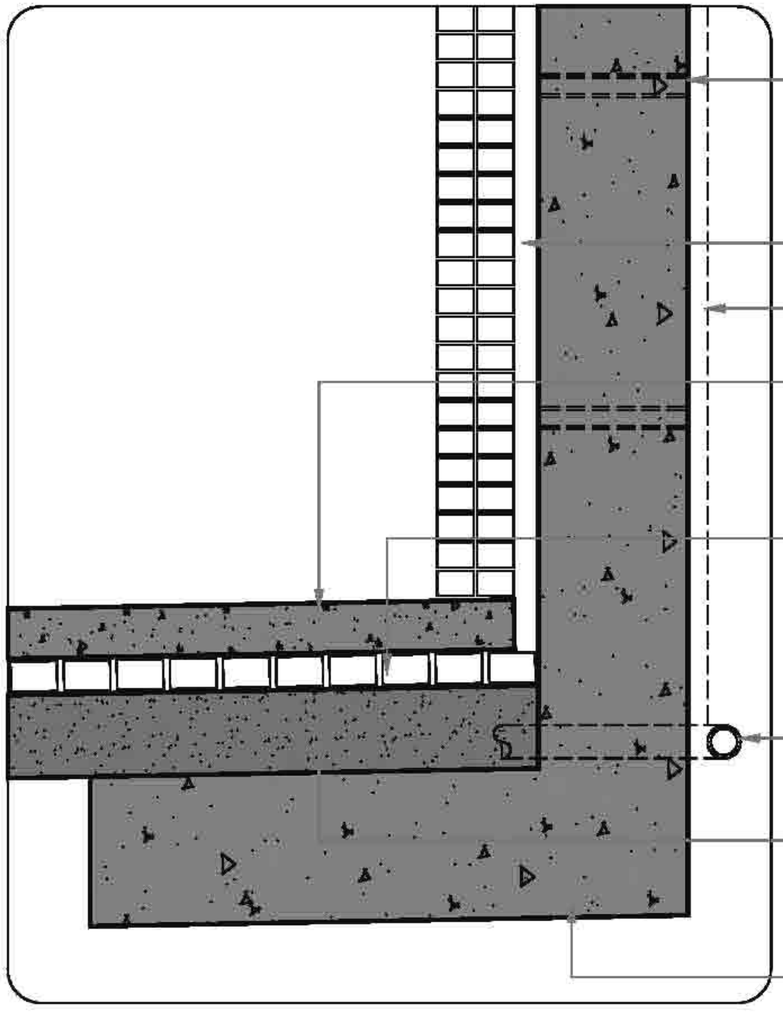
Chapter 6



Flow-drain punctures in retailing wall at 1m² spacing 450mm cast in situ reinforced concrete retaining wall

Min 75mm cavity

Geo-textile membrane

Min 150mm mesh reinforced structural concrete floor slab with 1:50 fall towards water catch-pit on 0.45 polyolefin membrane

290x140x90mm concrete bricks with 20mm joints for water drain

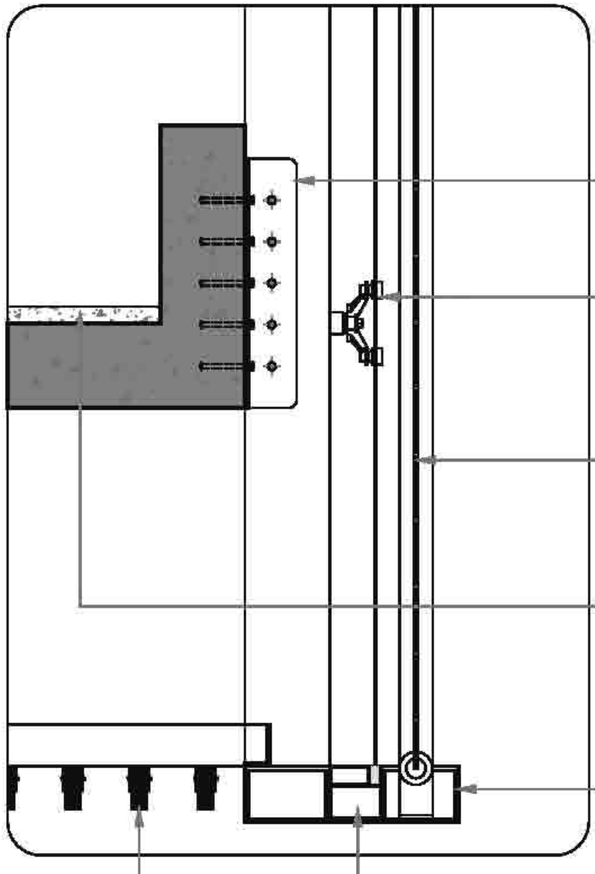
Geo-pipe on cast in situ reinforced concrete footing for water pressure

250mm no fines cast in situ concrete floor slab at 1:50 fall to sump

Reinforced concrete footing

Detail_Drained cavity basement

DETAIL 009 1:20



Two 150 x 90 x 15 galvanized mild steel angles fixed with bolts to glazing support frame and reinforced concrete up- stand as per eng

Pilkington 4 point spider arm structural glazing facade system adjusted to fit curve as per manufacturer

GKD AG4 MediaMESH vertically supported by GKD fixing bracket to mild steel galvanized frame as per manufacturer

255mm reinforced concrete floor slab as per eng approved with polished and pigmented screed onto concrete floor slab

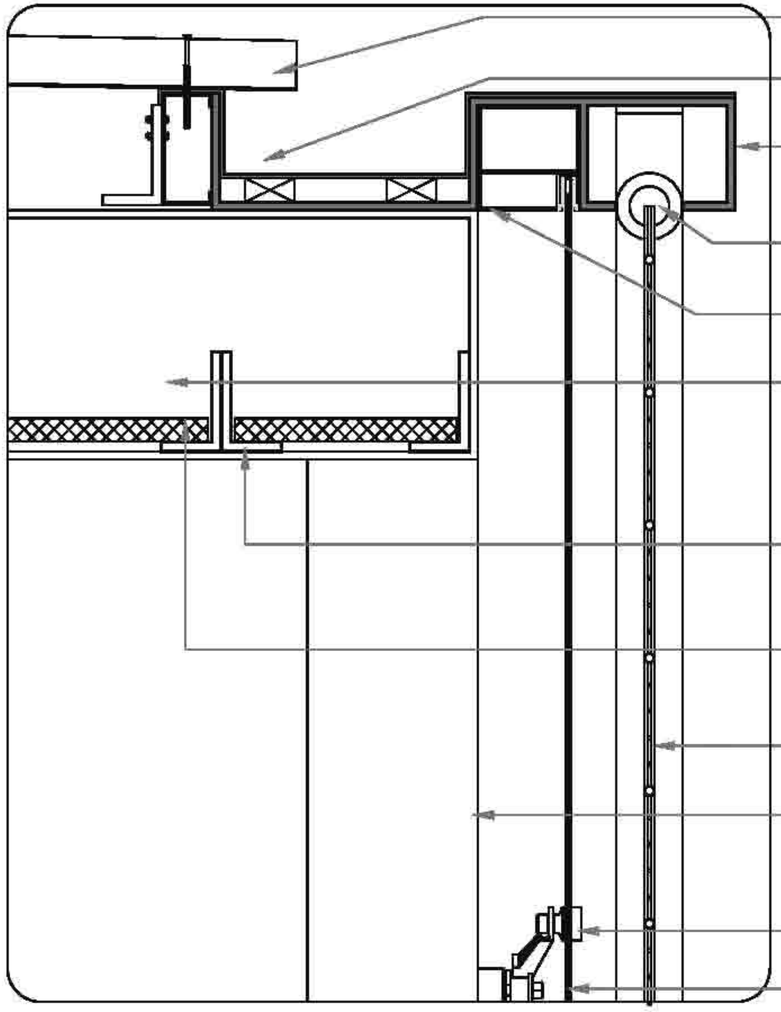
Purpose made structural steel box frame for glazing and GKD AG4 MediaMESH end support welded onto vertical steel support frame as per engineer

Purpose made Aluminium frame fitted into structural box unit for spider arm structural glazing end support

Laminated timber bolt fixed into steel channels and welded onto purpose made suspended intermediate steel angle support frame at 2750mm c/c to fit media facade curve

Detail_Media Library facade end bottom support frame detail

DETAIL 012 1:20



RCP 8 Translucent roof sheet profile fixed to purlin support system with approved fasteners at every third interval

Purpose made box gutter supported on top of structural box unit to fall as per eng

Purpose made structural steel composite box unit as per engineer welded onto mild steel support frame

Purpose made structural steel vertical support bracket as per engineer and GKD MediaMESH manufacturer

Purpose made Aluminium frame fitted into structural box unit for spider arm structural glazing end support

Beamsize:
Maximum span 7500mm/slenderness ration of 20: 5000/20=375mm galvanised steel I-BEAM

150 x 75 mm steel cold-formed lipped channels fixed to i-beam roof support with mild steel a angle cleat as per engineer

Poly Carbonate roof panel sheeting supported in between lipped channels onto I-BEAM section to create mechanically ventilated cavity for solar heat control

GKD AG4 MediaMESH vertically supported by GKD mesh fixing bracket to mild steel galvanised frame

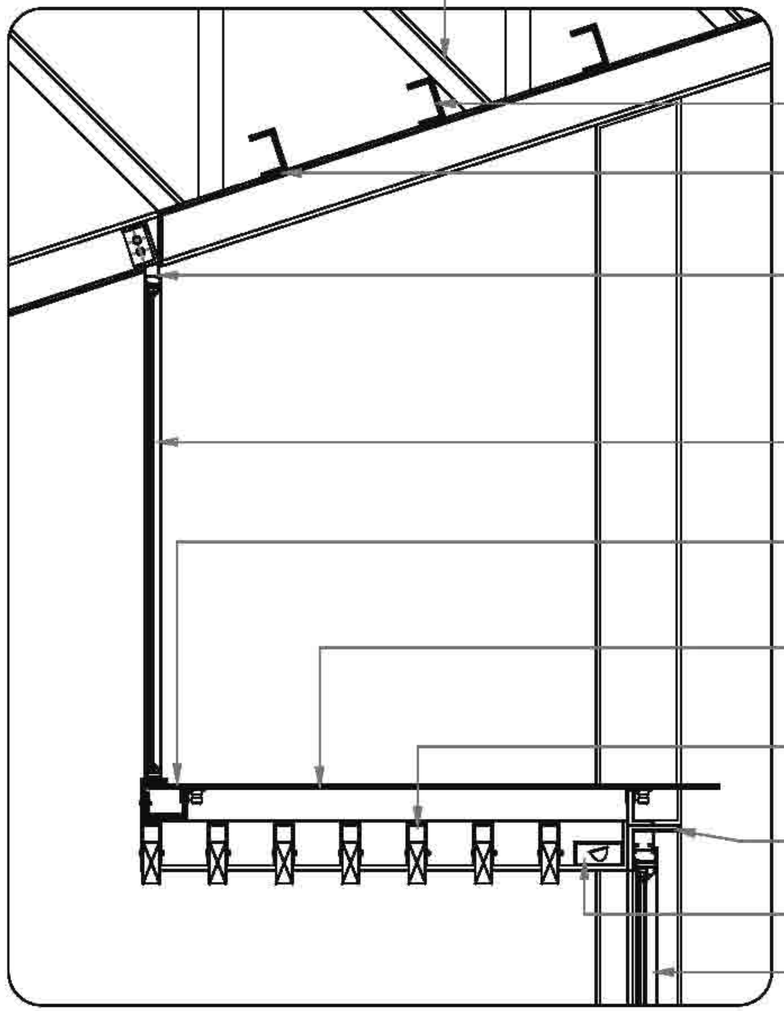
250 x 100mm galvanised hollow steel section for structural glazing support welded to I-BEAM and composite structural box as per engineer

Pilkington 4 point spider arm structural glazing facade system with arms adjusted to fit curve as per manufacturer

Glass panel intersection with site applied silicon sealant and backing rod as per manufacturer

Detail_Science Library facade and top support structural box

DETAIL 011 1:10



75 x 50 x 15mm steel angles welded onto IPE160 bottom truss member as per SANS 2001 - CS 1

127 x 75 x 15 mm galvanised steel channels bolt fixed onto IPE 160 exposed steel truss bottom cord

Fibre cement ceiling board fixed to galvanized steel channels

Purpose made supporting aluminium window sill for window frame

Aluminium window frame

125 x 75 x 15mm mild steel channels bolt fixed to composite steel frame for glazing arm support

Pilkington Planar flush glazing system with applied silicone sealant between glass panels

25 x 75mm timber purlins fixed into 125 x 25mm mild steel channel at 200 centres welded onto composite steel angle frame

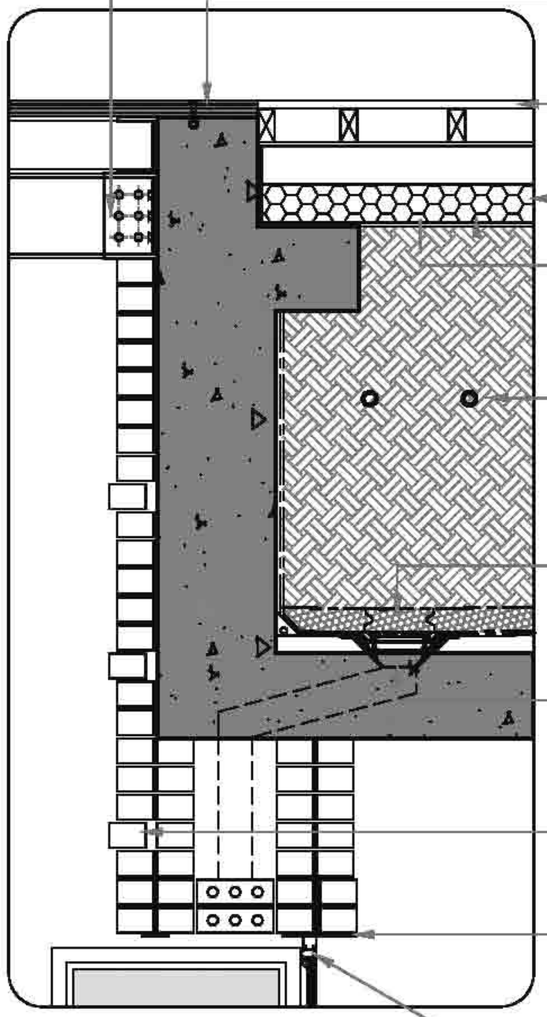
150 x 75 x 15mm composite steel angle frame

Light fitting installed into composite frame

Aluminium door frame

Detail_Roof and glass canopy junction

DETAIL 009 1:20



254 x 171mm mild steel I section fixed to concrete up stand and angle-cut for flush joint finish

4 x 12mm laminated frosted glass floor deck fixed with counter-sunk bolts onto rubber backing supported on steel frame

Timber floor deck fixed supported with 50x25mm timber battens onto 275x171x12mm steel I-Beam ont0 concrete footing

BEAMSIZE: Span of 5500mm/slenderness ration of 20 5500/20 = 275mm galvanized steel I-BEAM

75mm thick layer course aggregate of 20mm crushed stone laid above garden soil

Drip system installed as per manufacturer and garden soil for trees and shrubs growth and support in concrete planter box

Geo-textile membrane on 75mm thick layer of 20mm crushed stone with min 30mm concrete screed to 1:50 fall

Full-bore outlet casted into concrete planter box with connecting water outlet pipes in brick cavity wall

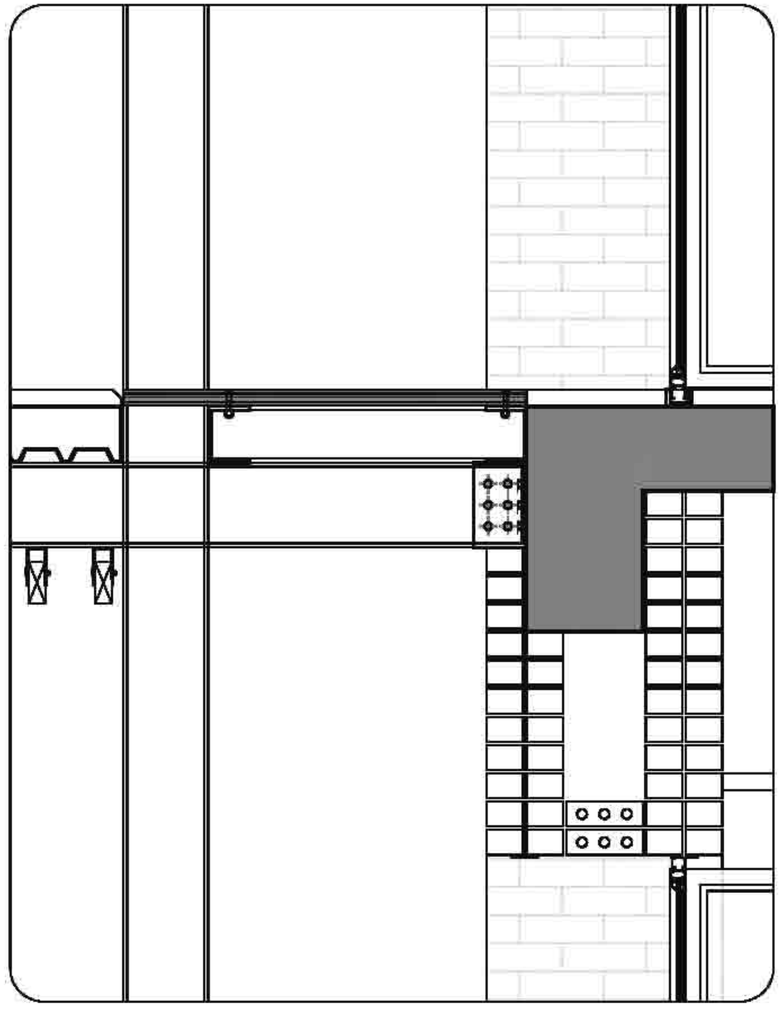
25mm extruded brick for shadow line

175 x 80mm mild steel angled fixed to supporting concrete and column brick work

Aluminium door and window frame supported with 50 x 50 x 15mm galvanised steel angle frame

Detail_Internal planter box and garden deck

DETAIL 008 1:20



Two 150 x 90 x 15 galvanized mild steel angles fixed with bolts to glazing support frame and reinforced concrete up-stand as per eng

Pilkington 4 point spider arm structural glazing facade system adjusted to fit curve

GKD AG4 MediaMESH vertically supported by GKD fixing bracket to mild steel galvanised frame

Purpose made structural steel box frame for glazing and GKD AG4 MediaMESH and support welded onto vertical steel support frame

255mm reinforced concrete floor slab as per eng approved

Polished and pigmented screed onto concrete floor slab

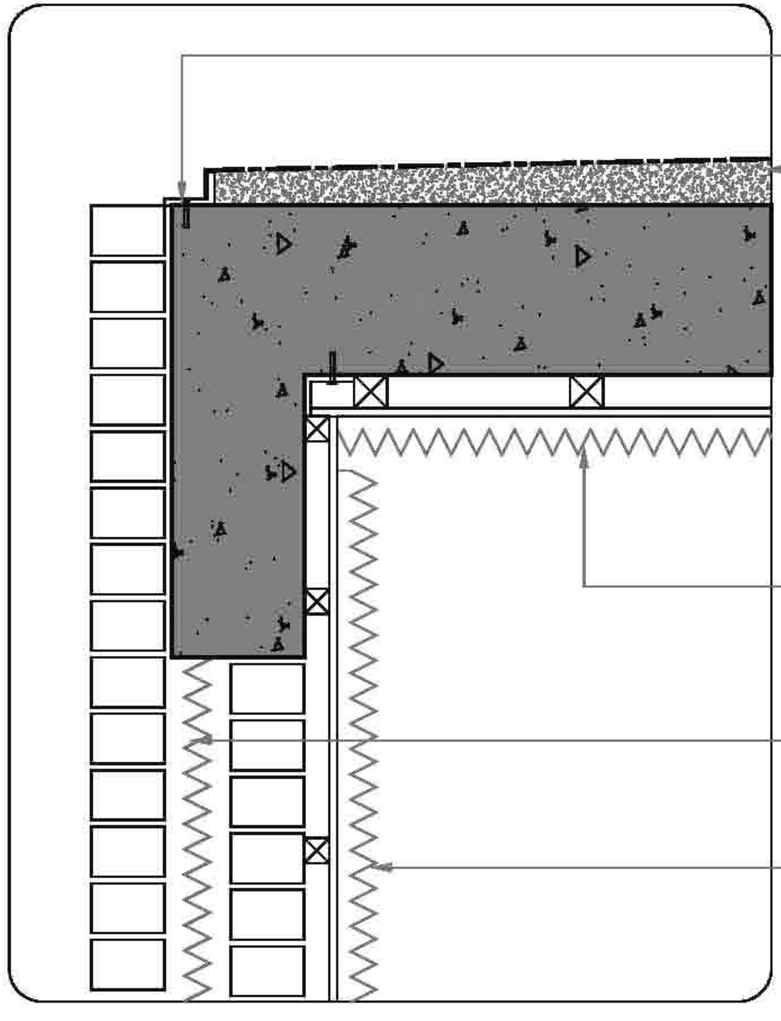
Purpose made structural steel composite box unit as per engineer welded onto mild steel support frame

Purpose made Aluminium frame fitted into structural box unit for spider arm structural glazing end support

Laminated timber bolt fixed into steel channels and welded onto purpose made suspended intermediate steel angle support frame at 2750mm c/c to fit media facade curve

Walkway junction detail

DETAIL 004 1:20



50 x 75 x 15mm galvanized mild steel angle counter-sunk into concrete beam

Bitumen torch-on waterproofing membrane laid on min 50mm concrete screen with min fall 1:70 towards ends

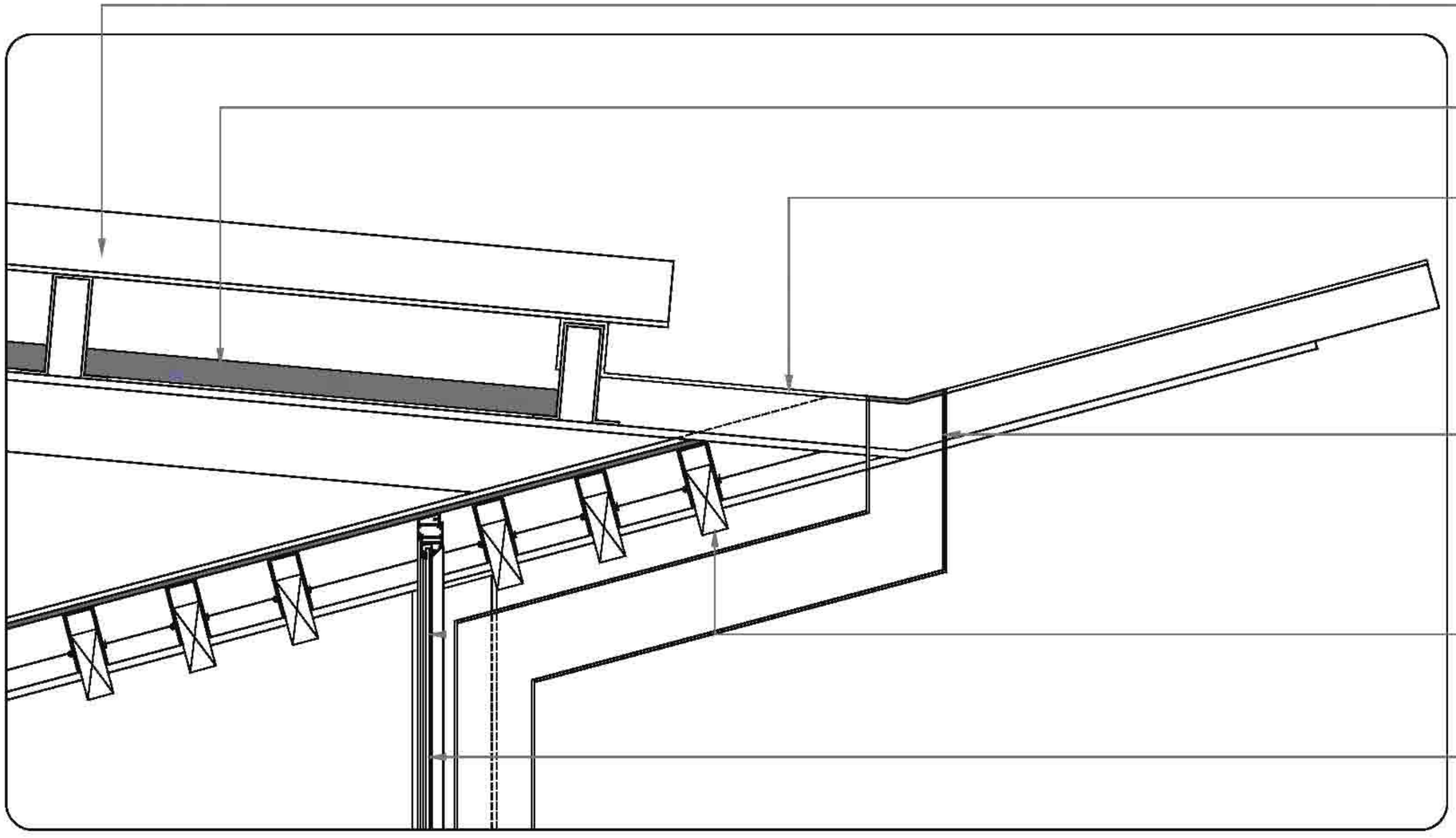
40mm SONITEK acoustic foam wedges onto 12mm timber ply-board fixed to 50 x 50mm timber batten frame at max 450mm c/c

50 - 75mm SONITEK acoustic wool insulation fixed into 100mm brick cavity wall

38 x 38mm timber batten frame at max 450mm c/c with 40mm SONITEK acoustic foam wedges onto 12mm plywood board

Detail_Aging Process of brick wall - Recording studio roof accoustic wall and ceiling detail

DETAIL 007 1:10



CORTEN finished BROWNBUILT roof sheets fixed to 175 x 75 top hats

Sagex boarded roof insulation panles supported over lip of top hat sections

Purpose made structural gutter galvanised mild steel flashing supported on top of steel angle bottom truss member

Purposed made gutter downpipe as per manufacturer specifications

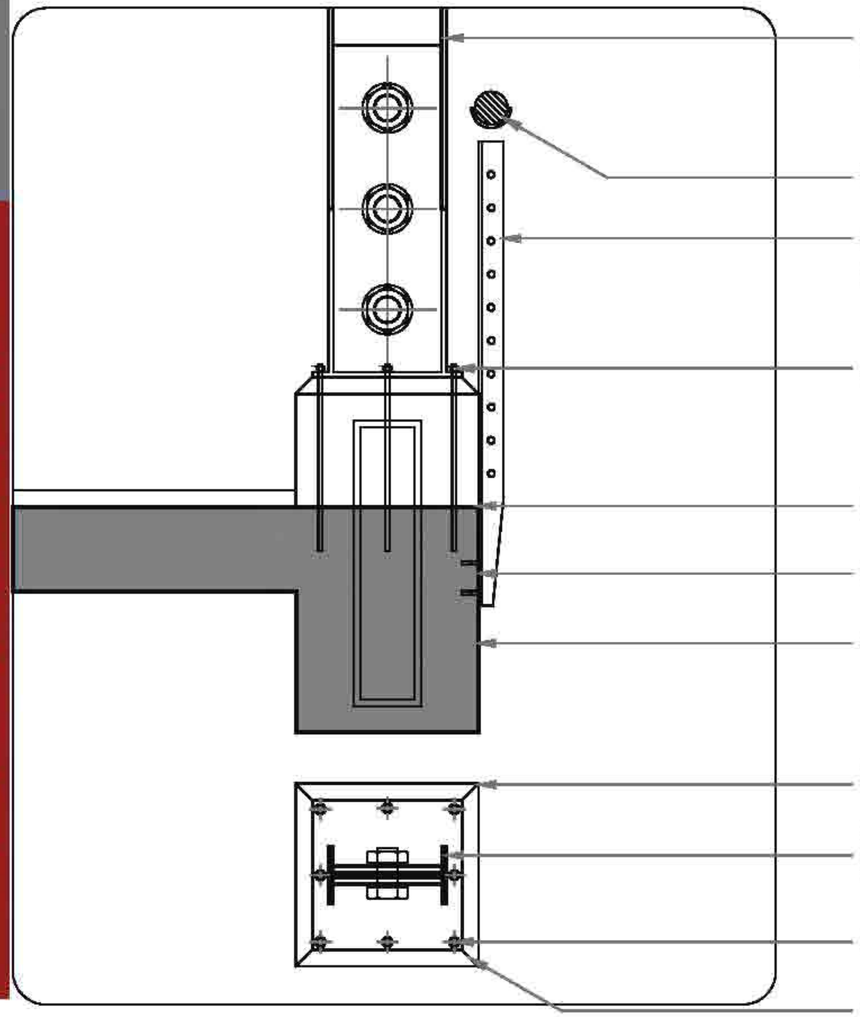
Two 150 x 75 x 15mm steel angles welded together as per engineer for top and bottom main support

125x75x15mm steel channels with closed ends bloit fixed to main stuctural member with timber purlins preserved and treated to manufacturer bolt fixed into channel frame

Aluminium window frame fitted to steel angle bottom truss member

Detail_Main roof underside and support

DETAIL 006 1:10



356x171x51mm galvinised steel comumn connected with oversized industrial M150 bolts to purpose made steel composite unit welded to 450 x 450 x 20 mm base plate

150mm diameter timber handrail preserved and treated as per manufacturer fixed onto steel tubing welded to balustrade

75 x 50 x 15mm galvanised mild steel balustrading lipped sections with 10mm diameter stainless steel rods and welded to 10mm base plate fixed to 255mm cast in situ reinforced conc floor slab with m10 galv mild steel bolts

eight holding bolts in anchor grout in concrete base bolt fixed to steel base plate with expansion grout under base plate

Lipped balustrade fixed to reinforced cast in situ concrete floor with stainless steel countersunk selftapping screws

255mm reinforced cast in situ concrete floor slab with exposed formwork finish as per engineer

column reinforcing into reinforced concrete beam

550 x 550mm reinforced concrete base 750mm upstand

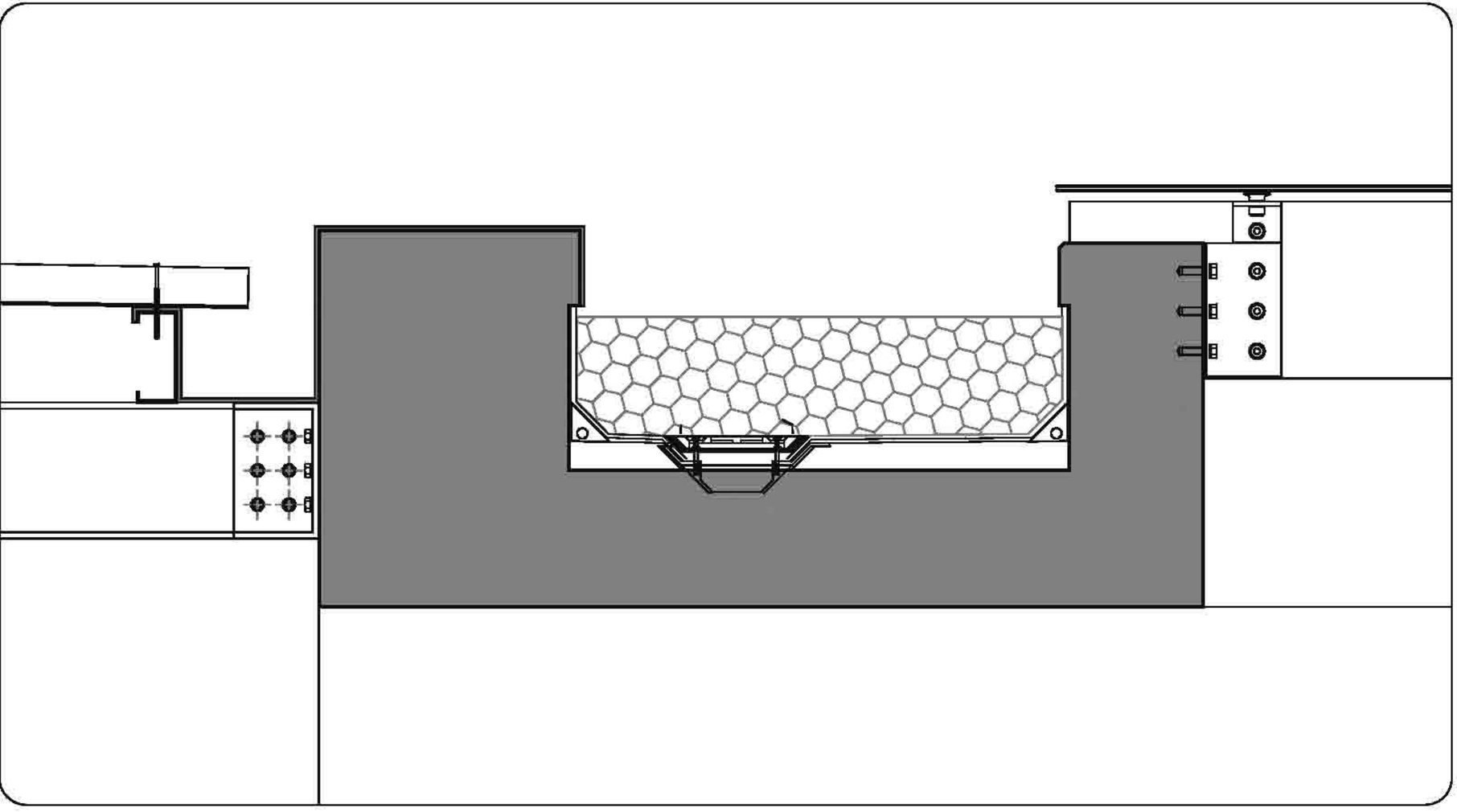
356x171x51mm galvinised steel comumn connected with oversized industrial M150 bolts to purpose made steel composite unit welded to 450 x 450 x 20 mm base plate

eight holding bolts in anchor grout in concrete base bolt fixed to steel base plate

expansion grout under base plate

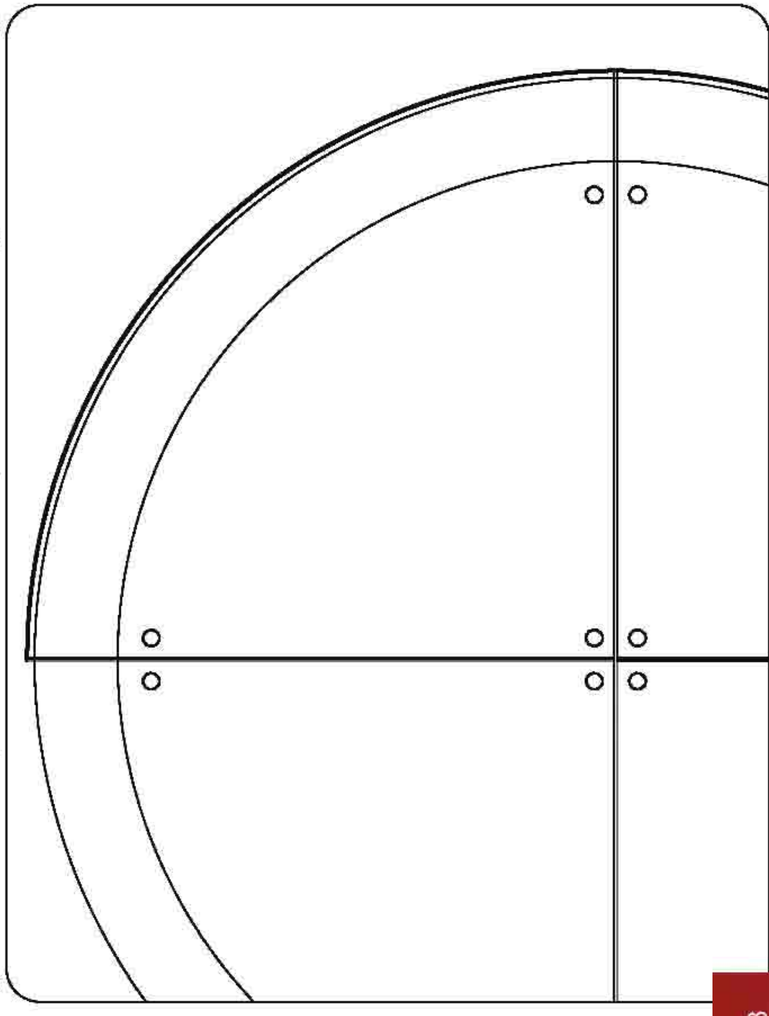
Planter box detail

DETAIL 005 1:20



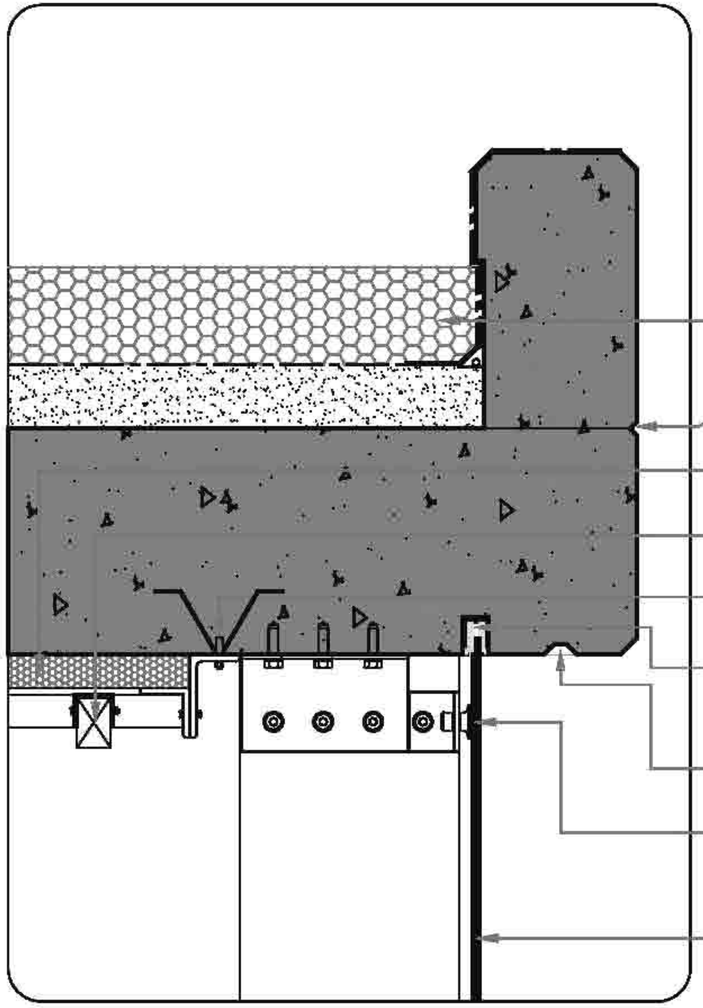
Science Library facade and top support structural box detail

DETAIL 002 1:10



Planter box detail

DETAIL 003 1:20



20mm crushed stone aggregrate layer onto approved waterproofing membrane on min 50mm screed to fall 1:50

Day joint

SAGEX boarded roof insulation as per manufacturer

75 x 50mm timber purlins fixed into welded steel angle frame at 2250mm c/c

125 x 75mm mild steel angle fixed with ceiling lug casted into concrete slab and bolt fixed to supporting framework

silicone sealant and neoprene guides in 50 x 50 x 3mm aluminium glazing channel at min 25mm cover with shims at between reinforced concrete lab installed as per manu- facturer

Drip

Pilkington Planar stainless steel bolt onto 80 x 80 x8mm springplate with splice bolt assembly onto 19mm armouplate fin with 1mm fibre gasket seal

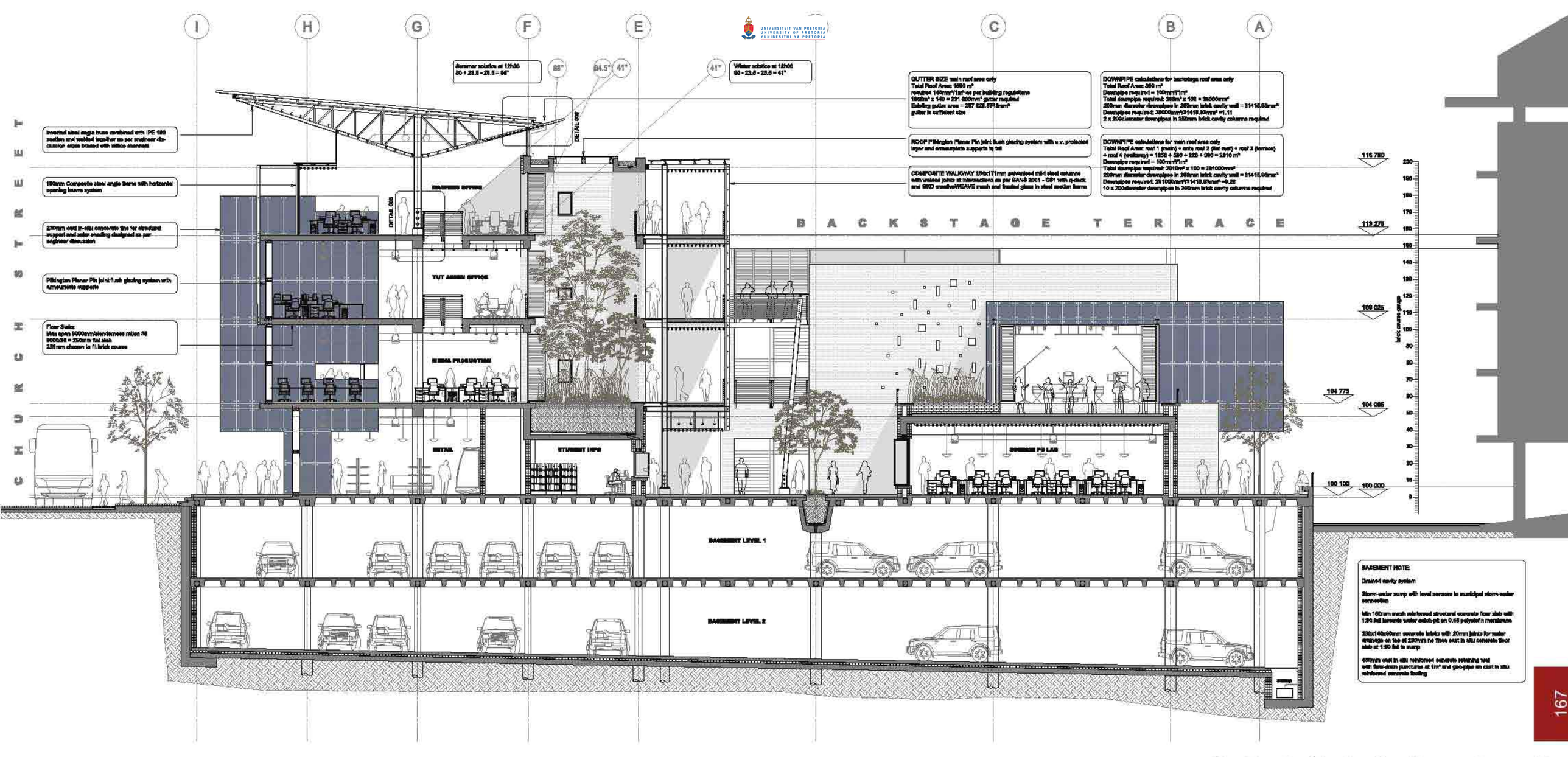
12mm armourplate glazing with silicone sealent and backer rod between glass plate connections

Detail_Live recording studion roof and glazing junction

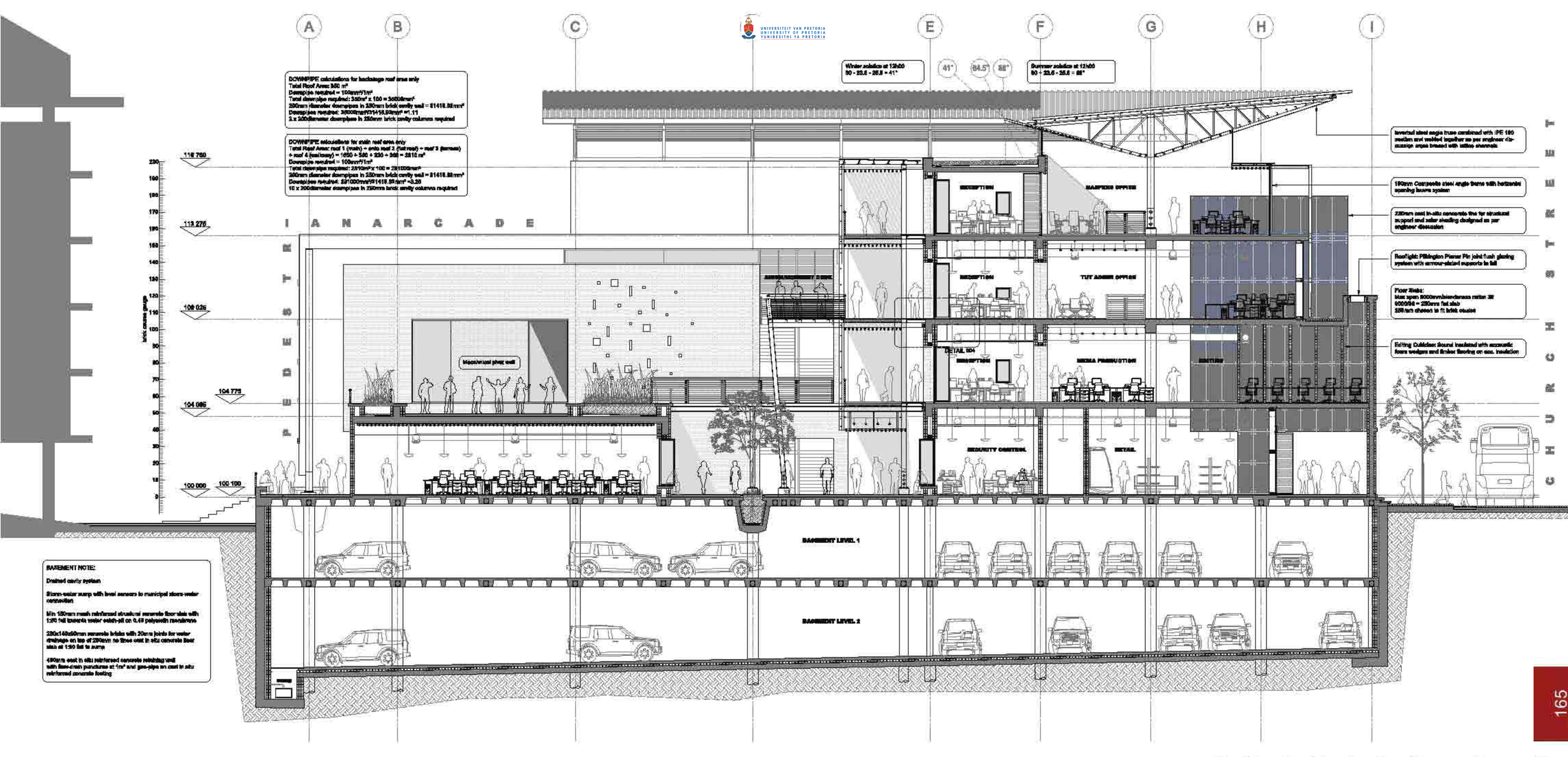
DETAIL 001 1:10

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
A
B
C
E
F
G
H
I
MEDIA PRODUCTION LAB
CHURCH STREET
GUTTER SIZE main roof area only
DOWNPIPE calculations for main roof area only
Floor Slabs:
BASEMENT LEVEL 1
BASEMENT LEVEL 2
BASEMENT NOTE:

S E C T I O N   D - D


I
H
G
F
E
C
B
A
CHURCH STREET
Summer solstice at 12h00
90 + 23.5 - 23.5 = 90°
88°
84.5°
41°
Winter solstice at 12h00
90 - 23.5 - 25.5 = 41°
DETAIL 002
DETAIL 003
DETAIL 004
Inverted steel angle truss combined with IPE 180 section and welded together as per engineer discussion angle braced with rafter channels
190mm Concrete steel angle beams with horizontal opening louvre system
230mm cast in-situ concrete tire for structural support and solar shading designed as per engineer discussion
Pilkington Planar Pin joint flush glazing system with armourplate supports
Floor Slabs:
Max span 9000centre-to-centres ration 30
9000/30 = 250mm Tot slab
225mm chosen to fit brick course
GUTTER SIZE main roof area only
Total Roof Area: 1880 m²
required 140mm²/1m² as per building regulations
1880m² x 140 = 231 200mm² gutter required
Existing gutter area = 287 628.87mm²
gutter is sufficient size
ROOF Pilkington Planar Pin joint flush glazing system with u.v. protected layer and armourplate supports to rail
COMPOSITE WALKWAY 250x171mm galvanized mild steel cellutive with welded joints at intersections as per SANS 2001 - CS1 with q-deck and SED crossbar/WEAVE mesh and framed glass in steel section frame
DOWNPIPE calculations for backstage roof area only
Total Roof Area: 369 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 369m² x 100 = 36900mm²
200mm diameter downpipes in 265mm brick cavity wall = 31415.93mm²
Downpipes required: 36900mm²/31415.93mm² =1.11
2 x 200diameter downpipes in 265mm brick cavity columns required
DOWNPIPE calculations for main roof area only
Total Roof Area: roof 1 (main) + orts roof 2 (flat roof) + roof 3 (terrace) + roof 4 (walkway) = 1852 + 580 + 220 + 360 = 2810 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 2810m² x 100 = 281000mm²
200mm diameter downpipes in 265mm brick cavity wall = 31415.93mm²
Downpipes required: 281000mm²/31415.93mm² =9.26
10 x 200diameter downpipes in 265mm brick cavity columns required
BACKSTAGE TERRACE
TUT ADMIN OFFICE
MEDIA PRODUCTION
RETAIL
STUDENT HUB
DESIGNER PS LAB
BASEMENT LEVEL 1
BASEMENT LEVEL 2
116 750
113 275
109 025
104 775
104 025
100 100
100 000
brick course gauge
BASEMENT NOTE:
Drained cavity system
Storm-water sump with level sensors to municipal storm-water connection
Min 150mm mesh reinforced structural concrete floor slab with 1:30 fall towards water catch-pit on 0.40 polyolefin membrane
230x140x90mm concrete bricks with 20mm joints for water drainage on top of 230mm re-fines cast in situ concrete floor slab at 1:30 fall to sump
450mm cast in situ reinforced concrete retaining wall with fine-drain puncture at 1m² and geo-pipe an cast in situ reinforced concrete footing

SECTION C-C


A
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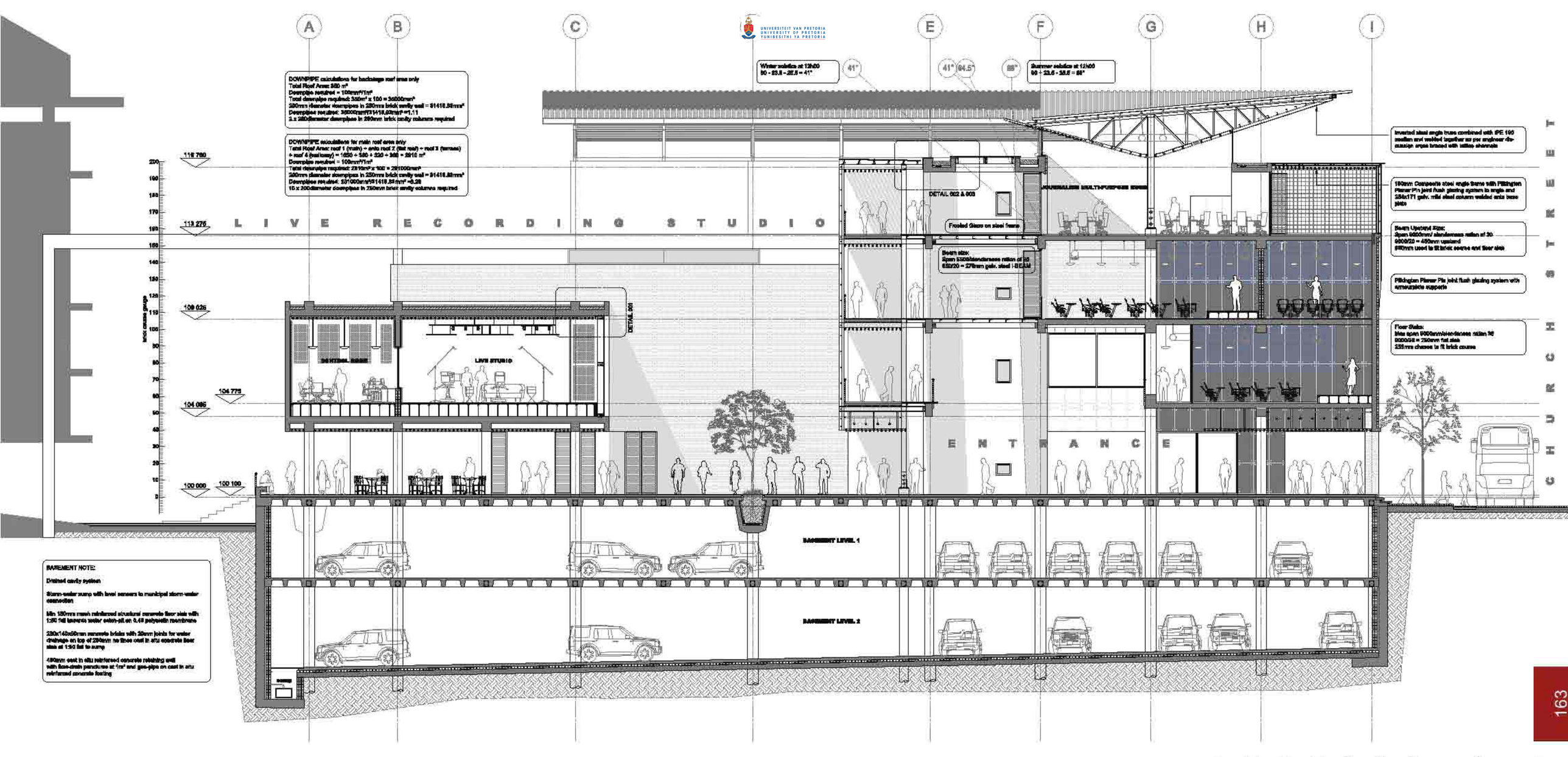
UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
DOWNPIPE calculations for hardstage roof area only
Total Roof Area: 360 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 360m² x 100 = 36000mm²
250mm diameter downpipes in 230mm brick cavity wall = 81416.88mm²
Downpipes required: 36000mm²/81416.88mm² =1.11
2 x 200diameter downpipes in 250mm brick cavity columns required
DOWNPIPE calculations for main roof area only
Total Roof Area: roof 1 (main) + entr roof 2 (flat roof) + roof 3 (tennis) + roof 4 (walkway) = 1650 + 360 + 230 + 360 = 2810 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 2810m² x 100 = 281000mm²
250mm diameter downpipes in 230mm brick cavity wall = 81416.88mm²
Downpipes required: 281000mm²/81416.88mm² =3.29
10 x 200diameter downpipes in 250mm brick cavity columns required
Winter solstice at 12h00
90 - 23.5 - 25.5 = 41°
Summer solstice at 12h00
90 + 23.5 - 25.5 = 88°
41°
64.5°
88°
116 750
113 275
109 025
104 775
104 025
100 000
100 100
brick course gauge
ARCADE
PEDESTRIAN
CHURCH STREET
RECEPTION
MAIN/PRES OFFICE
RECEPTION
TUT ADMIN OFFICES
DETAIL 504
RECEPTION
MEDIA PRESENTATION
EDITING
SECURITY CONTROL
RETAIL
Mechanical plant well
BASEMENT LEVEL 1
BASEMENT LEVEL 2
Inverted steel angle truss combined with IPE 180 section and welded together as per engineer discussion angles braced with lattice channels
190mm Composite steel angle beams with horizontal spacing beams system
230mm cast in-situ concrete tee for structural support and solar shading designed as per engineer discussion
Rooflight: Pilkington Planar Fin joint flush glazing system with armour-plated supports in fall
Floor Slabs:
Max span 8000mm/slendarness ratio 30
8000/30 = 230mm flat slab
255mm sheeon to fit brick course
Editing Cubicles: Sound insulated with acoustic foam wedges and timber flooring on acc. insulation
BASEMENT NOTE:
Drained cavity system
Storm-water sump with level sensors to municipal storm-water connection
Min 150mm mesh reinforced structural concrete floor slab with 1:50 fall towards water catch-pit on 0.48 polyseith membrane
230x140x90mm concrete bricks with 20mm joints for water drainage on top of 250mm no fines cast in situ concrete floor slab at 1:50 fall to sump
450mm cast in situ reinforced concrete retaining wall with flow-drain punctures at 1m² and geo-pipe on cast in situ reinforced concrete footing

SECTION B-B



BASEMENT NOTE:

Drained cavity system

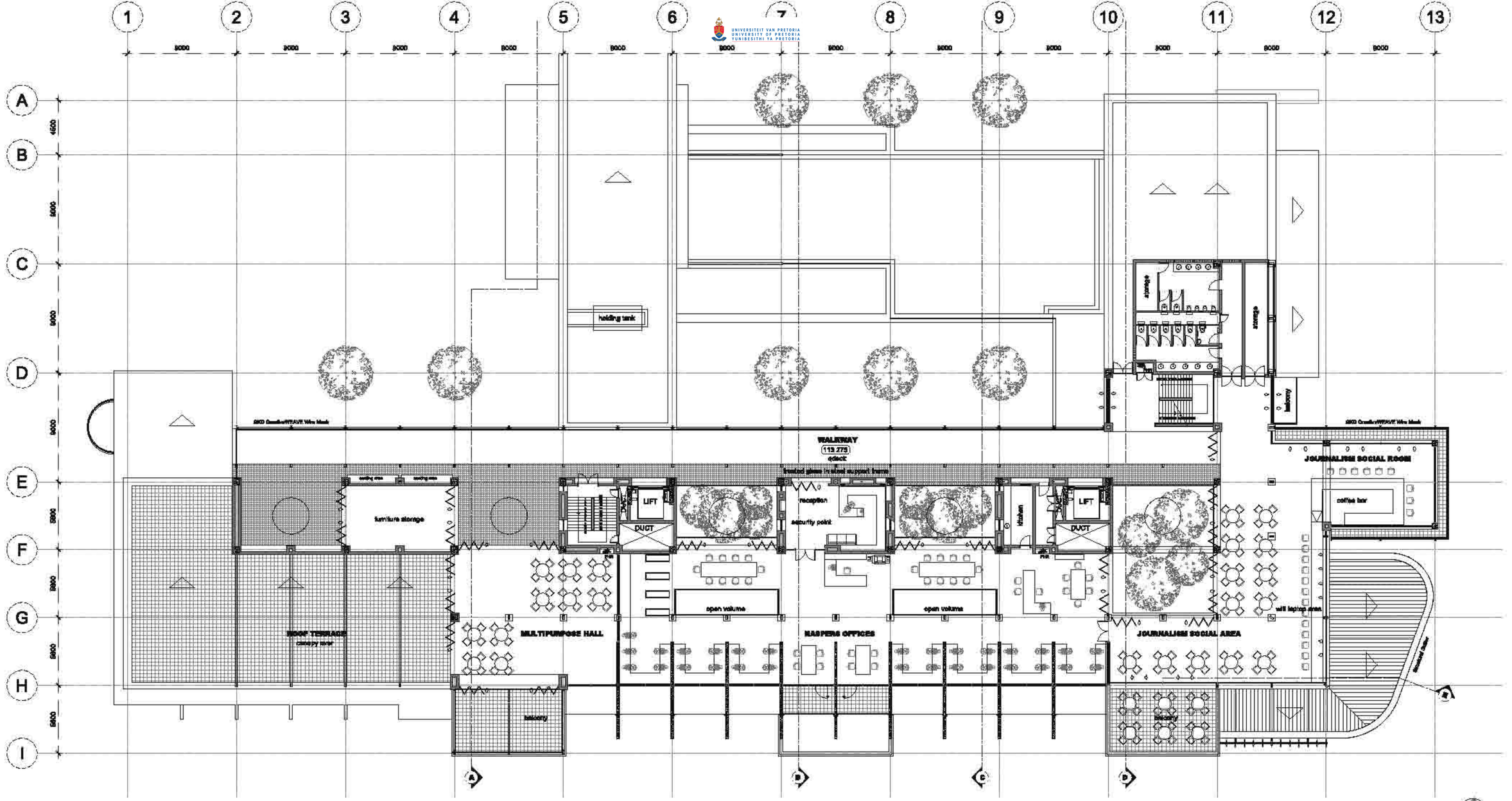
Storm-water sump with level sensors to municipal storm-water connection

Min 150mm mesh reinforced structural concrete floor slab with 1:50 fall towards water sump-pit on 0.48 polyesthi membrane

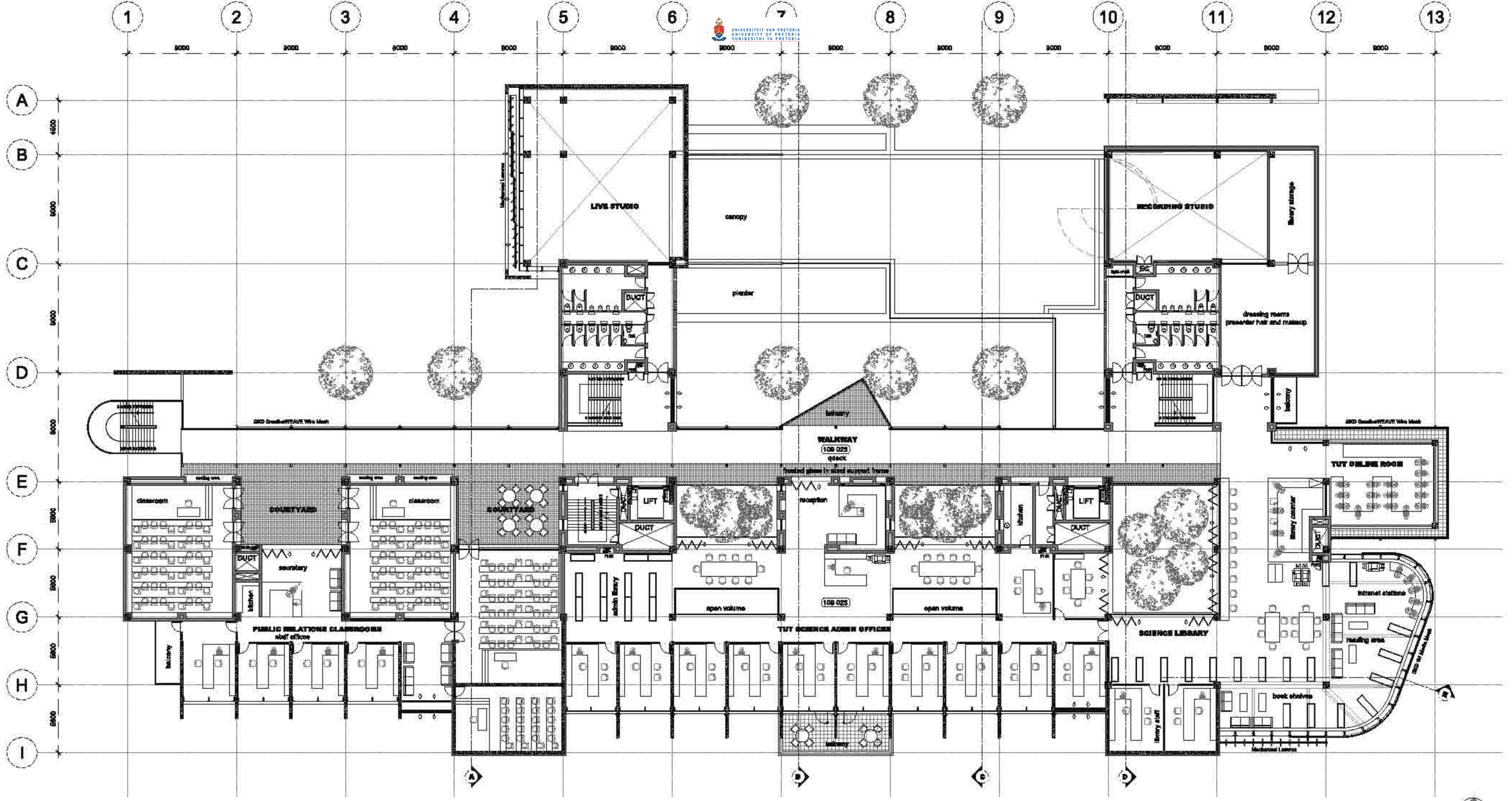
230x142x90mm concrete bricks with 10mm joints for water drainage on top of 280mm no fines cast in situ concrete floor slab at 1:50 fall to sump

490mm cast in situ reinforced concrete retaining wall with flow-drain punctures at 1m² and geo-pipe on cast in situ reinforced concrete footing

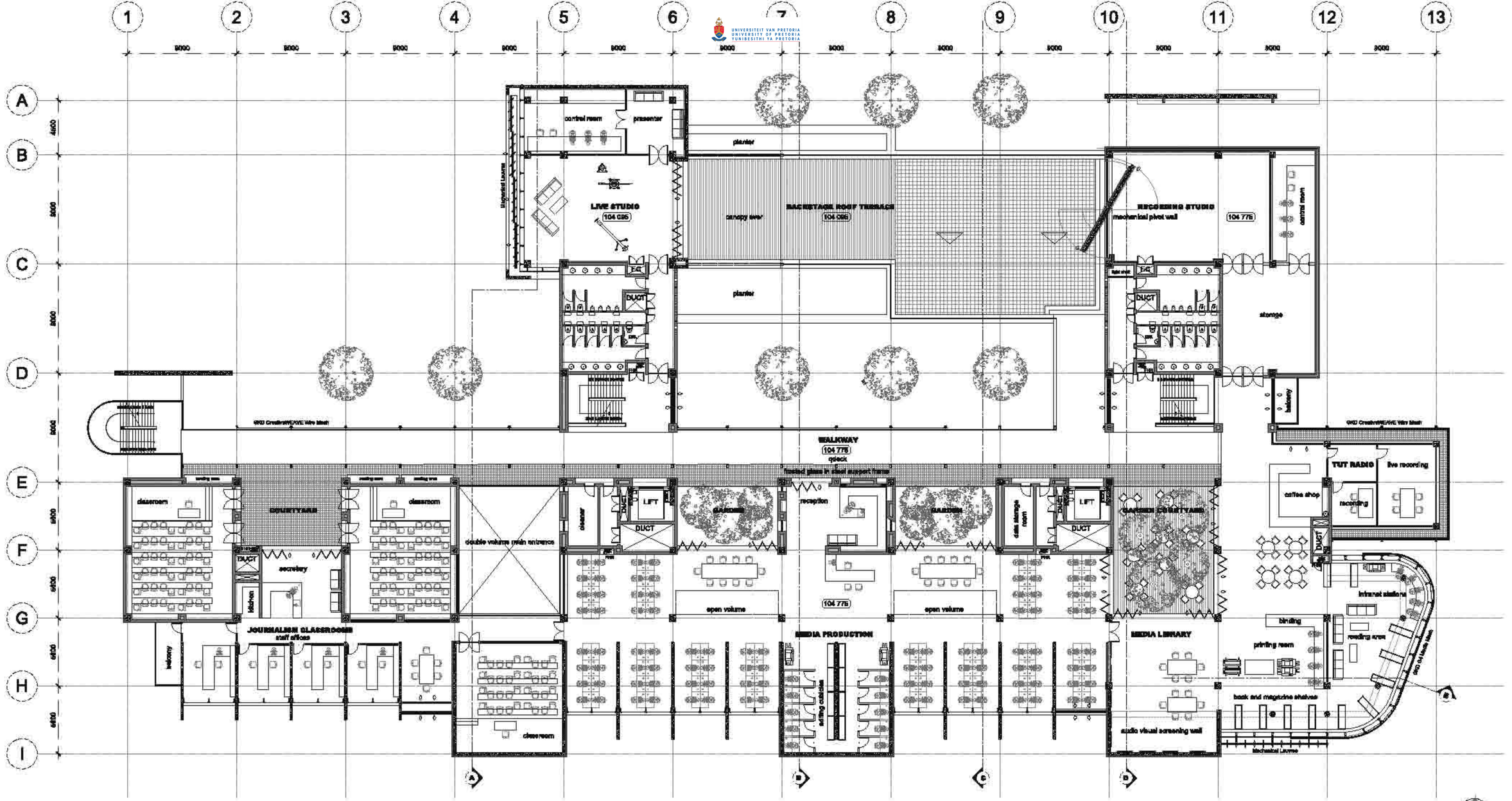
SECTION A-A



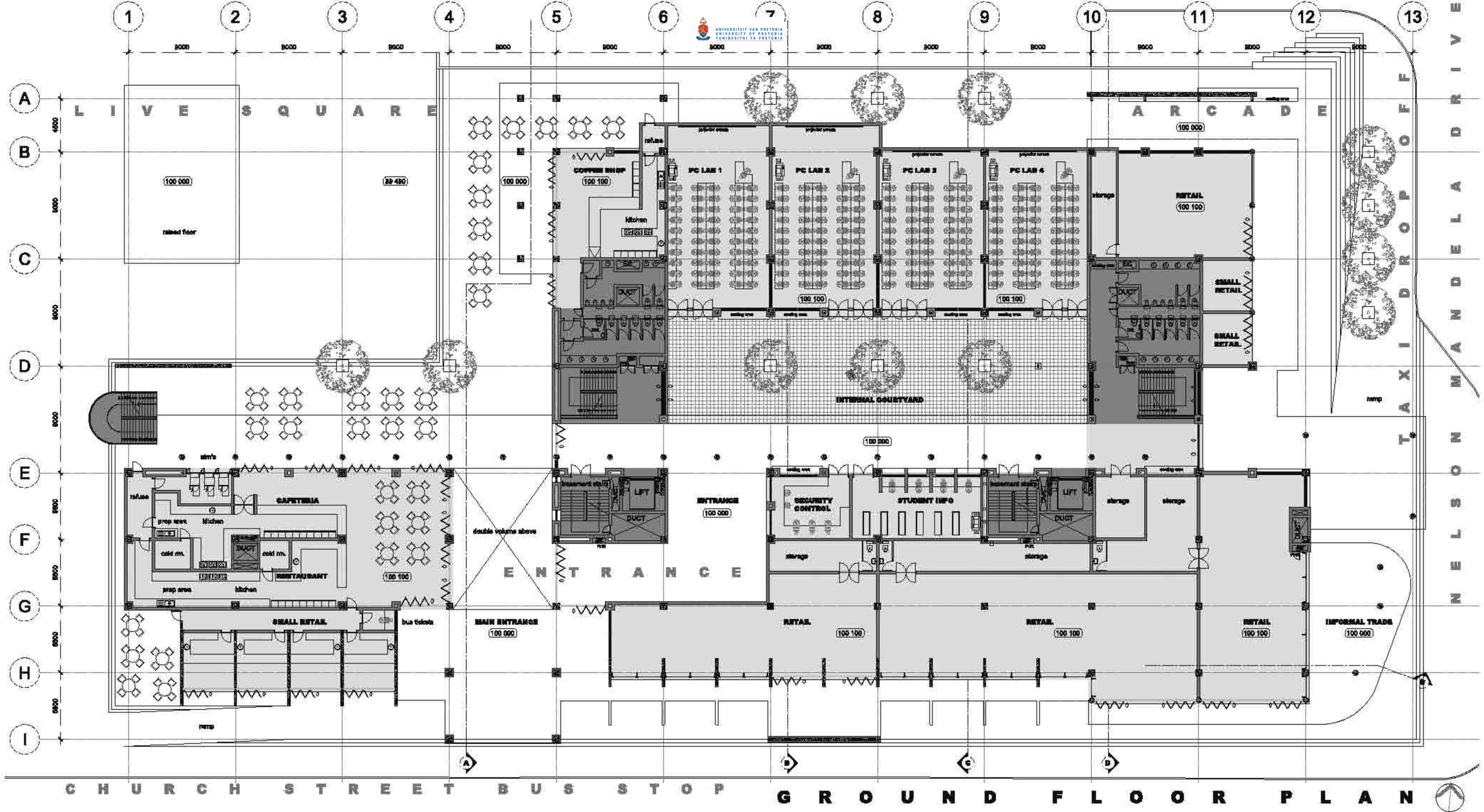
THIRD FLOOR PLAN

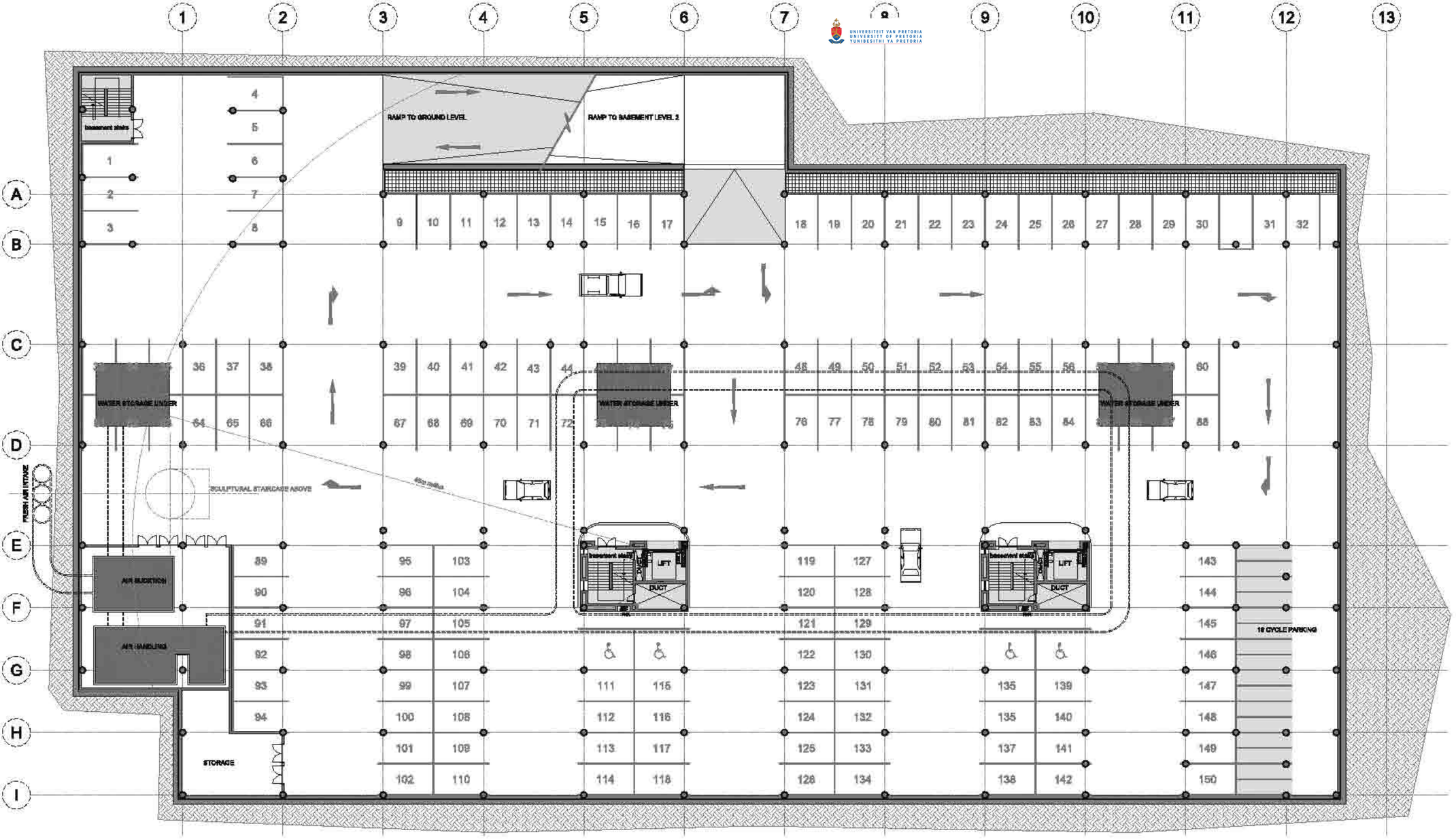


SECOND FLOOR PLAN



FIRST FLOOR PLAN


LIVE SQUARE
ARCADE
NELSON MANDELA DRIVE
TAXI DROP OFF
COFFEE SHOP
PC LAB 1
PC LAB 2
PC LAB 3
PC LAB 4
RETAIL
SMALL RETAIL
INTERNAL COURTYARD
CAFETERIA
RESTAURANT
kitchen
prep area
cold rm.
SMALL RETAIL
bus tickets
ENTRANCE
MAIN ENTRANCE
double volume above
LIFT
DUCT
SECURITY CONTROL
STUDENT INFO
storage
INFORMAL TRADE
ramp
CHURCH STREET BUS STOP
GROUND FLOOR PLAN



BASEMENT NOTE:

Drained cavity system

Storm-water sump with level sensors to municipal storm-water connection

Min 150mm mesh reinforced structural concrete floor slab with 1:50 fall towards water catch-pit on 0.45 polyolefin membrane

290x140x90mm concrete bricks with 20mm joints for water drainage on top of 250mm no fines cast in situ concrete floor slab at 1:50 fall to sump

450mm cast in situ reinforced concrete retaining wall with flow-drain punctures at 1m² and geo-pipe on cast in situ reinforced concrete footing

TOTAL ROOF AREA:
Total Roof Area
Roof 1 (main) = 1650 m²
Roof 2 (flat roof) = 680 m²
Roof 3 (terrace) = 320 m²
Roof 4 (walkway) = 380 m²
Roof 5 (1st floor) = 350 m²
Total catchment area= 3260 m² + 1500 m² (Live square)
= 4760 m²

TANK SIZES
Storage tanks: 5 x 6 x 2 = 50 000 x 3 (tanks) = 150 000 l
Holding tanks: 2 x 4 x 0.5 = 4000 x 2 (ablution cores) = 8000 l

DESIGN POPULATION ±2000 persons daily
WC usage 1450 x 8 l = 11 600 x 20 (weekdays) = 232 000 l
Maximum monthly rainfall (January 136mm) = 0.136 x 4760
= 647360 x 0.85 (evaporation) = 550 256 l
Turnover of 318 256 l
Minimum monthly rainfall (July 3mm) = 0.003 x 4760
= 14 280 x 0.85 (evaporation) = 12133 l
Shortfall of 218 862 l
(South African Weather service thirty year average)

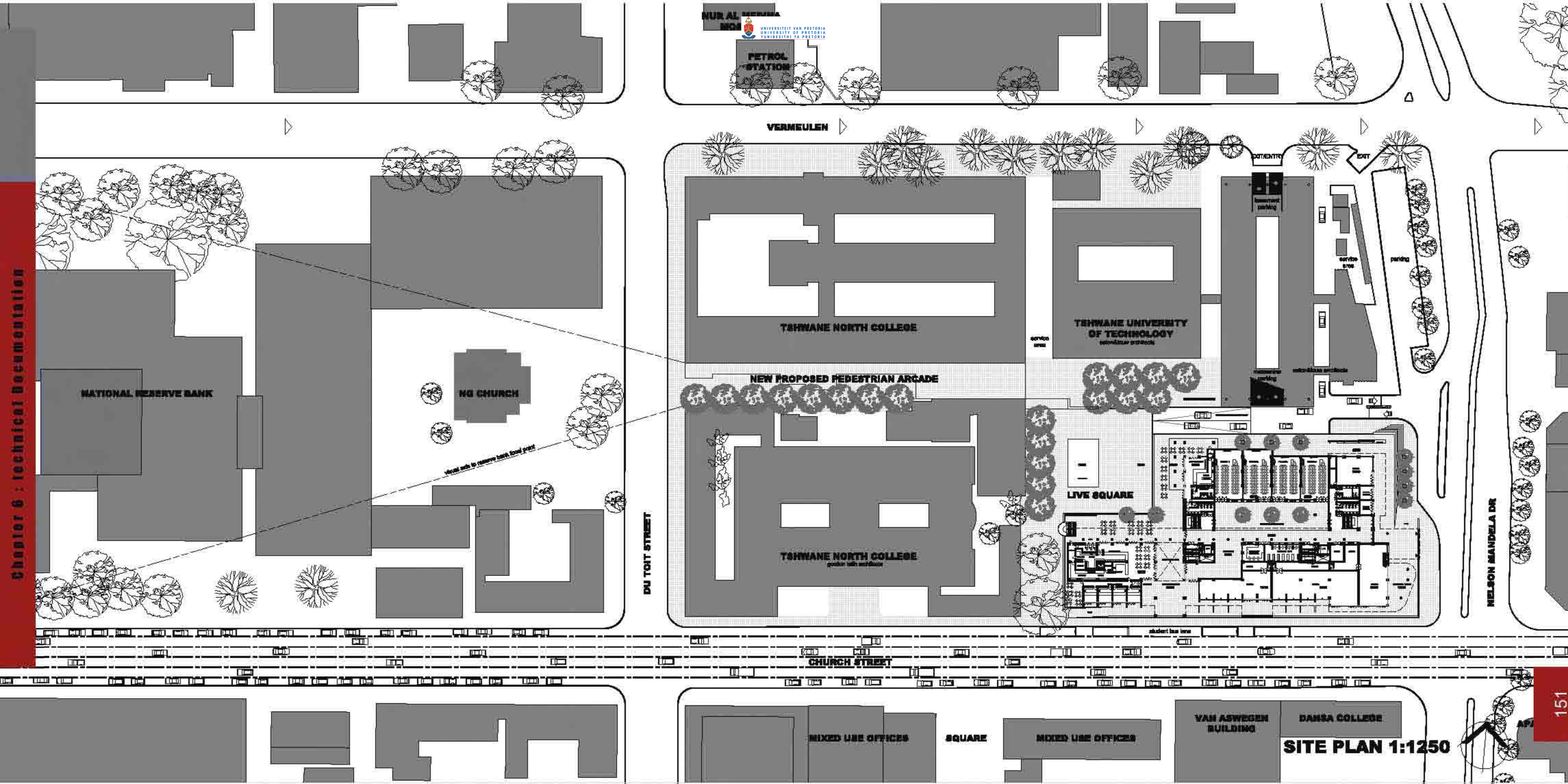
DOWNPIPE calculations for main roof area only
Total Roof Area: roof 1 (main) + onto roof 2 (flat roof) + roof 3 (terrace) + roof 4 (walkway) = 1650 + 680 + 320 + 360
= 2910 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 2910m² x 100 = 291000mm²
200mm diameter downpipes in 250mm brick cavity wall
= 31415.93mm²
Downpipes required: 291000mm²/31415.93mm² =9.26
10 x 200diameter downpipes in 250mm brick cavity columns required

DOWNPIPE calculations for backstage roof area only
Total Roof Area: 350 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 350m² x 100 = 35000mm²
200mm diameter downpipes in 250mm brick cavity wall
= 31415.93mm²
Downpipes required: 35000mm²/31415.93mm² =1.11
2 x 200diameter downpipes in 250mm brick cavity columns required

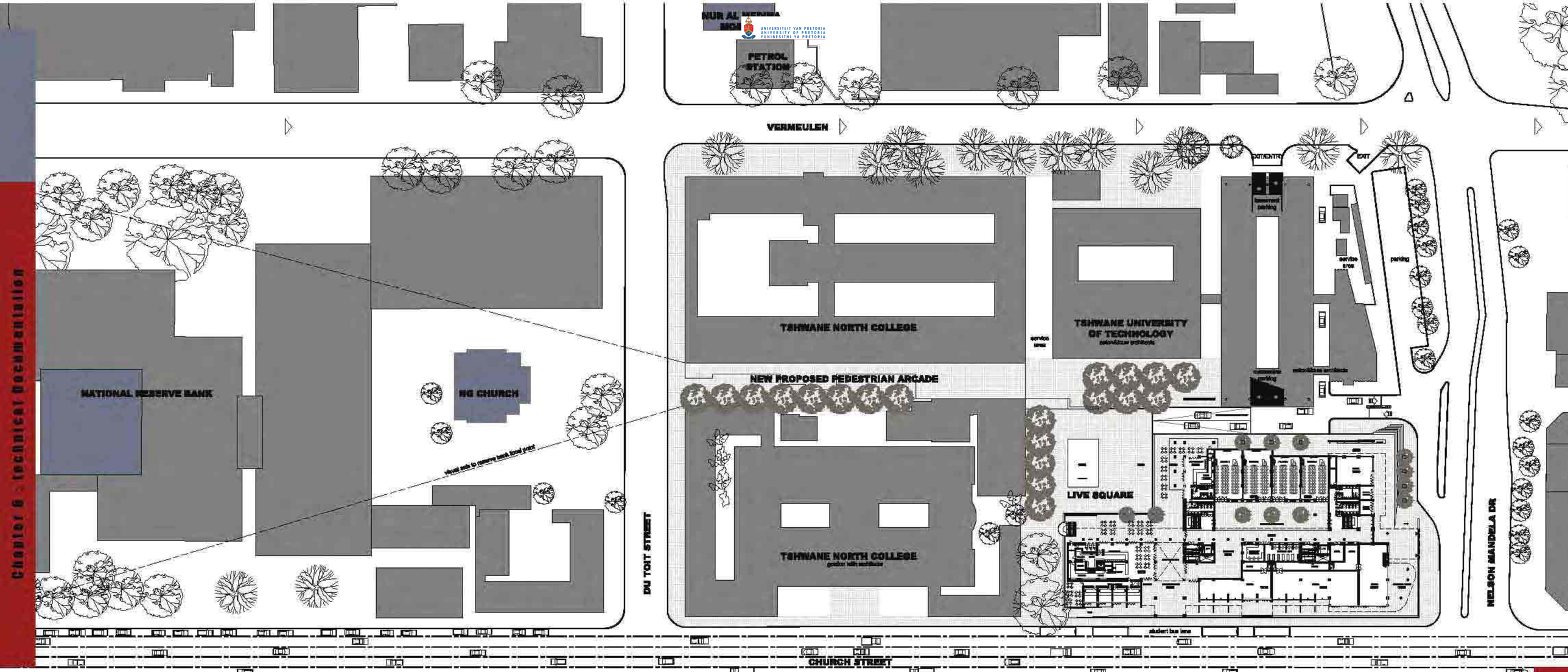
PARKING NOTE:

Basement Level 1: 150 parking + 4 disabled + 16 motor
= 170 parking bays
Basement Level 2: 150 parking + 4 disabled + 16 moto
= 170 parking bays
Total Parking bays - 340 (300 + 8 disabled + 32 motor

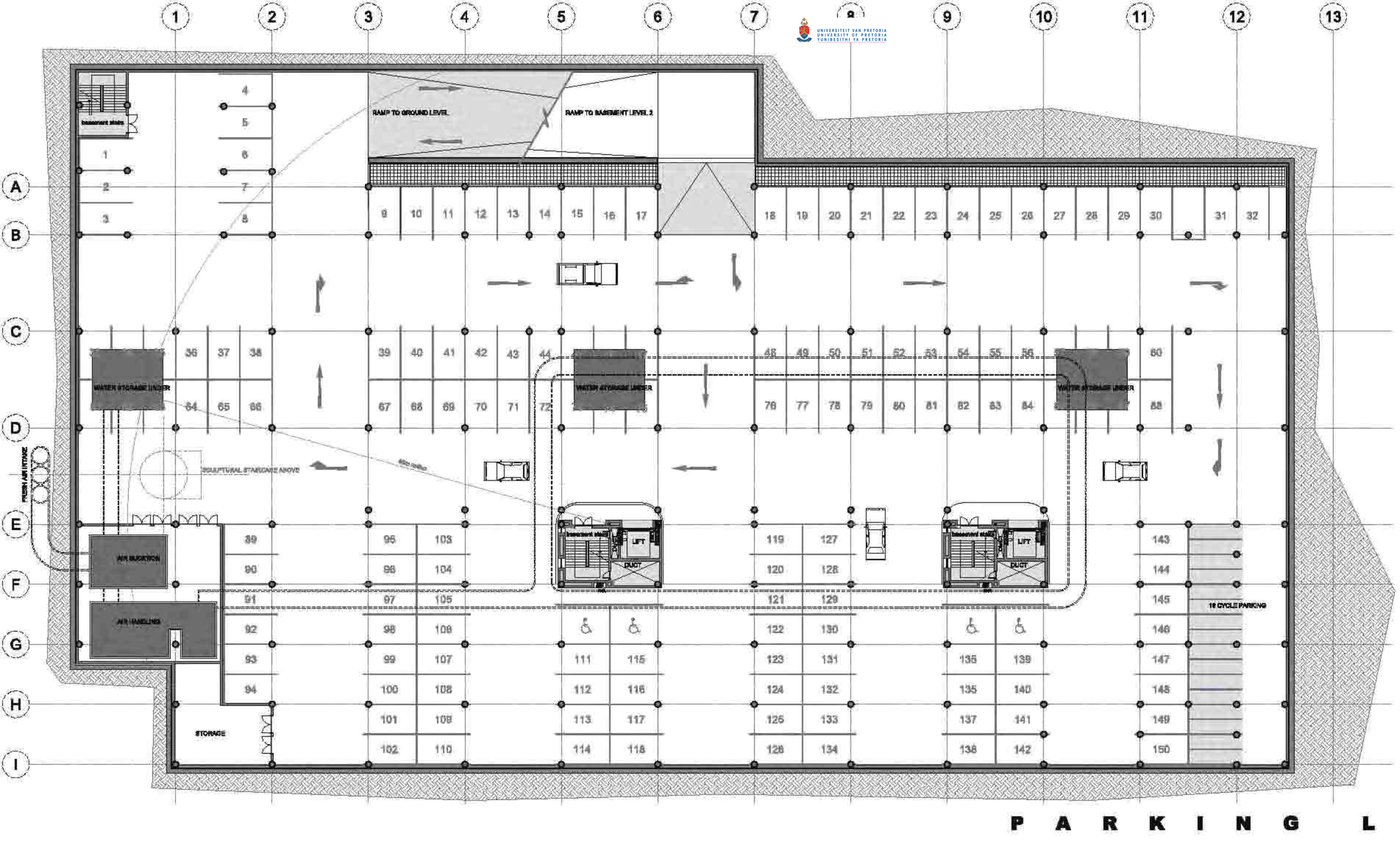
PARKING LAYOUT



SITE PLAN 1:1250



SITE PLAN 1:1250



BASEMENT NOTE:

Drained cavity system

Storm-water sump with level sensors to municipal storm-water connection

Min 150mm mesh reinforced structural concrete floor slab with 1:50 fall towards water catch-pit on 0.45 polyolefin membrane

290x140x90mm concrete bricks with 20mm joints for water drainage on top of 250mm no fines cast in situ concrete floor slab at 1:50 fall to sump

450mm cast in situ reinforced concrete retaining wall with flow-drain punctures at 1m² and geo-pipe on cast in situ reinforced concrete footing

TOTAL ROOF AREA:
Total Roof Area
Roof 1 (main) = 1650 m²
Roof 2 (flat roof) = 580 m²
Roof 3 (terrace) = 320 m²
Roof 4 (walkway) = 380 m²
Roof 5 (1st floor) = 350 m²
Total catchment area= 3280 m² + 1500 m² (Live square)
= 4780 m²

TANK SIZES
Storage tanks: 5 x 8 x 2 = 50 000 x 3 (tanks) = 150 000 l
Holding tanks: 2 x 4 x 0.5 = 4000 x 2 (ablution cores) = 8000 l

DESIGN POPULATION ±2000 persons daily
WC usage 1450 x 8 l = 11 600 x 20 (weekdays) = 232 000 l
Maximum monthly rainfall (January 136mm) = 0.136 x 4780
= 647360 x 0.85 (evaporation) = 550 256 l
Turnover of 318 256 l
Minimum monthly rainfall (July 3mm) = 0.003 x 4760
= 14 280 x 0.85 (evaporation) = 12133 l
Shortfall of 218 862 l
(South African Weather service thirty year average)

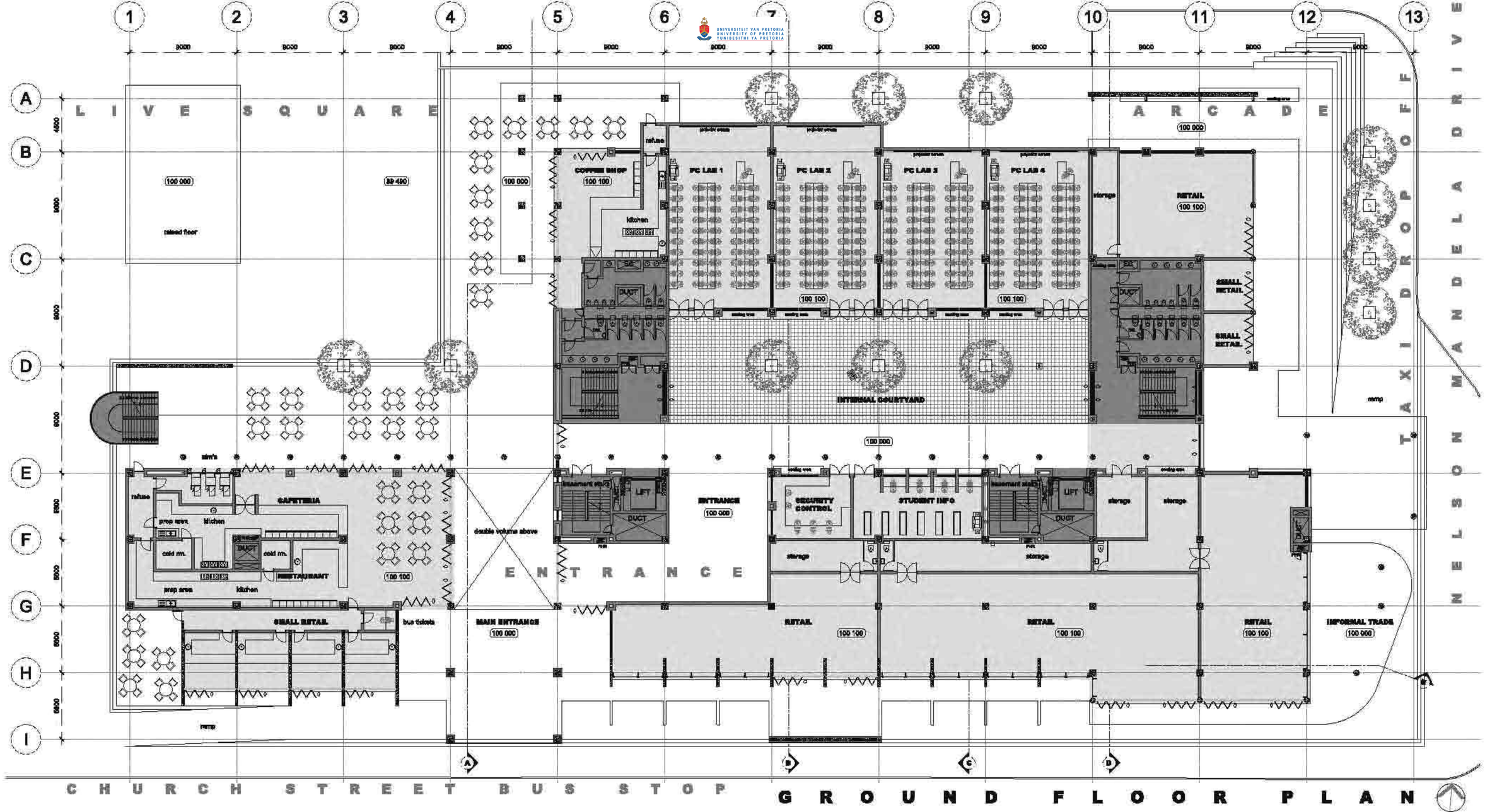
DOWNPIPE calculations for main roof area only
Total Roof Area: roof 1 (main) + onto roof 2 (flat roof) + roof 3 (terrace) + roof 4 (walkway) = 1650 + 580 + 320 + 360
= 2910 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 2910m² x 100 = 291000mm²
200mm diameter downpipes in 250mm brick cavity wall
= 31415.93mm²
Downpipes required: 291000mm²/31415.93mm² =9.26
10 x 200diameter downpipes in 250mm brick cavity columns required

DOWNPIPE calculations for backstage roof area only
Total Roof Area: 350 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 350m² x 100 = 35000mm²
200mm diameter downpipes in 250mm brick cavity wall
= 31415.93mm²
Downpipes required: 35000mm²/31415.93mm² =1.11
2 x 200diameter downpipes in 250mm brick cavity columns required

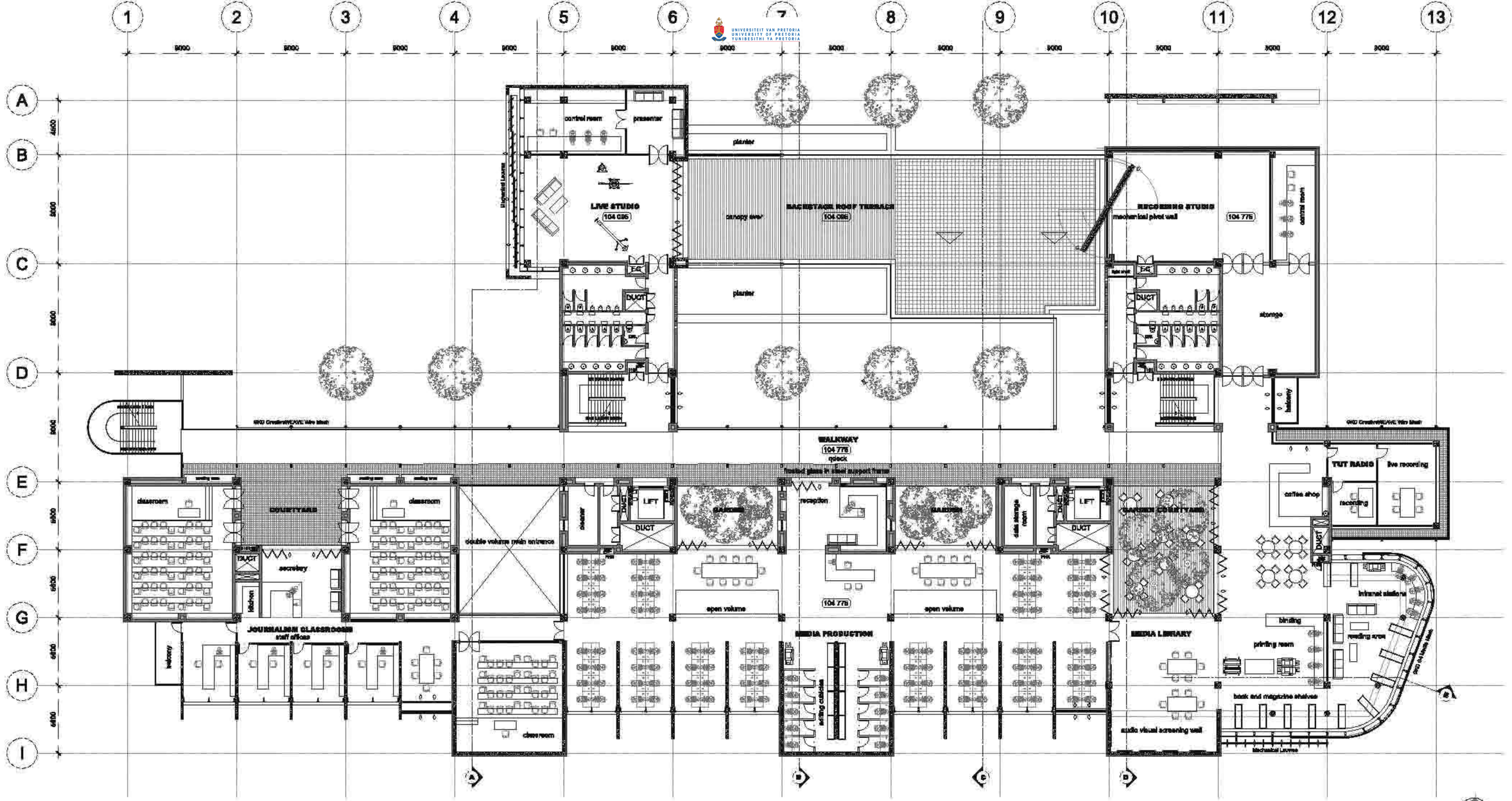
PARKING NOTE:

Basement Level 1: 150 parking + 4 disabled + 16 moto
= 170 parking bays
Basement Level 2: 150 parking + 4 disabled + 16 moto
= 170 parking bays
Total Parking bays - 340 (300 + 8 disabled + 32 moto

PARKING LAYOUT



G R O U N D F L O O R P L A N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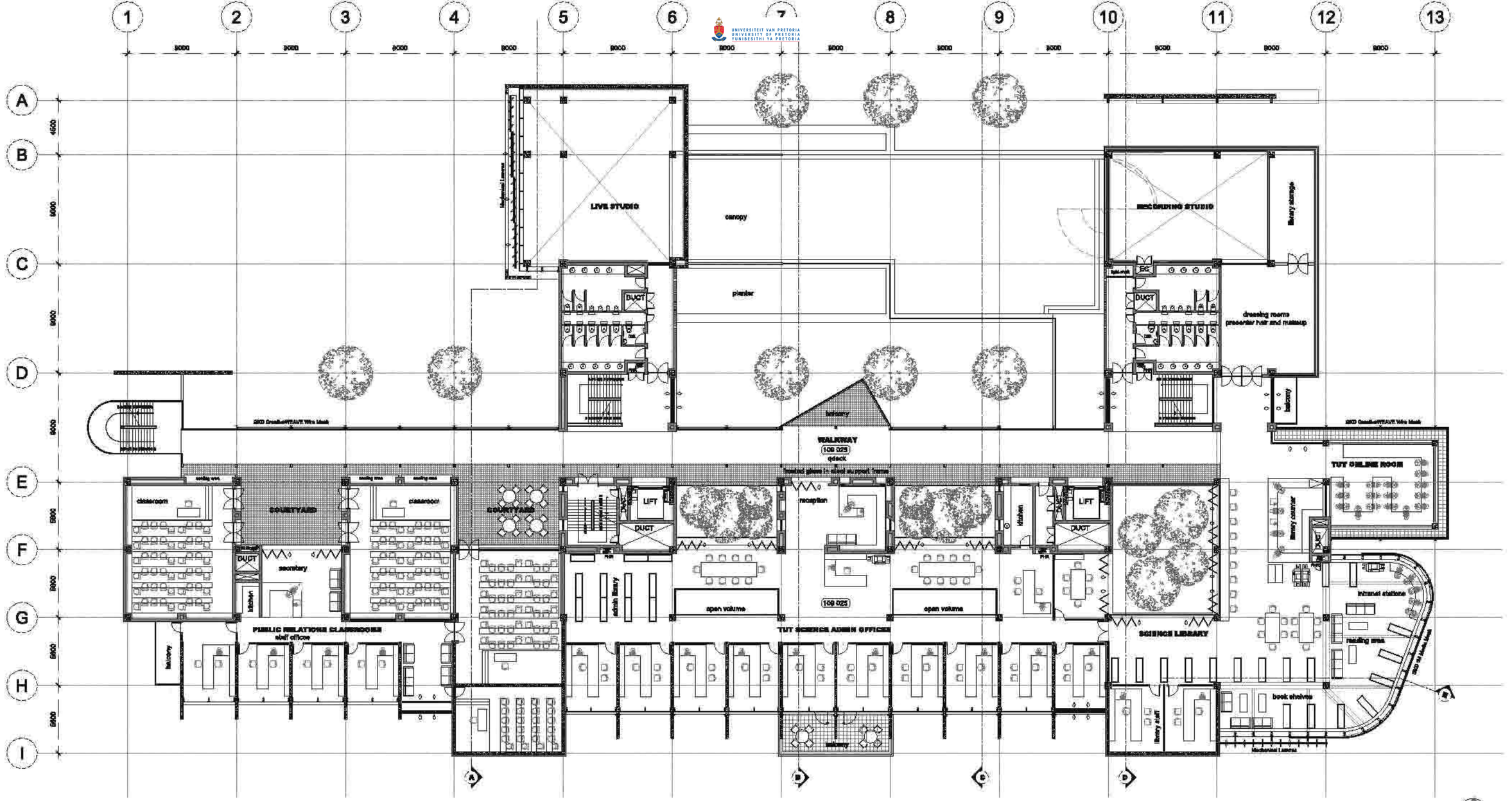
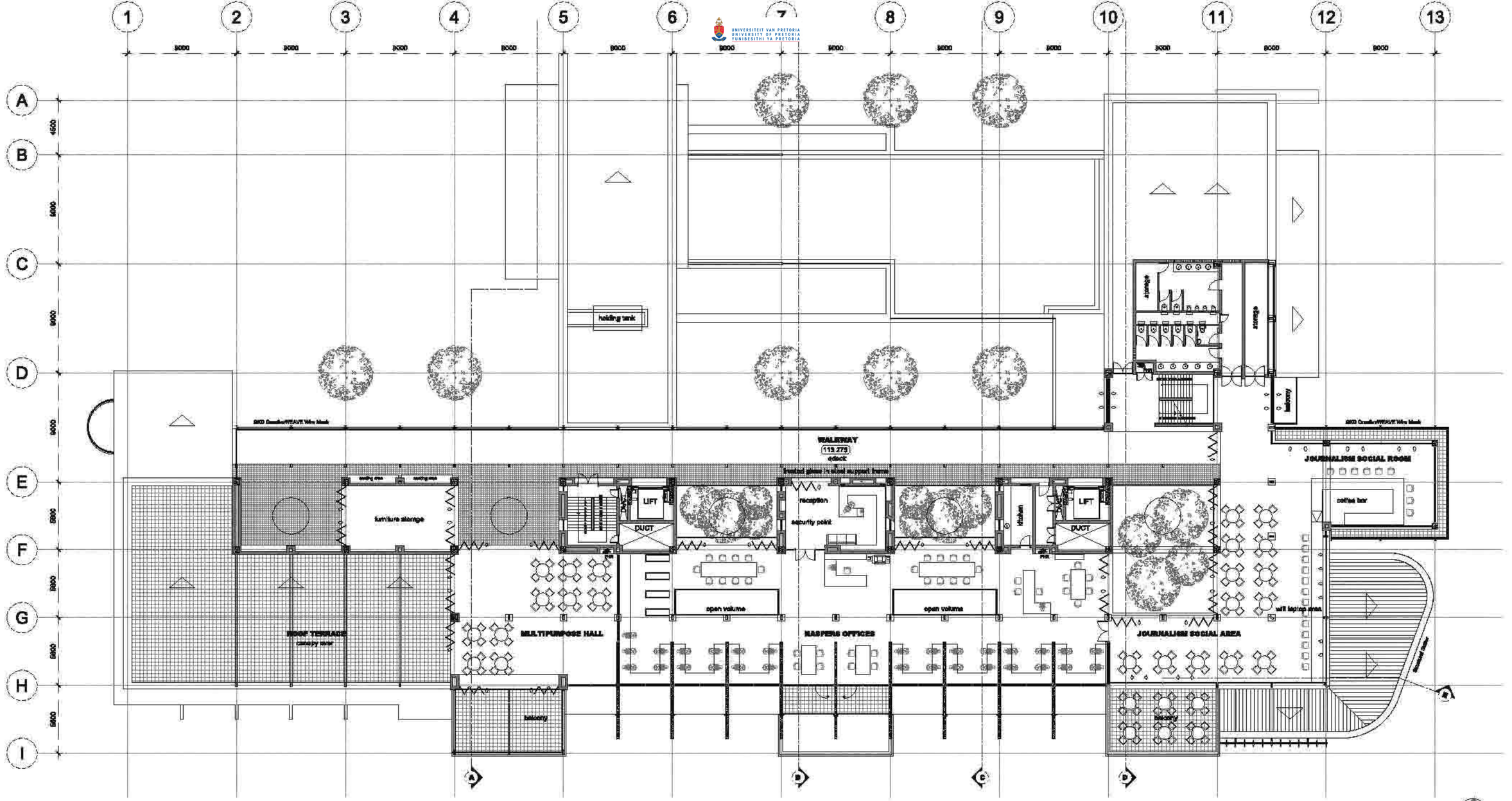
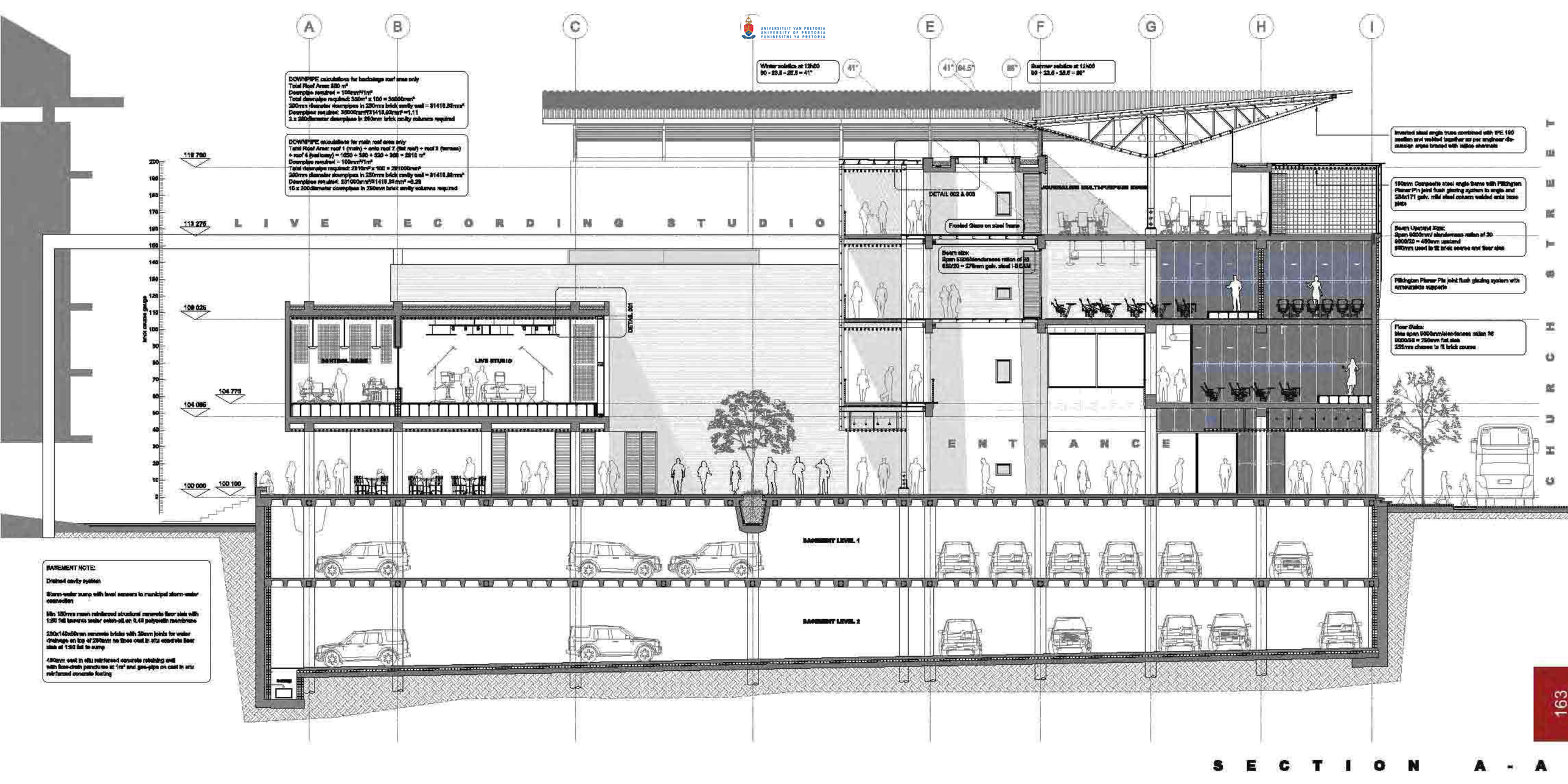
4500
6000
6300
6400
control room
presenter
LIVE STUDIO
104 C05
planter
canopy over
BACKSTAGE ROOF TERRACE
104 C05
RECORDING STUDIO
mechanical pivot wall
104 775
control room
storage
balcony
6WD CreativeWEAVE Wire Mesh
WALKWAY
104 775
quack
Tinted glass in steel support frame
TUT RADIO
live recording
recording
coffee shop
classroom
CRUSTTAIRS
secretary
kitchen
double volume main entrance
cleaner
LIFT
DUCT
GARDEN
reception
data storage room
GARDEN CRUSTTAIRS
open volume
104 775
JOURNALISM CLASSROOMS
staff offices
balcony
MEDIA PRODUCTION
editing cubicles
MEDIA LIBRARY
binding
printing room
reading area
intranet stations
book and magazine shelves
audio visual screening wall
Mechanical Louvres
FIRST FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN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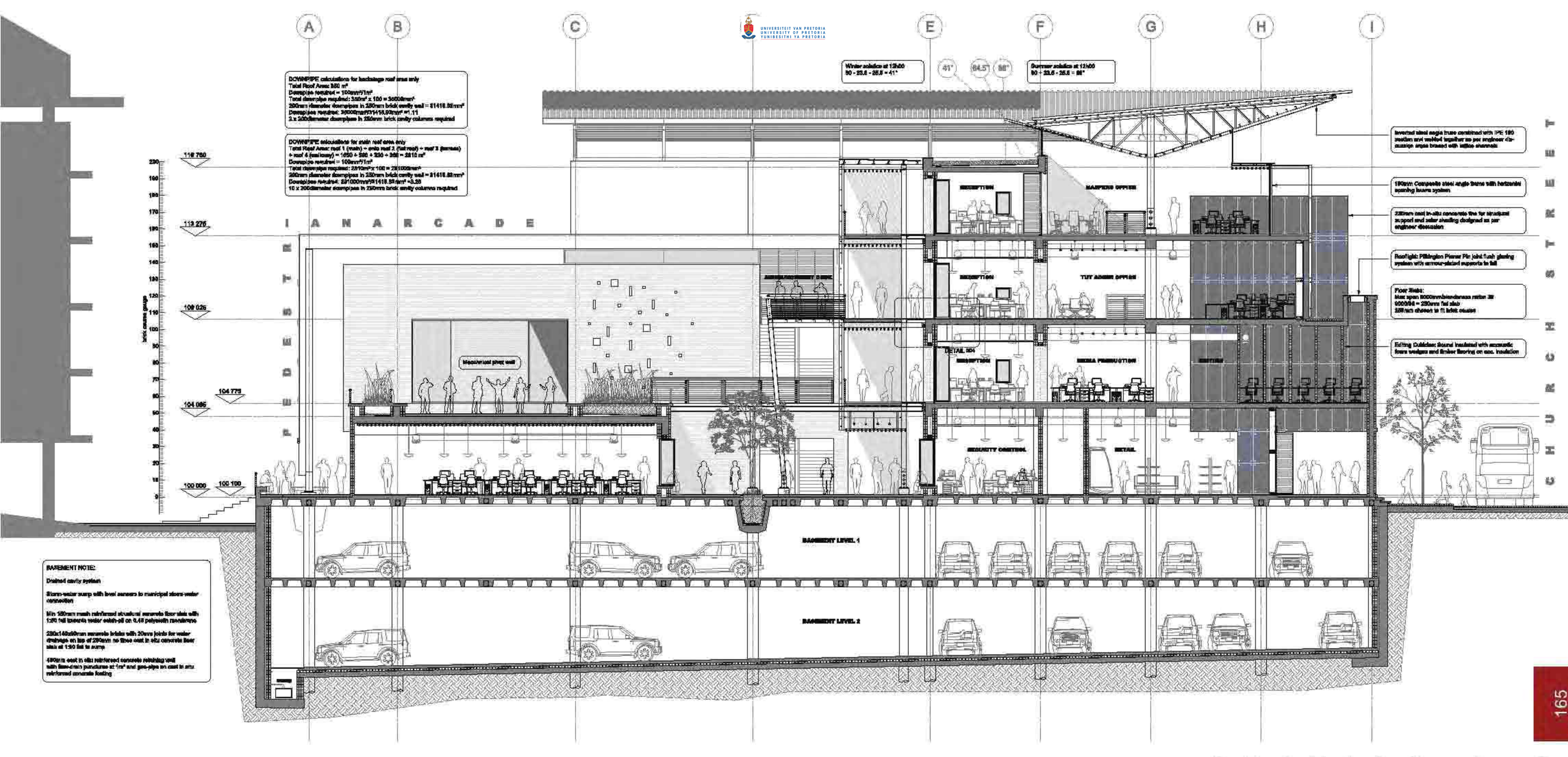
UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
DOWNPIPE calculations for backcage roof area only
Total Roof Area: 350 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 350m² x 100 = 35000mm²
250mm diameter downpipes in 230mm brick cavity wall = 31416.25mm²
Downpipes required: 35000mm²/31416.25mm² =1.11
2 x 250diameter downpipes in 250mm brick cavity columns required
DOWNPIPE calculations for main roof area only
Total Roof Area: roof 1 (main) + area roof 2 (flat roof) + roof 3 (terrace) + roof 4 (walkway) = 1650 + 580 + 320 + 360 = 2910 m²
Downpipe required = 100mm²/1m²
Total downpipe required: 2910m² x 100 = 291000mm²
250mm diameter downpipes in 250mm brick cavity wall = 31416.25mm²
Downpipes required: 291000mm²/31416.25mm² =9.26
10 x 250diameter downpipes in 250mm brick cavity columns required
Winter solstice at 12h00
90 - 23.5 - 25.5 = 41°
41°
41°
84.5°
88°
Summer solstice at 12h00
90 + 23.5 - 25.5 = 88°
Inverted steel angle truss combined with IPE 160 section and welded together as per engineer design. Truss braced with lattice channels
190mm Composite steel angle frame with Pilkington Planar Pin joint flush glazing system to angle and 356x171 galv. mild steel column welded onto base plate
Beam Upstand Size:
Span 9000mm/ slenderness ration of 20
9000/20 = 450mm upstand
600mm used to fit brick course and floor slab
Pilkington Planar Pin joint flush glazing system with armourplate supports
Floor Slabs:
Max span 9000mm/slenderness ration 36
9000/36 = 250mm flat slab
250mm chosen to fit brick course
113 780
113 276
109 026
104 775
104 086
100 000
100 100
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
brick course gauge
L I V E R E C O R D I N G S T U D I O
DETAIL 002 & 003
Frosted Glass on steel frame
Beam size:
Span 8500/slenderness ration of 18
650/20 = 278mm galv. steel I-BEAM
DETAIL 001
LIVE STUDIO
E N T R A N C E
C H U R C H S T R E E T
BASEMENT LEVEL 1
BASEMENT LEVEL 2
BASEMENT NOTE:
Drained cavity system
Storm-water sump with level sensors to municipal storm-water connection
Min 150mm mesh reinforced structural concrete floor slab with 1:50 fall towards water collection on 0.48 polyolefin membrane
230x142x90mm concrete bricks with 20mm joints for water drainage on top of 250mm no fines cast in situ concrete floor slab at 1:50 fall to sump
450mm cast in situ reinforced concrete retaining wall with face-drain puncture at 1m² and geo-pipe on cast in situ reinforced concrete footing

S E C T I O N A - A



BASEMENT NOTE:

Drained cavity system

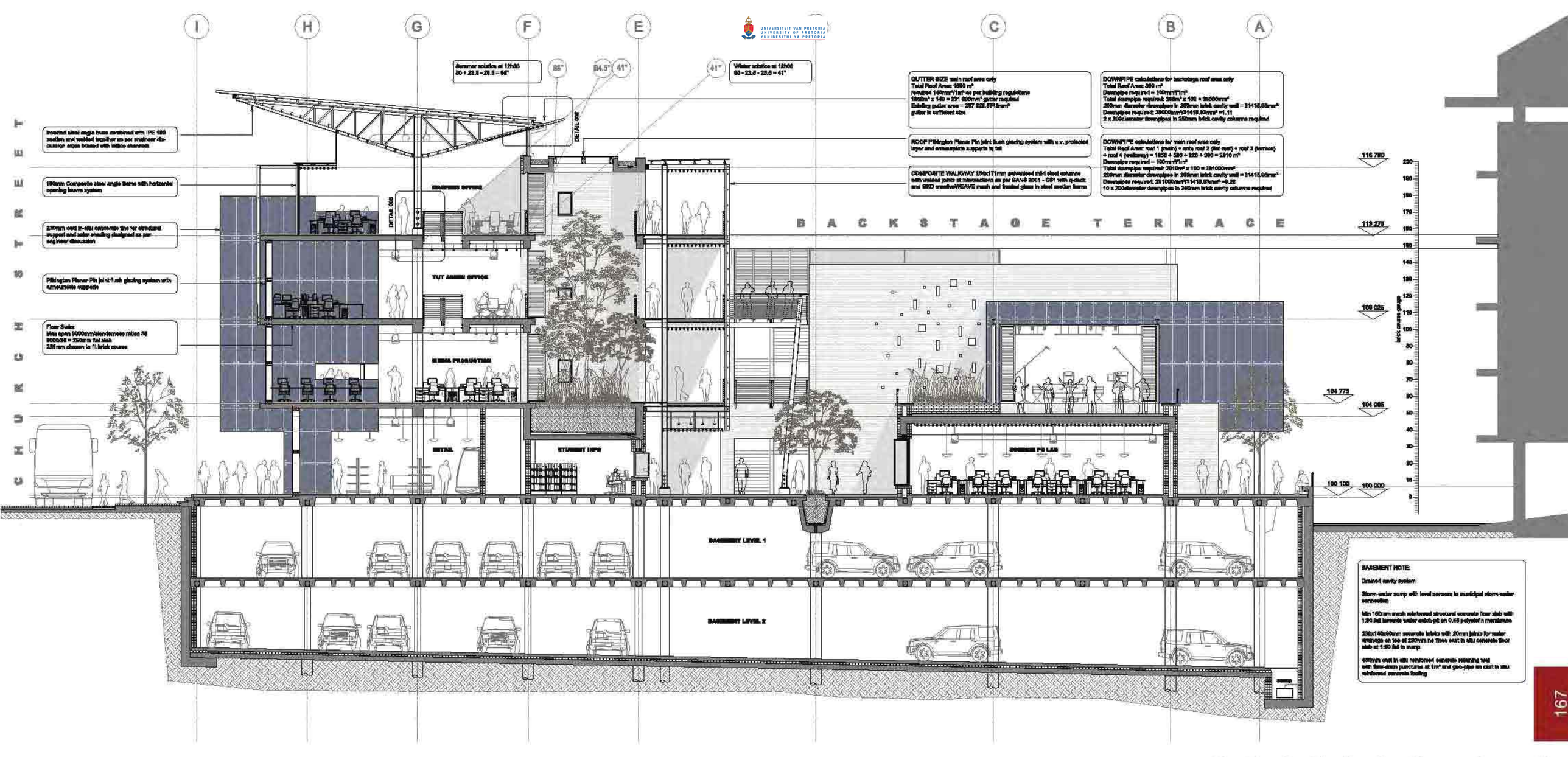
Storm-water sump with level sensors to municipal storm-water connection

Min 150mm mesh reinforced structural concrete floor slab with 1:50 fall towards water seals-pit on 0.48 polyseith membrane

230x140x90mm concrete bricks with 20mm joints for water drainage on top of 280mm no fines cast in situ concrete floor slab at 1:50 fall to sump

490mm cast in situ reinforced concrete retaining wall with flow-cram punctures at 1m² and geo-pipe on cast in situ reinforced concrete footing

SECTION B - B



BASEMENT NOTE:

Drained cavity system

Storm-water sump with level sensors to municipal storm-water connection

Min 150mm mesh reinforced structural concrete floor slab with 1:50 fall towards water catch-pit on 0.45 polyolefin membrane

230x140x90mm concrete bricks with 20mm joints for water drainage on top of 230mm re Tires cast in situ concrete floor slab at 1:50 fall to sump

450mm cast in situ reinforced concrete retaining wall with 6mm-drain puncture at 1m² and geo-pipe on cast in situ reinforced concrete footing

SECTION C-C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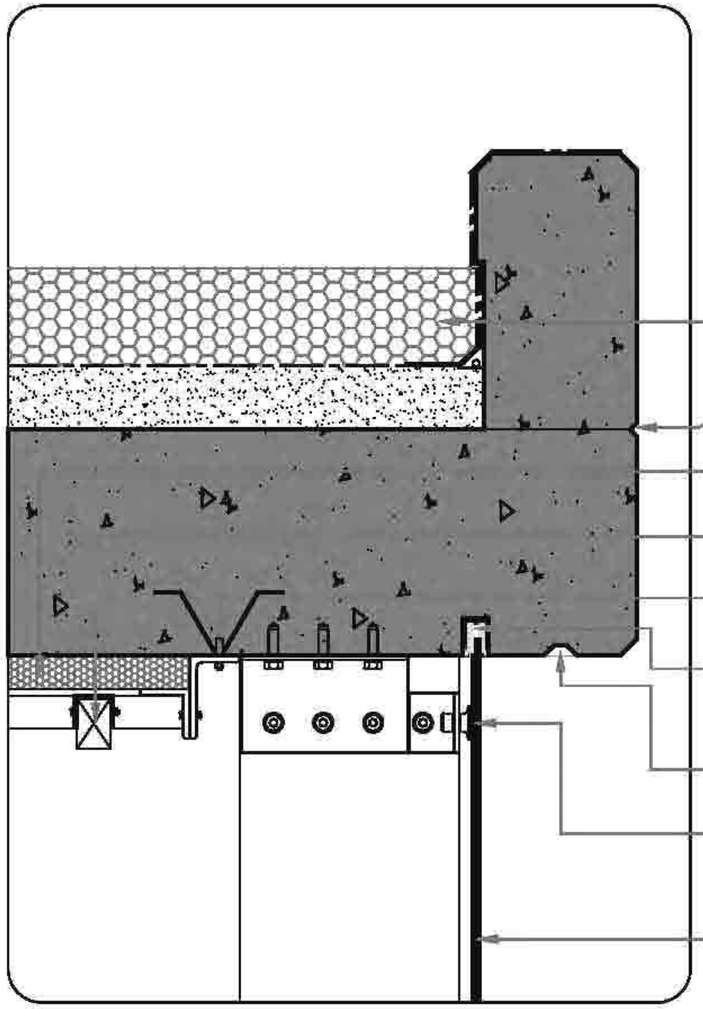
UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
GUTTER SIZE main roof area only
DOWNPIPE calculations for main roof area only
Winter solstice at 12h00
Summer solstice at 12h00
41°
84.5°
MEDIA PRODUCTION LAB
DETAIL 007
DETAIL 008
DETAIL 009
DETAIL 010
CHURCH STREET
BASEMENT LEVEL 1
BASEMENT LEVEL 2
BASEMENT NOTE:
Floor Slabs:
Beam Upstand Size:
STORAGE
RETAIL
MEDIA LIBRARY
116 760
113 275
109 025
104 776
104 095
100 000
100 150

SECTION D-D



20mm crushed stone aggregrate layer onto approved waterproofing membrane on min 50mm screed to fall 1:50

Day joint

SAGEX boarded roof insulation as per manufacturer

75 x 50mm timber purlins fixed into welded steel angle frame at 2250mm c/c

125 x 75mm mild steel angle fixed with ceiling lug casted into concrete slab and bolt fixed to supporting framework

silicone sealant and neoprene guides in 50 x 50 x 3mm aluminium glazing channel at min 25mm cover with shims at between reinforced concrete lab installed as per manu- facturer

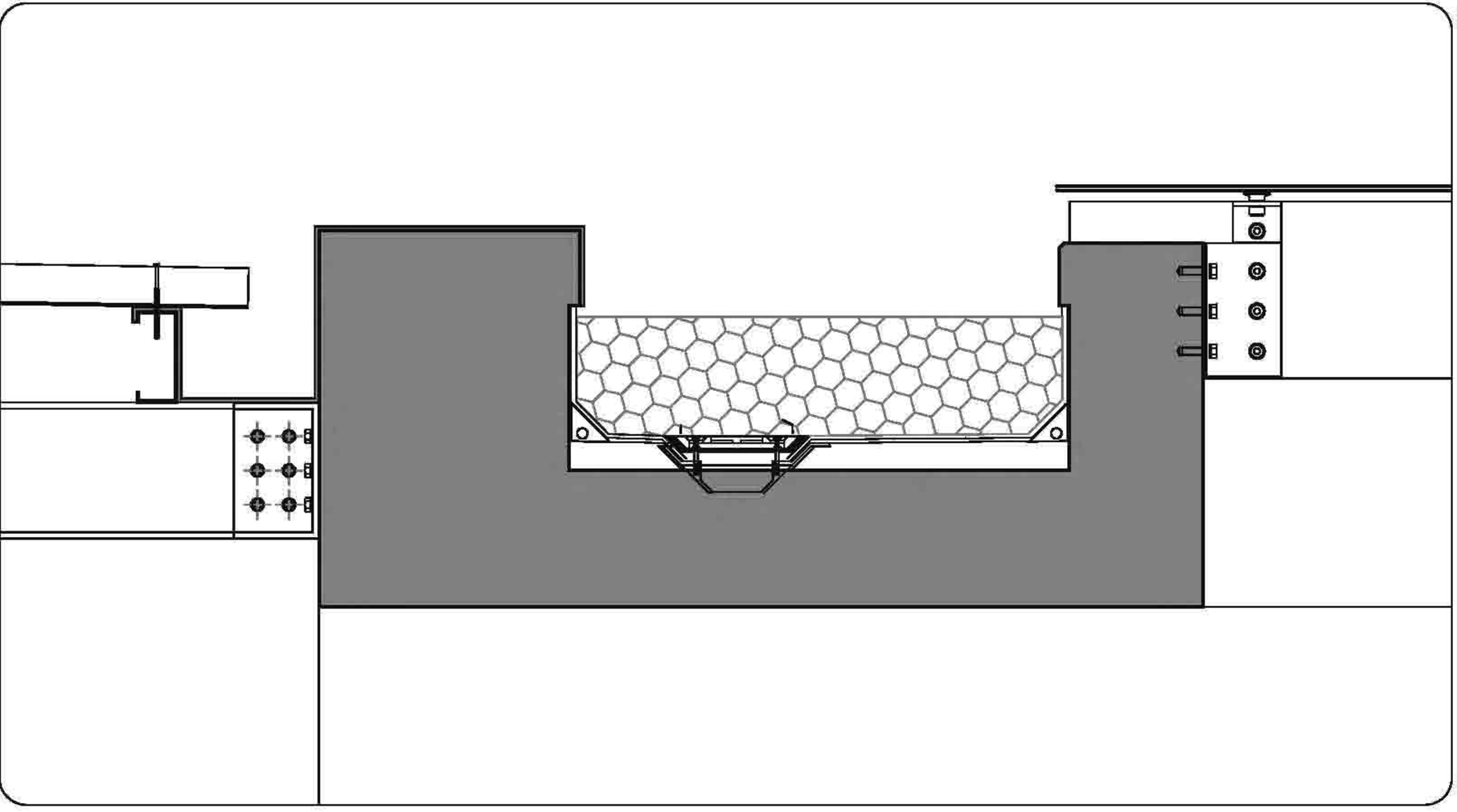
Drip

Pilkington Planar stainless steel bolt onto 80 x 80 x8mm springplate with splice bolt assembly onto 19mm armouplate fin with 1mm fibre gasket seal

12mm armourplate glazing with silicone sealent and backer rod between glass plate connections

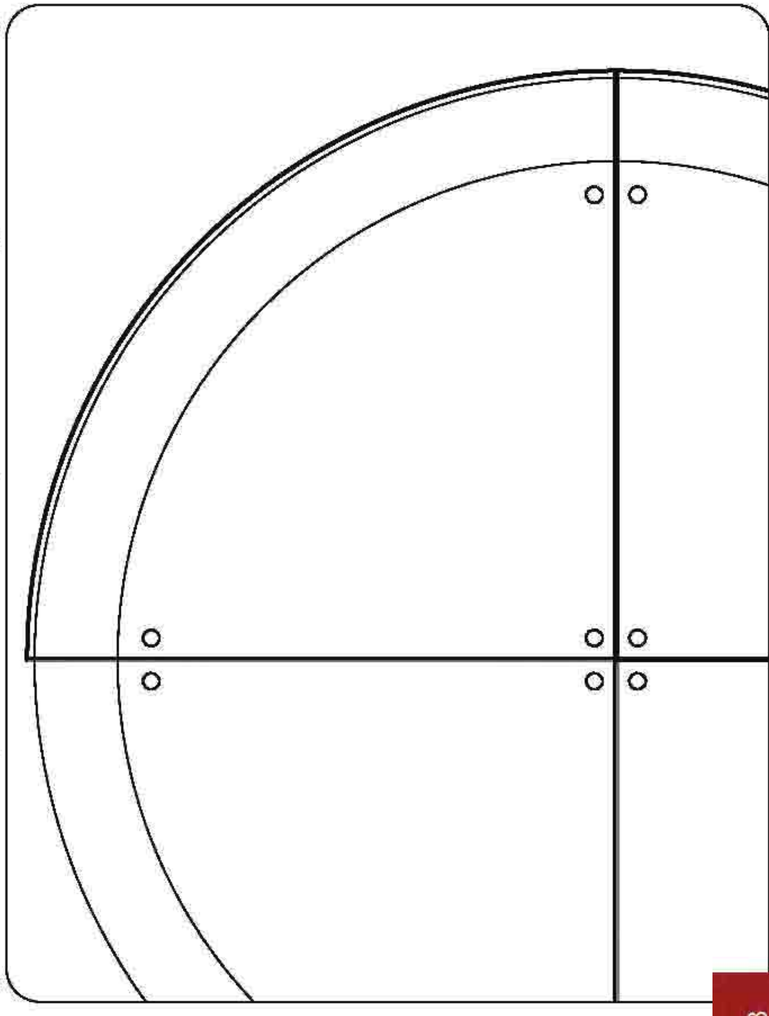
Detail_Live recording studion roof and glazing junction

DETAIL 001 1:10



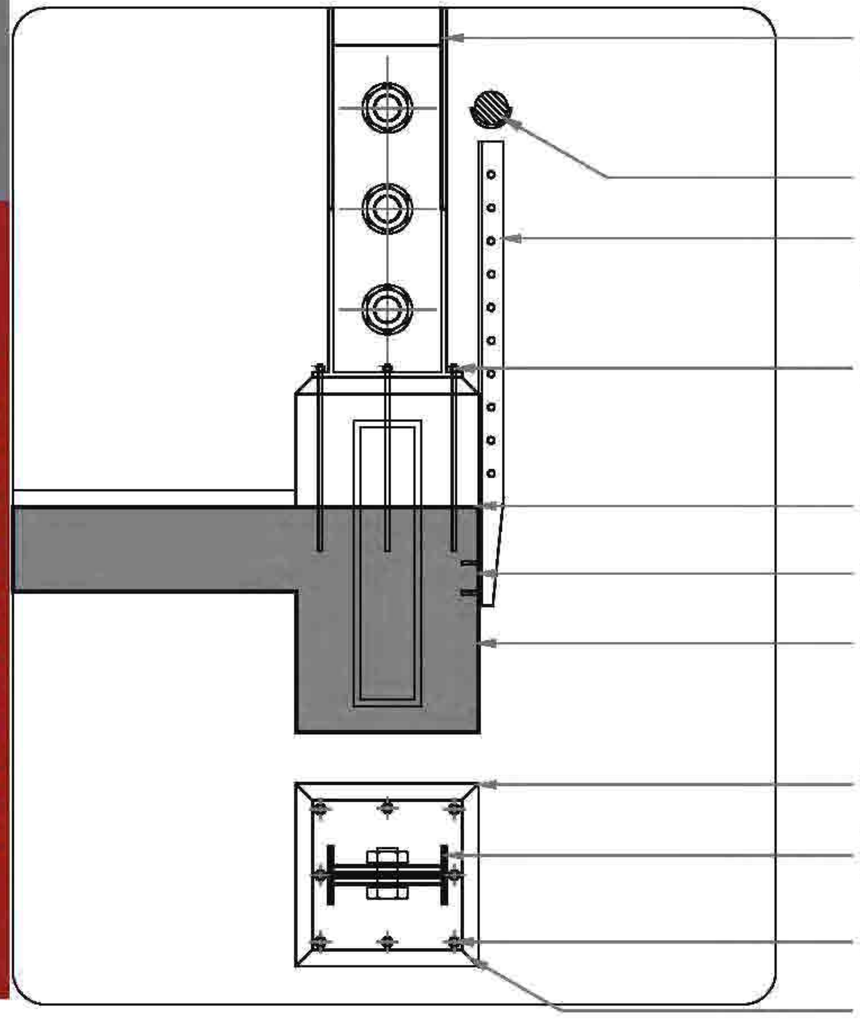
Science Library facade and top support structural box detail

DETAIL 002 1:10



Planter box detail

DETAIL 003 1:20



356x171x51mm galvinised steel comumn connected with oversized industrial M150 bolts to purpose made steel composite unit welded to 450 x 450 x 20 mm base plate

150mm diameter timber handrail preserved and treated as per manufacturer fixed onto steel tubing welded to balustrade

75 x 50 x 15mm galvanised mild steel balustrading lipped sections with 10mm diameter stainless steel rods and welded to 10mm base plate fixed to 255mm cast in situ reinforced conc floor slab with m10 galv mild steel bolts

eight holding bolts in anchor grout in concrete base bolt fixed to steel base plate with expansion grout under base plate

Lipped balustrade fixed to reinforced cast in situ concrete floor with stainless steel countersunk selftapping screws

255mm reinforced cast in situ concrete floor slab with exposed formwork finish as per engineer

column reinforcing into reinforced concrete beam

550 x 550mm reinforced concrete base 750mm upstand

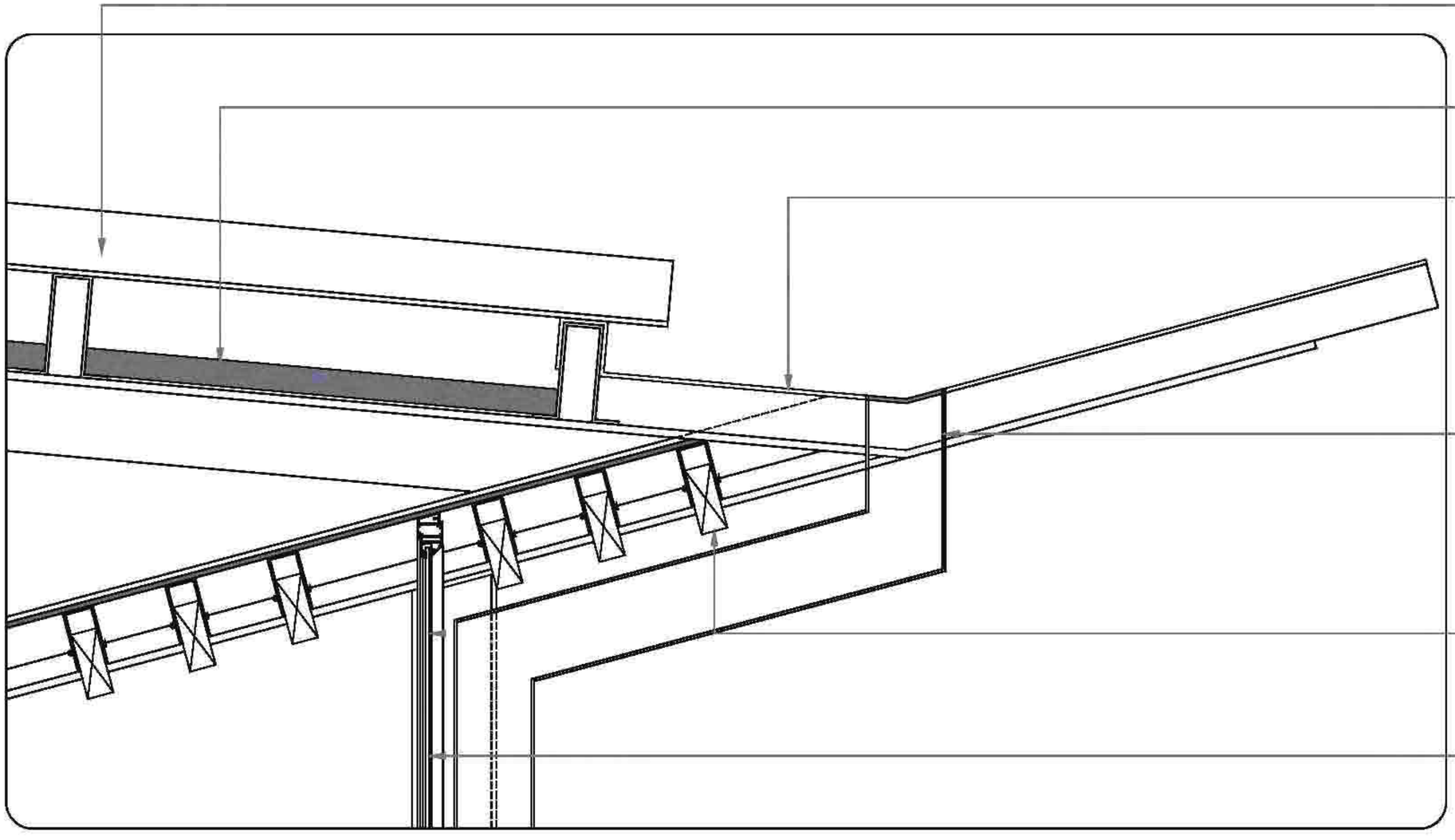
356x171x51mm galvinised steel comumn connected with oversized industrial M150 bolts to purpose made steel composite unit welded to 450 x 450 x 20 mm base plate

eight holding bolts in anchor grout in concrete base bolt fixed to steel base plate

expansion grout under base plate

Planter box detail

DETAIL 005 1:20



CORTEN finished BROWNBUILT roof sheets fixed to 175 x 75 top hats

Sagex boarded roof insulation panles supported over lip of top hat sections

Purpose made structural gutter galvanised mild steel flashing supported on top of steel angle bottom truss member

Purposed made gutter downpipe as per manufacturer specifications

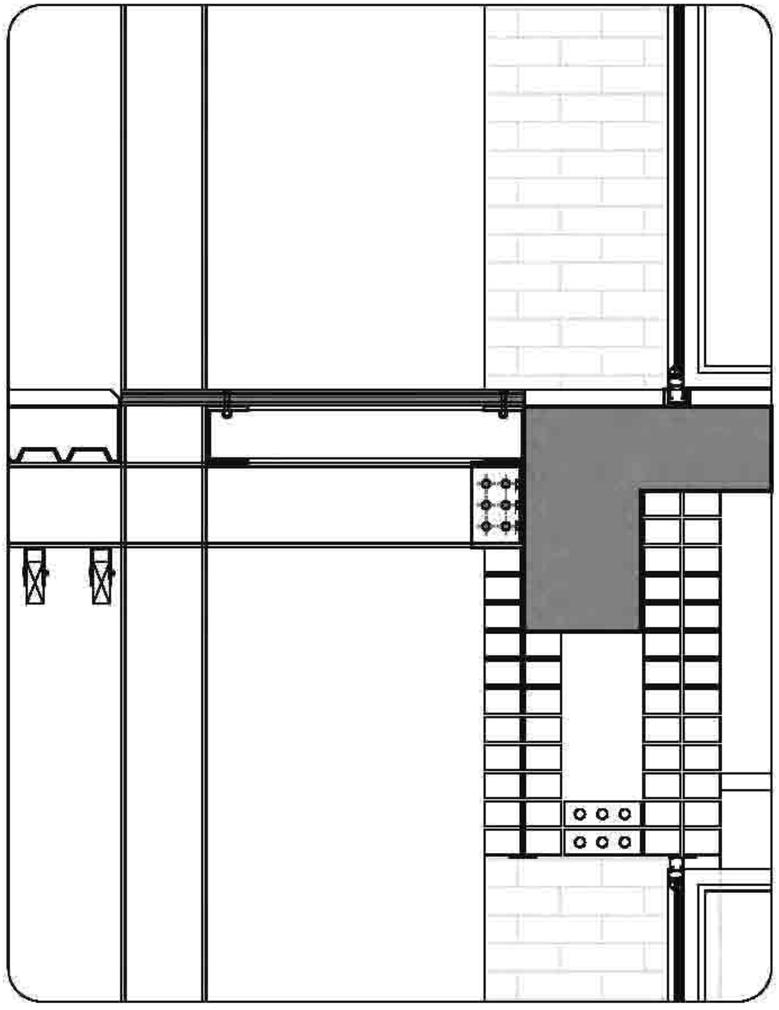
Two 150 x 75 x 15mm steel angles welded together as per engineer for top and bottom main support

125x75x15mm steel channels with closed ends bloit fixed to main stuctural member with timber purlins preserved and treated to manufacturer bolt fixed into channel frame

Aluminium window frame fitted to steel angle bottom truss member

Detail_Main roof underside and support

DETAIL 006 1:10



Two 150 x 90 x 15 galvanized mild steel angles fixed with bolts to glazing support frame and reinforced concrete up-stand as per eng

Pilkington 4 point spider arm structural glazing facade system adjusted to fit curve

GKD AG4 MediaMESH vertically supported by GKD fixing bracket to mild steel galvanised frame

Purpose made structural steel box frame for glazing and GKD AG4 MediaMESH end support welded onto vertical steel support frame

255mm reinforced concrete floor slab as per eng approved

Polished and pigmented screed onto concrete floor slab

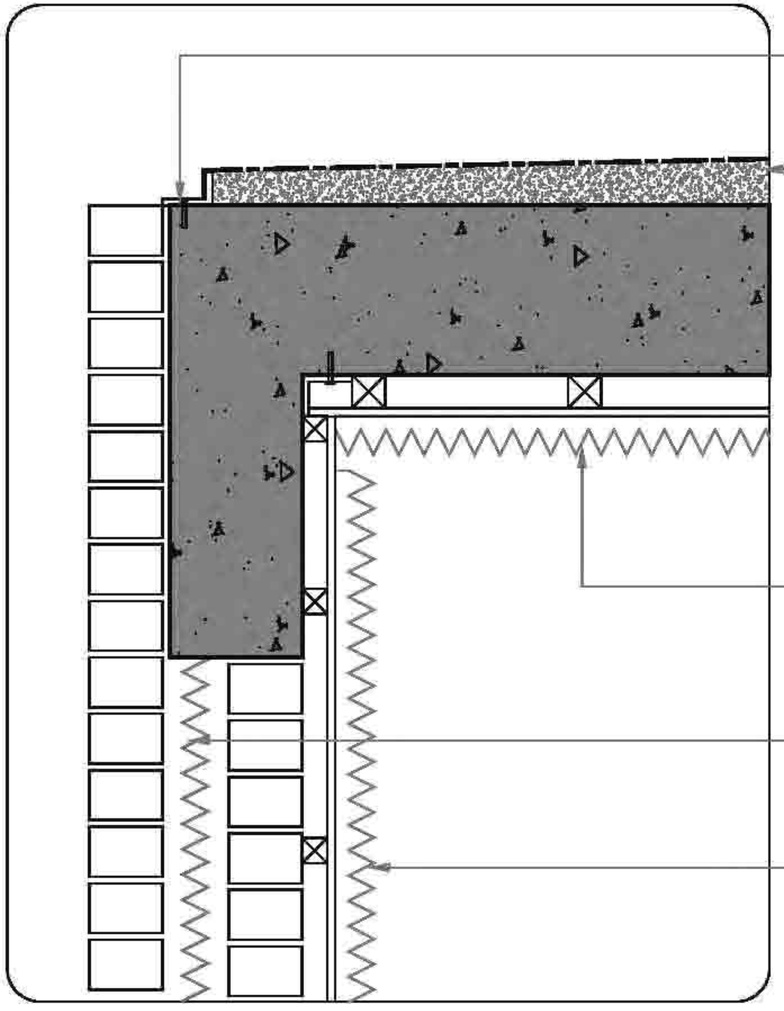
Purpose made structural steel composite box unit as per engineer welded onto mild steel support frame

Purpose made Aluminium frame fitted into structural box unit for spider arm structural glazing end support

Laminated timber bolt fixed into steel channels and welded onto purpose made suspended intermediate steel angle support frame at 2750mm c/c to fit media facade curve

Walkway junction detail

DETAIL 004 1:20



50 x 75 x 15mm galvanized mild steel angle counter-sunk into concrete beam

Bitumen torch-on waterproofing membrane laid on min 50mm concrete screen with min fall 1:70 towards ends

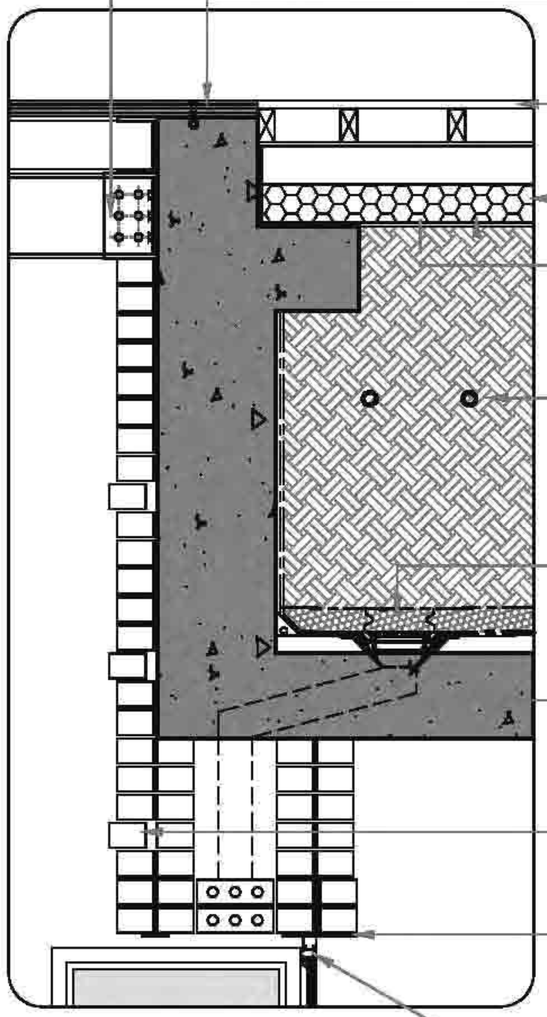
40mm SONITEK acoustic foam wedges onto 12mm timber ply-board fixed to 50 x 50mm timber batten frame at max 450mm c/c

50 - 75mm SONITEK acoustic wool insulation fixed into 100mm brick cavity wall

38 x 38mm timber batten frame at max 450mm c/c with 40mm SONITEK acoustic foam wedges onto 12mm plywood board

Detail_Aging Process of brick wall - Recording studio roof accoustic wall and ceiling detail

DETAIL 007 1:10



254 x 171mm mild steel I section fixed to concrete up stand and angle-cut for flush joint finish

4 x 12mm laminated frosted glass floor deck fixed with counter-sunk bolts onto rubber backing supported on steel frame

Timber floor deck fixed supported with 50x25mm timber battens onto 275x171x12mm steel I-Beam ont0 concrete footing

BEAMSIZE: Span of 5500mm/slenderness ration of 20 5500/20 = 275mm galvanized steel I-BEAM

75mm thick layer course aggregate of 20mm crushed stone laid above garden soil

Drip system installed as per manufacturer and garden soil for trees and shrubs growth and support in concrete planter box

Geo-textile membrane on 75mm thick layer of 20mm crushed stone with min 30mm concrete screed to 1:50 fall

Full-bore outlet casted into concrete planter box with connecting water outlet pipes in brick cavity wall

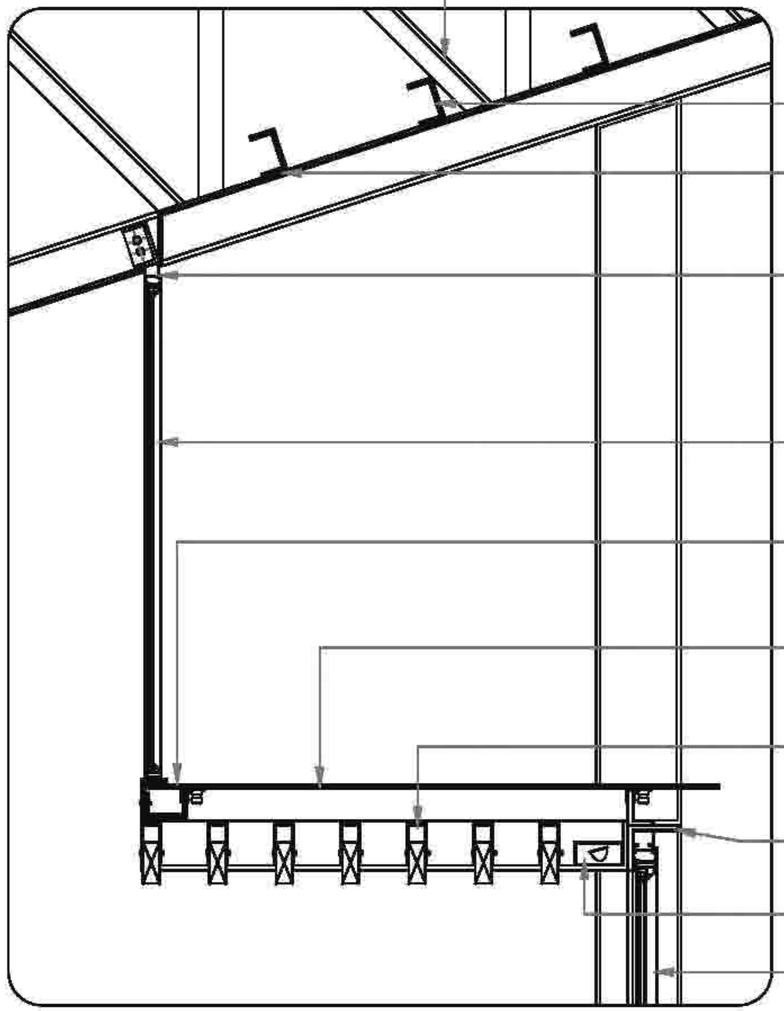
25mm extruded brick for shadow line

175 x 80mm mild steel angled fixed to supporting concrete and column brick work

Aluminium door and window frame supported with 50 x 50 x 15mm galvanised steel angle frame

Detail_Internal planter box and garden deck

DETAIL 008 1:20



75 x 50 x 15mm steel angles welded onto IPE160 bottom truss member as per SANS 2001 - CS 1

127 x 75 x 15 mm galvanised steel channels bolt fixed onto IPE 160 exposed steel truss bottom cord

Fibre cement ceiling board fixed to galvanized steel channels

Purpose made supporting aluminium window sill for window frame

Aluminium window frame

125 x 75 x 15mm mild steel channels bolt fixed to composite steel frame for glazing arm support

Pilkington Planar flush glazing system with applied silicone sealant between glass panels

25 x 75mm timber purlins fixed into 125 x 25mm mild steel channel at 200 centres welded onto composite steel angle frame

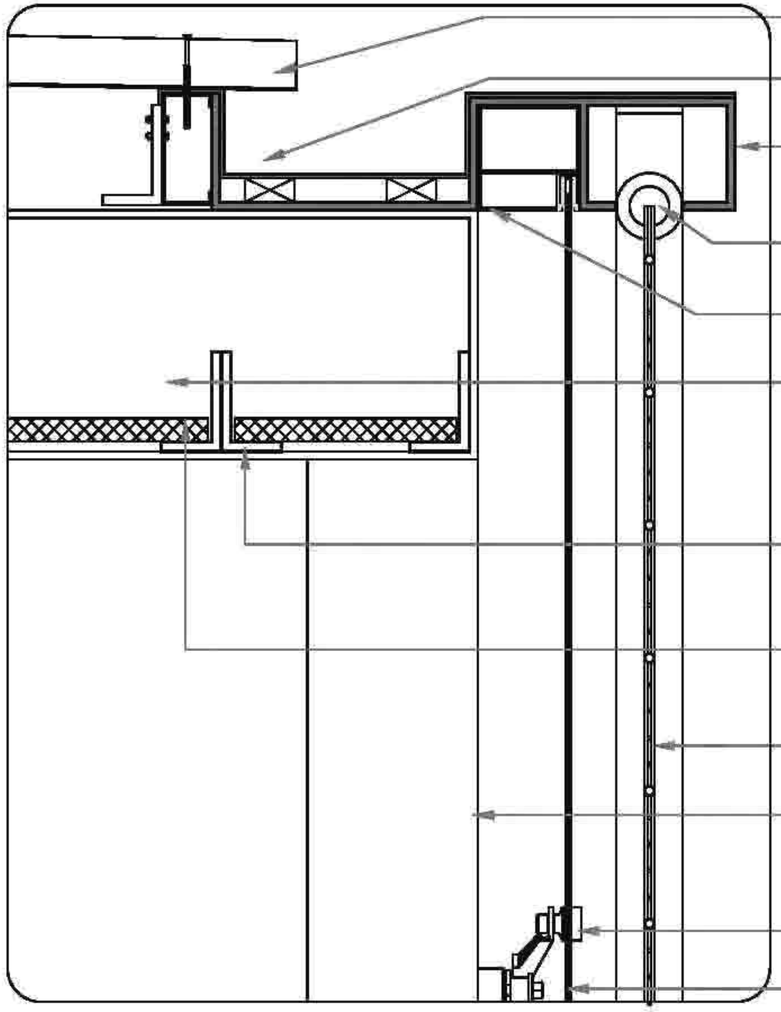
150 x 75 x 15mm composite steel angle frame

Light fitting installed into composite frame

Aluminium door frame

Detail_Roof and glass canopy junction

DETAIL 009 1:20



RCP 8 Translucent roof sheet profile fixed to purlin support system with approved fasteners at every third interval

Purpose made box gutter supported on top of structural box unit to fall as per eng

Purpose made structural steel composite box unit as per engineer welded onto mild steel support frame

Purpose made structural steel vertical support bracket as per engineer and GKD MediaMESH manufacturer

Purpose made Aluminium frame fitted into structural box unit for spider arm structural glazing end support

Beamsize:
Maximum span 7500mm/slenderness ration of 20: 5000/20=375mm galvanised steel I-BEAM

150 x 75 mm steel cold-formed lipped channels fixed to i-beam roof support with mild steel a angle cleat as per engineer

Poly Carbonate roof panel sheeting supported in between lipped channels onto I-BEAM section to create mechanically ventilated cavity for solar heat control

GKD AG4 MediaMESH vertically supported by GKD mesh fixing bracket to mild steel galvanised frame

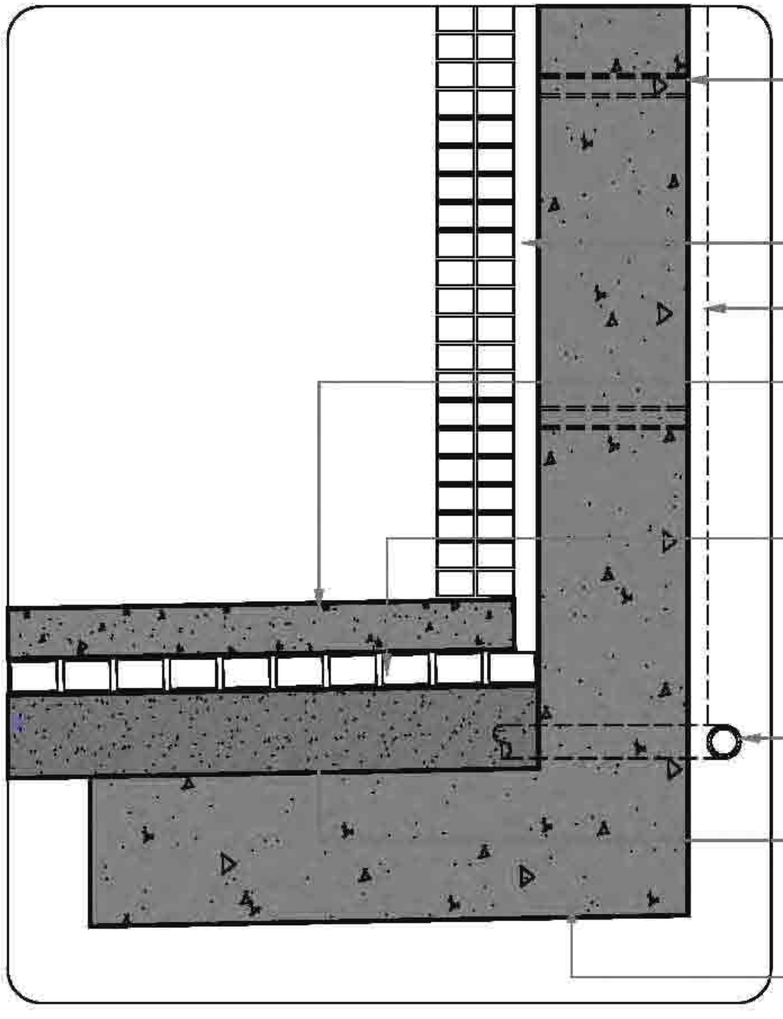
250 x 100mm galvanised hollow steel section for structural glazing support welded to I-BEAM and composite structural box as per engineer

Pilkington 4 point spider arm structural glazing facade system with arms adjusted to fit curve as per manufacturer

Glass panel intersection with site applied silicon sealant and backing rod as per manufacturer

Detail_Science Library facade and top support structural box

DETAIL 011 1:10



Flow-drain punctures in retailing wall at 1m² spacing 450mm cast in situ reinforced concrete retaining wall

Min 75mm cavity

Geo-textile membrane

Min 150mm mesh reinforced structural concrete floor slab with 1:50 fall towards water catch-pit on 0.45 polyolefin membrane

290x140x90mm concrete bricks with 20mm joints for water drain

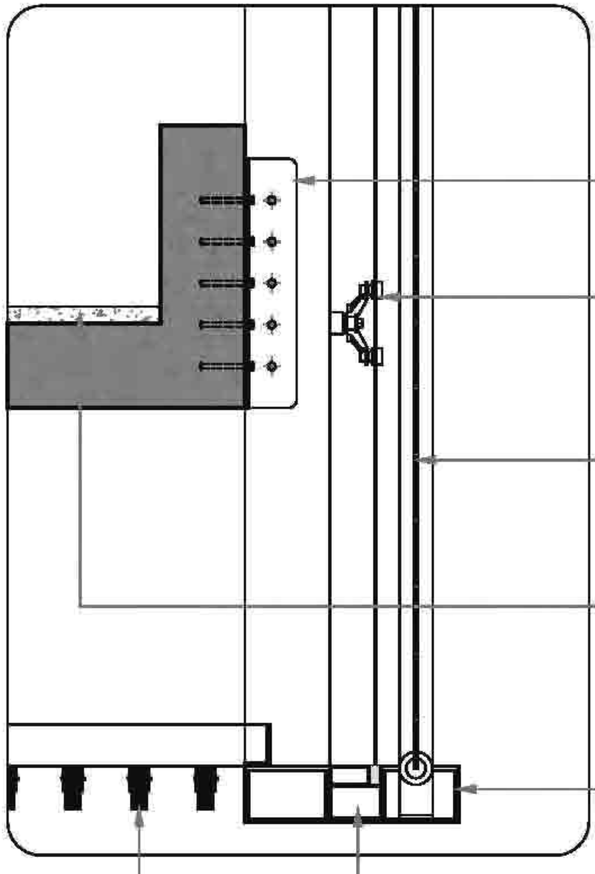
Geo-pipe on cast in situ reinforced concrete footing for water pressure

250mm no fines cast in situ concrete floor slab at 1:50 fall to sump

Reinforced concrete footing

Detail_Drained cavity basement

DETAIL 009 1:20



Two 150 x 90 x 15 galvanized mild steel angles fixed with bolts to glazing support frame and reinforced concrete up- stand as per eng

Pilkington 4 point spider arm structural glazing facade system adjusted to fit curve as per manufacturer

GKD AG4 MediaMESH vertically supported by GKD fixing bracket to mild steel galvanized frame as per manufacturer

255mm reinforced concrete floor slab as per eng approved with polished and pigmented screed onto concrete floor slab

Purpose made structural steel box frame for glazing and GKD AG4 MediaMESH end support welded onto vertical steel support frame as per engineer

Purpose made Aluminium frame fitted into structural box unit for spider arm structural glazing end support

Laminated timber bolt fixed into steel channels and welded onto purpose made suspended intermediate steel angle support frame at 2750mm c/c to fit media facade curve

Detail_Media Library facade and bottom support frame detail

DETAIL 012 1:20