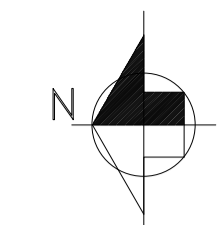
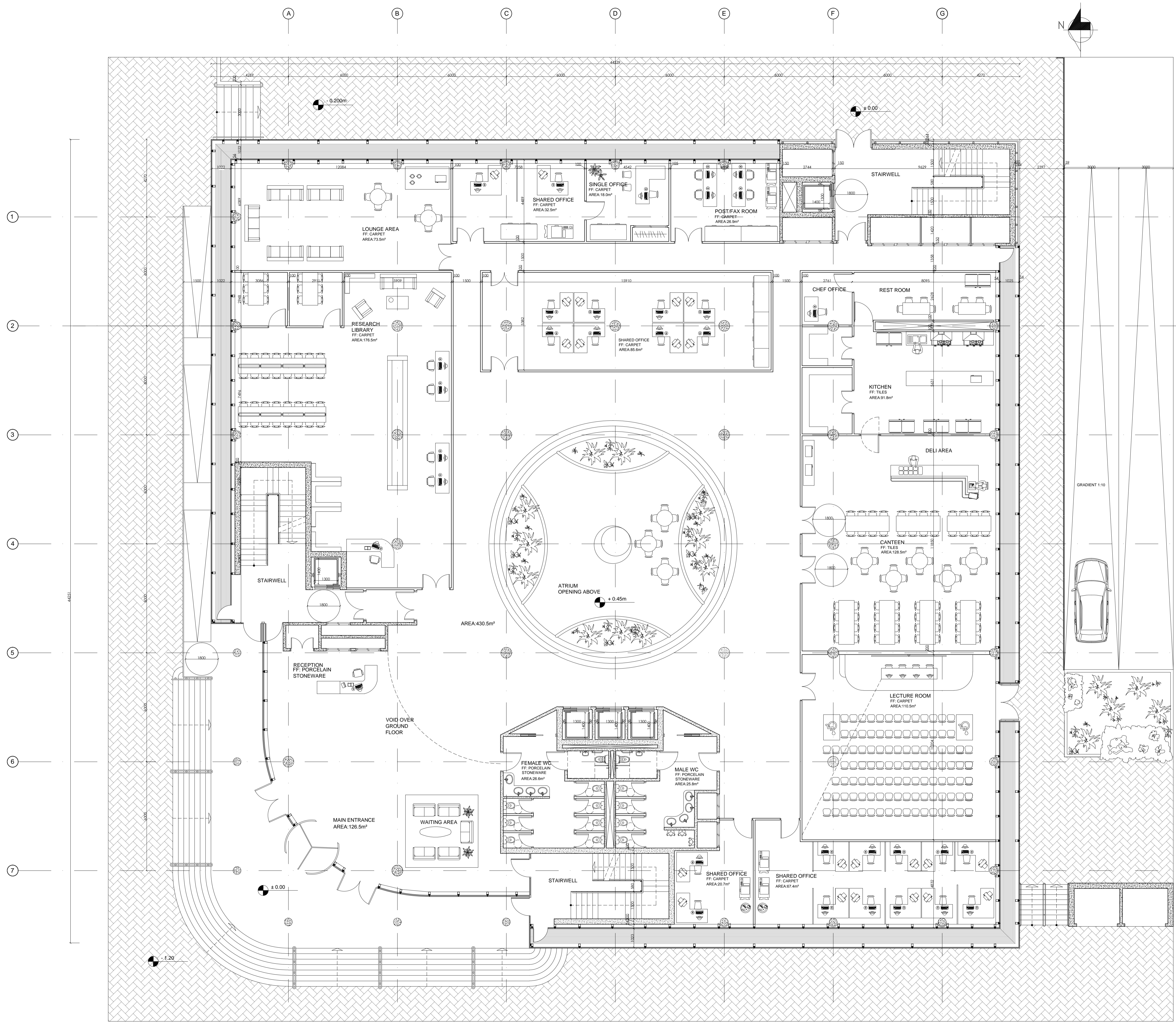




RIVERSIDE I.

IRIA XOUBANOVA MARTÍNEZ



S.1:
"Kone R3" PULLEY TYPE LIFT WITH LOADING CAPACITY OF 10 people/800 kg MAX. INTERNAL CAR DIMENSIONS: 1300 x 1400 WITH 900 mm CLEAR DOOR OPENING. CLEAR UNOBSTRUCTED AREA OF 1800 x 1800 mm AT EVERY ELEVATOR. ALL ELEVATORS CONTINUOUS TO THE BASEMENT TO THE CARPARK.

S.2:
"Ecocem GGBS" 300 mm THICK IN-SITU LOAD BEARING SHAFT CONTINUES DOWN TO BASEMENT FOUNDATION. FIRE RESISTANCE OF 60 min MINIMUM.

S.3:
REYNAER CURTAIN WALL. FIXED BY PRESSURE PLATES. FIXED TO INTERNAL R.C. COLUMNS TO MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATION. ALL REYNAERS SYSTEMS TOP HUNG WINDOW (GLASS FROM 23-34 MM) POW (GLASS FROM 22-28 MM)

S.4
ALLUCOBOND COMPOSITE PANEL CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE. SLIMLINE STEEL BRACKETS FACTORY FITTED TO ENSURE QUICK AND SAFE CONSTRUCTION. BRACKETS FIXED TO 100MM.C CHANNELS WHICH ARE BOLTED BACK TO 300 MM. R.C STRUCTURAL PROTECTED STAIR SHAFT 100MM XTRATHERM HIGH DENSITY POLYURETHANE INSULATION WITH TYVEK SUPRO BREATHER MEMBRANE.

S.5:
Ø 600 mm "Ecocem GBS" IN-SITU CONCRETE COLUMNS WITH STEEL REINFORCEMENT CONINUOUS TO BASEMENT FOUNDATION SPREAD AROUND THE BUILDING PRIMARILY AT 6 m GRID

S.6:
Ø 440 mm "Ecocem GBS" IN-SITU CONCRETE COLUMNS WITH STEEL REINFORCEMENT CONINUOUS TO BASEMENT FOUNDATION SPREAD AROUND THE BUILDING PRIMARILY AT 6 m GRID

SUSPENDED CEILING (S.7):
KNAUFF NOISE-ABSORPTION SYSTEMS. ACOUSTICS DESIGN CEILING, INCORPORATING A CLEANEO ACOUSTIC FF BOARD STRUCTURE WITH REGULAR ROUND PERFORATIONS 8/18 R AND WITH A BACKGROUND MADE UP OF WHITE, 20 MM-THICK FIBROUS WEBBING USING THE NECESSARY COMPONENTS REQUIRED FOR THE ROOM AIR-CONDITIONING, THE FIRE PROTECTION AND THE LIGHTING. IN ACCORDANCE WITH THE AIR-CONDITIONING AND VENTILATION SYSTEM IN THE CEILING SPACE, THE FIBROUS WEBBING WAS EMBEDDED IN FOIL. THE SYSTEM IS SUSPENDED BY APPROX. 80 CENTIMETRES.

INTERNAL GLAZED PARTITION SPEC (S.8):
"Rational" DOMUS 54 x 115mm WINDOW FRAME MECHANICALLY FIXED TO 150 x 150mm STUDS WITH SINGLE GLAZED UNIT AND WOODEN BEADS FIXED MECHANICALLY BACK TO PRIMARY STRUCTURE.

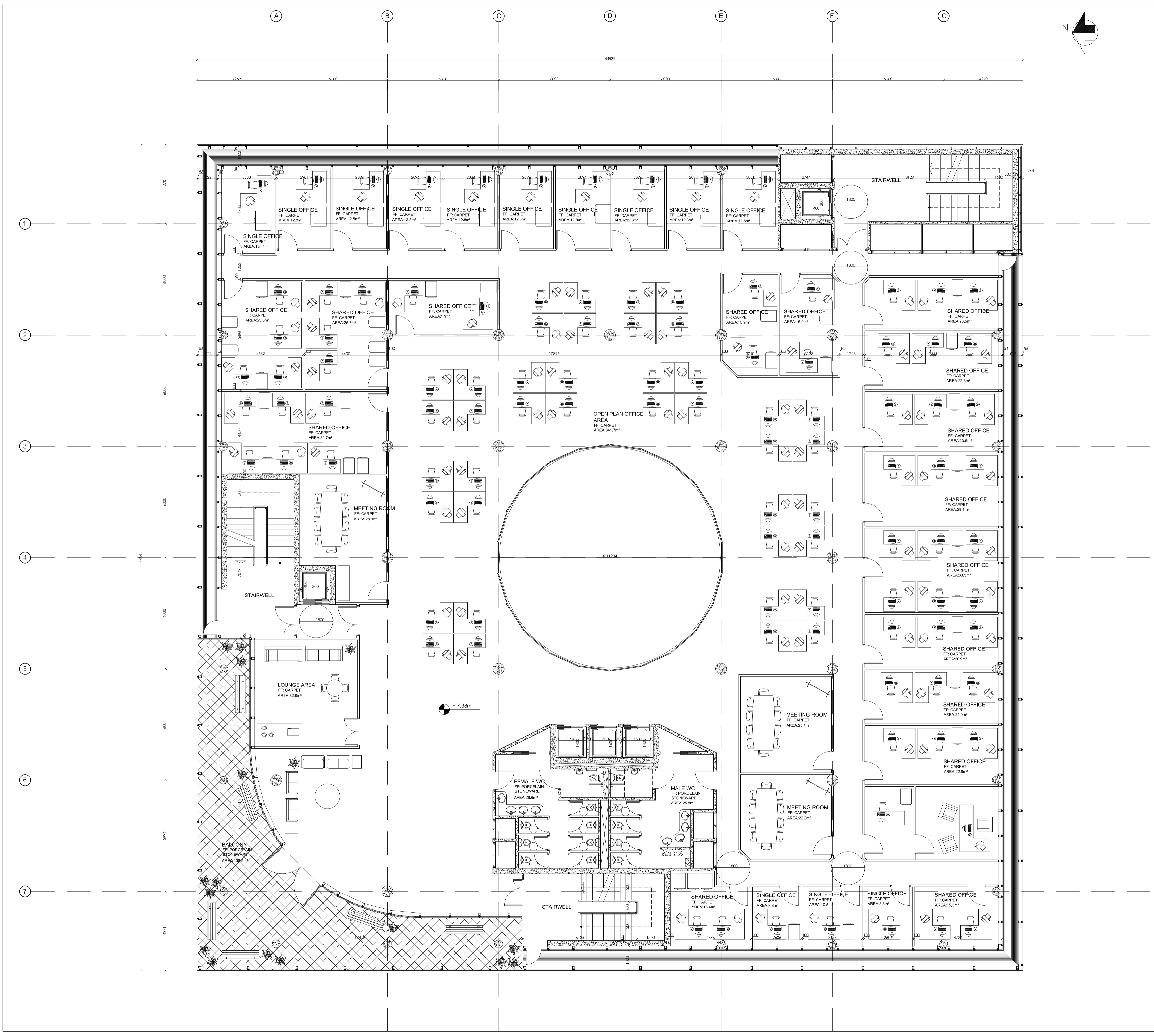
PARTITION WALL SPEC (S.8):
15 MM THICK "GYPROC FIRELINE" PLASTER BOARD EACH SIDE OF 48 MM THICK "GYPF" FRAME C" STUDS AT 600 MM C/C WITH 50 MM THICK ACOUSTIC ROLL IN CAVITY. PROVIDING 60 MIN. OF FIRE RESISTANCE. COLOR FINISH TO DESIGNERS CHOICE



BSC ARCHITECTURAL TECHNOLY YEAR 3	
Project: OFFICE BUILDING, DUBLIN	
Plan Title: GROUND FLOOR.	
Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
Scale: 1/100	Date: 14-5-2012
Checked By: Gundo Sohn, Emer Maughan	

PRODUCIDO POR UN PRODUCTO EDUCATIVO DE AUTODESK

PRODUCIDO POR UN PRODUCTO EDUCATIVO DE AUTODESK



S.1:
 'Kone R3' PULLEY TYPE LIFT WITH LOADING CAPACITY OF 10 people/800 kg MAX. INTERNAL CAR DIMENSIONS: 1300 x 1400 WITH 900 mm CLEAR DOOR OPENING. CLEAR UNOBSTRUCTED AREA OF 1800 x 1800 mm AT EVERY ELEVATOR. ALL ELEVATORS CONTINUOUS TO THE BASEMENT TO THE CARPARK.

S.2:
 'Ecocem GGBS' 300 mm THICK IN-SITU LOAD BEARING SHAFT CONTINUES DOWN TO BASEMENT FOUNDATION. FIRE RESISTANCE OF 60 min MINIMUM.

S.3:
 REYNAER CURTAIN WALL. FIXED BY PRESSURE PLATES. FIXED TO INTERNAL R.C. COLUMNS TO MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATION. ALL REYNAERS SYSTEMS TOP HUNG WINDOW (GLASS FROM 23-34 MM) POW (GLASS FROM 22-28 MM)

S.4
 ALUCOBOND COMPOSITE PANEL CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE. SLIMLINE STEEL BRACKETS FACTORY FITTED TO ENSURE QUICK AND SAFE CONSTRUCTION. BRACKETS FIXED TO 100MM C CHANNELS WHICH ARE BOLTED BACK TO 300 MM R.C STRUCTURAL PROTECTED STAIR SHAFT 100MM XTRATHERM HIGH DENSITY POLYURETHANE INSULATION WITH TYVEK SUPRO BREATHER MEMBRANE.

S.5:
 Ø 600 mm 'Ecocem GBS' IN-SITU CONCRETE COLUMNS WITH STEEL REINFORCEMENT CONINUOUS TO BASEMENT FOUNDATION SPREAD AROUND THE BUILDING PRIMARILY AT 6 m GRID

S.6:
 Ø 440 mm 'Ecocem GBS' IN-SITU CONCRETE COLUMNS WITH STEEL REINFORCEMENT CONINUOUS TO BASEMENT FOUNDATION SPREAD AROUND THE BUILDING PRIMARILY AT 6 m GRID

SUSPENDED CEILING (S.7):
 KNAUFF NOISE-ABSORPTION SYSTEMS. ACOUSTICS DESIGN CEILING. INCORPORATING A CLEANEO ACOUSTIC FF BOARD STRUCTURE WITH REGULAR ROUND PERFORATIONS 8/16 R AND WITH A BACKGROUND MADE UP OF WHITE, 20 MM-THICK FIBROUS WEBBING USING THE NECESSARY COMPONENTS REQUIRED FOR THE ROOM AIR-CONDITIONING, THE FIRE PROTECTION AND THE LIGHTING. IN ACCORDANCE WITH THE AIR-CONDITIONING AND VENTILATION SYSTEM IN THE CEILING SPACE, THE FIBROUS WEBBING WAS EMBEDDED IN FOIL. THE SYSTEM IS SUSPENDED BY APPROX. 80 CENTIMETRES.

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 'Rationel' DOMUS 54 x 115mm WINDOW FRAME MECHANICALLY FIXED TO 150 x 150mm STUDS WITH SINGLE GLAZED UNIT AND WOODEN BEADS FIXED MECHANICALLY BACK TO PRIMARY STRUCTURE.

PARTITION WALL SPEC (S.8):
 15 MM THICK 'GYPROC FIRELINE' PLASTER BOARD EACH SIDE OF 48 MM THICK 'GYPFAME C' STUDS AT 600 MM C/C WITH 50 MM THICK ACOUSTIC ROLL IN CAVITY. PROVIDING 60 MIN. OF FIRE RESISTANCE. COLOR FINISH TO DESIGNERS CHOICE



BSC ARCHITECTURAL TECHNOLY YEAR 3

Project:
 OFFICE BUILDING, DUBLIN

Plan Title:
 SECOND FLOOR.

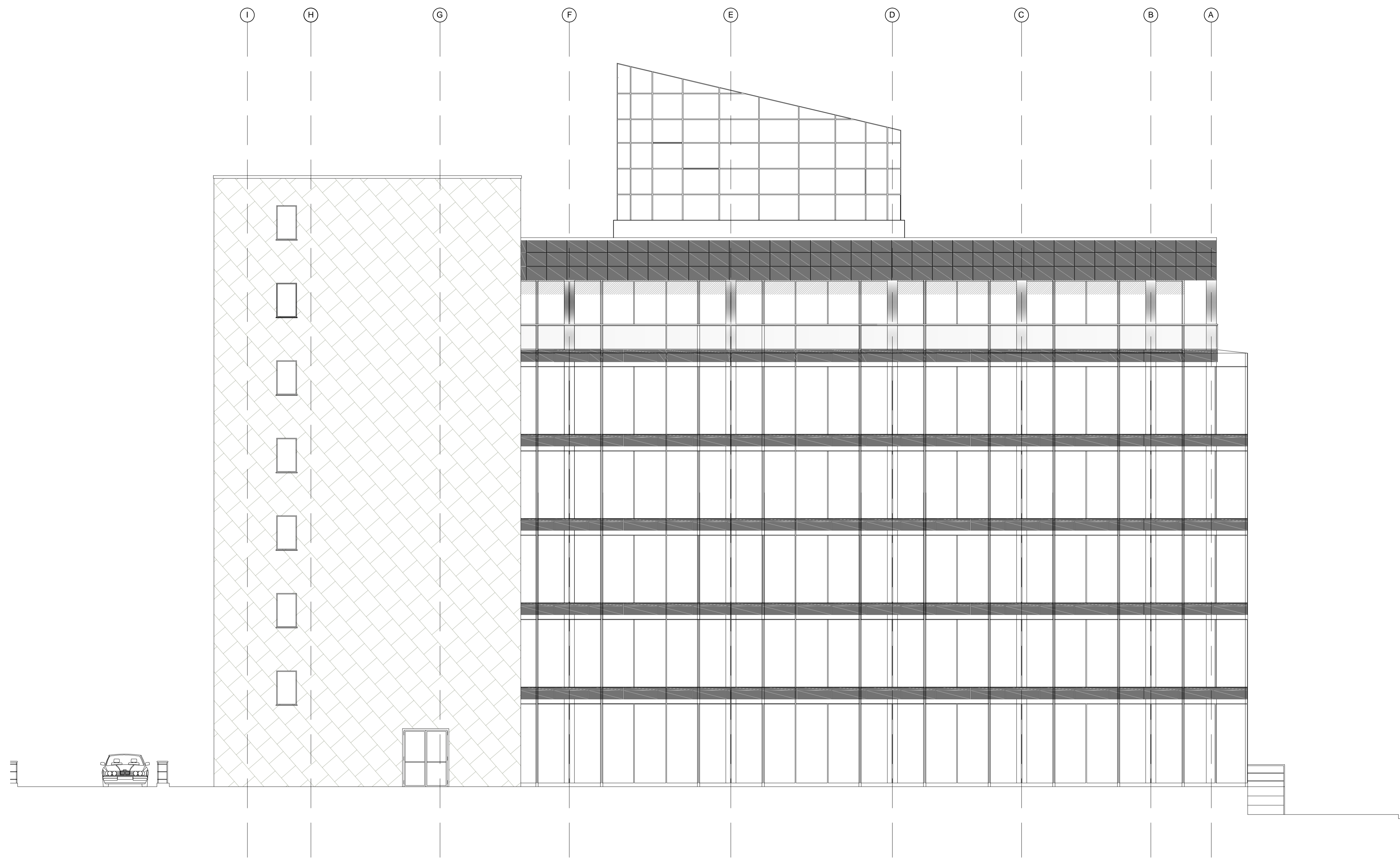
Drawn by:
 IRIA XOUBANOVA MARTINEZ

Subject:
 DESIGN AND DETAIL STUDIES 3

Scale:
 1/100

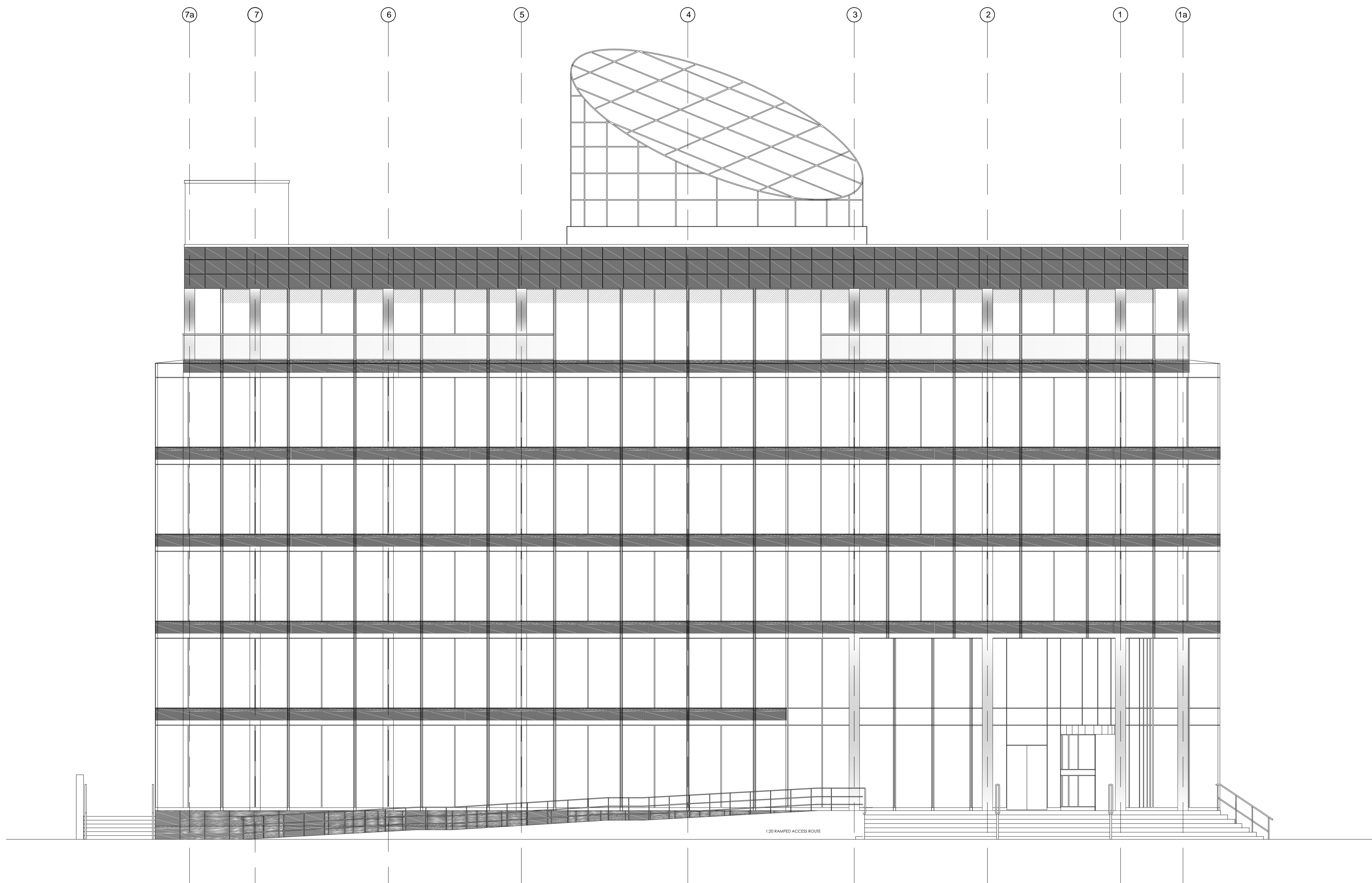
Date:
 14-5-2012

Checked By:
 Gundo Sohn, Emer Maughan



EAST ELEVATION
Scale 1:100

<p>GMT GALWAY MAYO INSTITUTE OF TECHNOLOGY INSTITIÚID TEICNEOLAÍOCHTA NA GALLAIMHE-MAIGH EO</p>	
BSC ARCHITECTURAL TECHNOLY YEAR 3	
Project: OFFICE BUILDING, DUBLIN	
Plan Title: EAST ELEVATION	
Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
Scale: 1/100	Date: 14-5-2012
Checked By: Gundo Sohn, Emer Maughan	



NORTH ELEVATION
Scale 1:100



BSC ARCHITECTURAL TECHNOLY YEAR 3

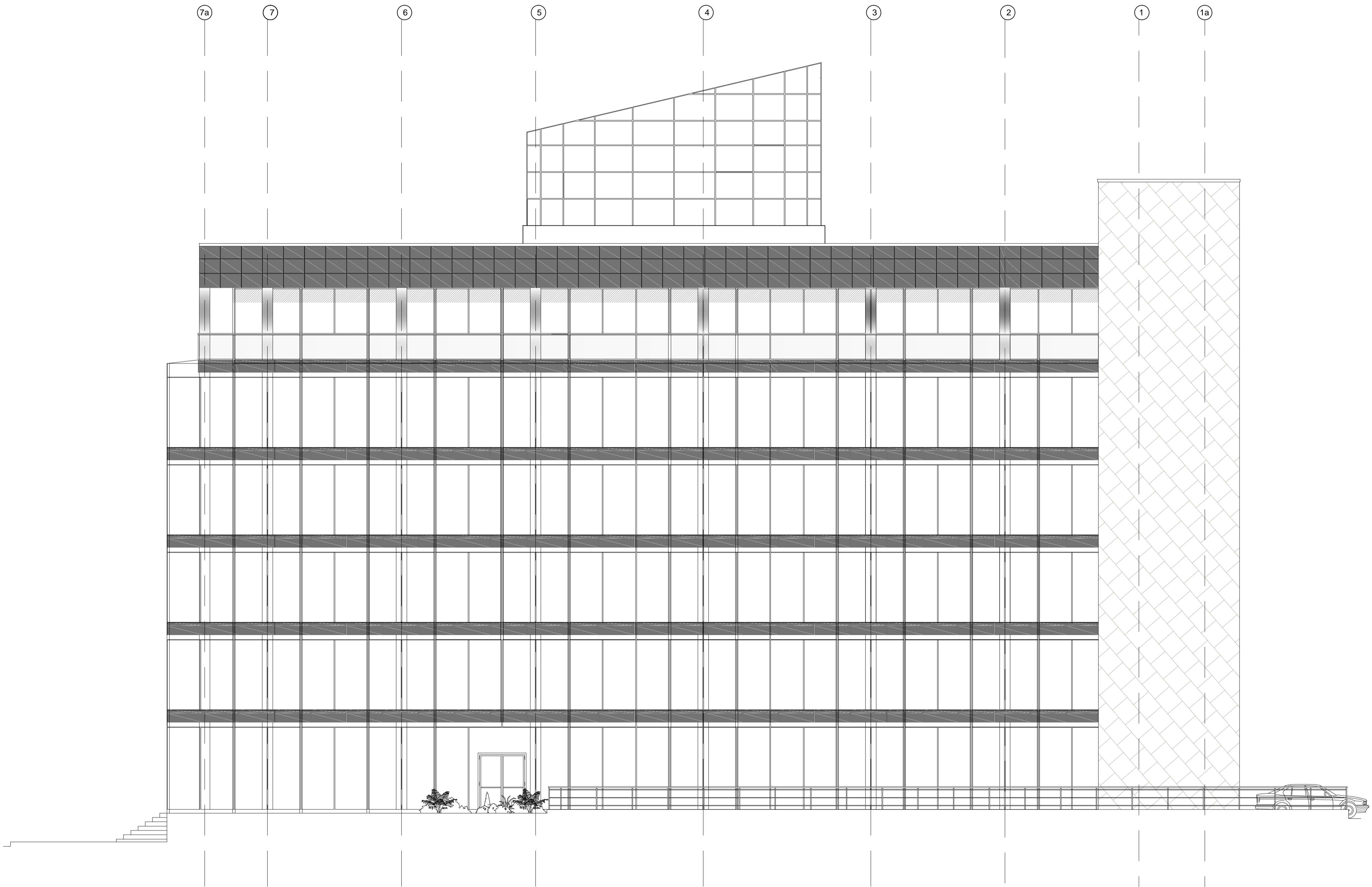
Project:
OFFICE BUILDING, DUBLIN

Plan Title:
NORTH ELEVATION


Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
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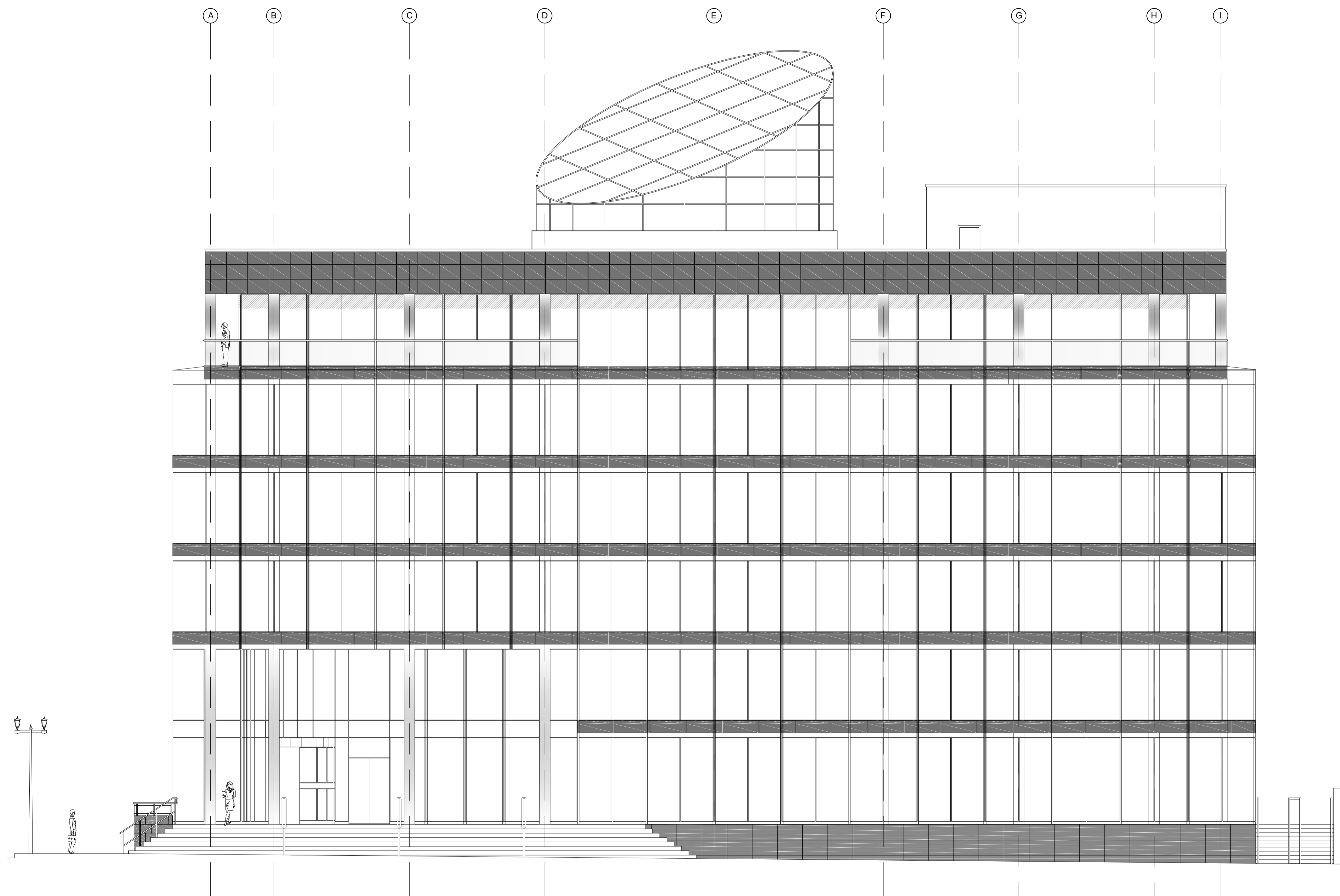
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Checked By:
Gundo Sohn, Emer Maughan



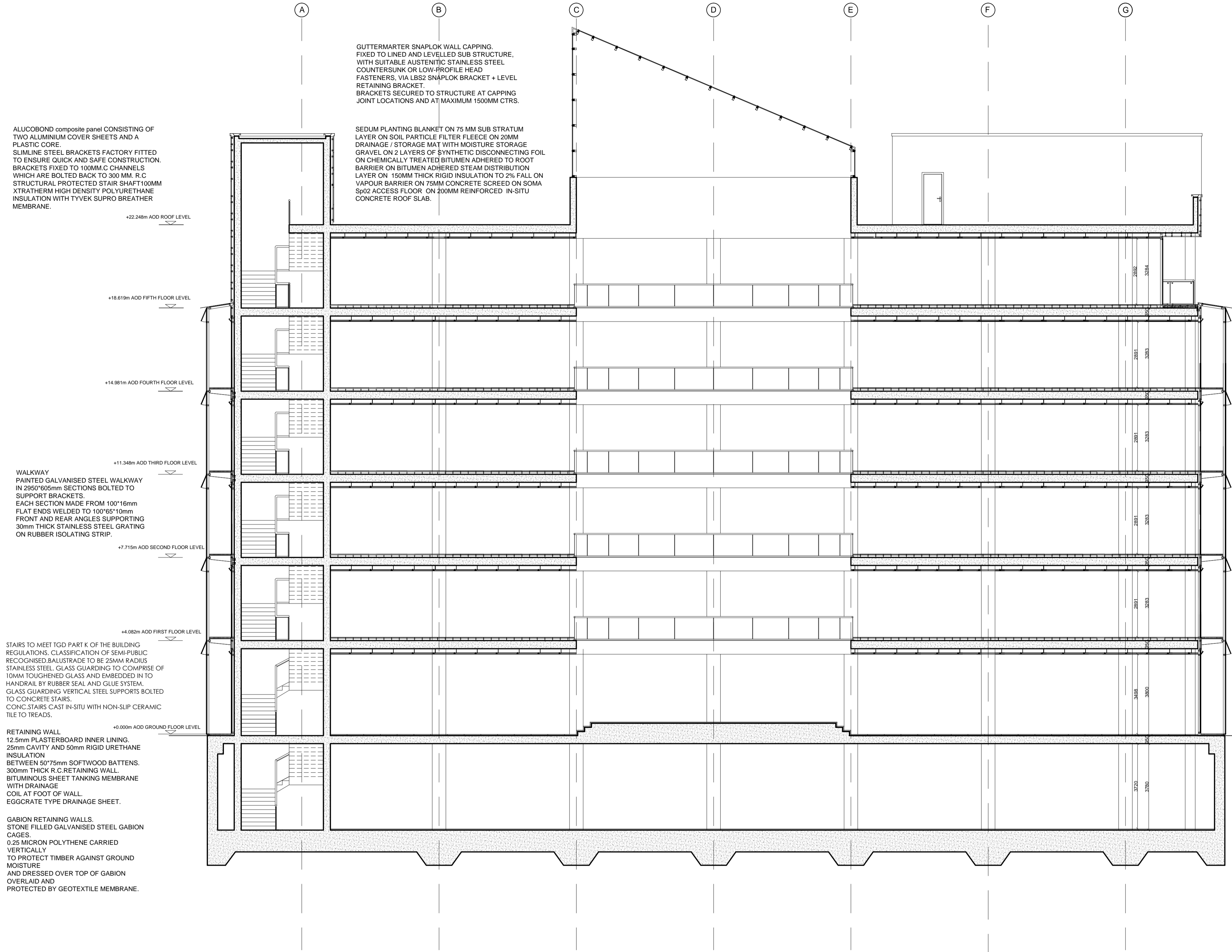
SOUTH ELEVATION
Scale 1:100

 <p>GMT GALWAY MAYO INSTITUTE OF TECHNOLOGY INSTITIUID TEICNEOLAIOCHTA NA GALLAIMHE-MAIGH EOI</p>	
BSC ARCHITECTURAL TECHNOLY YEAR 3	
Project: OFFICE BUILDING, DUBLIN	
Plan Title: SOUTH ELEVATION	
Subject: DESIGN AND DETAIL STUDIES 3	Drawn by: IRIA XOUBANOVA MARTINEZ
Date: 14-5-2012	Scale: 1/100
Checked By: Gundo Sohn, Emer Maughan	

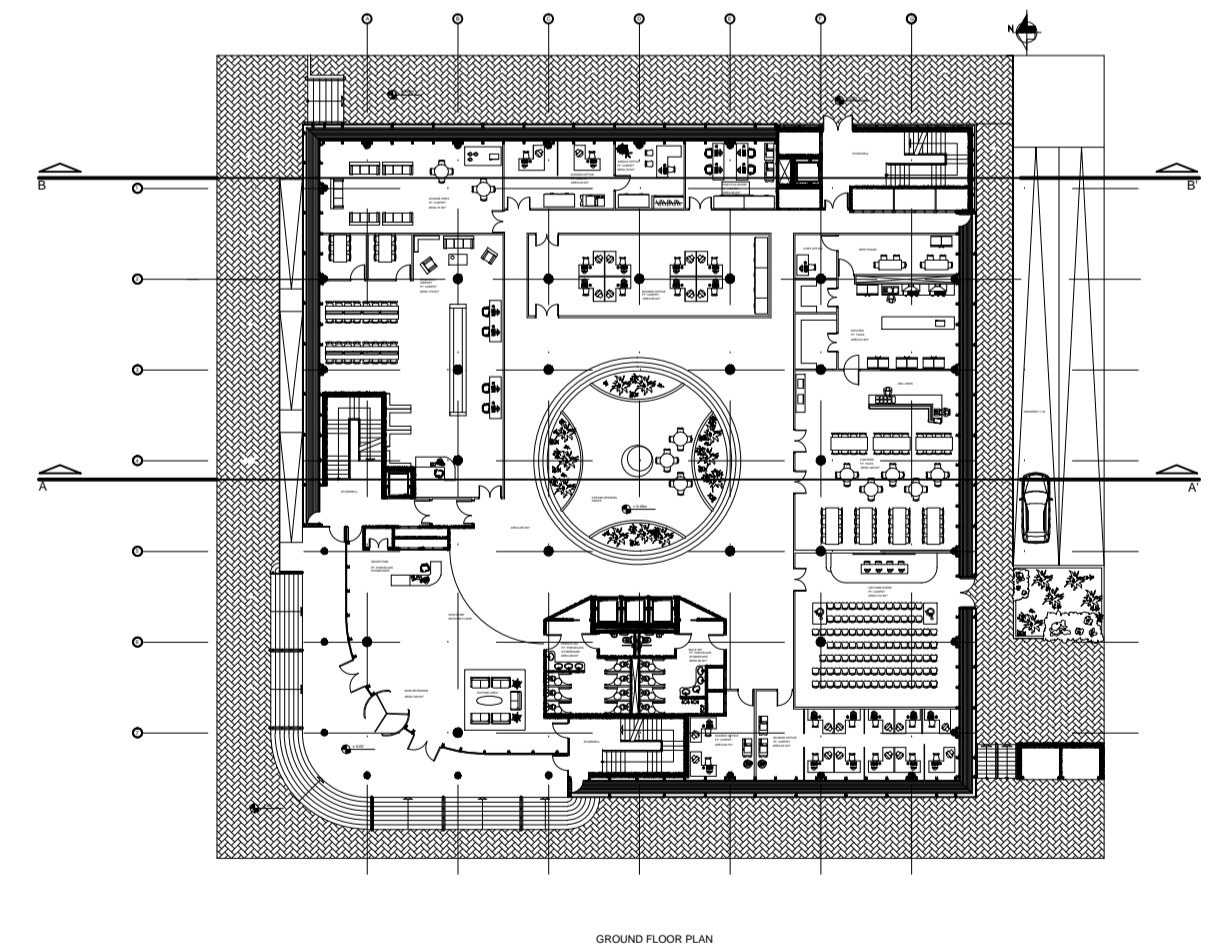


WEST ELEVATION

<p>GMIT GALWAY MAYO INSTITUTE OF TECHNOLOGY INSTITIÚD TEICNEOLAÍOCHTA NA GALLAIMHE-MAIGH EO</p>	
BSC ARCHITECTURAL TECHNOLY YEAR 3	
Project: OFFICE BUILDING, DUBLIN	
Plan Title: WEST ELEVATION	
Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
Scale: 1/100	Date: 14-5-2012
Checked By: Gundo Sohn, Emer Maughan	



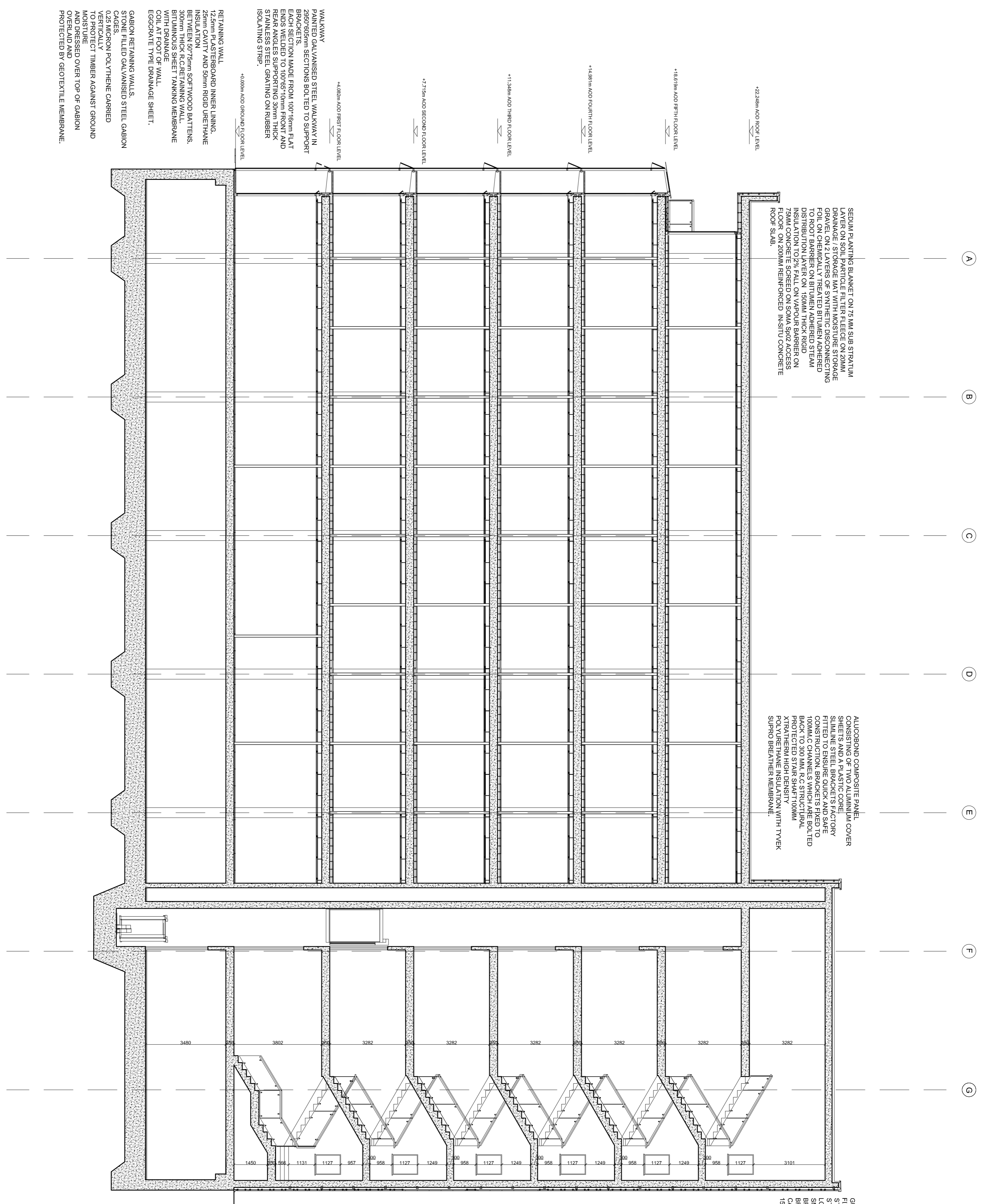
WALKWAY
 PAINTED GALVANISED
 STEEL WALKWAY IN
 2950*605mm SECTIONS
 BOLTED TO SUPPORT
 BRACKETS.
 EACH SECTION MADE
 FROM 100*16mm FLAT
 ENDS WELDED TO
 100*65*10mm FRONT
 AND REAR ANGLES
 SUPPORTING 30mm
 THICK STAINLESS
 STEEL GRATING ON
 RUBBER ISOLATING
 STRIP.



SECTION A-A'



BSC ARCHITECTURAL TECHNOLY YEAR 3	
Project: OFFICE BUILDING, DUBLIN	
Plan Title: SECTION A-A'	
Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
Scale: 1/100	Date: 14-5-2012
Checked By: Gundo Sohn, Emer Maughan	



SECTION B-B'

SEDUM PLANTING BLANKET ON 75 MM SUB STRATUM LAYER ON SOLI PARTICLE FILTER FLEECE ON 20MM GRAVEL ON 2 LAYERS OF SYNTHETIC DISCONNECTING POL ON CHEMICALLY TREATED BITUMEN ADHERED TO ROOT BARRIER ON BITUMEN ADHERED STEAM INSULATION TO 2% FALL ON VAPOUR BARRIER ON 75MM CONCRETE SCREED ON SQA S102 ACCESS FLOOR ON 200MM REINFORCED IN-SITU CONCRETE FLOOR SLAB.

AUTOBOND COMPOSITE PANEL CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE FACTORY FILLED STEEL BRACKET'S FACTORY CONSTRUCTION BRACKETS FIXED TO 100MM C CHANNELS WHICH ARE BOLTED TO 300MM STAINLESS STEEL CHANNELS WITH 100MM POLYURETHANE HIGH DENSITY SUPRO BREATHER MEMBRANE.

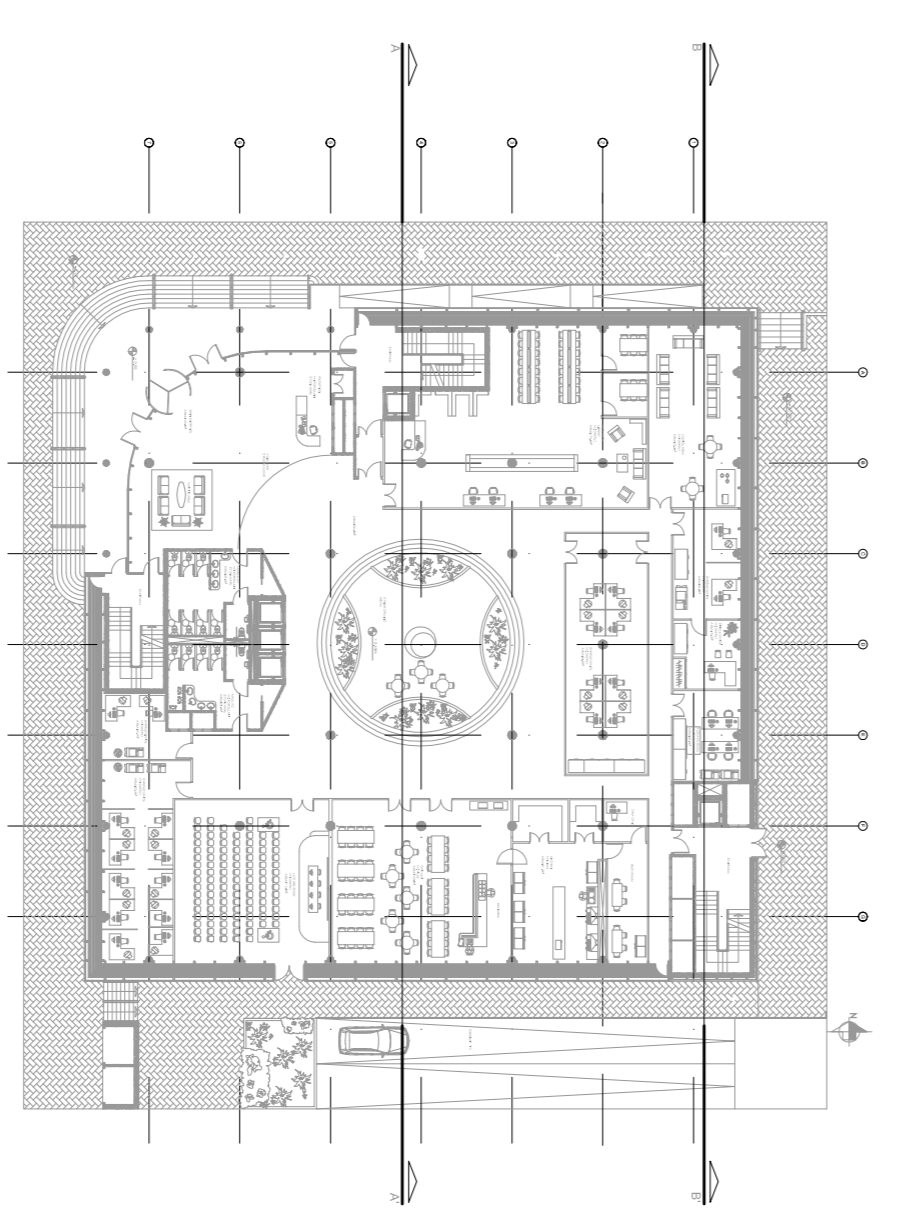
GUTTERWATER SNIPE/LOK WALL CAPPING. STRUCTURE WITH SUITABLE AUSTENITIC STAINLESS STEEL COUNTERSUNK OR LOW PROFILE HEAD FASTENERS. WALLS2 BRACKET BRACKET LEVEL RETAINING BRACKETS SECURED TO STRUCTURE AT CAPPING JOINT LOCATIONS AND AT MAXIMUM 1500MM CRTS.

WALKWAY 75mm GALVANISED STEEL WALKWAY IN 2500x950mm SECTIONS BOLTED TO SUPPORT BRACKETS. EACH SECTION MADE FROM 100x18mm FLAT BAR WITH 10mm RADIUS ROUNDED REAR ANGLES SUPPORTING 30mm THICK STAINLESS STEEL GRATING ON RUBBER ISOLATING STRIP.

RETAINING WALL 125mm PLASTERBOARD INNER LINING, 25mm CAVITY AND 50mm RIGID URETHANE INSULATION WITH 75mm SOFTWOOD BATTENS 300mm THICK R.C. RETAINING WALL BITUMINOUS SHEET TANKING MEMBRANE WITH DRAINAGE WALL AND DRAINAGE CHANNELS TO EGGRATE TYPE DRAINAGE SHEET.

AUTOBOND COMPOSITE PANEL CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE FACTORY FILLED STEEL BRACKETS FACTORY CONSTRUCTION BRACKETS FIXED TO 100MM C CHANNELS WHICH ARE BOLTED TO 300MM STAINLESS STEEL CHANNELS WITH 100MM POLYURETHANE HIGH DENSITY SUPRO BREATHER MEMBRANE.

STARTS TO MEET TOP PART OF THE BUILDING REGULATIONS. CLASSIFICATION OF SEMI-PUBLIC BUILDING. 25MM RADIUS STAINLESS STEEL GLASS GUARDING TO COVER OF 10MM TONGUED AND GROUED GLASS AND EMBEDDED AND GLEU VERTICAL GLASS GUARDING VERTICAL STEEL BRACKETS BOLTED TO CONCRETE CONC. JAMS CAST IN-SITU WITH NON-SLIP CERAMIC TILE TO REGRAS.



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BSC ARCHITECTURAL TECHNOLOGY YEAR 3

Project: OFFICE BUILDING, DUBLIN

Plan Title: SECTION B-B'

Drawn by: IRJA XOUBANOVA MARTINEZ

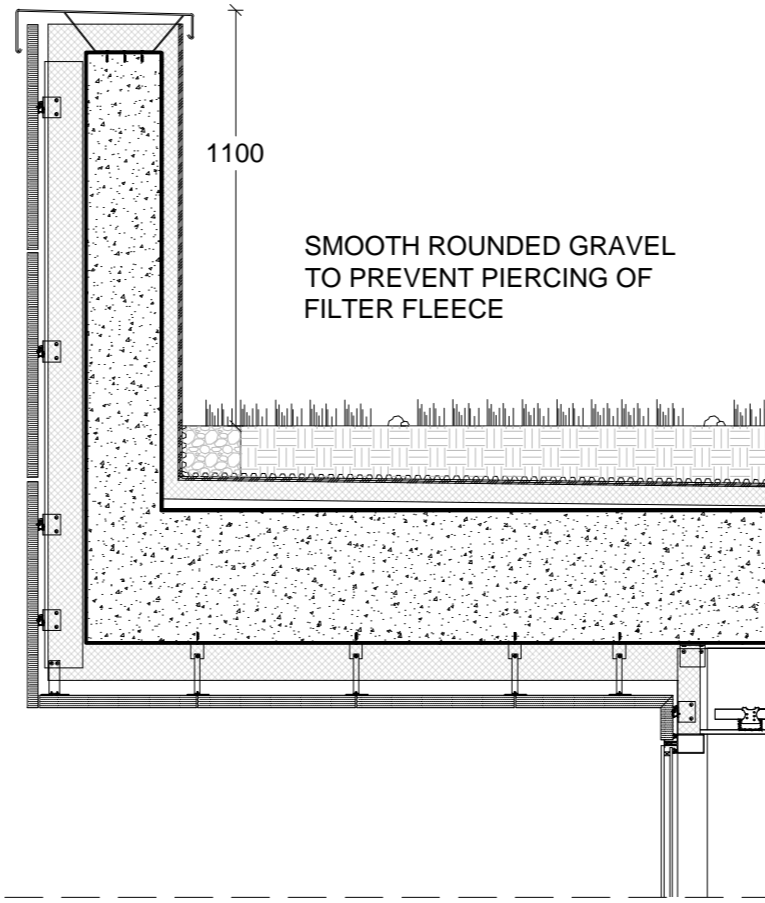
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Checked by: Grand John, Emer Naughtan

Subject: DESIGN AND DETAIL STUDIES 3

Date: 14-5-2012

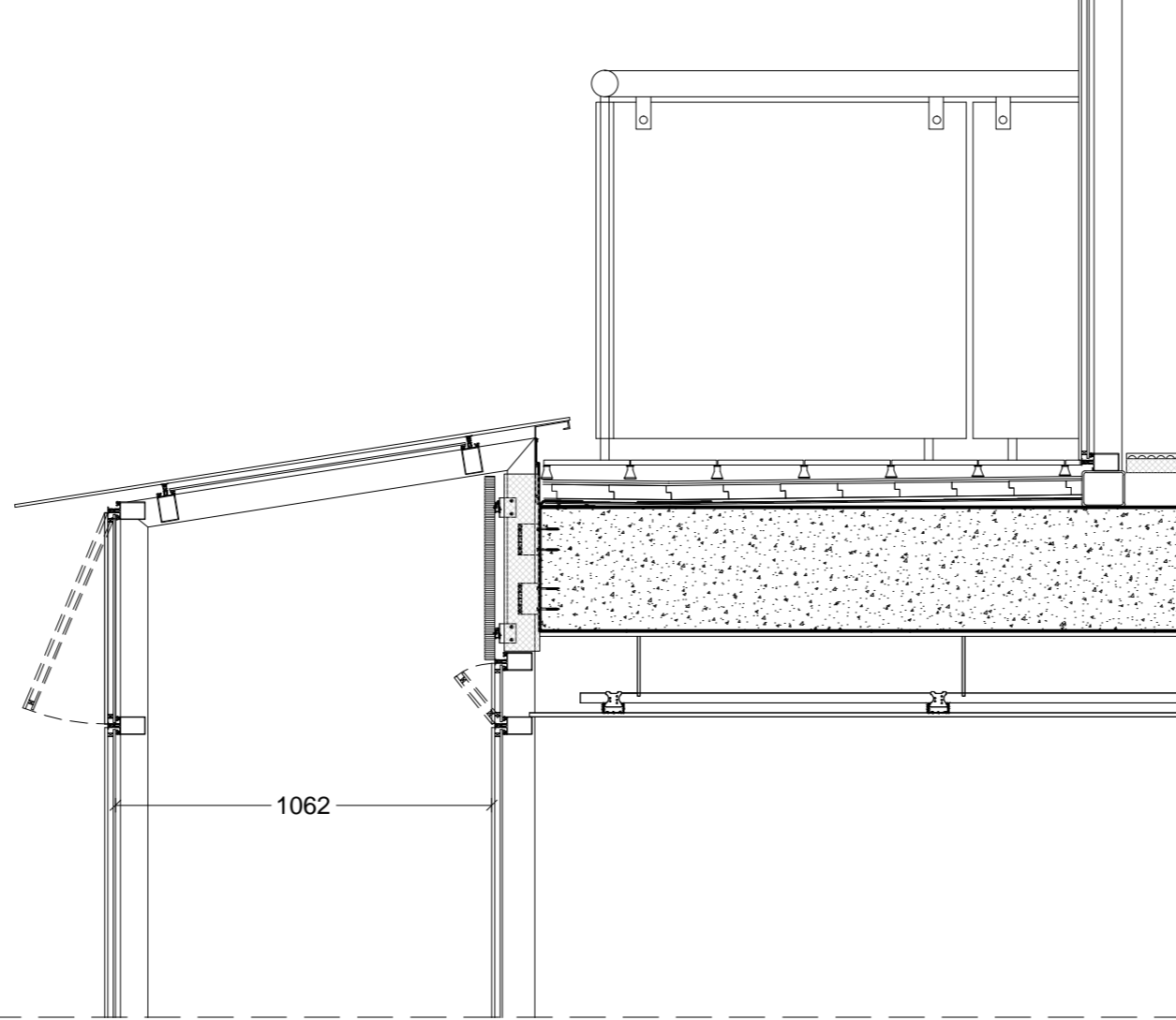
+22.248m AOD ROOF LEVEL



SEDUM PLANTING BLANKET ON 75 MM SUB STRATUM LAYER ON SOIL PARTICLE FILTER FLEECE ON 20MM DRAINAGE / STORAGE MAT WITH MOISTURE STORAGE GRAVEL ON 2 LAYERS OF SYNTHETIC DISCONNECTING FOIL ON CHEMICALLY TREATED BITUMEN ADHERED TO ROOT BARRIER ON BITUMEN ADHERED STEAM DISTRIBUTION LAYER ON 150MM THICK RIGID INSULATION TO 2% FALL ON VAPOUR BARRIER ON 75MM CONCRETE SCREED ON SOMA Sp02 ACCESS FLOOR ON 200MM REINFORCED IN-SITU CONCRETE ROOF SLAB.

E 1:20

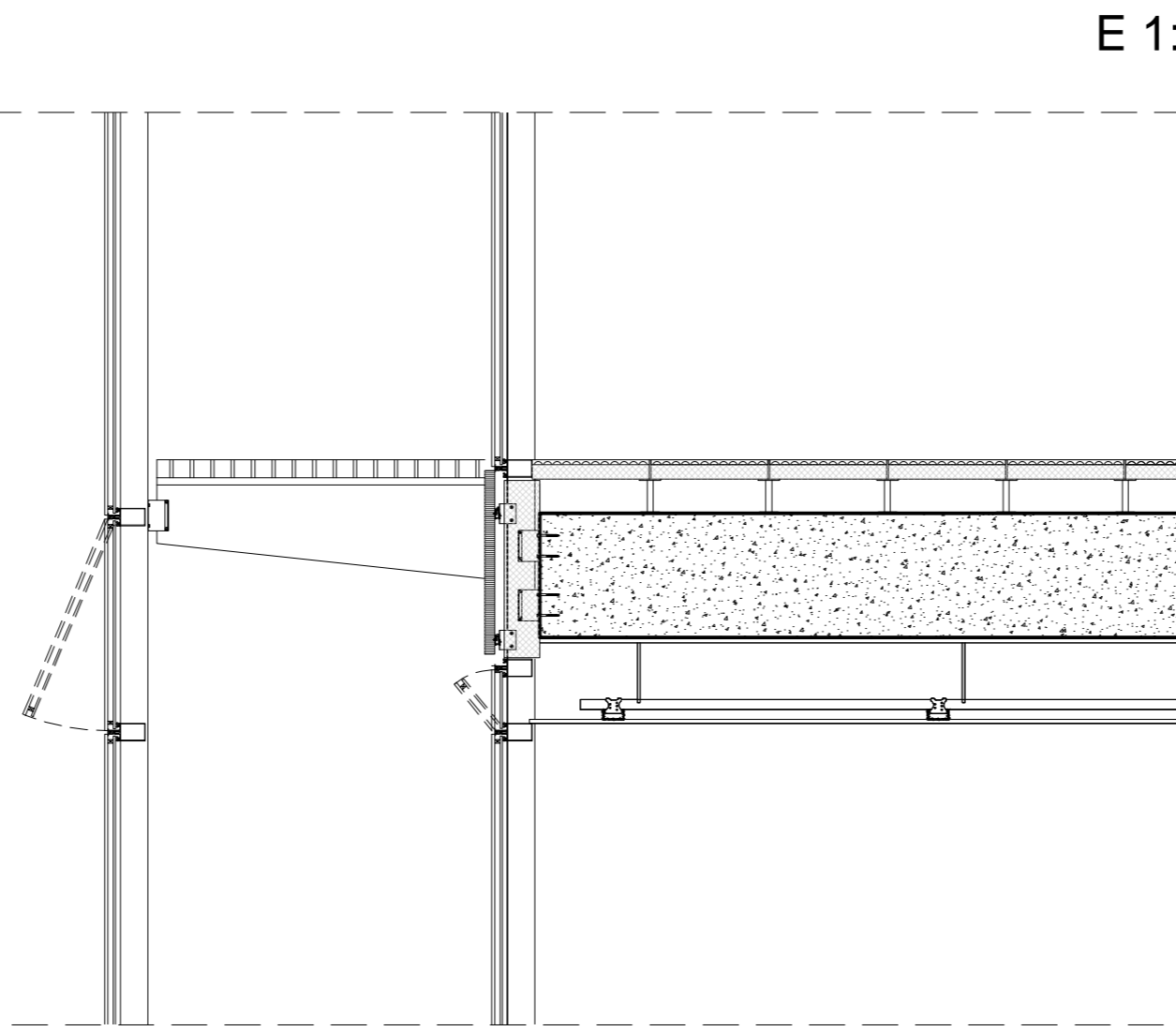
+18.619m AOD FIFTH FLOOR LEVEL



REYNAER CURTAIN WALL FIXED BY PRESSURE PLATES FIXED TO INTERNAL R.C. COLUMNS TO MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATION. ALL REYNAERS SYSTEMS TOP HUNG WINDOW (GLASS FROM 23-34 MM) POW (GLASS FROM 22-28 MM)

E 1:20

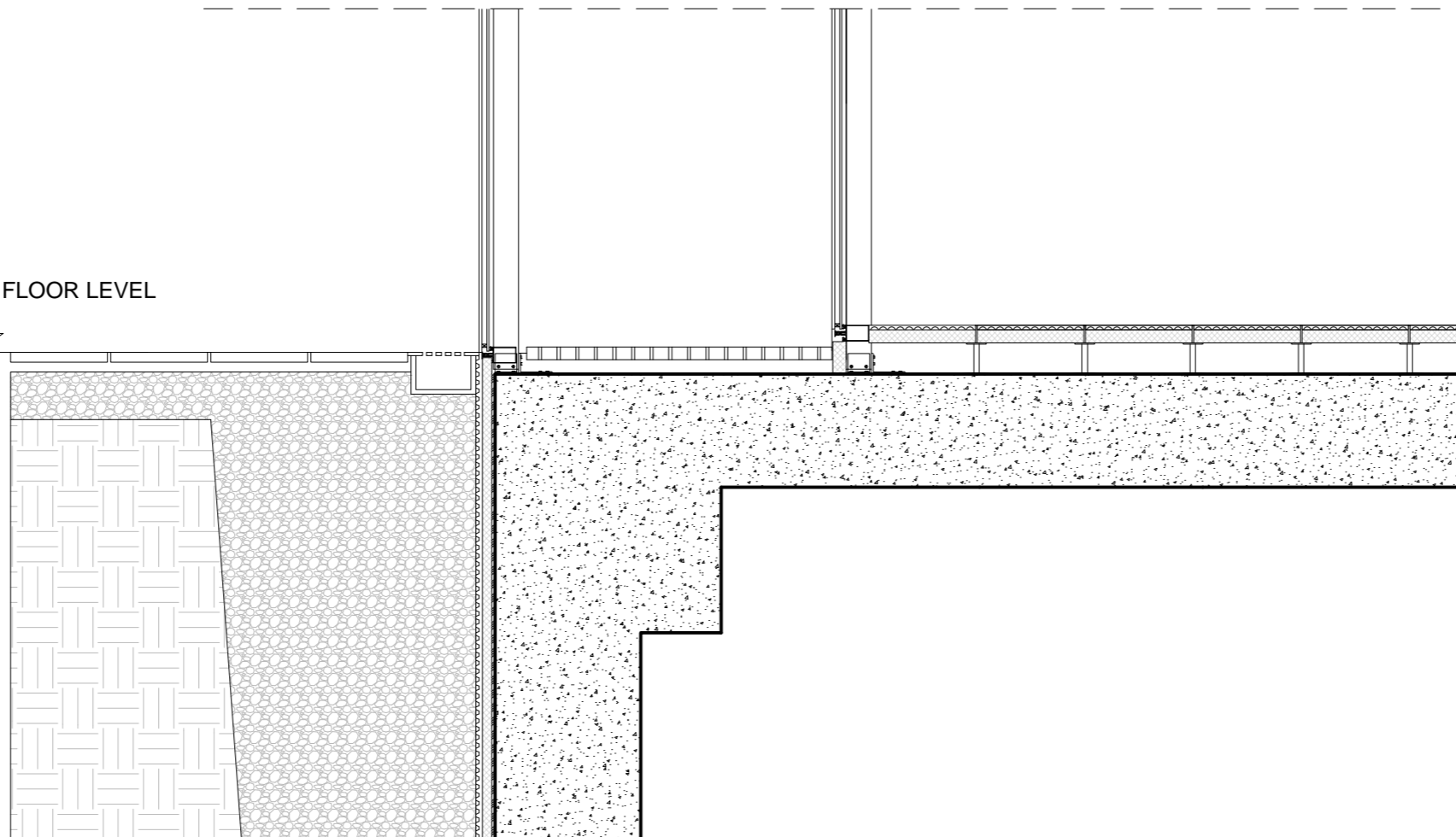
+4.082m AOD FIRST FLOOR LEVEL



WALKWAY PAINTED GALVANISED STEEL WALKWAY IN 2950*605mm SECTIONS BOLTED TO SUPPORT BRACKETS. EACH SECTION MADE FROM 100*16mm FLAT ENDS WELDED TO 100*65*10mm FRONT AND REAR ANGLES SUPPORTING 30mm THICK STAINLESS STEEL GRATING ON RUBBER ISOLATING STRIP.

E 1:20

+0.000m AOD GROUND FLOOR LEVEL



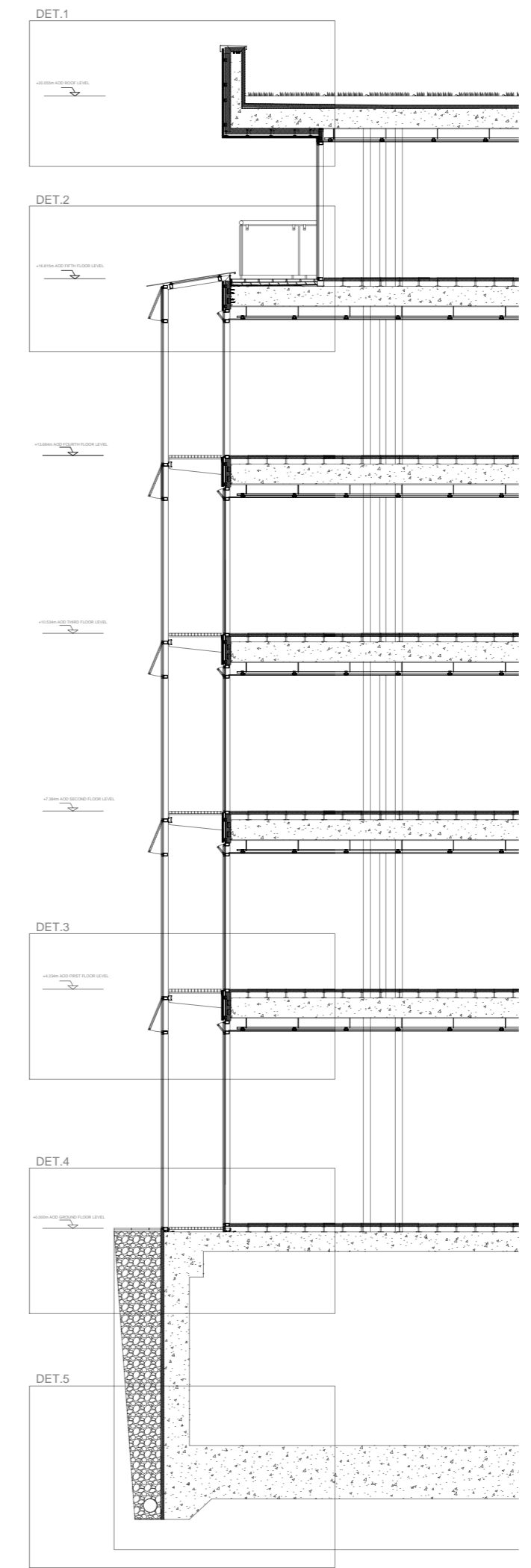
STAIRS TO MEET TGD PART K OF THE BUILDING REGULATIONS. CLASSIFICATION OF SEMI-PUBLIC RECOGNISED. BALUSTRADE TO BE 25MM RADIUS STAINLESS STEEL GLASS GUARDING TO COMPRISE OF 10MM TOUGHENED GLASS AND EMBEDDED IN TO HANDRAIL BY RUBBER SEAL AND GLUE SYSTEM. GLASS GUARDING VERTICAL STEEL SUPPORTS BOLTED TO CONCRETE STAIRS. CONC. STAIRS CAST IN-SITU WITH NON-SLIP CERAMIC TILE TO TREADS.

E 1:20

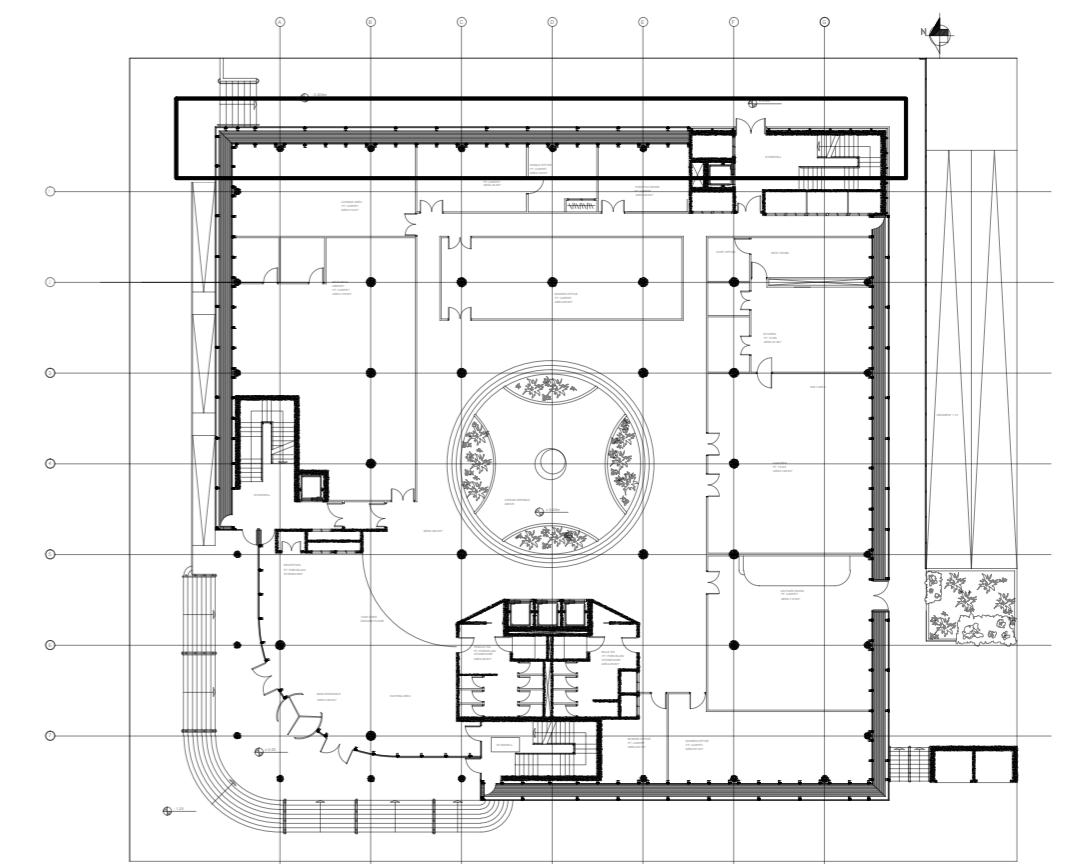
RETAINING WALL 12.5mm PLASTERBOARD INNER LINING. 25mm CAVITY AND 50mm RIGID URETHANE INSULATION BETWEEN 50*75mm SOFTWOOD BATTENS. 300mm THICK R.C. RETAINING WALL. BITUMINOUS SHEET TANKING MEMBRANE WITH DRAINAGE COIL AT FOOT OF WALL. EGGCRATE TYPE DRAINAGE SHEET.

GABION RETAINING WALLS. STONE FILLED GALVANISED STEEL GABION CAGES. 0.25 MICRON POLYTHENE CARRIED VERTICALLY TO PROTECT TIMBER AGAINST GROUND MOISTURE AND DRESSED OVER TOP OF GABION OVERLAID AND PROTECTED BY GEOTEXTILE MEMBRANE.

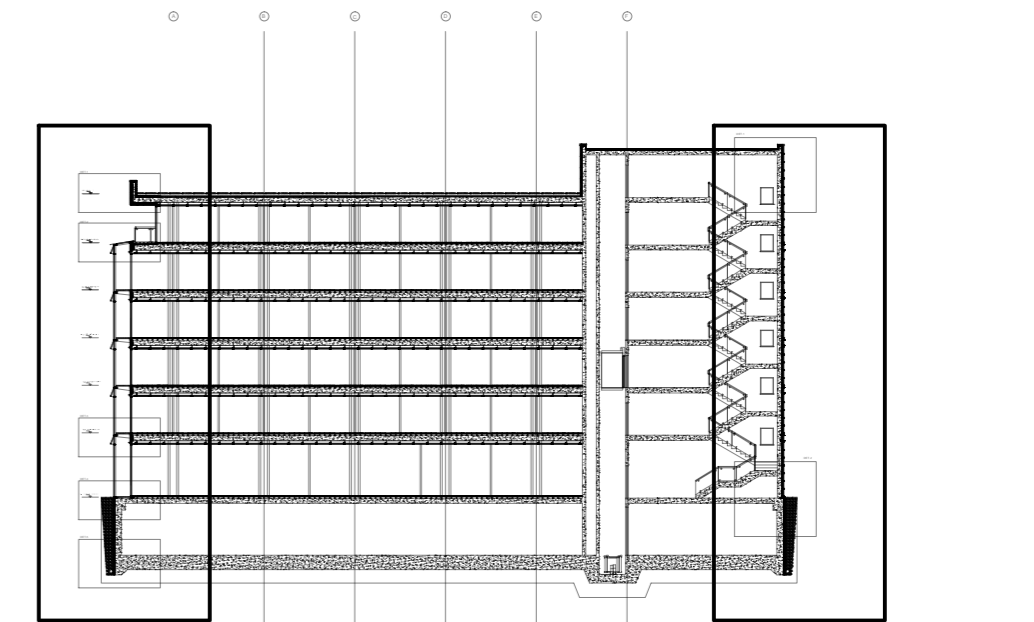
E 1:20



E 1:100



E 1:500



E 1:500



BSC ARCHITECTURAL TECHNOLOGY YEAR 3

Project: OFFICE BUILDING, DUBLIN

Plan Title: DETAIL DEVELOPMENT, FACADE SECTION.

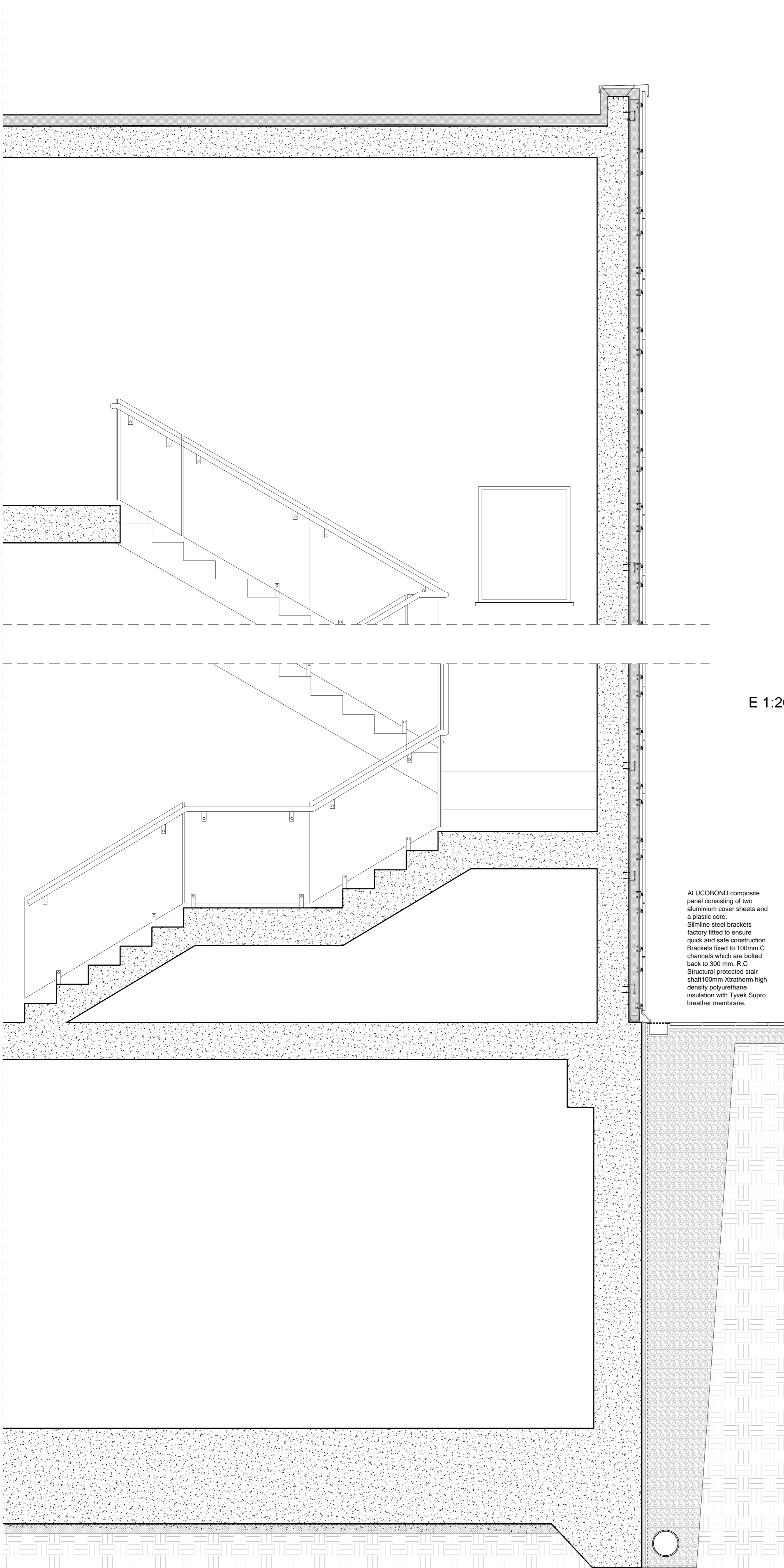
Drawn by: IRIA XOUBANOVA MARTINEZ

Subject: DESIGN AND DETAIL STUDIES 3

Scale: 1/20

Date: 14-5-2012

Checked By: Gundo Sohn, Emer Maughan



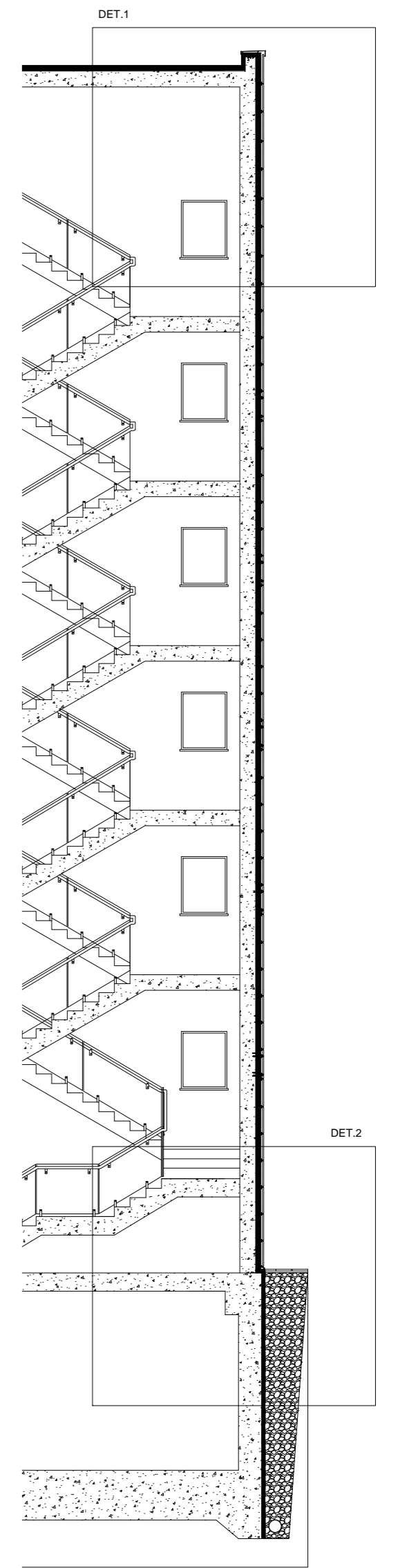
Guttermarker SnapLok wall capping.
Fixed to lined and levelled sub structure, with suitable austenitic stainless steel countersunk or low-profile head fasteners, via LBS2 SnapLok bracket + level retaining bracket.
Brackets secured to structure at capping joint locations and at maximum 1500mm ctrs.

ALUCOBOND composite panel consisting of two aluminium cover sheets and a plastic core.
Slimline steel brackets factory fitted to ensure quick and safe construction. Brackets fixed to 100mm.C channels which are bolted back to 300 mm. R.C
Structural protected stair shaft 100mm Xtratherm high density polyurethane insulation with Tyvek Supro breather membrane.

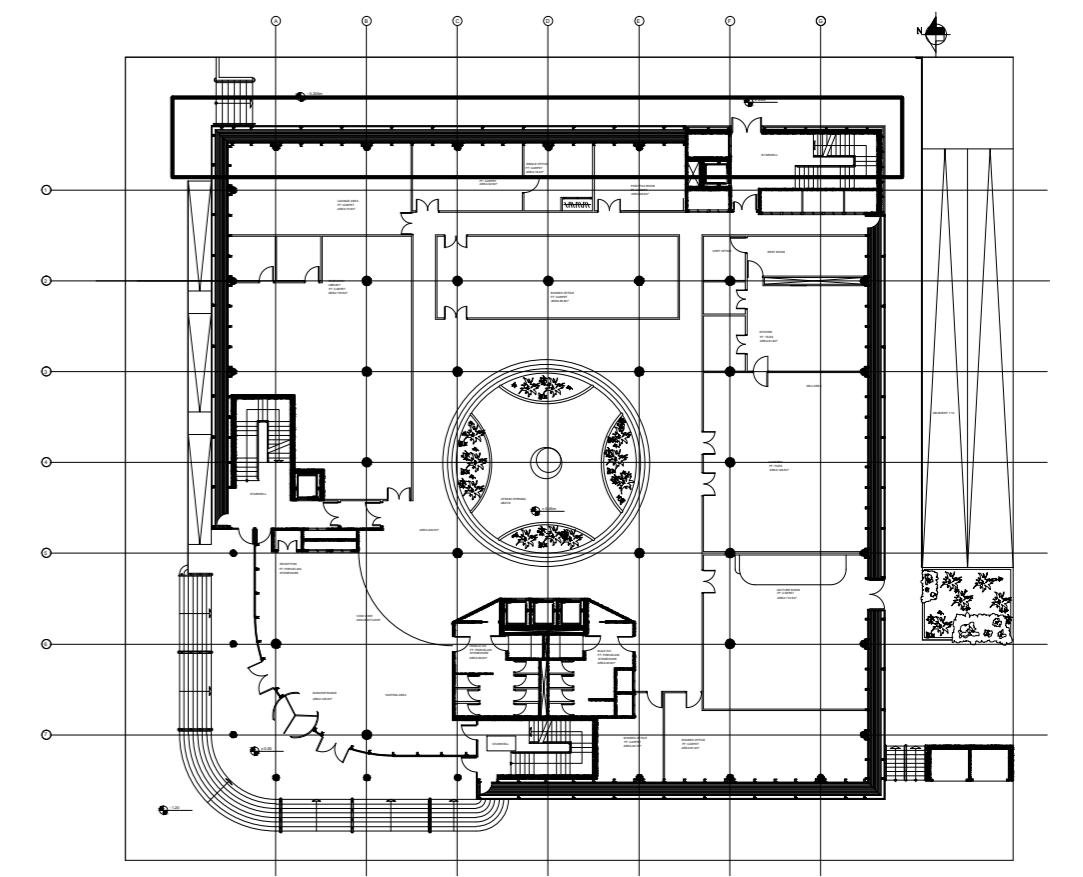
E 1:20

ALUCOBOND composite panel consisting of two aluminium cover sheets and a plastic core.
Slimline steel brackets factory fitted to ensure quick and safe construction. Brackets fixed to 100mm.C channels which are bolted back to 300 mm. R.C
Structural protected stair shaft 100mm Xtratherm high density polyurethane insulation with Tyvek Supro breather membrane.

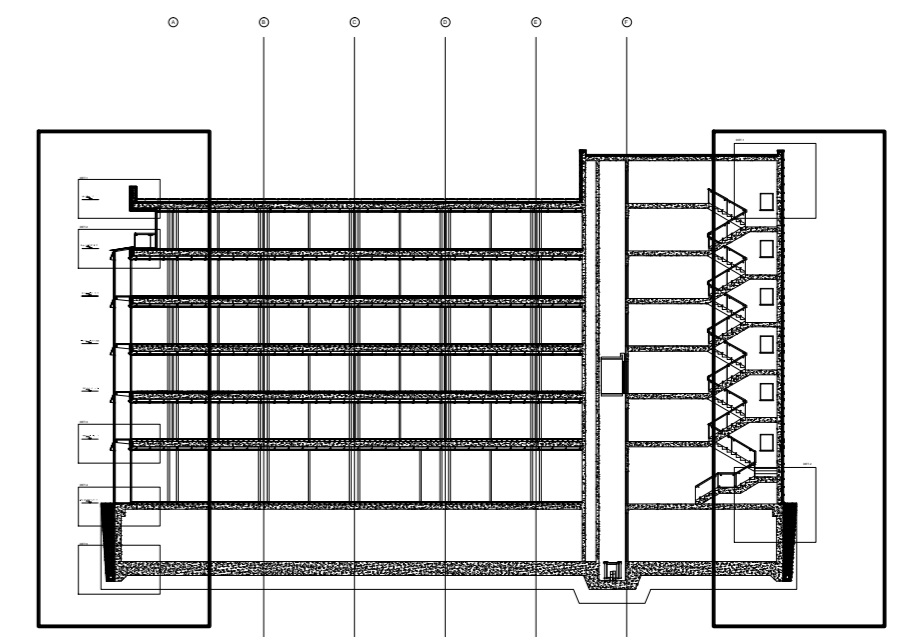
E 1:20



E 1:100



E 1:500



SECTION A-A
E 1:500



BSC ARCHITECTURAL TECHNOLOGY YEAR 3

Project:
OFFICE BUILDING, DUBLIN

Plan Title:
DETAIL DEVELOPMENT, FACADE SECTION.

Drawn by:
IRIA XOUBANOVA MARTINEZ

Subject:
DESIGN AND DETAIL STUDIES 3

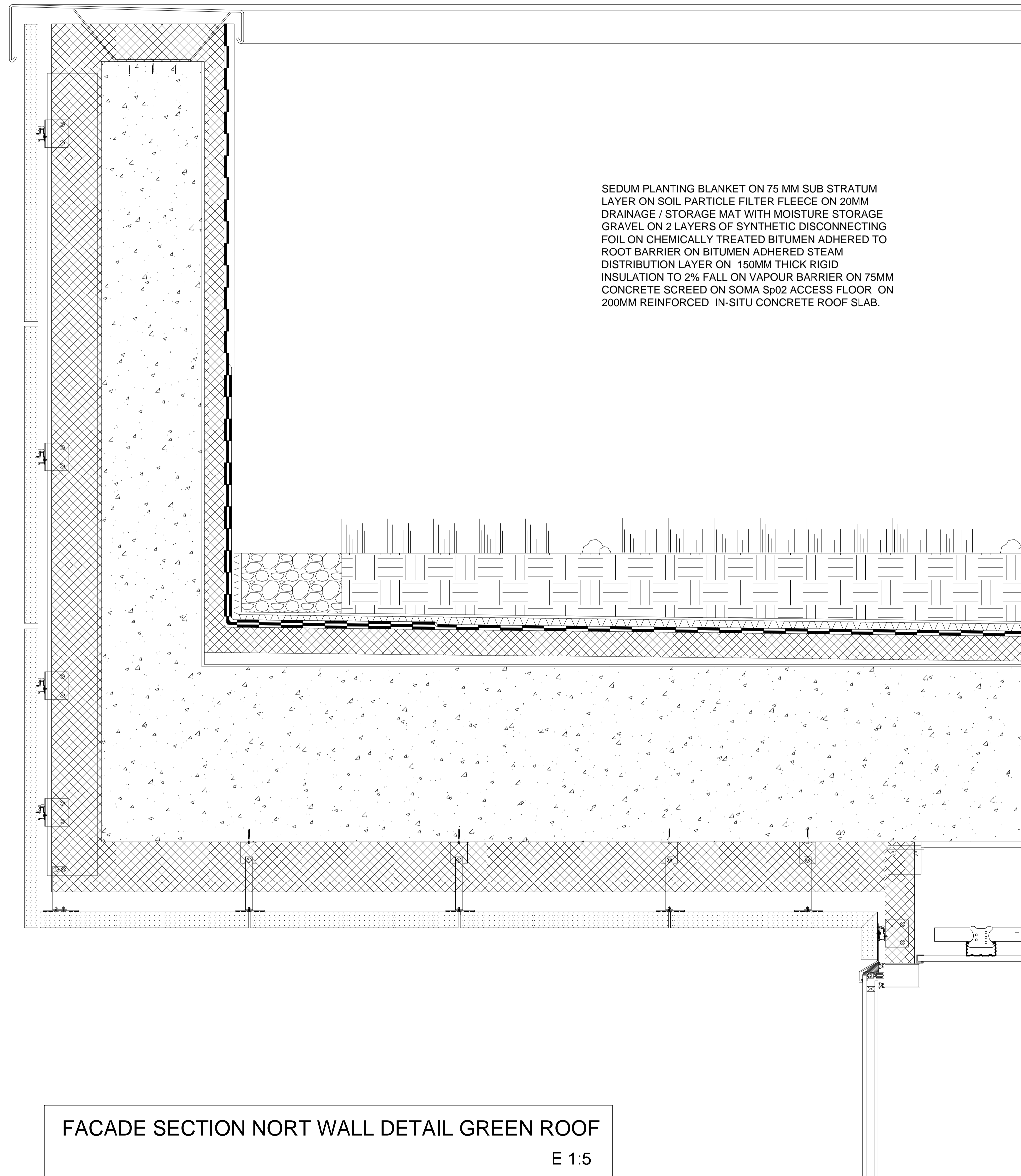
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Date:
14-5-2012

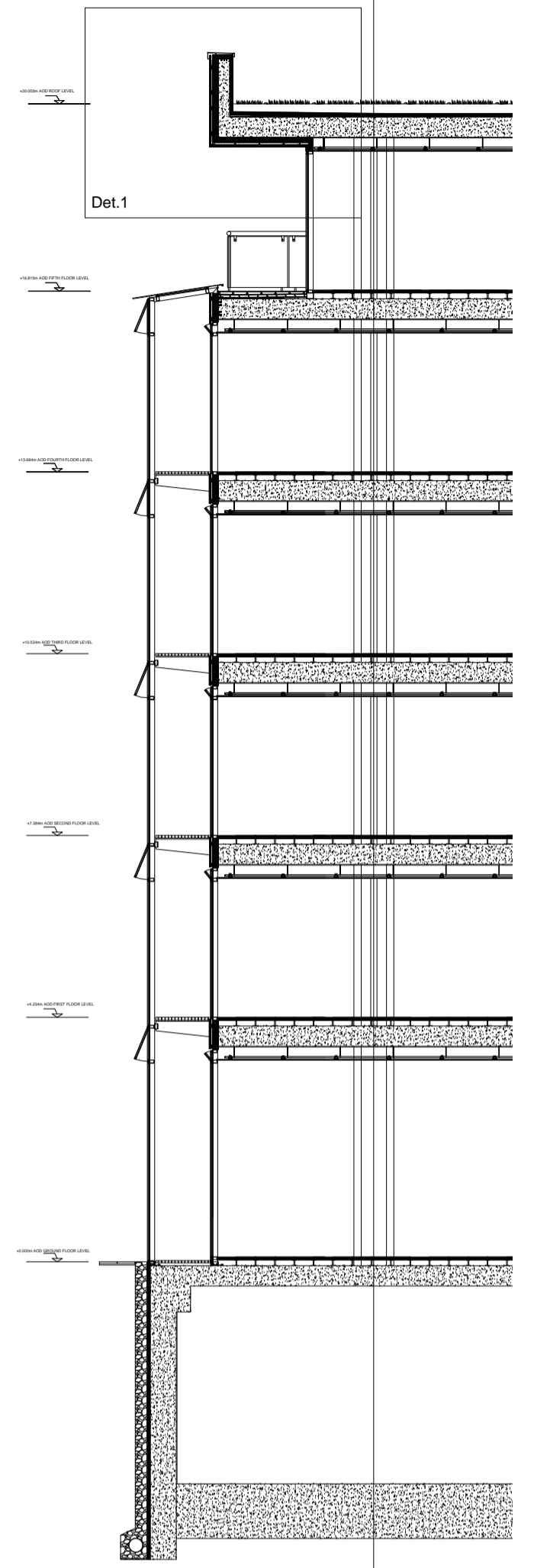
Checked By:
Gundo Sohu, Emer Maughan

ALUCOBOND COMPOSITE PANEL
 CONSISTING OF TWO ALUMINIUM COVER
 SHEETS AND A PLASTIC CORE.
 SLIMLINE STEEL BRACKETS FACTORY
 FITTED TO ENSURE QUICK AND SAFE
 CONSTRUCTION. BRACKETS FIXED TO
 100MM.C CHANNELS WHICH ARE BOLTED
 BACK TO 300 MM. R.C STRUCTURAL
 PROTECTED STAIR SHAFT100MM
 XTRATHERM HIGH DENSITY
 POLYURETHANE INSULATION WITH TYVEK
 SUPRO BREATHER MEMBRANE.

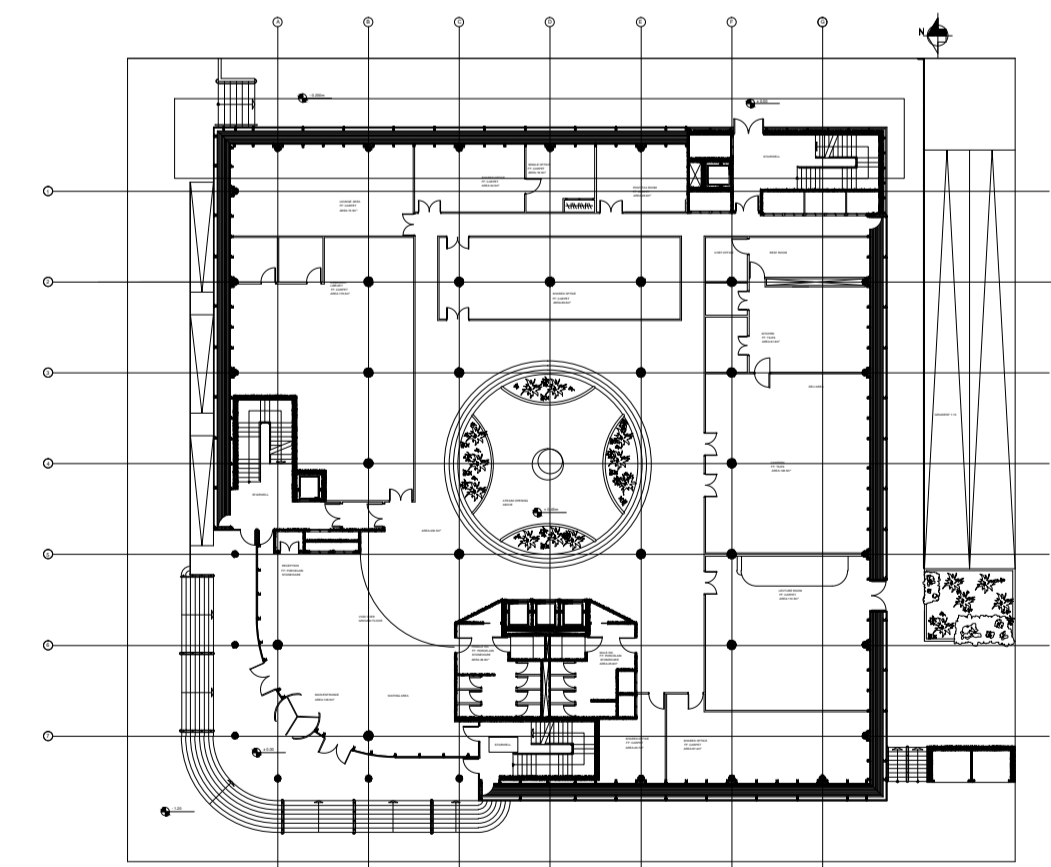
SEDUM PLANTING BLANKET ON 75 MM SUB STRATUM
 LAYER ON SOIL PARTICLE FILTER FLEECE ON 20MM
 DRAINAGE / STORAGE MAT WITH MOISTURE STORAGE
 GRAVEL ON 2 LAYERS OF SYNTHETIC DISCONNECTING
 FOIL ON CHEMICALLY TREATED BITUMEN ADHERED TO
 ROOT BARRIER ON BITUMEN ADHERED STEAD
 DISTRIBUTION LAYER ON 150MM THICK RIGID
 INSULATION TO 2% FALL ON VAPOUR BARRIER ON 75MM
 CONCRETE SCREED ON SOMA Sp02 ACCESS FLOOR ON
 200MM REINFORCED IN-SITU CONCRETE ROOF SLAB.



FACADE SECTION NORT WALL DETAIL GREEN ROOF
 E 1:5



E 1:100



E 1:500

GMT
 GALWAY MAYO INSTITUTE OF TECHNOLOGY
 INSTITIÚID TEICNEOLAÍOCHTA NA GALLAIMHE-MAIGH EO

BSC ARCHITECTURAL TECHNOLY YEAR 3

Project:
 OFFICE BUILDING, DUBLIN

Plan Title:
 DETAIL DEVELOPMENT, FACADE SECTION.

Drawn by:
 IRIA XOUBANOVA MARTINEZ

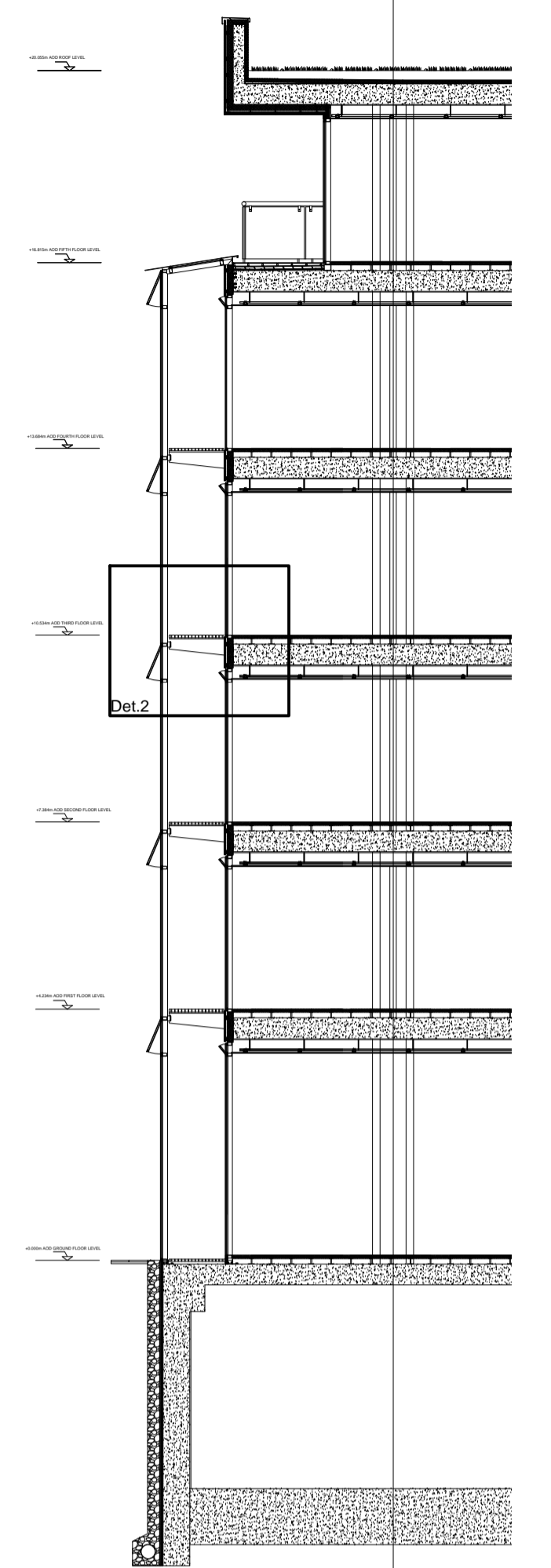
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 DESIGN AND DETAIL STUDIES 3

Scale:
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 14-5-2012

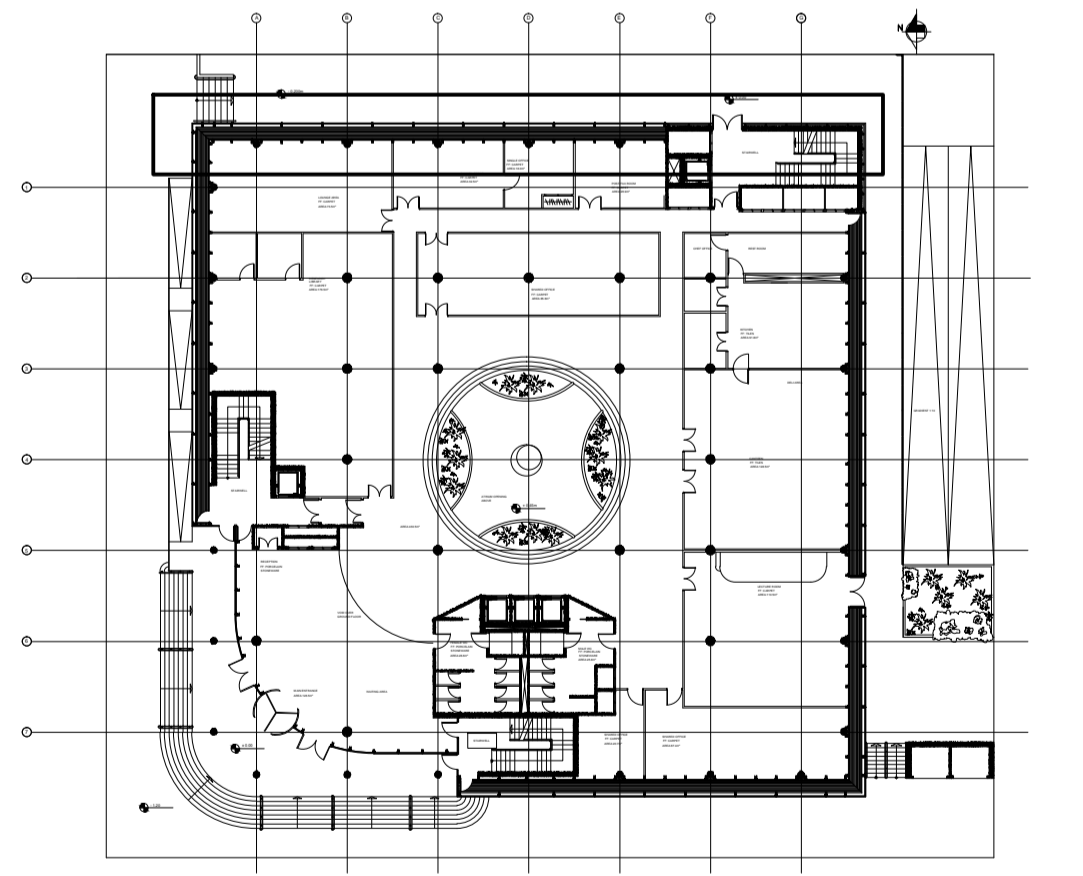
Checked By:
 Gundo Sohn, Emer Maughan

REYNAER CURTAIN WALL FIXED BY PRESSURE PLATES. FIXED TO INTERNAL R.C. COLUMNS TO MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATION. ALL REYNAER SYSTEMS TOP HUNG WINDOW (GLASS FROM 23-34 MM) POW (GLASS FROM 22-28 MM)

INTERMEDIATE FLOOR DETAIL CONSISTED OF AN EXTERNAL DOUBLE GLAZED CURTAIN WALL CONNECTED BY AN IPN BEAM WITH A GALVANIZED STEEL WALKWAY GRILL TO THE IN SITU CONCRETE SLAB STRUCTURE WITH FIXING ANCHORS AND FORCING SCREWS AND AN INTERNAL CURTAIN WALL CONNECTED TO THE STRUCTURE BY HORIZONTAL AND VERTICAL MULLIONS, THE GLASS IS FIXED BY STRUCTURAL SILICONE. THE VENTILATION SYSTEMS CONSIST OF SOME MECHANICAL OPENING WINDOWS. THE FRONT OF THE SLAB IS COVERED BY ALUCUBOND COMPOSITE PANEL CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE. THE BRAQUETS ARE FIXED TO 100mm POLYURETHANE INSULATION WITH TYVEK SUPRO BREATHER MEMBRANE. THE FLOOR CONSISTED OF A RAISED FLOOR PANEL WITH THERMAL INSULATION, SEPARATED TO THE SLAB BY RAISED FLOOR PEDESTALS.



E 1:100



E 1:500

FACADE SECTION NORT WALL DETAIL INTERMEDIATE FLOOR
E 1:5



BSC ARCHITECTURAL TECHNOLOGY YEAR 3

Project: OFFICE BUILDING, DUBLIN

Plan Title: DETAIL DEVELOPMENT, FACADE SECTION.

Drawn by: IRIA XOUBANOVA MARTINEZ Subject: DESIGN AND DETAIL STUDIES 3

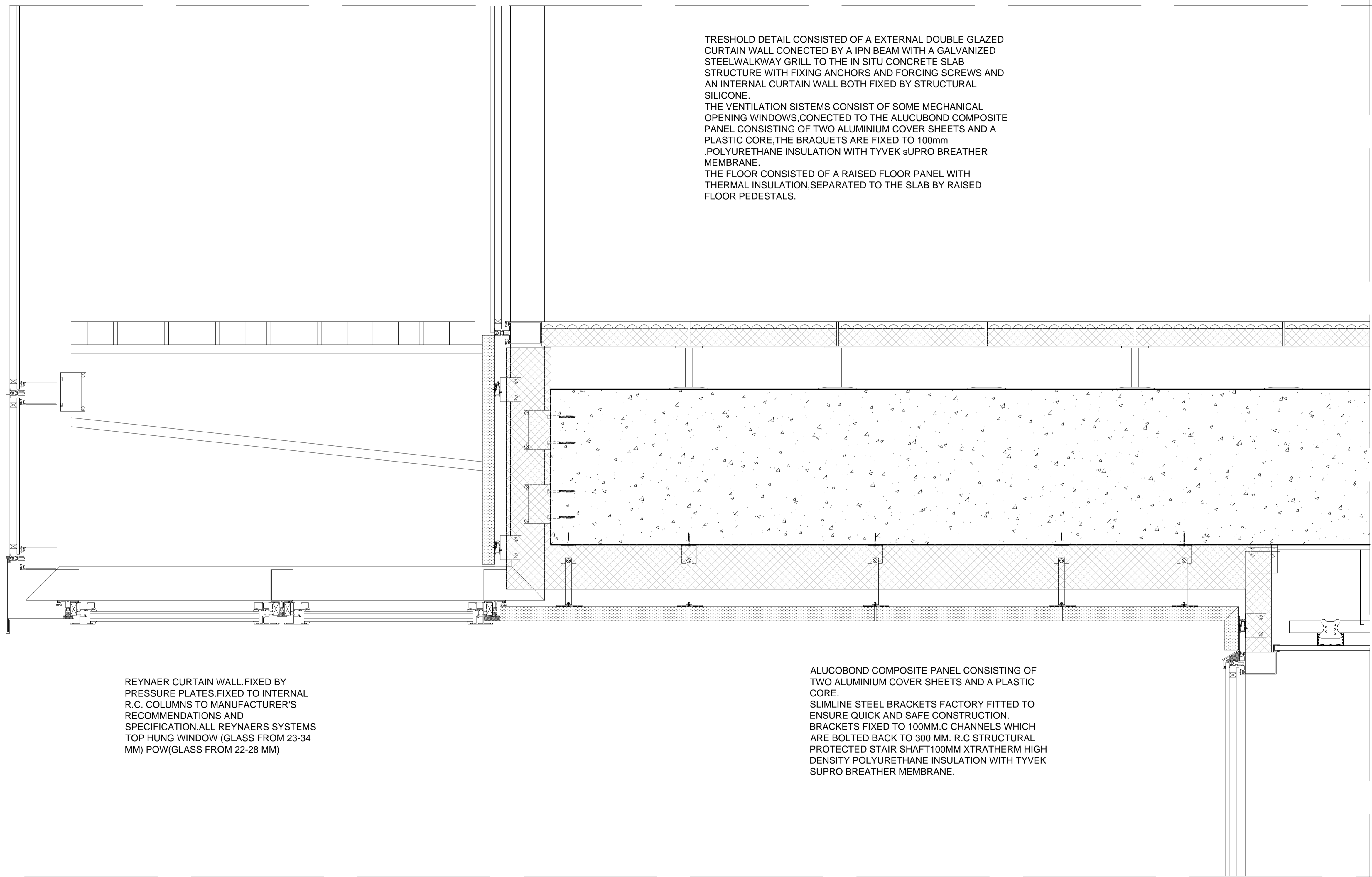
Scale: Date: 14-5-2012

Checked By: Gundo Sohn, Emer Maughan

TRESHOLD DETAIL CONSISTED OF A EXTERNAL DOUBLE GLAZED CURTAIN WALL, CONECTED BY A IPN BEAM WITH A GALVANIZED STEEL WALKWAY GRILL TO THE IN SITU CONCRETE SLAB STRUCTURE WITH FIXING ANCHORS AND FORCING SCREWS AND AN INTERNAL CURTAIN WALL BOTH FIXED BY STRUCTURAL SILICONE.

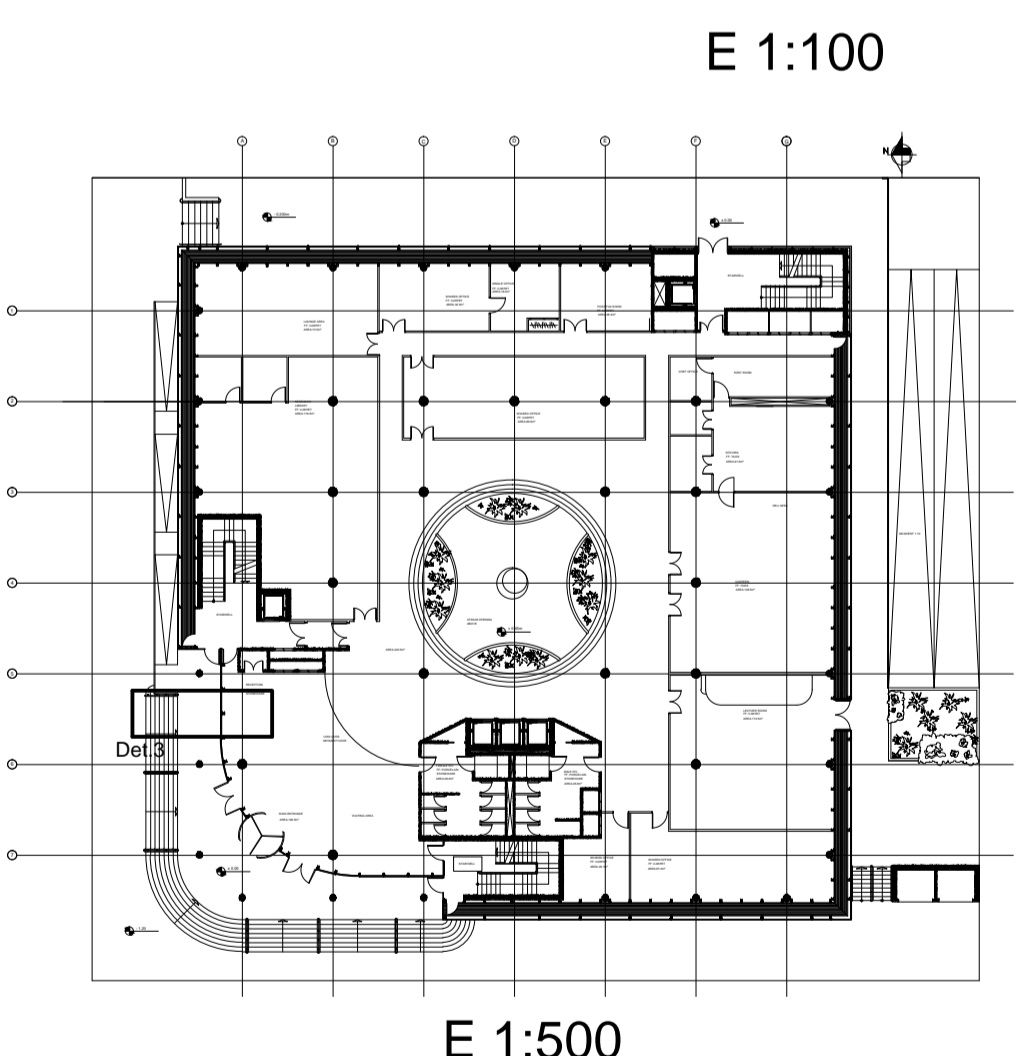
THE VENTILATION SYSTEMS CONSIST OF SOME MECHANICAL OPENING WINDOWS, CONECTED TO THE ALUCUBOND COMPOSITE PANEL CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE, THE BRAQUETS ARE FIXED TO 100mm POLYURETHANE INSULATION WITH TYVEK sUPRO BREATHER MEMBRANE.

THE FLOOR CONSISTED OF A RAISED FLOOR PANEL WITH THERMAL INSULATION, SEPARATED TO THE SLAB BY RAISED FLOOR PEDESTALS.



REYNAER CURTAIN WALL, FIXED BY PRESSURE PLATES, FIXED TO INTERNAL R.C. COLUMNS TO MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATION. ALL REYNAERS SYSTEMS TOP HUNG WINDOW (GLASS FROM 23-34 MM) POW (GLASS FROM 22-28 MM)

ALUCUBOND COMPOSITE PANEL CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE. SLIMLINE STEEL BRACKETS FACTORY FITTED TO ENSURE QUICK AND SAFE CONSTRUCTION. BRACKETS FIXED TO 100MM.C CHANNELS WHICH ARE BOLTED BACK TO 300 MM. R.C STRUCTURAL PROTECTED STAIR SHAFT 100MM XTRATHERM HIGH DENSITY POLYURETHANE INSULATION WITH TYVEK SUPRO BREATHER MEMBRANE.



E 1:100

E 1:500

FACADE SECTION NORT WALL DETAIL DOOR TRESHOLD

E 1:5



BSC ARCHITECTURAL TECHNOLY YEAR 3	
Project: OFFICE BUILDING, DUBLIN	
Plan Title: DETAIL DEVELOPMENT, FACADE SECTION.	
Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
Scale:	Date: 14-5-2012
Checked By: Gundo Sohn, Emer Maughan	

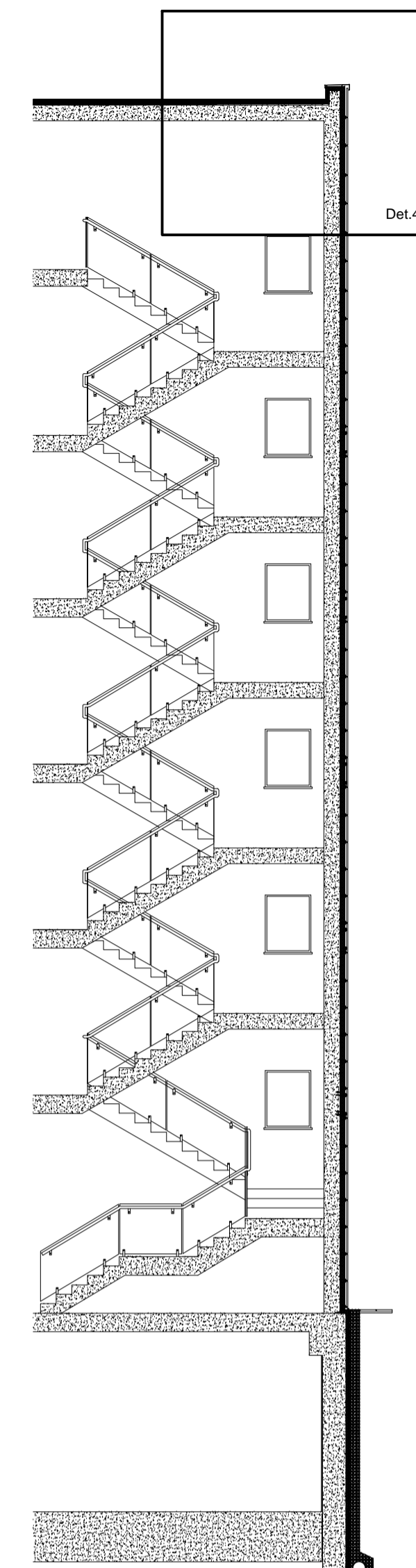
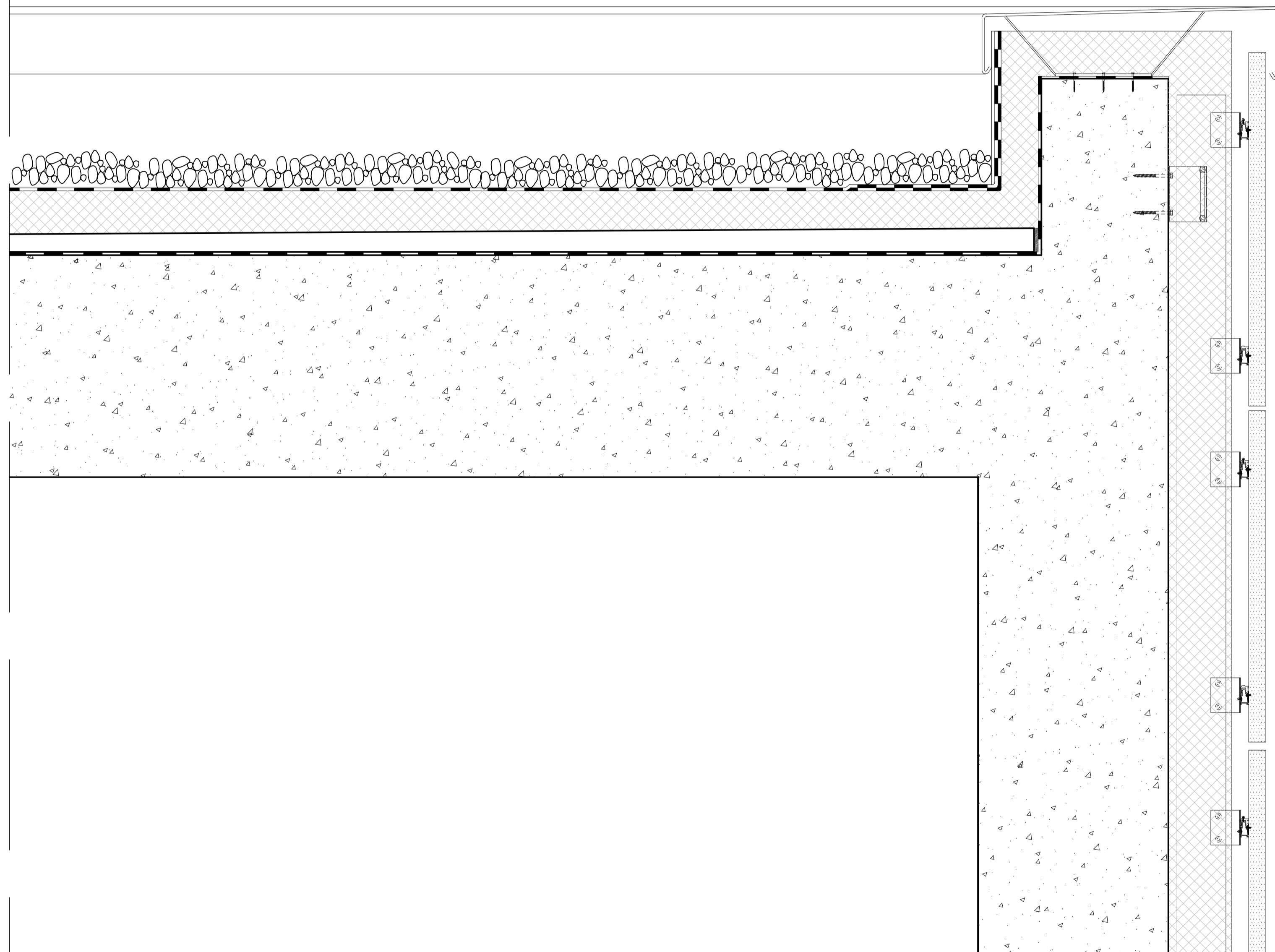
FACADE SECTION SOUTH WALL DETAIL GRAVEL ROOF

E 1:5

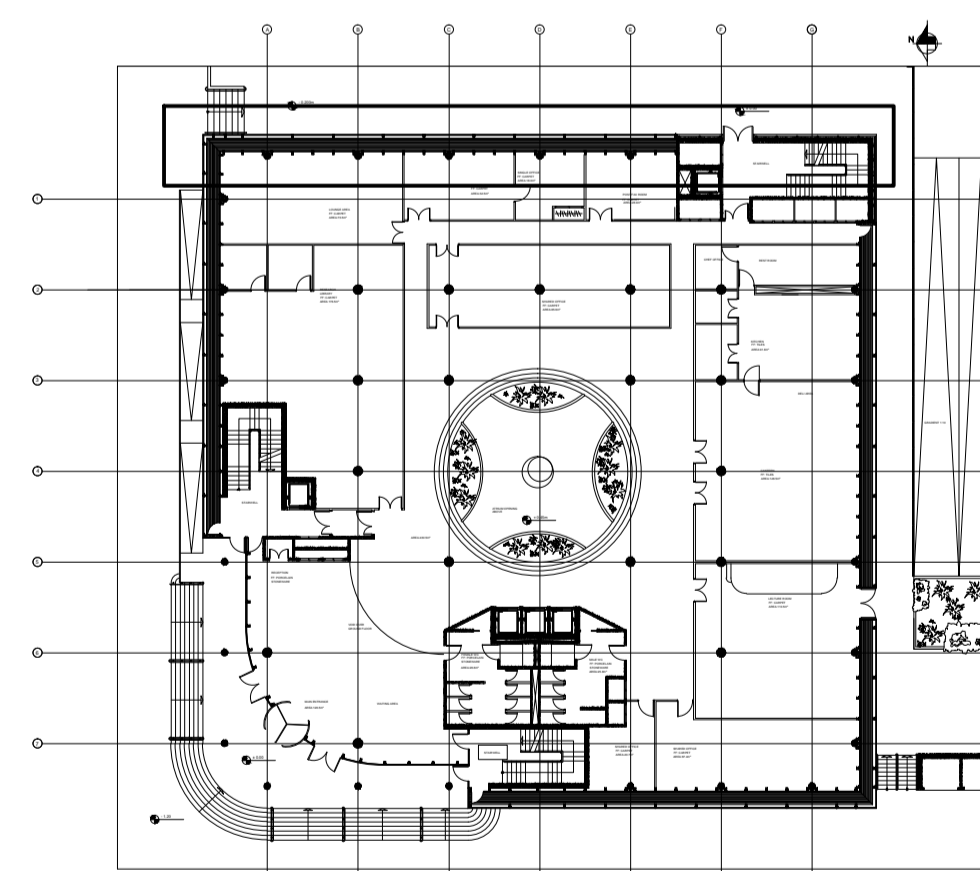
GRAVEL ROOF, COMPOSED OF ALTERNATING LAYERS OF BITUMEN AND REINFORCING FABRICS THAT CREATE A FINISHED MEMBRANE ON A LAYER OF LIGHTWEIGHT AERATED CONCRETE. THE BITUMEN TYPICALLY USED IS ASPHALT. 50mm OF HIGH DENSITY THERMAL ISOLATION, AND A FINAL LAYER OF GRAVEL.

GUTTERMARTER SNAPLOK WALL CAPPING. FIXED TO LINED AND LEVELLED SUB STRUCTURE, WITH SUITABLE AUSTENITIC STAINLESS STEEL COUNTERSUNK OR LOW-PROFILE HEAD FASTENERS, VIA LBS2 SNAPLOK BRACKET + LEVEL RETAINING BRACKET. BRACKETS SECURED TO STRUCTURE AT CAPPING JOINT LOCATIONS AND AT MAXIMUM 1500MM CTRS.

ALUCOBOND COMPOSITE PANEL CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE. SLIMLINE STEEL BRACKETS FACTORY FITTED TO ENSURE QUICK AND SAFE CONSTRUCTION. BRACKETS FIXED TO 100MM.C CHANNELS WHICH ARE BOLTED BACK TO 300 MM. R.C STRUCTURAL PROTECTED STAIR SHAFT 100MM XTRATHERM HIGH DENSITY POLYURETHANE INSULATION WITH TYVEK SUPRO BREATHER MEMBRANE.



E 1:100



E 1:500



BSC ARCHITECTURAL TECHNOLOGY YEAR 3

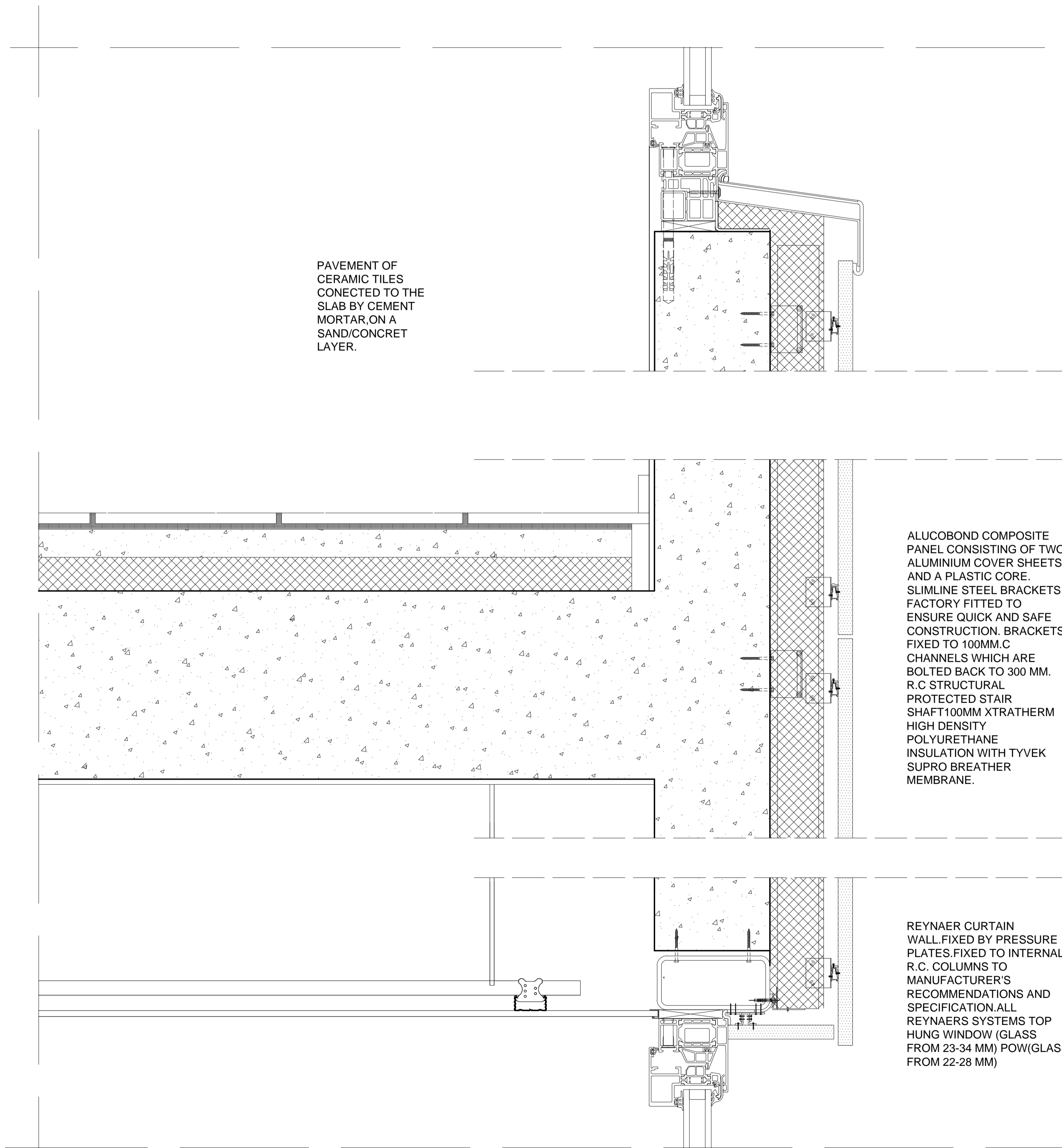
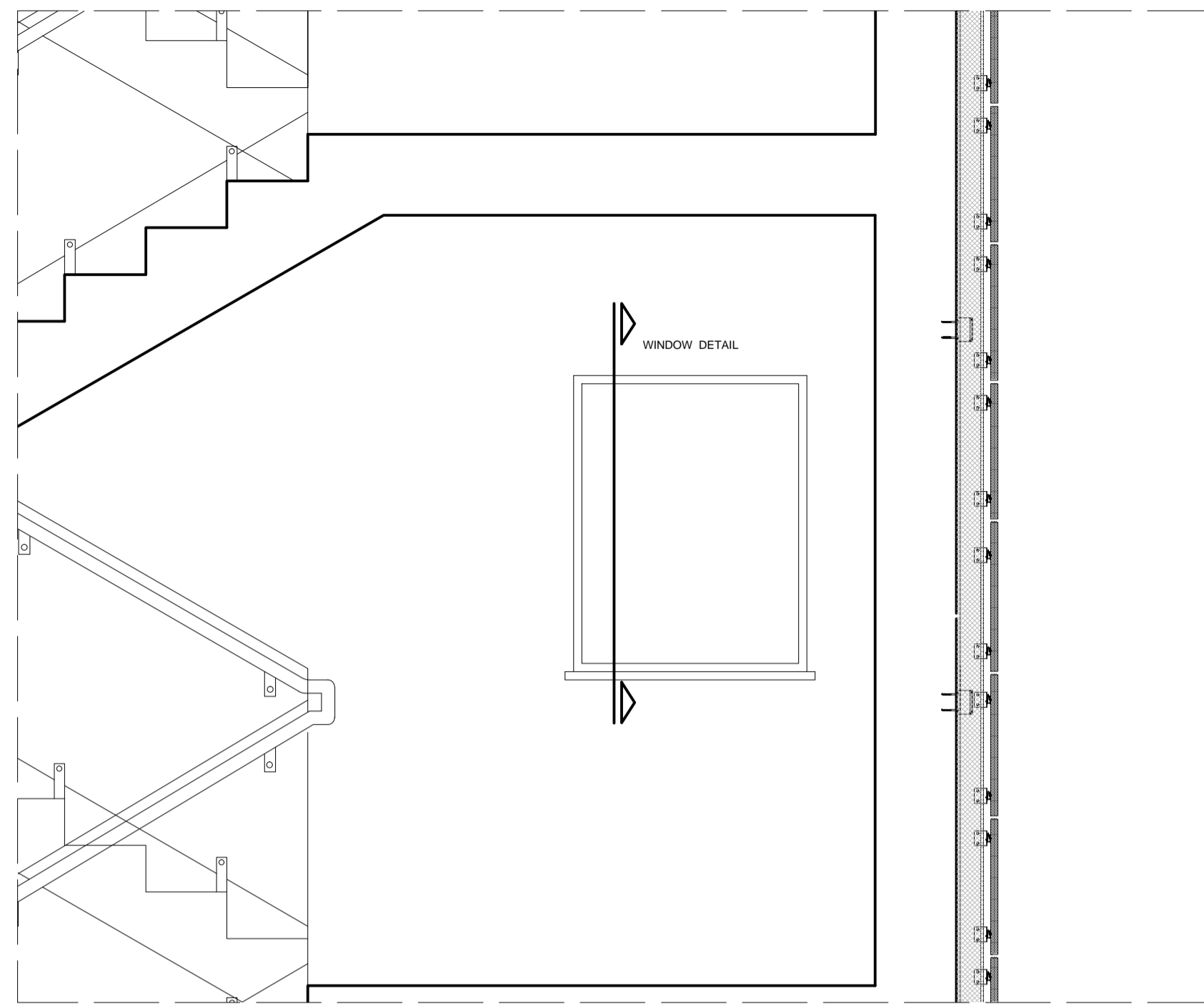
Project: OFFICE BUILDING, DUBLIN

Plan Title: DETAIL DEVELOPMENT, FACADE SECTION.

Drawn by: IRIA XOUBANOVA MARTINEZ Subject: DESIGN AND DETAIL STUDIES 3

Scale: Date: 14-5-2012

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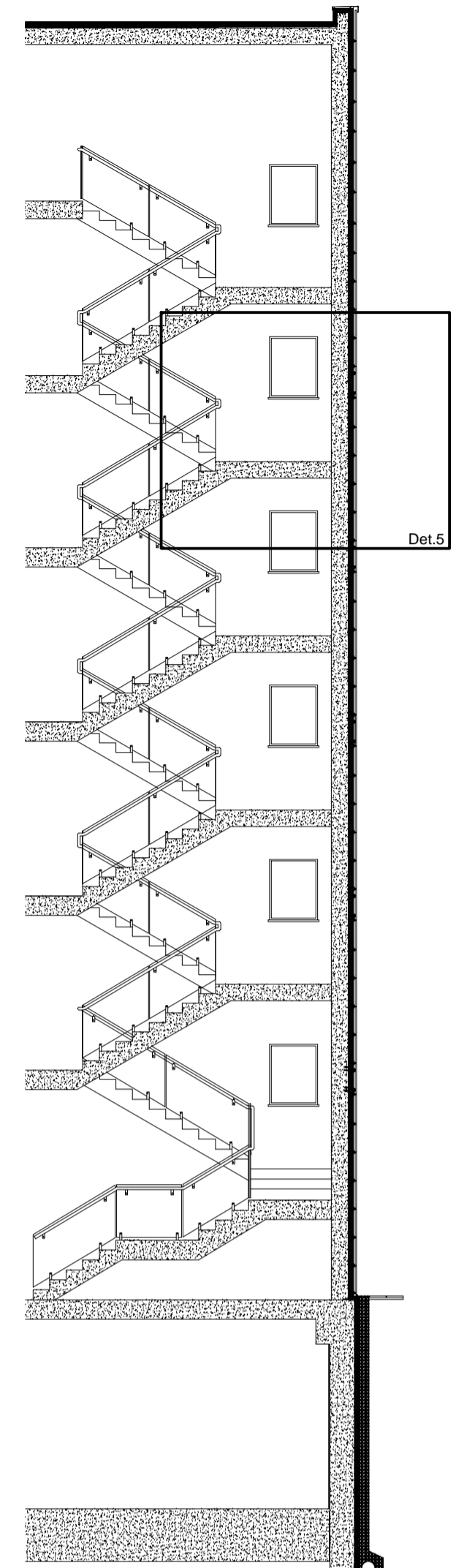


PAVEMENT OF CERAMIC TILES CONNECTED TO THE SLAB BY CEMENT MORTAR, ON A SAND/CONCRETE LAYER.

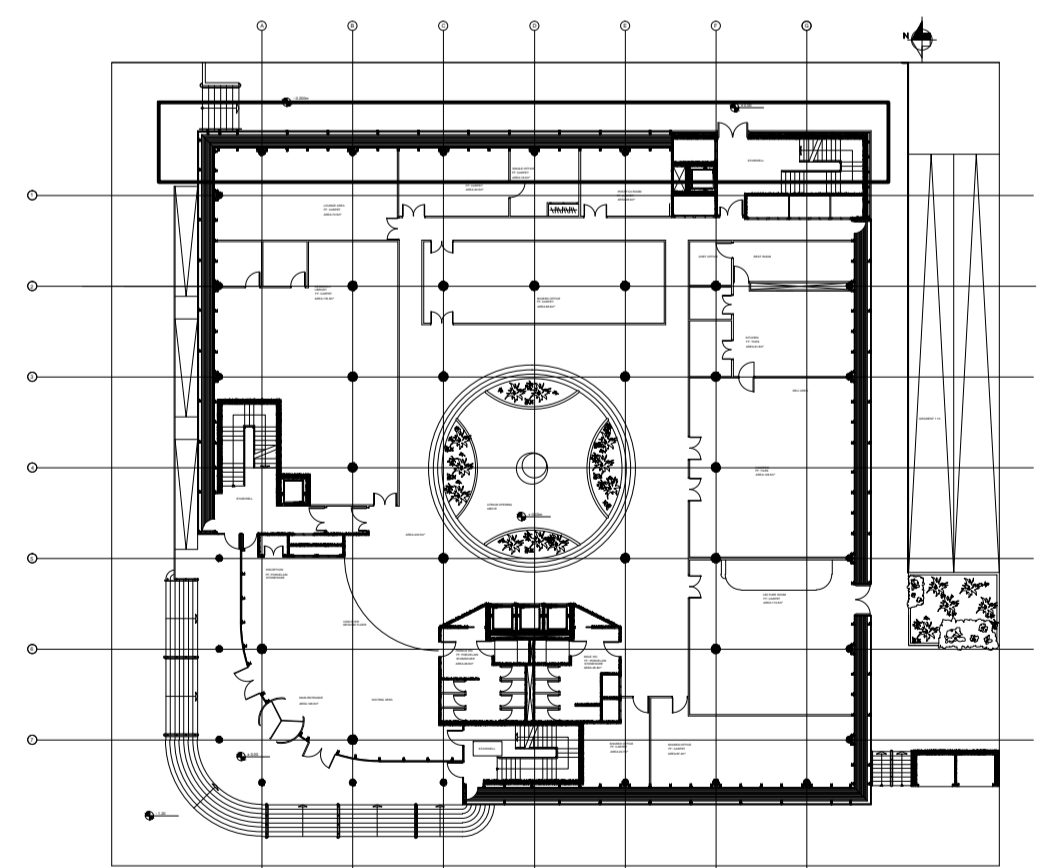
ALUCOBOND COMPOSITE PANEL CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE. SLIMLINE STEEL BRACKETS FACTORY FITTED TO ENSURE QUICK AND SAFE CONSTRUCTION. BRACKETS FIXED TO 100MM.C CHANNELS WHICH ARE BOLTED BACK TO 300 MM. R.C STRUCTURAL PROTECTED STAIR SHAFT 100MM XTRATHERM HIGH DENSITY POLYURETHANE INSULATION WITH TYVEK SUPRO BREATHER MEMBRANE.

REYNAER CURTAIN WALL, FIXED BY PRESSURE PLATES, FIXED TO INTERNAL R.C. COLUMNS TO MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATION. ALL REYNAERS SYSTEMS TOP HUNG WINDOW (GLASS FROM 23-34 MM) POW (GLASS FROM 22-28 MM)

FACADE SECTION EAST WALL WINDOW DETAIL INTERMEDIATE FLOOR
E 1:5



E 1:100



E 1:500



BSC ARCHITECTURAL TECHNOLOGY YEAR 3

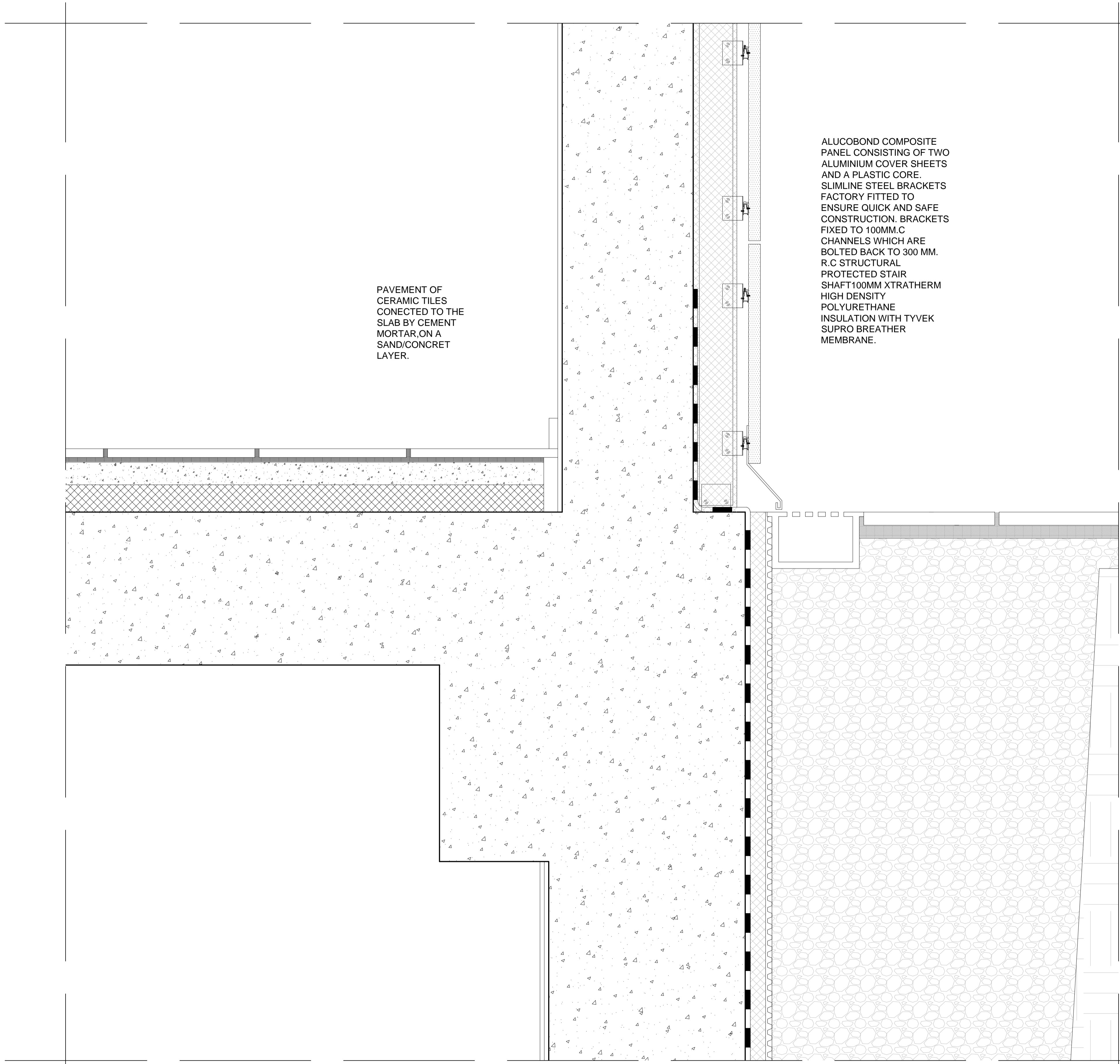
Project: OFFICE BUILDING, DUBLIN

Plan Title: DETAIL DEVELOPMENT, FACADE SECTION.

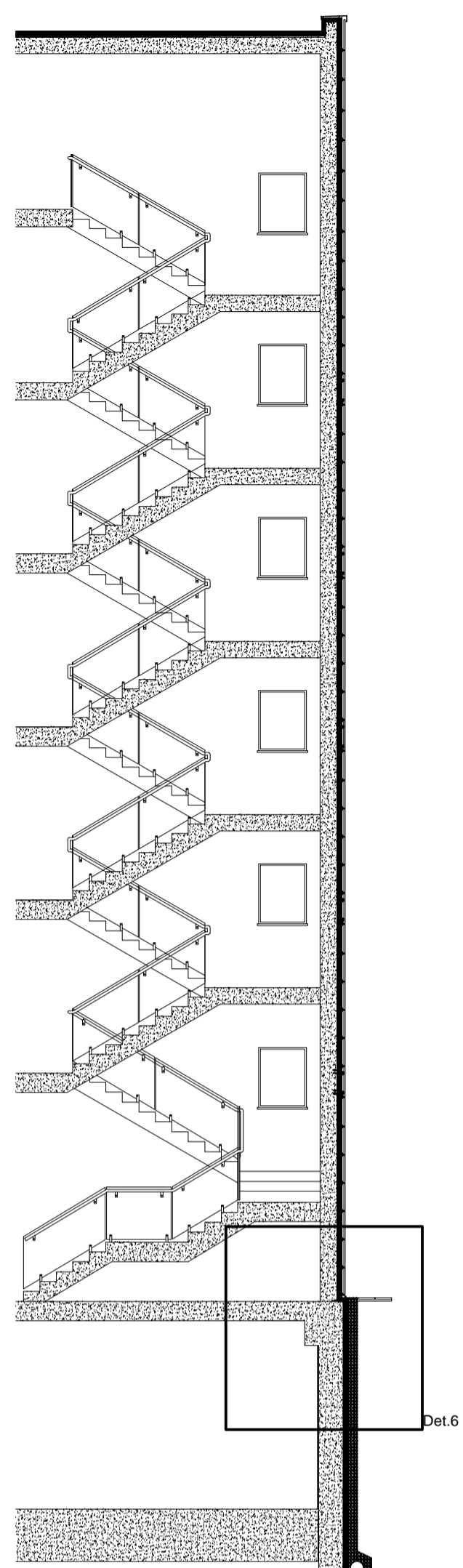
Drawn by: IRIA XOUBANOVA MARTINEZ Subject: DESIGN AND DETAIL STUDIES 3

Scale: Date: 14-5-2012

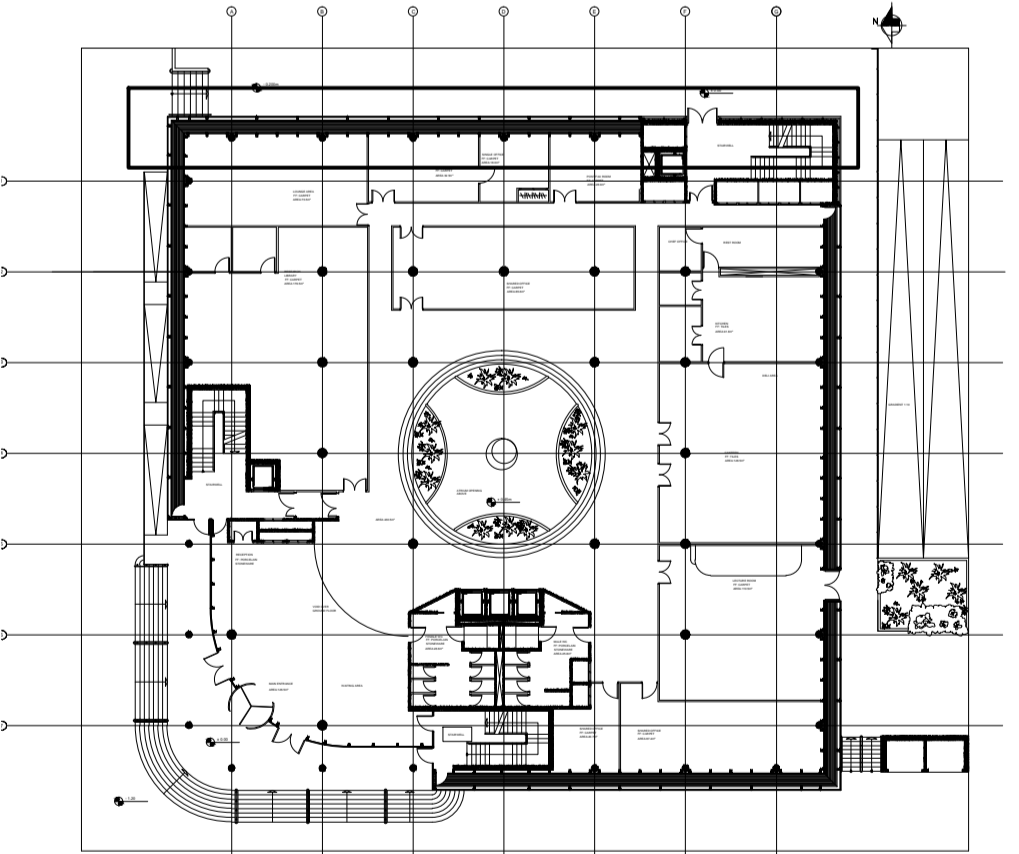
Checked By: Gundo Sohn, Emer Maughan



FACADE SECTION SOUTH WALL
E 1:5



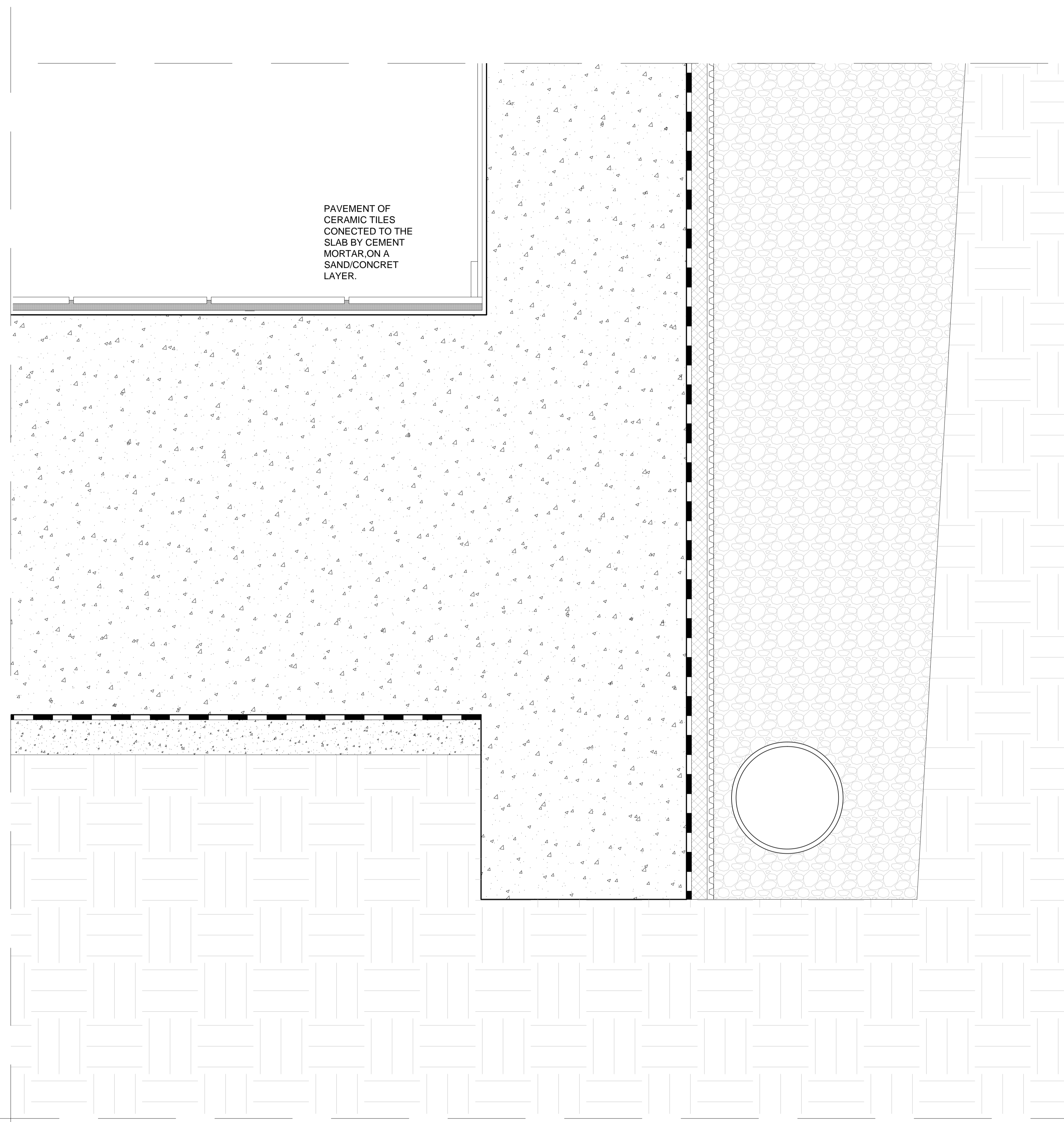
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E 1:500



BSC ARCHITECTURAL TECHNOLOGY YEAR 3	
Project: OFFICE BUILDING, DUBLIN	
Plan Title: DETAIL DEVELOPMENT, FACADE SECTION.	
Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
Scale:	Date: 14-5-2012
Checked By: Gundo Sohn, Emer Maughan	

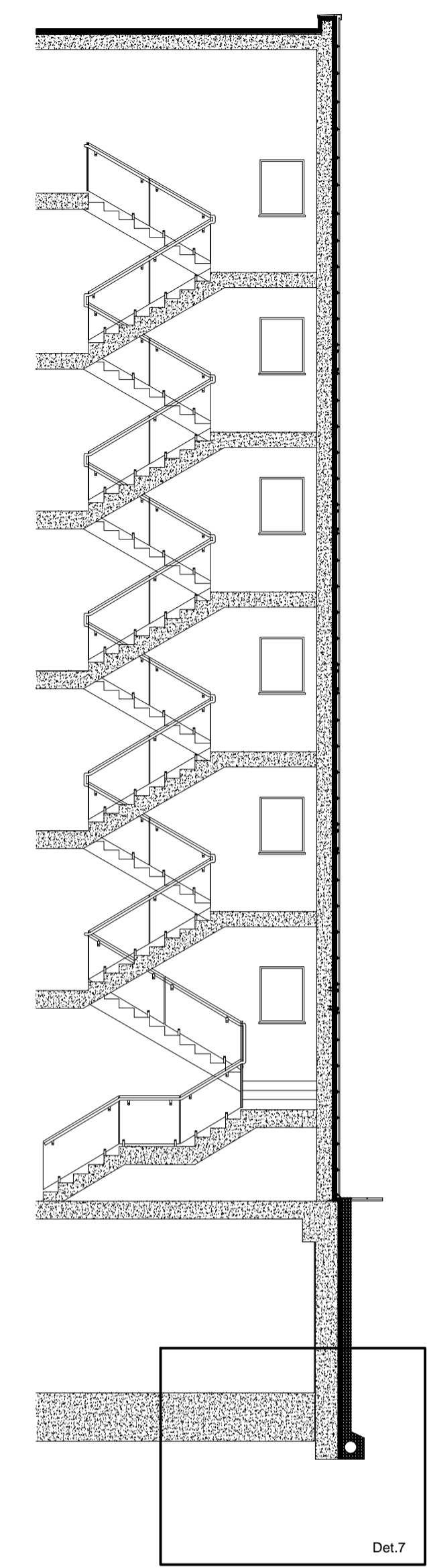


PAVEMENT OF CERAMIC TILES CONNECTED TO THE SLAB BY CEMENT MORTAR, ON A SAND/CONCRETE LAYER.

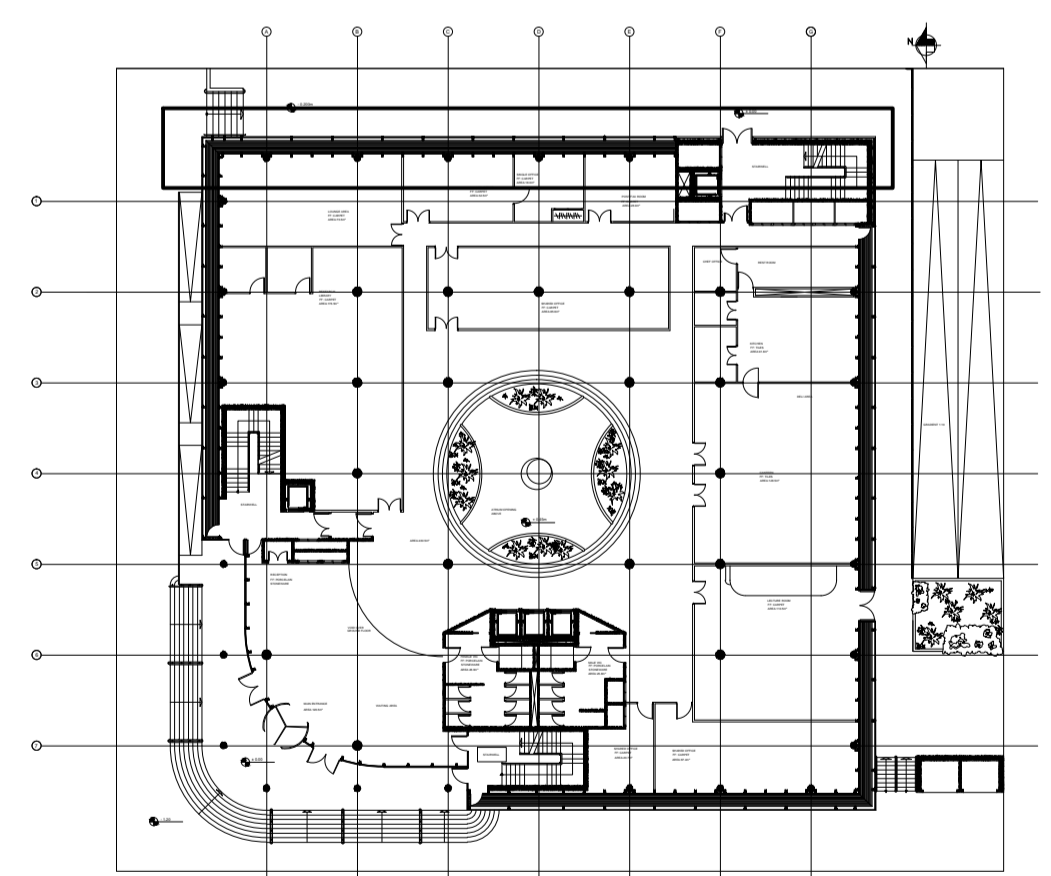
RETAINING WALL
 12.5mm PLASTERBOARD
 INNER LINING.
 25mm CAVITY AND 35mm RIGID URETHANE INSULATION
 BETWEEN 50*75mm SOFTWOOD BATTENS.
 450mm THICK R.C. RETAINING WALL.
 BITUMINOUS SHEET TANKING MEMBRANE WITH DRAINAGE COIL AT FOOT OF WALL.
 EGGRATE TYPE DRAINAGE SHEET.

GABION RETAINING WALLS.
 STONE FILLED GALVANISED STEEL GABION CAGES.
 0.25 MICRON POLYTHENE CARRIED VERTICALLY TO PROTECT TIMBER AGAINST GROUND MOISTURE AND DRESSED OVER TOP OF GABION OVERLAD AND PROTECTED BY GEOTEXTILE MEMBRANE.

FACADE SECTION SOUTH WALL
 E 1:5



E 1:100



E 1:500



BSC ARCHITECTURAL TECHNOLOGY YEAR 3

Project:
OFFICE BUILDING, DUBLIN

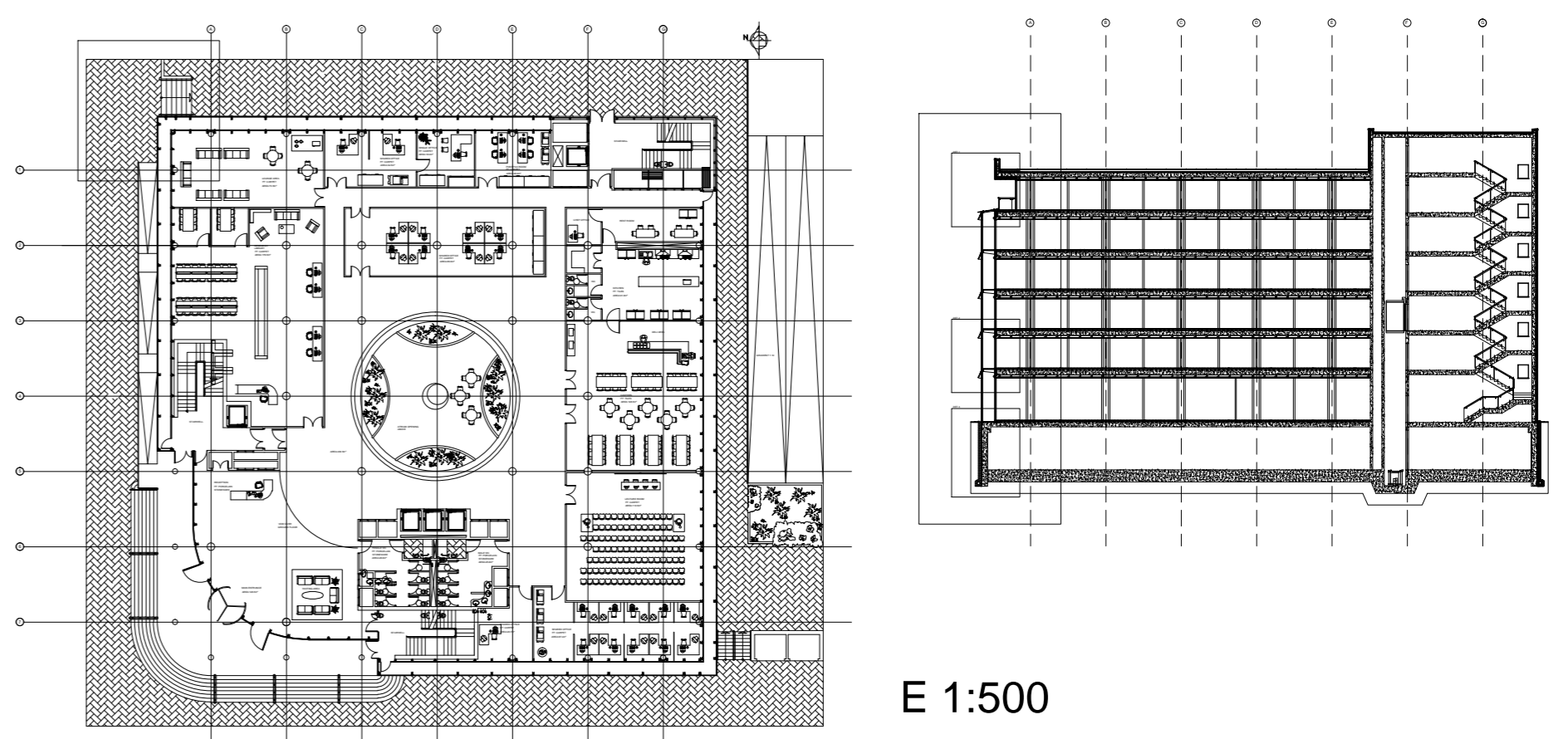
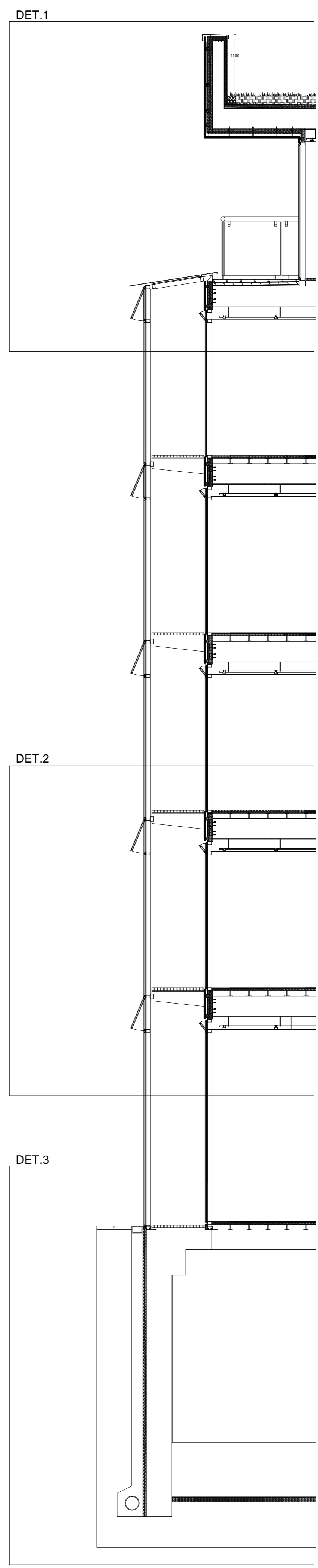
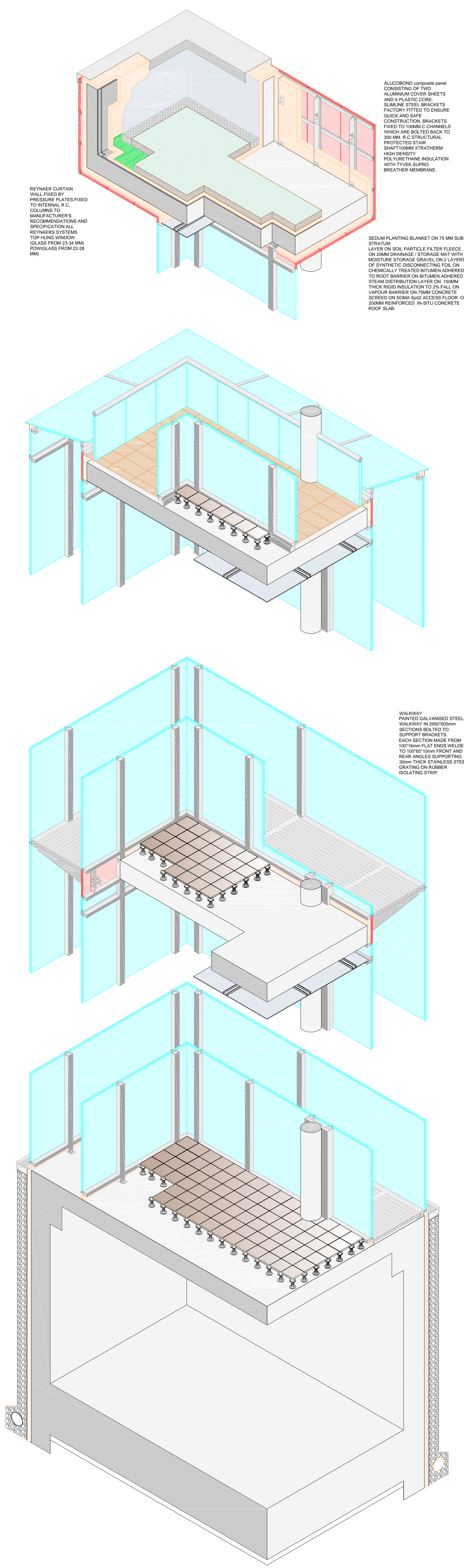
Plan Title:
DETAIL DEVELOPMENT, FACADE SECTION.

Drawn by:
IRIA XOUBANOVA MARTINEZ

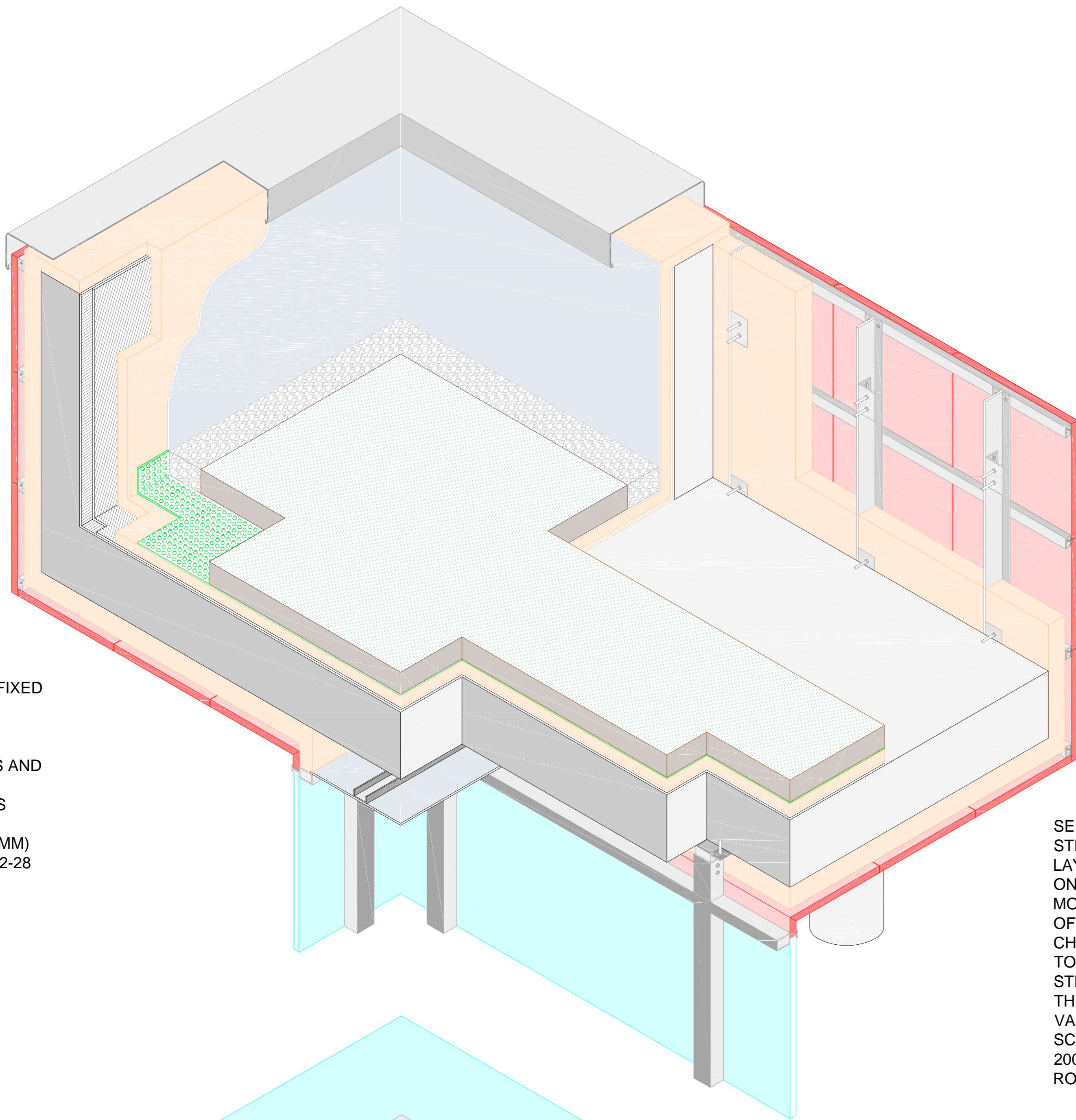
Subject:
DESIGN AND DETAIL STUDIES 3

Scale:
Date:
14-5-2012

Checked By:
Gundo Sohn, Emer Maughan



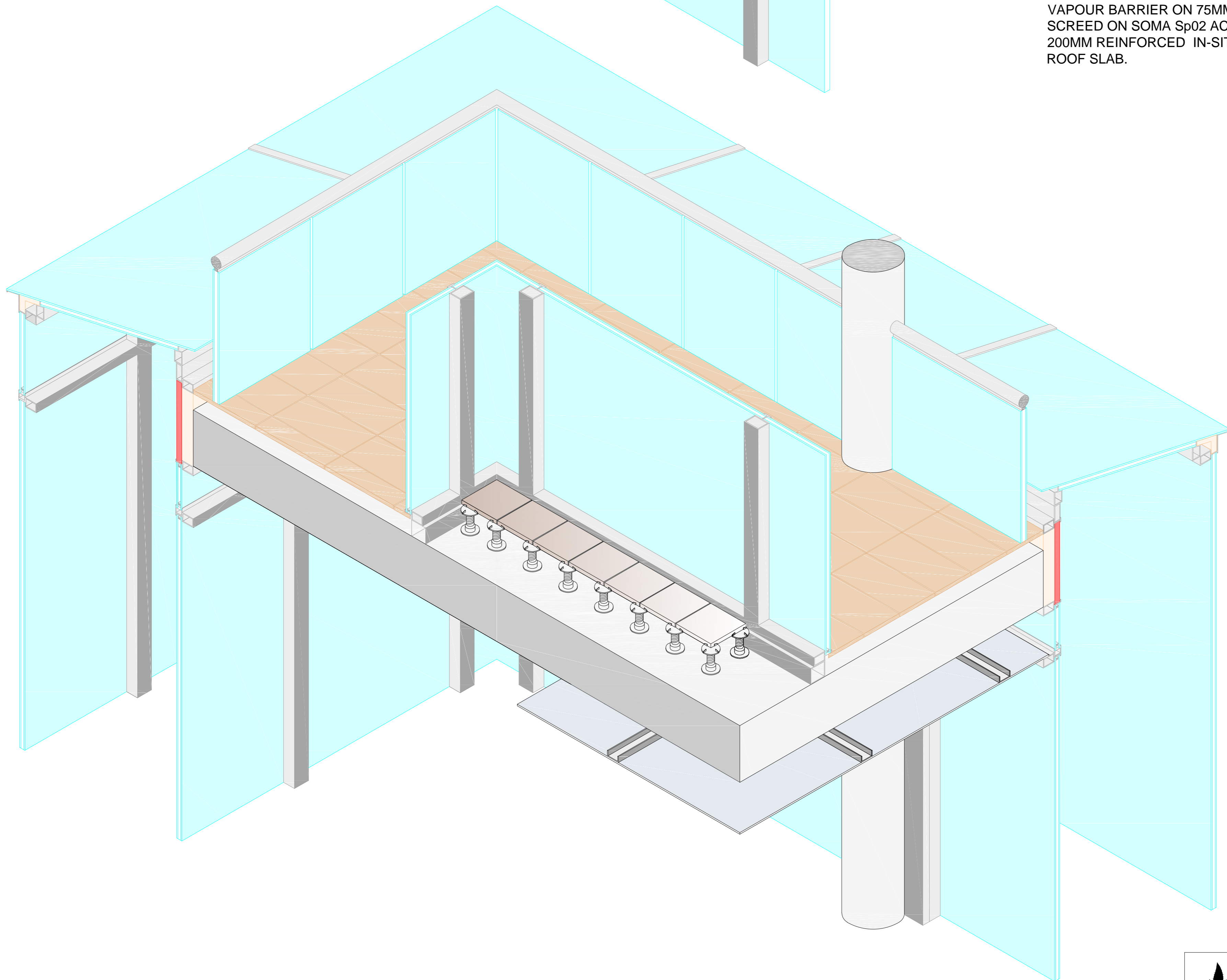
BSC ARCHITECTURAL TECHNOLOGY YEAR 3	
Project: OFFICE BUILDING, DUBLIN	
Plan Title: ISOMETRIC CORNER	
Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
Scale: Varies	Date: 14-5-2012
Checked By: Gundo Sohn, Emer Maughan	



REYNAER CURTAIN WALL, FIXED BY PRESSURE PLATES, FIXED TO INTERNAL R.C. COLUMNS TO MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATION. ALL REYNAERS SYSTEMS TOP HUNG WINDOW (GLASS FROM 23-34 MM) POW (GLASS FROM 22-28 MM)

ALUCOBOND composite panel CONSISTING OF TWO ALUMINIUM COVER SHEETS AND A PLASTIC CORE. SLIMLINE STEEL BRACKETS FACTORY FITTED TO ENSURE QUICK AND SAFE CONSTRUCTION. BRACKETS FIXED TO 100MM.C CHANNELS WHICH ARE BOLTED BACK TO 300 MM. R.C STRUCTURAL PROTECTED STAIR SHAFT 100MM XTRATHERM HIGH DENSITY POLYURETHANE INSULATION WITH TYVEK SUPRO BREATHER MEMBRANE.

SEDUM PLANTING BLANKET ON 75 MM SUB STRATUM LAYER ON SOIL PARTICLE FILTER FLEECE ON 20MM DRAINAGE / STORAGE MAT WITH MOISTURE STORAGE GRAVEL ON 2 LAYERS OF SYNTHETIC DISCONNECTING FOIL ON CHEMICALLY TREATED BITUMEN ADHERED TO ROOT BARRIER ON BITUMEN ADHERED STEAM DISTRIBUTION LAYER ON 150MM THICK RIGID INSULATION TO 2% FALL ON VAPOUR BARRIER ON 75MM CONCRETE SCREED ON SOMA Sp02 ACCESS FLOOR ON 200MM REINFORCED IN-SITU CONCRETE ROOF SLAB.



BSC ARCHITECTURAL TECHNOLOGY YEAR 3

Project: OFFICE BUILDING, DUBLIN

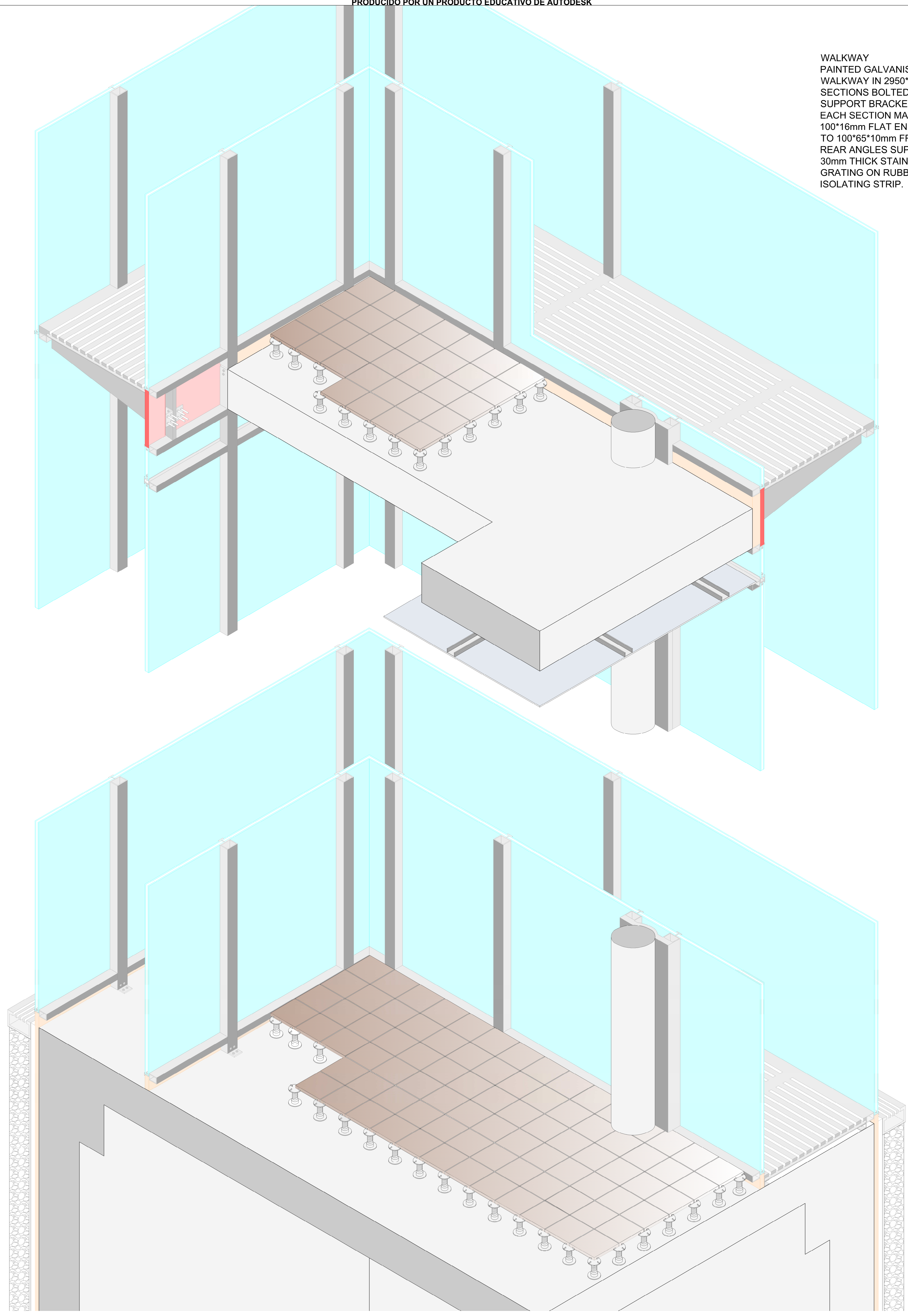
Plan Title: ISOMETRIC CORNER

Drawn by: IRIA XOUBANOVA MARTINEZ Subject: DESIGN AND DETAIL STUDIES 3

Scale: Varies Date: 14-5-2012

Checked By: Gundolo Sohn, Emer Maughan

WALKWAY
PAINTED GALVANISED STEEL
WALKWAY IN 2950*605mm
SECTIONS BOLTED TO
SUPPORT BRACKETS.
EACH SECTION MADE FROM
100*16mm FLAT ENDS WELDED
TO 100*65*10mm FRONT AND
REAR ANGLES SUPPORTING
30mm THICK STAINLESS STEEL
GRATING ON RUBBER
ISOLATING STRIP.



PRODUCIDO POR UN PRODUCTO EDUCATIVO DE AUTODESK

PRODUCIDO POR UN PRODUCTO EDUCATIVO DE AUTODESK

GMT
GALWAY MAYO INSTITUTE OF TECHNOLOGY
INSTITIÚD TEICNEOLAÍOCHTA NA GALLARHIE-MAIGH EÓ

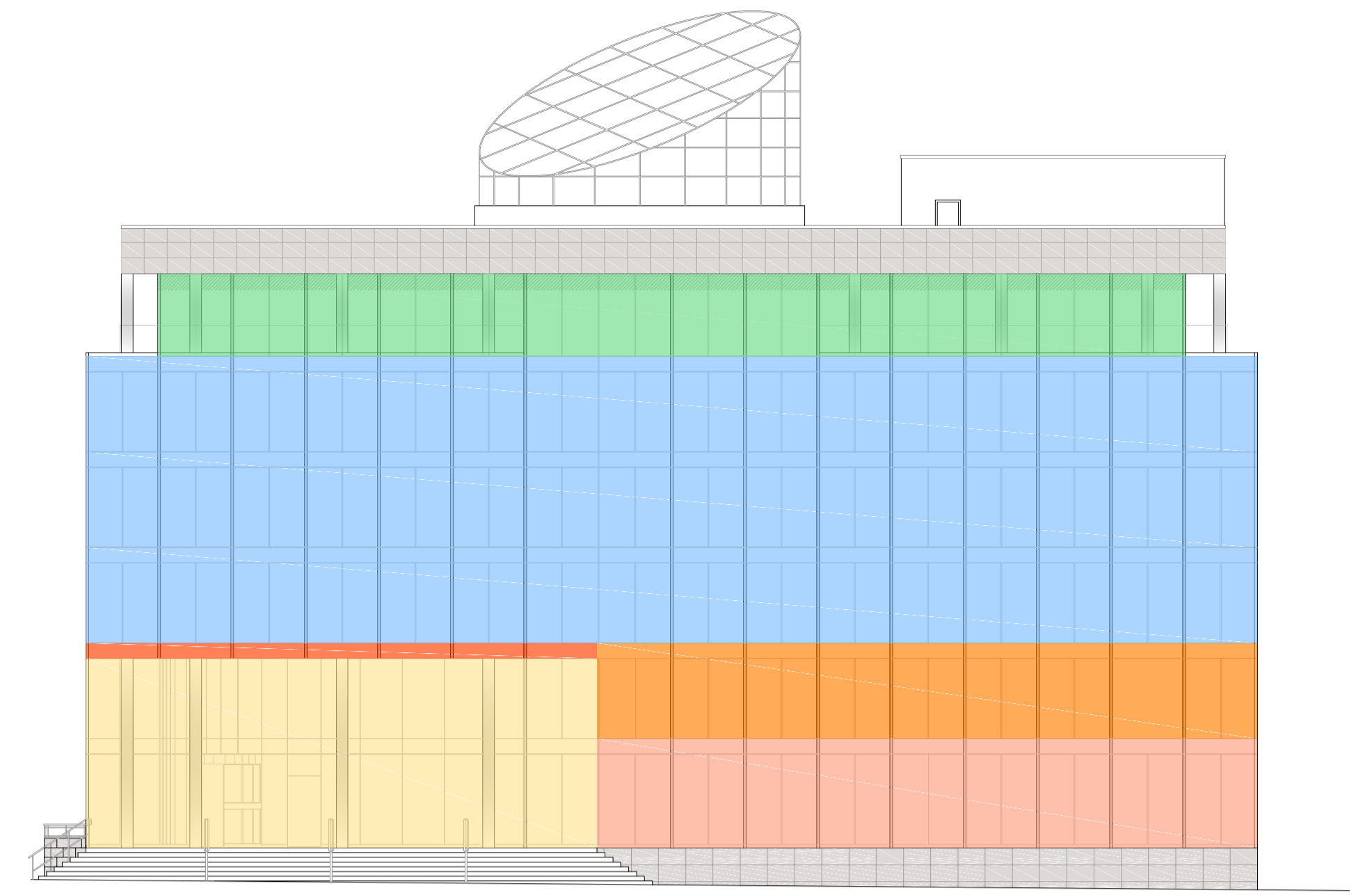
BSC ARCHITECTURAL TECHNOLOGY YEAR 3

Project: OFFICE BUILDING, DUBLIN

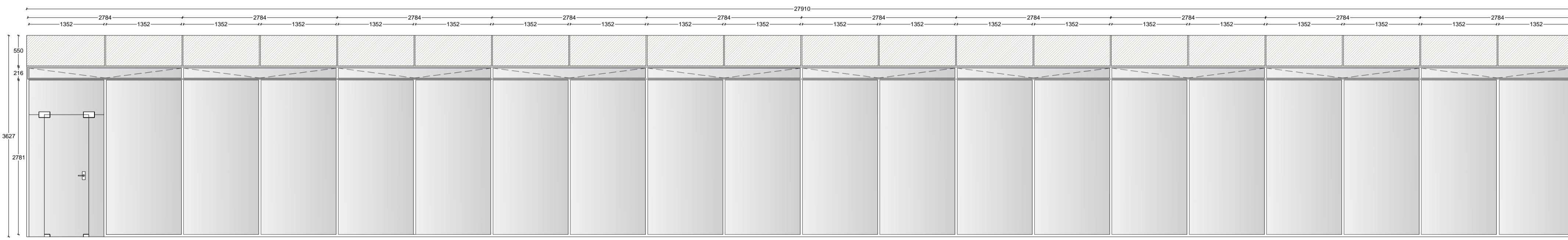
Plan Title: ISOMETRIC CORNER

Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
Scale: Varies	Date: 14-5-2012


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Gundo Sohn, Emer Maughan

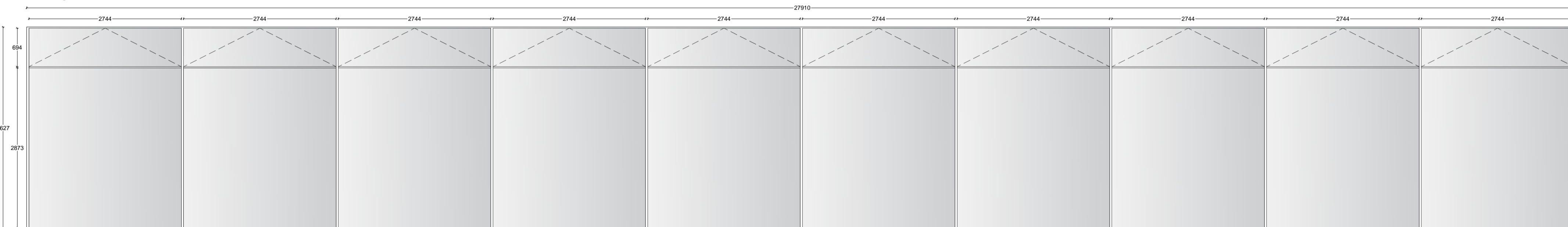


WEST ELEVATION




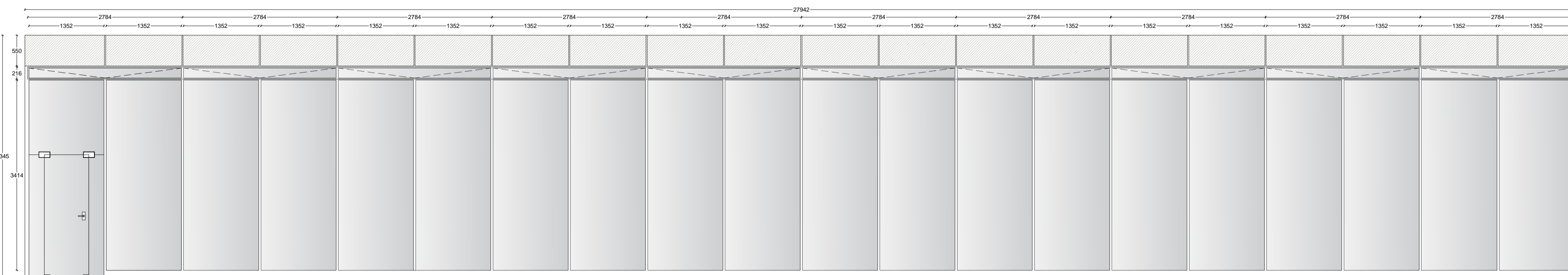
C

COLOUR		CURTAIN WALL TYPE 4 INSIDE SKIN
SIZE	27910x3627 mm.	
PANELLING	1352x2781 mm. -1352x550 trespas panels & 2784x216 mm for ventilation window	
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices	
GLAZING	Hermetically sealed double glazing (6+16+6)	




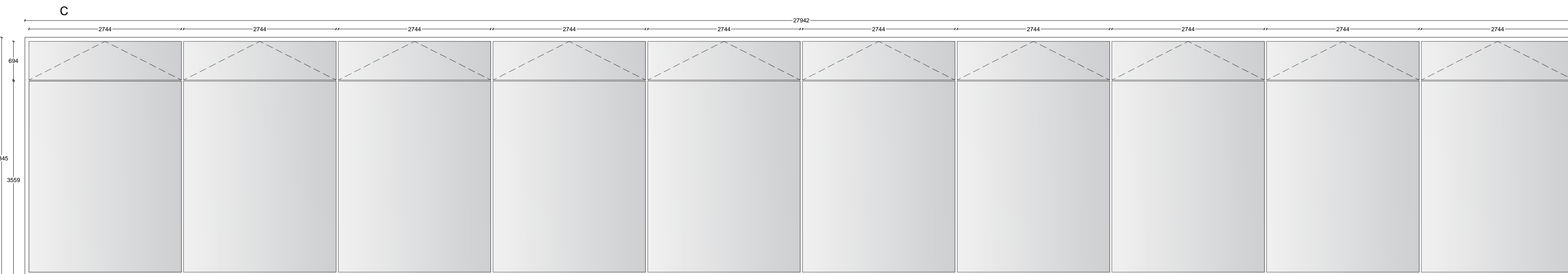
C

COLOUR		CURTAIN WALL TYPE 3 OUTSIDE SKIN
SIZE	27910x3627 mm.	
PANELLING	2744x2876 mm. & 2744x694mm for ventilation window	
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices	
GLAZING	Hermetically sealed double glazing (6+16+6)	




C

COLOUR		CURTAIN WALL TYPE 2 INSIDE SKIN
SIZE	27942x4345 mm.	
PANELLING	1352x3414 mm. - 1352x550Trespas panels & 2784x216mm for ventilation window	
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices	
GLAZING	Hermetically sealed double glazing (6+16+6)	



C

COLOUR		CURTAIN WALL TYPE 1 OUTSIDE SKIN
SIZE	27942x4345 mm.	
PANELLING	2744x3559 panels & 2744x694mm for ventilation window	
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices	
GLAZING	Hermetically sealed double glazing (6+16+6)	



BSC ARCHITECTURAL TECHNOLOGY YEAR 3

Project:
OFFICE BUILDING, DUBLIN

Plan Title:
EXTERIOR WINDOW AND DOOR SCHEDULES

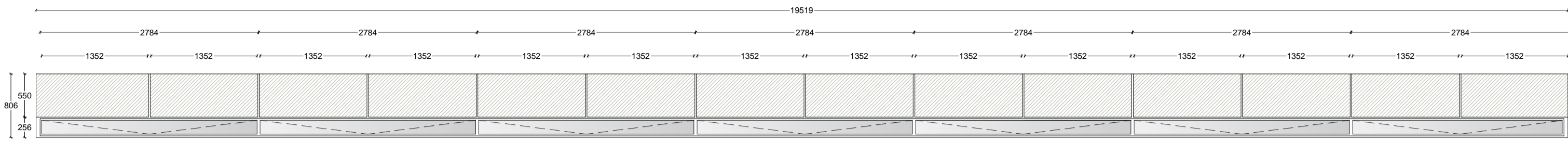
Drawn by:
IRIA XOUBANOVA MARTINEZ

Subject:
DESIGN AND DETAIL STUDIES 3

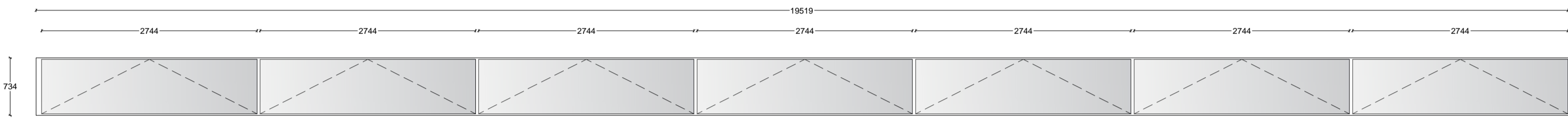
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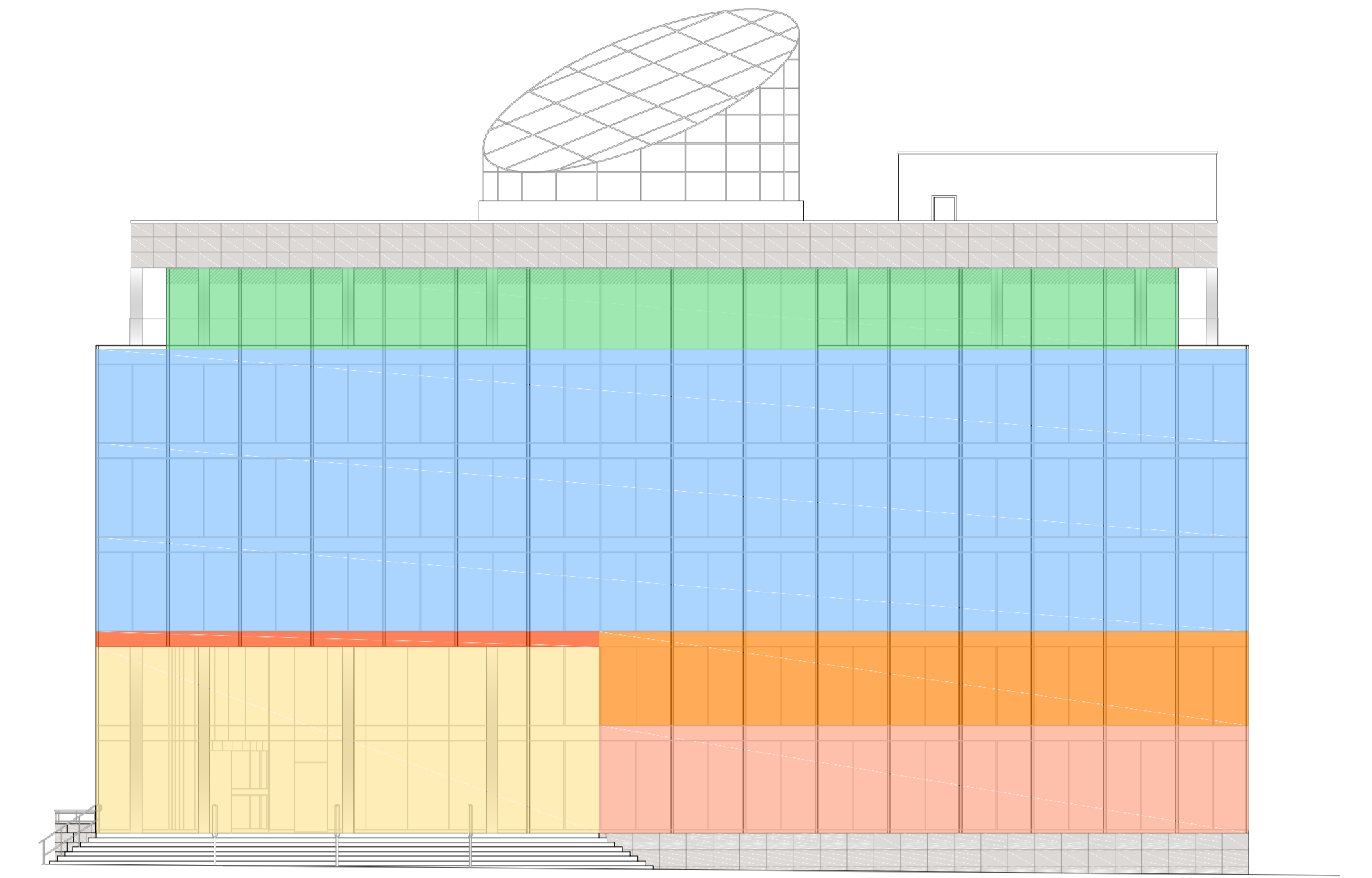
Checked By:
Gundo Sohn, Emer Maughan



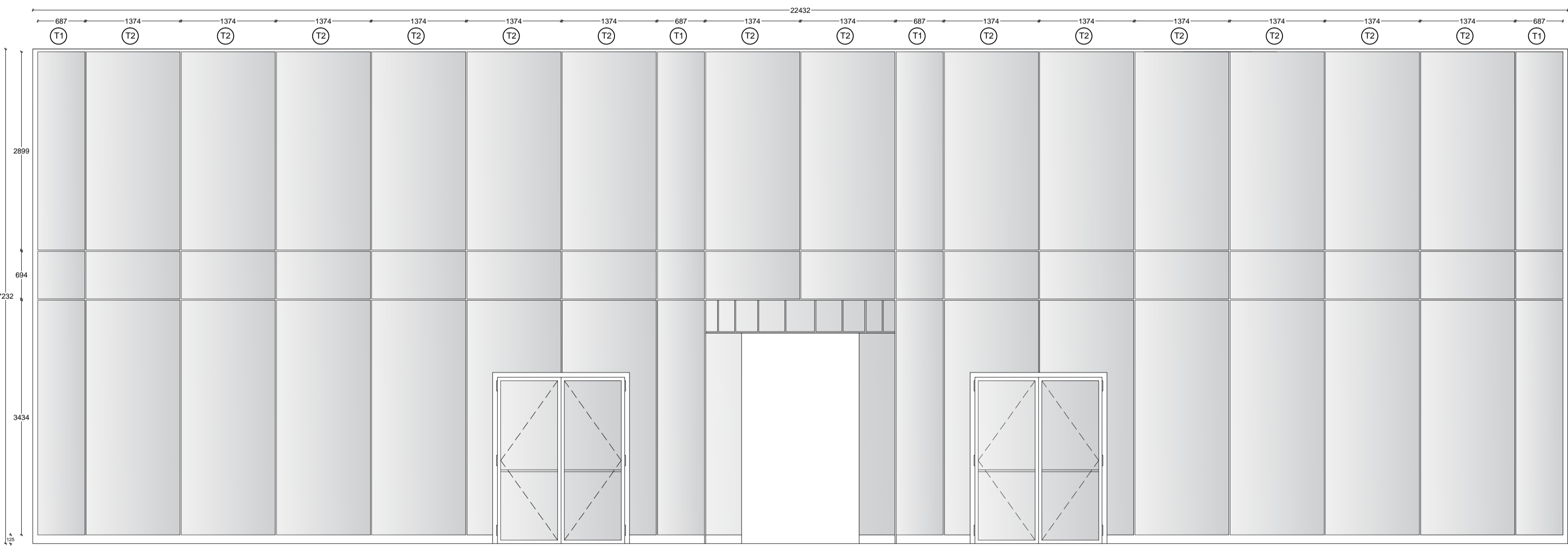
COLOUR		CURTAIN WALL TYPE 4 INSIDE SKIN
SIZE	19519x809 mm.	
PANELLING	1352x550 trespa panels & 2784x216 mm for ventilation window	
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices	
GLAZING	Hermetically sealed double glazing (6+16+6)	



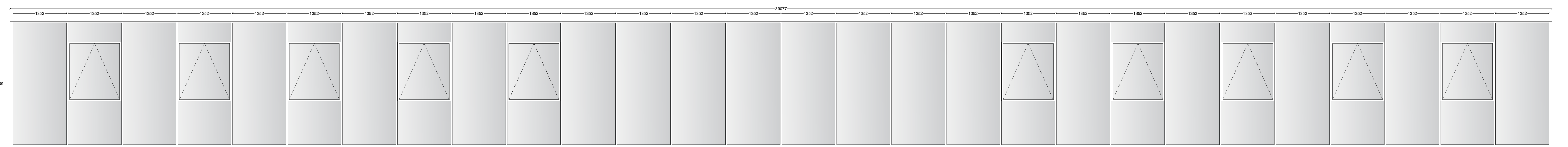
COLOUR		CURTAIN WALL TYPE 3 OUTSIDE SKIN
SIZE	19519x734 mm.	
PANELLING	2744x694mm for ventilation window	
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices	
GLAZING	Hermetically sealed double glazing (6+16+6)	



WEST ELEVATION



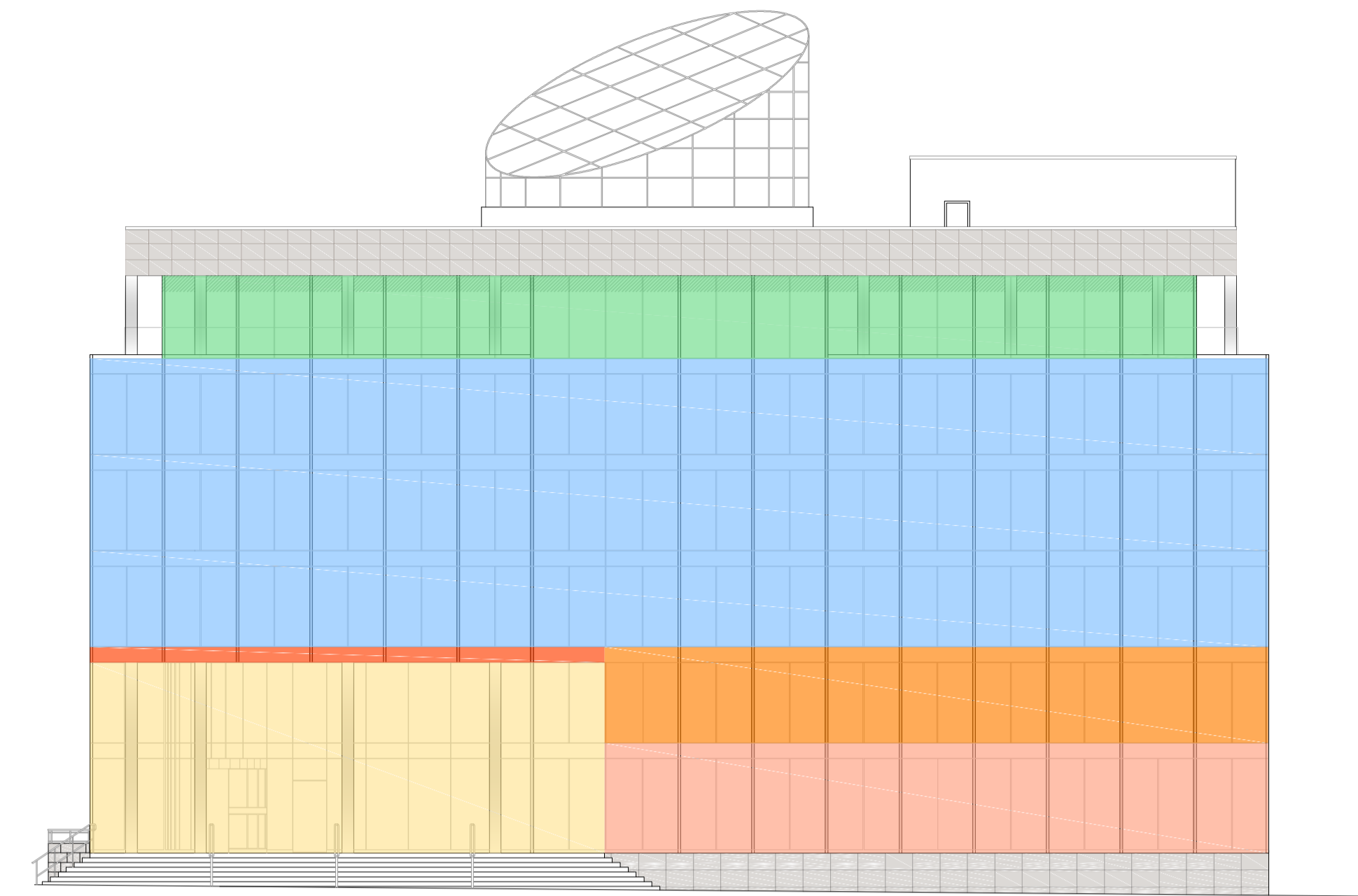
COLOUR		CURTAIN WALL TYPE 8 OUTSIDE SKIN
SIZE	22432x7232 mm.	
PANELLING	T1- 687x2899-687x694-687x3434 T2- 1374x2899-1374x694-1374x3434	
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices	
GLAZING	Hermetically sealed double glazing (6+16+6)	



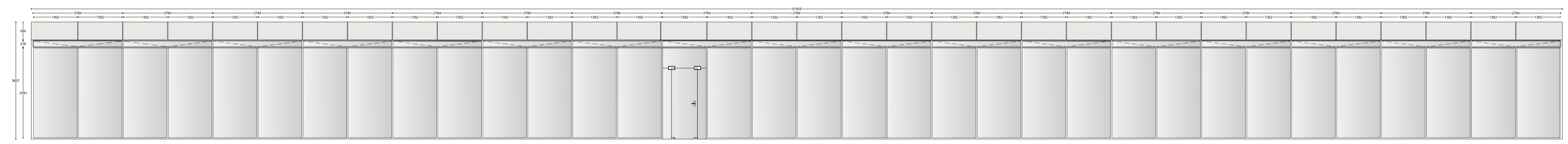
COLOUR		CURTAIN WALL TYPE 7 OUTSIDE SKIN
SIZE	39077x3159 mm.	
PANELLING	1352x3159 mm.	
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices	
GLAZING	Hermetically sealed double glazing (6+16+6)	



BSC ARCHITECTURAL TECHNOLY YEAR 3	
Project: OFFICE BUILDING, DUBLIN	
Plan Title: EXTERIOR WINDOW AND DOOR SCHEDULES	
Drawn by: IRIA XOUBANOVA MARTINEZ	Subject: DESIGN AND DETAIL STUDIES 3
Scale: Varies	Date: 14-5-2012
Checked By: Gundo Sohn, Emer Maughan	

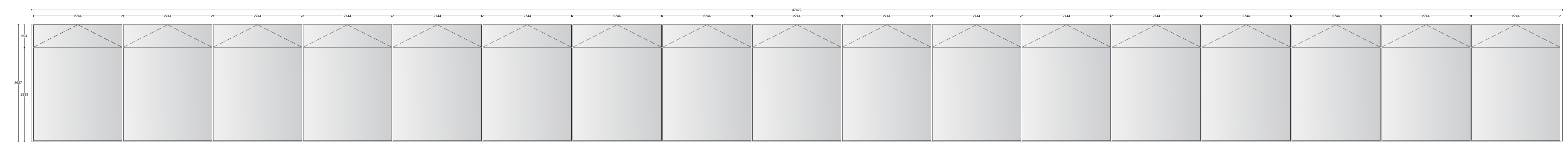


WEST ELEVATION



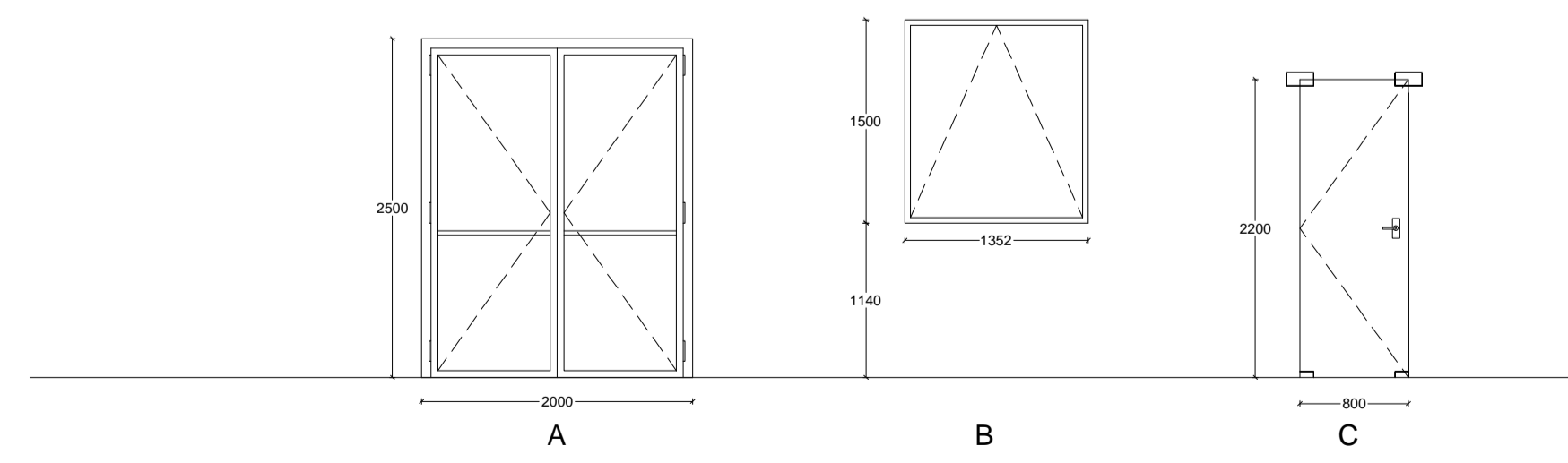
C

COLOUR	CURTAIN WALL TYPE 5 OUTSIDE SKIN
SIZE	47429x3627 mm.
PANELLING	1352x2781 mm.-1352x550 trispa panels & 2784x216 mm for ventilation window
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices
GLAZING	Hermetically sealed double glazing (6+16+6)



COLOUR	CURTAIN WALL TYPE 5 OUTSIDE SKIN
SIZE	47429x3627 mm.
PANELLING	2744x2893 mm. & 2744x694mm for ventilation window
FRAME	Thermally broken anodized aluminium curtain wall section, self draining and with matching cill at lower level, with a concealed motor hidden in the window frame which opens a glazing parallel for a ventilation in offices
GLAZING	Hermetically sealed double glazing (6+16+6)

CURTAIN WALL DETAIL WINDOWS/DOORS



A

B

C



BSC ARCHITECTURAL TECHNOLY YEAR 3

Project:
OFFICE BUILDING, DUBLIN

Plan Title:
EXTERIOR WINDOW AND DOOR SCHEDULES

Drawn by:
IRIA XOUBANOVA MARTINEZ

Subject:
DESIGN AND DETAIL STUDIES 3

Scale:
Varies

Date:
14-5-2012

Checked By:
Gundo Sohn, Emer Maughan



GMIT

GALWAY-MAYO INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO



UNIVERSITAT
POLITÈCNICA
DE VALÈNCIA

COMPARATIVE STUDY BETWEEN STRUCTURES AND TECHNOLOGIES IN IRELAND & SPAIN.

(DOUBLE SKIN FAÇADE)

BSC Architectural Technology year 3

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1. INTRODUCCIÓN:

The aim of this comparative report is to show the differences between the constructive systems in Spain and in Ireland, and how a new system (the double skin facade) can change depending on the climate conditions and the requirements of the building to make it suitable to work and reduced use of energy in the same time.

In Spain this kind of system is relative new and in this kind of system is starting in the latest office buildings, as we can see in the examples of Spanish buildings with this kind of façade, and one of the reasons is the highest price of build with glass instead of using bricks, as we used to do. So we only can see this system in office buildings where the construction budget is high and to make sustainable buildings, according to the new regulations of energy efficiency.

1.1 DOUBLE SKIN FACADE. INTRODUCTION TO THIS FACADE SYSTEM.

The Double Skin Façade is a system that consists of an external screen, a ventilated cavity and an internal screen. Solar shading is positioned in the ventilated cavity. The external and internal screens can be single glass or double glazed units, the depth of the cavity and the type of ventilation depend on environmental conditions, the desired envelope performance and the overall design of the building including environmental systems.

The external and internal skins do not need to be hermetic, the exterior cavity surface is usually, fully glazed (single glazing). The interior surface of a naturally ventilated facade is composed of an opaque wall and an operable window to enable the natural ventilation.

In winter the cavity forms a thermal buffer zone which reduces heat losses and enables passive thermal gain from solar radiation

This system could be classified in three big groups:

- **Naturally Ventilated Wall:** An extra skin is added to the outside of the building envelope. In periods with no solar radiation, the extra skin provides additional *thermal insulation*. In periods with solar irradiation, the skin is naturally ventilated from/to the outside by buoyancy (stack) effects.
This type of façade cannot be recommended for hot climates.
- **Active Wall:** An extra skin is applied to the inside of the building envelope; inside return air is passing through the cavity of the façade and returning to the ventilation system. In periods with solar radiation the energy, which is absorbed

by the blinds, is removed by ventilation. In periods with heating loads, solar energy can be recovered by means of heat exchangers. Both during cold periods with no or little solar irradiation and during periods with solar gains or cooling loads, the surface temperature of the inner glass is kept close to room temperature, leading to increased occupant comfort in the perimeter zone, near the façade. This type of façade is recommended for cold climates, because of the increased comfort during the cold season and the possible recovery of solar energy.

- **Interactive Wall:** The principle of the interactive is much like that of the naturally ventilated wall with the significant difference that the ventilation is forced. This means that the system works in situations with high ambient temperatures, as it does not depend on the stack effect alone. The system is thus ideal for hot climates with high cooling loads. During cold periods with no solar irradiation (during night-time) the ventilation can be minimized for increased thermal insulation. Apart from the advantages in terms of solar and thermal performance the system allows the use of operable windows for natural ventilation, even in high rise buildings.

The façade ventilation modes depend of the HVAC(heating, ventilating and air conditioning) system.

- Full HVAC system (the Double Façade is not a part of the HVAC) which can result in high energy use. On the other hand, the user can select whenever he prefers a controlled mechanically conditions inside or natural ventilation with the use of the Double Skin Façade.
- Limited HVAC system (the Double Façade contributes partly to the HVAC system or is playing the major role in creating the right indoor climate).
- **No HVAC. The Double Facade fulfills all the requirements of an HVAC system. This is the ideal case that can lead to low energy use.**

-1.External air curtain. In this ventilation mode, the air introduced into the cavity comes from the outside and is immediately rejected towards the outside. The ventilation of the cavity therefore forms an air curtain enveloping the outside facade.

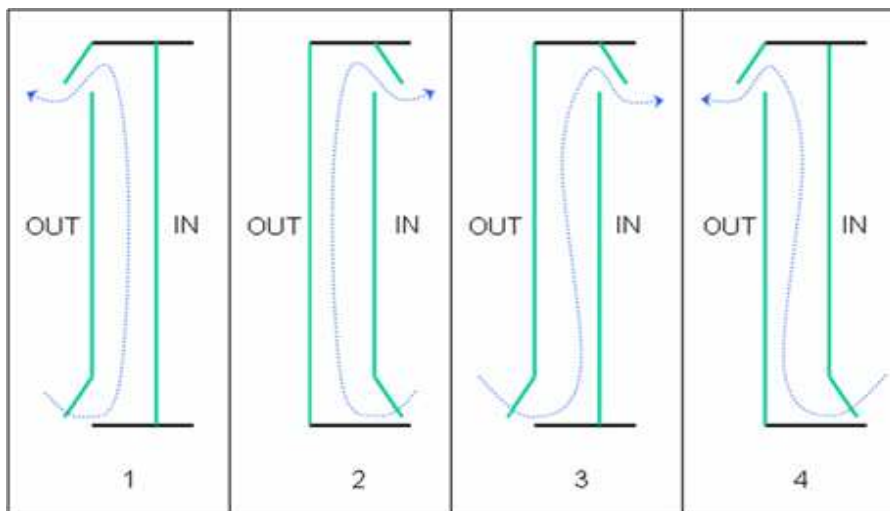
-2.Internal air curtain. The air comes from the inside of the room and is returned to the inside of the room or via the ventilation system. The ventilation of the cavity therefore forms an air curtain enveloping the indoor facade.

-3. Supply air. The ventilation of the facade is created with outdoor air. This air is then brought to the inside of the room or into the ventilation system. The ventilation of the facade thus makes it possible to supply the building with air.

-4. Exhaust air: The air comes from the inside of the room and is evacuated towards the outside. The ventilation of the facade thus makes it possible to evacuate the air from the building.

The ventilation mode is independent of the type of ventilation applied.

The facade can adopt several ventilation modes at different moments, depending on whether or not certain components integrated into the facade permit it.



In conclusion, doing a combination the different ventilation system you can save in heating and cooling systems, and prevent the “sick building syndrome”(SBS) associated with an individual's place of work (office building) and related to poor indoor air quality.

Sick building causes are frequently pinned down to flaws in the heating, ventilation, and air conditioning (HVAC) systems. Symptoms are often dealt with after the fact by boosting the overall turn-over rate of fresh air exchange with the outside air, but the new green building design goal should be able to avoid most of the SBS problem sources in the first place, minimize the ongoing use of VOC cleaning compounds, and eliminate conditions that encourage allergenic, mold growth.

We can use the **External air curtain system** in summer of cold climates where the outside temperature is not so high and the air chamber, makes the temperature of the inside of the building became optimal. This system in warm climates, where the external temperature is so high would refresh and control the internal temperature. The best in warm climates is adding to the facade some system of brise-soleils.

The Internal air curtain system is indicated in winter to clear the internal air without opening windows and losing the heat of the building.

To control the HVAC ,the building uses a “Building Management System” (BMS)is a computer-based control system installed in buildings that controls and monitors the building's mechanical and electrical equipment such as ventilation, lighting, power systems, fire systems, and security systems.

A BMS is most common in a large building. Its core function is to manage the environment within the building and may control temperature, carbon dioxide levels and humidity within a building. As a core function in most BMS systems, it controls heating and cooling, manages the systems that distribute this air throughout the building (by operating fans or opening/closing dampers), and then locally controls the mixture of heating and cooling to achieve the desired room temperature. A secondary function sometimes is to monitor the level of human-generated CO₂, mixing in outside air with waste air to increase the amount of oxygen while also missing heat/cooling losses.

- **AIR SUPPLY STRATEGY BY THE FACADE.**

- PREHEATED AIR.

During the heating periods the outdoor air can be inserted from the lower part of the facade and be preheated in the cavity. The exterior openings control the air flow and thus the temperatures. Then, through the central ventilation system the air can enter the building at a proper temperature. During the summer, the air can be extracted through the openings from the upper part of the façade. This strategy is applied usually to multi storey high Double Skin Facades. This type provides better air temperatures during the winter but during the summer the possibility of overheating is increased.

- AIR SUPPLY INDIVIDUAL PRE-HEATED

The possibility to use the Double Skin Façade as an individual supply of the preheated air also exists. An exhaust ventilation system improves the flow from the cavity to the room and to exhaust duct. Extra conditioning of air is needed in every room by means of VRV system or radiators. This solution is not applicable for the summer conditions since the air temperature inside the cavity is higher than the thermal comfort levels.

- **AIR EXTRACTION STRATEGY BY THE FACADE.**

- AIR EXTRACTION.

During the whole year, the double skin façade cavity can be used only as an exhaust duct without possibility of heat recovery for the HVAC system .It can be applied both during winter and summer to the same extent. The main aim of this configuration is to improve the insulation properties in the winter and to reduce

the solar radiation heat gains during the summer. There are no limitations in individual control of the windows openings.

➤ VENTILATED AND AIR EXTRACTION

Finally, the Double Skin Façade cavity can be used as a central exhaust duct for the ventilation system. The air enters through the lower part of the cavity and from each floor. Supply ventilation system stimulates the flow through the room to the cavity. The recovery of air is possible by means of heat pump or heat regenerator on the top of the cavity. The windows cannot be operable due to the not fresh air in the cavity.

1.2 BRIEF INTRODUCTION TO THE STUDIED BUILDING.



The studied building, Riverside I, occupies a prominent location in the South Docklands with profile directly onto the River Liffey. The building is directly opposite the new National Convention Centre and adjacent to the new Samuel Beckett Bridge.

Recognising the importance of the light, the building incorporates a centrally circular atrium above roof level. All internal partitions are glazed crystal. At night LED lighting is used to emphasize the timber blinds. This low energy lighting mounted within the twin wall permits an infinite variety of multi color scenes to reflect the particular activity conducted within. The overall result is a distinctive building on the Dublin waterfront.



The building was projected by the architecture studio "Scott Tallon Walker architects"

The project size is 11.711m² and the cost was 50 m€, in other hand the duration was 21 months.

The essence of the design is that the building frame together with its intricate and dynamic façade act as part of the overall

building services systems with the expressed intent of influencing the rate of heat gain or loss from the building in a positive way to minimise the overall demand of energy.

1.3 SPANISH DOUBLE SKIN FACADE BUILDINGS.

First of all, it is important to know the construction with that kind of façade in Spain is relatively new, and we can see office buildings with the double skin façade now because of new regulations of sustainability and energy efficiency.

In Spain the most common way of construction is using the ventilated ceramic façade, using bricks and ceramic tiles to recover the building because of its low cost and easy on site installation, and for the Spanish climate the lack of natural light is not a real problem.

However, nowadays the construction with that façade is starting in the office buildings constructions for its energetic benefits and the esthetic attributes of the glass.

Some sources claim that, the first instance of a Double Skin Curtain Wall appears in 1903 in the Steiff Factory in Giengen, Germany. According to her, "the priorities were to maximize daylighting while taking into account the cold weather and the strong winds of the region."

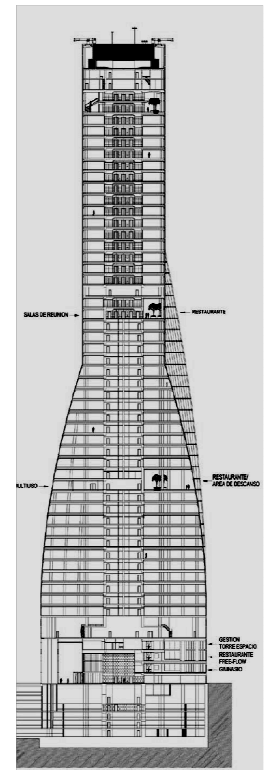
Some examples of Spanish buildings with this kind of façade are this: (as we can see the dates are very recent).

1-The building "Torre Espacio"



- Architects: Pei, Cobb Freed & Partners
- Floors: 57 above ground level, 6 underground level.
- Height: 236 metros
- Area: 60.142 m²
- Location: Madrid, Spain.
- 2004-2006
- The structural system of the underground garage is completely different from the tower: its columns, beams and floors are made of pre-cast concrete pieces, while the tower is built with in-situ

poured concrete. The building's elevation features cosine curves on two sides, forming a transition between its square base and elliptical roof plan.

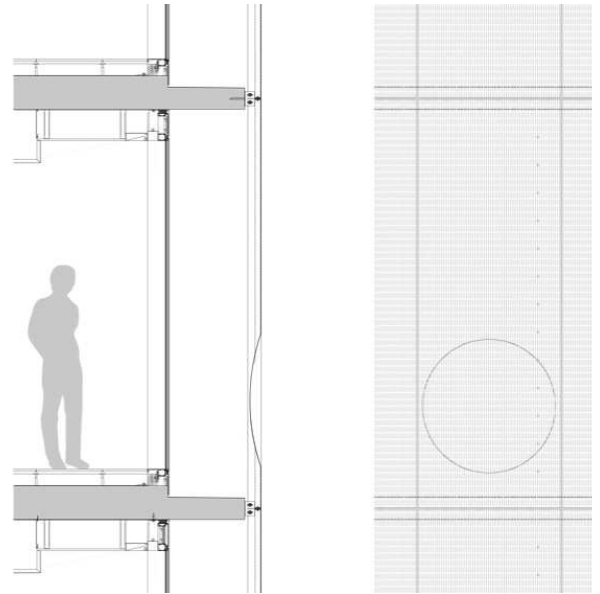


2- The corporate building Indra.

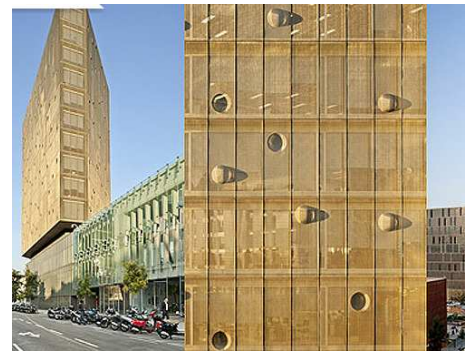


- Architects: Fermín Vázquez, Carlos Rubio, Enrique Álvarez-Sala (R&AS)
- Location: Barcelona, España
- Floors:13 above ground level, 1 underground level.
- Area: 10.375m²
- 2004-2006

-The Indra Building's façade is a large glass curtain wall of panels, which flood each office in the building with natural light.



Some of the glass panels open in to allow natural ventilation throughout the building. The exterior has been treated with a multi-purpose decorative shell and the glass skin is encased with a golden mesh fabric made from panels of stainless steel. **The mesh fabric protects the interior from solar gain and has a shade coefficient of 50%.** It also creates privacy during daytime, and a light and airy appearance to the façade. About a quarter of the golden screens have 90 centimeter spherical cuts in them, some convex and some concave. At night, when interior lights are illuminated, the building then becomes almost transparent.



4- health department of Bilbao.



- Arquitectos: Coll-Barreu Arquitectos
- Location: Bilbao, España
- Floors: 8 above ground level, 3 underground level.
- Area: 9.200m²
- 2004-2008

- A double facade solves not only zoning rules requirements but also energetic, fire-resistant and acoustic insulation ones. This duplicated plane



is not just a wrapper but a volume between Bilbao and the inner space. This element allows to breath the building. In the other hand, that folded element

produces multiple views of the city, and changing its appearance depending on the point of view, the hour and the season. The objective of this element is to introduce the mutability, the dynamic spirit of the city

3- Endesa Building.

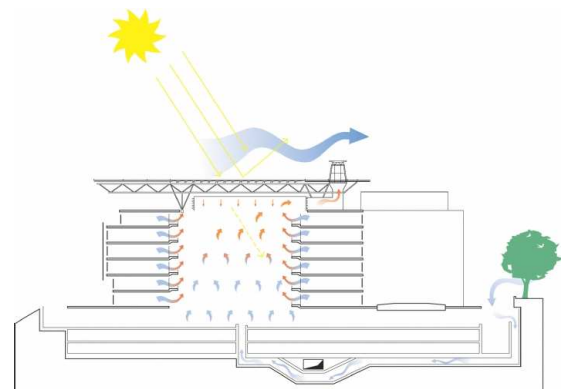


- Arquitectos: Rafael de la Hoz
- Location: Madrid, España
- Floors: 7 above ground level, 2 underground level.
- Area: 100.000 m²
- 1999-2004



- The eight-story atrium at the center of this corporate headquarters is actually a kind of condenser, combining aspects of identity, urbanity, and climate control in much the same way as the traditional patio in southern Spain does. Its main floor, surrounded by services and overlooked by the changing drama of light filtering through the roof's louvers and struts, brings a measure of urban intensity to its suburban setting. And with its sophisticated control of sun, heat, and air, it makes effective use of the traditional patio's climatic benefits, offering a model for office-building energy conservation. This last is a particularly appropriate feature, since Endesa is one of the country's major electric producers.

The project had to create a strong identity for Endesa on a limited budget (the total cost, according to La-Hoz, was \$81.6 million). This required, for example, the use of standard components for the facades to partially compensate for the extra expenditure of the atrium. The design had to contend with isolation, noise, and pollution.



KPF, which has designed several atrium-centered projects in the colder climates of northern Europe, and La-Hoz divided the office floor area into two continuous blocks embracing the atrium. These are concrete structures with modular plans and floor plates over 50 feet deep. Open offices predominate, lit by continuous floor-to-ceiling windows. The layering of the facades, and the shadows they cast, further enlivens the indoors. The facades vary according to the exposure, with fixed aluminum brise-soleils on southern elevations of the comb-shaped block that faces away from the highway, with its northern corners marked by crisp folded planes of white Córdoba limestone.

2. COMPARATIVE BETWEEN THE STRUCTURE AND THE FACADE SOLUTION IN THE STUDIED BUILDING WITH THE CLIMATIC CONDITIONS OF SPAIN

In this section, we will analyze the solutions that we might use in the studied building in case of this will be built in Spain instead of in Dublin, and how the weather may influence in the materials and structure solutions.

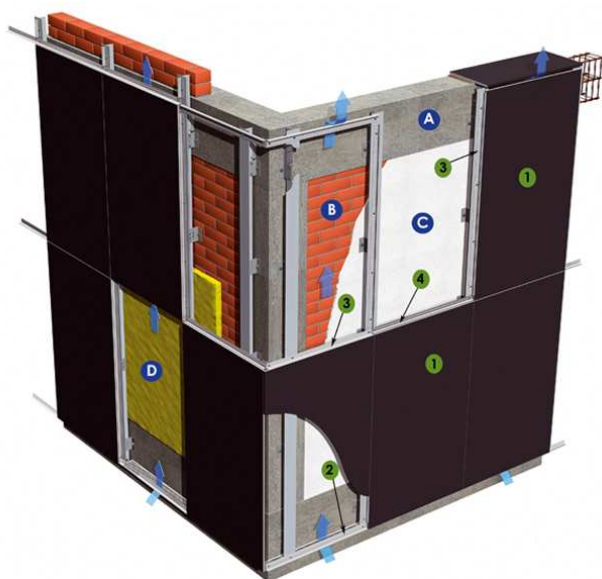
As we have said before, the main characteristic of that facade system is the energy and economical saving with the diary use, and at the same time, the thermal and acoustic comfort properties afforded by the facade technology.

This facade is recommended in areas where the light is a needed factor to avoid the use of electric light, but in areas with so much impact of solar radiation, it can benefit using new technologies to save energy like **using photovoltaic cells**, so one of the main differences between the building in Ireland or in Spain is the installation of **solar panels in the roof** nowadays we can use new technologies like transparent photovoltaic cells, based on organic molecules similar to dyes and pigments, tailored to absorb only the near-infrared spectrum and have the potential to transform that light into electricity at relatively high efficiency.

In other hand, the common construction in Spain is made with bricks and ceramic ventilated facades because it low cost. In Spain is not necessary to import this products from other parts, and the lack of light is not a real problem, the worst problem is the hot weather and the needed of a good ventilation to have the appropriate climatic conditions inside of the building.

Is for that reason that the Spanish construction uses that kind of facade solution instead of glass facades. However the use of the double skin facade is now one of

the most facade systems used in office buildings due to its visual impact and the new energy efficiency regulations.



This way, the work will focus on the double skin facade technology, and try to describe the differences will need to be considered to solve the problems of Spanish climate.

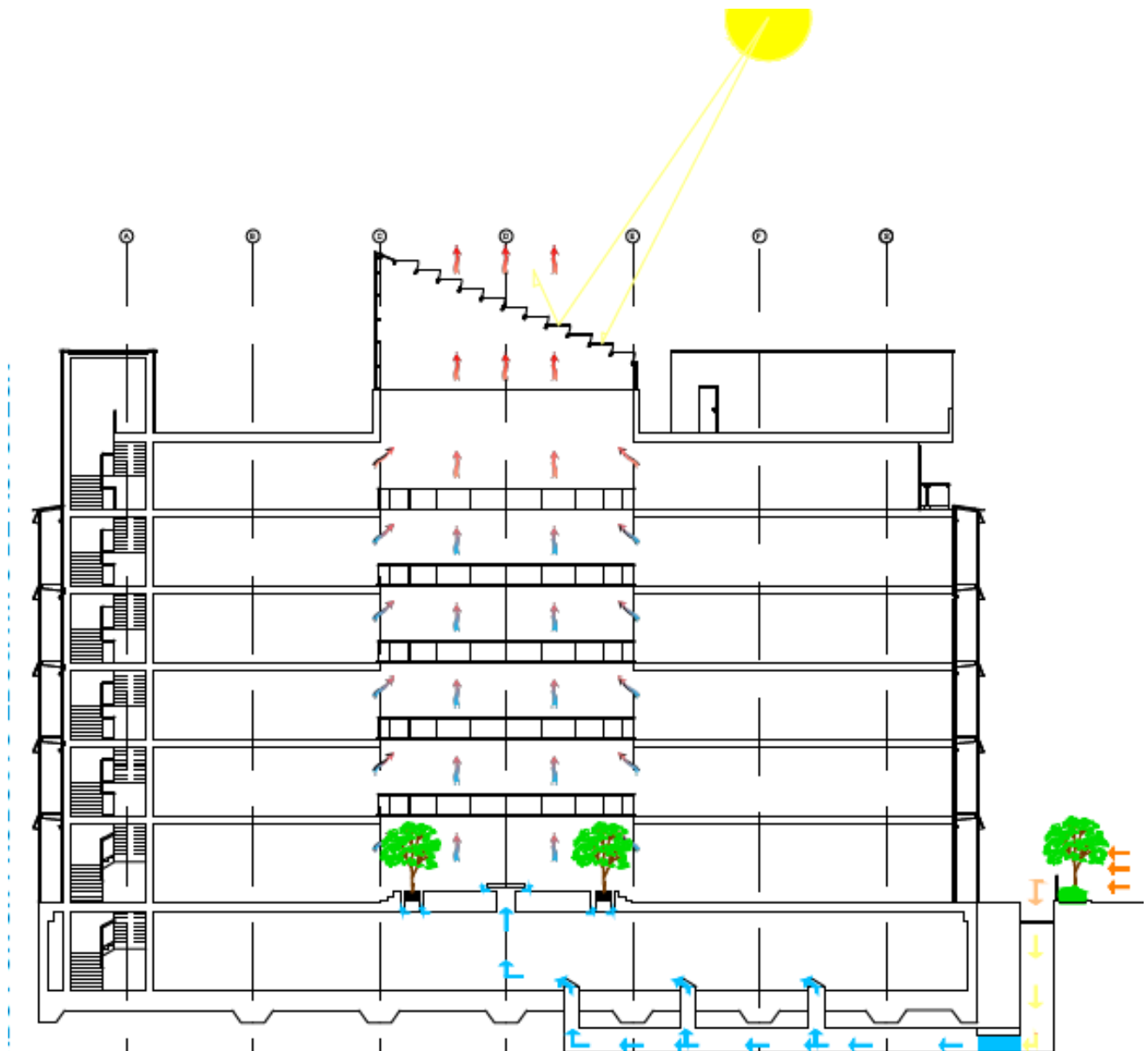
We will take as example the Endesa building that establishes great solutions to the high solar impact in Spanish climates.

The double skin curtain walling provides the occupants with the ability to open windows to allow for passive cooling and ventilation with an additional plane outside which acts as a shield to the sounds of a busy city centre.

The thermal insulation in this kind of construction is an important factor for the energy efficiency and is solved by the double and the considerable void, the double skin system does provide the envelope with a better u-value.

Nevertheless, in the Spanish climate the problem is the heat excess in summer, and for that reason the building will incorporate some solutions to solve this problem.

For the Spanish climate we will add an extra system to supply fresh air into the building using **geothermal energy**. Fresh air supplied to the atrium is cooled by underground ducts that are connected to fresh-air inlets. Offices have operable windows for natural ventilation. During the summer, hot air in the atrium vents at the glazed, louvered perimeter and roof-mounted wind towers remain open to increase airflow through the



- TINTED GREEN GLASS	- Solar transmission:	Light	LIGHT - DARK	→ 75,5% - 65,5%
		Heat		→ 44,7% - 32,7%
	- Solar Reflecting:	Light		→ 7,1% - 6,6%
		Heat		→ 5,3% - 5%

Other option based in the latest technologies are the "smart energy glass"(SEG) based on a polymer coating that is placed between two layers of glass. These layers together form the external pane of an insulated glazing unit. By applying an external voltage to the coating, it is possible to control the optical properties of the window within less than a second. SEG can be switched into three different states: a bright state, a dark state and a translucent state.

<http://www.peerplus.nl/default/index/index/language/2>



Finally the green roof could be a solution to reduce the "Heat Island effect" apart from giving beauty to the building; it provides functional improvements to the building and the environment. The Green Roof recuperates thousands of litres of rain water. On the other hand, the Green Roof improves the thermal behavior of the building and the photosynthesis of the plants reduces the emission of gases. In Spain the lack of rain water could be solved using native plant green roof similar to the native ecosystems found on and adjacent to the site before construction to avoid the high maintenance.

In most cases designers install drip irrigation inside the substrate which consumes less water than spray irrigation. When available they use non-potable water sources such as recycled city water. Water from underground cisterns that collect excess roof water during the rainy season is used to irrigate green roofs in the dry season. Others irrigate with excess water of air conditioning condensing units that are already on the roof.