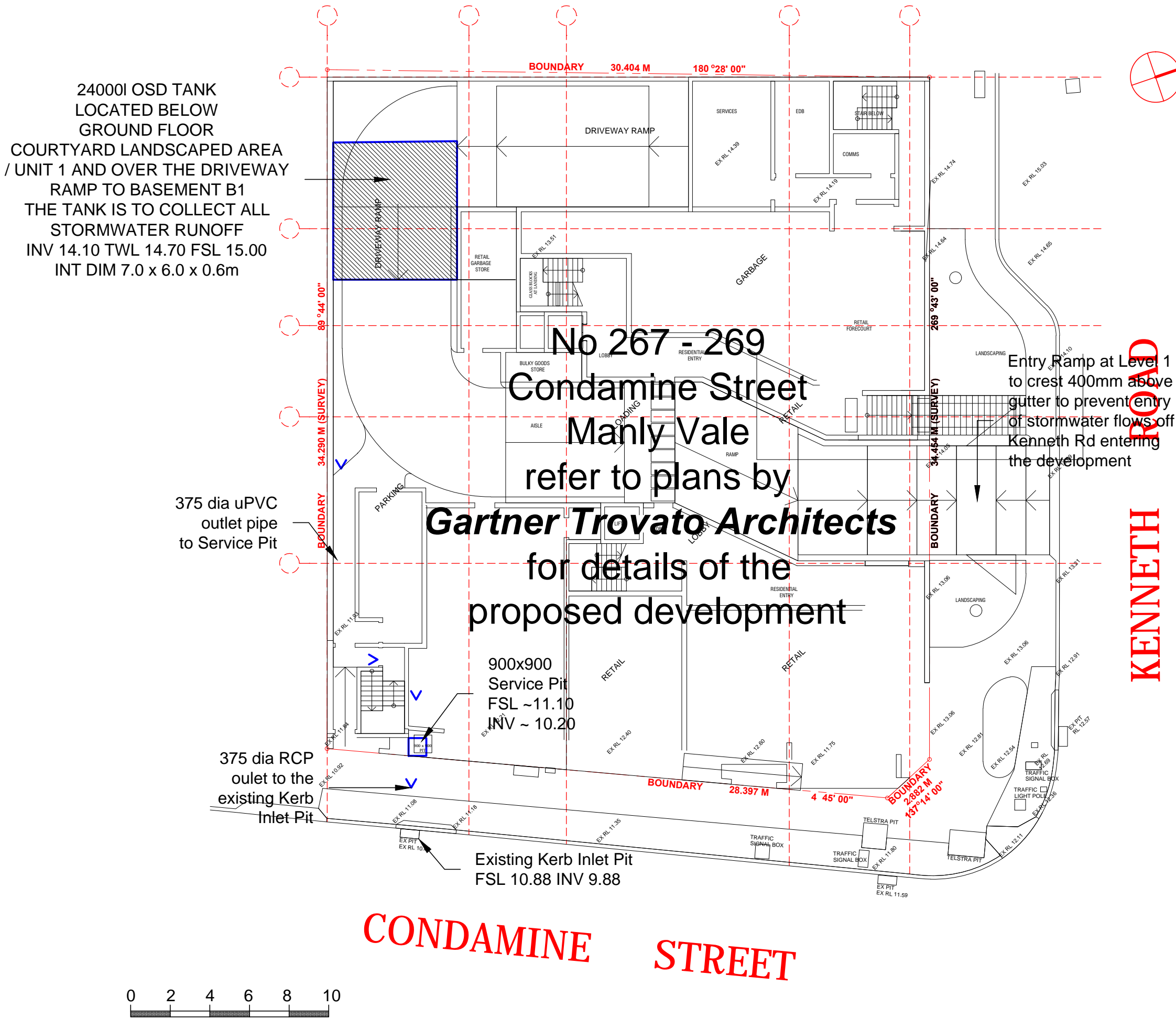
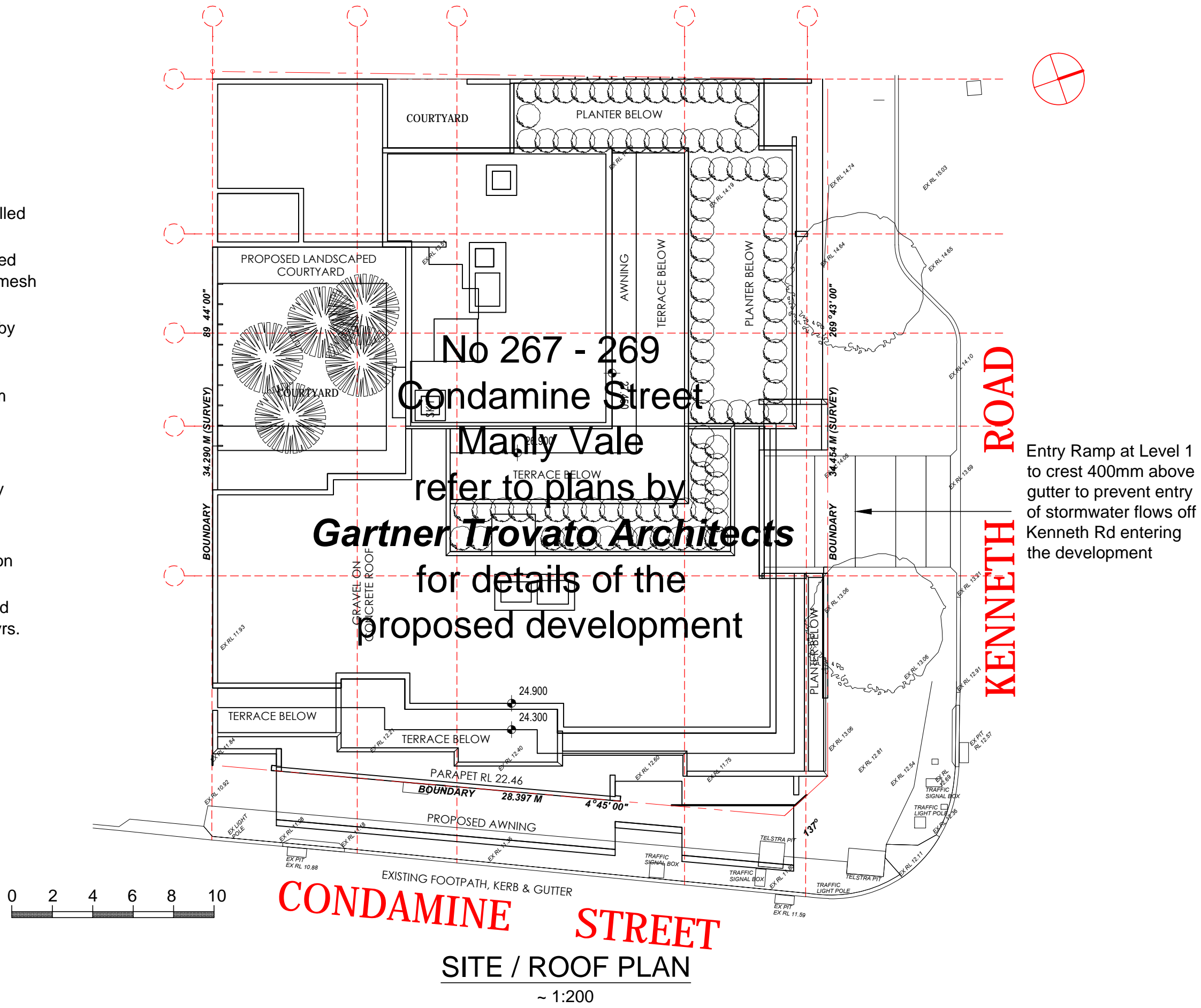


STORMWATER NOTES

1. All roof collection components (ie gutters / DPs etc)are to be located / sized by the Developments Hydraulic Consultant for a 1% AEP event capacity.
2. All Trunk Drainage pipes, as shown on this plan are to be minimum of 150mm dia uno.
3. All pipes to be uPVC to AS 1254:2002.
4. All pipes to be laid at the grade required to match pit invert levels.
5. All pipes to be installed and laid in accordance with AS 3500.3:2003.
6. Thrust blocks to be installed to the trunk drainage pipes in accordance with AS 3500.3:2003.
7. All roof guttering/ down pipes / valley gutters / box gutters etc are to be sized and installed in accordance with AS 3500.3:2003.
8. All pits are to be proprietary uv resistant polypropylene or similar unless noted (approved by the Engineer)and are to include a min 50mm sediment trap in the base and a maximesh screen laid at 45' across the pit to protect the outlet pipe .
9. All pits greater than 600mm in depth are to be proprietary precast concrete (approved by the Engineer).
10. All pits greater than 1000mm in depth are to have adequate access requirements in accordance with OH&S/Workcover requirements (ie; minimum dimensions 900x600mm with step irons).
11. All works are to be inspected and certified by the Principle Certifying Authority prior to backfilling.
12. All works requiring certification by the Engineer will require a works as executed survey prepared by a registered Surveyor detailing all levels etc as on the Engineering plans.
13. The system is too be flushed and cleaned of all sediment and debris annually.
14. The system will require regular cleaning and maintenance to ensure its ability to function is maintained.
15. To ensure the system's ability to function is maintained it is to be inspected and certified as operating effectively by a licensed plumber every 5 years, and a engineer every 20yrs.



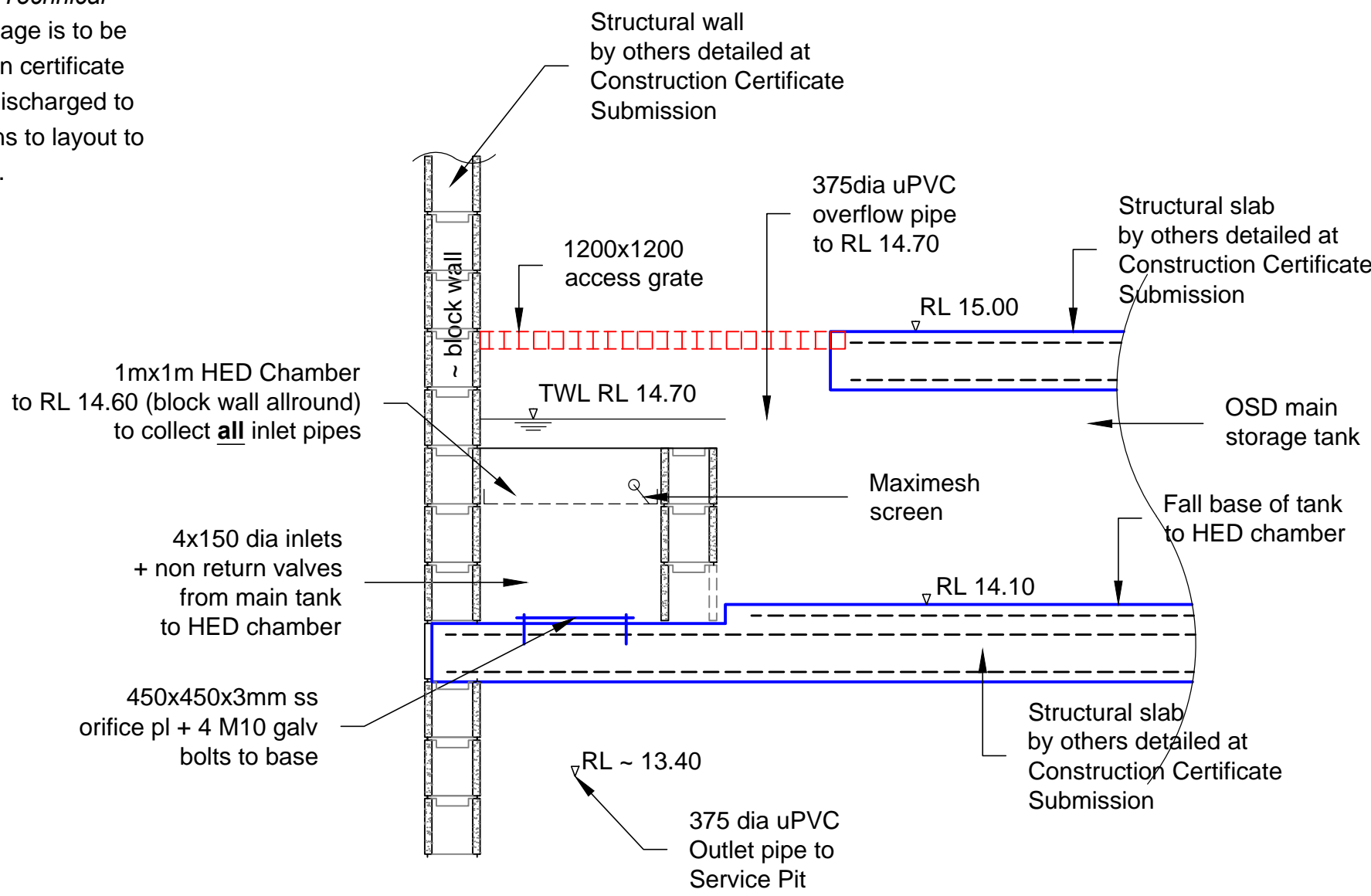
OSD CONTROL
ORIFICE PLATE DETAIL
1:10

SITE STORMWATER MANAGEMENT PLAN
1:200

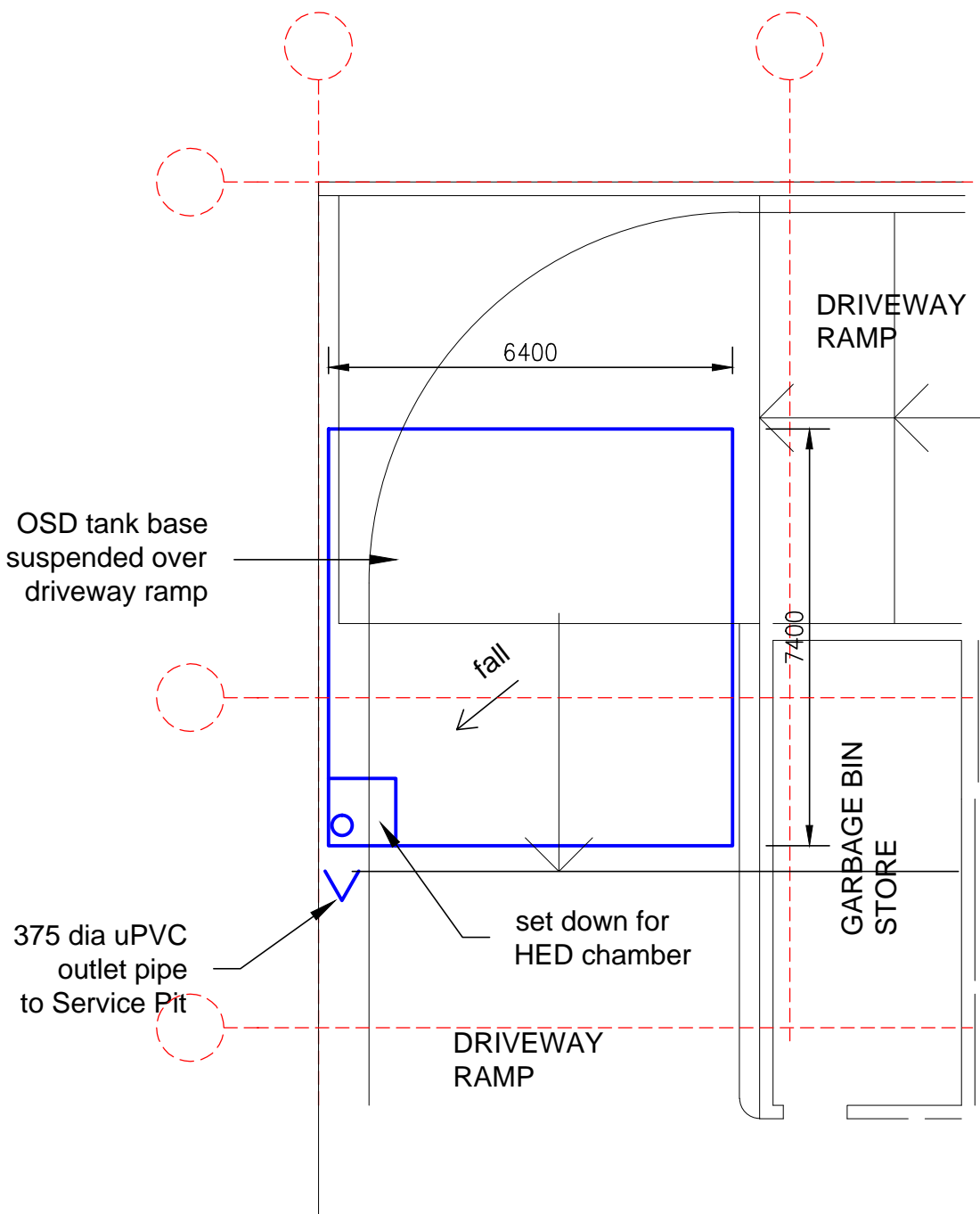
All run-off from the development is to be directed to the OSD Control Pit (inc overflow from any storage tanks).
The OSD is designed in accordance with Warringah Councils "On Site Stormwater Detention Technical Specification" to reduce peak storm run-off flowrates to that of a "greenfields" site. All roof drainage is to be sized by the hydraulic engineer for a 1% AEP event and to be documented with the construction certificate works. Drive run-off and any seepage flows collected at Basement 2 Level are to be pumped / discharged to the 900x900 Service Pit on Condamine St and onto the adjacent existing Kerb Inlet Pit . Variations to layout to be reviewed and approved by Barrenjoey Consulting Engineers before construction.

STORMWATER FLOW SUMMARY
(DRAINS ANALYSIS)

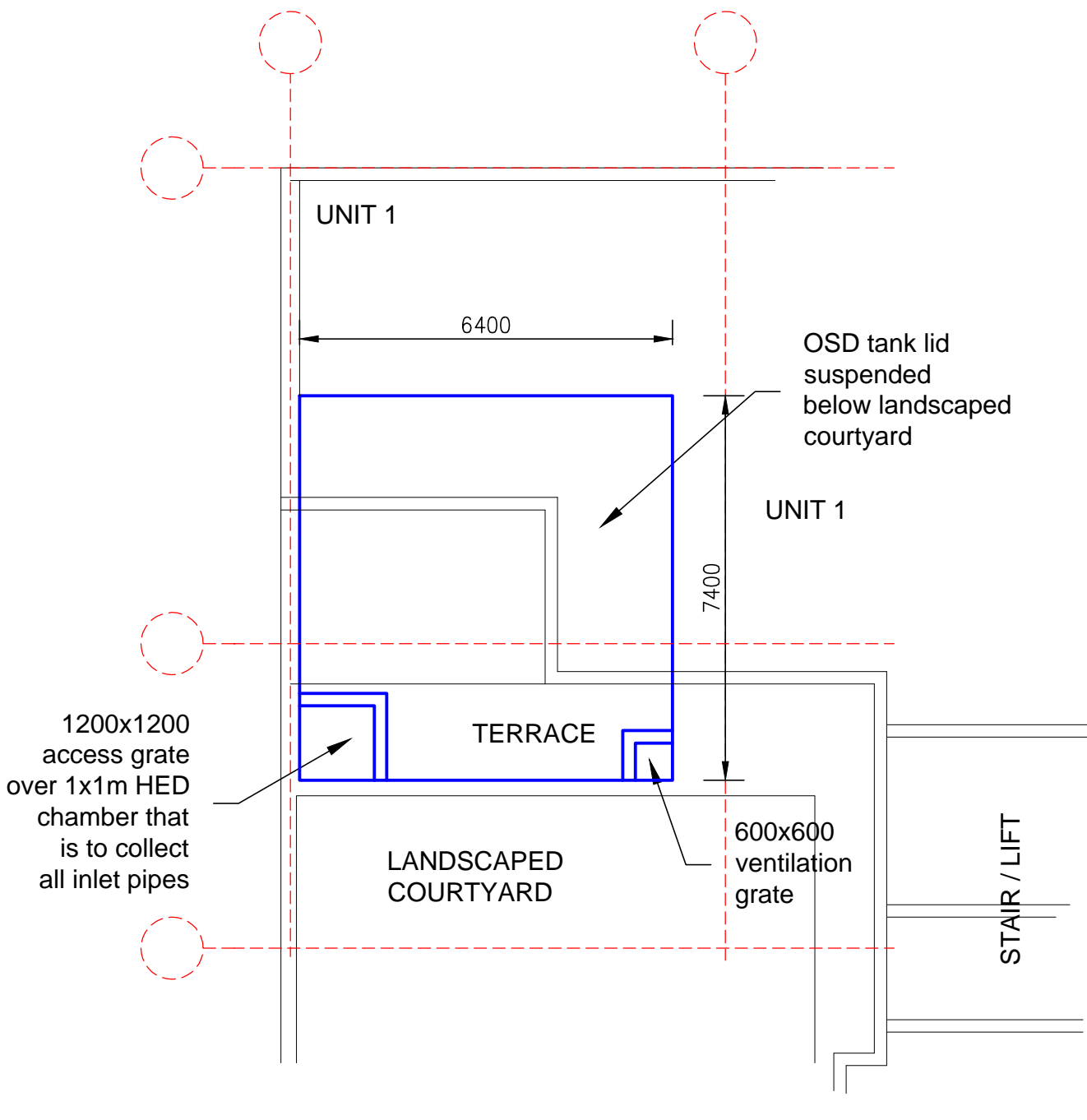
Site area	- 1075m ²
Existing impervious area	- ~1000 m ² (0m ² modeled)
Proposed impervious area	- ~1075 m ² (1075m ² modeled)
Detention Volume modeled	- 24000l (inc HED chamber)
PSD modeled	- 24 l/s
Existing Site Discharge	
5yr ARI Storm	- 30 l/s
100yr ARI Storm	- 54 l/s
Post Development Site Discharge	
5yr ARI Storm	- 29 l/s
100yr ARI Storm	- 33 l/s



OSD TANK HED CHAMBER SECTION
1:20



OSD BASE PLAN
~ 1:100



OSD LID PLAN
~ 1:100

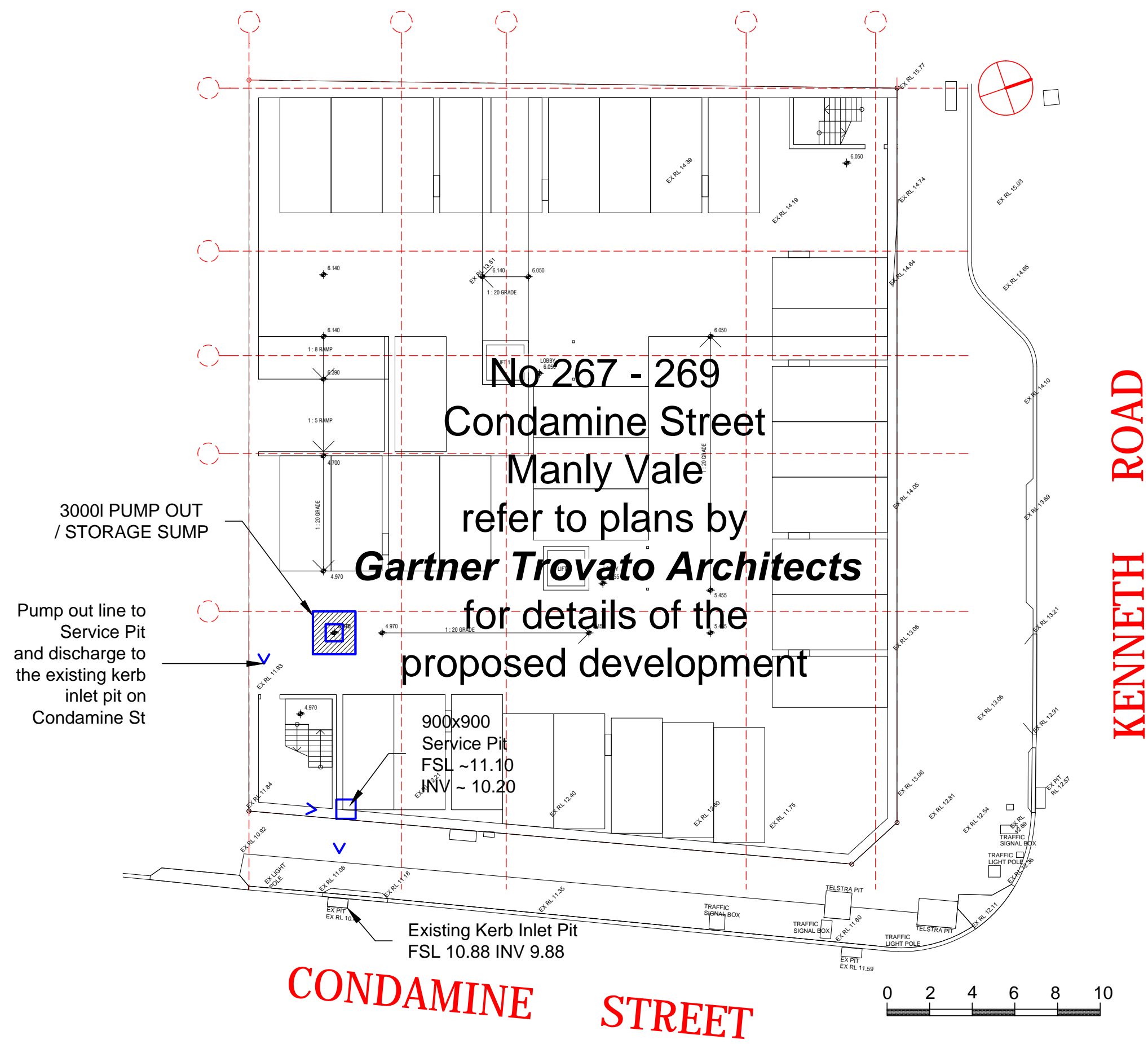
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Barrenjoey Consulting Engineers Pty Ltd
Stormwater Structural Civil
PO Box 672
Avoca NSW 21107
M: 0418 620 530
E: lucasbee@bigpond.com
ABN: 13124694917
ACN: 124694917

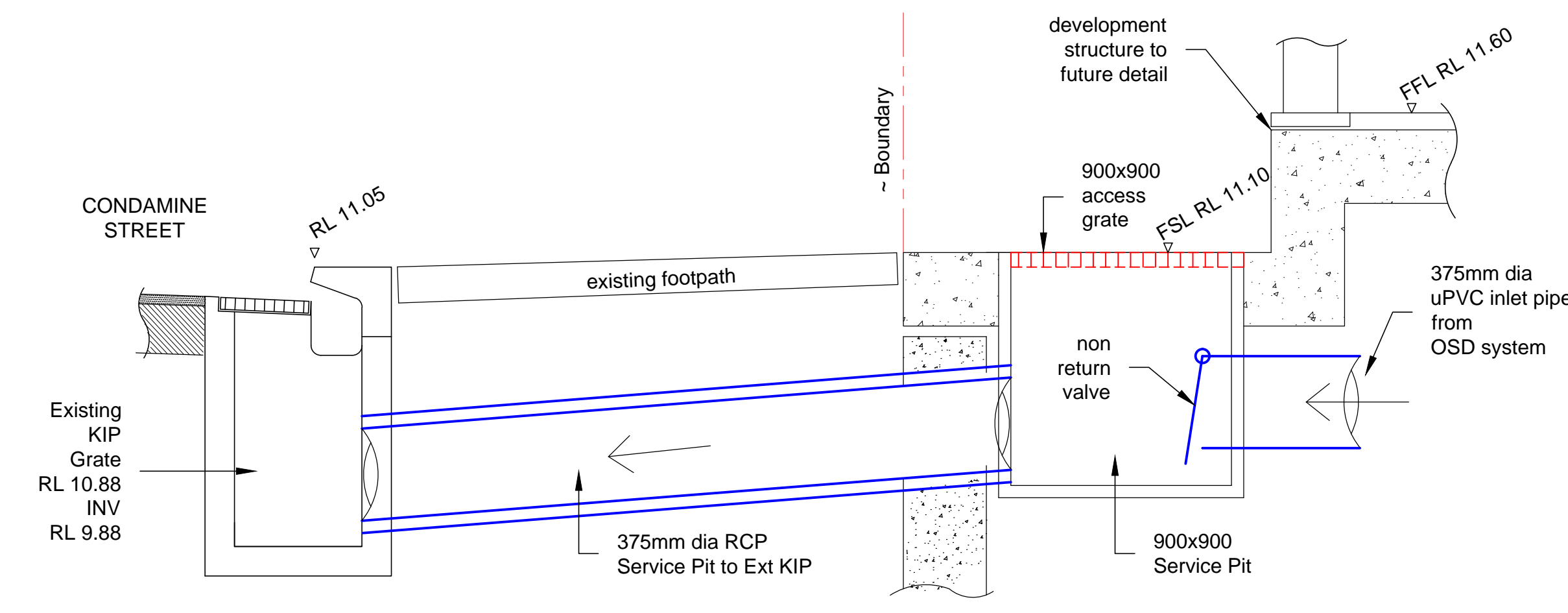
PROJECT:
PROPOSED RESIDENTIAL
& COMMERCIAL DEVELOPMENT
267 - 269 CONDAMINE STREET
MANLY VALE
for ~ CITE GROUP

DRAWING :
STORMWATER MANAGEMENT
PLAN

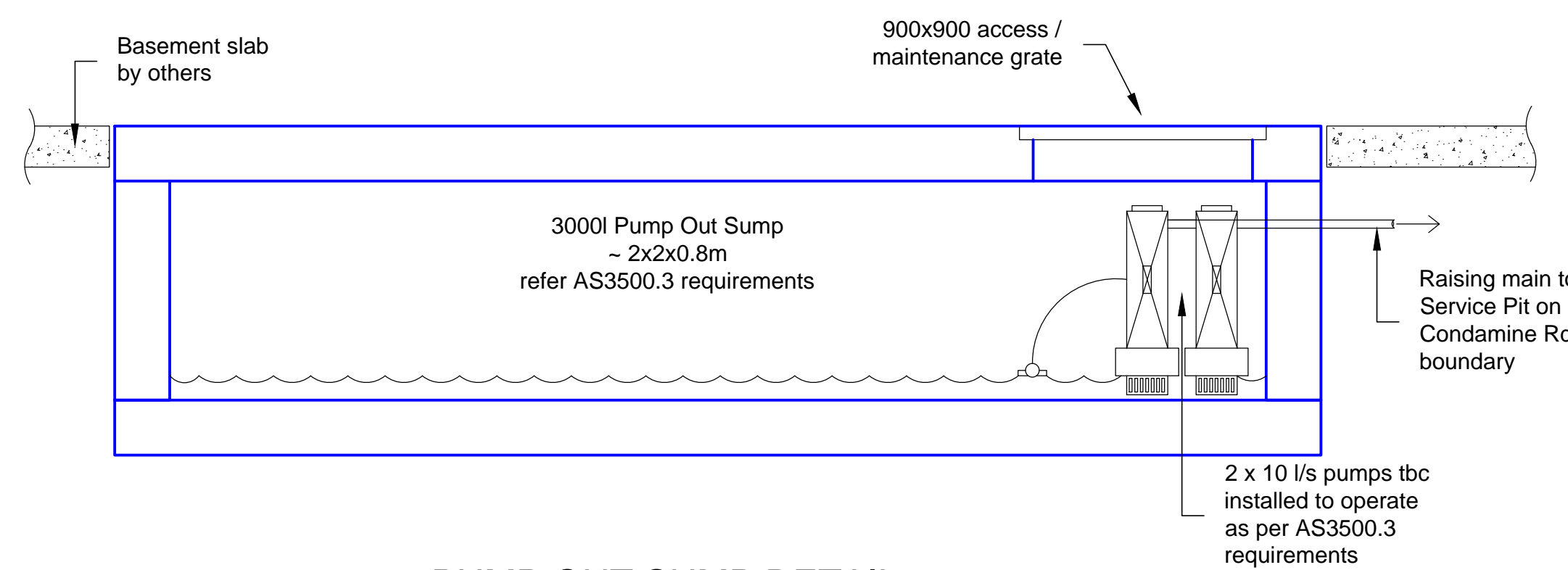
Job No :
180803
Drawing No
SW1DA
Document Certification
Barrenjoey Consulting Engineers Pty Ltd
per
Lucas Molloy MIEA CPEng NER Director



LEVEL B2 BASEMENT DRAINAGE PLAN
1:200

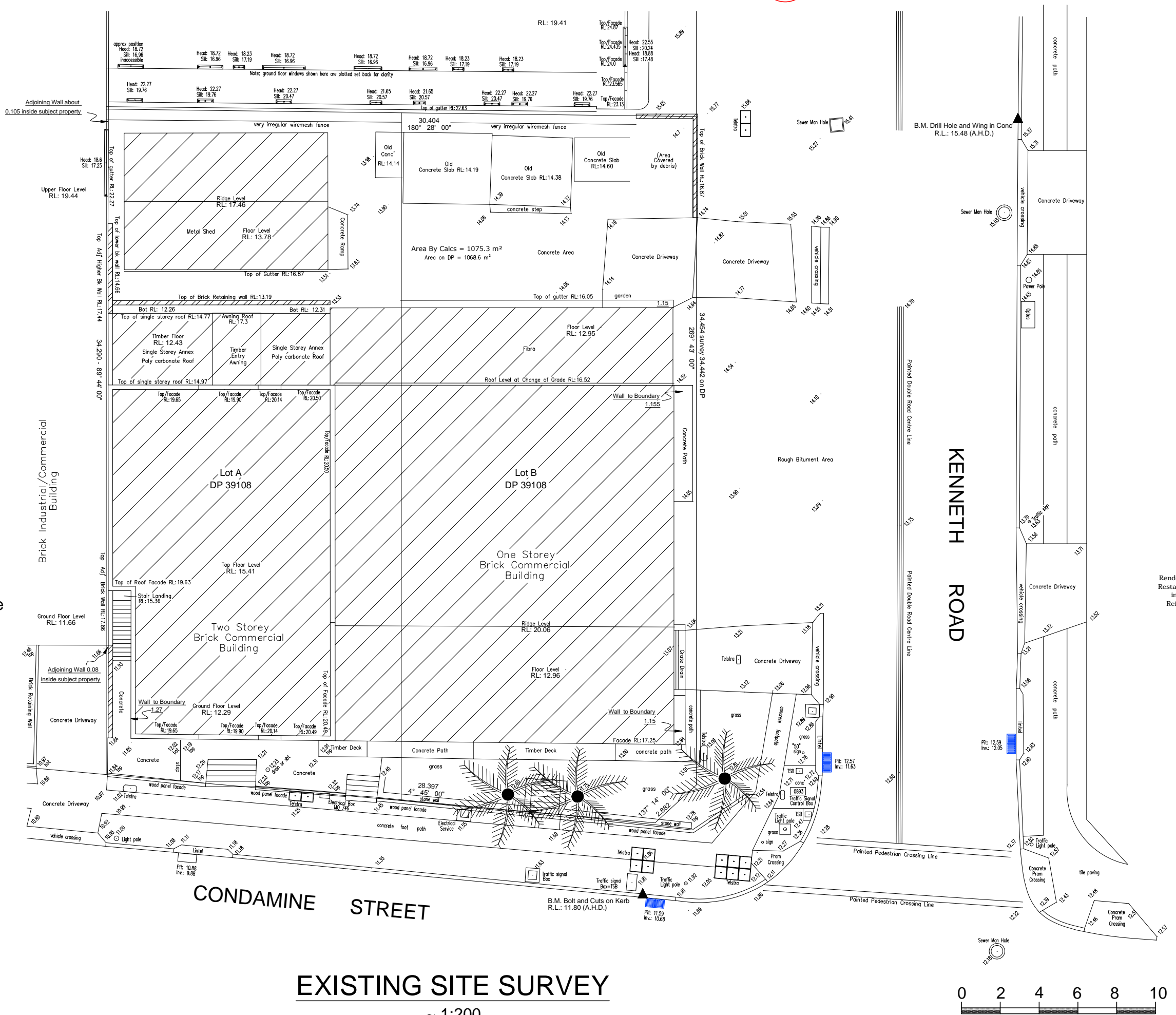


SERVICE PIT / OUTLET PIPE DETAIL
~ 1:20



PUMP OUT SUMP DETAIL
~ 1:20

refer to AS3500.3 requirements re pump out capacity, volume and alarm requirements etc.
All to be reviewed / confirmed during construction based on site conditions encountered.



EXISTING SITE SURVEY
~ 1:200
refer to plan by John R Holt Surveyors for details

AS 3500.3 REQUIREMENTS

SECTION 9 PUMPED SYSTEMS
9.1 SCOPE OF SECTION
This Section specifies criteria for pumped systems.
9.2 GENERAL
Pumped systems are for areas normally less than 2000 m2 where it is not possible for the stormwater to be discharged by gravity through the available gravitational point of connection.
The pumping equipment shall include a wet well, pumps and motors, pipework and electrical equipment and be located to facilitate easy connection to either the surface water system or the pumped point of connection.
NOTE: An illustration of the application of this Section is given in Appendix L.
9.3 WET WELLS
9.3.1 General
Wet wells, for submersible or non-submersible type pumps, shall be installed in accessible locations.
9.3.2 Construction and materials
The structure shall be sound and constructed of materials that will resist corrosion from ground water and aggressive soils.
Authorized materials include pre-cast or cast in situ reinforced concrete, corrosion-resistant metals, brickwork or glass-reinforced plastics.
9.3.3 Base
The base shall be constructed of materials compatible with the walls and shall maintain a self-cleansing gradient towards the pump inlet. The base shall be supported on stable ground.
9.3.4 Cover
The cover shall be constructed of similar materials to that of the wet well and shall have removable access openings sized for maintenance purposes. If the access opening is airtight, a breather pipe with a non-corrodible screen shall be installed.
9.3.5 Ladders
Where a wet well exceeds a depth of 1.2 m, a ladder, in accordance with Clause 8.6.5.4, shall be installed.
9.3.6 Combined effective storage
The capacity of the pumped system shall be achieved by a combination of pump capacity and wet well storage between the high and low working levels of the wet well. The combined effective storage comprising the volume able to be pumped in 30 min plus the wet well storage shall not be less than the volume of the run-off from the storm of ARI = 10 years and duration of 120 min, or as otherwise directed by the authority having jurisdiction. The maximum pump capacity shall be as detailed in Clause 9.4(a). The minimum wet well storage between the high and low working levels expressed in cubic metres shall be 1% of the catchment area in m2 but in any case shall not be less than 3 m3. NOTE: The minimum pump capacity should be 10 L/s.
9.3.7 Alarm
High-level and low-level alarms shall be installed in each wet well and located clear of the discharge from the inlet pipe so that false alarms are prevented. The high level alarm should be set no higher than 100 mm above the invert of the inlet pipe, provided that flooding of habitable or storage areas and vehicle garages shall be avoided. Where flooding could occur the overflow and high-level alarm shall be lowered accordingly to prevent flooding.
9.3.8 Inlet
The invert of the inlet pipe to the wet well shall be located at least 100 mm above the level of the Design Top Water Level.
9.3.9 Sealing
All pipes or apparatus passing through a wall or cover of a wet well shall be sealed with a compatible material.
9.4 PUMPS
The pumps shall be suitable for unscreened stormwater and shall be installed as follows:
(a) Pumps shall be in duplicate. The maximum capacity of each pump shall be selected so that the capacity of the system receiving the discharge is not exceeded. The pump controls shall be set up to enable alternate pump operation at each start. In the event that a pump fails to operate when the water level in the wet well reaches the pump start, the other pump shall be activated and a visible alarm initiated. In the event that both pumps fail to operate, an audible alarm shall be initiated.
(b) Pumping equipment shall be securely fixed to the wet well using corrosion-resistant fixings.
(c) Pumps shall be fitted with a gate valve and non-return valve on the delivery side of each pump.
(d) Pumps shall have flanges or unions installed to facilitate removal.
(e) Pumps shall be controlled so as to limit the number of starts per hour to within the capacity of the electrical motors and equipment, and shall, as far as practicable, empty the contents of the wet well at each operation.
(f) The required pumping rate shall be calculated based on an assessment of the expected inflow and, where appropriate, the allowable discharge rate.
9.5 RISING MAINS
Rising mains shall comply with the relevant Sections of AS/NZS 3500.1 and this Standard, and connect to—
(a) a stormwater or inlet pit; or
(b) direct to a stormwater drain.
9.6 ELECTRICAL CONNECTION
All electrical motors and equipment shall be installed in accordance with AS/NZS 3000.

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Barrenjoey Consulting Engineers ptg ltd
Stormwater Structural Civil
PO Box 672
Avon NSW 2107
M: 0418 420 530
E: lucasbee@bigpond.com
ABN: 13124694917
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