

LEGEND

- DP-1 100 dia. Downpipe with min. size
- SDP Stormwater Drainage Pit with Size, Grate Level & Invert Level
- GD Grated Drain
- RWH Rain Water Head With Overflow
- BG-A Balcony Inlet Grate 200 Dia flat inlet X 100 dia outlet by GALIN ENGR. or similar
- BG-B Trace Grate 150 Dia flat inlet X 80 dia outlet by GALIN ENGR. or similar
- GGI 100 Dia. Grated Gully Inlet In Garden On Suspended Slab
- POSS 350 x 350 Grated Inlet Pit On Suspended Slab
- 100 dia. @ 1% P.V.C. Gravity Stormwater Drainage With Pipe Size & Flow Direction
- 80 Dia Pump Well Rising Main Sub-Soil Drain
- 80 Dia Pump Well Rising Main
- Existing Level
- Proposed Level
- Suspended slab area drained with 40mm ATLANTIS drainage cell

GENERAL STORMWATER NOTES

1. All pipes and stormwater structures shall be in strict accordance with relevant S.A. Codes for materials, workmanship and to rules and regulations of the local Council.
2. The drawings are diagrammatic and setouts shall be checked with the Architectural drawings.
3. All levels and dimensions shall be checked on site prior to start of construction.
4. Pipe materials indicated may be altered provided they comply with the requirements of the relevant authorities.
5. Gutters and downpipes shall be in strict accordance with AS 2179 & AS 2180. Gutters shall have a minimum effective cross sectional area of 9300mm sq (12500mm GUTTER or similar) with 1 in 500 min. grade with 100 x 75 downpipes unless otherwise noted on plans.
6. Stormwater pipes up to and including 300 dia. shall be PVC pipes, sewer grade, conforming to AS 1260 and installed in accordance with AS 3500.3 and related reference documents.
7. All existing services to be located prior to the commencement of construction. Any costs incurred for adjustments and/or relocation of services to be borne by the applicant.
8. Provide unrestricted overland flowpaths from all pits and drain to detention tank inlet grates.
9. On-site stormwater detention reduces flooding by providing temporary storage of stormwater during storms. After the storm, the stored water is slowly released, normally through a control orifice. Systems incorporating a High Early Discharge fill the HED section, then overflow into the storage and later flow back into HED through a one-way line. During light rain, no storage occurs. During extreme rainfall, the detention system will fill and could overflow. A typical storage system will quickly fill but take several hours to empty. Submerison during this period will not affect most grass, plants or trees.
10. Councils require that on-site detention systems be inspected during construction to enable a final Hydraulic Certificate and Work as Executed details to be supplied upon completion. Councils require that concrete works (tank bases, lids, retaining walls etc.) are inspected before pouring and a Structural Engineers Certificate is issued on completion.
11. These details are subject to approval by Council and possibly other authorities. Do not continue or commit to any works until these details are approved. Advise Design Engineer of any special conditions imposed or design variations made to the details. Any alterations (however minor) must be authorised by the Design Engineer.
12. Conditions found during construction that conflict with these details shall be reported to the Design Engineer. If in doubt, ask. Design sizes, levels, heights and depths must not be varied without approval.
13. All works are to be completed before the Final Certificate will be issued. Tanks are to be clear of all formwork, builder's rubbish and silt. The outline and sump drain is to be clear. All pits and grates are to be completed and shall be free of building material and spoil. All downpipes are to be connected. Landscape works including driveways, kerbs and drive trench grates shall be installed. Orifices, screens, step irons and tank grate locks are to be correctly fitted. Surface detention areas are to be turfed.
14. Maintenance of the on-site stormwater detention system is the responsibility of the Owner. A complete set of these details shall be provided to the present owner. The details should be passed on to subsequent owners. It is important that these systems are not modified without approval. Do not enter any pit or tank where there is risk of inadequate ventilation or buildup of noxious odours, gases, or leakage of any volatile or toxic contaminants into the chamber. Obtain professional assistance if any of these conditions occur.
15. Maintenance and cleaning is required as follows. Remove and flush clean the trash screen. Hose out the tank base and remove accumulated debris. Flush the discharge-line clear. This must be done to Council's time requirements and as all Council's vary it is the responsibility of the Owner to find out Council's requirements.
16. Orifice plates shall be fabricated from 3mm thick stainless steel, with a circular hole machined to 1.2mm. Plates shall be fixed flush using four stainless steel expansion or chemical anchors. If required by Council, the orifice plate shall also be epoxy fixed. Unless otherwise detailed, plates shall be fixed on the centreline of the outlet.
17. Screen mesh shall be Lysaght's expanded metal, type RH3030, and shall not be hot dipped galvanised after fabrication. The screen shall have elongated mesh openings set horizontal, and the projecting mesh lines pointing down and facing upstream. Screens shall be provided with a suitable handle located on the top upstream face of the screen (for removal and, for flat screens, to define the screen orientation). All screens shall be removable by hand without the use of tools. Fixing brackets shall be stainless or galvanised mild-steel type. Bracket anchors shall be stainless steel. When installed, the maximum edge gap shall be 3mm + or - 3mm.
18. One-way flaps shall be Flocia Floodgate type. Flaps shall be located clear of inlets, screens and step irons and must not prevent the screen from being removed.
19. Concrete shall be 20 MPa for footings and tank bases, and 25 MPa for suspended tank lid slabs. Mesh reinforcement shall be lapped one square plus 25mm and bar reinforcement shall be lapped 500mm.
20. Permanent (non-structural) formwork shall be Lysaght's Bondtek, any grade, or equal.
21. Tanks may be in-situ or precast. Note that falls, sumps and the position and depth to orifice plates or discharge control pipe is critical: both for hydraulic and health reasons. Overflow and access grates also provide light and ventilation requirements of various Authorities. Provide step irons to all tanks over 1200 depth.
22. Tank risers should be in-situ concrete. Risers shall have the same clear internal size as the tank access opening. Provide step irons to risers as specified.
23. Individual-rung step irons to tank, tank risers and deep pits shall be an approved type (galvanised steel or high impact plastic) complying with AS 1657. Fix rungs permanently and securely by drilling and epoxy grouting. Provide the specified number of step-irons, equally spaced vertically between 250mm and 350mm, with alternate rungs offset 200mm.
24. Grates and frame units shall be hinged and childproof, using either a spring loaded bolt or a bolt and lug locking system (padlocks are not permitted). The frames shall be securely attached to the tank or riser, or built into an in-situ slab.
25. Grates shall be class A (light duty) in paths and lawns; class B (medium duty) in residential vehicular areas; and class C (heavy duty) in public roadways.

B	Grated drain moved.	2021-3-30
A	Floor levels altered. Drainage altered to suit	2021-3-25

Revision Details Date

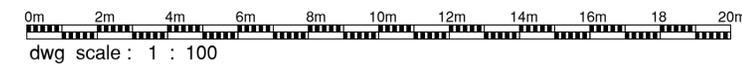
Project
Proposed Residential Flat Building
 At 53-55 Donnison Street
 West Gosford

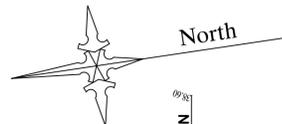
BURGESS, ARNOTT & GRAVA PTY. LTD.
 CONSULTING STRUCTURAL, CIVIL &
 HYDRAULIC ENGINEERS
 61A THE CENTRE FORESTVILLE P.O. BOX 69 FORESTVILLE 2087
 Ph. 9451 4411 Fax. 9975 2274
 email rob@gravaconsulting.com.au

Title STORMWATER DRAINAGE BASEMENT 2 CONCEPT PLAN				
Checked	Scale	Date	Drawing No.	Rev.
R. Grava	As shown	Oct. 2020	2020-205 -H1	B
Approved by			Drawing 1 in set of 10	
Chartered Engineer			Drawing size A1	

BASEMENT 2 FLOOR PLAN
 Scale 1 in 100
 Scale 1 in 100 when printed on A1 sheet

ALL STORMWATER DRAINAGE TO BE SEWER GRADE P.V.C.
 ALL STORMWATER DRAINAGE TO 100 Dia. @ 1% MIN. GRADE
 UNLESS OTHERWISE NOTED ON PLAN





WEST

STREET

DONNISON

North

BITUMEN

B.M. Nail in Bitumen.
r.l. 39.22m A.H.D.

PATH

CONCRETE

EDGE

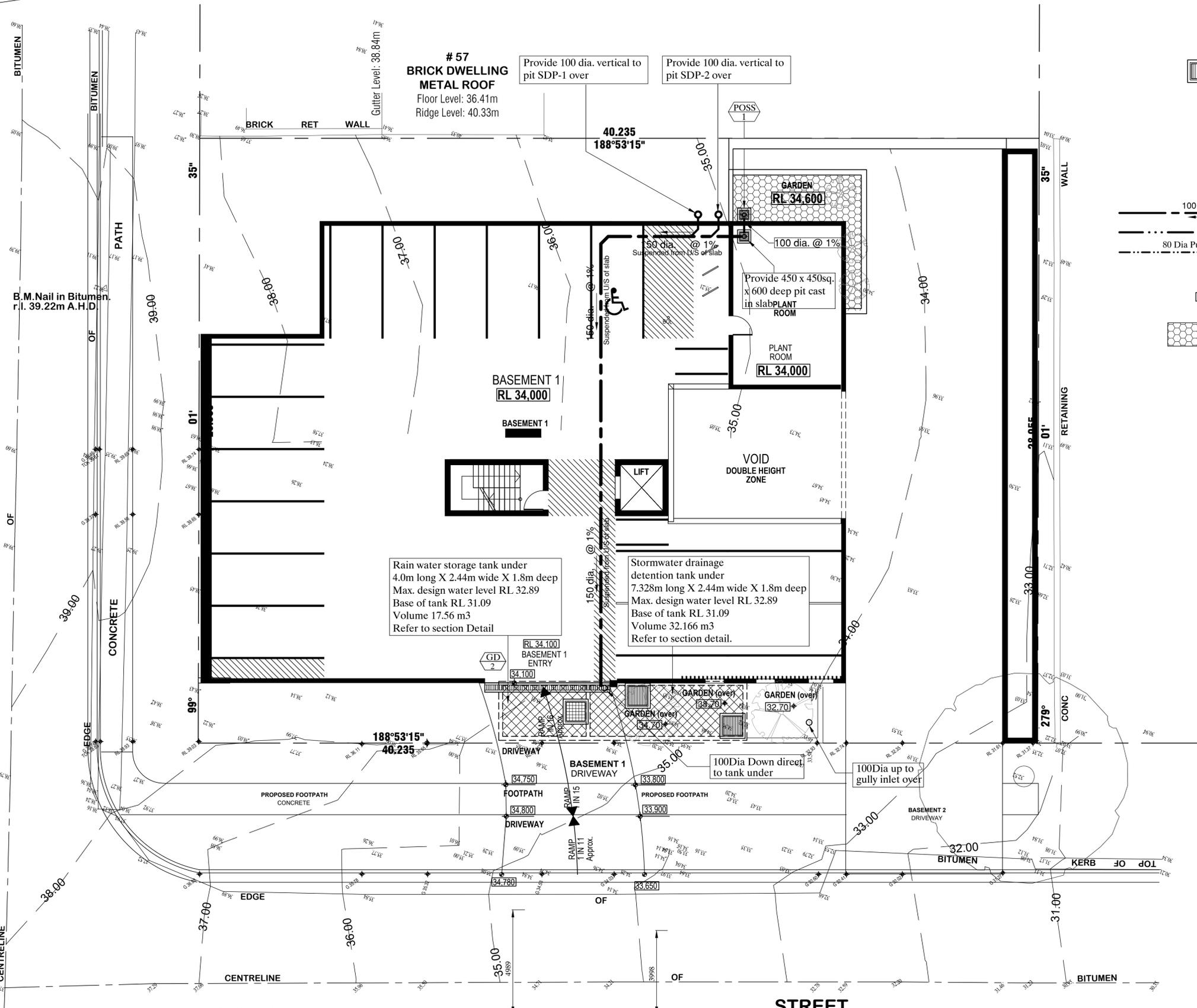
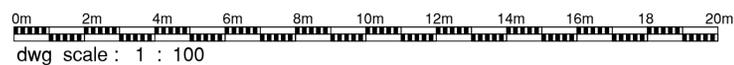
EDGE

BATLEY

BASEMENT 1 FLOOR PLAN

Scale 1 in 100
Scale 1 in 100 when printed on A1 sheet

ALL STORMWATER DRAINAGE TO BE SEWER GRADE P.V.C.
ALL STORMWATER DRAINAGE TO 100 Dia. @ 1% MIN. GRADE
UNLESS OTHERWISE NOTED ON PLAN



LEGEND

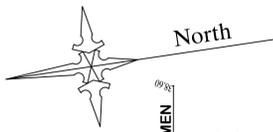
- 450 X 450 G=13.60 IL=13.05
- DP-1 100 dia Downpipe with min. size
- SDP 1 Stormwater Drainage Pit with Size, Grate Level & Invert Level
- GD 1 Grated Drain
- RWH 1 Rain Water Head With Overflow
- BG-A 1 Balcony Inlet Grate 200 Dia flat inlet X 100 dia outlet by GALIN ENG. or similar
- BG-B 1 Trace Grate 150 Dia flat inlet X 80 dia outlet by GALIN ENG. or similar
- GGI 1 100 Dia. Grated Gully Inlet In Garden On Suspended Slab
- POSS 1 350 x 350 Grated Inlet Pit On Suspended Slab
- 100 dia. @ 1% P.V.C. Gravity Stormwater Drainage With Pipe Size & Flow Direction
- 80 Dia Pump Well Rising Main Sub-Soil Drain
- 20.25 and 20.25 Existing Level
- 20.25 and 20.25 Proposed Level
- Suspended slab area drained with 40mm ATLANTIS drainage cell

B	Driveway to basement 1 altered.	2021-3-30
A	Floor levels altered. Drainage altered to suit	2021-3-25

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Title STORMWATER DRAINAGE BASEMENT 1 CONCEPT PLAN				
Checked	Scale	Date	Drawing No.	Rev.
R. Grava	As shown	Oct. 2020	2020-205 -H2	B
Approved by			Drawing 2 in set of 10	
Chartered Engineer			Drawing size A1	



WEST

STREET

DONNISON

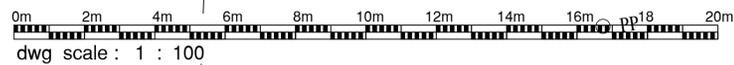
BATLEY

STREET

GROUND FLOOR / SITE PLAN

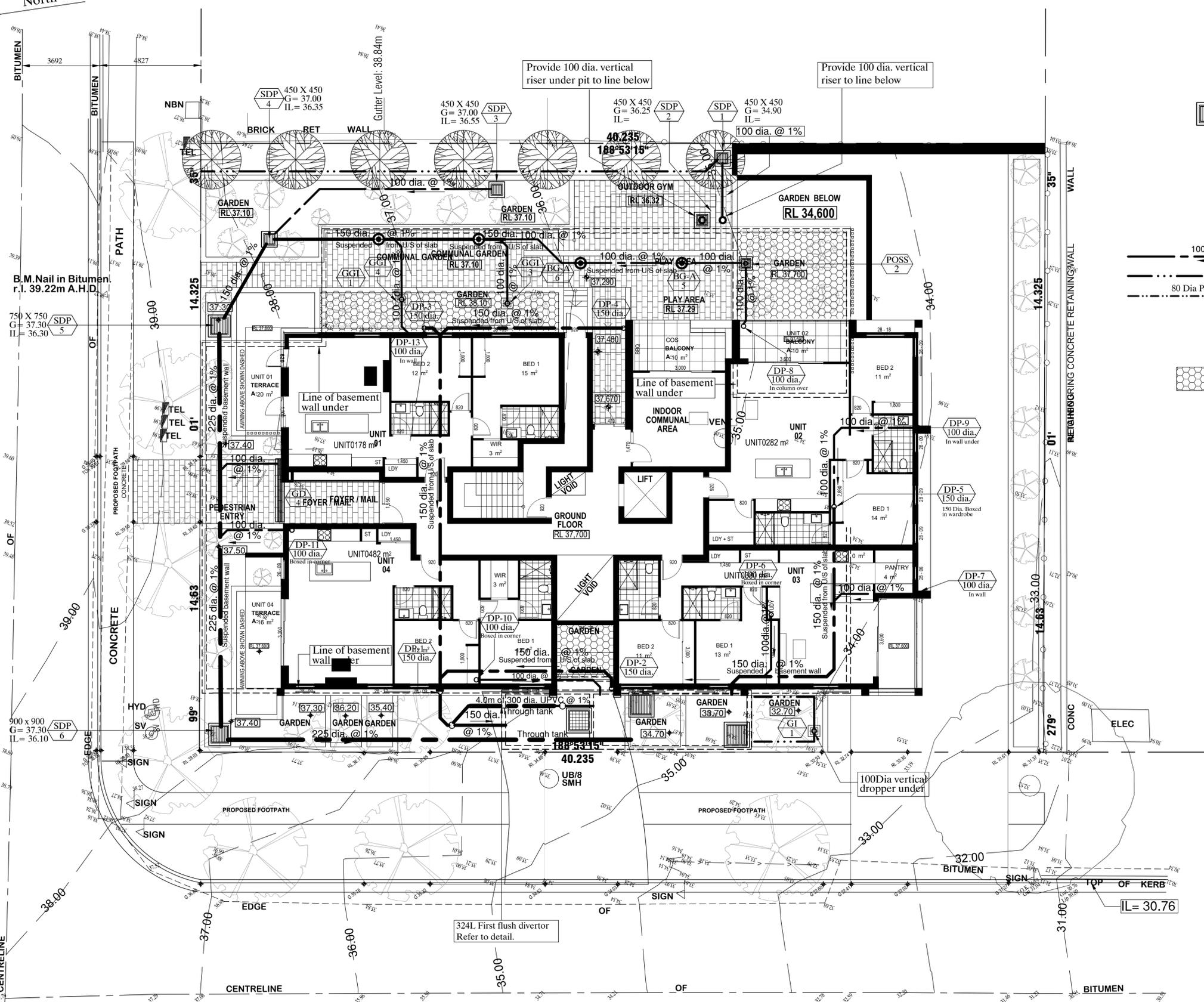
Scale 1 in 100
Scale 1 in 100 when printed on A1 sheet

ALL STORMWATER DRAINAGE TO BE SEWER GRADE P.V.C.
ALL STORMWATER DRAINAGE TO 100 Dia. @ 1% MIN. GRADE
UNLESS OTHERWISE NOTED ON PLAN

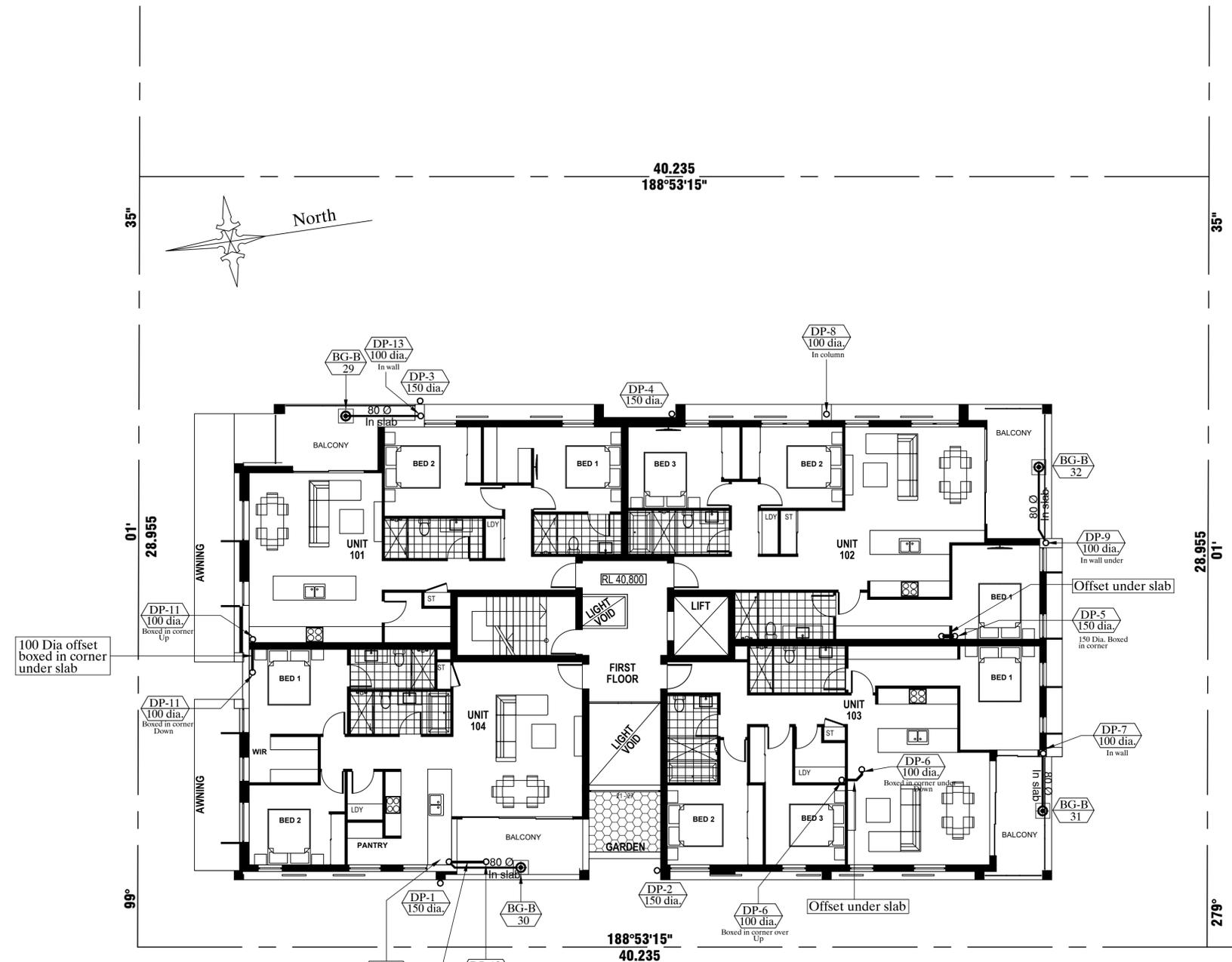


LEGEND

- 450 X 450 SDP
G = 13.60
IL = 13.05
- DP-1
100 dia.
- SDP
1
- GD
1
- RWH
1
- BG-A
1
- BG-B
1
- GGI
1
- POSS
1
- 100 dia. @ 1%
- 80 Dia Pump Well Rising Main
- 80 Dia Pump Well Rising Main
- 15.36
- 20.25 and 20.25
- Suspended slab area drained with 40mm ATLANTIS drainage cell

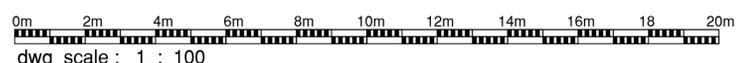


B	Driveway to basement 1 altered.	2021-3-30
A	Floor levels altered. Drainage altered to suit	2021-3-25
Revision	Details	Date
Project		
Proposed Residential Flat Building At 53-55 Donnison Street West Gosford		
BURGESS, ARNOTT & GRAVA PTY. LTD. CONSULTING STRUCTURAL, CIVIL & HYDRAULIC ENGINEERS 61A THE CENTRE FORESTVILLE P.O. BOX 69 FORESTVILLE 2087 Ph. 9451 4411 Fax. 9975 2274 email rob@gravaconsulting.com.au		
Title		
STORMWATER DRAINAGE CONCEPT GROUND FLOOR / SITE PLAN		
Checked	Scale	Date
R. Grava	As shown	Oct. 2020
Approved by	Drawing 3 in set of 10	
Chartered Engineer	Drawing size A1	



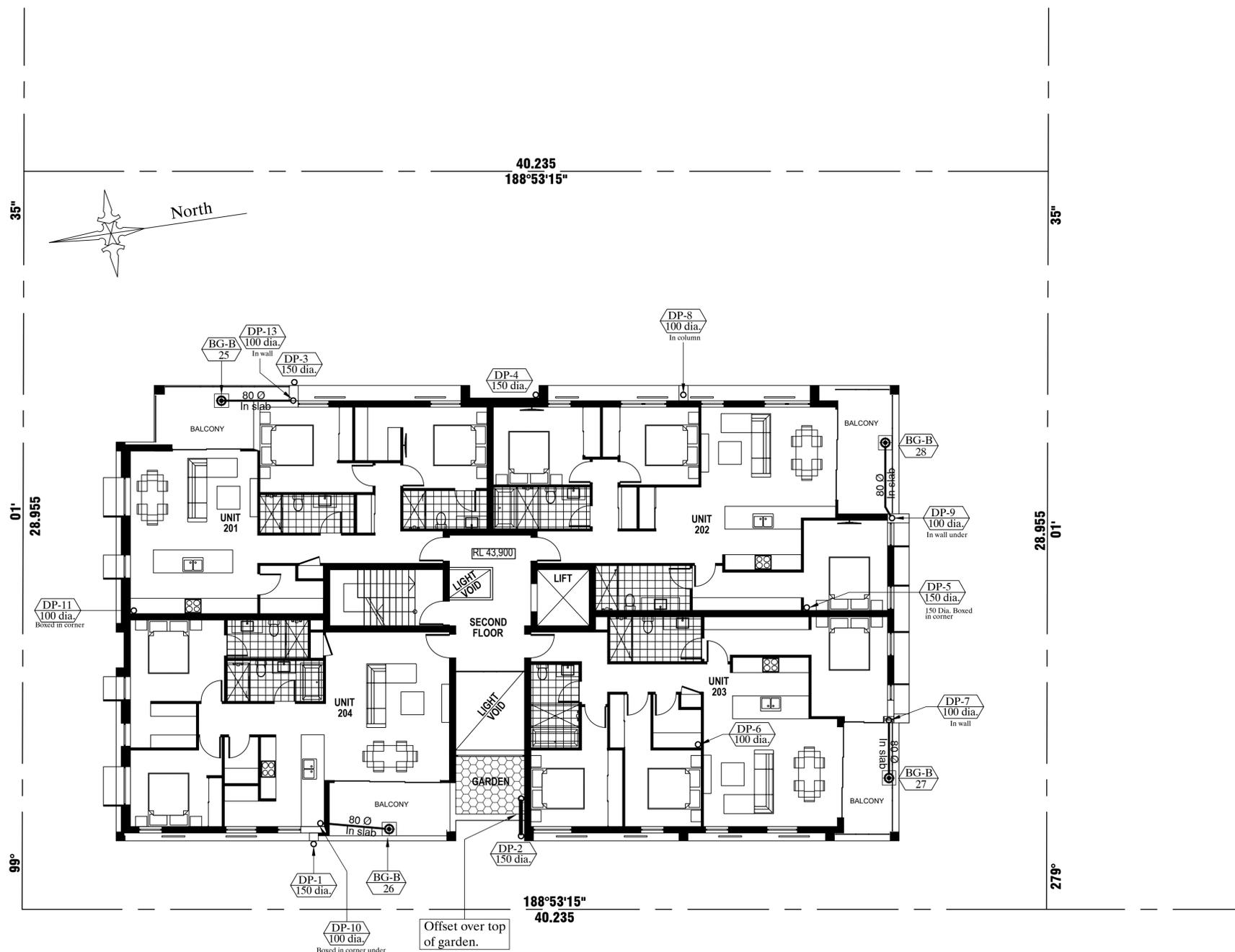
FIRST FLOOR PLAN

Scale 1 in 100
Scale 1 in 100 when printed on A1 sheet



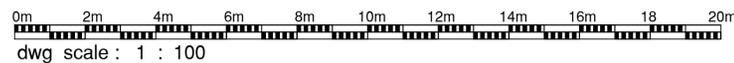
dwg scale : 1 : 100

Revision	Details	Date		
Project				
Proposed Residential Flat Building At 53-55 Donnison Street West Gosford				
BURGESS, ARNOTT & GRAVA PTY. LTD. CONSULTING STRUCTURAL, CIVIL & HYDRAULIC ENGINEERS 61A THE CENTRE FORESTVILLE P.O. BOX 69 FORESTVILLE 2087 Ph. 9451 4411 Fax. 9975 2274 email rob@gravaconsulting.com.au				
Title				
STORMWATER DRAINAGE CONCEPT FIRST FLOOR PLAN				
Checked	Scale	Date	Drawing No.	Rev.
R. Grava	As shown	Oct. 2020	2020-000-H4	0
Approved by			Drawing 4 in set of 10	
Chartered Engineer			Drawing size A1	



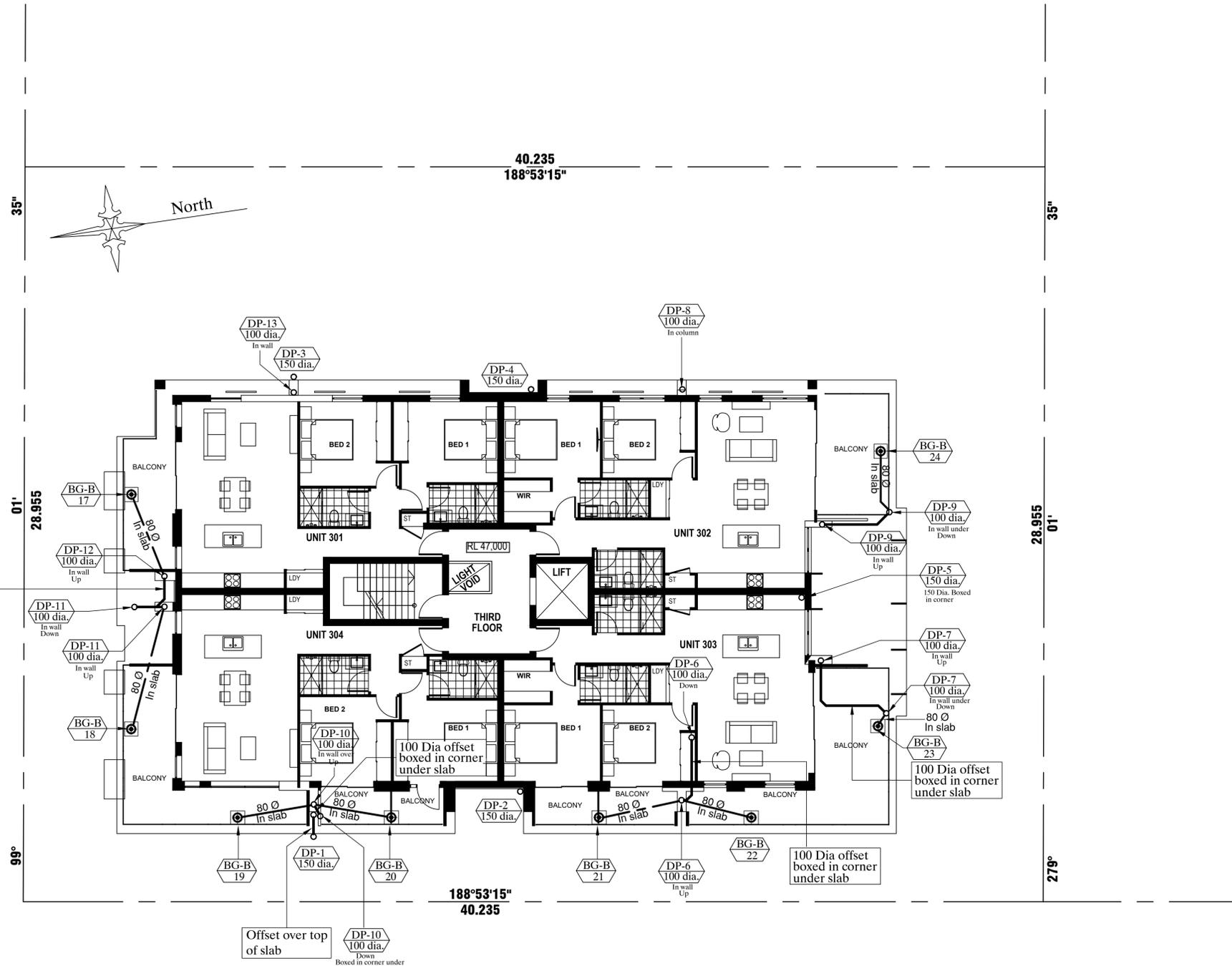
SECOND FLOOR PLAN

Scale 1 in 100
Scale 1 in 100 when printed on A1 sheet



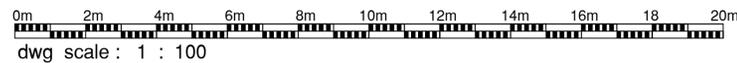
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Revision	Details		Date	
Project	Proposed Residential Flat Building At 53-55 Donnison Street West Gosford			
BURGESS, ARNOTT & GRAVA PTY. LTD. CONSULTING STRUCTURAL, CIVIL & HYDRAULIC ENGINEERS 61A THE CENTRE FORESTVILLE P.O. BOX 69 FORESTVILLE 2087 Ph. 9451 4411 Fax. 9975 2274 email rob@gravaconsulting.com.au				
Title STORMWATER DRAINAGE CONCEPT SECOND FLOOR PLAN				
Checked	Scale	Date	Drawing No.	Rev.
R. Grava	As shown	Oct. 2020	2020-000-H5	0
Approved by			Drawing 5 in set of 10	
Chartered Engineer			Drawing size A1	



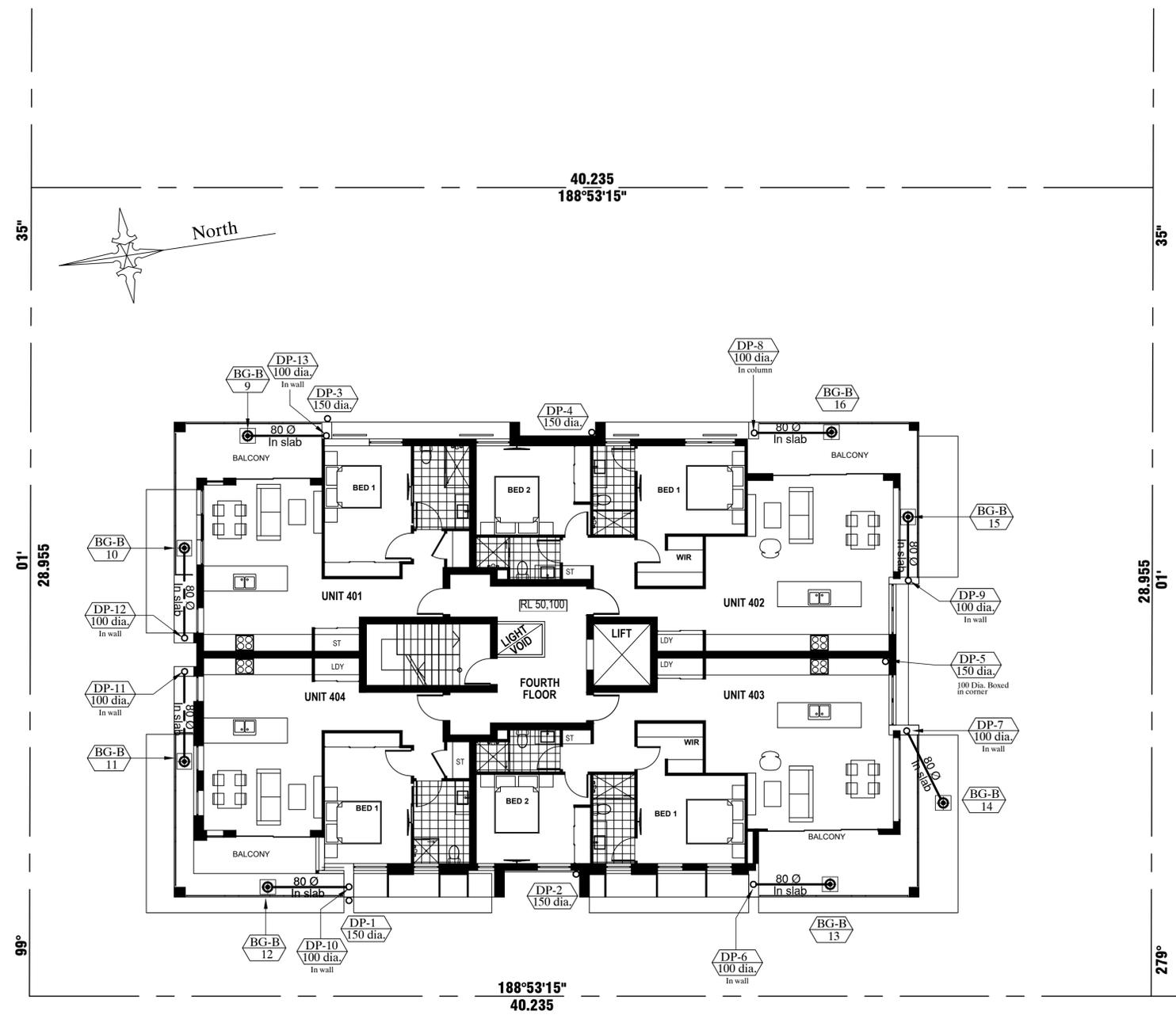
THIRD FLOOR PLAN

Scale 1 in 100
Scale 1 in 100 when printed on A1 sheet

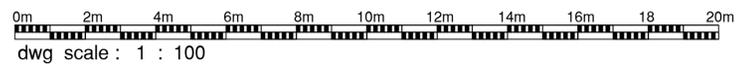


dwg scale : 1 : 100

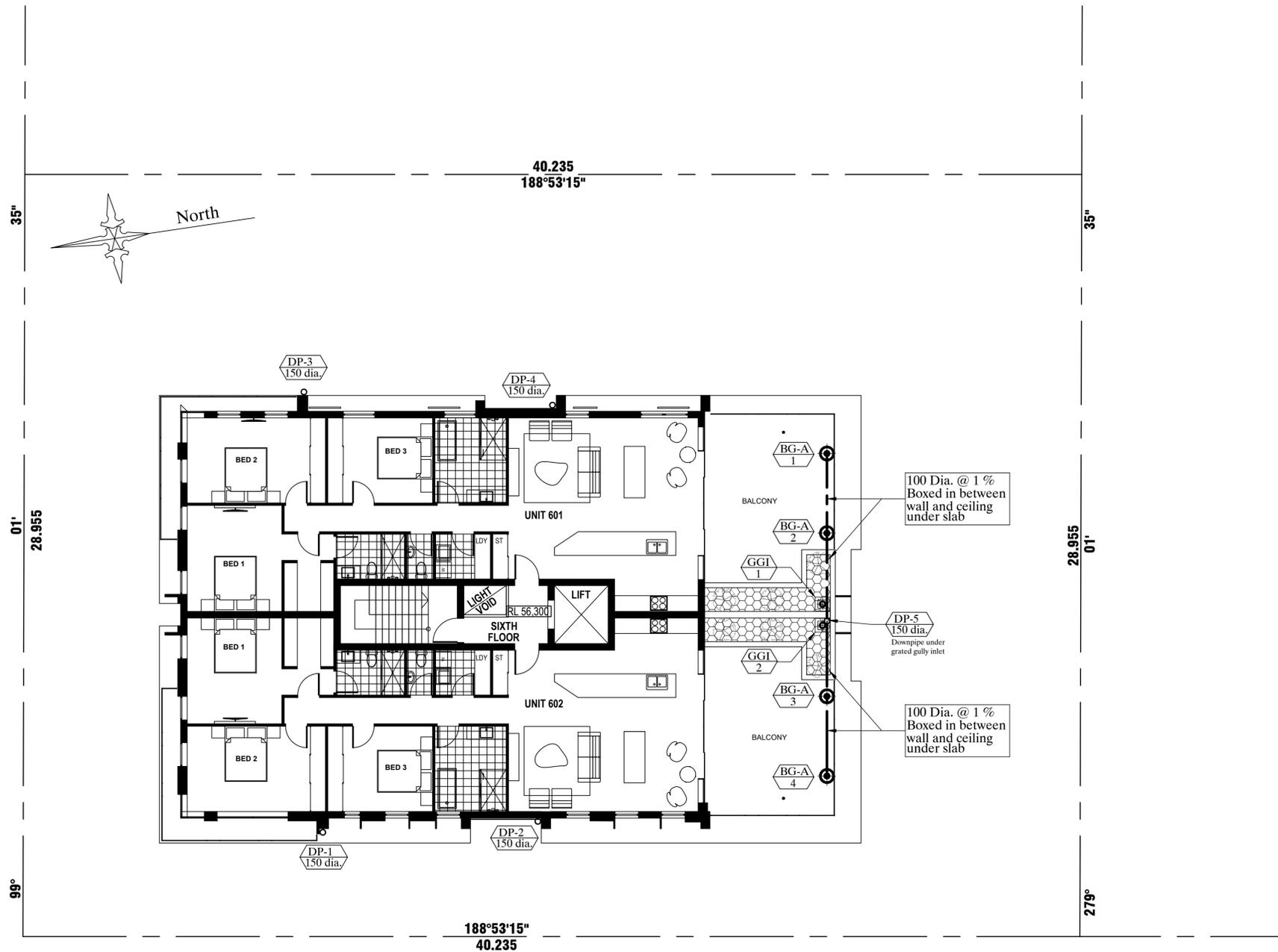
Revision	Details	Date
Project		
Proposed Residential Flat Building At 53-55 Donnison Street West Gosford		
BURGESS, ARNOTT & GRAVA PTY. LTD. CONSULTING STRUCTURAL, CIVIL & HYDRAULIC ENGINEERS 61A THE CENTRE FORESTVILLE P.O. BOX 69 FORESTVILLE 2087 Ph. 9451 4411 Fax. 9975 2274 email rob@gravaconsulting.com.au		
Title		
STORMWATER DRAINAGE CONCEPT THIRD FLOOR PLAN		
Checked	Scale	Date
R. Grava	As shown	Oct. 2020
Approved by		Drawing No.
Chartered Engineer		2020-000-H6
		Rev.
		0
		Drawing 6 in set of 10
		Drawing size A1



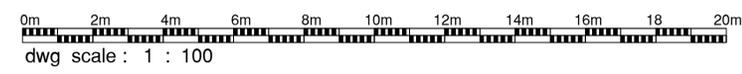
FORTH FLOOR PLAN
 Scale 1 in 100
 Scale 1 in 100 when printed on A1 sheet
FIFTH FLOOR PLAN SIMILAR



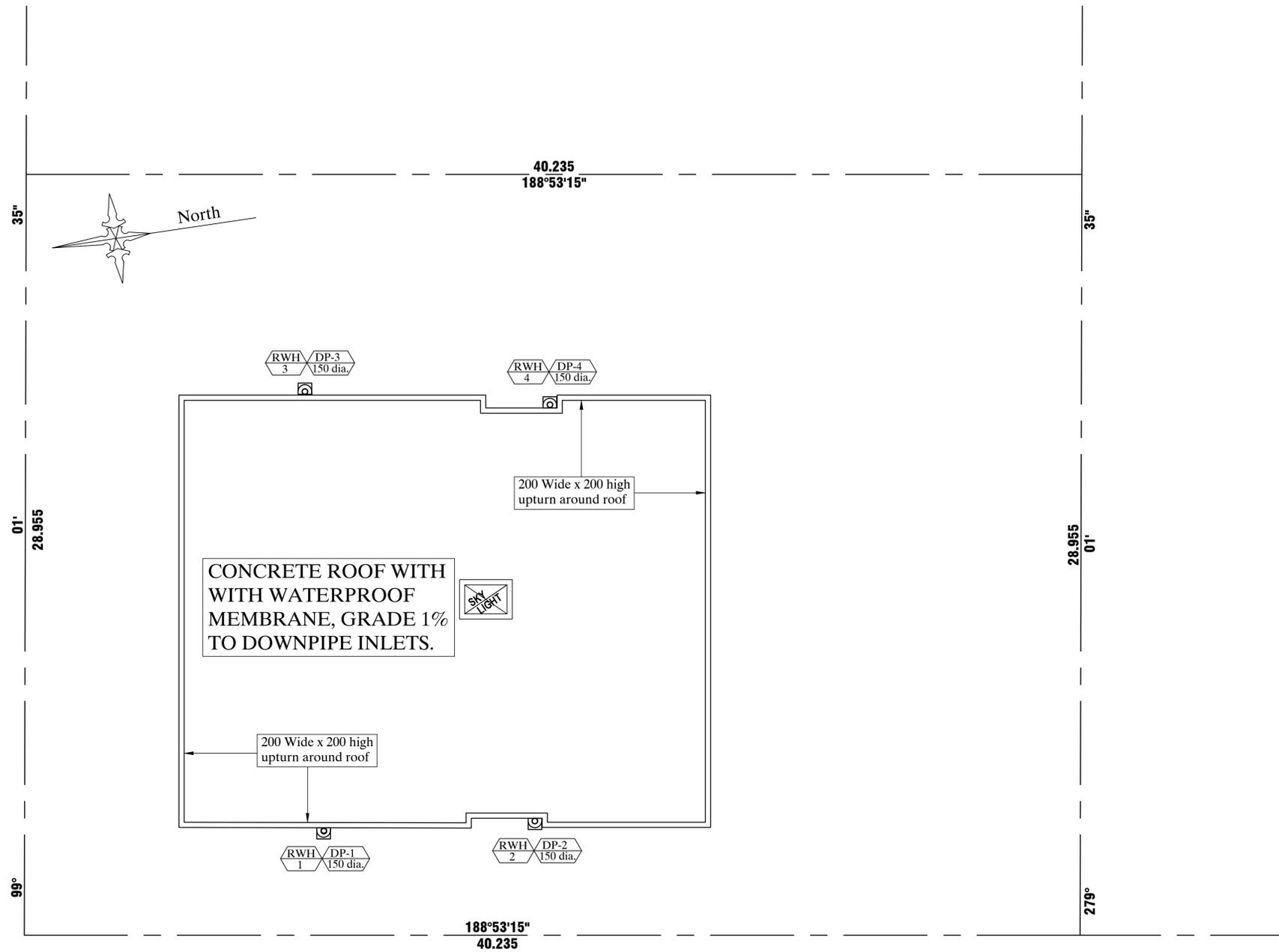
Revision	Details	Date		
Project				
Proposed Residential Flat Building At 53-55 Donnison Street West Gosford				
BURGESS, ARNOTT & GRAVA PTY. LTD. CONSULTING STRUCTURAL, CIVIL & HYDRAULIC ENGINEERS 61A THE CENTRE FORESTVILLE P.O. BOX 69 FORESTVILLE 2087 Ph. 9451 4411 Fax. 9975 2274 email rob@gravaconsulting.com.au				
Title				
STORMWATER DRAINAGE CONCEPT FORTH FLOOR PLAN FIFTH FLOOR PLAN SIMILAR				
Checked	Scale	Date	Drawing No.	Rev.
R. Grava	As shown	Oct. 2020	2020-000 -H7	0
Approved by			Drawing 7 in set of 10	
Chartered Engineer			Drawing size A1	



SIXTH FLOOR PLAN
 Scale 1 in 100
 Scale 1 in 100 when printed on A1 sheet



Revision	Details	Date
Project		
Proposed Residential Flat Building At 53-55 Donnison Street West Gosford		
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Title		
STORMWATER DRAINAGE CONCEPT SIXTH FLOOR PLAN		
Checked	Scale	Date
R. Grava	As shown	Oct. 2020
Approved by		Drawing No.
Chartered Engineer		2020-000-H8
		Rev.
		0
		Drawing 8 in set of 10
		Drawing size A1

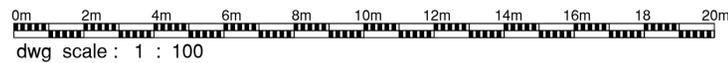


CONCRETE ROOF WITH
WITH WATERPROOF
MEMBRANE, GRADE 1%
TO DOWNPIPE INLETS.

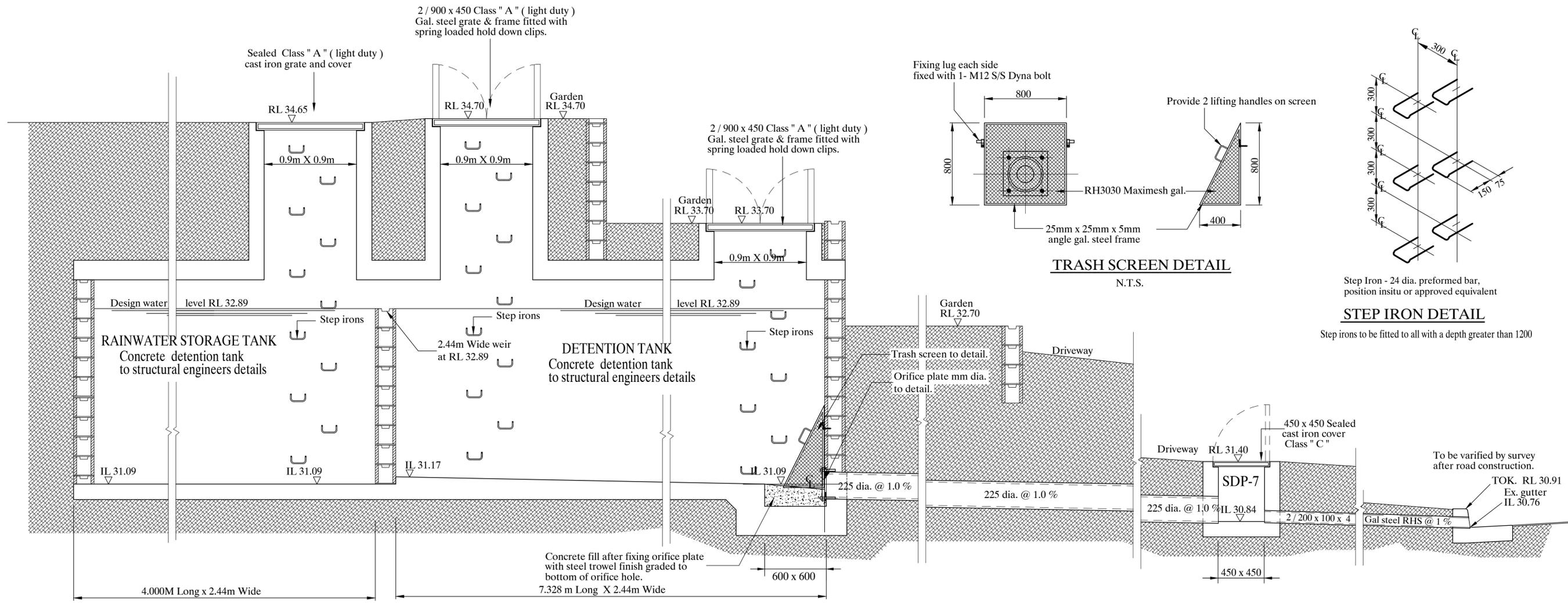


ROOF PLAN

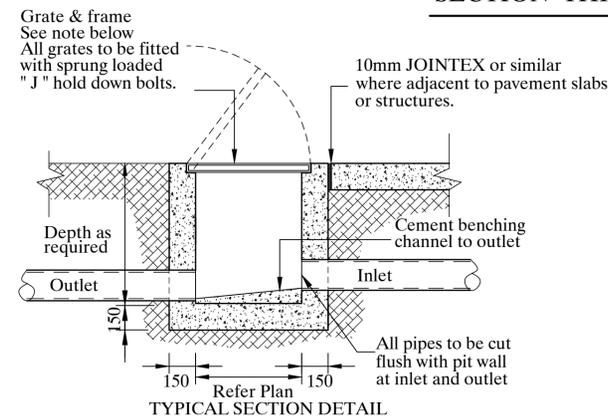
Scale 1 in 100
Scale 1 in 100 when printed on A1 sheet



Revision	Details	Date		
Project				
Proposed Residential Flat Building At 53-55 Donnison Street West Gosford				
BURGESS, ARNOTT & GRAVA PTY. LTD. CONSULTING STRUCTURAL, CIVIL & HYDRAULIC ENGINEERS 61A THE CENTRE FORESTVILLE P.O. BOX 69 FORESTVILLE 2087 Ph. 9451 4411 Fax. 9975 2274 email rob@gravaconsulting.com.au				
Title				
STORMWATER DRAINAGE CONCEPT ROOF PLAN				
Checked	Scale	Date	Drawing No.	Rev.
R. Grava	As shown	Oct. 2020	2020-000-H9	0
Approved by			Drawing 9 in set of 10	
Chartered Engineer			Drawing size A1	

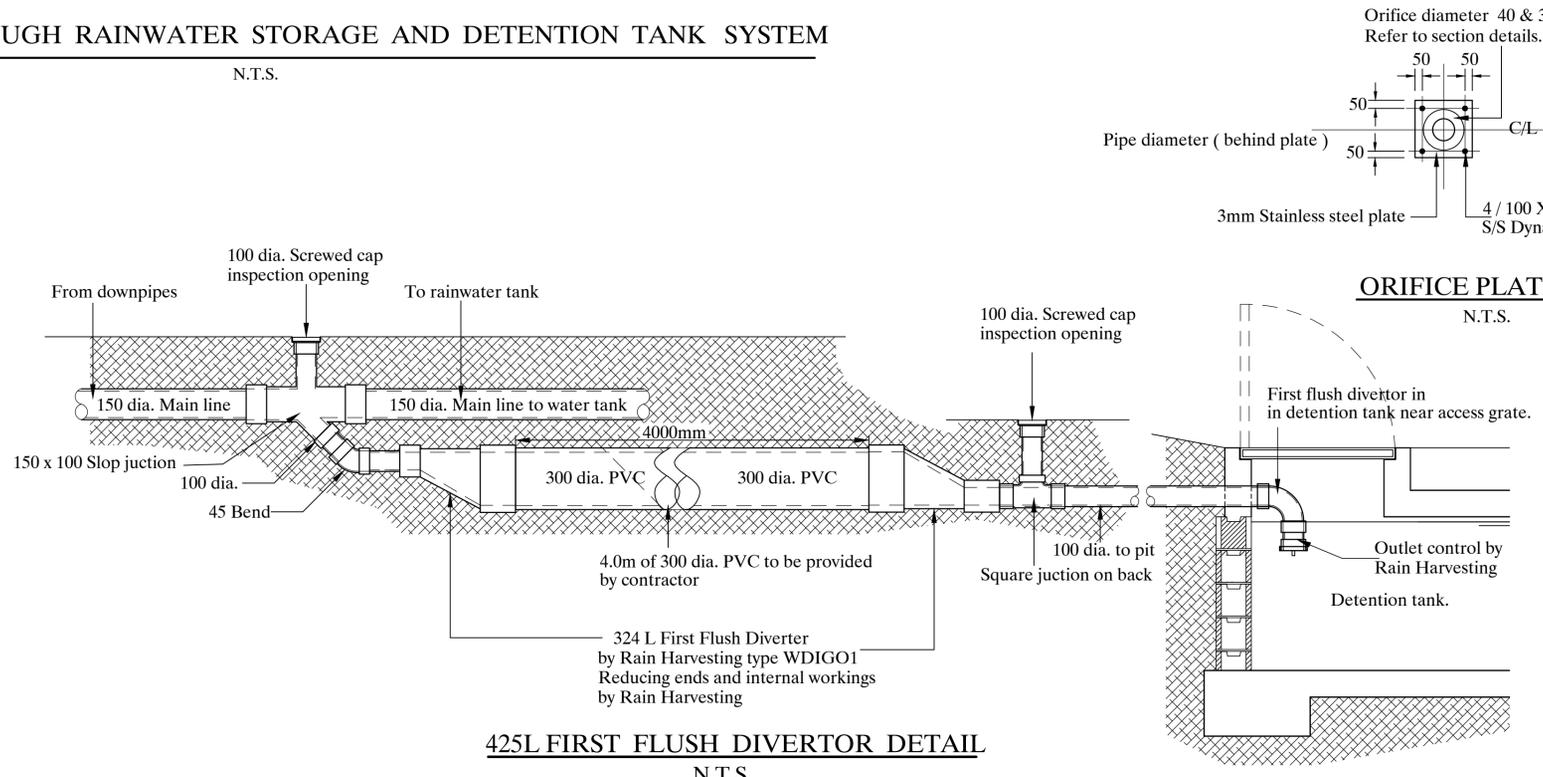


SECTION THROUGH RAINWATER STORAGE AND DETENTION TANK SYSTEM
N.T.S.

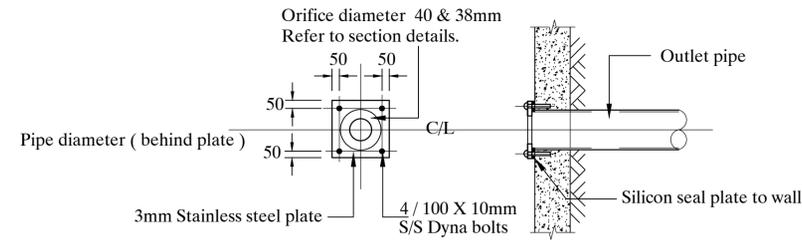


NOTE :
 All grates over 450sq. to be hinged galvanized steel with galvanized steel frames unless nominated on plan.
 Grates in gardens and landscape to be class "A"
 Grates in footpaths and light traffic areas to be class "B"
 Grates in roads, pavements and driveways to be class "C"
 All grates are to be held down with spring loaded "J" bolts.
 Sealed pits to be provided with gas tight cast iron covers and cast iron frames for the class loading shown above.
 All landscape inlet pits to 300 x 300sq. X 300 deep with cast aluminum grates. Pits are to be surrounded and supported with 100mm thick concrete.
 An alternative approved Pre-cast F.R.C. or Pre-cast Concrete pit may be used.
 Pits smaller 450 x 450sq. may be of U.P.V.C. provide they are not located in traffic areas.
 Pits 450 x 450 sq. and larger the plastic pit may only be used as a form for concrete and not as a finished pit
 Pits deeper than 1200 reinforce walls with N12 at 300 centers eachway all round.
 Provide step irons to pits deeper than 1200

TYPICAL PIT DETAIL U.O.N.
N.T.S.



425L FIRST FLUSH DIVERTOR DETAIL
N.T.S.



ORIFICE PLATE DETAIL
N.T.S.

Revision	Details	Date
0		

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Title
**STORMWATER DRAINAGE
 CONCEPT DETAILS**

Checked	Scale	Date	Drawing No.	Rev.
R. Grava	As shown	Oct. 2020	2020-000-H10	0

Approved by
 Drawing 10 in set of 10
 Drawing size A1