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NL100012

17/02/2011

de Witt Consulting
Mr David Humphris
PO Box 850
CHARLESTOWN NSW 2290

Dear David,

RE: DA 10/1049 158A & 164 CROUDACE ROAD ELEMORE VALE

I refer to the letter you provided to us from Newcastle City Council dated 21 December 2010 regarding DA 10/1049 for 158A and 164 Croudace Road, Elermore Vale. Below we have provided additional information and revised drawings for Council's assessment. The points addressed in this letter are a portion of Item 23 – Engineering Issues, and a part of Item 6 – Landscaping.

Firstly, we have considered the issues raised in **Item 23 – Engineering Issues.**

1. *Justification and calculations for guaranteed drawdown on the 10kL rainwater tank proposed on the community facilities should the full 10kL be required to meet the stormwater discharge control requirements of Element 4.5 of NDCP is required to be submitted. Justification should detail number of toilets and laundry facilities and likely usage to show that a guaranteed drawdown of 10kL is achievable.*

   Approximately 1,000 square metres of roof catchment drains to the 10kL reuse tank shown on the plans. To this effect, Element 4.5 of NDCP 2005 states that a minimum draw down of 2mm of rainfall per day from the contributing catchment must be achieved.

   It is anticipated that this water will be used for internal reuse as well as externally for irrigation. 18 toilets have been shown on drawings A-011 and A-012 in the Community Hall and Washroom building. An average of 335 6 litre flushes per day is required to draw down the 2mm of rainfall. This is equivalent to roughly 19 flushes per toilet per day. No toilets have been shown in the Mosque Praying Hall and no laundry facility has been shown.

   This volume of toilet use is considered congruent with the proposed use of the site as a place of worship, community hall facility and ancillary uses. It is expected that well over the average number of flushes will be concentrated around times of peak demand such as events and the community hall and

prayer times at the Mosque. A steady demand is also expected at other times from people using the study space and the library.

External reuse through irrigation is also expected to augment the draw down rate, but has not been considered in this analysis due to the unpredictable nature of application rates.

From the calculated draw down rate, the proposed 10kL reuse tank will have 5 days of storage prior to being empty. Due to the minimum draw down requirement being satisfied, it is considered that this proposal meets the intent of Element 4.5 of NDCP 2005.

2. *Typical sections of the overland flow paths through the site and calculations to show that the 100yr flows through the site can be accommodated needs to be provided. In this regard critical sections are considered to be western boundary near the Mosque (noting the Mosque is in cut in this location), the rear boundary and the overland flow path beside the driveway.*

   An investigation has been undertaken in order to determine whether there is sufficient provision to convey the 1 in 100yr ARI storm peak flows through the site. This included a peak flow analysis of the upstream catchment to the low point in Cambronne Parade, determination of the capacity of the existing piped system in the easement along the western boundary, as well as a peak flow analysis of the properties immediately upstream of the subject site.

   The catchment draining to the low point in Cambronne Parade is approximately 7.74ha in size and consists of a portion of urbanised residential area as well as an undeveloped portion with dense wooded vegetation. Using a probabilistic rational method calculation, the peak flow for the 1 in 100yr ARI storm event is 3.40m^3/s (calculations and catchment map attached).

   A 900mm diameter stormwater pipe is located in an easement traversing the site along the western boundary. This easement conveys water from Cambronne Parade to Croudace Road where it continues to drain to Ironbark Creek. The grade between the two inlet pits either side of the site is in the order of 7 percent. The capacity of this system is 5.20m^3/s from the Colebrook – White formula. Assuming this system has a 50% blockage factor, the flow taken in the pipe would be 2.60m^3/s. In this event, a secondary flow path is required to convey the 1 in 100yr ARI storm peak flow through this easement; and this is provided in the form of a grassed swale.

   This grassed swale has been sized to cater for in excess of the remaining 0.80m^3/s using Manning's equation. Whilst it is noted that the Mosque is in cut in this location, the path leading to the Imam's house is significantly

above the natural surface and will form a barrier to flow as shown in the typical section on drawing NL100012 C01DA[B].

It is noted that an overland flow path currently diverts flow from properties immediately upstream of the subject site to the stormwater easement running along the western boundary. It is proposed to redirect this flow through the site as part of a piped drainage system and connect with the easement which runs along the western boundary at its intersection with Croudace Road. Flow will enter the site in a controlled fashion through low level block outs in the fence along the north eastern boundary. This will be captured by a concrete dish drain, directing water to a series of sag pits running along the back of the community hall, washrooms and house. These will fall into pipes located on the same alignment, before running between the Mosque and the community hall and out to the street. This configuration is shown on the drawings with pipes sized to cater for the 1 in 100yr ARI storm peak flow and pits designed with a 50% blockage factor.

The overland flow path along the driveway will capture runoff during the 1 in 100yr ARI storm from the driveway and lower carpark. Using a probabilistic rational method approximation, this would be in the order of 160L/s. This swale has been sized accordingly and is shown on drawing NL100012 C01DA [B].

3. *The multi-storey car park drainage is currently shown ending at a pit in the south western corner of the car park. It should connect to the rest of the property drainage and this link needs to be shown.*

   This has been amended in our latest drawings showing a solid drainage pipe between Pits 11 and 10. Please find these drawings attached.

4. *A drainage pit is required at the top of the internal drainage line where the subsoil lines from the impermeable paving in the top car park meets the first solid drainage pipe.*

   This has been amended in our latest drawings as a new pit, Pit 9. Please find these drawings attached.

5. *The subsoil drainage line shown connecting the upstream and downstream pits in the central permeable paving car park is to be changed to a solid drainage pipe.*

   This has been amended in our latest drawings to show a solid drainage pipe.

6. *Pits are to be numbered and a Pit schedule provided showing pipe sizes and pit inverts.*

This has been added in our latest drawings to show pit sizes and inverts, as well as pipe sizes. It is noted that these are preliminary sizes only, to be confirmed pending full design at Construction Certificate stage.

Furthermore comment has been requested in response to **Item 6 - Landscaping,** regarding the existing overland flow path through the site.

It was noted that there is currently a clearly evident stormwater overland flow path on site which runs from approximately the rear of No 32 Cambronne Parade at the north of the subject site, southwards to a detention basin at its western most corner. The proposed Mosque straddles the flow path. While it is expected that this will have been taken into account by the applicant's hydraulic engineer, the Group suggested that it was highly desirable that an overland flow path be included in the design to cater for extreme downpour events.

As described above, this flow from upstream catchments has been catered for in a piped system traversing the site and has been sized for the 1 in 100yr ARI storm event plus a blocking factor.

In storm events larger than the 1 in 100yr ARI, water will spill into the swale provided in the stormwater easement on the western boundary as well as the proposed carpark in the eastern corner.

It is considered that the proposed flow regime will limit hazard to property in the design storm event as well as limit hazard to life in storms up to the PMF event.

We trust that this meets your requirements and the information supplied will be sufficient to facilitate Council's further assessment of this application. If you have any questions, please feel free to contact the undersigned on (02) 4943 1777 to discuss.

Yours sincerely,

Angus Brien
Civil Engineer

Attachments

Upstream Catchment Plan

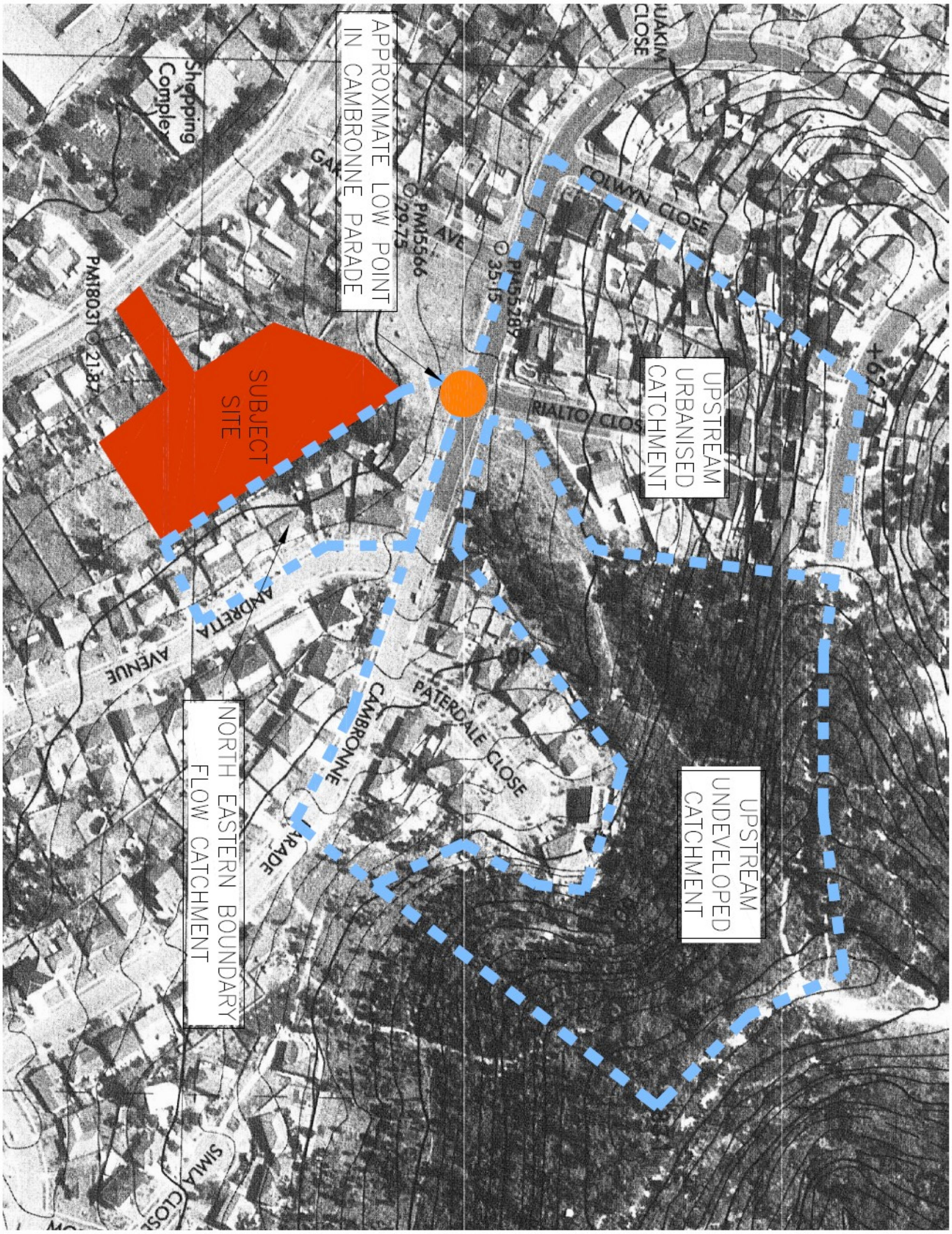
Upstream Catchment Probabilistic Rational Method Calculations

Western Boundary Easement Pipe Capacity

Manning's Channel Capacity Calculations

Revised Drawings

Upstream Catchment Plan



Upstream Catchment Probabilistic Rational Method Calculations

Catchment area = $77{,}350m^2$

C_{10p} = 0.43

Undeveloped area = $36{,}560m^2$

Assume developed area 70% impervious.

Impervious area = 0.7(77,350 – 36,560)
= $28{,}550m^2$

Impervious fraction = 28,550/77,350
= 0.369

C_{10} = $C_i.f + C_{10p}.(1 - f)$
= 0.9 x 0.369 + 0.43 x 0.631
= 0.60

FF_{100} = 1.20

Time of concentration is assumed to be 6 minutes.

$^{100}I_{6min}$ = 217mm/hr

Q_{100} = $C_{10}FF_{100}{}^{100}I_{6min}A/3.6x10^6$
= $0.60 \times 1.2 \times 217 \times 77{,}350 / 3.6x10^6$
= $3.40m^3/s$

Western Boundary Easement Pipe Capacity

Q = V.A

k = 0.6mm

g = $9.81m^2/s$

D = 0.9m

S = 0.07m/m

Q = V.A

v = $1.01 \times 10^{-6}\ m^2/s$

A = $0.636m^2$

V = $-2(2gDS)^{0.5}\log(k/(3.7D + 2.5v/[D(2gDS)^{0.5}]$
= 8.31m/s

Q = 8.31 x 0.636
= $5.2m^3/s$

Assume 50% blockage factor on system

Q_{cap} = 2.60m3/s

Q_{req} = 3.40 – 2.60
= 0.80m^3/s

Manning's Channel Capacity Calculations

Assume 0.80m^3/s required for secondary flow path along easement.

Grass swale n = 0.035

Slope S = 0.07

Section:

Base = 2.0m
Side batters = 1:2.5H
Depth = 0.20m

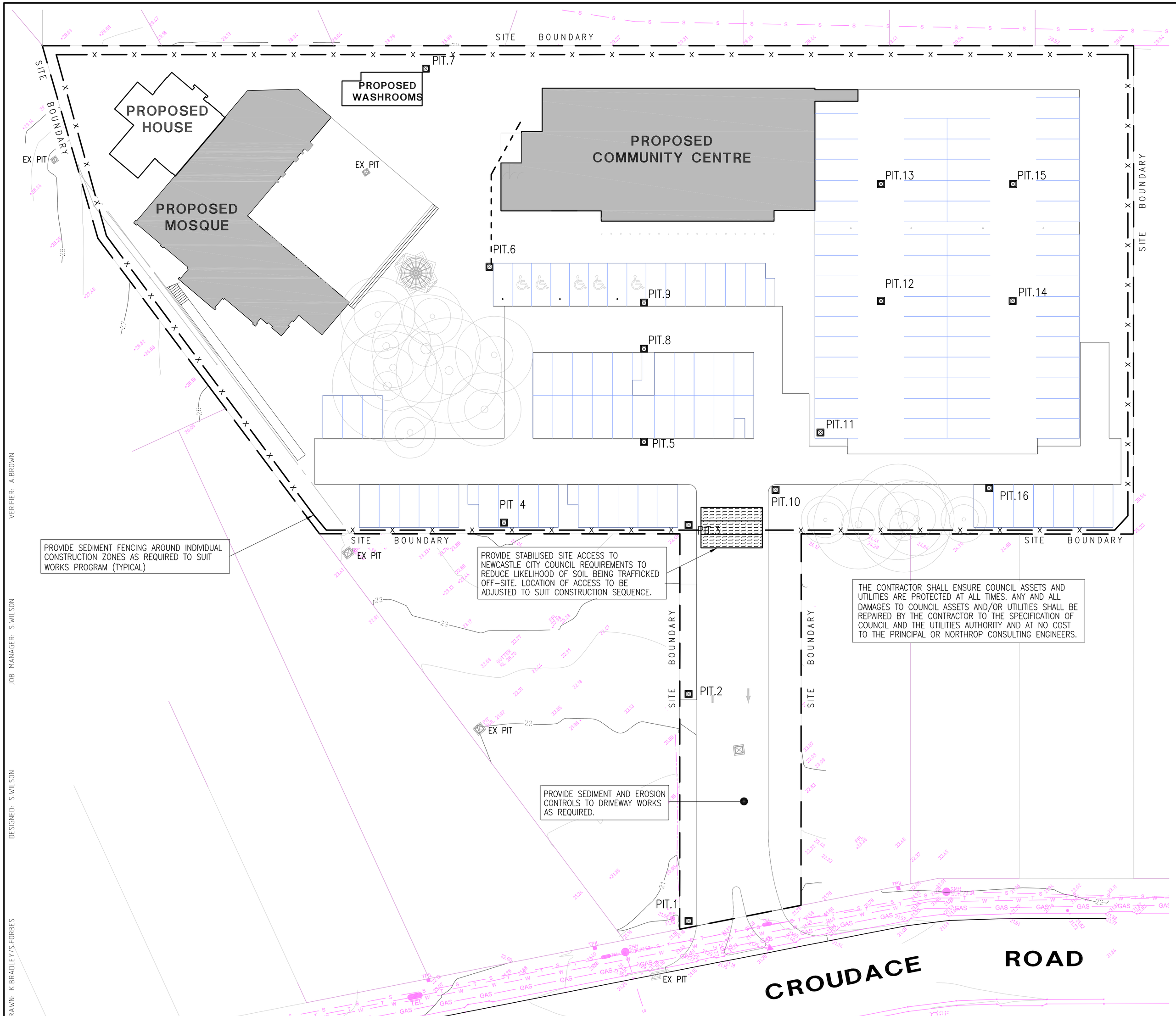
A = d/2(a+b)
= 0.2/(2+3)
= 0.50m^2

P = 2 sqrt(0.5^2 + 0.2^2)
= 3.08m

V = 1/n $(A/P)^{2/3}S^{1/2}$
= $(1/0.035)(0.50/3.08)^{2/3}0.07^{1/2}$
= 2.25m/s

Q = V.A
= 1.13m^3/s

Therefore swale can adequately convey to 1 in 100yr ARI storm peak flow.



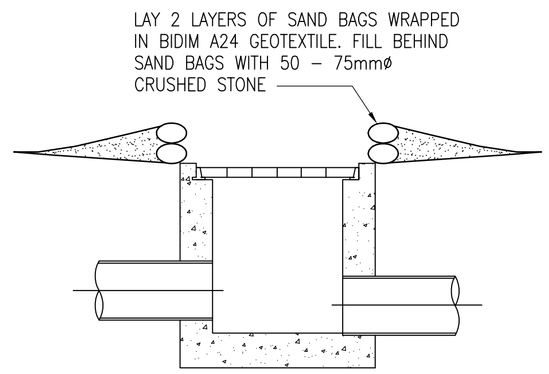
VERIFIER: A.BROWN
JOB MANAGER: S.WILSON
DESIGNED: S.WILSON
DRAWN: K.BRADLEY/S.FORBES

LEGEND

- DENOTES PROPOSED SEDIMENT CONTROL FENCE
- EX PIT — DENOTES EXISTING STORMWATER PIT
- DENOTES PROPOSED STABILISED SITE ACCESS
- PIT — DENOTES PROPOSED STORMWATER PIT

SEDIMENT & EROSION CONTROL NOTES

1. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH RELEVANT ORDINANCES AND REGULATIONS; NOTE IN PARTICULAR THE REQUIREMENTS OF LANDCOMS MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION' (THE 'BLUE BOOK').
2. INSTALL SEDIMENT PROTECTION FILTERS ON ALL NEW AND EXISTING STORMWATER INLET PITS IN ACCORDANCE WITH EITHER THE MESH AND GRAVEL INLET FILTER DETAIL SD6-11 OR THE GEOTEXTILE INLET FILTER DETAIL SD6-12 OF THE 'BLUE BOOK' OR THE DETAIL BELOW.
3. ESTABLISH ALL REQUIRED SEDIMENT FENCES IN ACCORDANCE WITH DETAIL SD6-8 OF THE 'BLUE BOOK'.
4. INSTALL SEDIMENT FENCING AROUND INDIVIDUAL BUILDING ZONES/AREAS AS REQUIRED AND AS DIRECTED BY THE SUPERINTENDENT.
5. ESTABLISH STAKED HAY-BALES IN ACCORDANCE WITH DETAIL SD6-7 OF THE BLUEBOOK AS REQUIRED.
6. ALL TRENCHES INCLUDING ALL SERVICE TRENCHES AND SWALE EXCAVATION SHALL BE SIDE-CAST TO THE HIGH SIDE AND CLOSED AT THE END OF EACH DAYS WORK.
7. ENSURE ALL VEGETATION (TREE, SHRUB & GROUND COVER) WHICH IS TO BE RETAINED IS PROTECTED DURING THE DURATION OF CONSTRUCTION. REFER ARCHITECTS PLANS FOR TREES TO BE KEPT.
8. CONSTRUCT AND MAINTAIN ALL MATERIAL STOCKPILES IN ACCORDANCE WITH DETAIL SD4-1 OF THE 'BLUE BOOK' (INCLUDING CUT-OFF SWALES TO THE HIGH SIDE AND SEDIMENT FENCES TO THE LOW SIDE).
9. ENSURE STOCKPILES DO NOT EXCEED 2.0m HIGH. PROVIDE WIND AND RAIN EROSION PROTECTION AS REQUIRED IN ACCORDANCE WITH THE 'BLUE BOOK'.
10. PROVIDE WATER TRUCKS OR SPRINKLER DEVICES DURING CONSTRUCTION AS REQUIRED TO SUPPRESS DUST.
11. ONCE CUT/FILL OPERATIONS HAVE BEEN FINALISED ALL DISTURBED AREAS THAT ARE NOT BEING WORKED ON SHALL BE RE-VEGETATED AS SOON AS IS PRACTICAL.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING A DETAILED WRITTEN RECORD OF ALL EROSION & SEDIMENT CONTROLS ON-SITE DURING THE CONSTRUCTION PERIOD. THIS RECORD SHALL BE UPDATED ON A DAILY BASIS & SHALL CONTAIN DETAILS ON THE CONDITION OF CONTROLS AND ANY/ ALL MAINTENANCE, CLEANING & BREACHES. THIS RECORD SHALL BE KEPT ON-SITE AT ALL TIMES AND SHALL BE MADE AVAILABLE FOR INSPECTION BY THE PRINCIPAL CERTIFYING AUTHORITY AND THE SUPERINTENDENT DURING NORMAL WORKING HOURS.
13. PROVIDE A STABILISED SITE ACCESS IN ACCORDANCE WITH DETAIL SD 6-14 OF 'THE BLUE BOOK'.
14. OBTAIN AND DISPLAY PROMINENTLY ANY REQUIRED SIGNAGE TO NEWCASTLE CITY COUNCIL REGULATIONS.



PIT PROTECTION DETAIL

ALTERNATIVE DETAIL TO DETAIL SD 6-11 OR SD 6-12 OF 'THE BLUE BOOK'

DA APPROVAL

ISSUE	AMENDMENT	VERIFIED	APPROVED	DATE
A	ISSUED FOR APPROVAL	BC	BC	27.07.10
B	RE-ISSUED FOR APPROVAL	BC	BC	17.02.11
C	RE-ISSUED FOR APPROVAL	BC	BC	18.02.11

CLIENT
NEWCASTLE MUSLIM ASSOCIATION

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT
DARDIRY & DOROCH ARCHITECTURAL SERVICES

HAKIM & HAMZAH

PLANS 1:250 0 2.5 5 7.5 10 12.5m

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE MAKING ANY SHOP DRAWINGS OR COMMENCING ANY WORK.

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PROJECT
PROPOSED COMMUNITY CENTRE AND MOSQUE
158A 164 CROUDACE ROAD ELERMORE VALE NSW

DRAWING TITLE
SEDIMENT AND EROSION CONTROL PLAN

JOB NUMBER **NL100012**
DRAWING NUMBER **C00 DA** ISSUE **C**
DRAWING SHEET SIZE = A1

PROPOSED REUSE TANK 3kL (MIN)

STAIRS FROM LOWER LEVEL

PROPOSED WASHROOMS FFL 29.00

FLOWS FROM UPSTREAM DIRECTED TO PIPED SYSTEM THROUGH CONCRETE DISH DRAINS

SITE BOUNDARY

PIT.19 CL 28.90 ø225 PL 29.00 DD

PIT.18 CL 28.50 ø300 PL 28.50 DD

PIT.17 CL 28.40 ø300 DD

PIT.7 CL 28.50 ø375 PL 28.70 DD

PIT.20 CL 28.60 ø375 PL 28.80 DD

PIT.21 CL 28.70 ø375 PL 28.90 DD

PIT.22 CL 28.80 ø300 PL 29.00 DD

PIT.23 CL 28.90 ø300 PL 29.10 DD

PIT.24 CL 29.00 DD

EX 29.63 EX 29.27 EX 29.54

FALL

PROPOSED HOUSE
FFL. 29.00

PL 28.995

PL 28.85

EX 27.50

ACCESS FROM FIRST FLOOR OF MOSQUE (MOSQUE FFL 29.00)

RAMP FROM LOWER LEVEL

PROPOSED COMMUNITY CENTRE
FIRST FLOOR FFL. 29.00

FFL. 28.00

PROPOSED CEREMONIAL BUILDING
FFL. 28.10

PL 28.995 PL 26.30 PL 27.20 PL 28.95 PL 28.995 PL 28.10 PL 28.85 PL 24.95 PL 28.99 PL 28.90 PL 27.90 PL 27.995 PL 27.85 PL 27.95

EXTERNAL PAVEMENTS SHALL BE CONSTRUCTED TO FALL AWAY FROM BUILDINGS AT MINIMUM 0.5% GRADE IN COVERED AREAS AND MINIMUM 1% GRADE IN UN-COVERED AREAS (TYPICAL).

RAMP

RAMP DOWN TO GROUND FLOOR

RAMP UP FROM GROUND FLOOR

PROPOSED FIRST FLOOR CARPARK

S CL 27.75 PL 27.95

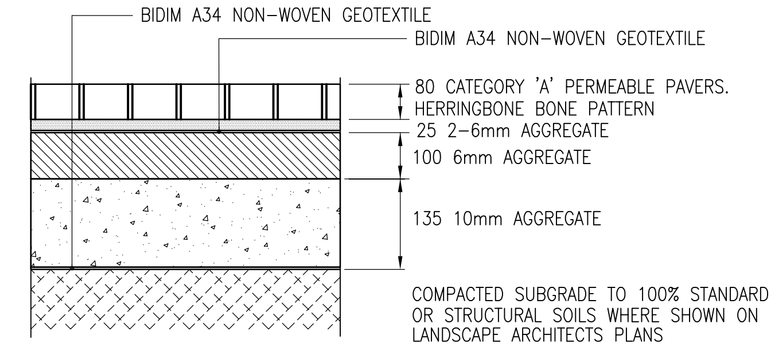
REFER TO C01 DA FOR DETAILS

PROPOSED SUMP INLET PITS IN THE SUSPENDED PAVEMENT SHALL COLLECT STORMWATER RUNOFF FOR CONTROLLED DISCHARGE TO THE STORMWATER NETWORK AT GROUND LEVEL. PIPEWORK SHALL BE PROVIDED FROM THE SUMPS, STRAPPED TO THE CARPARK STRUCTURE, TO CONVEY FLOWS TO GORUND LEVEL WITHOUT NUISANCE. FULL DETAILS SHALL BE PROVIDED AT CONSTRUCTION CERTIFICATE STAGE.

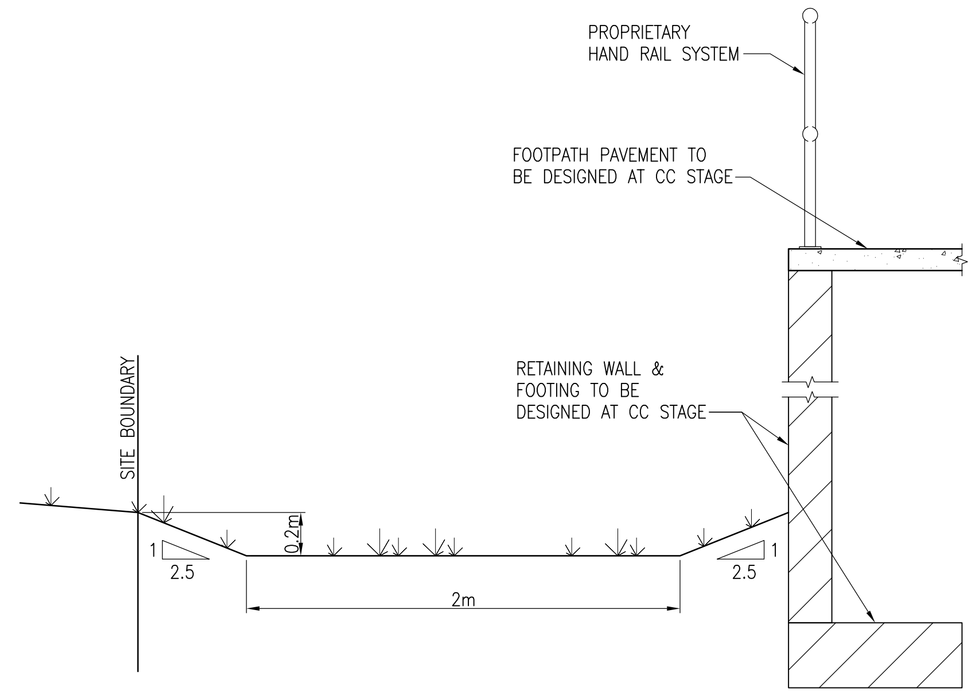
No.156 SINGLE STOREY DWELLING

CROUDACE ROAD

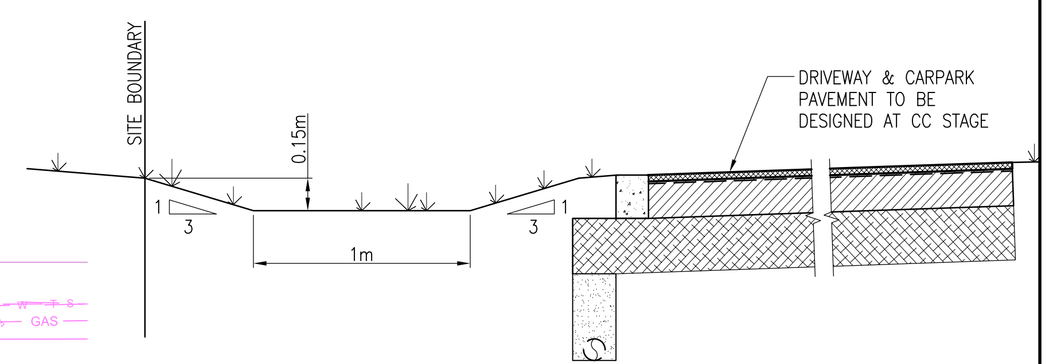
REFER TO DRAWING C01 DA FOR LEGEND



TYPICAL PERMEABLE PAVEMENT DETAIL



SECTION 1 C01DA



SECTION 2 C01DA

DA APPROVAL

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PLANS 1:250 0 2.5 5 7.5 10 12.5m

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PROJECT
PROPOSED COMMUNITY CENTRE AND MOSQUE
158A 164 CROUDACE ROAD ELERMORE VALE NSW

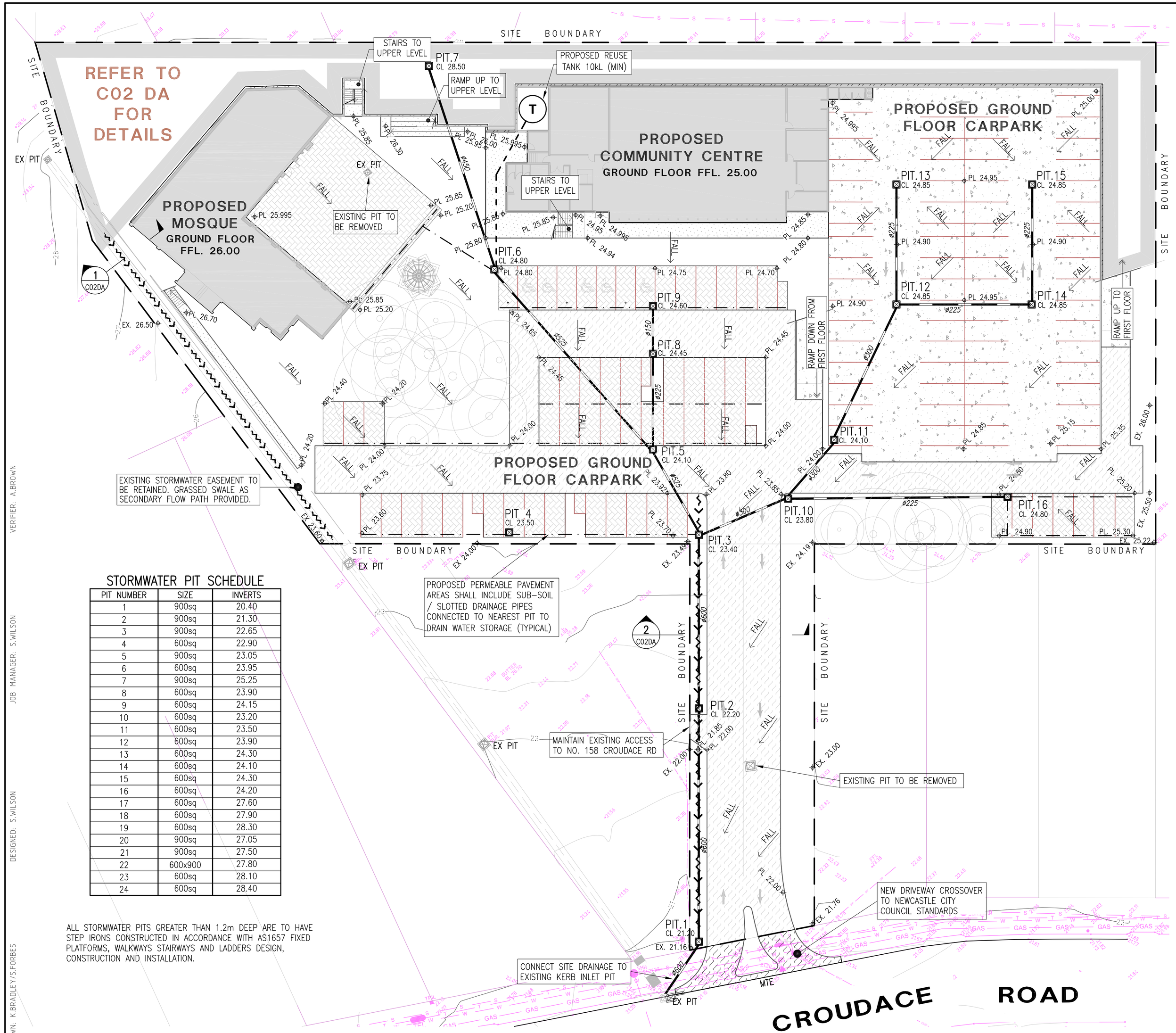
DRAWING TITLE
STORMWATER & LEVELS PLAN FIRST FLOOR

JOB NUMBER **NL100012**

DRAWING NUMBER **C02 DA** ISSUE **C**

DRAWING SHEET SIZE = A1

VERIFIER: A.BROWN
JOB MANAGER: S.WILSON
DESIGNED: S.WILSON
DRAWN: K.BRADLEY/S.FORBES



STORMWATER PIT SCHEDULE

PIT NUMBER	SIZE	INVERTS
1	900sq	20.40
2	900sq	21.30
3	900sq	22.65
4	600sq	22.90
5	900sq	23.05
6	600sq	23.95
7	900sq	25.25
8	600sq	23.90
9	600sq	24.15
10	600sq	23.20
11	600sq	23.50
12	600sq	23.90
13	600sq	24.30
14	600sq	24.10
15	600sq	24.30
16	600sq	24.20
17	600sq	27.60
18	600sq	27.90
19	600sq	28.30
20	900sq	27.05
21	900sq	27.50
22	600x900	27.80
23	600sq	28.10
24	600sq	28.40

ALL STORMWATER PITS GREATER THAN 1.2m DEEP ARE TO HAVE STEP IRONS CONSTRUCTED IN ACCORDANCE WITH AS1657 FIXED PLATFORMS, WALKWAYS STAIRWAYS AND LADDERS DESIGN, CONSTRUCTION AND INSTALLATION.

LEGEND

- PIT CL.43.05 — DENOTES PROPOSED STORMWATER PIT AND COVER LEVEL.
- ø300 — DENOTES PROPOSED STORMWATER PIPE & PRELIMINARY SIZING.
- S CL.43.05 — DENOTES PROPOSED SUMP INLET FOR STORMWATER DRAINAGE, DISCHARGING TO LOWER LEVEL VIA PIPEWORK.
- DENOTES EXISTING STORMWATER PIPE.
- EX PIT — DENOTES EXISTING STORMWATER PIT.
- PL 46.44 — DENOTES PROPOSED FINISHED SURFACE LEVEL
- EX. 46.50 — DENOTES EXISTING FINISHED SURFACE LEVEL
- DENOTES PROPOSED CONCRETE CARPARK PAVEMENT.
- DENOTES EXTENT OF PROPOSED TANKED PERMEABLE PAVEMENT, REFER TO C02 DA FOR DETAILS.
- DENOTES PROPOSED BITUMEN CARPARK PAVEMENT.
- DENOTES PROPOSED CONCRETE FOOTPATH.
- DENOTES APPROXIMATE LOCATION OF PROPOSED RETAINING WALLS, REFER TO ARCHITECTS PLANS FOR DETAILS.
- DENOTES PROPOSED GRASSED SWALE.
- T — DENOTES PROPOSED RAINWATER REUSE TANK.
- FALL — DENOTES PROPOSED DIRECTION OF FALL IN FINISHED SURFACE.
- DENOTES PROPOSED SUB-SOIL DRAINAGE LINE WITH NON-WOVEN GEOTEXTILE FILTER SOCK SURROUND.
- MTE — DENOTES MATCH TO EXISTING LEVELS.
- DD — DENOTES CONCRETE DISH DRAIN.

STORMWATER MANAGEMENT CONCEPT

STORMWATER RUNOFF FROM THE PROPOSED DEVELOPMENT WILL BE MANAGED IN ACCORDANCE WITH NEWCASTLE CITY COUNCIL'S DCP 2005 AND ASSOCIATED TECHNICAL GUIDELINES.

ROOFWATER RUNOFF FROM THE PROPOSED HOUSE AND FROM A PORTION OF THE PROPOSED MOSQUE BUILDING SHALL BE COLLECTED IN A (MIN 3kL) RAINWATER REUSE TANK VIA A GUTTER AND DOWNPIPE SYSTEM. HARVESTED RAINWATER SHALL BE REUSED FOR LANDSCAPING IRRIGATION AS WELL AS WITHIN THE PROPOSED HOUSE FOR TOILET FLUSHING AND LAUNDRY USE.

ROOFWATER RUNOFF FROM THE PROPOSED COMMUNITY CENTRE AND FROM THE NEARBY PROPOSED WASHROOMS SHALL BE COLLECTED IN A (MIN 10kL) RAINWATER REUSE TANK VIA A GUTTER AND DOWNPIPE SYSTEM. HARVESTED RAINWATER SHALL BE REUSED FOR LANDSCAPING IRRIGATION AS WELL AS WITHIN THE PROPOSED COMMUNITY CENTRE AND WOMEN'S WASHROOMS FOR TOILET FLUSHING.

FOR WATER QUALITY TREATMENT, PROPOSED DOWNPIPES SHALL BE FITTED WITH FIRST FLUSH DEVICES AND THE PROPOSED TANKS FITTED WITH APPROPRIATE SCREENS AND FILTERS. OVERFLOWS FROM THE PROPOSED RAINWATER TANKS SHALL BE DIRECTED TO THE PROPOSED SITE STORMWATER NETWORK FOR CONTROLLED DISCHARGE.

THE STORMWATER NETWORK FOR THE SITE SHALL CONSIST OF A PIT AND PIPE SYSTEM TOGETHER WITH APPROPRIATE SUB-SOIL DRAINAGE. SECTIONS OF PERMEABLE PAVEMENT SHALL PROVIDE STORMWATER DETENTION FOR THE IMPERVIOUS AREAS THAT DO NOT DRAIN TO THE PROPOSED RAINWATER REUSE TANKS.

RUNOFF FROM ADJACENT UPSTREAM PROPERTIES HAS BEEN CAPTURED IN CONCRETE DISH DRAINS AND DIRECTED TO A SERIES OF PITS RUNNING PARALLEL TO THE NORTH-EASTERN BOUNDARY. THE EXISTING DEPRESSION RUNNING THROUGH THE SITE HAS BEEN REPLACED BY A PIPED SYSTEM TO CATER FOR THE PEAK 1 IN 100 YEAR ARI STORM RUNOFF. THE STORMWATER EASEMENT RUNNING PARALLEL TO THE WESTERN BOUNDARY HAS BEEN MAINTAINED AND A SECONDARY FLOW PATH PROVIDED.

FOR WATER QUALITY TREATMENT, RUNOFF FROM IMPERVIOUS AREAS NOT DRAINING TO THE PROPOSED RAINWATER TANKS SHALL BE DIRECTED ACROSS LANDSCAPED AREAS AND / OR AREAS OF PERMEABLE PAVEMENT. PROPOSED STORMWATER INLET PITS AND SUMPS SHALL BE FITTED WITH APPROPRIATE FILTER INSERTS FOR THEIR LOCATIONS ON SITE.

CALCULATIONS:

TOTAL SITE AREA = 8279m² PROPOSED IMPERVIOUS AREA = 5643m²
PERCENTAGE IMPERVIOUS = 68%

FROM NCC DCP 2005 FIGURE B.4.1, 68% IMPERVIOUS AREA REQUIRES MIN 16.7mm STORAGE PER 1m² IMPERVIOUS AREA. THEREFORE TOTAL STORAGE VOLUME REQUIRED FOR SITE = 94kL.

STORAGE PROVIDED:

TANK 1 = 3kL (MIN) TANK 2 = 10kL (MIN)
PERMEABLE PAVEMENT = 81kL (MIN)

PERMEABLE PAVEMENT AREA = 790m². THEREFORE, TO ACHIEVE 81kL (MIN) STORAGE, A MINIMUM 260mm DEPTH OF AGGREGATE WITH A VOID SPACE RATIO OF 0.4 IS REQUIRED BELOW THE PAVERS.

DA APPROVAL

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JOB MANAGER: S.WILSON
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A	ISSUED FOR APPROVAL	BC	BC	27.07.10
B	RE-ISSUED FOR APPROVAL	BC	BC	17.02.11
C	RE-ISSUED FOR APPROVAL	BC	BC	18.02.11

CLIENT: NEWCASTLE MUSLIM ASSOCIATION

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT: DARDIRY & DOROCH ARCHITECTURAL SERVICES
HAKIM & HAMZAH

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE MAKING ANY SHOP DRAWINGS OR COMMENCING ANY WORK.

PLANS 1:250 0 2.5 5 7.5 10 12.5m

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Email newcastle@northrop.com.au ABN 81 094 433 100

PROJECT: PROPOSED COMMUNITY CENTRE AND MOSQUE
158A 164 CROUDACE ROAD ELERMORE VALE NSW

DRAWING TITLE: STORMWATER & LEVELS PLAN GROUND FLOOR

JOB NUMBER: NL100012
DRAWING NUMBER: C01 DA
ISSUE: C
DRAWING SHEET SIZE = A1