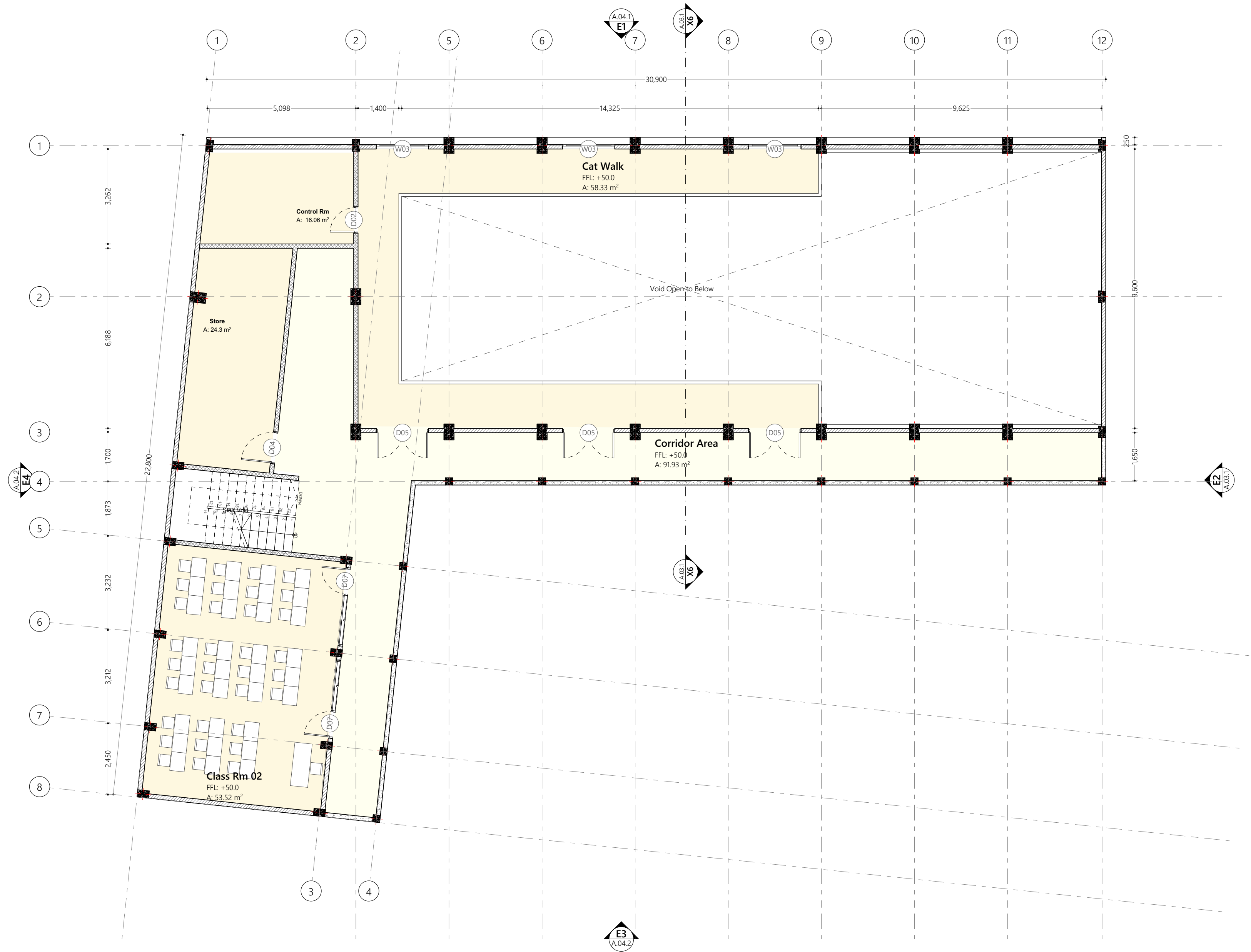




Ground Floor Plan  
1:100

Wall Legend	
2D Plan View	Description
	100mm thick solid masonry block exterior wall with 25mm plaster on exterior and 16mm plaster on interior finished with smoothed putty and semi gloss white paint
	100mm thick solid masonry block interior wall with 16mm plaster on both sides finished with smoothed putty and semi gloss white paint
	1200mm high 100mm thick concrete balcony wall as per structural detail
	75mm thick solid masonry block interior wall with 16mm plaster on both sides finished with smoothed putty and semi gloss white paint

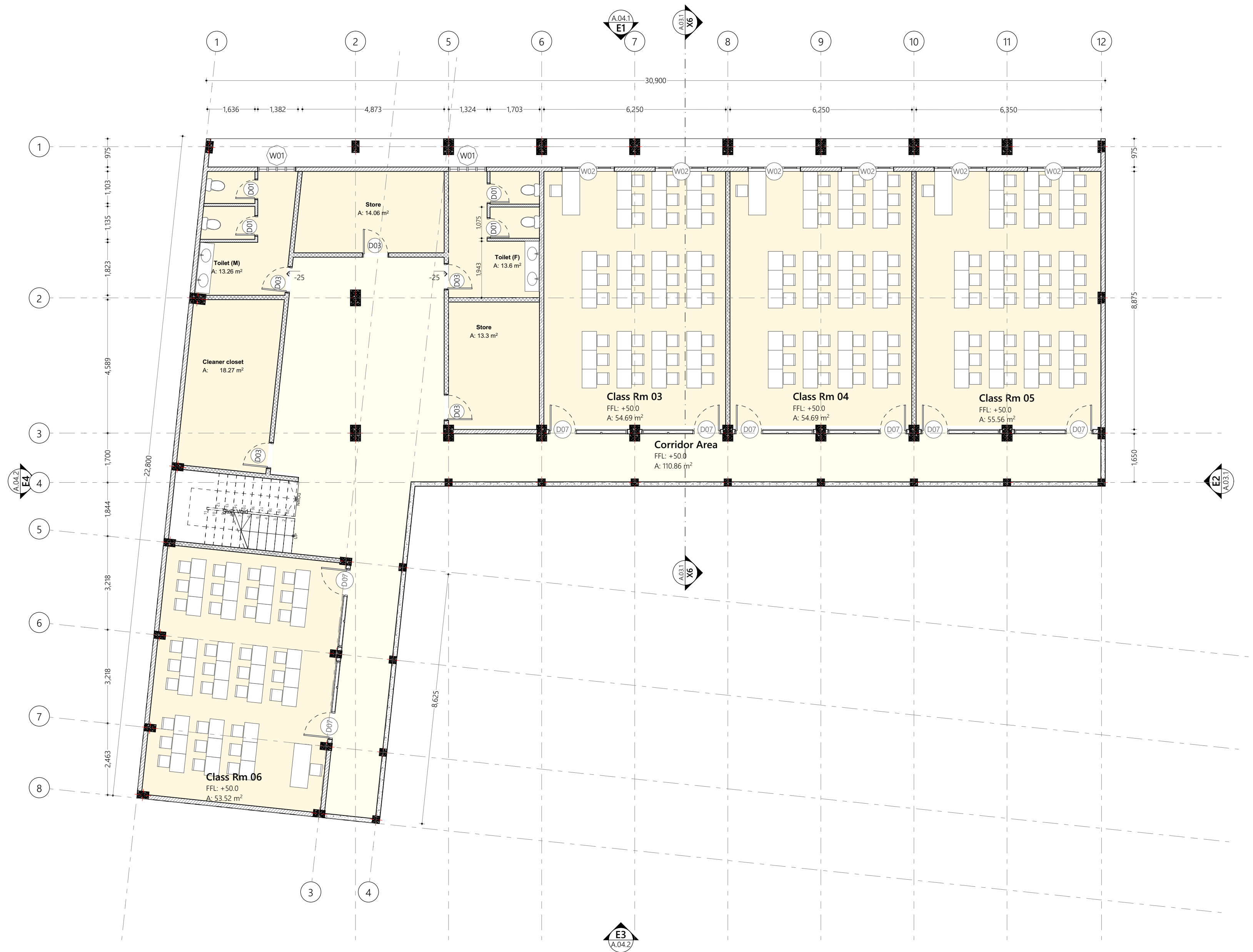
Zone schedule						
Home Story	Zone Name	Area (sqm)	Floor Level	Floor Finishes	Ceiling Level	Wall Finishes
Ground Floor	Changing Rm (F)	2.40	+350	300 X 300mm Homogenous non-slip tiles over 50mm screed		Exposed slab soffit to be finished with ground smooth finish in selected paint
	Changing Rm (M)	2.38	+350	300 X 300mm Homogenous non-slip tiles over 50mm screed		Exposed slab soffit to be finished with ground smooth finish in selected paint
	Class Rm 01	53.52	+350	600x600mm homogenous floor tiles on top of 50mm thick screed		Exposed slab soffit to be finished with ground smooth finish in selected paint
	Corridor Area	102.89	+335	300mm X 300mm ceramic non-skid tiles on 35mm screed		Exposed slab soffit to be finished with ground smooth finish in selected paint
	Hall Area	243.18	+350	Suspended acoustic ceiling system with aluminium framing	+7300	Exposed slab soffit to be finished with ground smooth finish in selected paint
	Store	18.88	+350	600x600mm homogenous floor tiles on top of 50mm thick screed		Slab Soffit ( no ceiling required)
	Toilet	5.31	+310	300 X 300mm Homogenous non-slip tiles over 50mm screed		Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Toilet (F)	2.37	+310	300 X 300mm Homogenous non-slip tiles over 50mm screed		Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Toilet (M)	2.38	+310	300 X 300mm Homogenous non-slip tiles over 50mm screed		Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint



First Floor Plan  
1:100

Wall Legend	
2D Plan View	Description
	100mm thick solid masonry block exterior wall with 25mm plaster on exterior and 16mm plaster on interior finished with smoothed putty and semi gloss white paint
	100mm thick solid masonry block interior wall with 16mm plaster on both sides finished with smoothed putty and semi gloss white paint
	1200mm high 100mm thick concrete balcony wall as per structural detail
	75mm thick solid masonry block interior wall with 16mm plaster on both sides finished with smoothed putty and semi gloss white paint

IES-03 Zone schedule 2							
Home Story	Zone Name	Area (sqm)	Floor Level	Floor Finishes	Ceiling Level	Ceiling Finishes	Wall Finishes
First Floor							
	Cat Walk	58.33	+3850	Self leveling cement floor screed with epoxy floor paint finish	+7300	Exposed slab soffit to be finished with ground smooth finish in selected paint	16mm thick Wall Plaster finished with ground smooth and paint of selected color
	Class Rm 02	53.52	+3850	600x600mm homogenous floor tiles on top of 50mm thick screed	+7150	Exposed slab soffit to be finished with ground smooth finish in selected paint	16mm thick Wall Plaster finished with ground smooth and paint of selected color
	Control Rm	16.06	+3850	600x600mm homogenous floor tiles on top of 50mm thick screed		Exposed slab soffit to be finished with ground smooth finish in selected paint	16mm thick Wall Plaster finished with ground smooth and paint of selected color
	Corridor Area	91.93	+3835	600x600mm homogenous floor tiles on top of 50mm thick screed		Exposed slab soffit to be finished with ground smooth finish in selected paint	16mm thick Wall Plaster finished with ground smooth and paint of selected color
	Store	24.30	+3850	600x600mm homogenous floor tiles on top of 50mm thick screed		Exposed slab soffit to be finished with ground smooth finish in selected paint	16mm thick Wall Plaster finished with ground smooth and paint of selected color



Second Floor Plan  
1:100

Wall Legend	
2D Plan View	Description
	100mm thick solid masonry block exterior wall with 25mm plaster on exterior and 16mm plaster on interior finished with smoothed putty and semi gloss white paint
	100mm thick solid masonry block interior wall with 16mm plaster on both sides finished with smoothed putty and semi gloss white paint
	1200mm high 100mm thick concrete balcony wall as per structural detail
	75mm thick solid masonry block interior wall with 16mm plaster on both sides finished with smoothed putty and semi gloss white paint

IES-03 Zone schedule 3						
Home Story	Zone Name	Area (sqm)	Floor Level	Floor Finishes	Ceiling Level	Ceiling Finishes
Second Floor						
	Class Rm 03	54.69	+7350	600x600mm homogenous floor tiles on top of 50mm thick screed	+10150	Exposed slab soffit to be finished with ground smooth finish in selected paint
	Class Rm 04	54.69	+7350	600x600mm homogenous floor tiles on top of 50mm thick screed	+10150	Exposed slab soffit to be finished with ground smooth finish in selected paint
	Class Rm 05	55.56	+7350	600x600mm homogenous floor tiles on top of 50mm thick screed	+10150	Exposed slab soffit to be finished with ground smooth finish in selected paint
	Class Rm 06	53.52	+7350	600x600mm homogenous floor tiles on top of 50mm thick screed	+10150	Exposed slab soffit to be finished with ground smooth finish in selected paint
	Cleaner closet	18.27	+7350	600x600mm homogenous floor tiles on top of 50mm thick screed	+10150	Exposed slab soffit to be finished with ground smooth finish in selected paint
	Corridor Area	110.86	+7335	600x600mm homogenous floor tiles on top of 50mm thick screed	+10150	Exposed slab soffit to be finished with ground smooth finish in selected paint
	Store	27.36	+7350	600x600mm homogenous floor tiles on top of 50mm thick screed	+10150	Exposed slab soffit to be finished with ground smooth finish in selected paint
	Toilet (F)	13.60	+7310	300 X 300mm Homogenous non-slip tiles over 50mm screeding	+9700	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Toilet (M)	13.26	+7310	300 X 300mm Homogenous non-slip tiles over 50mm screeding	+9700	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom**

Client:  
Ministry of Education,  
Maldives

Page Name:  
Second Floor Plan

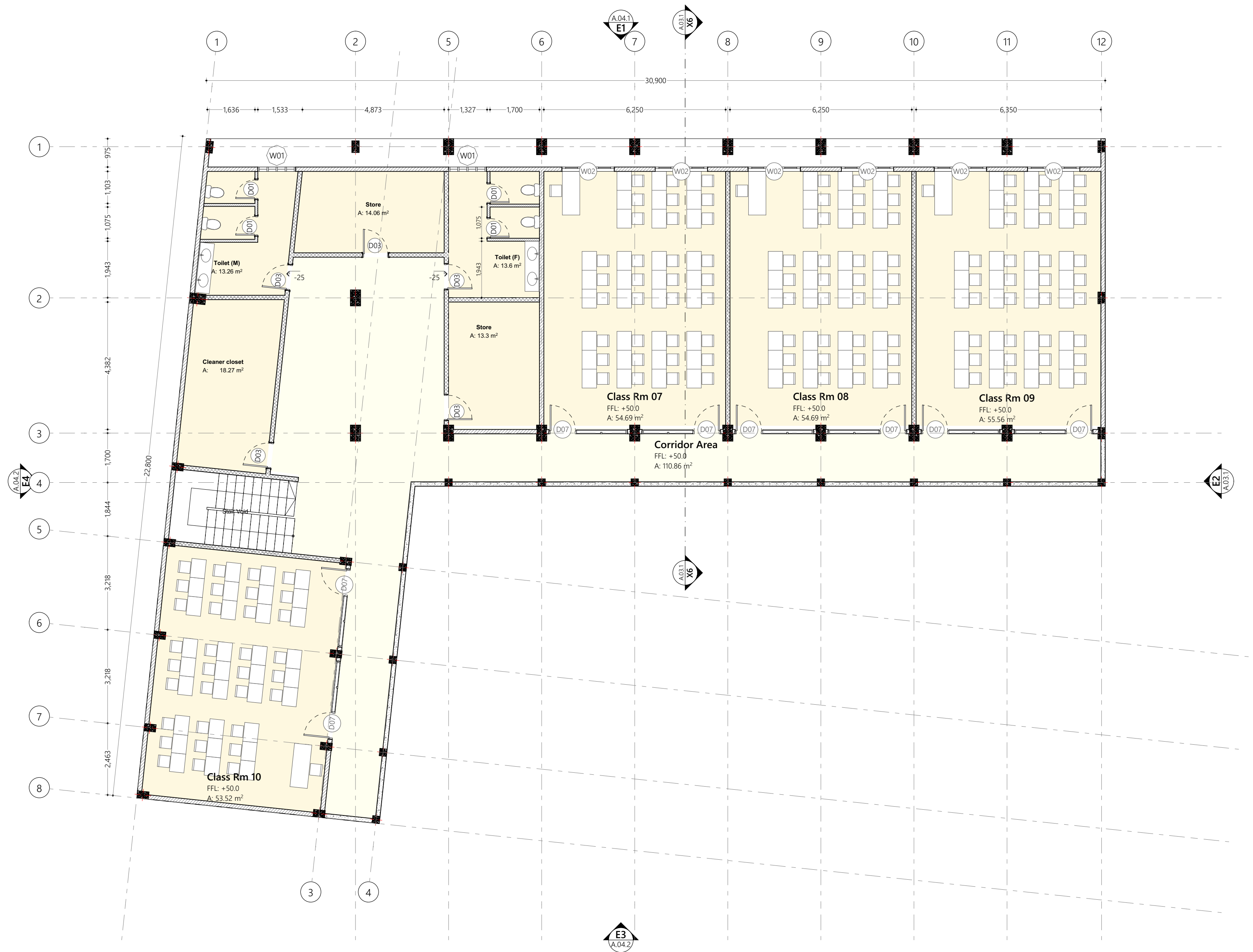
4/29/2021

Architect: Mohamed Hassan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadhin Alzai

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A.02.3



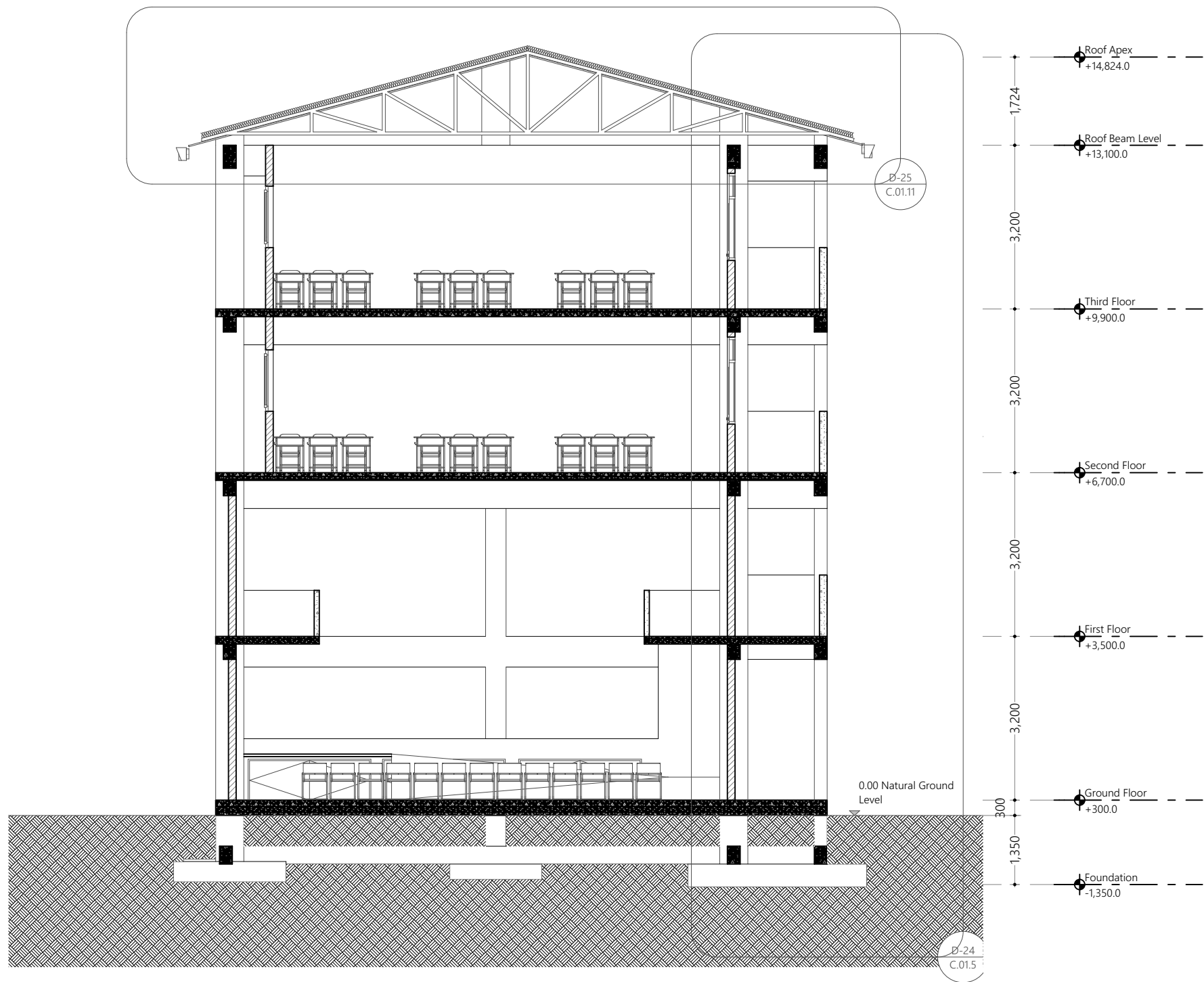


Third Floor  
1:100

Wall Legend	
2D Plan View	Description
	100mm thick solid masonry block exterior wall with 25mm plaster on exterior and 16mm plaster on interior finished with smoothed putty and semi gloss white paint
	100mm thick solid masonry block interior wall with 16mm plaster on both sides finished with smoothed putty and semi gloss white paint
	1200mm high 100mm thick concrete balcony wall as per structural detail
	75mm thick solid masonry block interior wall with 16mm plaster on both sides finished with smoothed putty and semi gloss white paint

IES-03 Zone schedule 4						
Home Story	Zone Name	Area (sqm)	Floor Level	Floor Finishes	Ceiling Level	Wall Finishes
Third Floor						
	Class Rm 07	54.69	+10350	600x600mm homogenous floor tiles on top of 50mm thick screed	+12850	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Class Rm 08	54.69	+10350	600x600mm homogenous floor tiles on top of 50mm thick screed	+12850	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Class Rm 09	55.56	+10350	600x600mm homogenous floor tiles on top of 50mm thick screed	+12850	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Class Rm 10	53.52	+10350	600x600mm homogenous floor tiles on top of 50mm thick screed	+12850	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Cleaner closet	18.27	+10350	600x600mm homogenous floor tiles on top of 50mm thick screed	+12850	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Corridor Area	110.86	+10335	300 X 300mm Homogenous non-slip tiles over 50mm screed	+12850	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Store	27.36	+10350	600x600mm homogenous floor tiles on top of 50mm thick screed	+12850	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Toilet (F)	13.60	+10310	300 X 300mm Homogenous non-slip tiles over 50mm screeding	+12700	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint
	Toilet (M)	13.26	+10310	300 X 300mm Homogenous non-slip tiles over 50mm screeding	+12700	Cementboard ceiling fixed to timber frames, with ground smooth finish in selected paint





Building Section  
1:100

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom**

Client:  
**Ministry of Education,  
Maldives**

Page Name:  
**Section 1**

4/29/2021

Architect: Mohamed Hassan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadiney Atzal

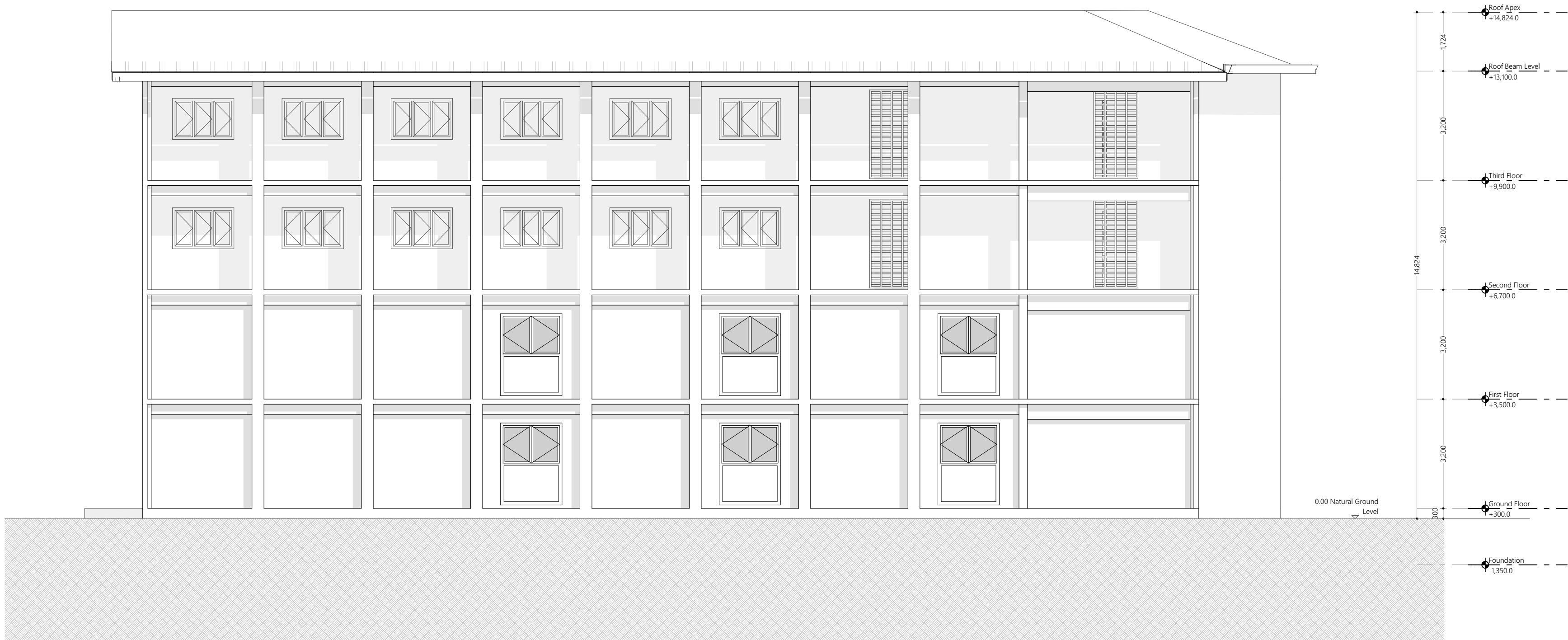


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Rev: Page:  
A.03.1





Elevation E1  
1:100

Elevation E2  
1:100

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom**

Client:  
Ministry of Education,  
Maldives

Page Name:  
Elevation 1 & 2

4/29/2021

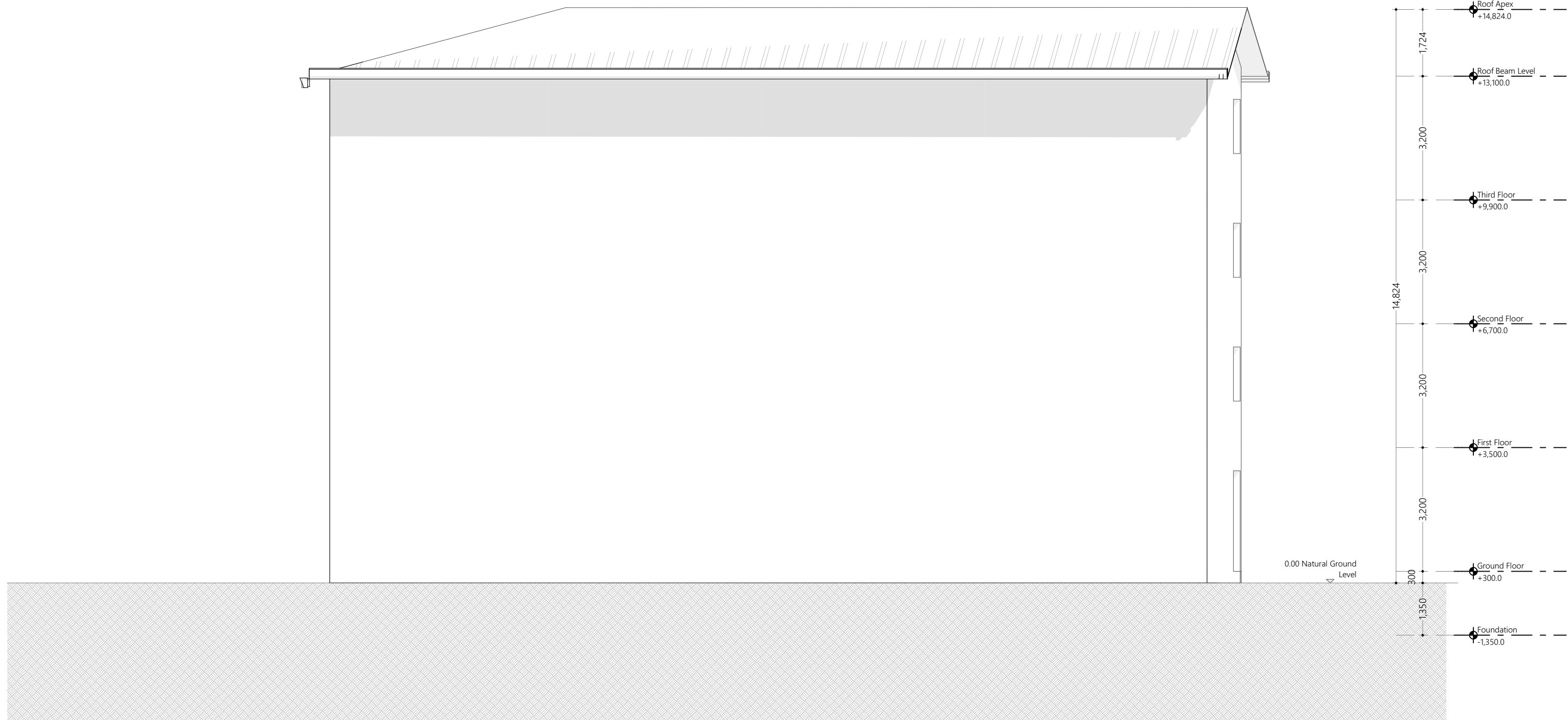
Architect: Mohamed Hassan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadrithy Atzal



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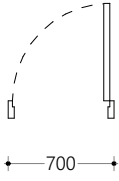
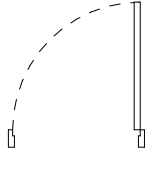
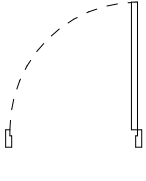
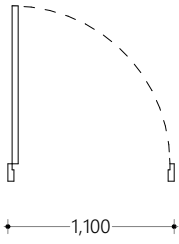
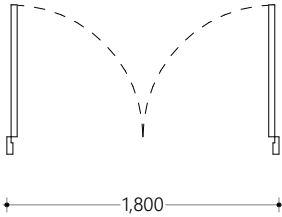
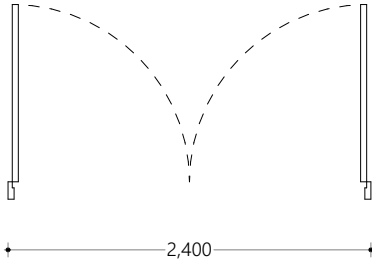
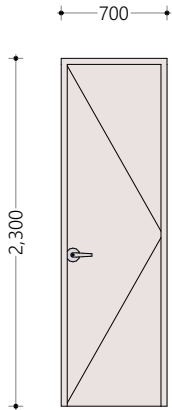
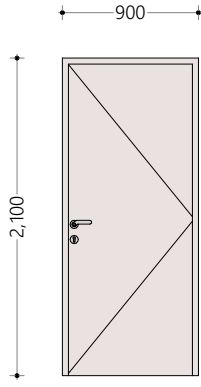
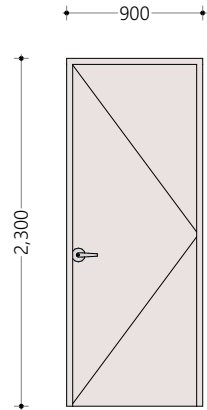
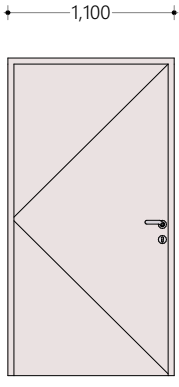
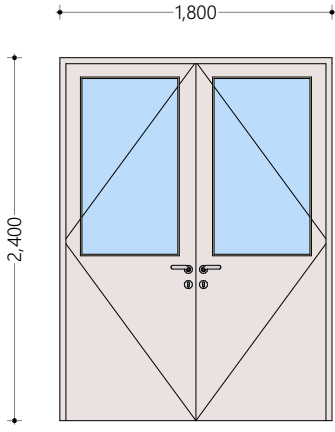
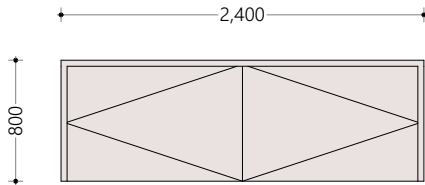
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A.04.1



Elevation E3  
1:100

Elevation E4  
1:100

All Openings Schedule						
Element ID	D01	D02	D03	D04	D05	D06
Quantity	8	6	10	4	6	3
W x H Size	700×2,300	900×2,100	900×2,300	1,100×2,100	1,800×2,400	2,400×800
W/D Nominal Sill Height	0	50	0	50	50	0
W/D Nominal Head Height	2,300	2,150	2,300	2,150	2,450	800
2D Symbol						
View from Side Opposite to Opening Side						
Frame	50mm Thick powder coated (60 microns) Aluminum frame of selected colour	50mm Thick powder coated (60 microns) Aluminum frame of selected colour	50mm Thick powder coated (60 microns) Aluminum frame of selected colour	50mm Thick powder coated (60 microns) Aluminum frame of selected colour	50mm Thick powder coated (60 microns) Aluminum frame of selected colour	50mm Thick powder coated (60 microns) Aluminum frame of selected colour
Door Leaf	50mm Thick powder coated (60 microns) Aluminum panel of selected colour	50mm Thick powder coated (60 microns) Aluminum panel of selected colour	50mm Thick powder coated (60 microns) Aluminum panel of selected colour	50mm Thick powder coated (60 microns) Aluminum panel of selected colour	50mm Thick powder coated (60 microns) Aluminum panel of selected colour	50mm Thick powder coated (60 microns) Aluminum panel of selected colour
Window Sash	---	---	---	---	---	---
Glazing	(No Glazing)	(No Glazing)	(No Glazing)	(No Glazing)	Clear Glass	(No Glazing)

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 wodden components should be wood stained finish  
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

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 cylindrical with master key sets  
Door knobs shall be1000mm above FFL

All Openings Schedule  
1:1

PROPOSED 03 STOREY BUILDING AT

N.Henbadhoo School,  
Multipurpose Hall and 10 Classroom

Client:  
Ministry of Education,  
Maldives

Page Name:

All Opening Schedule

4/29/2021

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



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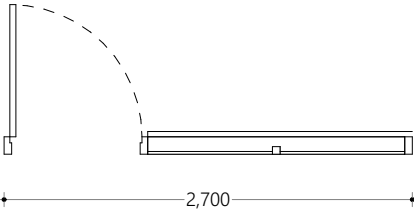
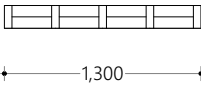
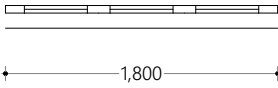
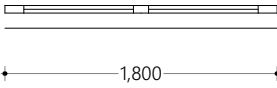
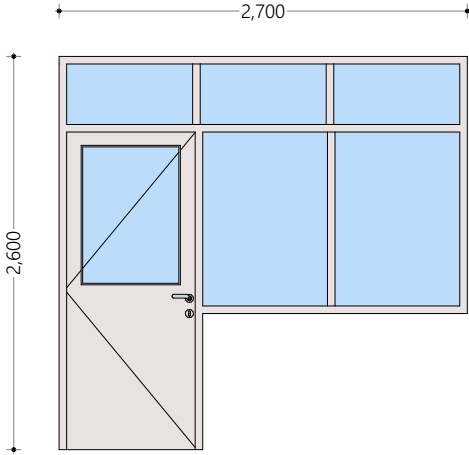
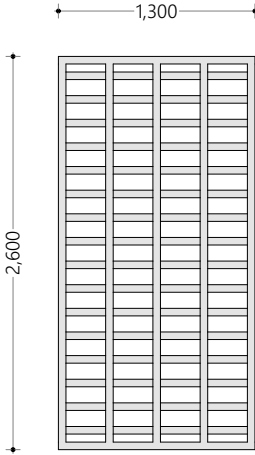
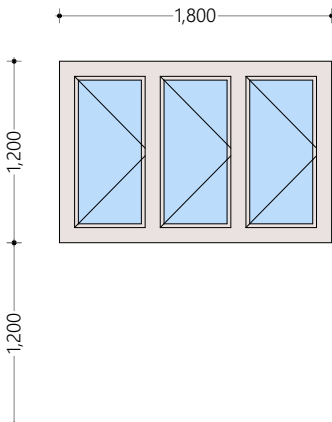
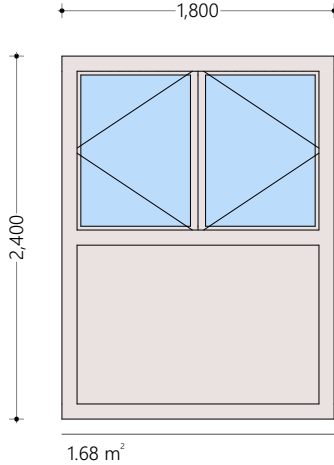
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A.04.3.1



All Openings Schedule				
Element ID	D07	W01	W02	W03
Quantity	20	4	12	6
W x H Size	2,700×2,600	1,300×2,600	1,800×1,200	1,800×2,400
W/D Nominal Sill Height	50	50	1,200	100
W/D Nominal Head Height	2,650	2,650	2,400	2,500
2D Symbol				
View from Side Opposite to Opening Side				
Frame	50mm Thick powder coated (60 microns) Aluminum frame of selected colour	Powder coated Aluminum (60 micron)	50mm Thick powder coated (60 microns) Aluminum frame of selected colour	50mm Thick powder coated (60 microns) Aluminum frame of selected colour
Door Leaf	50mm Thick powder coated (60 microns) Aluminum panel of selected colour	---	---	---
Window Sash	---	Powder coated Aluminum (60 micron)	50mm Thick powder coated (60 microns) Aluminum panel of selected colour	50mm Thick powder coated (60 microns) Aluminum panel of selected colour
Glazing	Clear Glass	---	Clear Glass	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 wodden components should be wood stained finish  
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

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 cylindrical with master key sets  
Door knobs shall be1000mm above FFL

All Openings Schedule  
1:1

PROPOSED 03 STOREY BUILDING AT

N.Henbadhoo School,  
Multipurpose Hall and 10 Classroom

Client: Ministry of Education, Maldives

Page Name:

All Opening Schedule

4/29/2021

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



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Rev:

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Page:

A.04.3.2

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 arse, 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 bs 8110 or ec-en2 building code

1.5. All structural steel work shall be done in accordance with the british structural code bs 5950 parts 1 to 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 asbuilt 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 consultants 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 where 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 reflects 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 BS 8110 or EC-EN, a grade of C25/30 indicates that concrete shall have a characteristic compressive strength of 30 N/mm<sup>2</sup> established from test cubes at 28 days equivalent to a compressive strength of 25 N/mm<sup>2</sup> established from cylinder tests at 28 days.

concrete mix design shall comply with BS 8500-1:2006 as follows:

Mix Number	1	2	3	4
Grade	C30/37	C25/30	C25/30	C16/20
Min cement content (kg/m <sup>3</sup> )	380	340	340	300
Cement Type	SRC	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-structure) or any reinforced concrete works in contact with soil or water.

mix 3 - used in reinforced concrete works above ground floor level (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 the contractor's 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 460 N/mm<sup>2</sup> to BS 4449 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 125 or the size of bar if greater at 1000 mm c/c; chairs in slabs shall be a minimum 125@1000 mm c/c; and minimum ties in walls shall be 10@1000 mm c/c.

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

- A) structure in contact with ground
- Footings = 60 mm
- Wall and column = 50 mm
- Ground beam = 50 mm
- Slab at ground level = 50 mm
- B) super structure
- Columns = 40 mm
- Beams = 35 mm
- Slabs = 30 mm
- Walls = 40 mm
- All concrete elements in contact with water/splash zone = 50 mm

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.

General Notes  
1:20

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 least 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 (dft 75 micron)  
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 work. To 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/m<sup>2</sup>  
poisson's ratio = 0.25  
density = 20kn/m<sup>3</sup>  
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

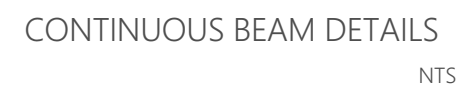
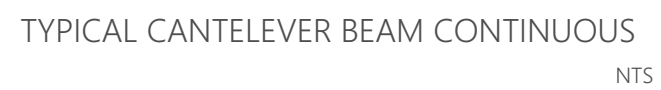
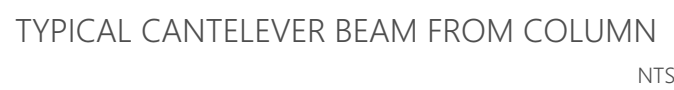
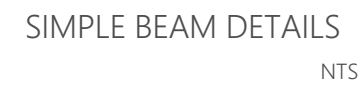
11.2. All timber members sizes are indicative. Contractor shall coordinate with supplier and submit detail designs for all prefab timber structure for approval.

General Notes  
1:100

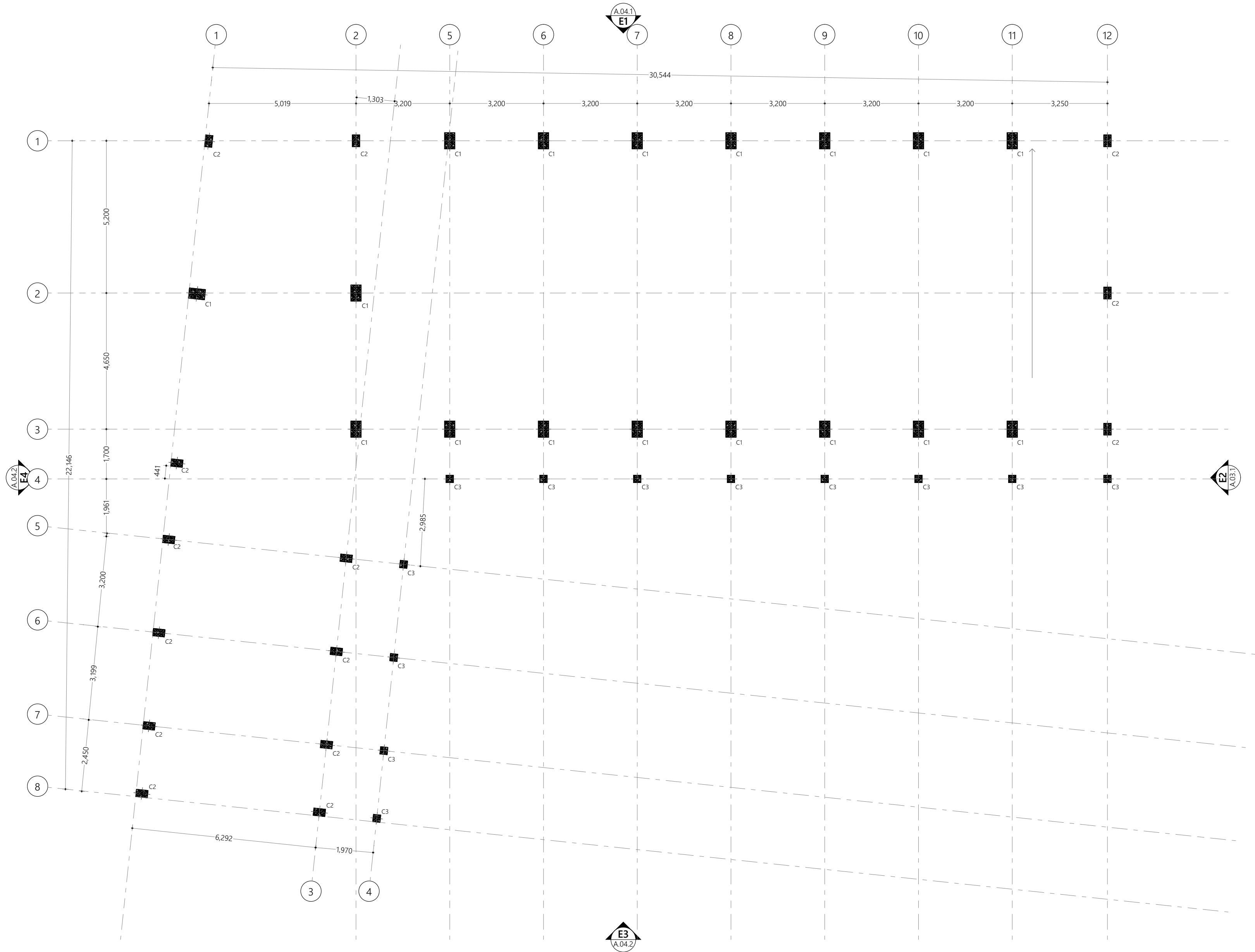


1. First stirrups location shall be  $\frac{y}{2}$  from the face of the column/ support
2. Place one b bar in each bottom corner and one t bar in each top corner of the stirrup cage.
3. Condition shown is at columns Where beams and girder intersect use typical interior girder section
4. All bottom bars and top bars shall be placed in one layer unless two layers are noted in the beam schedule Where to layers are noted provide  $25\text{ mm}$  clear between layers If two layers are noted place bar b<sub>1</sub> above bar b and bar t above b<sub>1</sub>.
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 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  $2m$ '  $l^* = \text{column width} / 2$ . For 'column width greater than  $2m$ '  $l^* = 1m$

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 supports  
W - width of member, mm



**General Notes**  
1:100



Column Layout  
1:100

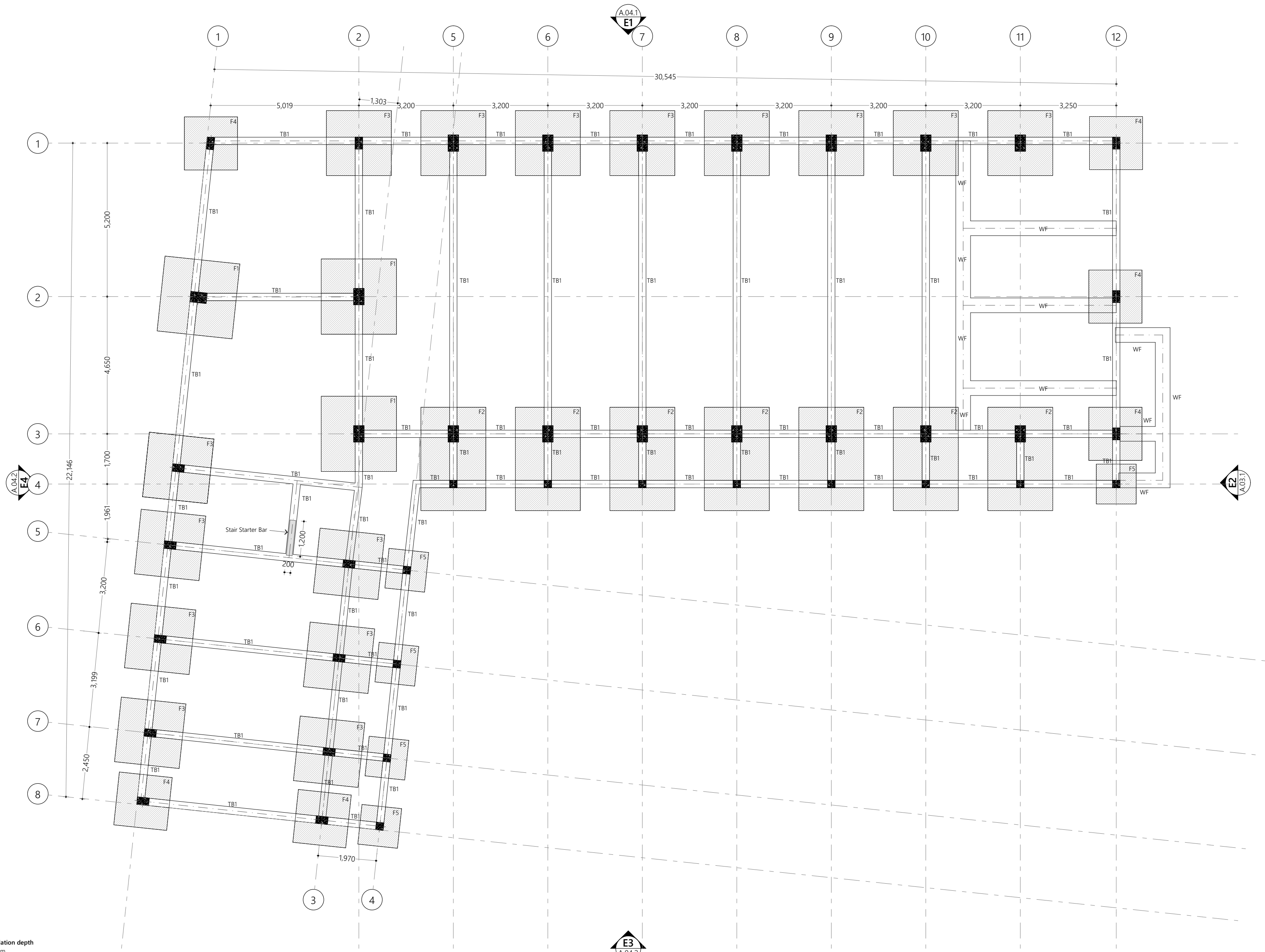
PROPOSED 03 STOREY BUILDING AT  
**N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom**  
Client:  
Ministry of Education,  
Maldives

Page Name:  
Column Layout

4/29/2021  
Architect: Mohamed Hassan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadriyya Atzal

  
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Foundation Details:

	Dimensions	Reinforcement	Foundation depth
F1	2550X2550X450	T12@100C/C B/W (B)	1350mm
F2	2200X3500X450	T16@75C/C B/W (T&B)	1350mm
F3	2200X2200X400	T12@125C/C B/W (B)	1300mm
F4	1800X1800X400	T12@150C/C B/W (B)	1300mm
F5	1350X1350X350	T12@150C/C B/W (B)	1250mm

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  
Add waterproofing admixture and apply waterproofing to all substructure (below ground elements)

Foundation  
1:100

PROPOSED 03 STOREY BUILDING AT

N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom

Client:  
Ministry of Education,  
Maldives

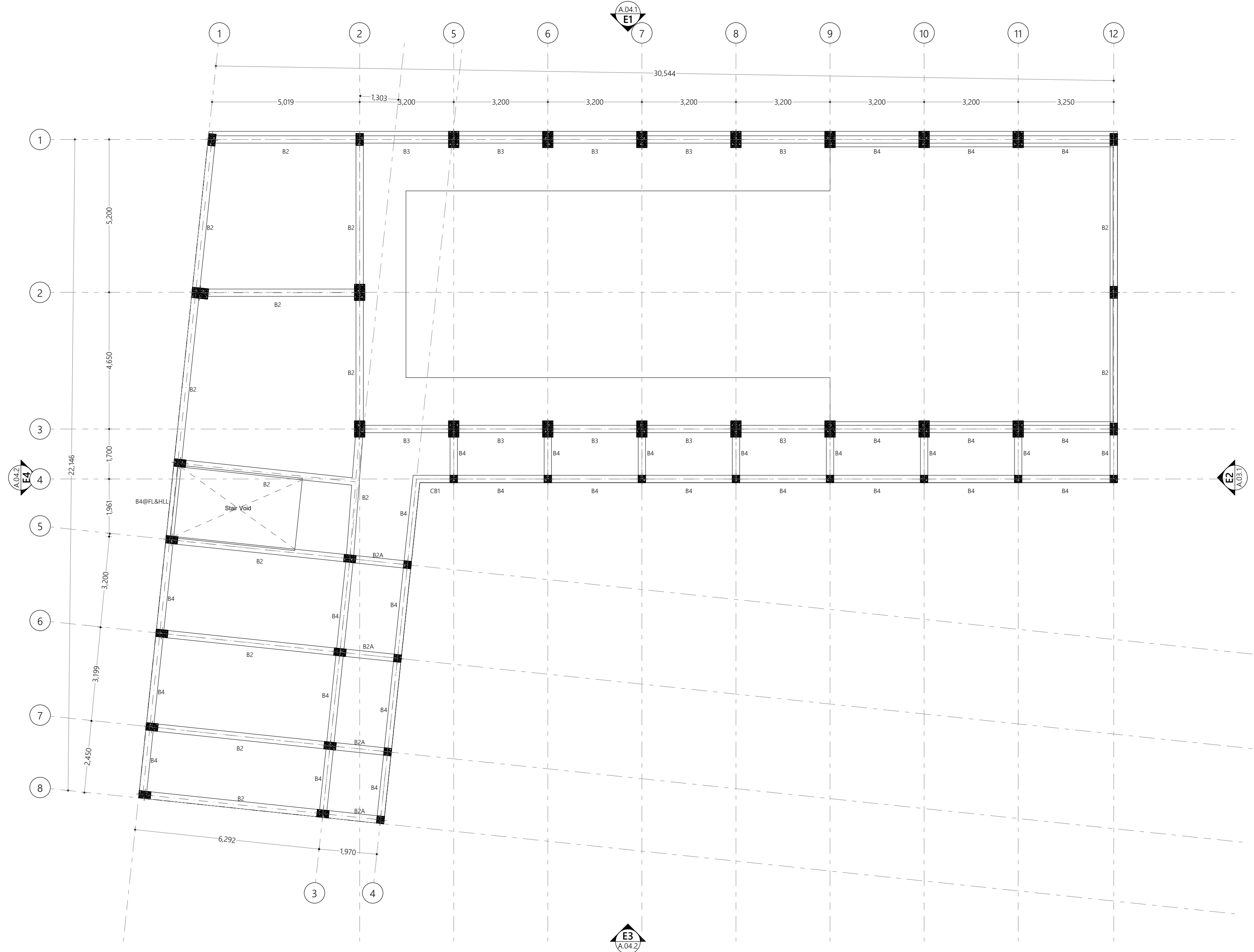
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Foundation Plan

4/29/2021  
Architect: Mohamed Hassan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadhny Atzal

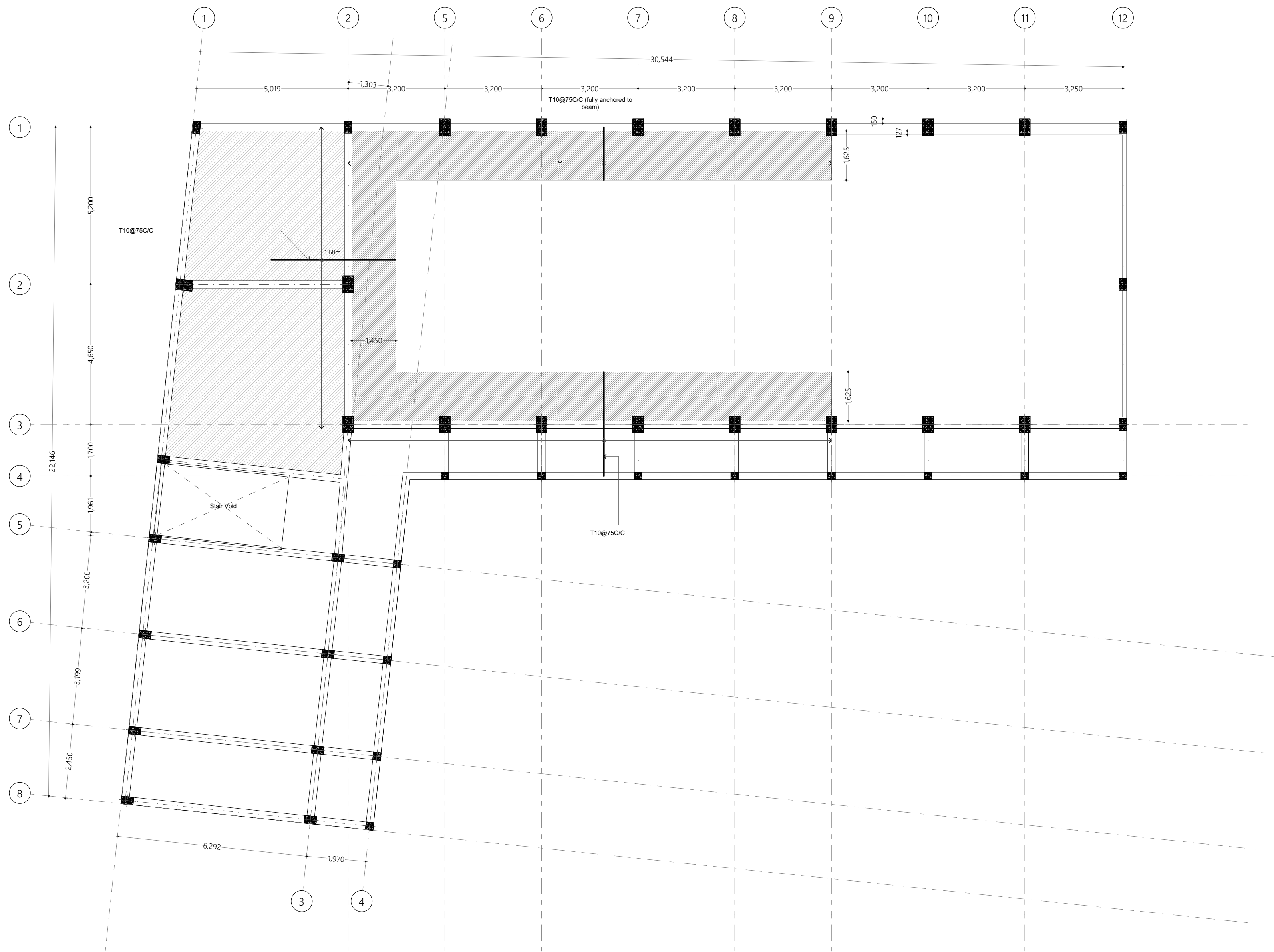
  
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A.05.5





First Floor Beam Plan  
1:100



#### Notes:

- Slab thickness = 185mm
- Slab thickness = 150mm
- Slab thickness = 175mm

Bottom Reinforcement = T10@150 C/C B/W (not shown)  
 Top Reinforcement = T10@150 C/C B/W (not shown)  
 Additional Top Reinforcement = T10@150 C/C (as shown)  
 Reinforcement discontinuous at voids

First Floor Slab Reinforcement Plan  
 1:100

PROPOSED 03 STOREY BUILDING AT

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 First Floor Reinforcement Plan

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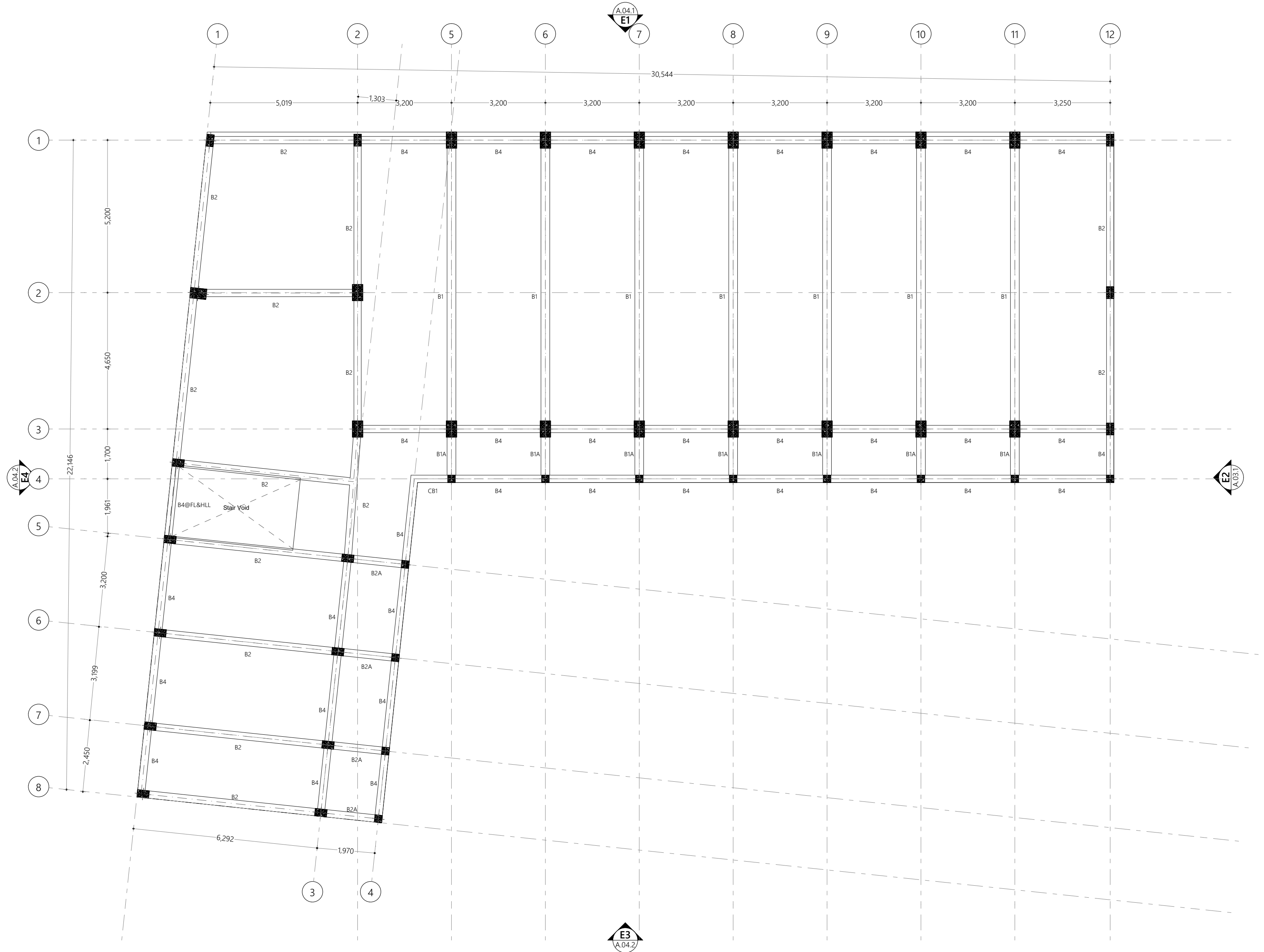
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 A.06.2



Second-Third Floor Beam Plan  
1:100

PROPOSED 03 STOREY BUILDING AT

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Second -Third Floor Beam Plan

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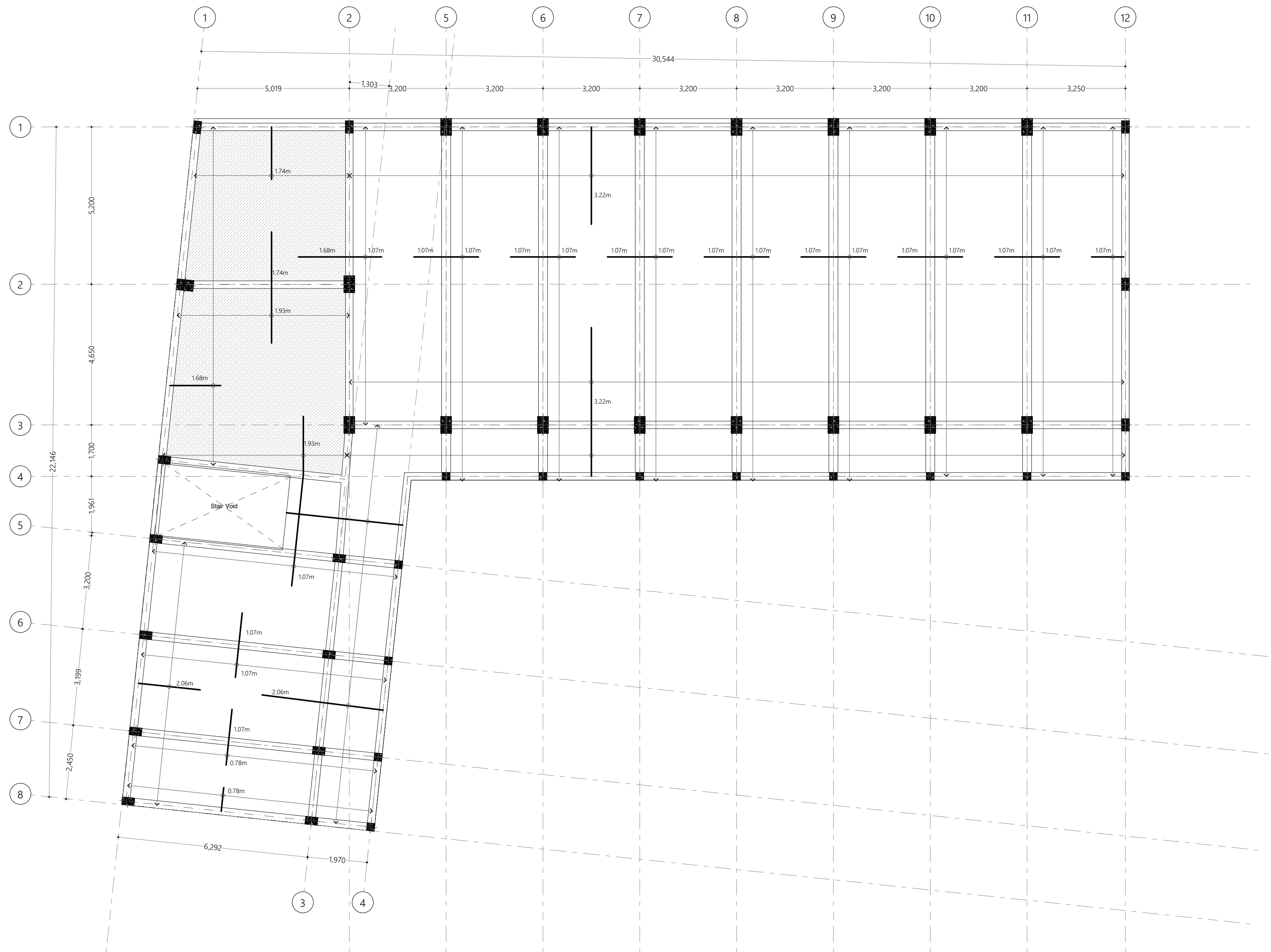


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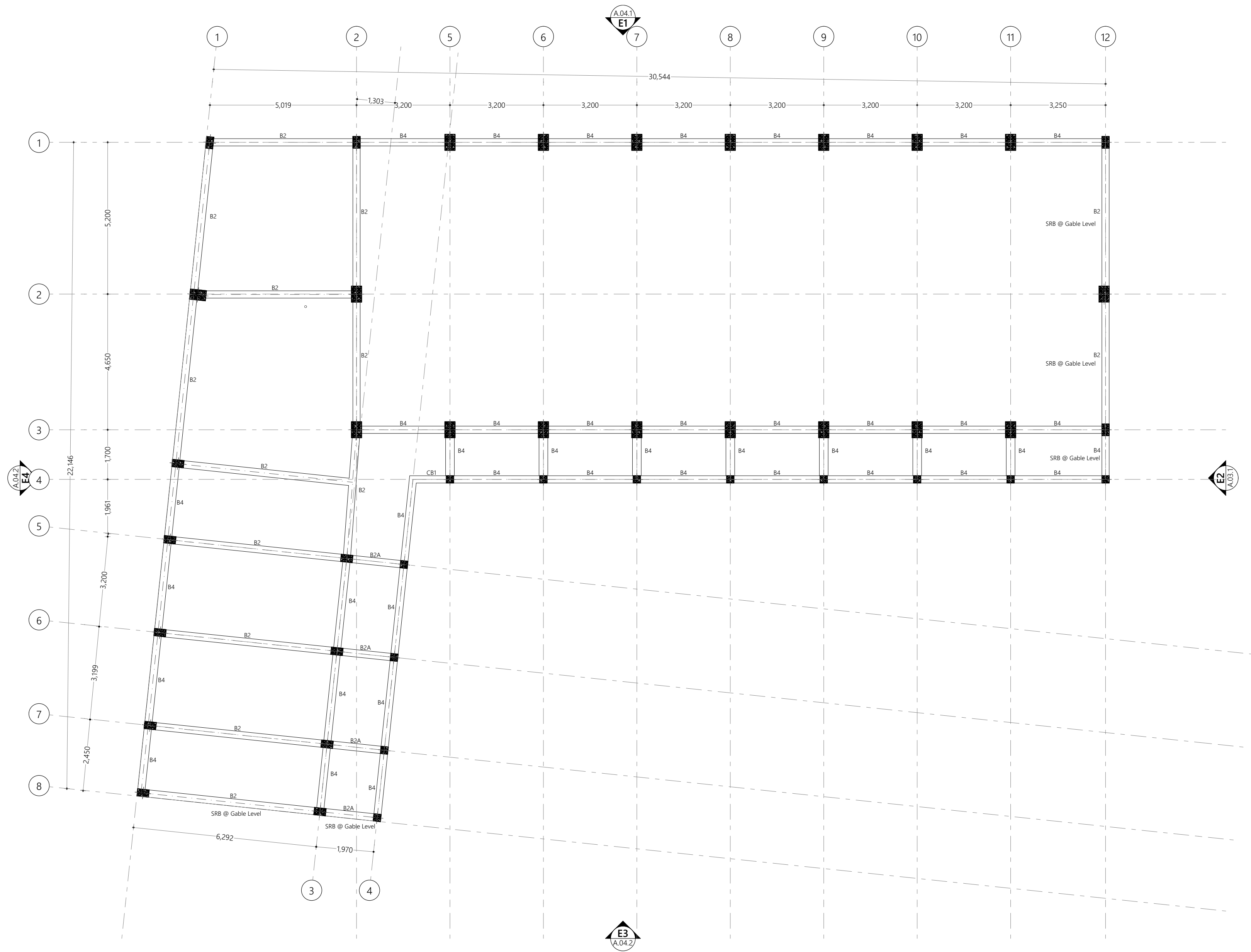
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Second-Third Floor Slab Reinforcement Plan  
1:100



**Roof Beam Plan**  
1:100

PROPOSED 03 STOREY BUILDING AT

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**Roof Beam Plan**

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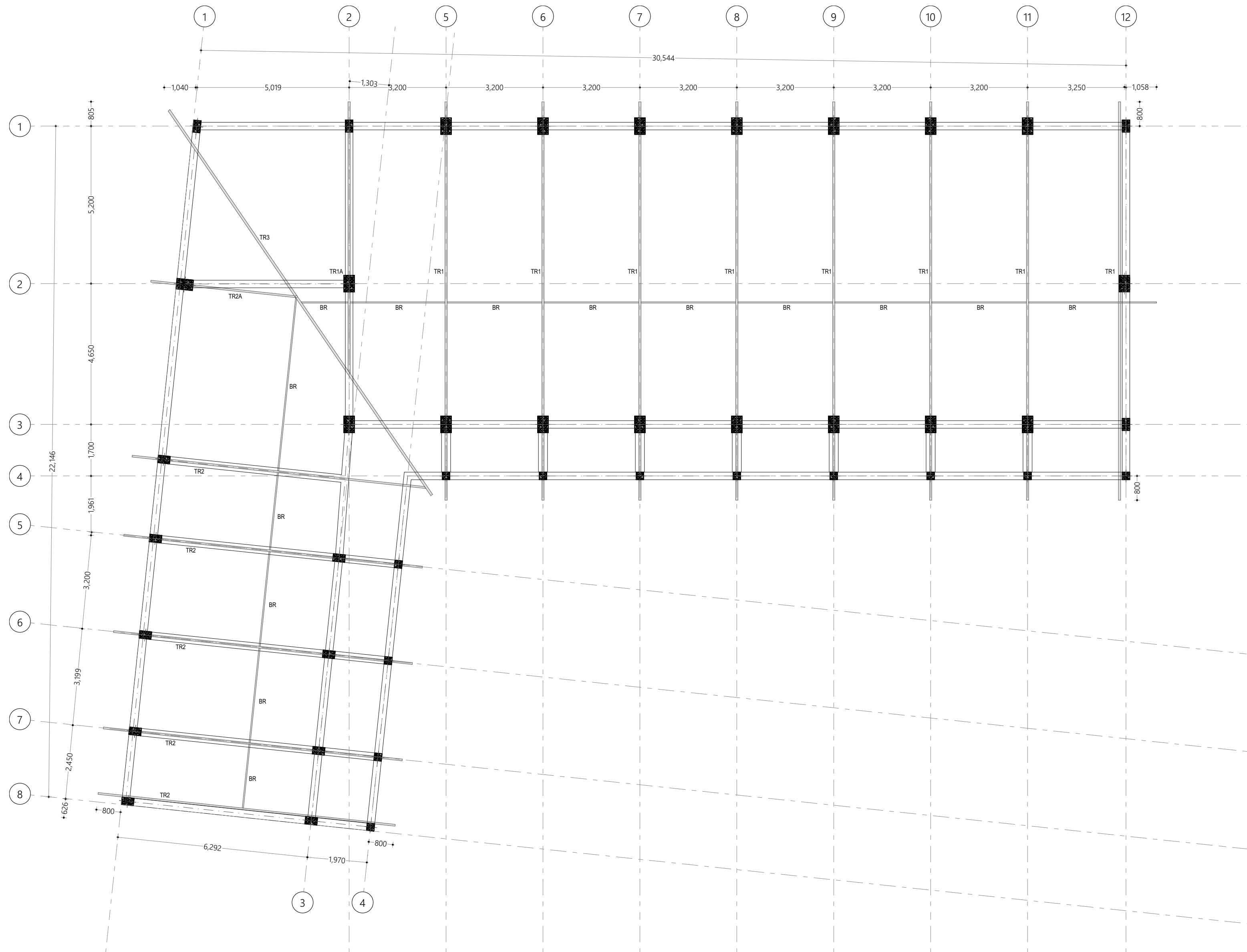
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Roof Truss Plan  
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PROPOSED 03 STOREY BUILDING AT

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Roof Truss Plan

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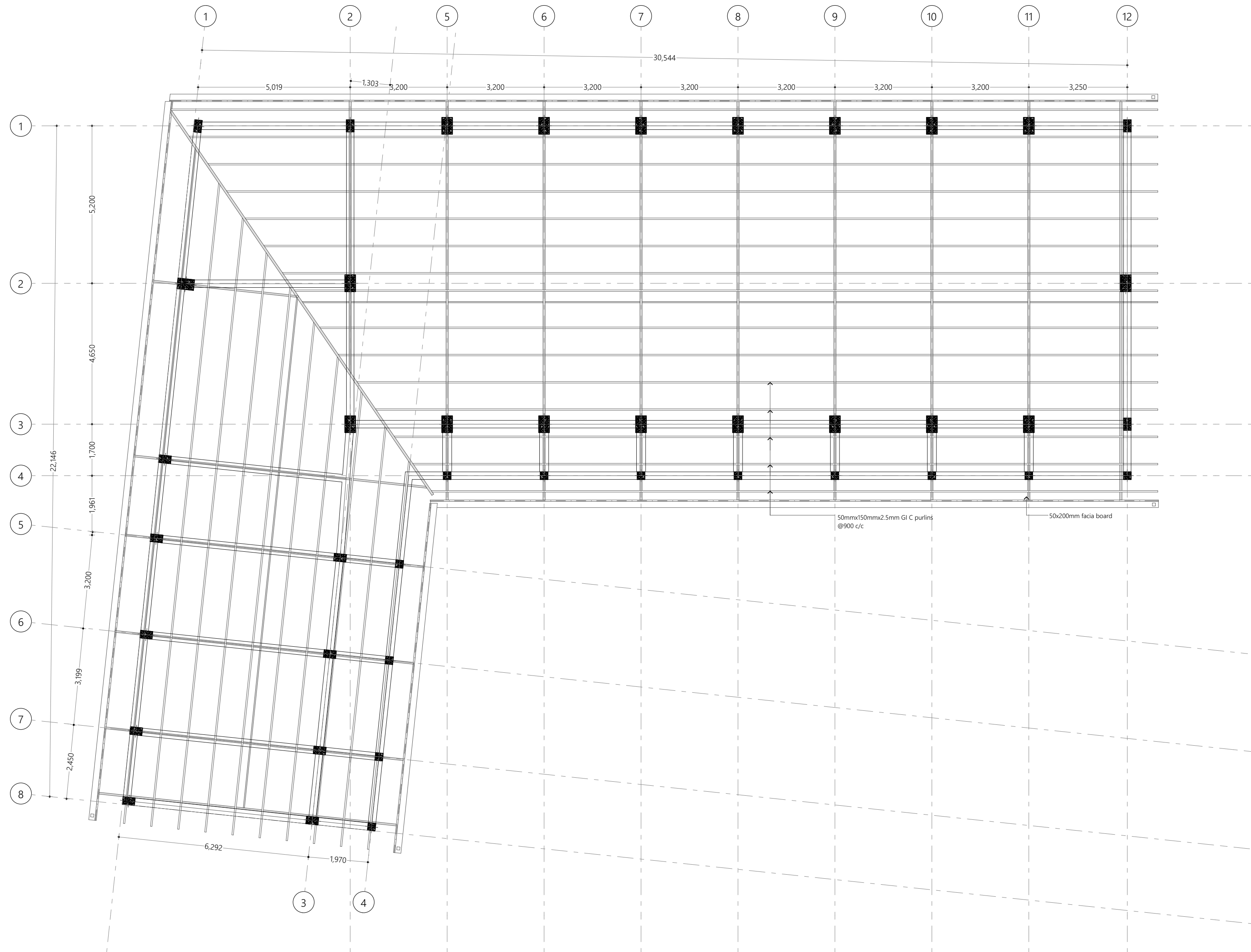
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A.06.6



Roof Framing Plan  
1:100

PROPOSED 03 STOREY BUILDING AT

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Roof Framing Plan

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A.06.7

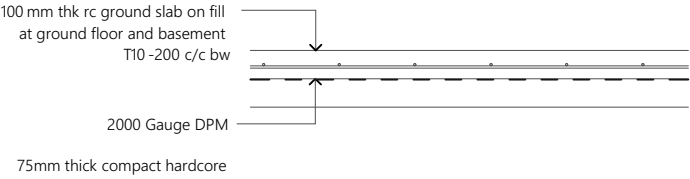
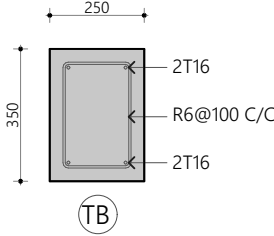
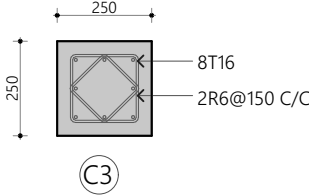
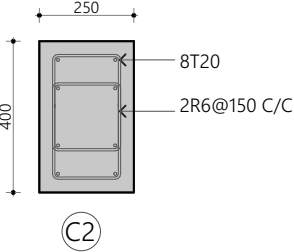
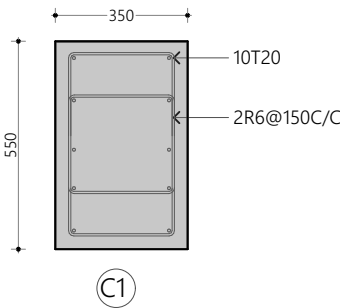


Foundation Details:

	Dimensions	Reinforcement	Foundation depth
F1	2550X2550X450	T12@100C/C B/W (B)	1350mm
F2	2200X3500X450	T16@75C/C B/W (T&B)	1350mm
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F4	1800X1800X400	T12@150C/C B/W (B)	1300mm
F5	1350X1350X350	T12@150C/C B/W (B)	1250mm

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

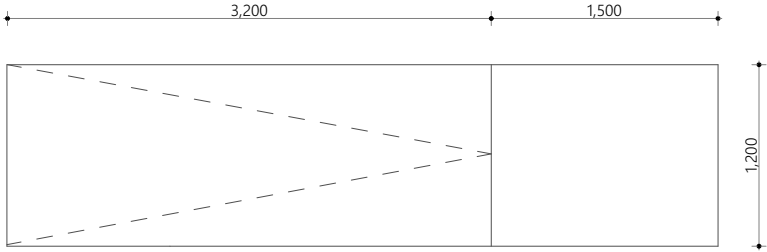
All Footings are to be laid on top of 50mm thick lean concrete  
Add waterproofing admixture and apply waterproofing to all substructure (below ground elements)



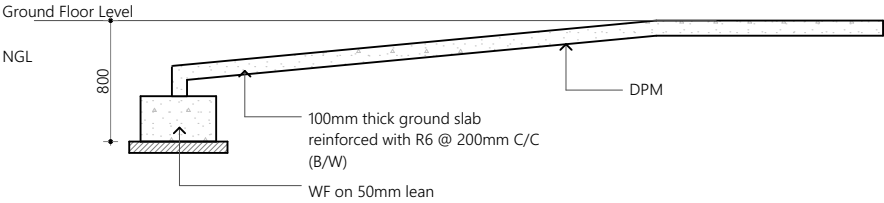
NOTE:  
All cover blocks shall be casted using grade C 25 / 30 concrete with 5-10 mm aggregates

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

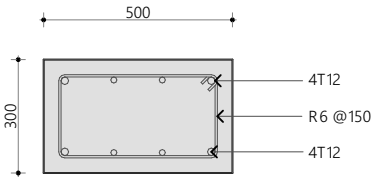
Foundation Detail  
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Ground Floor Ramp Plan View

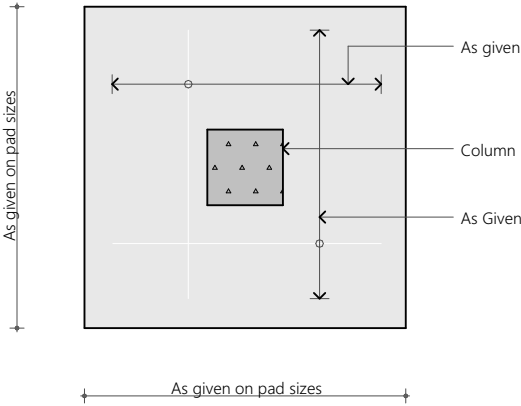


Ground Floor Ramp Elevation View

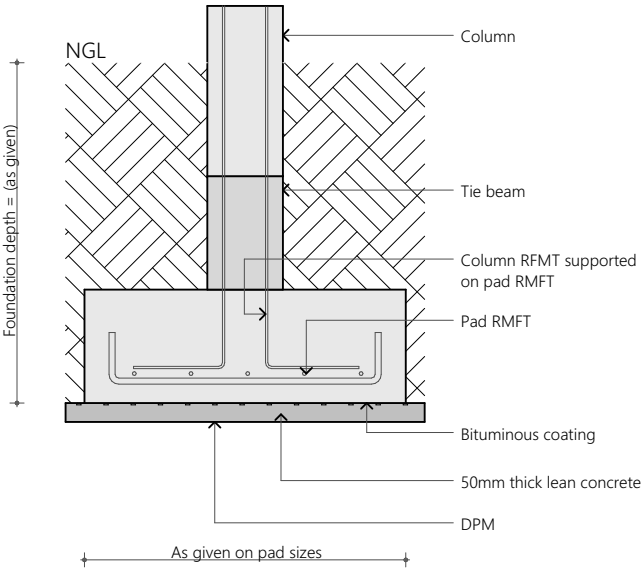


Wall Footing (WF) Detail  
Scale = 1:20

Ramp Detail  
1:50



Plan View



Sectional View

Typical Pad Footing Detail  
1:20

Ground Slab Detail  
1:20

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo School, Multipurpose Hall and 10 Classroom**

Client: Ministry of Education, Maldives

Page Name: Structural Details

4/29/2021

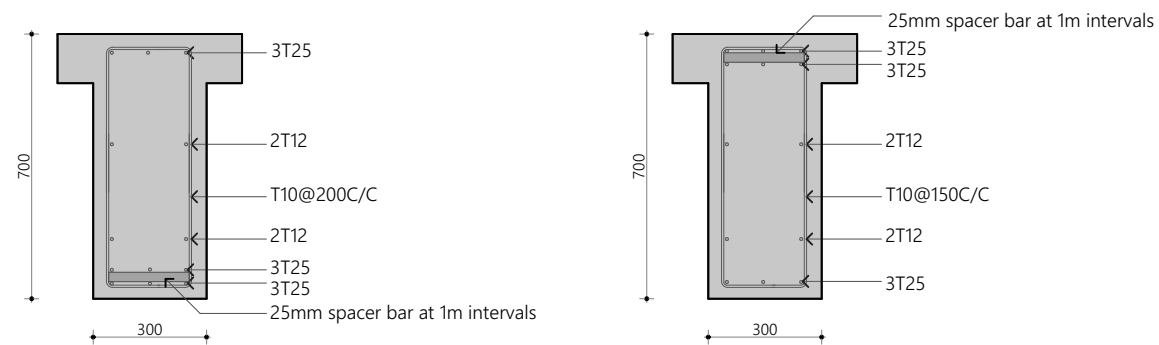
Architect: Mohamed Hassaan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadhny Afzal



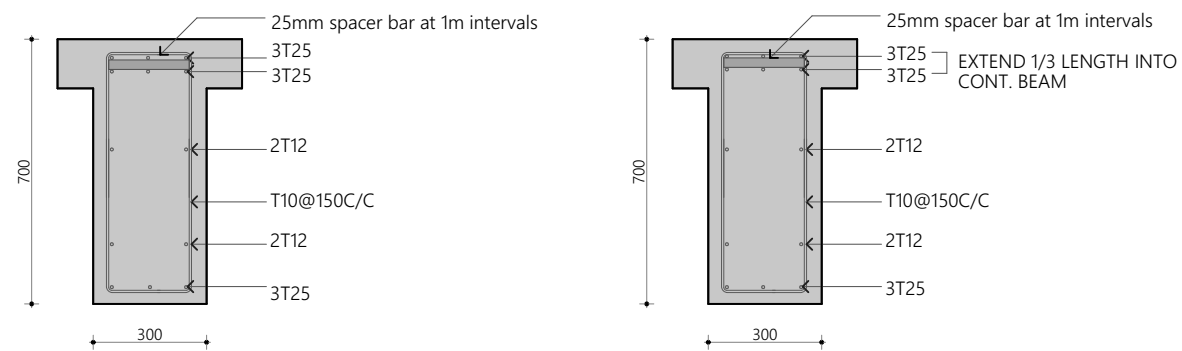
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W: www.epochassociates, A: G. Rosary West  
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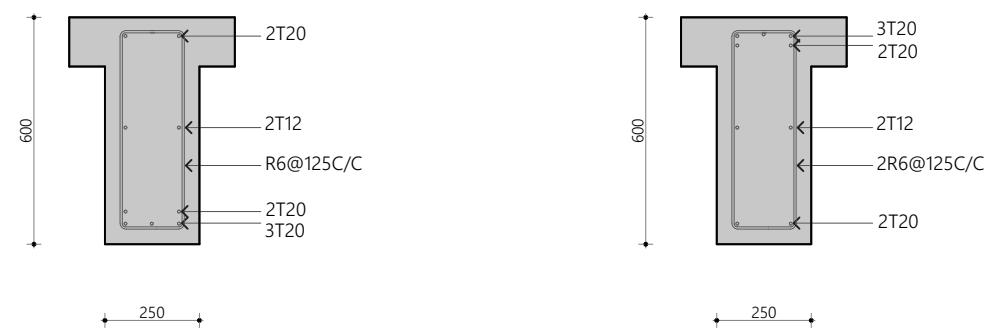
Rev: ---  
Page: C.01.1



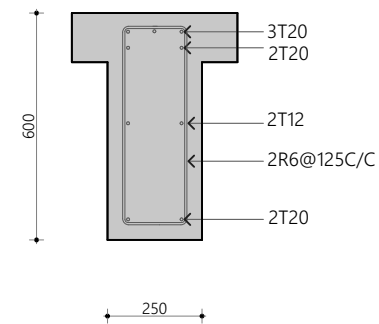
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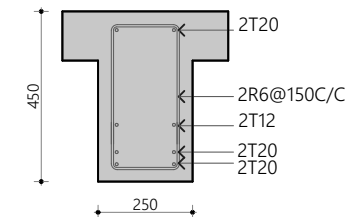
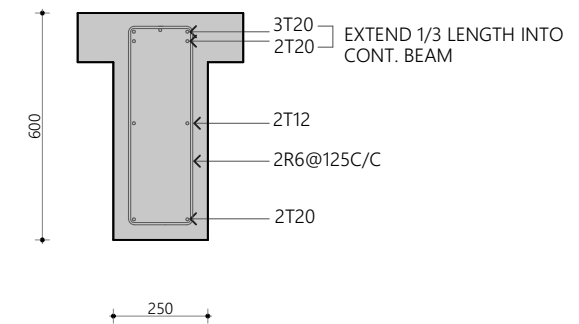
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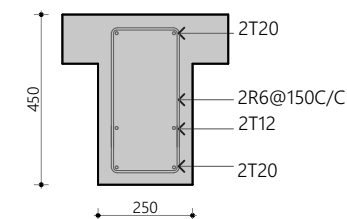
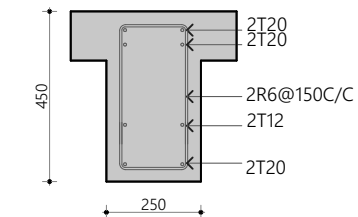
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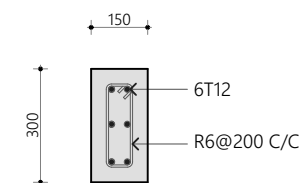
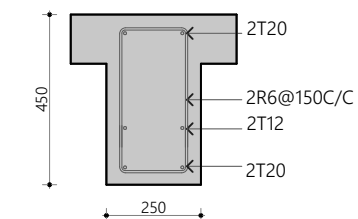
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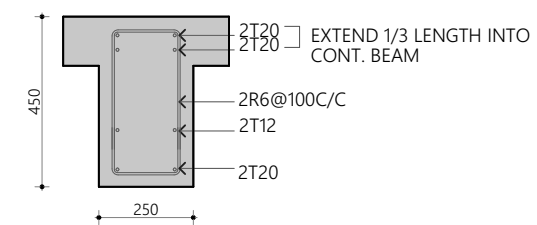
MID SPAN B3 SUPPORT



MID SPAN B4 SUPPORT



SRB



CB1

Beam Detail  
1:20

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom**

Client:  
**Ministry of Education,  
Maldives**

Page Name:  
**Structural Details**

4/29/2021

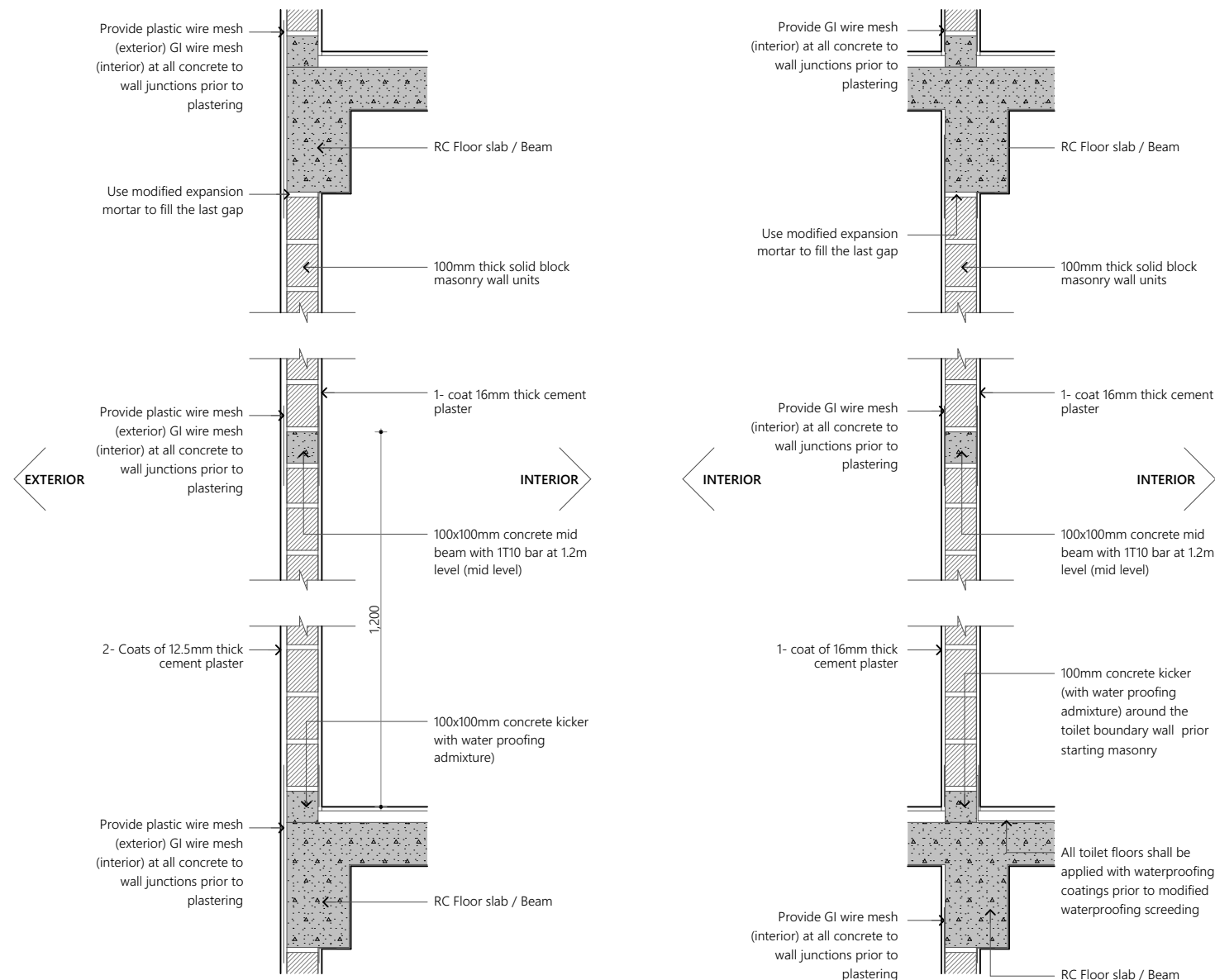
Architect: Mohamed Hassaan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadhny Afzal



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C.01.2



**Note:**

- \* Concrete surfaces shall be thoroughly cleaned with water & applied with mastercast 141 or equivalent bonding mortar prior to plastering.
- \* Plastering mortar mix shall be 1:4 (cement: sand) ratio.
- \* Plaster mix shall be modified using fibre wool & mastercast 141 or equivalent plasticisers as per manufacturer's specification.
- \* Height of placing blocks shall be maximum 1.2m per day.
- \* After initial coat of plastering, water curing shall be provided for minimum 3 days & after final coat water curing shall be provided for 7 days.

## Typical wall construction Detail

1:20

PROPOSED 03 STOREY BUILDING AT

### N.Henbadhoo School, Multipurpose Hall and 10 Classroom

Client:

Ministry of Education, Maldives

Page Name:

Typical Wall Construction Detail

4/29/2021

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



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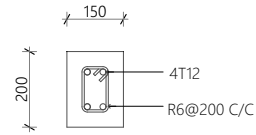
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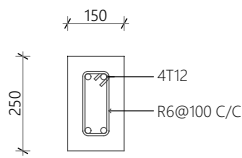
Page:

C.01.3



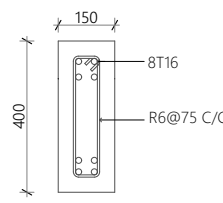
LT1

LINTELS OVER ALL DOORS, WINDOWS  
(THAT DOES NOT RISE TO BEAM LEVEL)  
LT1 FOR WINDOWS < 1.5M



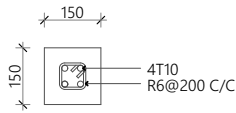
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LINTELS OVER ALL DOORS, WINDOWS  
(THAT DOES NOT RISE TO BEAM LEVEL)  
LT2 FOR WINDOWS > 1.5M & <3.0M



LT3

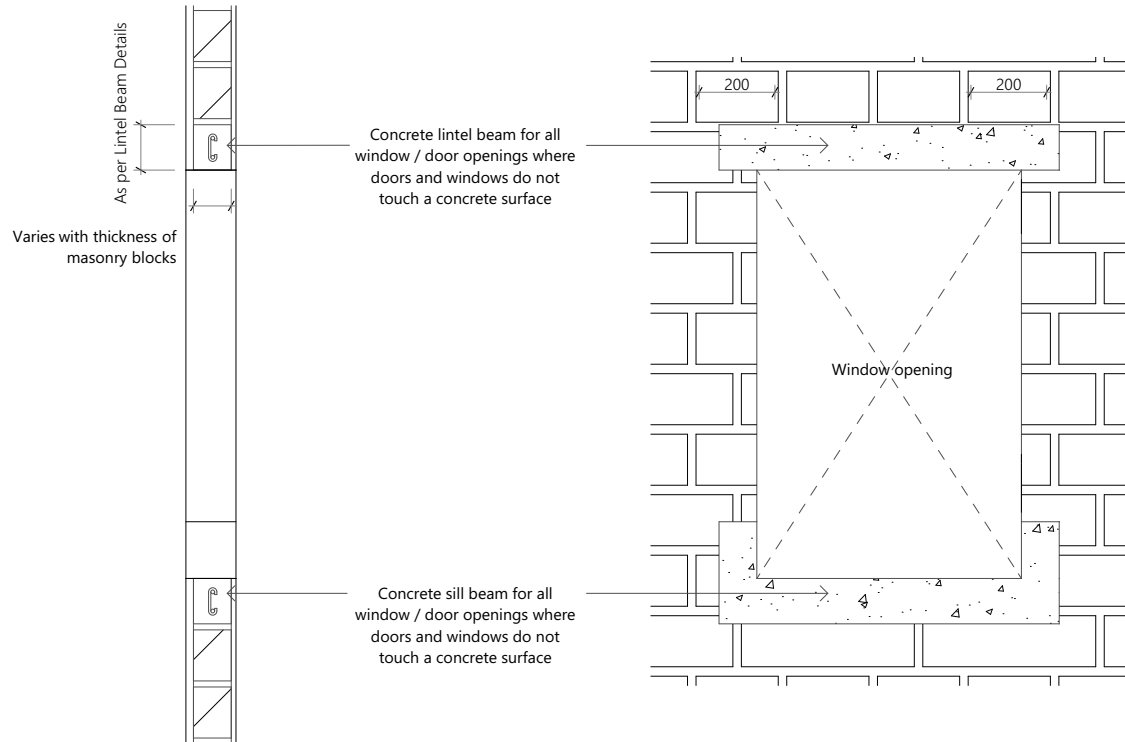
LINTELS OVER ALL DOORS, WINDOWS  
(THAT DOES NOT RISE TO BEAM LEVEL)  
LT3 FOR WINDOWS > 3.0M & <6.0M



LB1

Sill Beam Detail  
1:20

Lintel Beam Detail  
1:20



Typical Window  
Construction Detail

Window Construction Detail  
1:20

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom**

Client:  
**Ministry of Education,  
Maldives**

Page Name:  
**Window Construction Detail**

4/29/2021

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

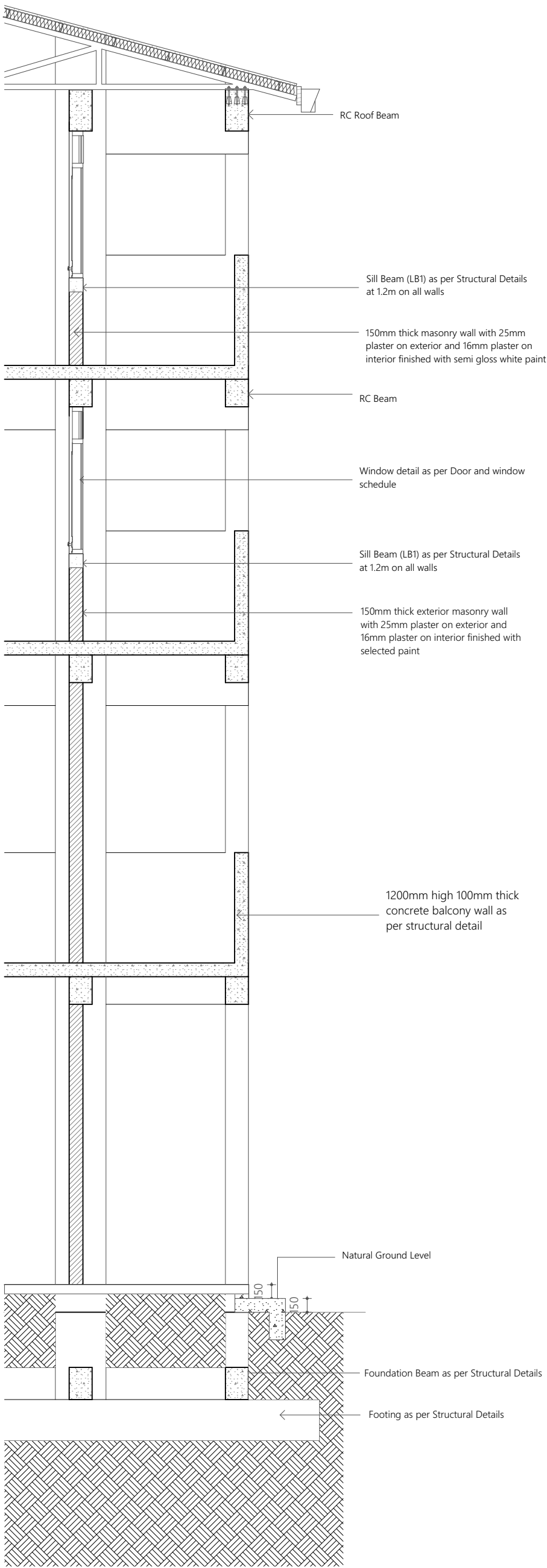


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C.01.4





Top to Bottom Detail  
1:50

PROPOSED 03 STOREY BUILDING AT


**N.Henbadhoo School,  
Multipurpose Hall and 10 Classroom**

Client: **Ministry of Education, Maldives**

Page Name:  
**Top to Bottom Detail**

4/29/2021

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

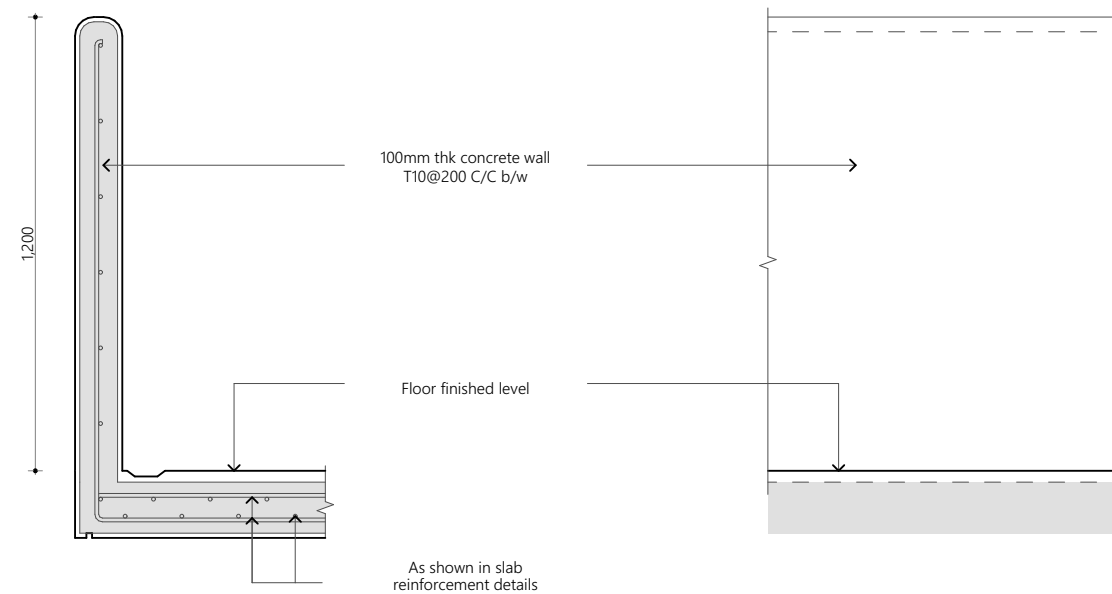


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Page:  
**C.01.5**



Sectional View

Elevation View

Balcony Detail 2  
1:20

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom**

Client:

**Ministry of Education,  
Maldives**

Page Name:

**Balcony detail**

4/29/2021

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



**EPOCH**

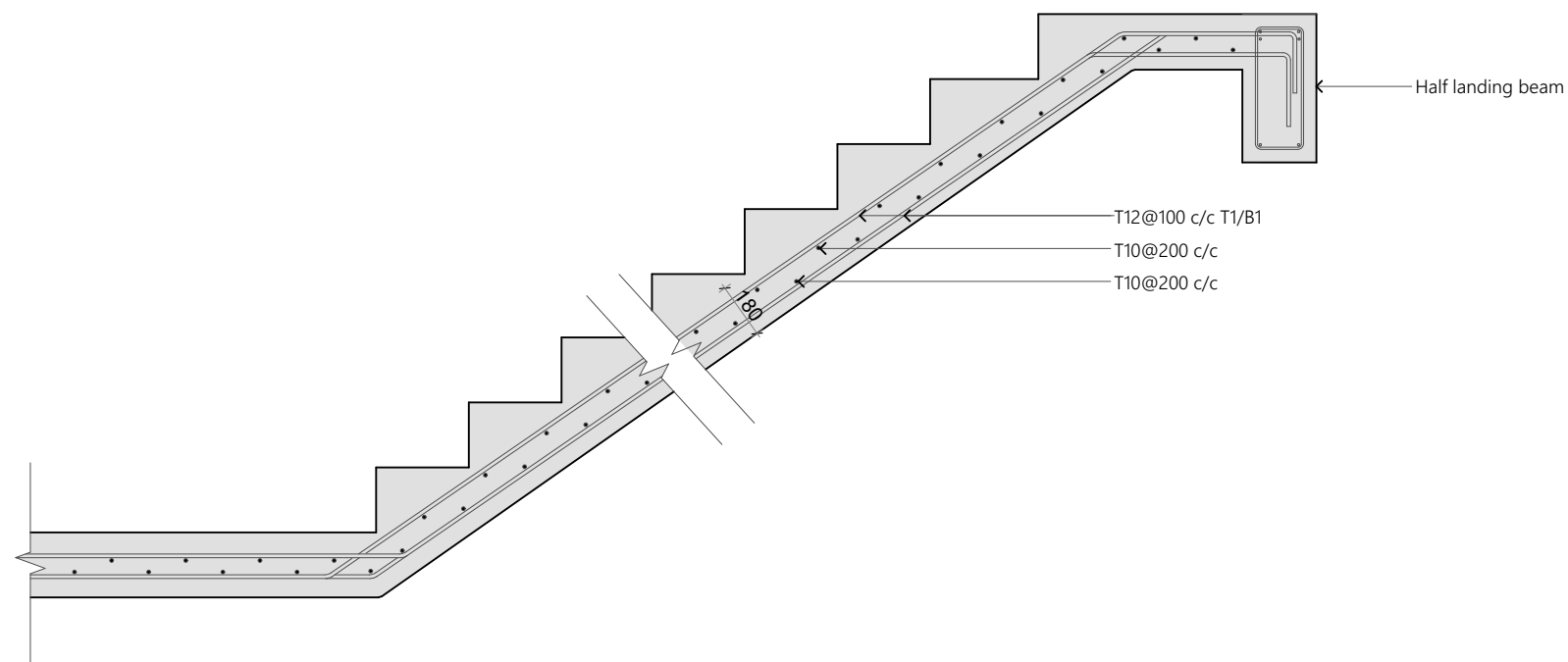
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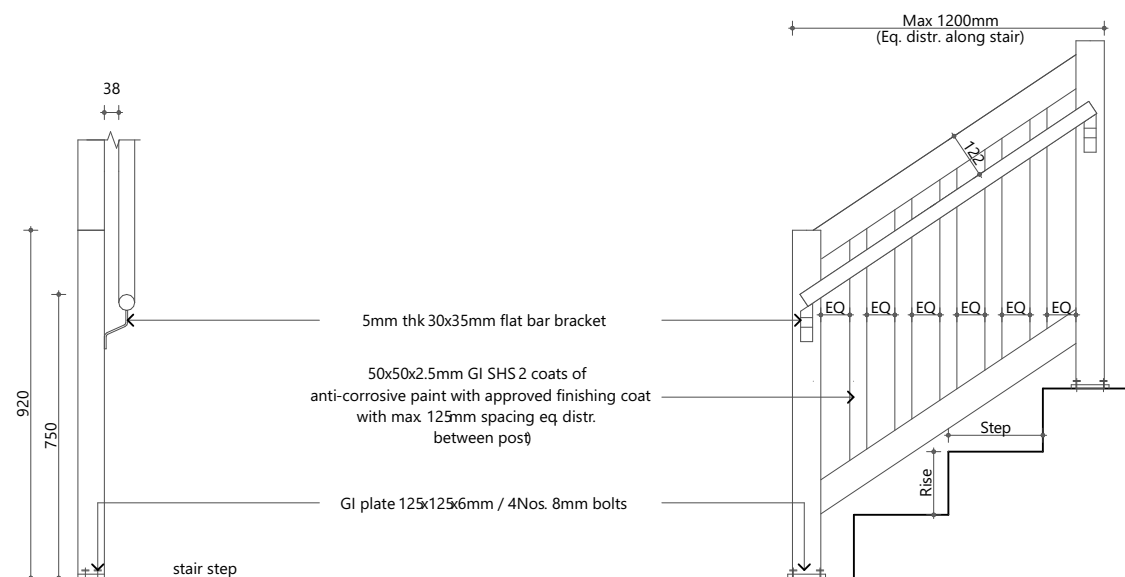
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Page:

**C.01.6**



**Stair Reinforcement Detail**  
1:20



1. Post top, bottom & 1.2m vertical support members to be 75x75x2.5mm thick GI SHS (2 coats of anti corrosive paint with approved finishing color coat)

2. Handrail material to be 50mm Ø 2.5mm thick GI CHS with 2 coats of anti-corrosive paint and approved finishing coat

3. Step: 300mm

4. Raise: 152mm

**Stair Railing Detail**  
1:20

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo  
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Multipurpose  
Hall and 10  
Classroom**

Client:

**Ministry of Education,  
Maldives**

Page Name:

**Staircase Detail**

4/29/2021

Architect: Mohamed Hassan

Engineer: Ihsaan Waheed

Drawn By: Aishath Shadhny Afzal



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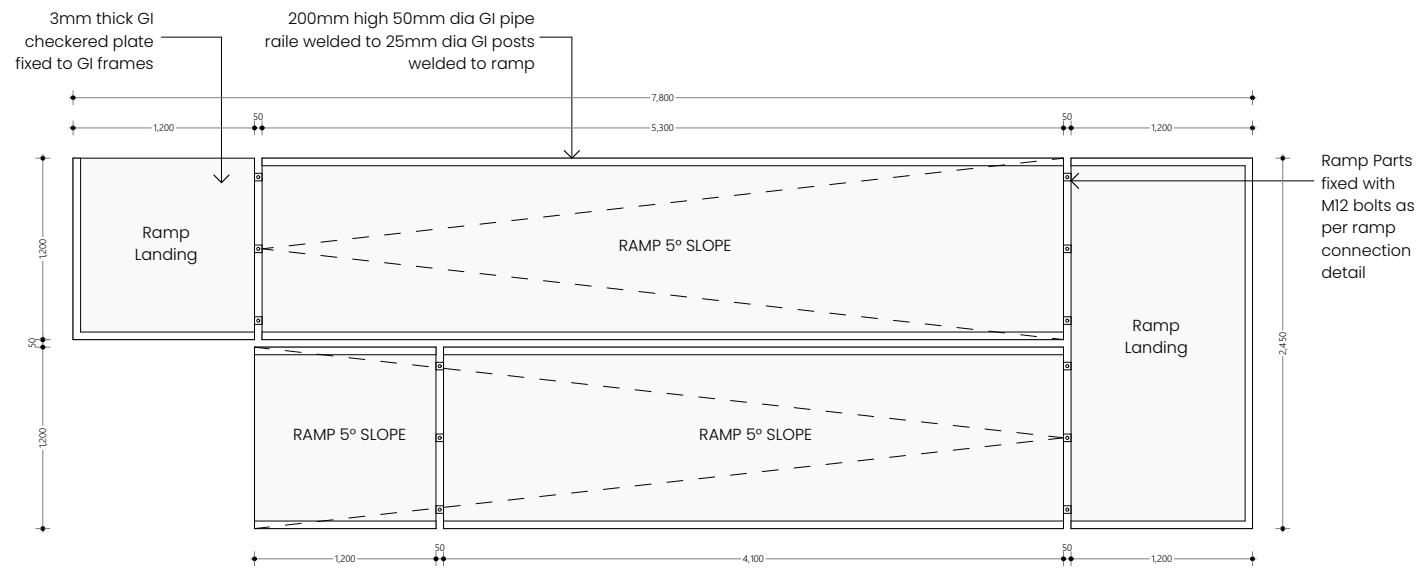
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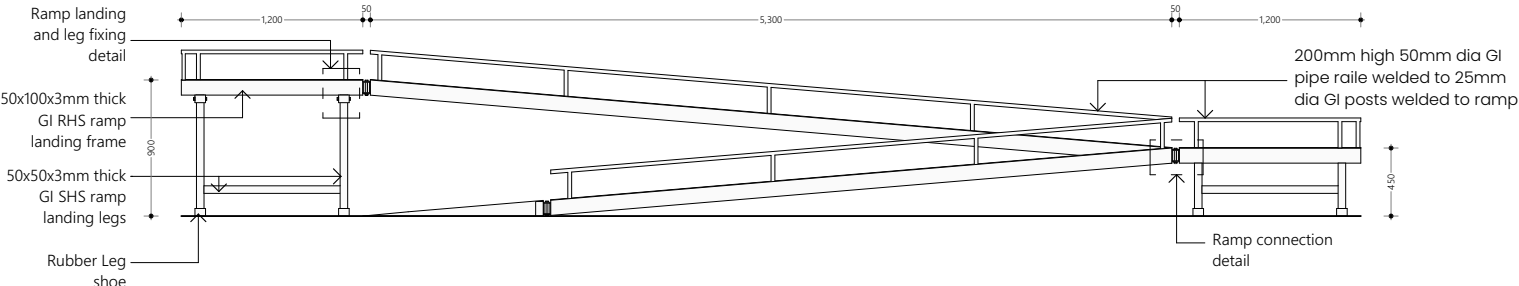
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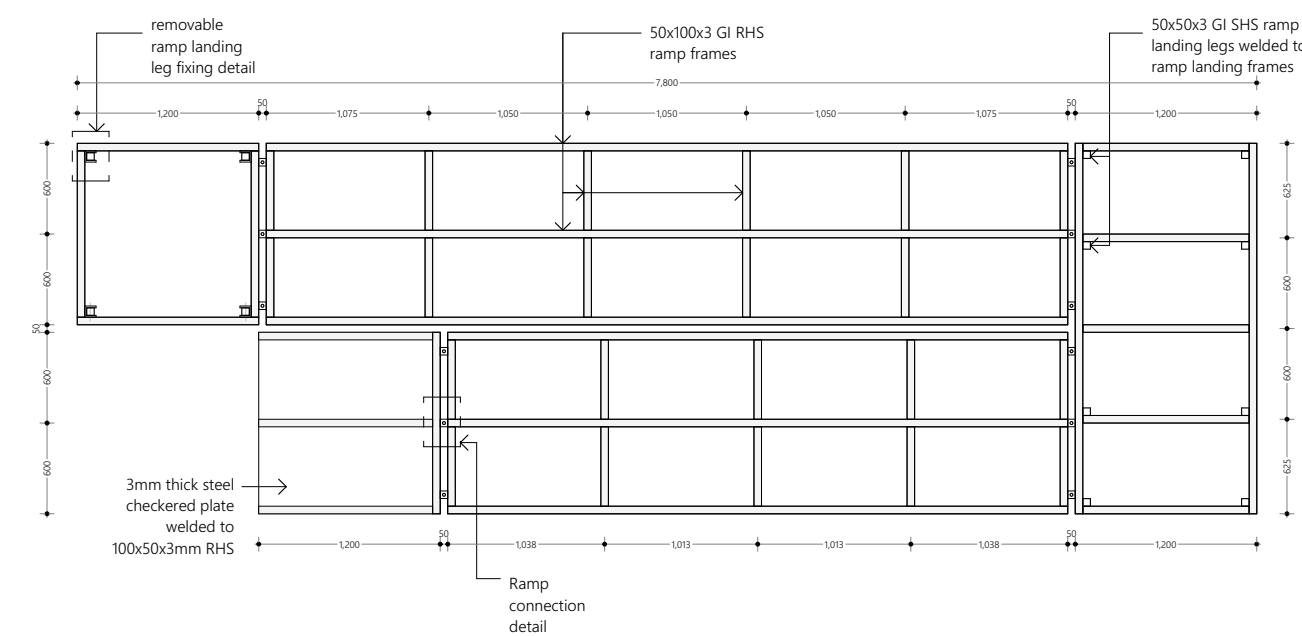
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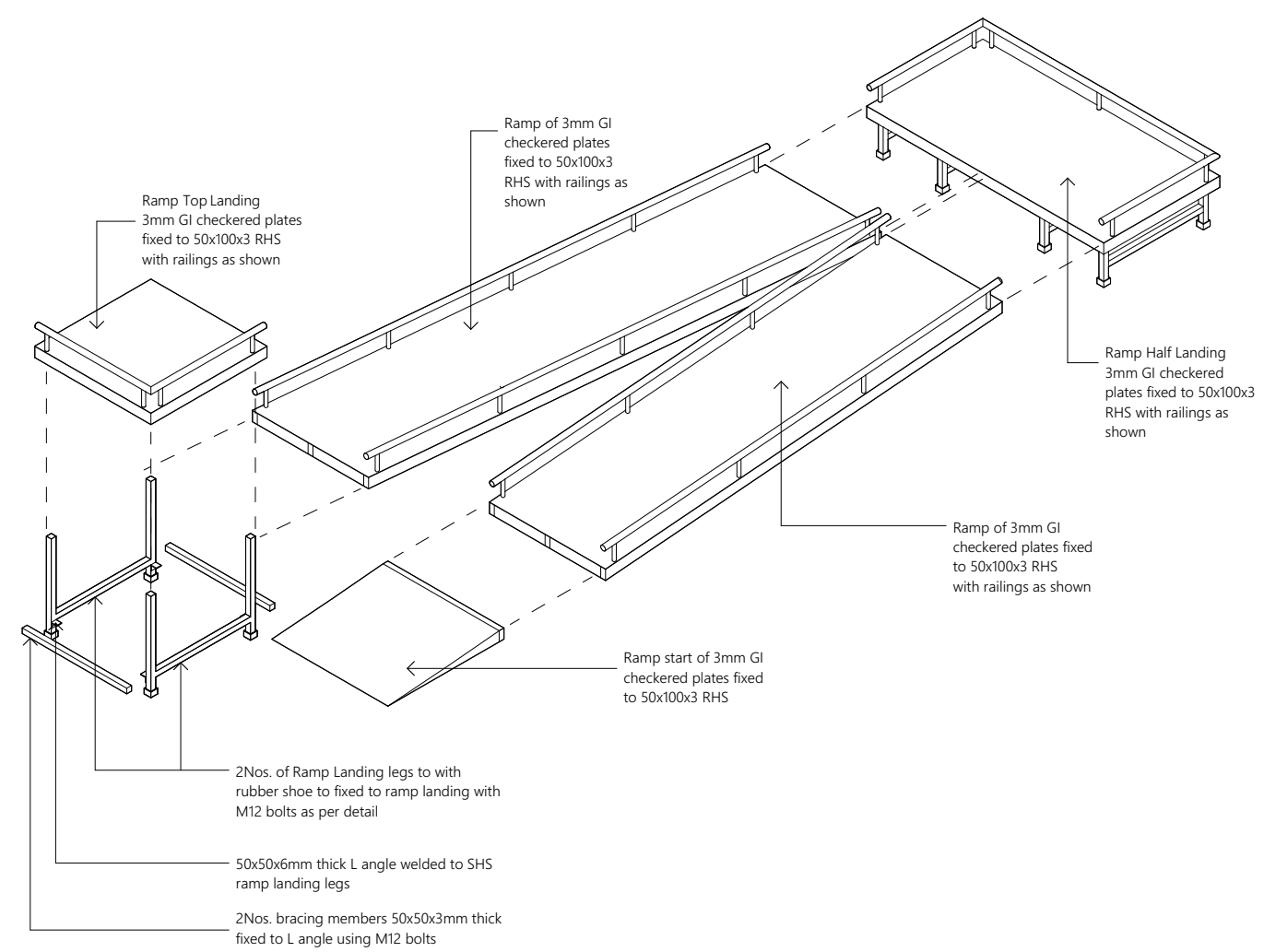
**Ramp Plan View**  
1:50



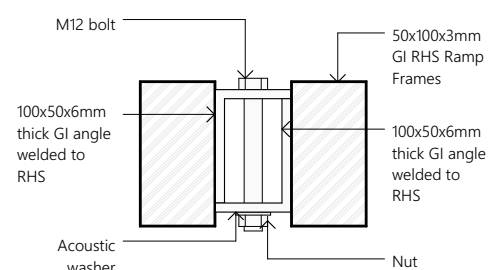
**Ramp Side Elevation**  
1:50



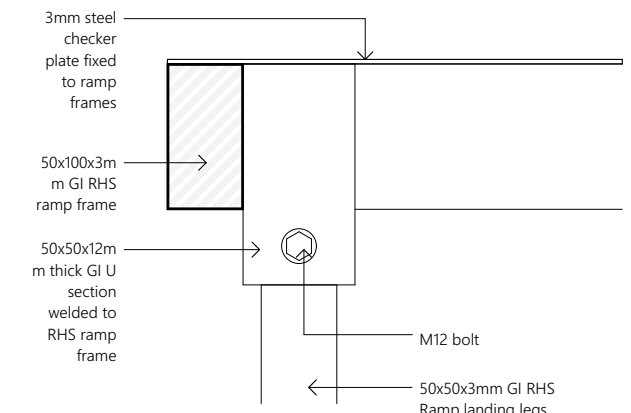
**Ramp Framing Detail**  
1:50



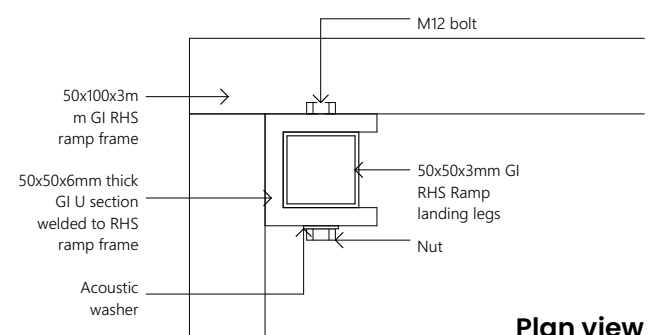
**Ramp Isometric**  
1:50



**Ramp Connection Detail**  
1:5



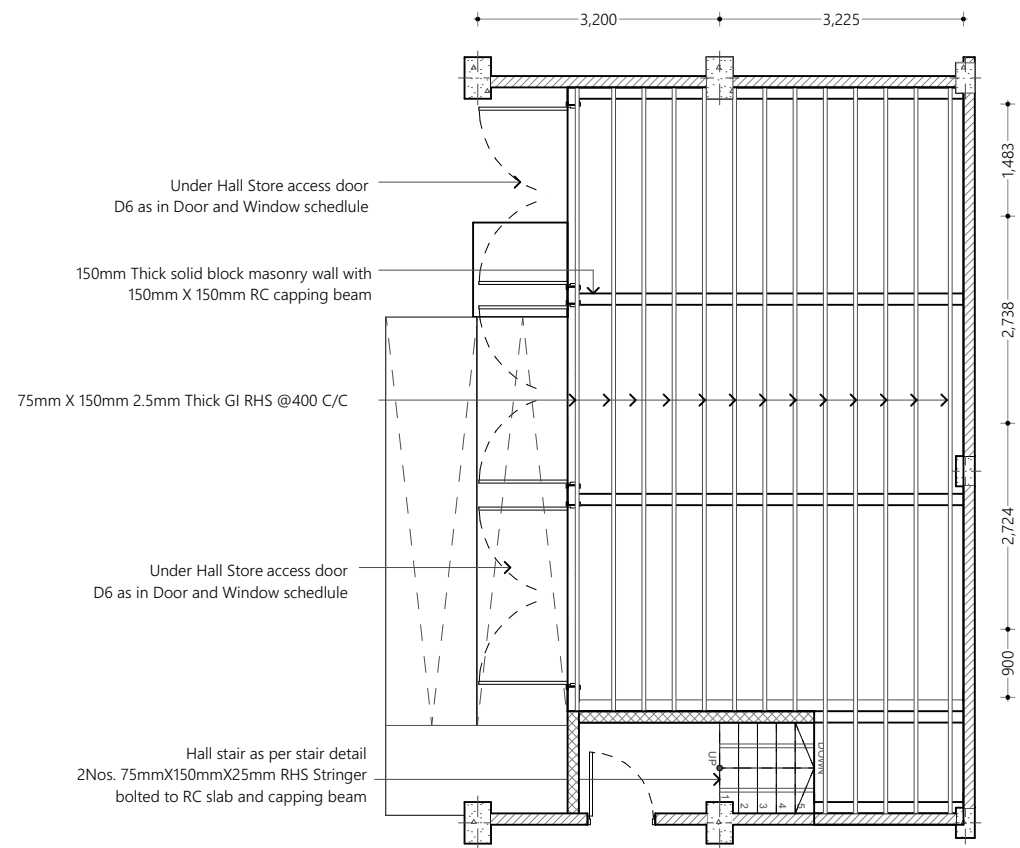
**Elevation view**



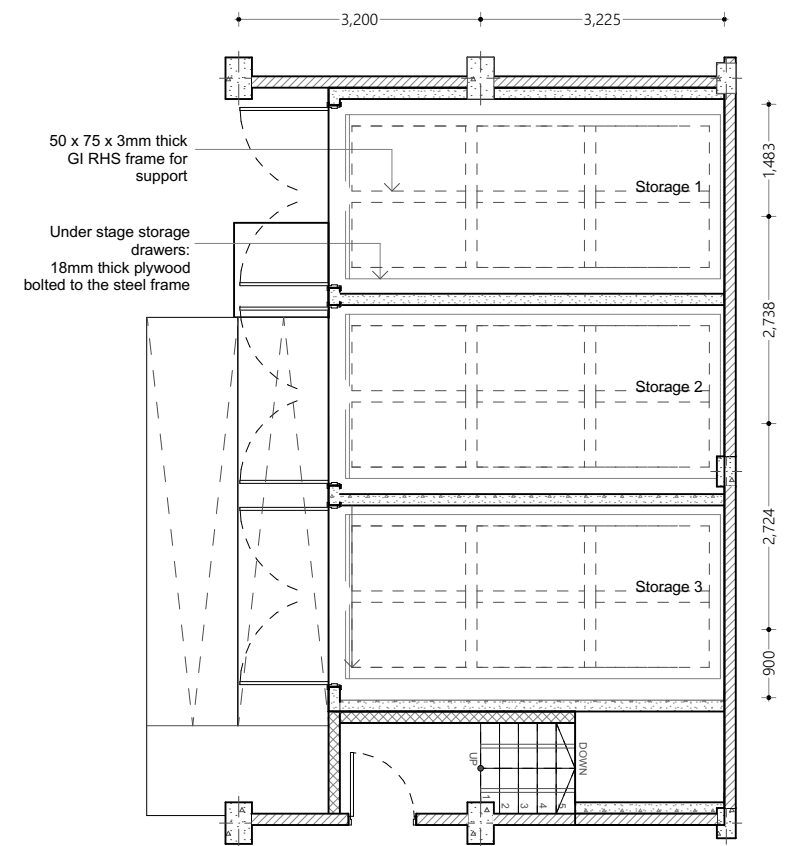
**Plan view**

**Ramp Leg Fixing Detail**  
1:5





Stage Framing Detail  
1:100



Stage Drawer Detail  
1:100

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom**

Client:

**Ministry of Education,  
Maldives**

Page Name:

**Stage Detail**

4/29/2021

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



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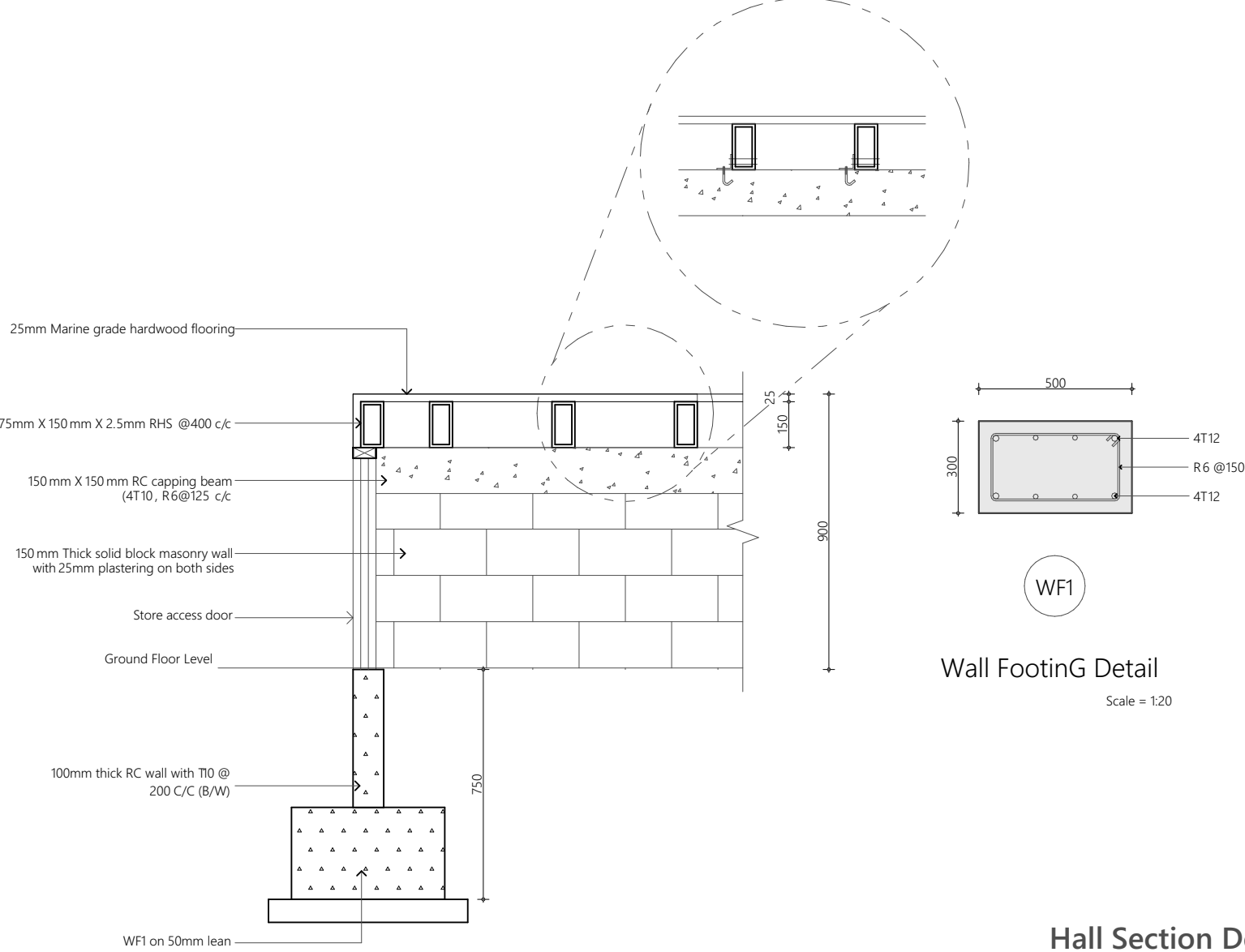
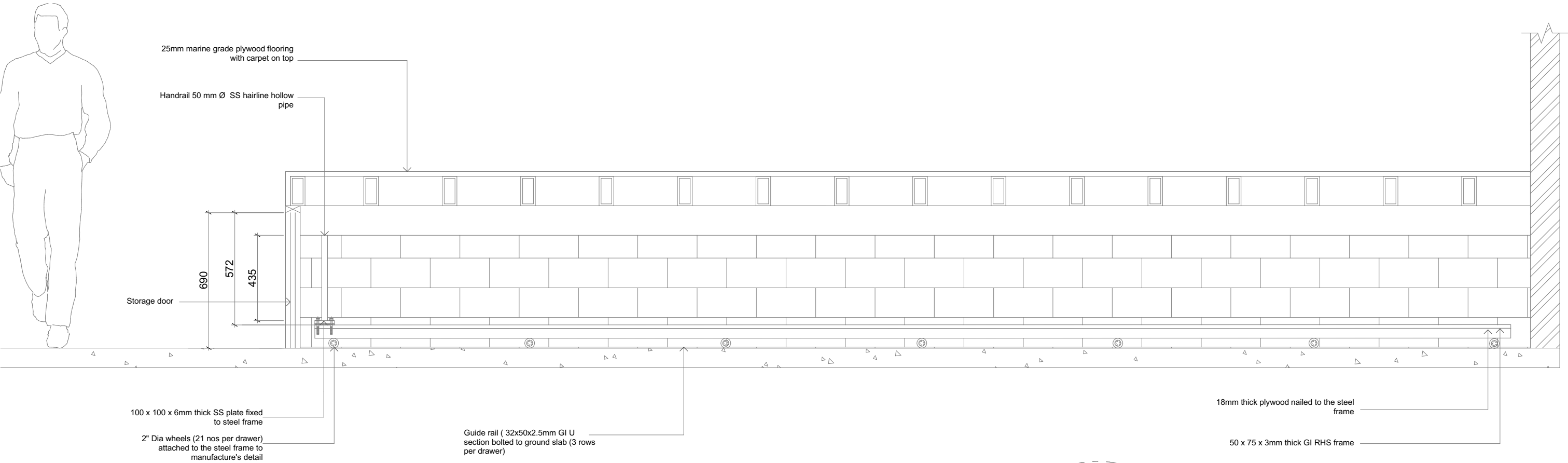
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Page:

**C.01.9**



Hall Section Detail  
1:100

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo School, Multipurpose Hall and 10 Classroom**

Client: Ministry of Education, Maldives


Page Name: Stage Detail

4/29/2021

Architect: Mohamed Hassaan

Engineer: Ihsaan Waheed

Drawn By: Aishath Shadhny Afzal



**EPOCH**

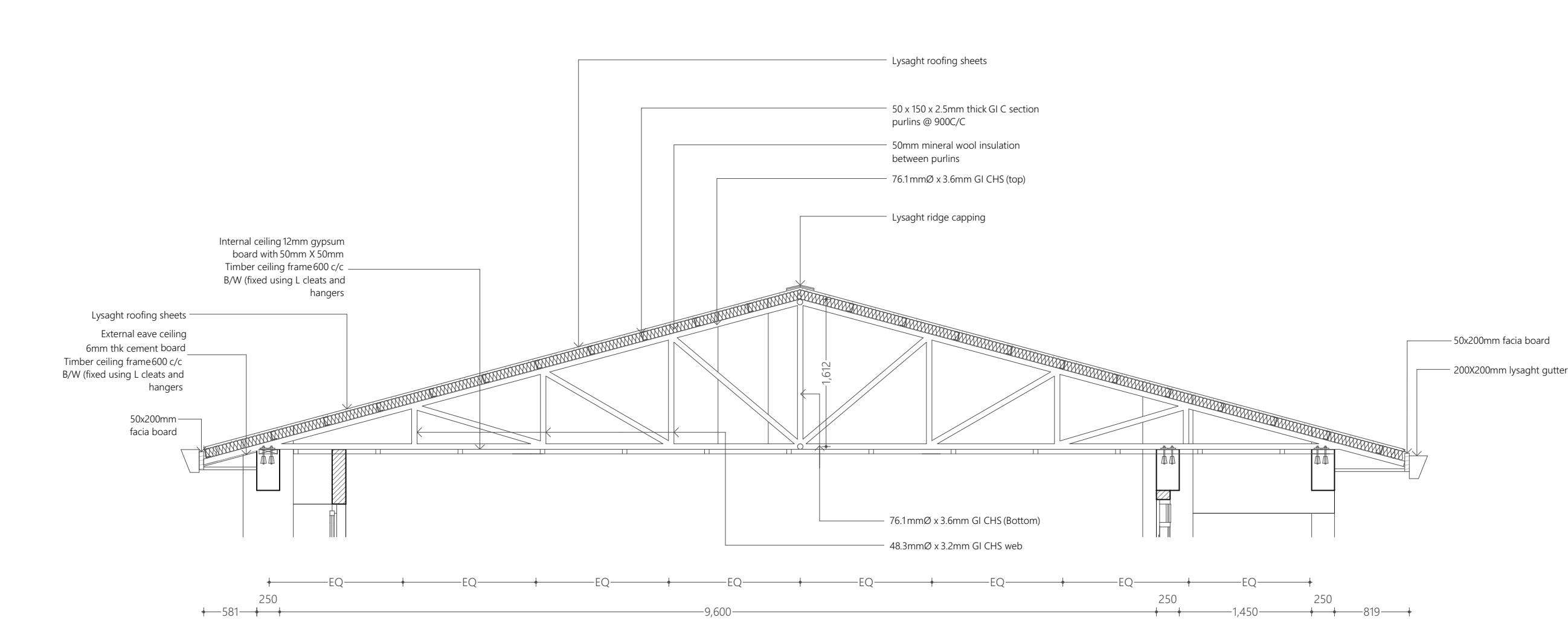
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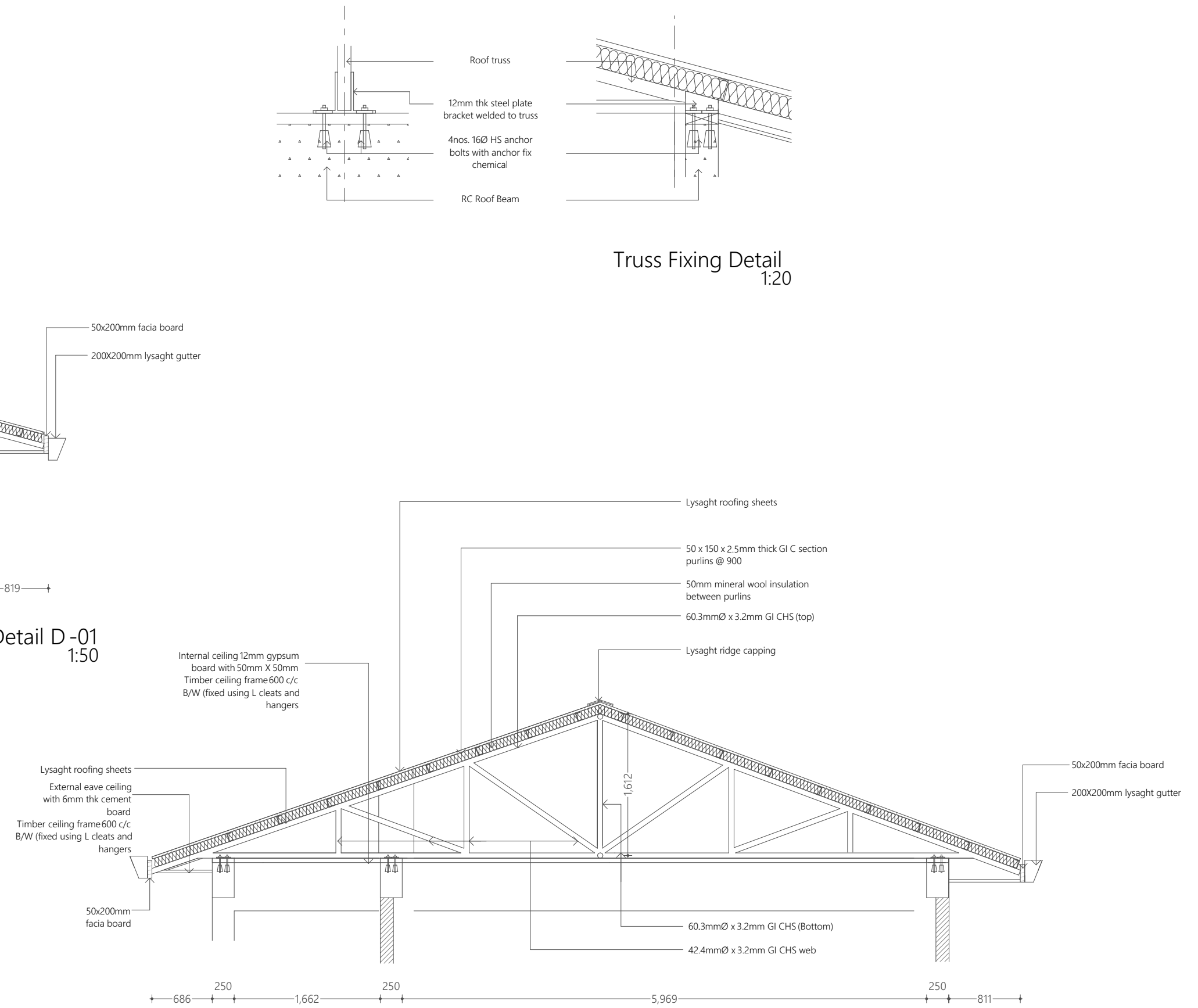
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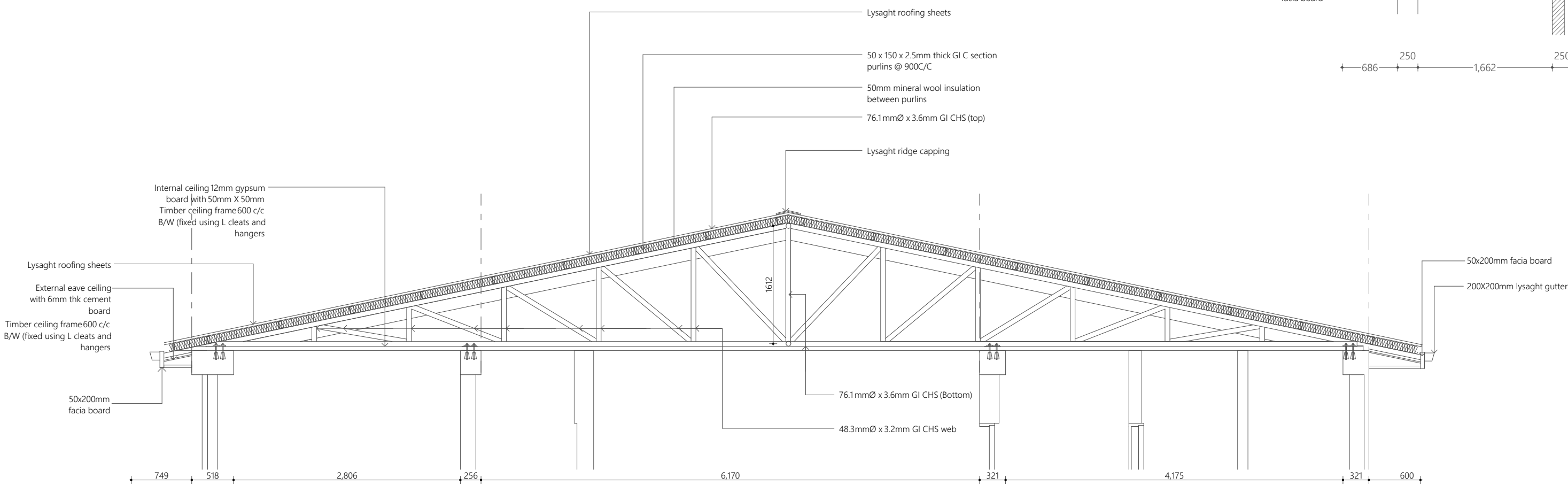
Page: C.01.10



Truss TR1 Detail D-01  
1:50



Truss TR2 Detail D-01  
1:50



Truss TR3 Detail D-01  
1:50

Notes:

All the CHS shall have minimum yield stress of 275MPa  
All welds shall be 6mm thick full parameter fillet welds  
All truss ends shall be capped with 6mm plates  
All truss members shall be protected with anti corrosive coatings  
All cleats and hangers shall be in GI

Truss Detail  
1:50

PROPOSED 03 STOREY BUILDING AT  
**N.Henbadhoo School, Multipurpose Hall and 10 Classroom**  
Client: Ministry of Education, Maldives

Page Name:  
Truss Detail

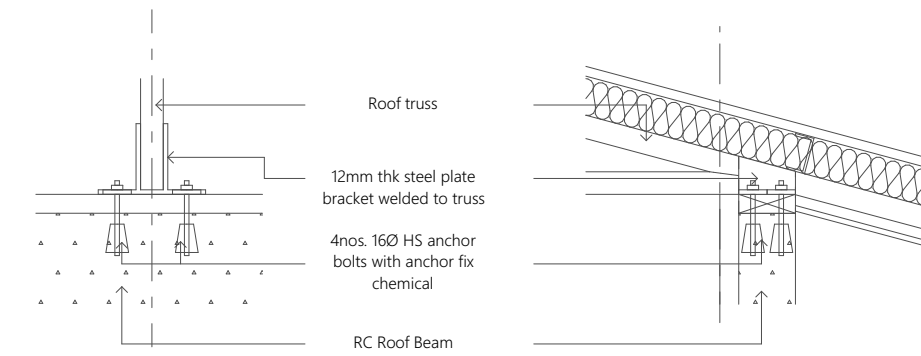
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Architect: Mohamed Hassan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadhira Atzal



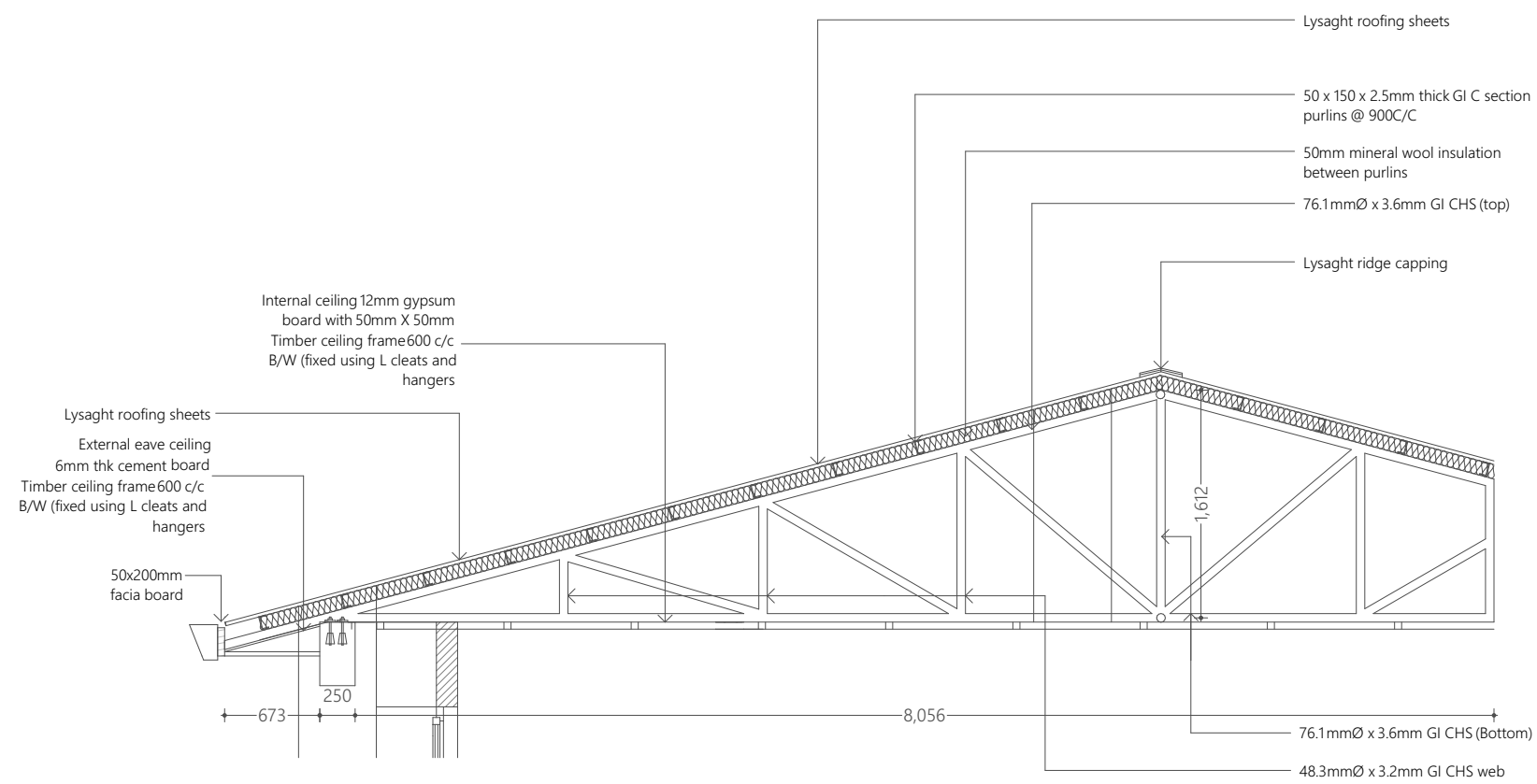
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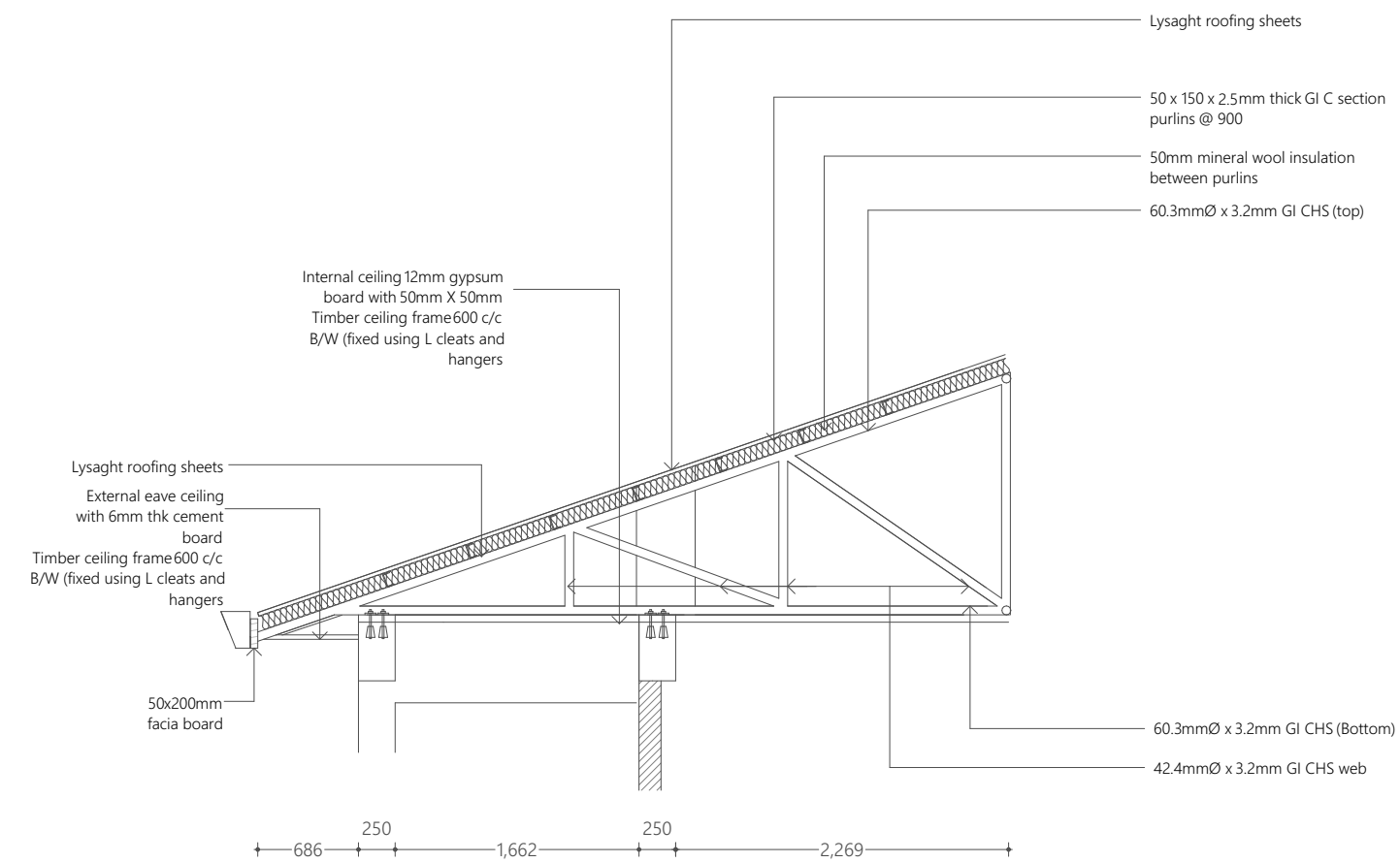
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C.01.11



Truss Fixing Detail  
1:20



Truss TR 1A Detail D-01  
1:50



Truss TR 2A Detail D-01  
1:50

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo  
School,  
Multipurpose  
Hall and 10  
Classroom**

Client:  
Ministry of Education,  
Maldives

Page Name:  
Truss Detail

4/29/2021

Architect: Mohamed Hassan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadrithy Atzal

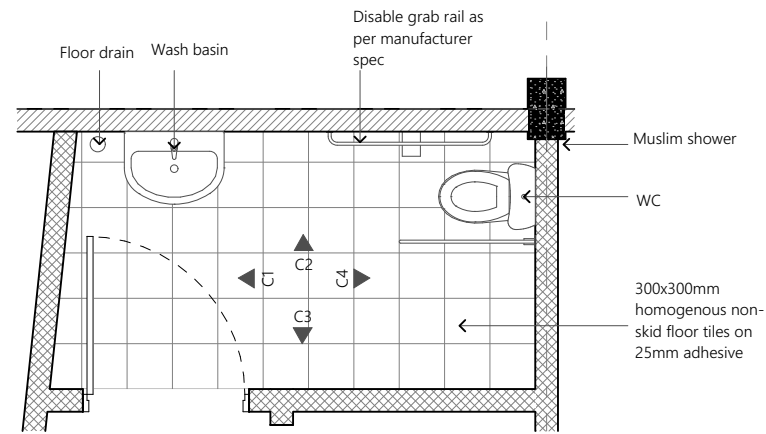


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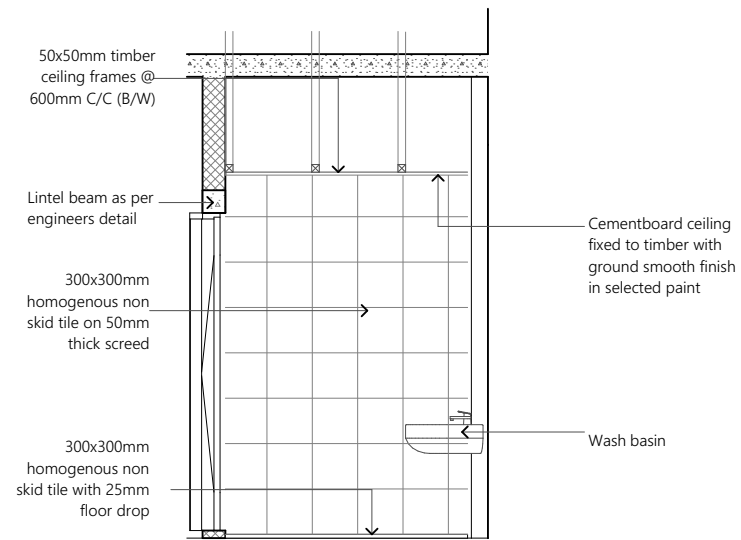
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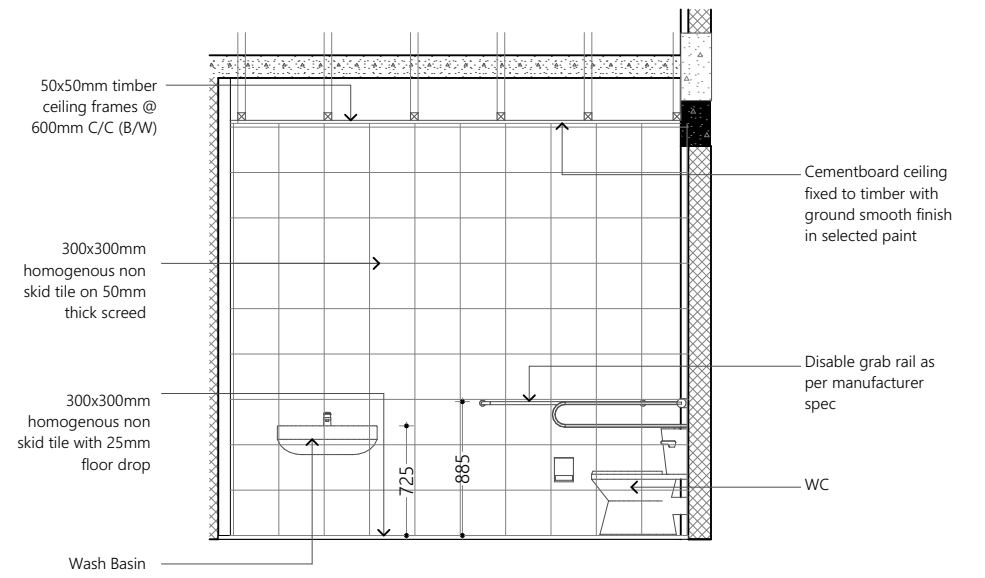




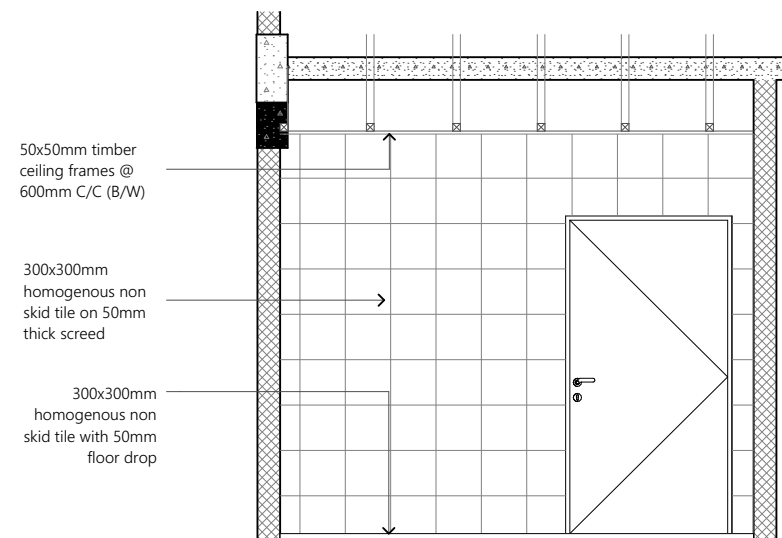
Ground Floor Toilet Details (Disable)  
1:50



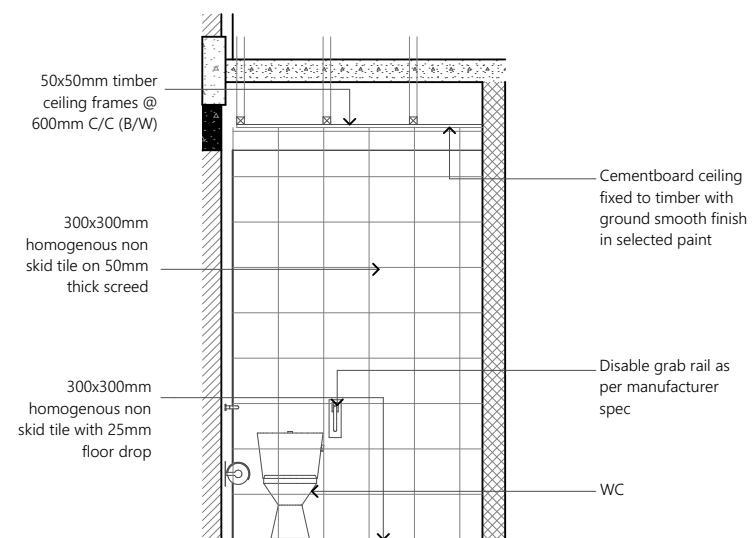
C1  
1:50



C2  
1:50



C3  
1:50



C4  
1:50

PROPOSED 03 STOREY BUILDING AT

## N.Henbadhoo School, Multipurpose Hall and 10 Classroom

Client: Ministry of Education, Maldives

Page Name: Toilet Details

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Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadhny Afzal



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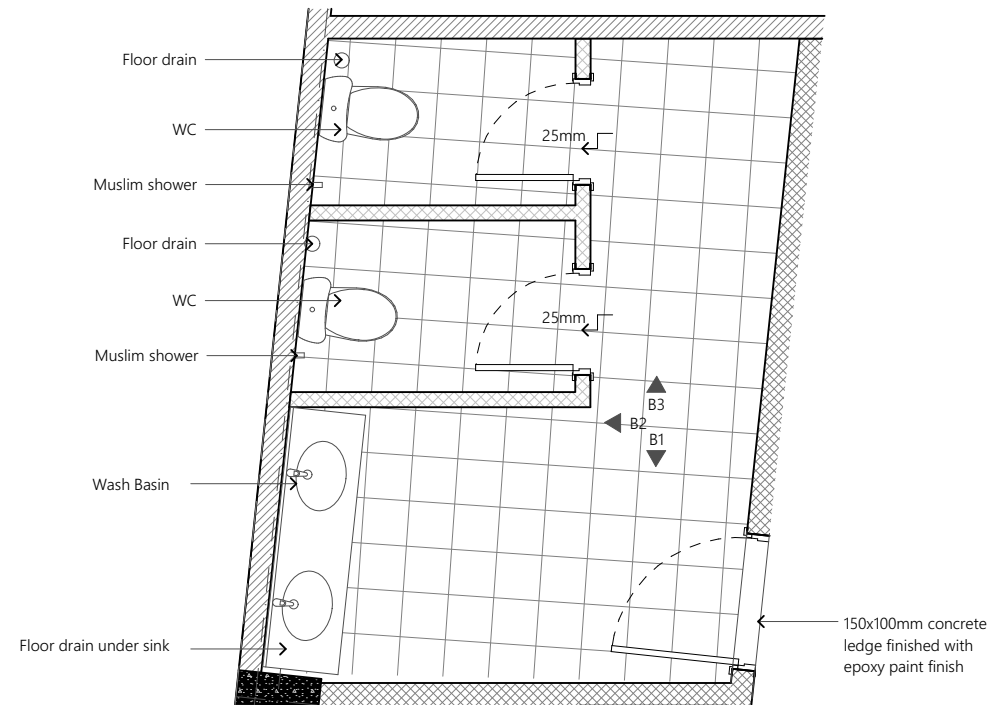
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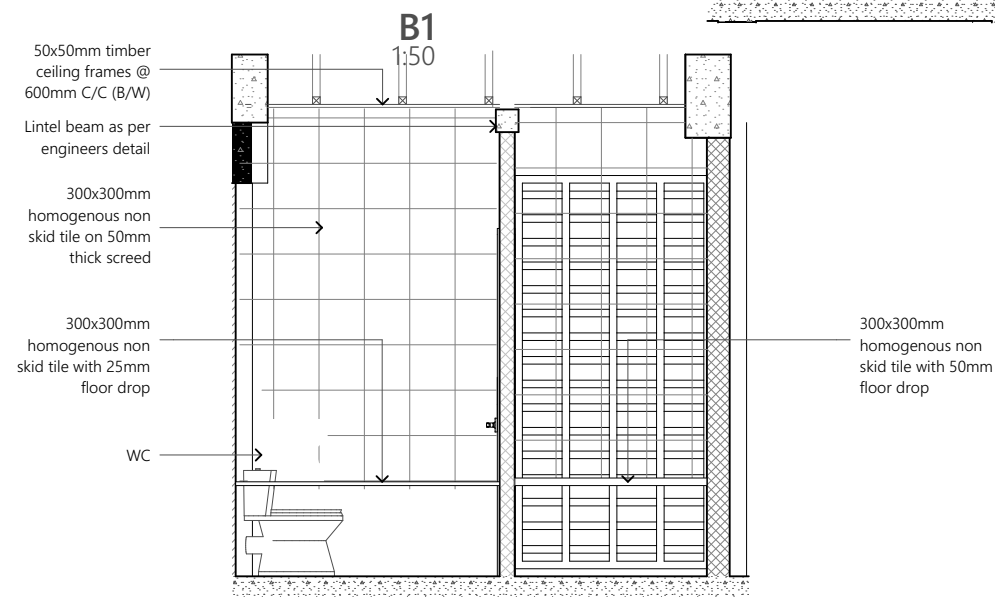
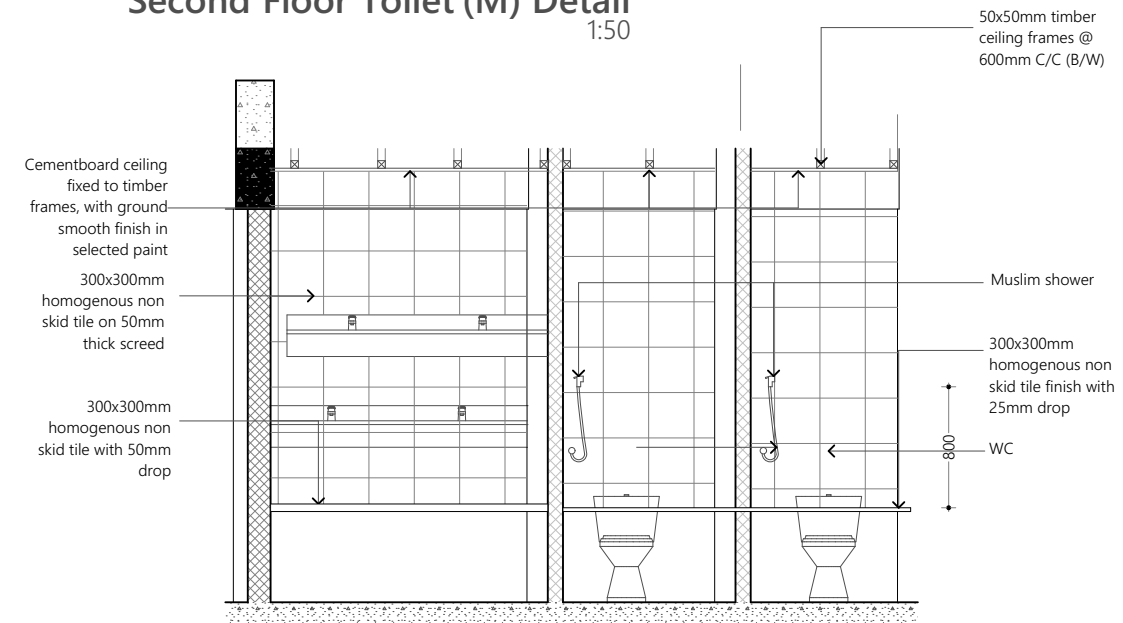
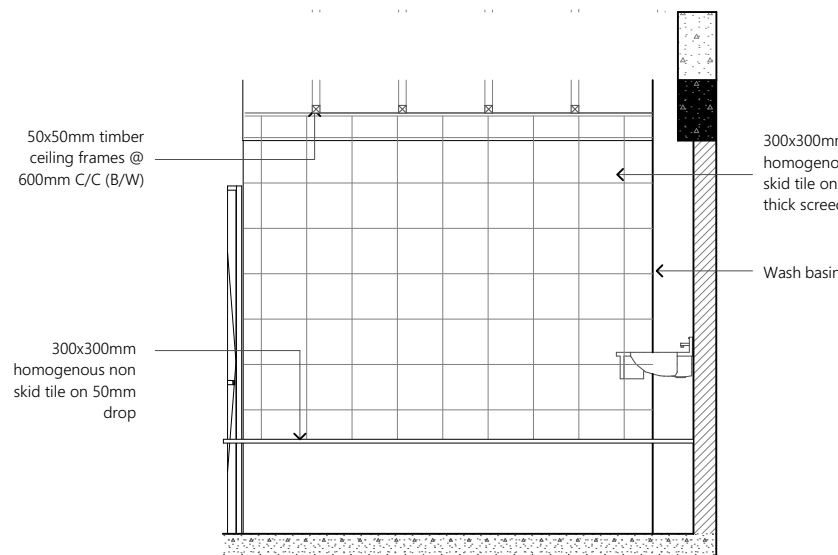
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C.01.13



**Second Floor Toilet (M) Detail**  
1:50



**B2**  
1:50

**B3**  
1:50

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo School, Multipurpose Hall and 10 Classroom**

Client: **Ministry of Education, Maldives**

Page Name: **Toilet Details**

4/29/2021

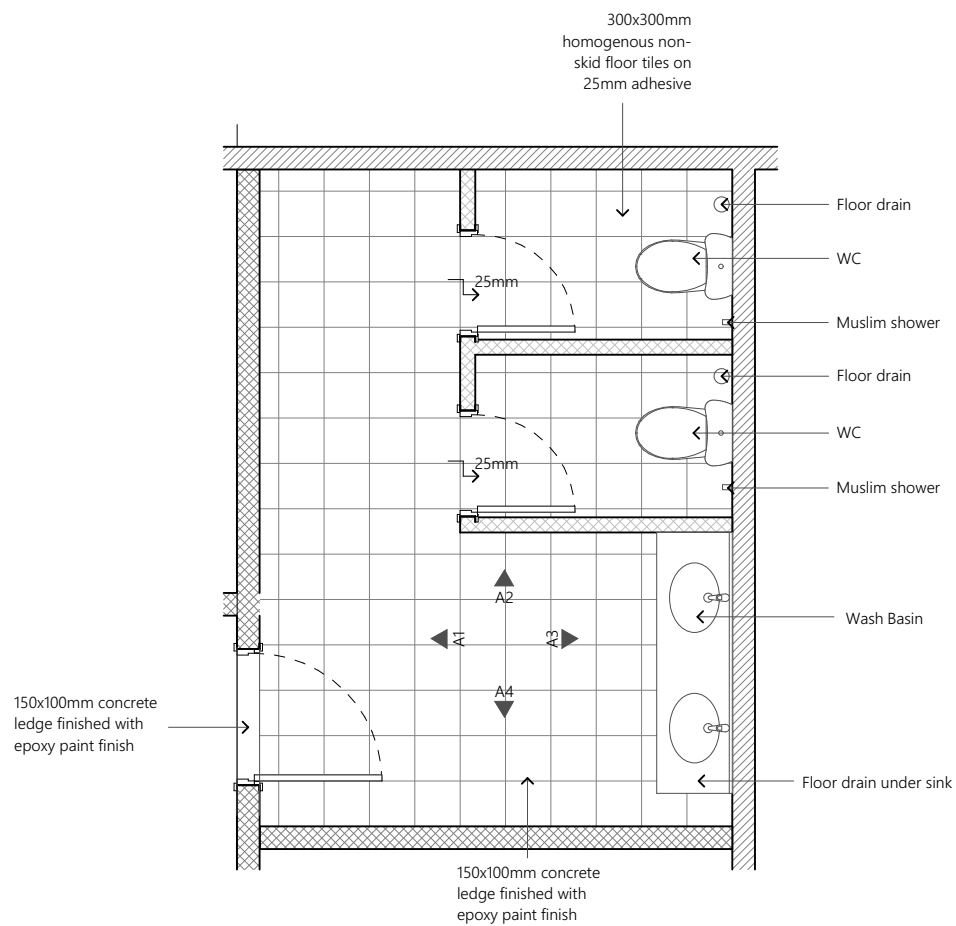
Architect: Mohamed Hassaan  
Engineer: Ihsaan Waheed  
Drawn By: Aishath Shadhny Afzal



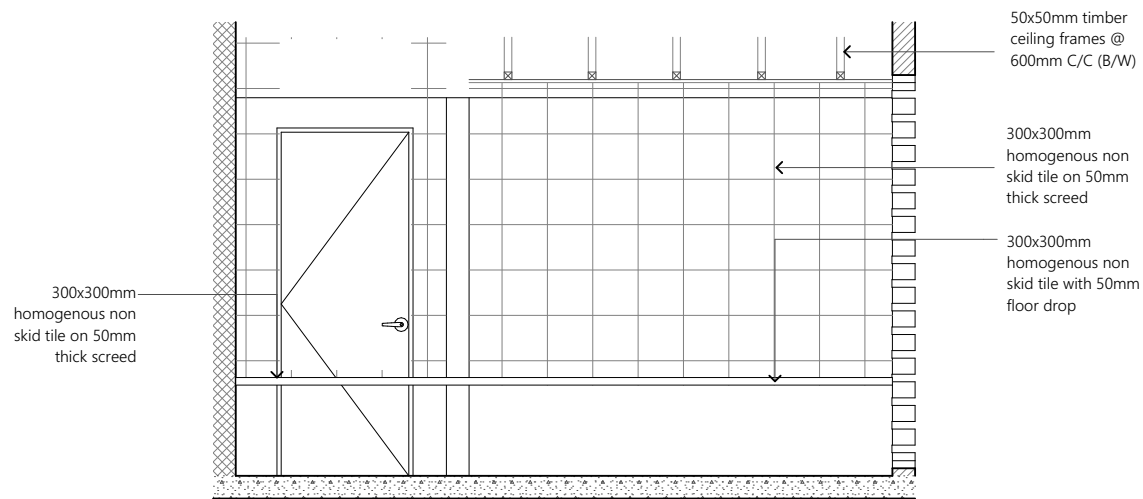
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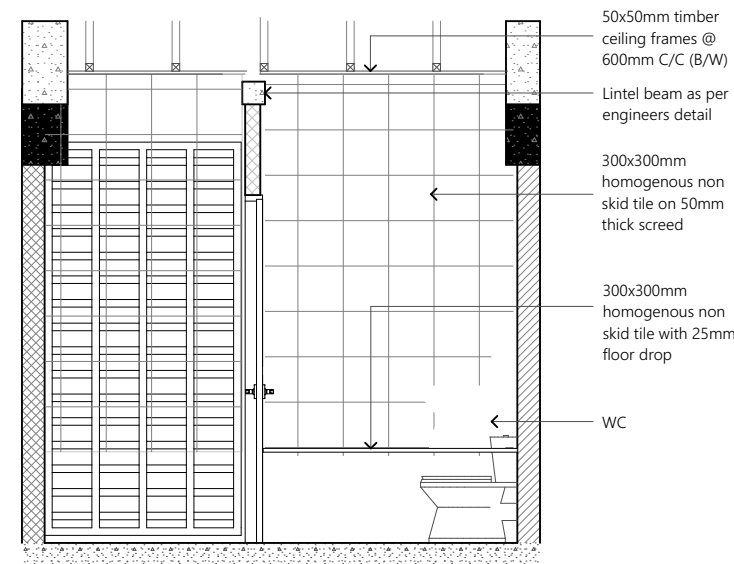
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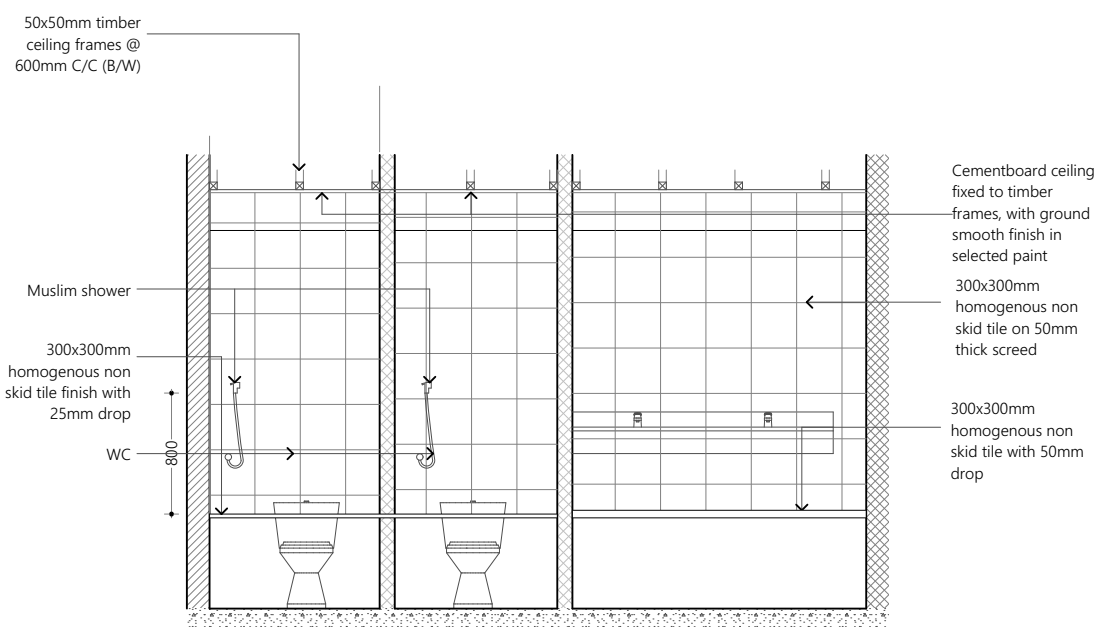
**Second Floor Toilet Details (Female)**  
1:50



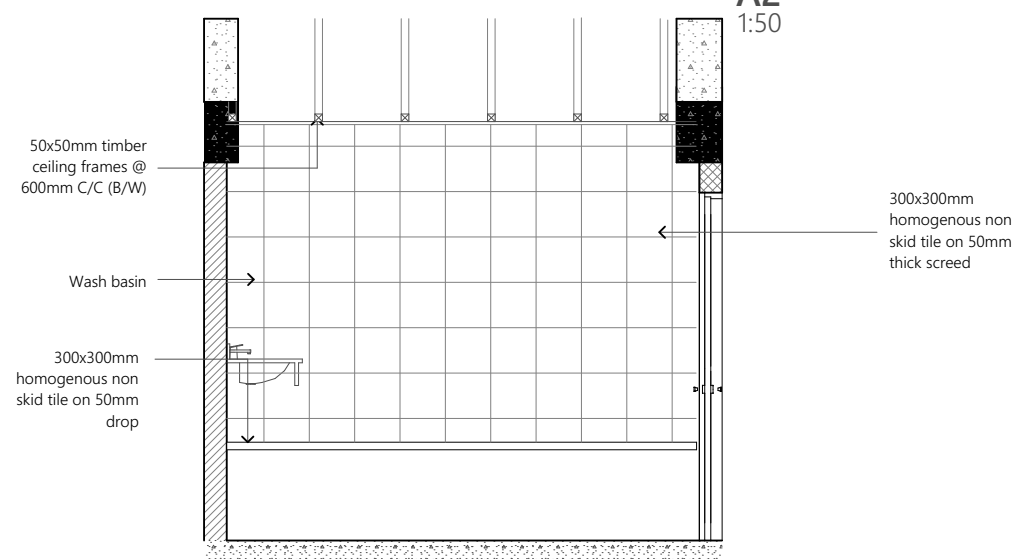
**A1**  
1:50



**A2**  
1:50



**A3**  
1:50



**A4**  
1:50

PROPOSED 03 STOREY BUILDING AT

**N.Henbadhoo School, Multipurpose Hall and 10 Classroom**

Client:  
**Ministry of Education, Maldives**

Page Name:  
**Toilet Details**

4/29/2021

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



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