185 FIFTH AVENUE, AUSTRAL

PROPOSED MULTI-UNIT DEVELOPMENT

STORMWATER CONCEPT PLAN

LEGEND

- PROPOSED STORMWATER
- PIPE OVERCROSSING MINIMUM 150mm CLEARANCE
- SS — SS — SUBSOIL DRAINAGE
- EXISTING STORMWATER
- PG PLANTER GRATE
- RWO RAINWATER OUTLET
- SURFACE FLOW ARROWS
- RL 47.00 DESIGN SURFACE LEVEL
- NS 26.45 EXISTING SURFACE LEVEL
- IL 47.00 INVERT LEVEL OF PIPE JUNCTION
- FENCE WITH 50mm GAP BENEATH FOR OVERLAND FLOWS
- CLOSED STYLE FENCING
- MASONRY RETAINING WALL TO STRUCTURAL ENGINEER'S DETAILS
- PROPOSED OSD STORAGE
- AREA BYPASSING OSD
- PROPOSED WSUD / BIO-RETENTION AREA / POND
- BALCONY AREA
- Ø65 RISER WITH NON-RETURN VALVE

LOCALITY PLAN

N.T.S

DRAWING INDEX	
Drawing No.	DESCRIPTION
ACE170579.SW.DA - 000	COVER SHEET, NOTES & LEGEND
ACE170579.SW.DA - 101	STORMWATER CONCEPT PLAN BASEMENT LEVEL 2 SHEET 1 OF 5
ACE170579.SW.DA - 102	STORMWATER CONCEPT PLAN BASEMENT LEVEL 2 - TANK 1 SHEET 2 OF 5
ACE170579.SW.DA - 103	STORMWATER CONCEPT PLAN BASEMENT LEVEL 2 - TANK 2 SHEET 3 OF 5
ACE170579.SW.DA - 104	STORMWATER CONCEPT PLAN BASEMENT LEVEL 2 - TANK 3 SHEET 4 OF 5
ACE170579.SW.DA - 105	STORMWATER CONCEPT PLAN BASEMENT LEVEL 2 - TANK 4 SHEET 5 OF 5
ACE170579.SW.DA - 106	STORMWATER CONCEPT PLAN BASEMENT LEVEL 1
ACE170579.SW.DA - 107	STORMWATER CONCEPT PLAN GROUND LEVEL
ACE170579.SW.DA - 108	CATCHMENT PLAN
ACE170579.SW.DA - 109	OSD/WSUD DETAILS SHEET 1 OF 2
ACE170579.SW.DA - 110	OSD/WSUD DETAILS SHEET 2 OF 2
ACE170579.SW.DA - 111	MISCELLANEOUS DETAILS SHEET

CATCHMENT NOTE:

REFER TO SHEET 108 FOR MORE INFORMATION REGARDING OSD CATCHMENT AREAS.

PIPES NOTE:

Ø65 PVC @ MIN 1.0%
Ø90 PVC @ MIN 1.0%
Ø100 PVC @ MIN 1.0%
Ø150 PVC @ MIN 1.0%
Ø225 PVC @ MIN 0.5%
Ø300 PVC @ MIN 0.4%
UNLESS NOTED OTHERWISE

BUILDING NOTE:

1- ALL PIPES IN BALCONIES TO BE Ø65 uPVC CAST IN CONCRETE SLAB.
2- CONTRACTOR TO PROVIDE A BREAK / OPEN VOID IN RAIL / BALLUSTRADE FOR STORMWATER EMERGENCY OVERFLOW.

ROOF NOTE:

ALL ROOF DRAINAGE SYSTEM TO BE IN ACCORDANCE WITH BASIX REPORT & IS SUBJECT TO DETAILED DESIGN STAGE. ALL DOWNPIPES TO BE CONNECTED TO THE WSUD CHAMBER.

GENERAL NOTES

1. ALL THE CLEANING EYES (OR INSPECTION EYES) FOR THE UNDERGROUND PIPES HAVE TO BE TAKEN UP TO THE FINISHED GROUND LEVEL FOR EASY IDENTIFICATION AND MAINTENANCE PURPOSES
2. ALL LEVELS SHALL RELATE TO THE ESTABLISHED BENCH MARK.
3. THE BUILDER SHALL ENSURE THAT THE STORMWATER ENGINEERS DRAWINGS CORRESPOND TO THE ARCHITECTURAL, STRUCTURAL AND LANDSCAPING DRAWINGS. IF THERE EXISTS AND DISCREPANCIES BETWEEN THE DRAWINGS, THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS
4. ALL MULCHING TO BE USED WITHIN THE AREA DESIGNATED AS ONS-SITE DETENTION STORAGE SHALL BE OF A NON-FLOTABLE MATERIAL SUCH AS DECORATIVE RIVER GRAVEL. PINE BARK MULCHING SHALL NOT BE USED WITHIN THE DETENTION STORAGE AREA.
5. ALL RETAINING WALLS SHALL BE CONSTRUCTED COMPLETELY WITHIN THE PROPERTY BOUNDARY LIMITS TO DETAILS PREPARED BY THE STRUCTURAL ENGINEER. WALLS FORMING THE ON-SITE DETENTION SYSTEM SHALL BE OF MASONARY/BRICK CONSTRUCTION AND WATER TIGHT.
6. ALL SUB-SOIL DRAINAGE SHALL BE A MINIMUM OF 65MM DIA AND SHALL BE PROVIDED WITH A FILTER SOCK. THE SUBSOIL DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH DETAILS TO BE PROVIDED BY THE LANDSCAPE ARCHITECT.
7. PRIOR TO COMMENCING ANY WORKS, THE BUILDER SHALL ENSURE THAT THE INVERT LEVELS OF WHERE THE SITE STORMWATER SYSTEM CONNECTS INTO THE COUNCILS KERB/DRAINAGE SYSTEM MATCHED THE DESIGN LEVELS. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY.
8. ALL LINES ARE TO BE Ø90 uPVC 1.0% GRADE UNLESS NOTED OTHERWISE. CHARGED LINES TO BE SEWERGRADE & SEALED.
9. EXISTING SERVICES LOCATIONS SHOWN INDICATIVE ONLY.
10. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE & LEVEL ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS.
11. ALL PIPES TO HAVE MIN 150mm COVER IF LOCATED WITHIN PROPERTY.
12. ALL PITS IN DRIVEWAYS TO BE 450x450 CONCRETE AND ALL PITS IN LANDSCAPED AREAS TO BE 450x450PLASTIC.
13. PITS LESS THAN 450 DEEP MAY BE BRICK, PRECAST OR CONCRETE.
14. ALL BALCONIES AND ROOFS TO BE DRAINED AND TO HAVE SAFETY OVERFLOWS IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.
15. ALL EXTERNAL SLABS TO BE WATERPROOFED.
16. ALL GRATES TO HAVE CHILD PROOF LOCKS.
17. ALL DRAINAGE WORKS TO AVOID TREE ROOTS.
18. ALL DP'S TO HAVE LEAF GUARDS.
19. ALL EXISTING LEVELS TO BE CONFIRMED BY BUILDER PRIOR TO CONSTRUCTION.
20. ALL WORK WITHIN COUNCIL RESERVE TO BE INSPECTED BY COUNCIL PRIOR TO CONSTRUCTION.
21. COUNCIL'S ISSUED FOOTWAY DESIGN LEVELS TO BE INCORPORATED INTO THE FINISHED LEVELS ONCE ISSUED BY COUNCIL.
22. ALL WORK SHALL BE IN ACCORDANCE WITH B.C.A. AND A.S.3500.3.
23. REFER TO LANDSCAPE ARCHITECT'S DRAWINGS FOR LANDSCAPING.
24. ALL WALLS FORMING THE DETENTION BASINS SHALL BE CONSTRUCTED WHOLLY WITHIN THE PROPERTY BOUNDARIES OF THE SITE BEING DEVELOPED.
25. OSD WARNING SIGN AND SAFETY FENCING SHALL BE PROVIDED TO ABOVE GROUND OSD STORAGE AREA IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.
26. ENSURE THAT NON FLOATABLE MULCH IS USED IN DETENTION BASINS, ie, USE DECORATIVE ROCK MULCH OR EQUIVALENT.
27. THE OSD BASIN / TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

0 1cm at full size 10cm 20cm

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale

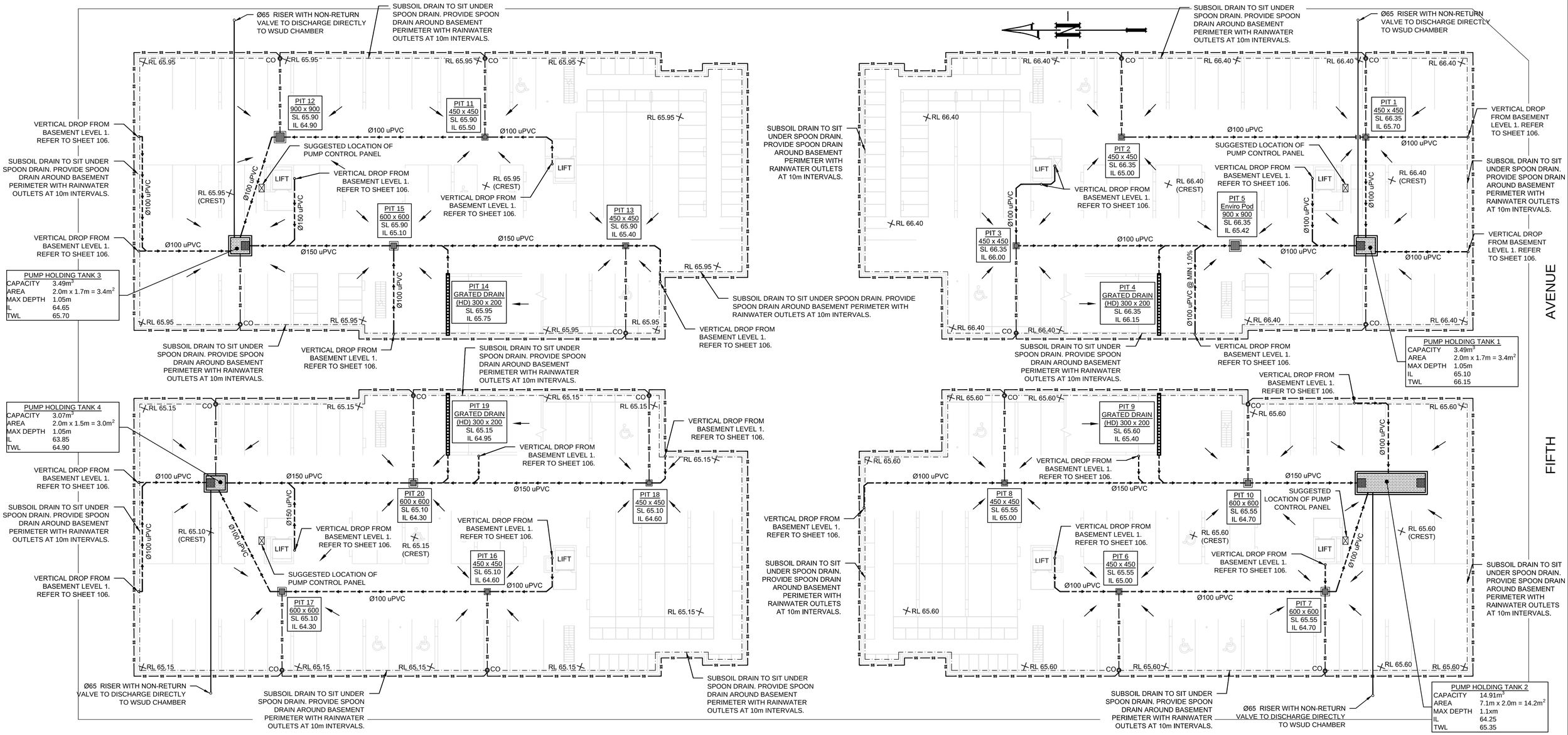
Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
COVER SHEET, NOTES & LEGEND

Scale	Project No.	Dwg. No.	Issue
A1 N.T.S.	ACE170579.SW.DA	000	A



LEGEND

- PROPOSED STORMWATER
- SURFACE FLOW ARROWS
- SS SS SUBSOIL DRAINAGE
- CLEANING EYE (OR INSPECTION EYE)
- PROPOSED STORAGE AREA
- × RL 27.56 FINISHED SURFACE LEVEL
- GRATED DRAIN
- FG FLOOR GRATE

STANDARD PUMP OUT DESIGN NOTES

THE PUMP OUT SYSTEM SHALL BE DESIGN TO BE OPERATED IN THE FOLLOWING MANNER:

1 - THE PUMP SHALL BE PROGRAMMED TO WORK ALTERNATELY TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.

2 - A FLOAT SHALL BE PROVIDED TO ENSURE OF THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS AT THE MINIMUM WATER LEVEL. THE SAME FLOAT SHALL BE SET TO TURN ONE OF THE PUMPS ON UPON THE WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL. THE PUMP SHALL OPERATE UNTIL THE TANK IS DRAINED TO THE MINIMUM WATER LEVEL.

3 - A SECOND FLOAT SHALL BE PROVIDE AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.

4 - AN ALARM SYSTEM SHALL BE PROVIDE WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT LEVEL THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.

5 - A CONFINED SPACE DANGER SIGN SHALL BE PROVIDED AT ALL ACCESS POINT TO THE PUMP-OUT STORAGE TANK IN ACCORDANCE WITH THE UPPER PARRAMATA RIVER CATCHMENT TRUST OSD HANDBOOK.

DANGER

WHEN EXCAVATING WITHIN ANY SITE, FOOTPATH AND ROADWAY, ALL SERVICES SHALL BE LOCATED PRIOR TO COMMENCEMENT OF THE EXCAVATION WORKS.

CONTACT "DIAL BEFORE YOU DIG" ON PHONE No. 1100 OR GO TO THE WEB SITE

"www.1100.com.au"

WARNING

PUMP OUT SYSTEM FAILURE IN BASEMENT WHEN LIGHT IS FLASHING AND SIREN SOUNDING

BASEMENT PUMP OUT FAILURE WARNING SIGN

SIGN SHALL BE PLACED IN A CLEAR AND VISIBLE LOCATION WHERE VEHICLES ENTER THE BASEMENT

COLOURS:
"WARNING" = RED
BORDER AND OTHER LETTERING = BLACK

DANGER

CONFINED SPACE
NO ENTRY WITHOUT CONFINED SPACE TRAINING

CONFINED SPACE DANGER SIGN

A) A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANK/S CONFINED SPACE.

B) MINIMUM DIMENSIONS OF THE SIGN - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS) -250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES)

C) THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINUM OR POLYPROPYLENE

D) SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN

COLOURS:
"DANGER" & BACKGROUND = WHITE
ELLIPTICAL AREA = RED
RECTANGLE CONTAINING ELLIPSE = BLACK
BORDER AND OTHER LETTERING = BLACK

PUMP HOLDING TANK NOTE:

THE PUMP HOLDING TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

1cm at full size (0, 10cm, 20cm)

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 4 8 12 m
SCALE 1:200 @ A1

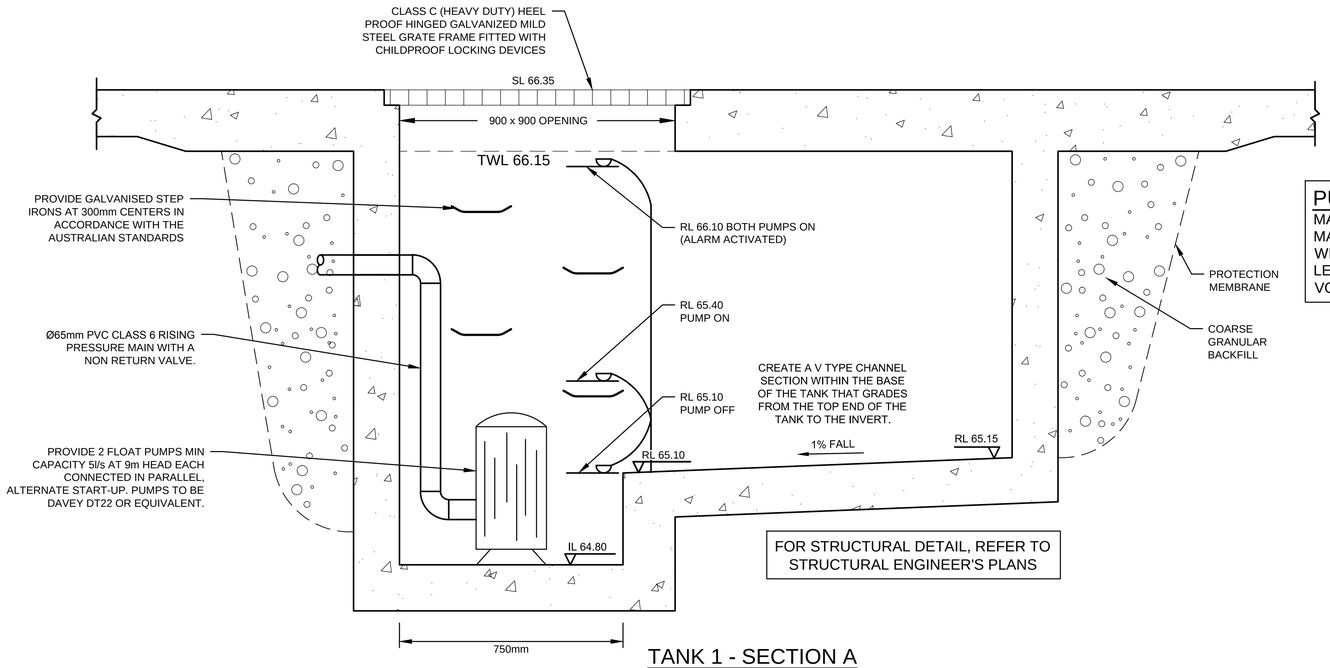
Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN
BASEMENT LEVEL 2
SHEET 1 OF 5

Scale	A1	Project No.	Dwg. No.	Issue
1:200		ACE170579.SW.DA	101	A



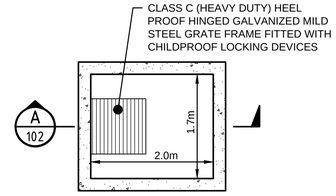
FOR STRUCTURAL DETAIL, REFER TO STRUCTURAL ENGINEER'S PLANS

TANK 1 - SECTION A
STORMWATER PUMP-OUT SUMP

SCALE 1:10

PUMP-OUT SUMP:

MAX TANK DEPTH (UPSTREAM)	1.0m
MAX TANK DEPTH (DOWNSTREAM)	1.05m
WIDTH	1.7m
LENGTH	2.0m
VOLUME PROVIDED	3.49m^3



NOTE:

1- FOR ALL THE STRUCTURAL DETAILS, REFER TO STRUCTURAL ENGINEER'S PLAN.
2- ALL THE AG LINES BEHIND BASEMENT WALLS TO BE CONNECTED TO PUMP-OUT SUMP.

TANK 1
PUMP-OUT SUMP DETAIL
PLAN VIEW

SCALE 1:50

BASEMENT PUMP OUT FAILURE WARNING SIGN

SIGN SHALL BE PLACED IN A CLEAR AND VISIBLE LOCATION WHERE VEHICLES ENTER THE BASEMENT

COLOURS:
"WARNING" = RED
BORDER AND OTHER LETTERING = BLACK

PUMP HOLDING TANK NOTE:

THE PUMP HOLDING TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

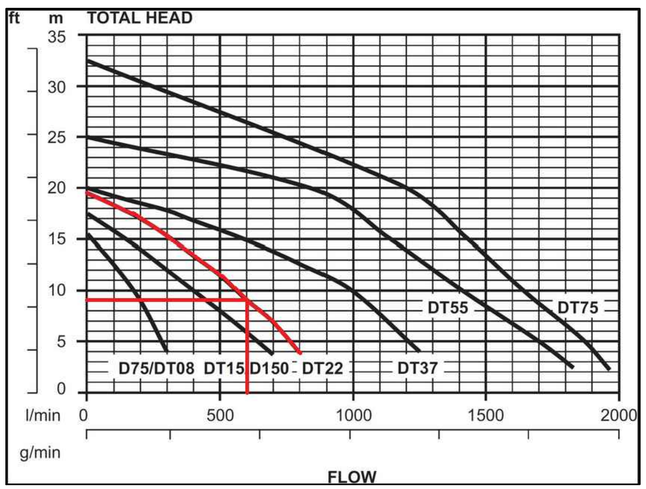
TANK 1
PUMP STORAGE VOLUME CALCULATION

- $I_{100,\ 90\ min}$ = 54.5 mm/hour
- PUMP STORAGE CATCHMENT AREA: A = 37.7 m^2 = 0.00377 ha
- Q = C x I x A / 360 WHERE C = 1.0 (REFER TO AS3500.3.5.4.6 (a))
  = 1.0 x 54.5 x 0.00377 / 360
  = 0.00057 m^3/s
  = 0.5707 L/s
- THEREFORE, THE PUMP HOLDING TANK VOLUME IS:
  V = 0.5707 x 1.5 x 3600
  = 3.08 m^3

STANDARD PUMP OUT DESIGN NOTES

THE PUMP OUT SYSTEM SHALL BE DESIGN TO BE OPERATED IN THE FOLLOWING MANNER:

1 - THE PUMP SHALL BE PROGRAMMED TO WORK ALTERNATELY TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.
2 - A FLOAT SHALL BE PROVIDED TO ENSURE OF THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS AT THE MINIMUM WATER LEVEL. THE SAME FLOAT SHALL BE SET TO TURN ONE OF THE PUMPS ON UPON THE WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL. THE PUMP SHALL OPERATE UNTIL THE TANK IS DRAINED TO THE MINIMUM WATER LEVEL.
3 - A SECOND FLOAT SHALL BE PROVIDE AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.
4 - AN ALARM SYSTEM SHALL BE PROVIDE WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT LEVEL THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.
5 - A CONFINED SPACE DANGER SIGN SHALL BE PROVIDED AT ALL ACCESS POINT TO THE PUMP-OUT STORAGE TANK IN ACCORDANCE WITH THE UPPER PARRAMATA RIVER CATCHMENT TRUST OSD HANDBOOK.



PUMP CALCULATIONS

Project Address:	Tank 1 - 185 Fifth Avenue, Austral

HL=(3.35x10e6xQ/(d^2.63xC))^1.852
HL(m/100m), Q(L/s(, d(mm)

h1=kv^2/2g
k(cum), v(m/s), g=9.8(m

H(total head)=Hf+h1+Elevation Head(static head)

v(m/s)= 0.00
d(mm)= 65
Bend Losses, Kb= 3.06
Valve Losses, Kv= 2.13
Entry/Exit Losses, Ke= 5.00
Cum Losses, K= 10.19

Elevation Head(m)= 7
Pipe Length(m)= 30

Hazen - Williams C= 145

Hazen-Williams Constant
125-140 Commercial steel pipe
135-140 Bitumen Lined Cast iron pipe
140-145 Copper Tube
145-150 PVC

Start Flow= 0
Increment= 1

Q(L/s)		0	1	2	3	4	5	6	7	8	9	10
HL(m/100m)		0.00	0.18	0.64	1.36	2.32	3.51	4.92	6.55	8.39	10.44	12.68
Hf(m)	HL x pipe Length/100	0.00	0.05	0.19	0.41	0.70	1.05	1.48	1.97	2.52	3.13	3.81
v(m/s)	Q(L/s) / area of pipe crossing section	0.00	0.30	0.60	0.90	1.21	1.51	1.81	2.11	2.41	2.71	3.01
h1(m)	k(cum) x v(m/s)^2/2xg	0.00	0.05	0.19	0.42	0.76	1.18	1.70	2.31	3.02	3.82	4.72
H(m)	=Hf+H1+Elevation Head	7.00	7.10	7.38	7.83	8.45	9.23	10.18	11.28	12.54	13.96	15.53

TANK 1
UNDERGROUND PUMP - OUT SUMP
STAGED STORAGE CALCULATIONS

DEPTH (mm)	AREA (m^2)	CUMULATIVE VOLUME (m^3)
0	3.4	0
100	3.4	0.255
200	3.4	0.595
300	3.4	0.935
400	3.4	1.275
500	3.4	1.615
600	3.4	1.955
700	3.4	2.295
800	3.4	2.635
900	3.4	2.975
1000	3.4	3.315
1050	3.4	3.485

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 200 400 600mm
SCALE 1:10 @ A1
0 1 2 3 m
SCALE 1:50 @ A1

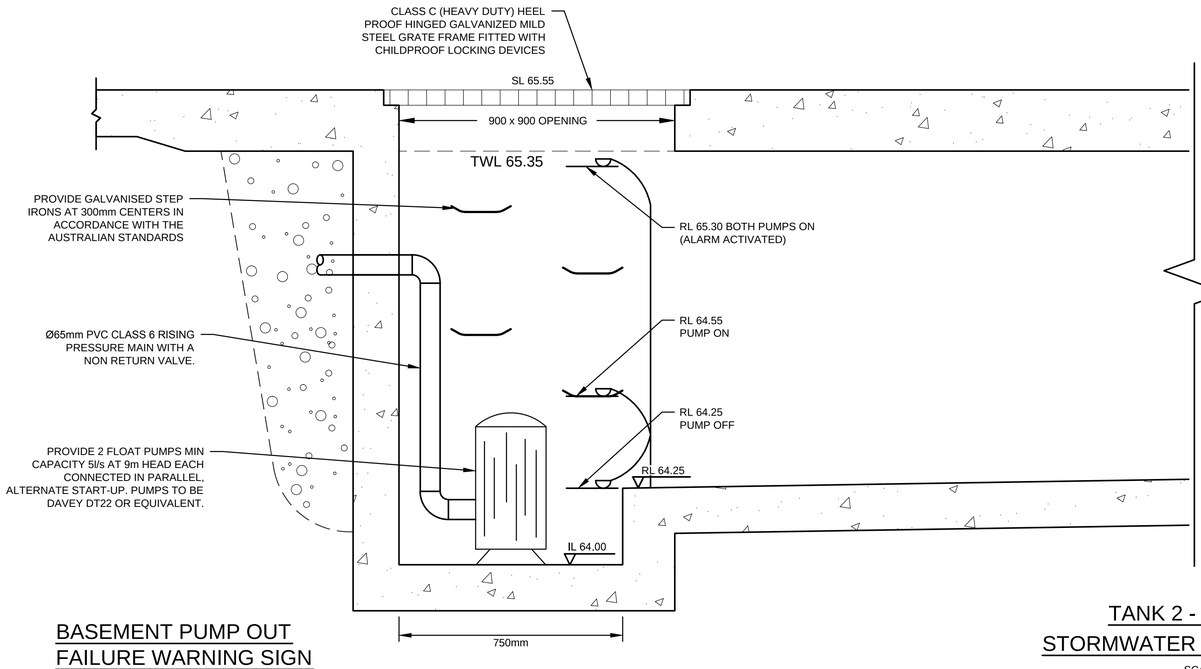
Certification By:
Anthony Hasham

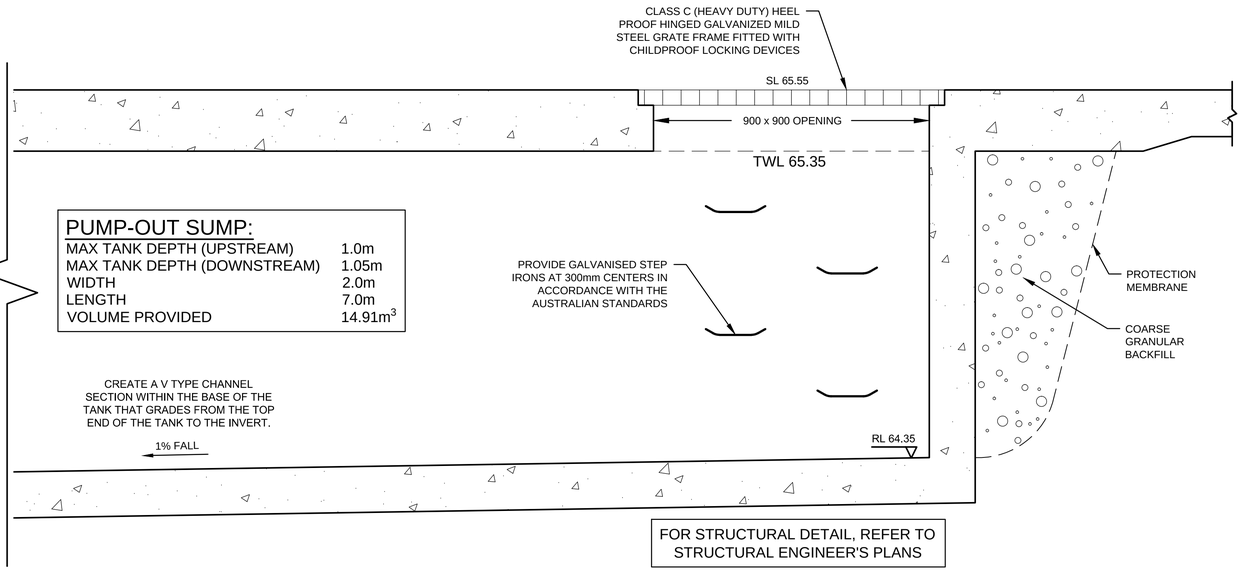
AUSTRALIAN CONSULTING ENGINEERS.
AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9765 1500 FX: (02) 9765 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN
BASEMENT LEVEL 2 - TANK 1
SHEET 2 OF 5

Scale	Project No.	Dwg. No.	Issue
As Shown A1	ACE170579.SW.DA	102	A





PUMP-OUT SUMP:	
MAX TANK DEPTH (UPSTREAM)	1.0m
MAX TANK DEPTH (DOWNSTREAM)	1.05m
WIDTH	2.0m
LENGTH	7.0m
VOLUME PROVIDED	14.91m^3

FOR STRUCTURAL DETAIL, REFER TO STRUCTURAL ENGINEER'S PLANS

TANK 2 - SECTION A
STORMWATER PUMP-OUT SUMP

SCALE 1:10

BASEMENT PUMP OUT FAILURE WARNING SIGN

SIGN SHALL BE PLACED IN A CLEAR AND VISIBLE LOCATION WHERE VEHICLES ENTER THE BASEMENT

COLOURS:
"WARNING" = RED
BORDER AND OTHER LETTERING = BLACK

TANK 2 PUMP STORAGE VOLUME CALCULATION

- $I_{100,\ 90\ min}$ = 54.5 mm/hour
- PUMP STORAGE CATCHMENT AREA: A = 160.7 m^2 = 0.01607 ha
- Q = C x I x A / 360 WHERE C = 1.0 (REFER TO AS3500.3.5.4.6 (a))
  = 1.0 x 54.5 x 0.01607 / 360
  = 0.00243 m^3/s
  = 2.432 L/s
- THEREFORE, THE PUMP HOLDING TANK VOLUME IS:
  V = 2.432 x 1.5 x 3600
  = 13.14 m^3

PUMP HOLDING TANK NOTE:

THE PUMP HOLDING TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

STANDARD PUMP OUT DESIGN NOTES

THE PUMP OUT SYSTEM SHALL BE DESIGN TO BE OPERATED IN THE FOLLOWING MANNER:

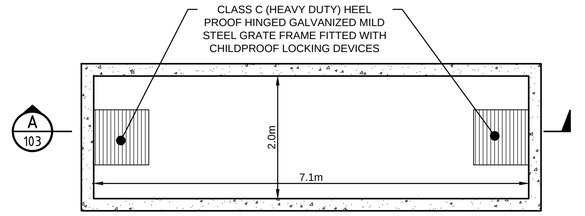
1 - THE PUMP SHALL BE PROGRAMMED TO WORK ALTERNATELY TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.

2 - A FLOAT SHALL BE PROVIDED TO ENSURE OF THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS AT THE MINIMUM WATER LEVEL. THE SAME FLOAT SHALL BE SET TO TURN ONE OF THE PUMPS ON UPON THE WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL. THE PUMP SHALL OPERATE UNTIL THE TANK IS DRAINED TO THE MINIMUM WATER LEVEL.

3 - A SECOND FLOAT SHALL BE PROVIDE AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.

4 - AN ALARM SYSTEM SHALL BE PROVIDE WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT LEVEL THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.

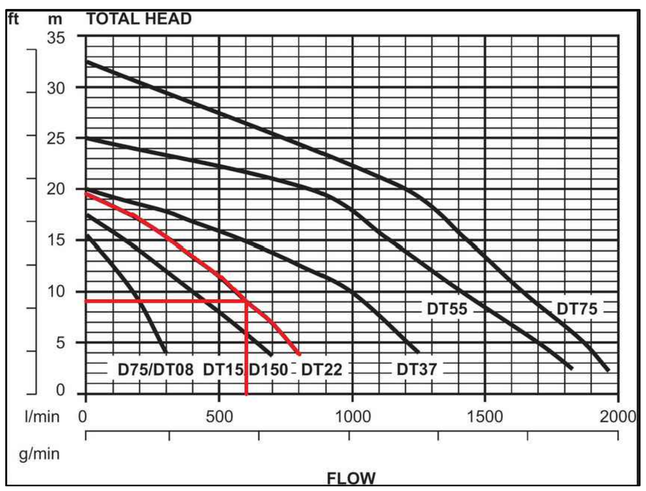
5 - A CONFINED SPACE DANGER SIGN SHALL BE PROVIDED AT ALL ACCESS POINT TO THE PUMP-OUT STORAGE TANK IN ACCORDANCE WITH THE UPPER PARRAMATA RIVER CATCHMENT TRUST OSD HANDBOOK.



NOTE:
1- FOR ALL THE STRUCTURAL DETAILS, REFER TO STRUCTURAL ENGINEER'S PLAN.
2- ALL THE AG LINES BEHIND BASEMENT WALLS TO BE CONNECTED TO PUMP-OUT SUMP.

TANK 2 PUMP-OUT SUMP DETAIL PLAN VIEW

SCALE 1:50



PUMP CALCULATIONS

Project Address: Tank 2 - 185 Fifth Avenue, Austral

HL=(3.35x10e6xQ/(d^2.63xC))^1.852
HL(m/100m), Q(L/s(, d(mm)

h1=kv^2/2g
k(cum), v(m/s), g=9.8(m

H(total head)=Hf+h1+Elevation Head(static head)

v(m/s)= 0.00
d(mm)= 65
Bend Losses, Kb= 3.06
Valve Losses, Kv= 2.13
Entry/Exit Losses, Ke= 5.00
Cum Losses, K= 10.19

Elevation Head(m)= 5
Pipe Length(m)= 26

Hazen - Williams C= 145

Hazen-Williams Constant
125-140 Commercial steel pipe
135-140 Bitumen Lined Cast iron pipe
140-145 Copper Tube
145-150 PVC

Start Flow= 0
Increment= 1

Q(L/s)		0	1	2	3	4	5	6	7	8	9	10
HL(m/100m)		0.00	0.18	0.64	1.36	2.32	3.51	4.92	6.55	8.39	10.44	12.68
Hf(m)	HL x pipe Length/100	0.00	0.05	0.17	0.35	0.60	0.91	1.28	1.70	2.18	2.71	3.30
v(m/s)	Q(L/s) / area of pipe crossing section	0.00	0.30	0.60	0.90	1.21	1.51	1.81	2.11	2.41	2.71	3.01
h1(m)	k(cum) x v(m/s)^2/2xg	0.00	0.05	0.19	0.42	0.76	1.18	1.70	2.31	3.02	3.82	4.72
H(m)	=Hf+H1+Elevation Head	5.00	5.09	5.36	5.78	6.36	7.09	7.98	9.02	10.20	11.54	13.02

TANK 2 UNDERGROUND PUMP - OUT SUMP STAGED STORAGE CALCULATIONS

DEPTH (mm)	AREA (m^2)	CUMULATIVE VOLUME (m^3)
0	14.2	0
100	14.2	0.71
200	14.2	2.13
300	14.2	3.55
400	14.2	4.97
500	14.2	6.39
600	14.2	7.81
700	14.2	9.23
800	14.2	10.65
900	14.2	12.07
1000	14.2	13.49
1100	14.2	14.91

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 200 400 600mm
SCALE 1:10 @ A1
0 1 2 3 m
SCALE 1:50 @ A1

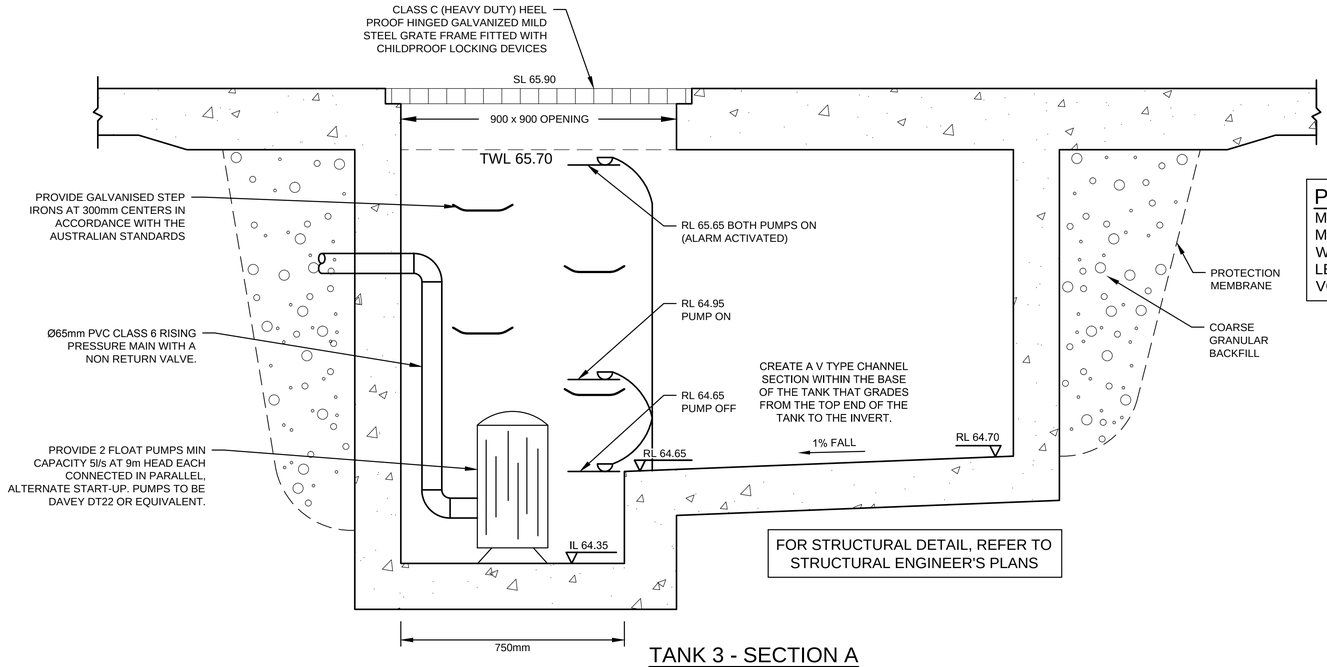
Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN
BASEMENT LEVEL 2 - TANK 2
SHEET 3 OF 5

Scale	Project No.	Dwg. No.	Issue
As Shown A1	ACE170579.SW.DA	103	A



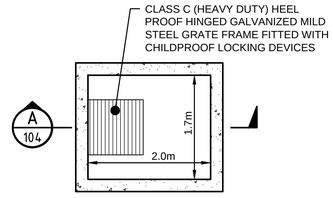
FOR STRUCTURAL DETAIL, REFER TO STRUCTURAL ENGINEER'S PLANS

TANK 3 - SECTION A
STORMWATER PUMP-OUT SUMP

SCALE 1:10

PUMP-OUT SUMP:

MAX TANK DEPTH (UPSTREAM)	1.0m
MAX TANK DEPTH (DOWNSTREAM)	1.05m
WIDTH	1.7m
LENGTH	2.0m
VOLUME PROVIDED	3.49m^3



NOTE:

1- FOR ALL THE STRUCTURAL DETAILS, REFER TO STRUCTURAL ENGINEER'S PLAN.
2- ALL THE AG LINES BEHIND BASEMENT WALLS TO BE CONNECTED TO PUMP-OUT SUMP.

TANK 3
PUMP-OUT SUMP DETAIL
PLAN VIEW

SCALE 1:50

PUMP HOLDING TANK NOTE:

THE PUMP HOLDING TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

TANK 3
PUMP STORAGE VOLUME CALCULATION

- $I_{100,\ 90\ min}$ = 54.5 mm/hour
- PUMP STORAGE CATCHMENT AREA: A = 37.7 m^2 = 0.00377 ha
- Q = C x I x A / 360 WHERE C = 1.0 (REFER TO AS3500.3.5.4.6 (a))
  = 1.0 x 54.5 x 0.00377 / 360
  = 0.00057 m^3/s
  = 0.5707 L/s
- THEREFORE, THE PUMP HOLDING TANK VOLUME IS:
  V = 0.5707 x 1.5 x 3600
  = 3.08 m^3

STANDARD PUMP OUT DESIGN NOTES

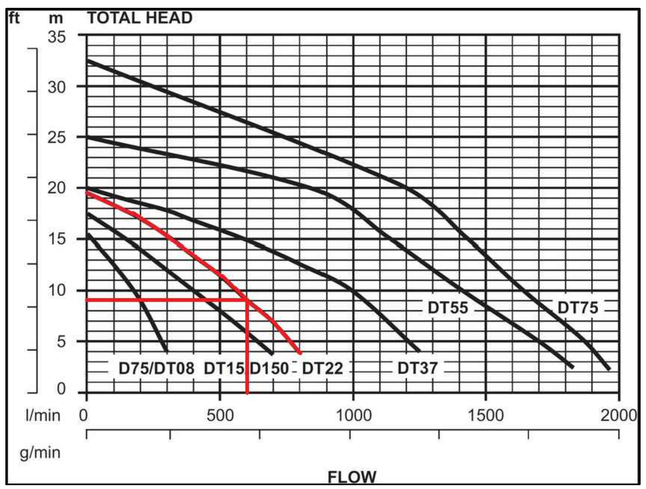
THE PUMP OUT SYSTEM SHALL BE DESIGN TO BE OPERATED IN THE FOLLOWING MANNER:

1 - THE PUMP SHALL BE PROGRAMMED TO WORK ALTERNATELY TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.
2 - A FLOAT SHALL BE PROVIDED TO ENSURE OF THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS AT THE MINIMUM WATER LEVEL. THE SAME FLOAT SHALL BE SET TO TURN ONE OF THE PUMPS ON UPON THE WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL. THE PUMP SHALL OPERATE UNTIL THE TANK IS DRAINED TO THE MINIMUM WATER LEVEL.
3 - A SECOND FLOAT SHALL BE PROVIDE AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.
4 - AN ALARM SYSTEM SHALL BE PROVIDE WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT LEVEL THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.
5 - A CONFINED SPACE DANGER SIGN SHALL BE PROVIDED AT ALL ACCESS POINT TO THE PUMP-OUT STORAGE TANK IN ACCORDANCE WITH THE UPPER PARRAMATA RIVER CATCHMENT TRUST OSD HANDBOOK.

BASEMENT PUMP OUT FAILURE WARNING SIGN

SIGN SHALL BE PLACED IN A CLEAR AND VISIBLE LOCATION WHERE VEHICLES ENTER THE BASEMENT

COLOURS:
"WARNING" = RED
BORDER AND OTHER LETTERING = BLACK



PUMP CALCULATIONS

Project Address:	Tank 3 - 185 Fifth Avenue, Austral

HL=(3.35x10e6xQ/(d^2.63xC))^1.852
HL(m/100m), Q(L/s(, d(mm)

h1=kv^2/2g
k(cum), v(m/s), g=9.8(m

H(total head)=Hf+h1+Elevation Head(static head)

v(m/s)= 0.00
d(mm)= 65
Bend Losses, Kb= 3.06
Valve Losses, Kv= 2.13
Entry/Exit Losses, Ke= 5.00
Cum Losses, K= 10.19

Elevation Head(m)= 7
Pipe Length(m)= 30

Hazen - Williams C= 145

Hazen-Williams Constant
125-140 Commercial steel pipe
135-140 Bitumen Lined Cast iron pipe
140-145 Copper Tube
145-150 PVC

Start Flow= 0
Increment= 1

Q(L/s)		0	1	2	3	4	5	6	7	8	9	10
HL(m/100m)		0.00	0.18	0.64	1.36	2.32	3.51	4.92	6.55	8.39	10.44	12.68
Hf(m)	HL x pipe Length/100	0.00	0.05	0.19	0.41	0.70	1.05	1.48	1.97	2.52	3.13	3.81
v(m/s)	Q(L/s) / area of pipe crossing section	0.00	0.30	0.60	0.90	1.21	1.51	1.81	2.11	2.41	2.71	3.01
h1(m)	k(cum) x v(m/s)^2/2xg	0.00	0.05	0.19	0.42	0.76	1.18	1.70	2.31	3.02	3.82	4.72
H(m)	=Hf+H1+Elevation Head	7.00	7.10	7.38	7.83	8.45	9.23	10.18	11.28	12.54	13.96	15.53

TANK 3
UNDERGROUND PUMP - OUT SUMP
STAGED STORAGE CALCULATIONS

DEPTH (mm)	AREA (m²)	CUMULATIVE VOLUME (m³)
0	3.4	0
100	3.4	0.255
200	3.4	0.595
300	3.4	0.935
400	3.4	1.275
500	3.4	1.615
600	3.4	1.955
700	3.4	2.295
800	3.4	2.635
900	3.4	2.975
1000	3.4	3.315
1050	3.4	3.485

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
SCALE 1:10 @ A1
SCALE 1:50 @ A1

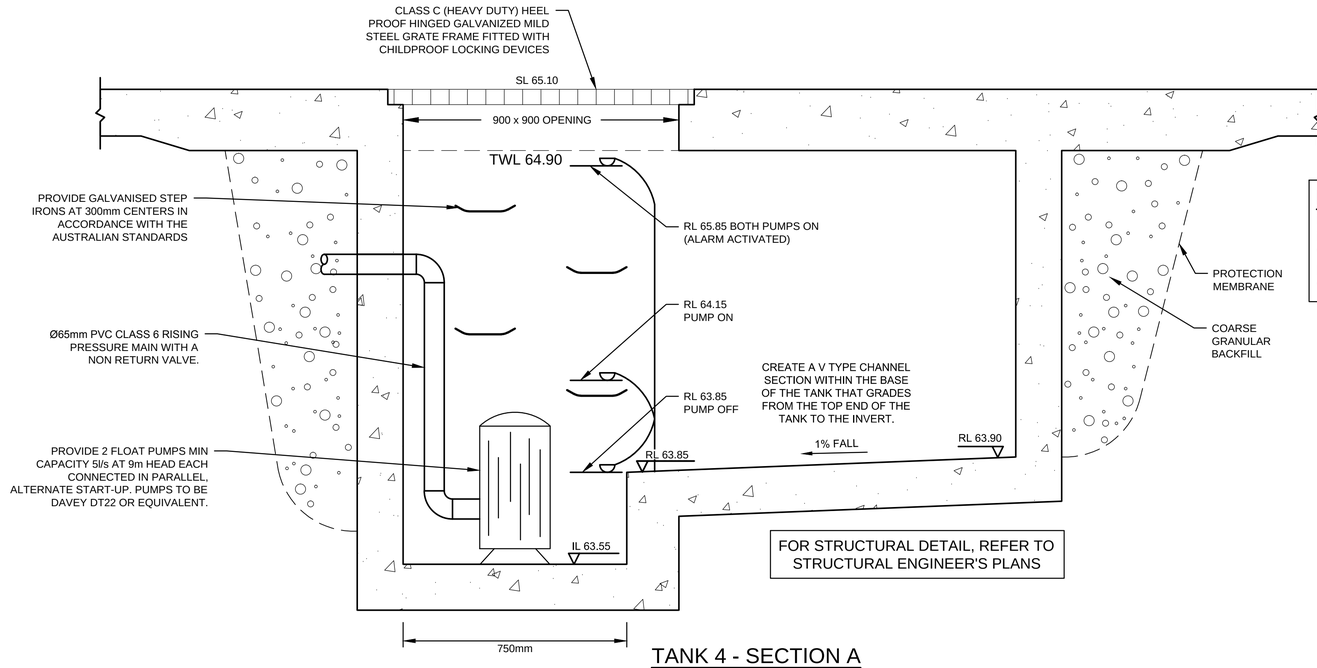
Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN
BASEMENT LEVEL - TANK 3
SHEET 4 OF 5

Scale	Project No.	Dwg. No.	Issue
As Shown A1	ACE170579.SW.DA	104	A

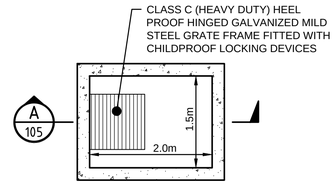


TANK 4 - SECTION A
STORMWATER PUMP-OUT SUMP

SCALE 1:10

PUMP-OUT SUMP:

MAX TANK DEPTH (UPSTREAM)	1.0m
MAX TANK DEPTH (DOWNSTREAM)	1.05m
WIDTH	1.5m
LENGTH	2.0m
VOLUME PROVIDED	3.07m^3



NOTE:

1- FOR ALL THE STRUCTURAL DETAILS, REFER TO STRUCTURAL ENGINEER'S PLAN.
2- ALL THE AG LINES BEHIND BASEMENT WALLS TO BE CONNECTED TO PUMP-OUT SUMP.

TANK 4
PUMP-OUT SUMP DETAIL
PLAN VIEW

SCALE 1:50

PUMP HOLDING TANK NOTE:

THE PUMP HOLDING TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

TANK 4
PUMP STORAGE VOLUME CALCULATION

- $I_{100,90\ min}$ = 54.5 mm/hour
- PUMP STORAGE CATCHMENT AREA: A = 37.7 m^2 = 0.00377 ha
- Q = C x I x A / 360 WHERE C = 1.0 (REFER TO AS3500.3.5.4.6 (a))
  = 1.0 x 54.5 x 0.00377 / 360
  = 0.00057 m^3/s
  = 0.5707 L/s
- THEREFORE, THE PUMP HOLDING TANK VOLUME IS:
  V = 0.5707 x 1.5 x 3600
  = 3.08 m^3

STANDARD PUMP OUT DESIGN NOTES

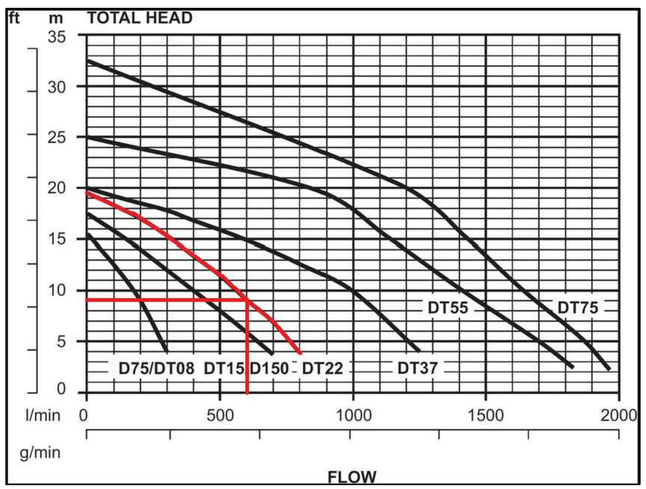
THE PUMP OUT SYSTEM SHALL BE DESIGN TO TO BE OPERATED IN THE FOLLOWING MANNER:

1 - THE PUMP SHALL BE PROGRAMMED TO WORK ALTERNATELY TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.
2 - A FLOAT SHALL BE PROVIDED TO ENSURE OF THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS AT THE MINIMUM WATER LEVEL. THE SAME FLOAT SHALL BE SET TO TURN ONE OF THE PUMPS ON UPON THE WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL. THE PUMP SHALL OPERATE UNTIL THE TANK IS DRAINED TO THE MINIMUM WATER LEVEL.
3 - A SECOND FLOAT SHALL BE PROVIDE AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.
4 - AN ALARM SYSTEM SHALL BE PROVIDE WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT LEVEL THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.
5 - A CONFINED SPACE DANGER SIGN SHALL BE PROVIDED AT ALL ACCESS POINT TO THE PUMP-OUT STORAGE TANK IN ACCORDANCE WITH THE UPPER PARRAMATA RIVER CATCHMENT TRUST OSD HANDBOOK.

BASEMENT PUMP OUT FAILURE WARNING SIGN

SIGN SHALL BE PLACED IN A CLEAR AND VISIBLE LOCATION WHERE VEHICLES ENTER THE BASEMENT

COLOURS:
"WARNING" = RED
BORDER AND OTHER LETTERING = BLACK



PUMP CALCULATIONS

Project Address:	Tank 4 - 185 Fifth Avenue, Austral

HL=(3.35x10e6xQ/(d^2.63xC))^1.852	h1=kv^2/2g
HL(m/100m), Q(L/s(, d(mm)	k(cum), v(m/s), g=9.8(m

H(total head)=Hf+h1+Elevation Head(static head)

	v(m/s)=	0.00	Elevation Head(m)= 6
d(mm)=	65	Bend Losses, Kb=	3.06
		Valve Losses, Kv=	2.13
		Entry/Exit Losses, Ke=	5.00
		Cum Losses, K=	10.19

Pipe Length(m)= 27

Start Flow=	0
Increment=	1

Hazen - Williams C= 145	Hazen-Williams Constant
	125-140 Commercial steel pipe
	135-140 Bitumen Lined Cast iron pipe
	140-145 Copper Tube
	145-150 PVC

Q(L/s)		0	1	2	3	4	5	6	7	8	9	10
HL(m/100m)		0.00	0.18	0.64	1.36	2.32	3.51	4.92	6.55	8.39	10.44	12.68
Hf(m)	HL x pipe Length/100	0.00	0.05	0.17	0.37	0.63	0.95	1.33	1.77	2.27	2.82	3.42
v(m/s)	Q(L/s) / area of pipe crossing section	0.00	0.30	0.60	0.90	1.21	1.51	1.81	2.11	2.41	2.71	3.01
h1(m)	k(cum) x v(m/s)^2/2xg	0.00	0.05	0.19	0.42	0.76	1.18	1.70	2.31	3.02	3.82	4.72
H(m)	=Hf+H1+Elevation Head	6.00	6.10	6.36	6.79	7.38	8.13	9.03	10.08	11.29	12.64	14.15

TANK 4
UNDERGROUND PUMP - OUT SUMP
STAGED STORAGE CALCULATIONS

DEPTH (mm)	AREA (m^2)	CUMULATIVE VOLUME (m^3)
0	3.0	0
100	3.0	0.225
200	3.0	0.525
300	3.0	0.825
400	3.0	1.125
500	3.0	1.425
600	3.0	1.725
700	3.0	2.025
800	3.0	2.325
900	3.0	2.625
1000	3.0	2.925
1050	3.0	3.075

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

1cm at full size

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 200 400 600mm
SCALE 1:10 @ A1
0 1 2 3 m
SCALE 1:50 @ A1

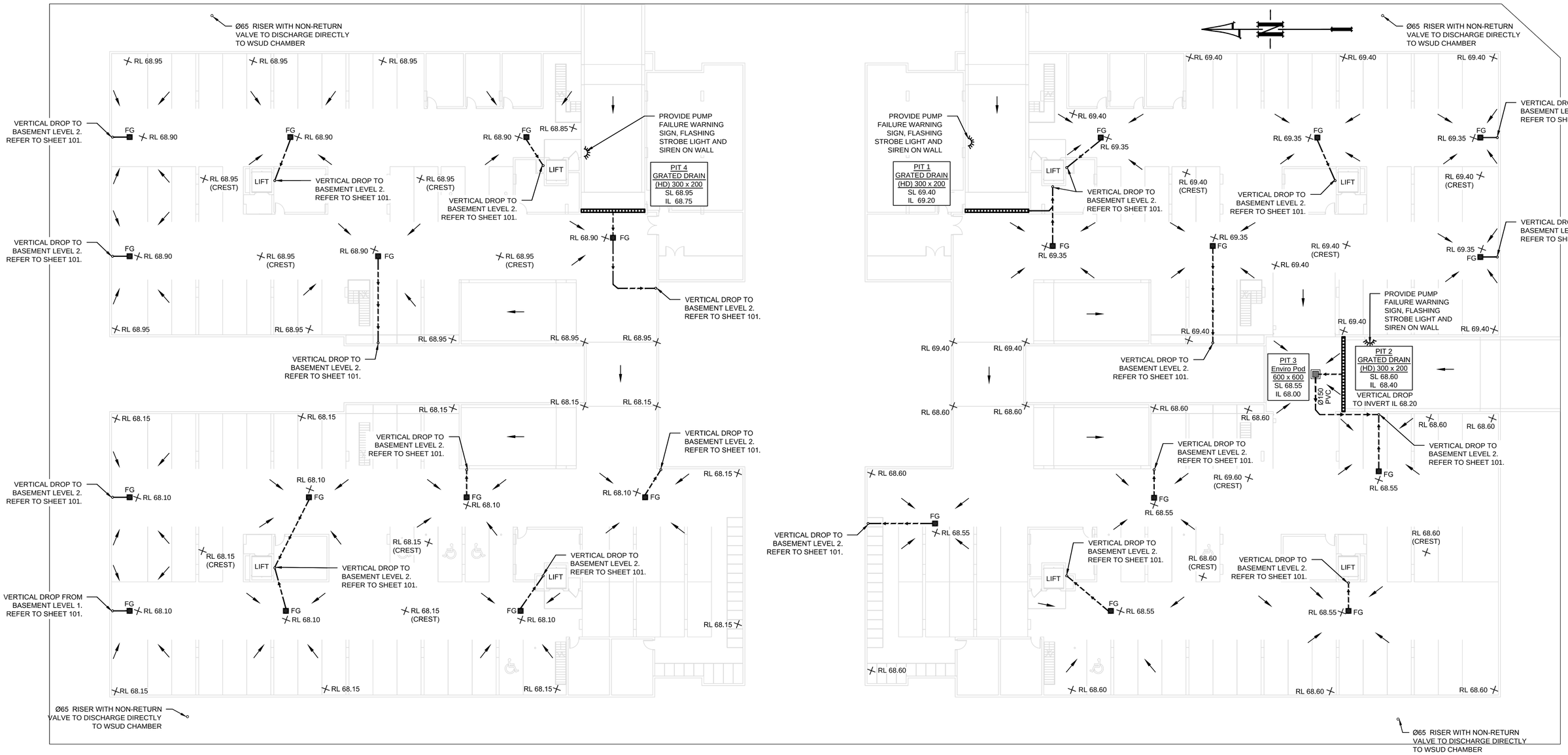
Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-14 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN
BASEMENT LEVEL - TANK 4
SHEET 5 OF 5

Scale	Project No.	Dwg. No.	Issue
A1 As Shown	ACE170579.SW.DA	105	A



LEGEND

- PROPOSED STORMWATER
- SURFACE FLOW ARROWS
- SS SS SUBSOIL DRAINAGE
- CLEANING EYE (OR INSPECTION EYE)
- PROPOSED STORAGE AREA
- × RL 27.56 FINISHED SURFACE LEVEL
- GRATED DRAIN
- FG FLOOR GRATE

STANDARD PUMP OUT DESIGN NOTES

THE PUMP OUT SYSTEM SHALL BE DESIGN TO BE OPERATED IN THE FOLLOWING MANNER:

1 - THE PUMP SHALL BE PROGRAMMED TO WORK ALTERNATELY TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.

2 - A FLOAT SHALL BE PROVIDED TO ENSURE OF THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS AT THE MINIMUM WATER LEVEL. THE SAME FLOAT SHALL BE SET TO TURN ONE OF THE PUMPS ON UPON THE WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL. THE PUMP SHALL OPERATE UNTIL THE TANK IS DRAINED TO THE MINIMUM WATER LEVEL.

3 - A SECOND FLOAT SHALL BE PROVIDE AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.

4 - AN ALARM SYSTEM SHALL BE PROVIDE WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT LEVEL THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.

5 - A CONFINED SPACE DANGER SIGN SHALL BE PROVIDED AT ALL ACCESS POINT TO THE PUMP-OUT STORAGE TANK IN ACCORDANCE WITH THE UPPER PARRAMATA RIVER CATCHMENT TRUST OSD HANDBOOK.

DANGER

WHEN EXCAVATING WITHIN ANY SITE, FOOTPATH AND ROADWAY, ALL SERVICES SHALL BE LOCATED PRIOR TO COMMENCEMENT OF THE EXCAVATION WORKS.

CONTACT "DIAL BEFORE YOU DIG" ON PHONE No. 1100 OR GO TO THE WEB SITE

"www.1100.com.au"

WARNING

PUMP OUT SYSTEM FAILURE IN BASEMENT WHEN LIGHT IS FLASHING AND SIREN SOUNDING

BASEMENT PUMP OUT FAILURE WARNING SIGN

SIGN SHALL BE PLACED IN A CLEAR AND VISIBLE LOCATION WHERE VEHICLES ENTER THE BASEMENT

COLOURS:
"WARNING" = RED
BORDER AND OTHER LETTERING = BLACK

DANGER

CONFINED SPACE
NO ENTRY WITHOUT CONFINED SPACE TRAINING

CONFINED SPACE DANGER SIGN

A) A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANK/S CONFINED SPACE.

B) MINIMUM DIMENSIONS OF THE SIGN - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS) -250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES)

C) THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINUM OR POLYPROPYLENE

D) SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN

COLOURS:
"DANGER" & BACKGROUND = WHITE
ELLIPTICAL AREA = RED
RECTANGLE CONTAINING ELLIPSE = BLACK
BORDER AND OTHER LETTERING = BLACK

PUMP HOLDING TANK NOTE:

THE PUMP HOLDING TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

1:1 0 1cm at full size 10cm 20cm

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 4 8 12 m
SCALE 1:200 @ A1

Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN
BASEMENT LEVEL 1

Scale	Project No.	Dwg. No.	Issue
1:200 A1	ACE170579.SW.DA	106	A

ROAD 1

PROPOSED DRIVEWAY CROSSOVER SIZE AND LAYOUT TO COMPLY WITH COUNCIL VEHICULAR CROSSING POLICY

DRIVEWAY CATCHMENT TO BE COLLECTED BY THE BASEMENT DRAINAGE SYSTEM AND PUMPED OUT. AREA = 37.7m²

PROPOSED DRIVEWAY CROSSOVER SIZE AND LAYOUT TO COMPLY WITH COUNCIL VEHICULAR CROSSING POLICY

PROPOSED DRIVEWAY CROSSOVER SIZE AND LAYOUT TO COMPLY WITH COUNCIL VEHICULAR CROSSING POLICY

CONNECT TO PROPOSED GULLY PIT TO COUNCIL REQUIREMENTS.

6 CARTRIDGE (690mm) MANHOLE STORMFILTER SYSTEM. REFER TO SHEET 109 & 111 FOR MORE DETAILS.

Ø375 RCP @ 1.0%

PIT 1 450 x 450 SL 72.10 IL 71.66

PIT 2 450 x 450 SL 72.18 IL 71.74

PIT 3 450 x 450 SL 72.38 IL 71.95

PIT 4 GRATED DRAIN (HD) 300 x 200 SL 72.30 IL 72.10

PIT 5 450 x 450 SL 72.61 IL 72.26

PIT 6 450 x 450 SL 72.73 IL 72.38

PIT 7 450 x 450 SL 72.83 IL 72.50

PIT 8 450 x 450 SL 72.87 IL 72.54

PIT 9 450 x 450 SL 72.94 IL 72.64

PIT 10 450 x 450 SL 73.08 IL 72.78

PIT 11 450 x 450 SL 73.11 IL 72.81

RL 72.11 Ø300 PVC RL 72.09 Ø300 PVC RL 72.18 RL 72.15 Ø225 PVC RL 72.28 Ø225 PVC Ø225 PVC RL 72.78 RL 72.83 RL 72.87 RL 72.94 Ø150 PVC RL 73.08 RL 73.11

Ø65 RISER WITH NON-RETURN VALVE TO DISCHARGE DIRECTLY TO WSUD CHAMBER

Ø150 PVC

Ø150 PVC

Ø65 RISER WITH NON-RETURN VALVE TO DISCHARGE DIRECTLY TO WSUD CHAMBER

PG RWO PG LINE OF BUILDING ABOVE PG RWO PG RWO PG RWO PG RWO PG RWO PG RWO

UNDERGROUND OSD TANK 1

CAPACITY	45.15m³
TANK AREA	43.00m²
DEPTH TO ORIFICE	1.10m
ORIFICE CL	70.35
TWL	71.45

ROOF OUTLINE

UNIT 2C FFL 72.78

UNIT 6C FFL 72.78

UNIT 35C FFL 72.78

LIFT

FFL 72.78

FFL 71.60

PIT 12 450 x 450 SL 72.80 IL 72.50

Ø150 PVC

ROOF OUTLINE

ROOF OUTLINE

DRIVEWAY CATCHMENT TO BE COLLECTED BY THE BASEMENT DRAINAGE SYSTEM AND PUMPED OUT. AREA = 37.7m²

UNIT 35A FFL 73.23

UNIT 6A FFL 73.23

UNIT 1A FFL 73.23

UNIT 2A FFL 73.23

LIFT

FFL 72.05

FFL 73.23

FFL 73.23

LINE OF BUILDING ABOVE

Ø300 PVC

UNIT 3C FFL 72.78

UNIT 4C FFL 72.78

UNIT 5C FFL 72.78

UNIT 36C FFL 72.78

UNIT 36A FFL 73.23

UNIT 5A FFL 73.23

UNIT 4A FFL 73.23

UNIT 3A FFL 73.23

PIT 13 450 x 450 SL 71.46 IL 70.88

PIT 14 450 x 450 SL 71.34 IL 70.94

PIT 16 900 x 900 SL 73.18 IL 72.03

PIT 17 600 x 600 SL 73.18 IL 72.31

PIT 18 600 x 600 SL 73.18 IL 72.50

PIT 19 450 x 450 SL 73.40 IL 73.10

PIT 21 GRATED DRAIN SL 73.00 IL 72.80

PIT 23 600 x 600 SL 73.63 IL 72.91

RL 71.46 RWO RWO RWO WO RWO Ø300 PVC Ø225 PVC RWO RWO RWO LINE OF BUILDING ABOVE

Ø300 PVC @ 1.1% Ø300 PVC RWO RWO Ø150 PVC

PIT 20 450 x 450 SL 73.00 IL 72.70

PIT 22 600 x 600 SL 73.63 IL 72.82

RL 71.34

PIT 15 Enviro Pod 900 x 900 SL 73.18 IL 71.58

PIT 25 450 x 450 SL 71.27 IL 70.97

PIT 34 450 x 450 SL 73.23 IL 72.93

PIT 35 450 x 450 SL 71.90 IL 71.36

PIT 37 450 x 450 SL 71.90 IL 71.50

PIT 24 450 x 450 SL 73.23 IL 72.93

PIT 39 450 x 450 SL 71.90 IL 71.60

DRIVEWAY CATCHMENT TO BE COLLECTED BY THE BASEMENT DRAINAGE SYSTEM AND PUMPED OUT. AREA = 160.7m²

RL 71.27 Ø150 PVC @ 1.0% Ø150 PVC RWO RWO Ø150 PVC Ø225 PVC Ø225 PVC Ø150 PVC Ø150 PVC LINE OF BUILDING ABOVE

PIT 31 450 x 450 SL 71.67 IL 71.17

PIT 32 450 x 450 SL 71.67 IL 71.27

PIT 26 Enviro Pod 600 x 600 SL 71.11 IL 70.60

PIT 27 600 x 600 SL 72.00 IL 71.12

PIT 28 600 x 600 SL 72.00 IL 71.23

PIT 29 450 x 450 SL 71.85 IL 71.40

PIT 30 450 x 450 SL 71.85 IL 71.55

PIT 33 450 x 450 SL 72.30 IL 72.00

PIT 36 450 x 450 SL 72.30 IL 72.00

PIT 38 450 x 450 SL 72.30 IL 72.00

PIT 40 450 x 450 SL 72.30 IL 72.00

RL 71.14 RWO RWO RWO RWO RWO RWO RWO ROOF OUTLINE RWO RWO RWO RL 72.08 RL 71.96

ROOF OUTLINE

UNIT 36D FFL 71.45

UNIT 37D FFL 71.45

UNIT 37B FFL 71.90

UNIT 36B FFL 71.90

UNIT 5B FFL 71.90

UNIT 4B FFL 71.90

UNIT 3B FFL 71.90

UNIT 3D FFL 71.45

UNIT 4D FFL 71.45

UNIT 5D FFL 71.45

FFL 71.45

FFL 71.90

FFL 71.90

LIFT

LIFT

LIFT

Ø225 PVC

Ø300 PVC

ROOF OUTLINE

ROOF OUTLINE

LINE OF BUILDING ABOVE

Ø150 PVC

PIT 41 450 x 450 SL 71.42 IL 71.02

UNIT 6D FFL 71.45

UNIT 35D FFL 71.45

UNIT 35B FFL 71.90

UNIT 6B FFL 71.90

UNIT 2B FFL 71.90

UNIT 1B FFL 71.90

PIT 43 450 x 450 SL 71.24 IL 70.84

PIT 44 450 x 450 SL 71.24 IL 70.94

UNIT 2D FFL 71.45

UNIT 1D FFL 71.45

UNIT 38B FFL 71.90

UNIT 39B FFL 71.90

UNIT 39D FFL 71.45

PIT 42 450 x 450 SL 71.24 IL 70.94

Ø150 PVC

Ø300 PVC @ 1.0%

UNDERGROUND OSD TANK 2

CAPACITY	45.15³
TANK AREA	43.00²
DEPTH TO ORIFICE	1.10m
ORIFICE CL	68.95
TWL	70.05

UNIT 38D FFL 71.45

PIT 45 Enviro Pod 600 x 600 SL 71.02 IL 70.40

PIT 53 450 x 450 SL 70.90 IL 70.60

Ø65 RISER WITH NON-RETURN VALVE TO DISCHARGE DIRECTLY TO WSUD CHAMBER

PIT 62 450 x 450 SL 71.13 IL 70.83

RWO RWO PG RWO RWO PG RWO ROOF OUTLINE RWO PG RWO ROOF OUTLINE PG RWO Ø150 PVC RWO PG RWO LINE OF BUILDING ABOVE PG PG PG RWO Ø150 PVC RWO RWO

RL 70.62 RL 70.62 Ø375 PVC RL 70.70 Ø375 PVC RL 70.74 RL 70.74 Ø375 PVC RL 70.76 Ø375 PVC RL 70.86 Ø375PVC RL 70.86 Ø375 PVC Ø225 PVC RL 70.93 Ø225 PVC RL 70.93 Ø225 PVC Ø150 PVC RL 71.00 Ø150 PVC RL 71.02 RL 71.02 Ø150 PVC RL 71.05 Ø150 PVC RL 71.13 RL 71.13 Ø150 PVC

Ø375 RCP @ 1.0%

6 CARTRIDGE (690mm) MANHOLE STORMFILTER SYSTEM. REFER TO SHEET 110 & 111 FOR MORE DETAILS.

CONNECT TO PROPOSED GULLY PIT TO COUNCIL REQUIREMENTS.

PIT 46 900 x 900 SL 70.62 IL 69.56

PIT 47 900 x 900 SL 70.70 IL 69.70

PIT 48 900 x 900 SL 70.74 IL 69.78

PIT 49 900 x 900 SL 70.74 IL 69.82

PIT 50 600 x 600 SL 70.76 IL 69.89

PIT 51 600 x 600 SL 70.86 IL 69.96

PIT 52 600 x 600 SL 70.86 IL 70.02

PIT 54 600 x 600 SL 70.93 IL 70.21

PIT 55 600 x 600 SL 70.93 IL 70.27

PIT 56 600 x 600 SL 77.00 IL 70.40

PIT 57 450 x 450 SL 77.02 IL 70.46

PIT 58 450 x 450 SL 71.02 IL 70.50

PIT 59 450 x 450 SL 77.10 IL 70.67

PIT 60 450 x 450 SL 77.13 IL 70.72

PIT 61 450 x 450 SL 71.13 IL 70.75

FUTURE ROAD

FIFTH AVENUE

PIPES NOTE:

Ø65 PVC @ MIN 1.0%
Ø90 PVC @ MIN 1.0%
Ø100 PVC @ MIN 1.0%
Ø150 PVC @ MIN 1.0%
Ø225 PVC @ MIN 0.5%
Ø300 PVC @ MIN 0.4%
UNLESS NOTED OTHERWISE

BUILDING NOTE:

1- ALL PIPES IN BALCONIES TO BE Ø65 uPVC CAST IN CONCRETE SLAB.
2- CONTRACTOR TO PROVIDE A BREAK / OPEN VOID IN RAIL / BALLUSTRADE FOR STORMWATER EMERGENCY OVERFLOW.

ROOF NOTE:

ALL ROOF DRAINAGE SYSTEM TO BE IN ACCORDANCE WITH BASIX REPORT & IS SUBJECT TO DETAILED DESIGN STAGE. ALL DOWNPIPES TO BE CONNECTED TO THE WSUD CHAMBER.

CATCHMENT NOTE:

REFER TO SHEET 108 FOR MORE INFORMATION REGARDING OSD CATCHMENT AREAS.

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

0 1cm at full size 10cm 20cm

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 4 8 12 m
SCALE 1:200 @ A1

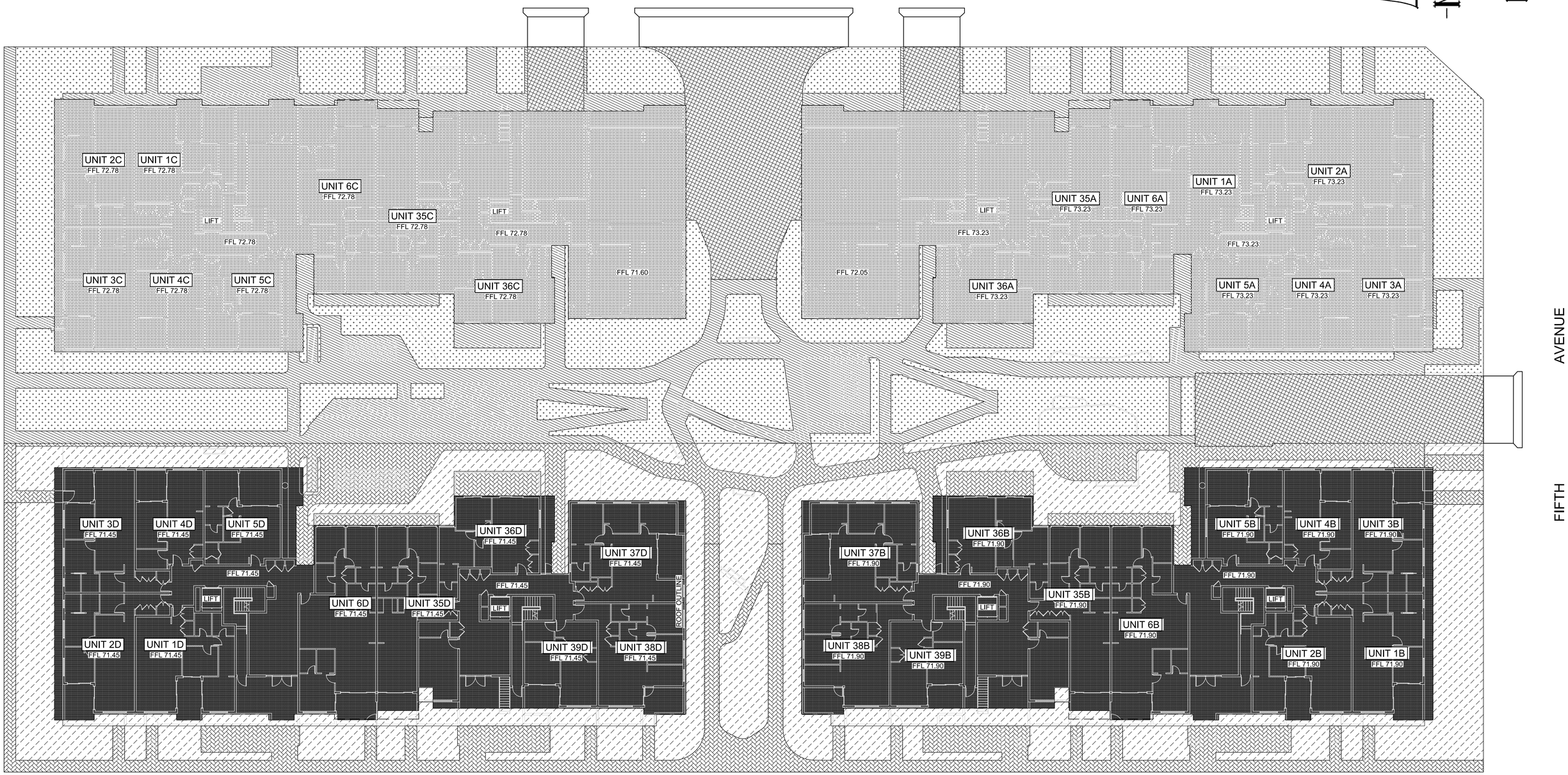
Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN
GROUND LEVEL

Scale	A1	Project No.	Dwg. No.	Issue
1:200		ACE170579.SW.DA	107	A



CATCHMENT LEGEND

- ROOF TO WSUD TANK 1 = 2845m²
- DRIVEDWAY TO WSUD TANK 1 = 549.4m²
- PAVED TO WSUD TANK 1 = 1080m²
- LANDSCAPE TO WSUD TANK 1 = 1531m²
- ROOF TO WSUD TANK 2 = 2845m²
- PAVED TO WSUD TANK 2 = 1033.6m²
- LANDSCAPE TO WSUD TANK 2 = 1252.8m²

PIPES NOTE:

Ø65 PVC @ MIN 1.0%
Ø90 PVC @ MIN 1.0%
Ø100 PVC @ MIN 1.0%
Ø150 PVC @ MIN 1.0%
Ø225 PVC @ MIN 0.5%
Ø300 PVC @ MIN 0.4%
UNLESS NOTED OTHERWISE

BUILDING NOTE:

1- ALL PIPES IN BALCONIES TO BE Ø65 uPVC CAST IN CONCRETE SLAB.
2- CONTRACTOR TO PROVIDE A BREAK / OPEN VOID IN RAIL / BALLUSTRADE FOR STORMWATER EMERGENCY OVERFLOW.

ROOF NOTE:

ALL ROOF DRAINAGE SYSTEM TO BE IN ACCORDANCE WITH BASIX REPORT & IS SUBJECT TO DETAILED DESIGN STAGE. ALL DOWNPIPES TO BE CONNECTED TO THE WSUD CHAMBER.

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

0 1cm at full size 10cm 20cm

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 4 8 12 m
SCALE 1:200 @ A1

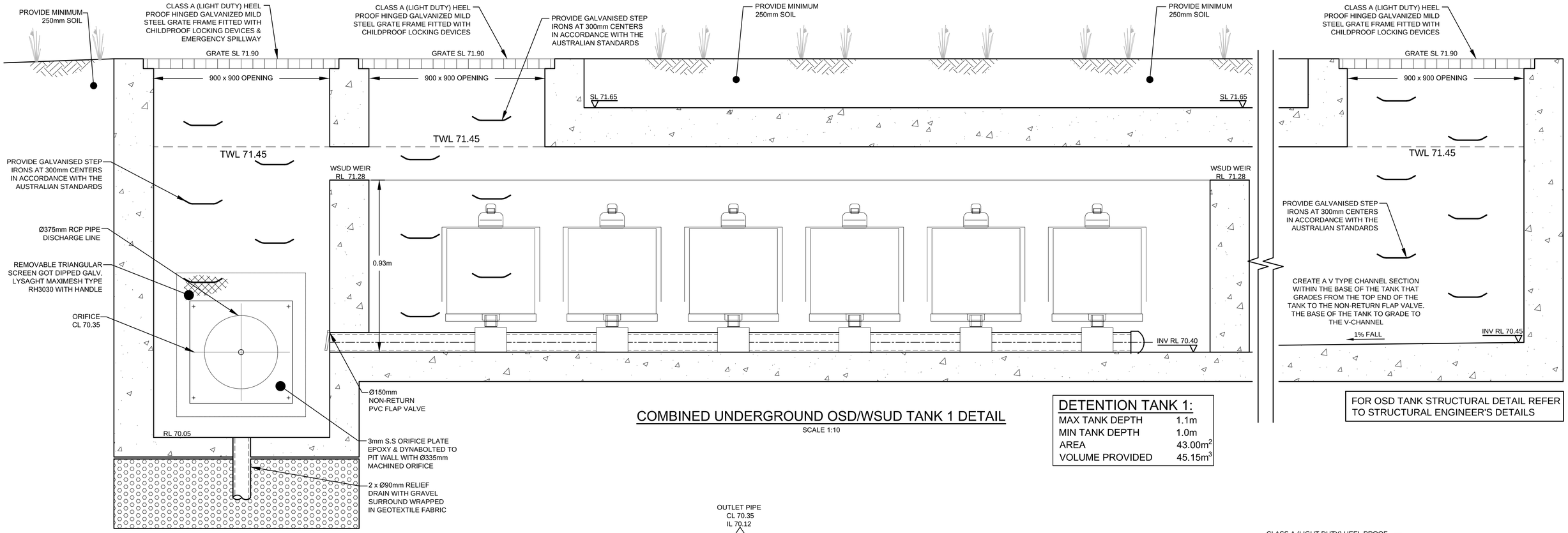
Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
CATCHMENT PLAN

Scale	A1	Project No.	Dwg. No.	Issue
1:200		ACE170579.SW.DA	108	A



COMBINED UNDERGROUND OSD/WSUD TANK 1 DETAIL

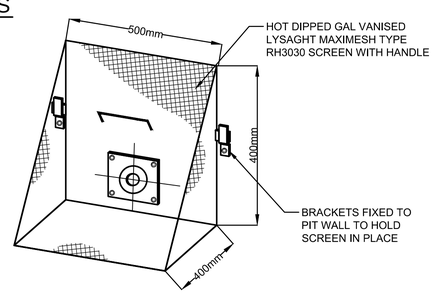
SCALE 1:10

DETENTION TANK 1:	
MAX TANK DEPTH	1.1m
MIN TANK DEPTH	1.0m
AREA	43.00m^2
VOLUME PROVIDED	45.15m^3

FOR OSD TANK STRUCTURAL DETAIL REFER TO STRUCTURAL ENGINEER'S DETAILS

UNDERGROUND OSD TANK B STAGED STORAGE CALCULATIONS

DEPTH (mm)	AREA (m²)	CUMULATIVE VOLUME (m³)
0	43.00	0
100	43.00	2.15
200	43.00	6.45
300	43.00	10.75
400	43.00	15.05
500	43.00	19.35
600	43.00	23.65
700	43.00	27.95
800	43.00	32.25
900	43.00	36.55
1000	43.00	40.85
1100	43.00	45.15

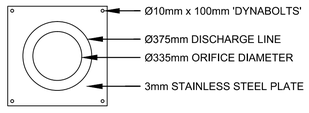


TRASH SCREEN DETAIL

N.T.S.

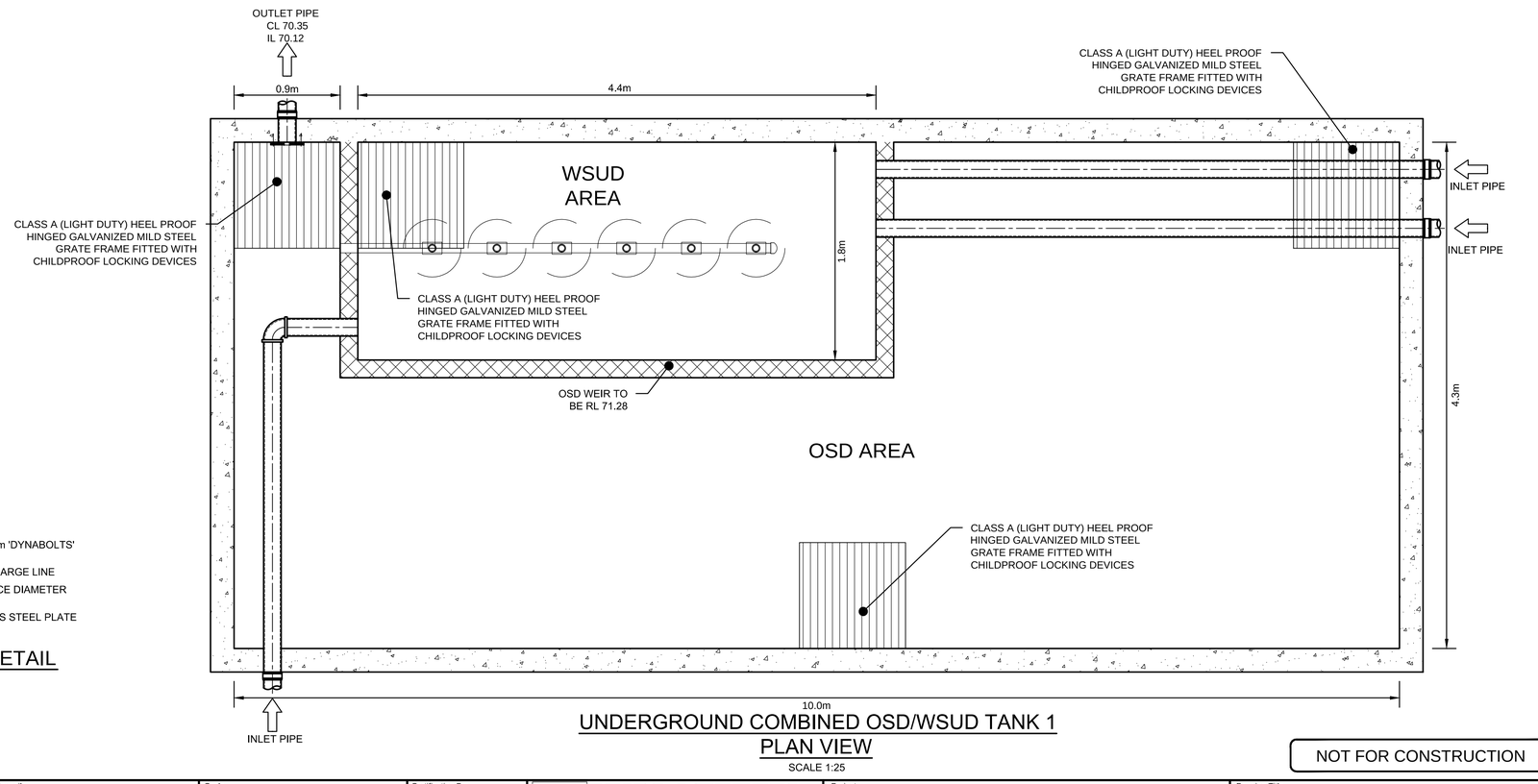
ON-SITE DETENTION NOTE:

THE OSD BASIN / TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.



ORIFICE PLATE B DETAIL

N.T.S



UNDERGROUND COMBINED OSD/WSUD TANK 1 PLAN VIEW

SCALE 1:25

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

1 0 1cm at full size 10cm 20cm

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 200 400 600mm
SCALE 1:10 @ A1
0 0.2 0.4 0.6 0.8 1.0 1.2m
SCALE 1:25 @ A1

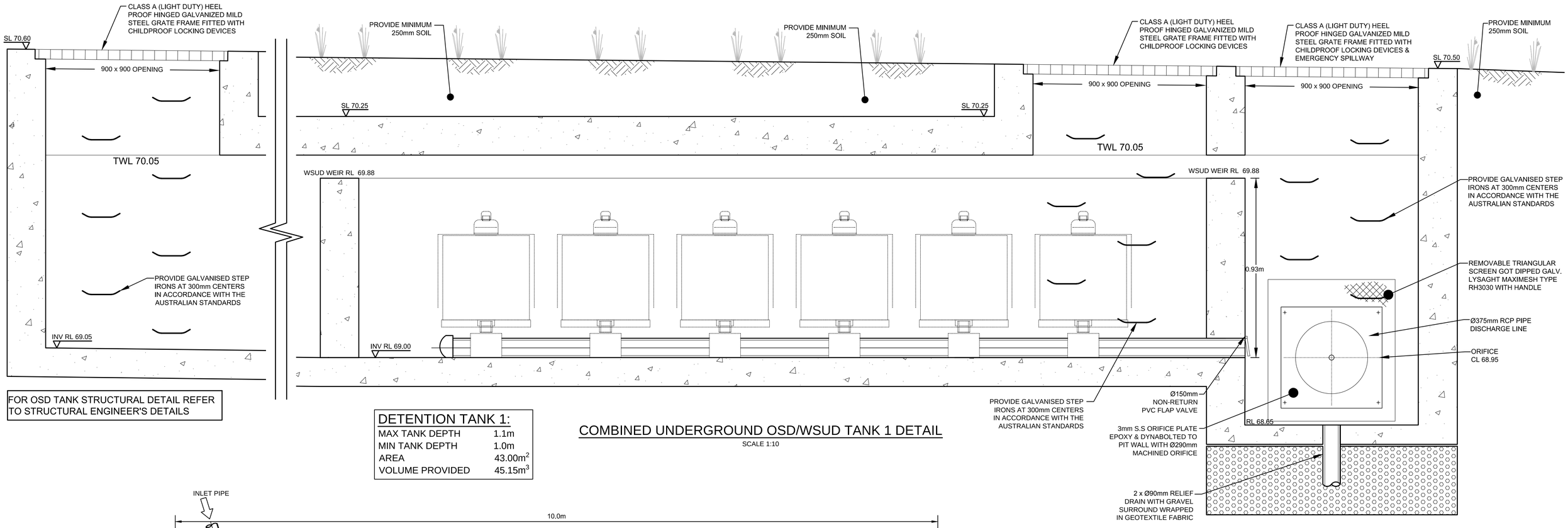
Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
OSD & WSUD DETAILS
SHEET 1 OF 3

Scale	Project No.	Dwg. No.	Issue
A1 As Shown	ACE170579.SW.DA	109	A



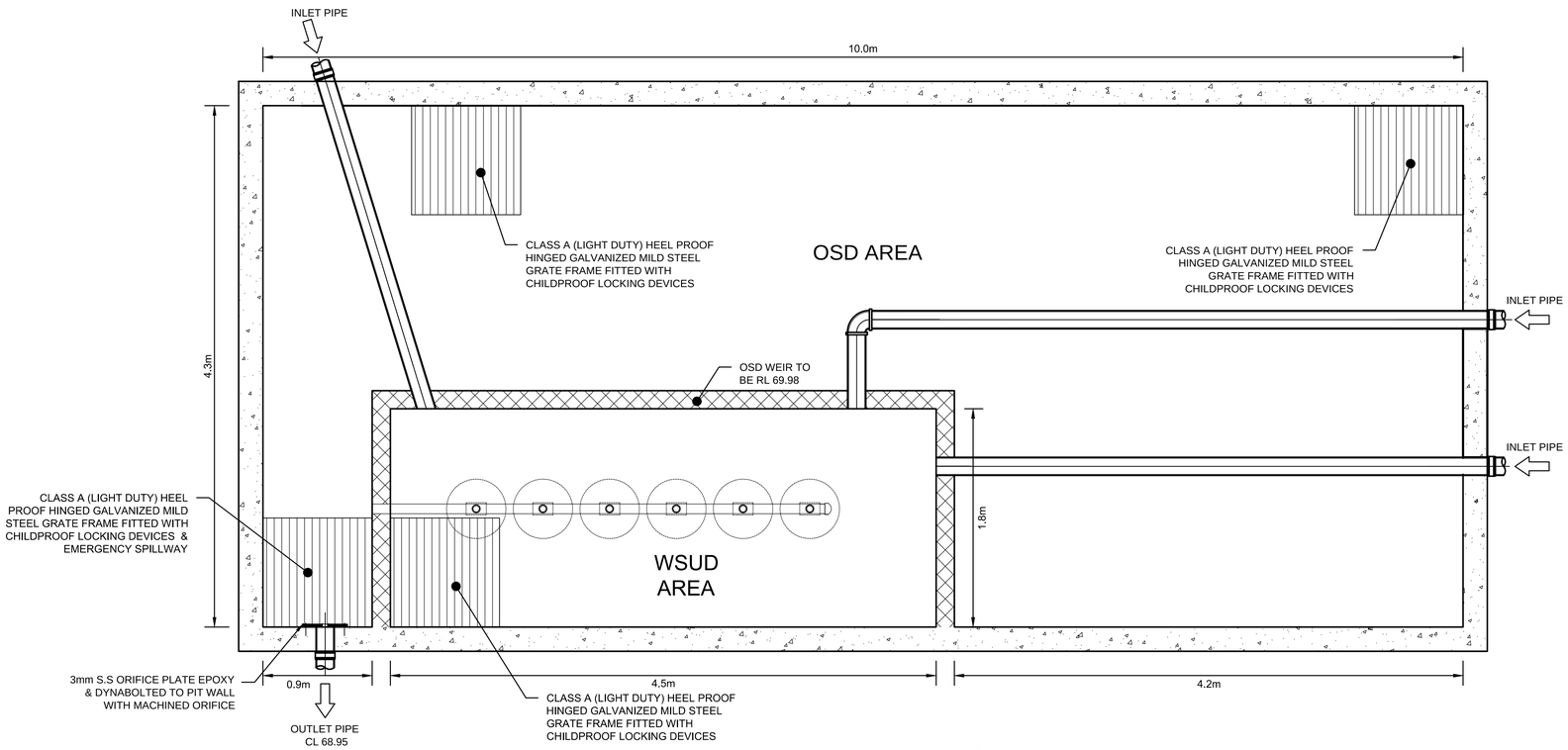
FOR OSD TANK STRUCTURAL DETAIL REFER TO STRUCTURAL ENGINEER'S DETAILS

DETENTION TANK 1:

MAX TANK DEPTH	1.1m
MIN TANK DEPTH	1.0m
AREA	43.00m^2
VOLUME PROVIDED	45.15m^3

COMBINED UNDERGROUND OSD/WSUD TANK 1 DETAIL

SCALE 1:10



UNDERGROUND COMBINED OSD/WSUD TANK 2 PLAN VIEW

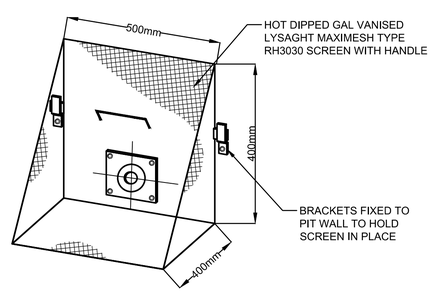
SCALE 1:25

ON-SITE DETENTION NOTE:

THE OSD BASIN / TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

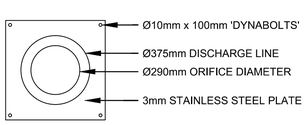
UNDERGROUND OSD TANK B STAGED STORAGE CALCULATIONS

DEPTH (mm)	AREA (m²)	CUMULATIVE VOLUME (m³)
0	43.00	0
100	43.00	2.15
200	43.00	6.45
300	43.00	10.75
400	43.00	15.05
500	43.00	19.35
600	43.00	23.65
700	43.00	27.95
800	43.00	32.25
900	43.00	36.55
1000	43.00	40.85
1100	43.00	45.15



TRASH SCREEN DETAIL

N.T.S.



ORIFICE PLATE B DETAIL

N.T.S

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

0 1cm at full size 10cm 20cm

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 200 400 600mm
SCALE 1:10 @ A1
0 0.2 0.4 0.6 0.8 1.0 1.2m
SCALE 1:25 @ A1

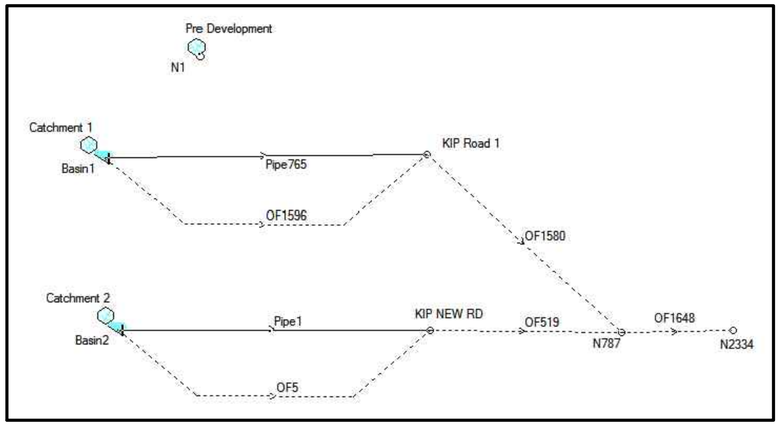
Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

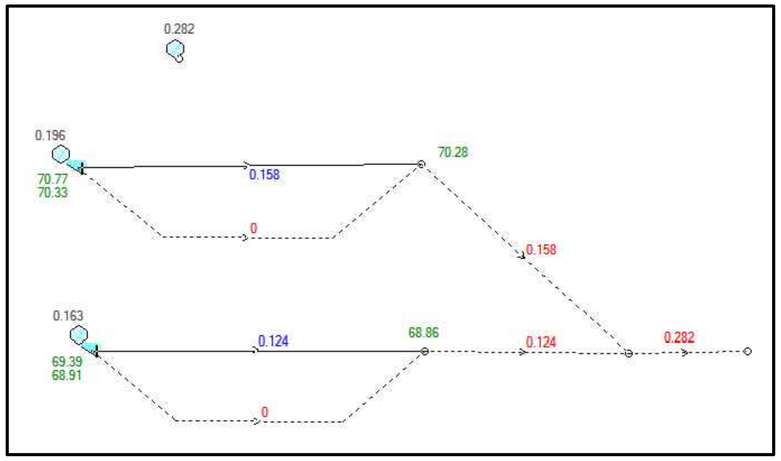
Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
OSD & WSUD DETAILS
SHEET 2 OF 3

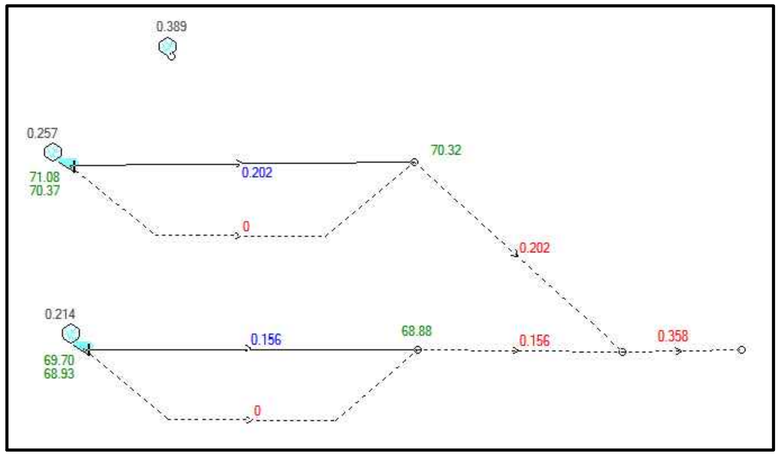
Scale	Project No.	Dwg. No.	Issue
As Shown A1	ACE170579.SW.DA	110	A



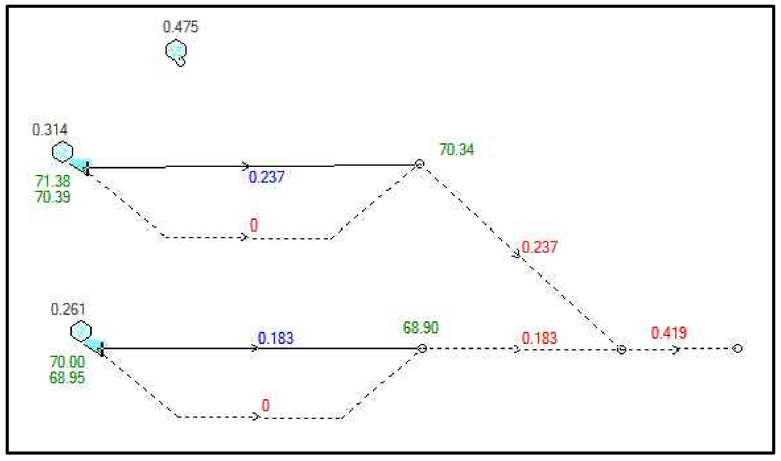
DRAINS WITHOUT RESULTS
N.T.S.



DRAINS RESULTS 5yr
N.T.S.



DRAINS RESULTS 20yr
N.T.S.



DRAINS RESULTS 100yr
N.T.S.

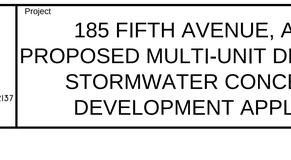
YEAR (event)	PRE DEVELOP FLOWS (l/s)	ORIFICE FLOWS (l/s)		OSD DISCHARGE (l/s)		TOTAL SITE DISCHARGE (l/s)	WATER STORAGE LEVEL (m)	
		T1	T2	T1	T2		T1	T2
5	282	158	124	158	124	282	70.77	69.39
20	389	202	156	202	156	358	71.08	69.70
100	475	237	183	237	183	419	71.38	70.00

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	T1
WATER QUALITY FLOW RATE (L/S)	-
PEAK FLOW RATE (L/S)	-
RETURN PERIOD OF PEAK FLOW (yrs)	-
# OF CARTRIDGES REQUIRED (8-22)	6
CARTRIDGE HEIGHT (310, 460 or 690mm)	690
MEDIA TYPE (PERLITE, PERLITE/ZEOLITE OR ZPG)	PSORB
PRECAST VAULT WEIGHT	-
PRECAST LID WEIGHT	-

PIPE DATA:	I.L.	MATERIAL	DIAMETER
INLET PIPE #1	71.42	PVC	300
INLET PIPE #2	70.62	PVC	300
OUTLET PIPE	70.35	PVC	150

PIPE ORIENTATION



LADDER		YES/NO
ANTI-FLOTATION BALLAST	N/A	N/A
	N/A	N/A

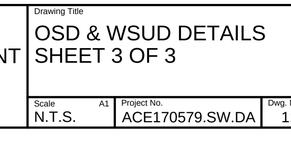
STORMFILTER TABLE 1
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	T2
WATER QUALITY FLOW RATE (L/S)	-
PEAK FLOW RATE (L/S)	-
RETURN PERIOD OF PEAK FLOW (yrs)	-
# OF CARTRIDGES REQUIRED (8-22)	6
CARTRIDGE HEIGHT (310, 460 or 690mm)	690
MEDIA TYPE (PERLITE, PERLITE/ZEOLITE OR ZPG)	PSORB
PRECAST VAULT WEIGHT	-
PRECAST LID WEIGHT	-

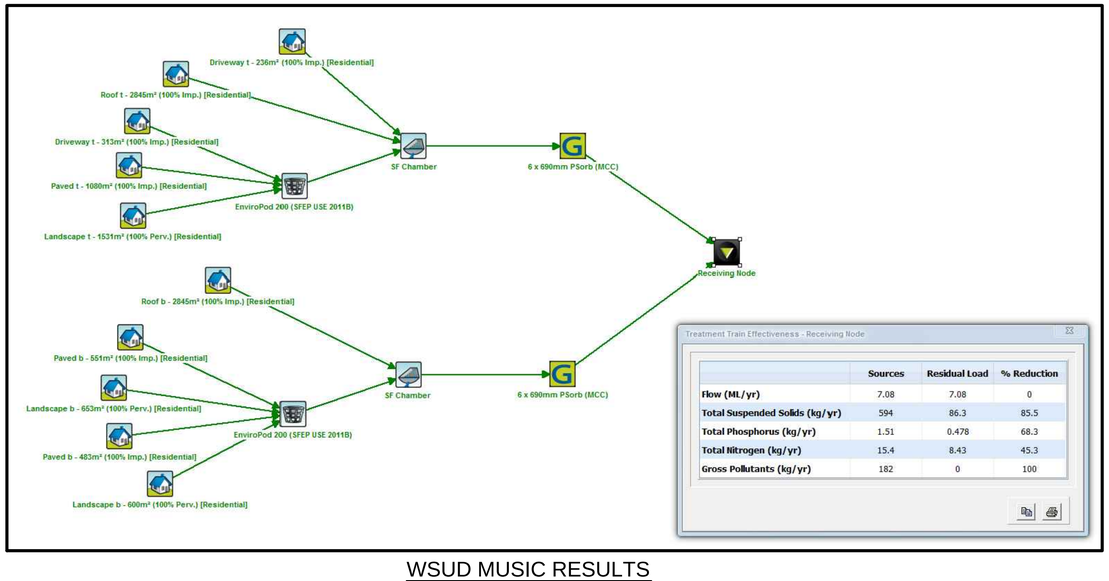
PIPE DATA:	I.L.	MATERIAL	DIAMETER
INLET PIPE #1	70.00	PVC	150
INLET PIPE #2	69.47	PVC	375
OUTLET PIPE	68.95	PVC	150

PIPE ORIENTATION



LADDER		YES/NO
ANTI-FLOTATION BALLAST	N/A	N/A
	N/A	N/A

STORMFILTER TABLE 2
N.T.S.



WSUD MUSIC RESULTS
N.T.S.

GENERAL NOTES

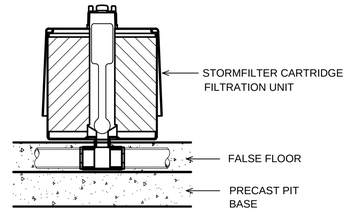
1. INLET AND OUTLET PIPING SHALL BE SPECIFIED BY SITE CIVIL ENGINEER (SEE PLANS) AND PROVIDED BY CONTRACTOR. STORMFILTER IS PROVIDED WITH OPENINGS AT INLET AND OUTLET LOCATIONS.
2. IF THE PEAK FLOW RATE, AS DETERMINED BY THE SITE CIVIL ENGINEER, EXCEEDS THE PEAK HYDRAULIC CAPACITY OF THE PRODUCT, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED. PLEASE CONTACT STORMWATER360 FOR OPTIONS.
3. THE FILTER CARTRIDGE(S) ARE SIPHON-ACTUATED AND SELF-CLEANING. THE STANDARD DETAIL DRAWING SHOWS THE MAXIMUM NUMBER OF CARTRIDGES. THE ACTUAL NUMBER SHALL BE SPECIFIED BY THE SITE CIVIL ENGINEER ON SITE PLANS OR IN DATA TABLE BELOW. PRECAST STRUCTURE TO BE CONSTRUCTED IN ACCORDANCE WITH AS3600.
4. FOR SHALLOW, LOW DROP OR SPECIAL DESIGN CONSTRAINTS, CONTACT STORMWATER360 FOR DESIGN OPTIONS.
5. ALL WATER QUALITY PRODUCTS REQUIRE PERIODIC MAINTENANCE AS OUTLINED IN THE O&M GUIDELINES. PROVIDE MINIMUM CLEARANCE FOR MAINTENANCE ACCESS.
6. STRUCTURE AND ACCESS COVERS DESIGNED TO MEET AUSTROADS T44 LOAD RATING WITH 0-2m FILL MAXIMUM.
7. THE STRUCTURE THICKNESSES SHOWN ARE FOR REPRESENTATIONAL PURPOSES AND VARY REGIONALLY.
8. ANY BACKFILL DEPTH, SUB-BASE, AND OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY SITE CIVIL ENGINEER.
9. STORMFILTER BY STORMWATER360:
   SYDNEY (AU) PHONE: (02) 9525 5833,
   BRISBANE (AU) PHONE: (07) 3272 1872.

STORMFILTER DESIGN TABLE

- STORMFILTER TREATMENT CAPACITY VARIES BY NUMBER OF FILTER CARTRIDGES INSTALLED AND BY REGION SPECIFIC INTERNAL FLOW CONTROLS. CONVEYANCE CAPACITY IS RATED AT 80L/S.
- THE STANDARD CONFIGURATION IS SHOWN. ACTUAL CONFIGURATION OF THE SPECIFIED STRUCTURE(S) PER CIVIL ENGINEER WILL BE SHOWN ON SUBMITTAL DRAWING(S).
- ALL PARTS PROVIDED AND INTERNAL ASSEMBLY BY STORMWATER360 AUSTRALIA UNLESS OTHERWISE NOTED.

CARTRIDGE HEIGHT	690		460		310	
SYSTEM HYDRAULIC DROP (H - REQ'D. MIN.)	930		700		550	
TREATMENT BY MEDIA SURFACE AREA L/S/m2	1.4	0.7	1.4	0.7	1.4	0.7
CARTRIDGE FLOW RATE (L/s)	1.42	0.71	0.95	0.47	0.63	0.32

SYSTEM HYDRAULIC DROP
CARTRIDGE FLOW RATE



NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

1 0 1cm at full size 10cm 20cm

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale

Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2/141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

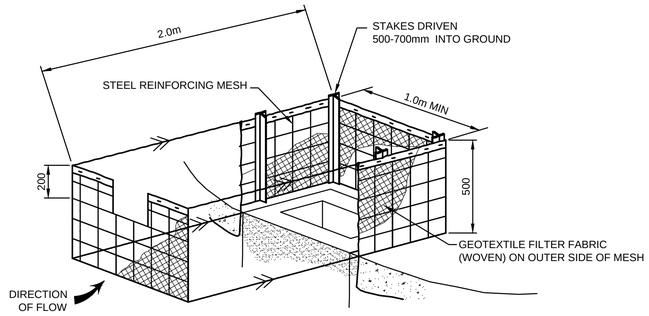
Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
OSD & WSUD DETAILS
SHEET 3 OF 3

Scale	Project No.	Dwg. No.	Issue
N.T.S. A1	ACE170579.SW.DA	111	A

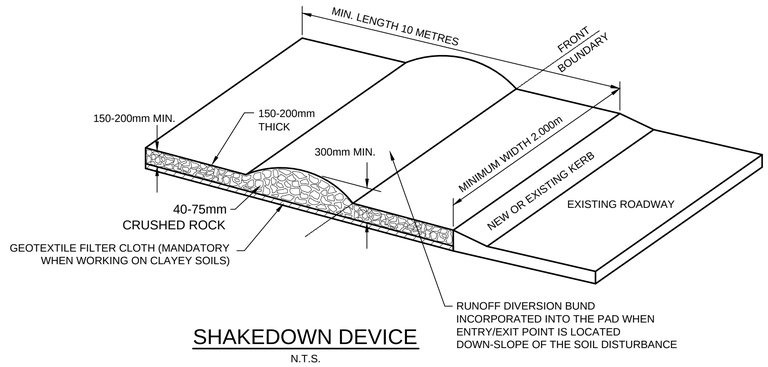
SEDIMENT & EROSION NOTES

1. IMMEDIATELY FOLLOWING SETTING OUT OF THE WORKS, BUT PRIOR TO COMMENCEMENT OF ANY CLEARING OR EARTHWORKS, THE CONTRACTOR AND SUPERINTENDENT SHALL WALK THE SITE TO NOMINATE THE LOCATIONS AND TYPES OF SEDIMENT AND EROSION CONTROL MEASURES TO BE ADOPTED. THESE MEASURES SHALL BE IMPLEMENTED PRIOR TO ANY CLEARING OR EARTHWORKS AND MAINTAINED UNTIL THE WORKS ARE COMPLETED AND NO LONGER POSE AN EROSION HAZARD, UNLESS OTHERWISE APPROVED BY THE SUPERINTENDENT.
2. IMMEDIATELY FOLLOWING SETTING OUT OF THE WORKS, BUT PRIOR TO COMMENCEMENT OF ANY CLEARING OR EARTHWORKS, THE CONTRACTOR AND SUPERINTENDENT SHALL WALK THE SITE TO IDENTIFY AND MARK TREES WHICH ARE TO BE PRESERVED. NOTWITHSTANDING THE ABOVE,THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO MINIMISE DISTURBANCE TO EXISTING VEGETATION AND GROUND COVER OUTSIDE THE MINIMUM AREAS REQUIRED TO COMPLETE THE WORKS AND SHALL BE RESPONSIBLE FOR RECTIFICATION, AT ITS OWN COST, OF ANY DISTURBANCE BEYOND THOSE AREAS.
3. PROVIDE GULLY GRATE INLET SEDIMENT TRAPS AT ALL GULLY PITS.
4. PROVIDE SILT FENCING ALONG PROPERTY LINE AS DIRECTED BY SUPERINTENDENT.
5. ADDITIONAL CONTROL DEVICES TO BE PLACED WHERE DIRECTED BY THE PRINCIPLE.
6. ALTERNATIVE DESIGNS TO BE APPROVED BY SUPERINTENDENT PRIOR TO CONSTRUCTION.
7. WASH DOWN/RUMBLE AREA TO BE CONSTRUCTED WITH PROVISIONS RESTRICTING ALL SILT AND TRAFFICKED DEBRIS FROM ENTERING THE STORMWATER SYSTEM.
8. NO WORK OR STOCKPILING OF MATERIALS TO BE PLACED OUTSIDE OF SITE WORK BOUNDARY.
9. APPROPRIATE EROSION AND SEDIMENT CONTROLS TO BE USED TO PROTECT STOCKPILES AND MAINTAINED THROUGH OUT CONSTRUCTION.
10. IT IS THE CONTRACTORS RESPONSIBILITY TO TAKE DUE CARE OF NATURAL VEGETATION. NO CLEARING IS TO BE UNDERTAKEN WITHOUT PRIOR APPROVAL FROM THE SUPERINTENDENT.
11. TO AVOID DISTURBANCE TO EXISTING TREES, EARTHWORKS WILL BE MODIFIED AS DIRECTED ON-SITE BY THE SUPERINTENDENT.
12. THE LOCATION OF EROSION AND SEDIMENTATION CONTROLS WILL BE DETERMINED ON SITE BY THE SUPERINTENDENT.
13. ACCESS TRACKS THROUGH THE SITE WILL BE LIMITED TO THOSE DETERMINED BY THE SUPERINTENDENT AND THE CONTRACTOR PRIOR TO ANY WORK COMMENCING.
14. ALL SETTING OUT IS THE RESPONSIBILITY OF THE CONTRACTOR PRIOR TO WORKS COMMENCING ON SITE. THE SUPERINTENDENT'S SURVEYOR SHALL PEG ALL ALLOTMENT BOUNDARIES, PROVIDE COORDINATE INFORMATION TO THESE PEGS AND PLACE BENCH MARKS. THE CONTRACTOR SHALL SET OUT THE WORKS FROM AND MAINTAIN THESE PEGS.
15. PLANS ARE MINIMUM REQUIREMENTS AND ARE TO BE USED AS A GUIDE ONLY. EXACT MEASURES USED SHALL BE DETERMINED ON SITE IN CONJUNCTION WITH PROGRAM OF CONTRACTORS WORKS etc.



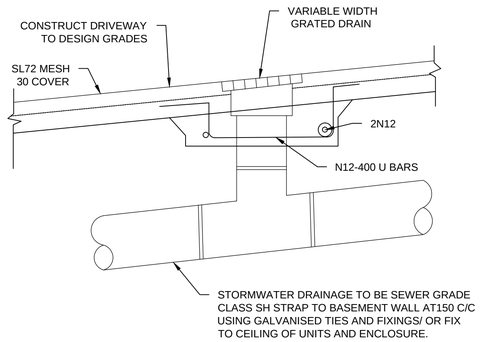
FIELD INLET SEDIMENT TRAP

N.T.S.



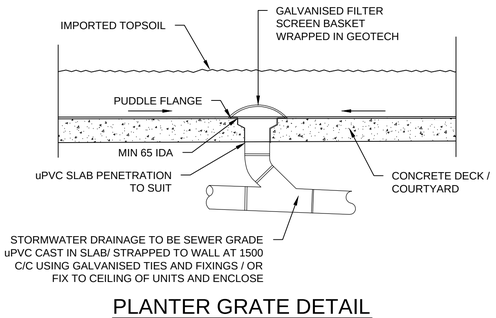
SHAKEDOWN DEVICE

N.T.S.



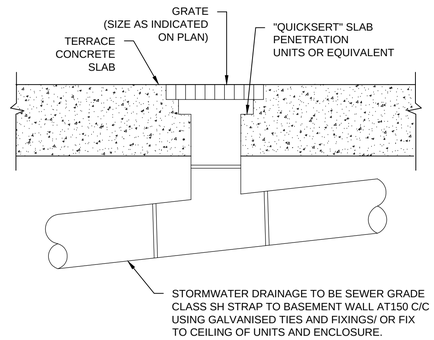
GRATED DRAIN DETAIL

N.T.S.



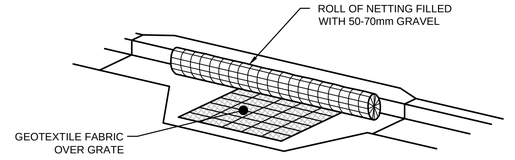
PLANTER GRATE DETAIL

N.T.S.



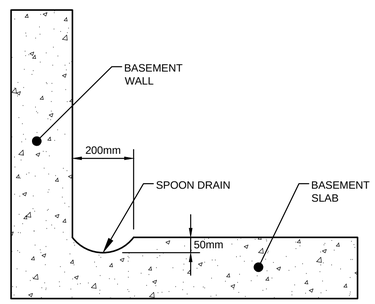
RAINWATER OUTLET DETAIL

N.T.S.



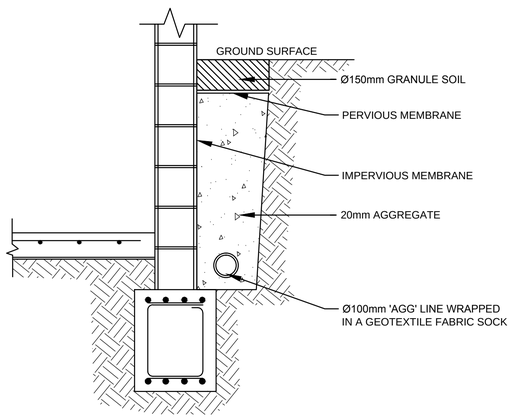
KERB INLET PROTECTION SAG GULLIES

N.T.S.



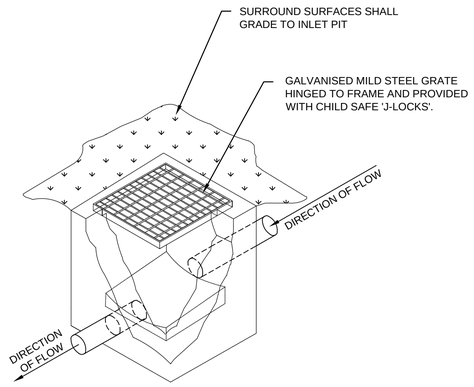
SPOON DRAIN SECTION DETAIL

SCALE 1:10



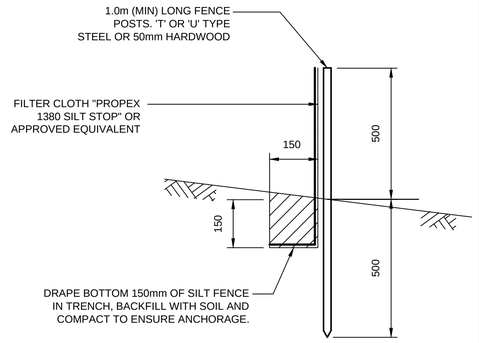
TYPICAL SUBSOIL DRAIN

N.T.S



TYPICAL GRATED INLET PIT DETAIL

N.T.S.



SILT FENCE DETAIL

N.T.S

SILT FENCE NOTES:

1. FILTER CLOTH TO BE FASTENED SECURELY TO POSTS WITH GALVANISED WIRE TIES, STAPLES OR ATTACHMENT BELTS.
2. POSTS SHOULD NOT BE SPACED MORE THAN 3.0m APART.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 150mm AND FOLDED.
4. FOR EXTRA STRENGTH TO SILT FENCE, WOVEN WIRE (14mm GAUGE, 150mm MESH SPACING) TO BE FASTENED SECURELY BETWEEN FILTER CLOTH AND POSTS BY WIRE TIES OR STAPLES
5. INSPECTIONS SHALL BE PROVIDED ON A REGULAR BASIS, ESPECIALLY AFTER RAINFALL AND EXCESSIVE SILT DEPOSITS REMOVED WHEN "BULGES" DEVELOP IN SILT FENCE
6. SEDIMENT FENCES SHALL BE CONSTRUCTED WITH SEDIMENT TRAPS AND EMERGENCY SPILLWAYS AT SPACINGS NO GREATER THAN 40m ON FLAT TERRAIN DECREASING TO 20m SPACINGS ON STEEP TERRAIN.

NOT FOR CONSTRUCTION

Issue	Description	Date	Drawn	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	17/10/2017	HUV	XNT	OC

0 1cm at full size 10cm 20cm

Architect
GM Architects
330a Parramatta Road
Homebush West NSW 2140
EMAIL : info@gmarchitects.com.au
PHONE : (02) 9797 1599

Council
Liverpool City Council

Scale
0 200 400 600mm
SCALE 1:10 @ A1

Certification By:
Anthony Hasham

AUSTRALIAN CONSULTING ENGINEERS.
AUSTRALIAN CONSULTING ENGINEERS.
PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

Project
185 FIFTH AVENUE, AUSTRAL
PROPOSED MULTI-UNIT DEVELOPMENT
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
MISCELLANEOUS DETAILS SHEET

Scale	Project No.	Dwg. No.	Issue
As Shown (A1)	ACE170579.SW.DA	111	A