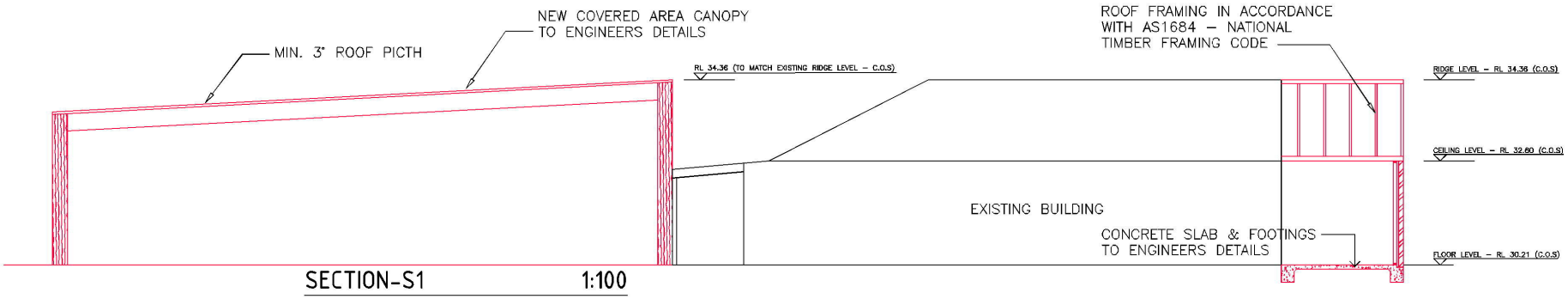
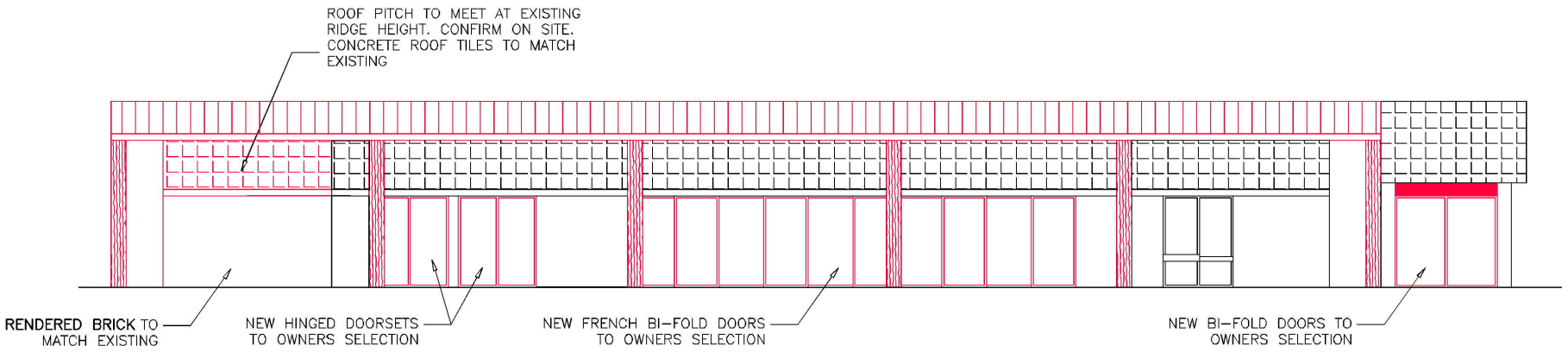
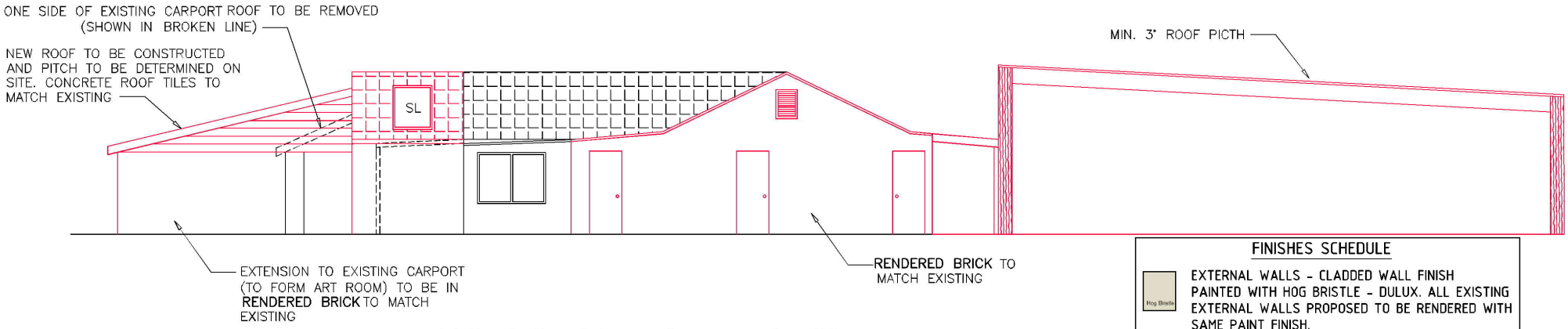


SECTION-S1 1:100



PROPOSED NORTHERN ELEVATION

Scale 1:100

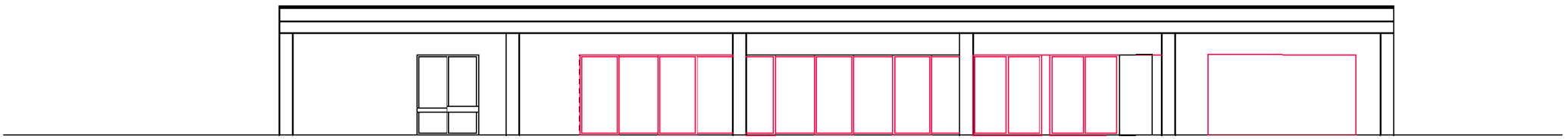


EXISTING EASTERN ELEVATION

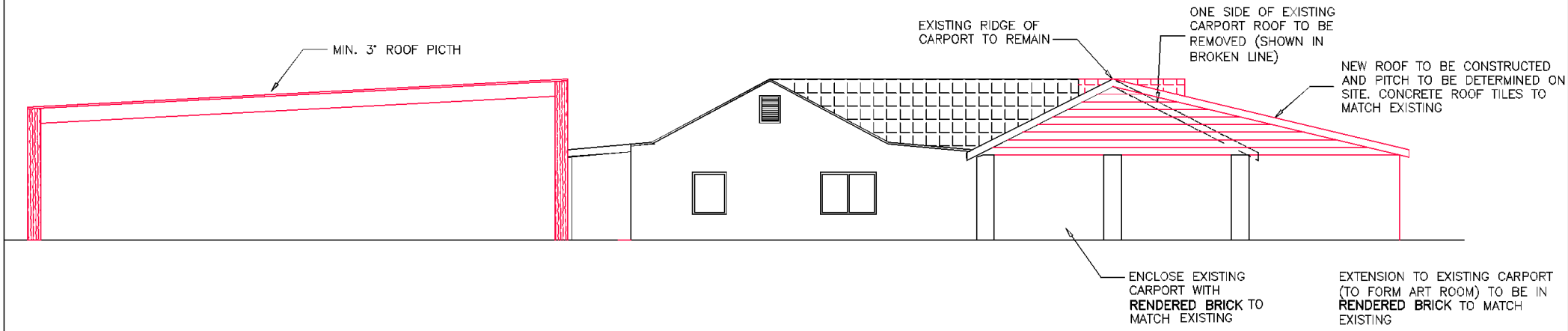
Scale 1:100

FINISHES SCHEDULE

- Hog Bristle — EXTERNAL WALLS - CLADDED WALL FINISH PAINTED WITH HOG BRISTLE - DULUX. ALL EXISTING EXTERNAL WALLS PROPOSED TO BE RENDERED WITH SAME PAINT FINISH.
- NEW WINDOWS AND DOORS - TO BE PAINTED IN MONUMENT (CHARCOAL GREY)-DULUX
- Domino — ROOF TO BE REPAINTED - DOMINO-DULUX

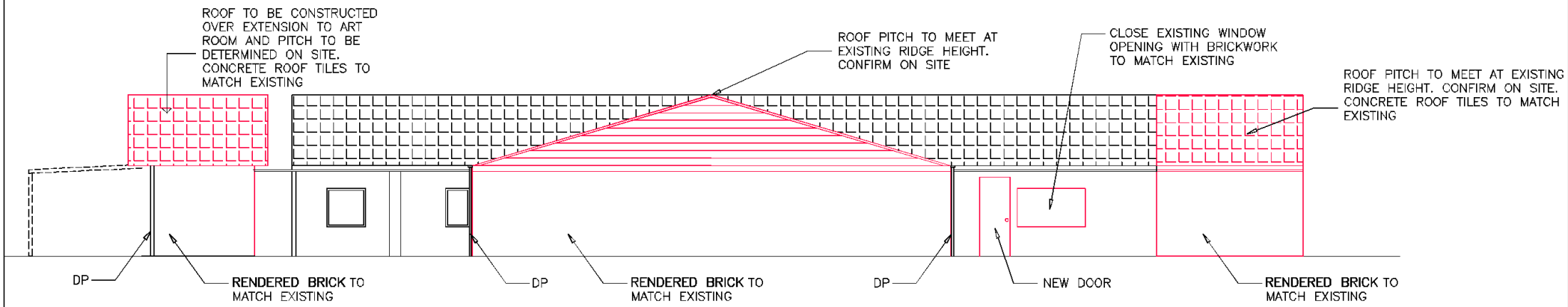


SECTION-S2 1:100



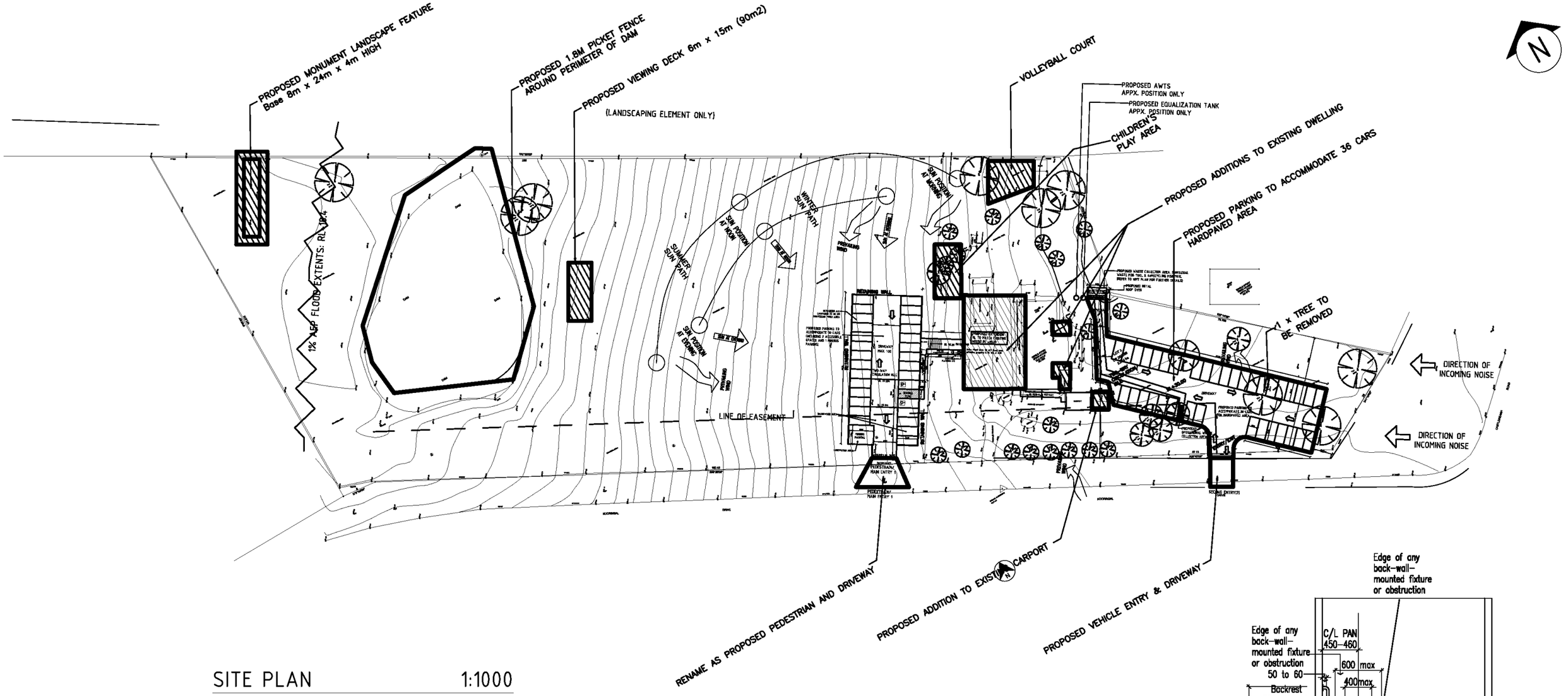
PROPOSED WESTERN ELEVATION

Scale 1:100

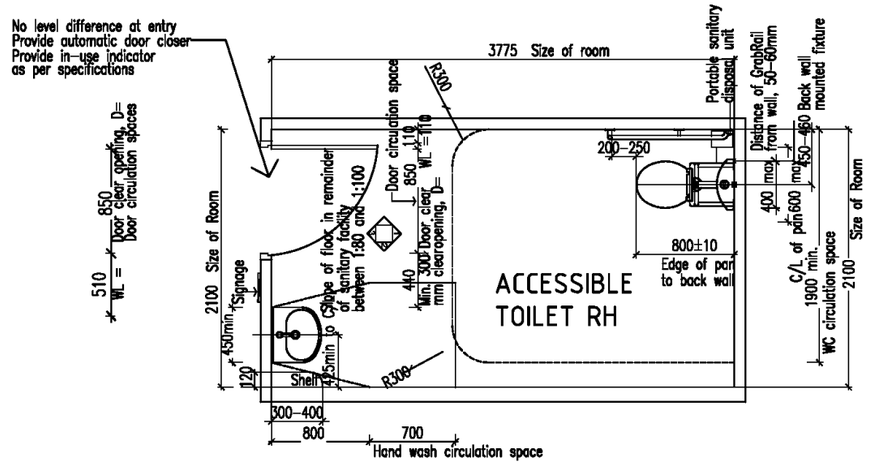


PROPOSED SOUTHERN ELEVATION

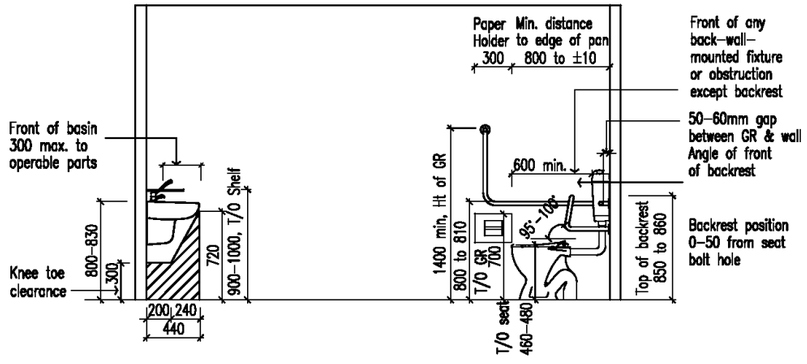
Scale 1:100



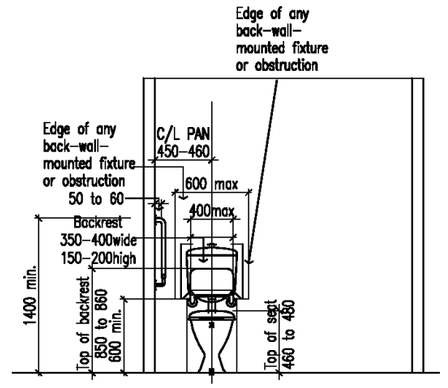
SITE PLAN 1:1000



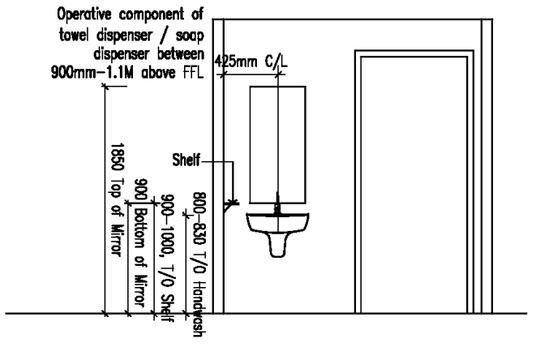
Accesible Toilet- Floor plan 1:50



Elevation 2 1:50



Elevation 1 1:50



Elevation 3 1:50

RETAINING WALL

REMAINDER ALL CARPARKS TO BE ON GRAVELLED FINISH AREA

PROPOSED PARKING TO ACCOMMODATE 30 CARS (INCLUDING 2 ACCESSIBLE SPACES AND 1 MINIBUS PARKING)

7100

DRIVEWAY MAX. 1:20

TWO-WAY CIRCULATION ISLE

RL 27.334

SHARED ZONE

RL 27.154

7200 MAX. 1:40

HARDPAVED AREA

6500

4985

MINIBUS PARKING

13080 MAX. 1:20

5400

6000

3370

ASSUMED RL 26.50

ENTRY/EXIT

PEDESTRAIN/ MAIN ENTRY 1

39175

RETAINING WALL

GRASSED AREA

11135

RL 27.664

FENCE

RL 30.20 ENTRY

Max 1:14

RL 28.165

6875

WHEELCHAIR PLATFORM LIFT

Max 1:20 To match driveway

6600

1200

1925

RETAINING WALL

PAVING

SWIMMING POOL

PROPOSED EXTENSION RL TO MATCH EXISTING HOUSE RL +30.20

Note- Flood level: 1% AEP flood level affecting property is RL 18.4 M AHD

CONCRETE

(AWNING ABOVE)

SHED

RIDGE 34.36

GRASSED AREA

SINGLE STORY BRICK HOUSE TILE ROOF NO 682

WASTE BINS

DRIVEWAY

ROCK

PEBBLED PATH

GARDEN

5000

3000

3985

4500

6010

CARPORT

RL 30.20 FLAT PATHWAY

PEBBLED DRIVEWAY

GARDEN

GRASSED AREA

PEBBLED DRIVEWAY

GRASSED AREA

RETAINING WALL

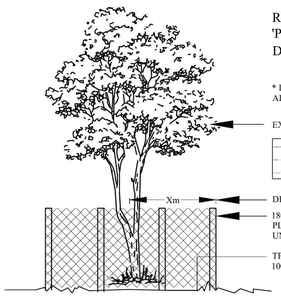
FENCE

WIRED

HARDPAVED AREA

PREVAILING WIND

FRONT CAR PARK 1:200



REFER TO AS 4970-2009 - 'PROTECTION OF TREES ON DEVELOPMENT SITES'

* IRRIGATION WITHIN TPZ AT ARBORIST OR COUNCIL DISCRETION

EXISTING TREE SPECIES

TPZ BARRIER
TPZ
SRZ

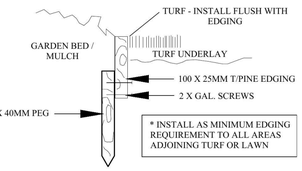
DISTANCE AS SHOWN ON PLAN

1800MM TEMPORARY FENCE HIRE WITH PLASTIC FEET - NO STAKES IN GROUND UNLESS SPECIFIED

TPZ TO BE MULCHED WITH A MINIMUM 100MM RECYCLED LEAF LITTER MULCH

TYPICAL TREE PROTECTION DETAIL - (NTS)

(IF NO ARBORIST REPORT REQUIRED)



TYPICAL EDGING (NTS)

PLANT SCHEDULE

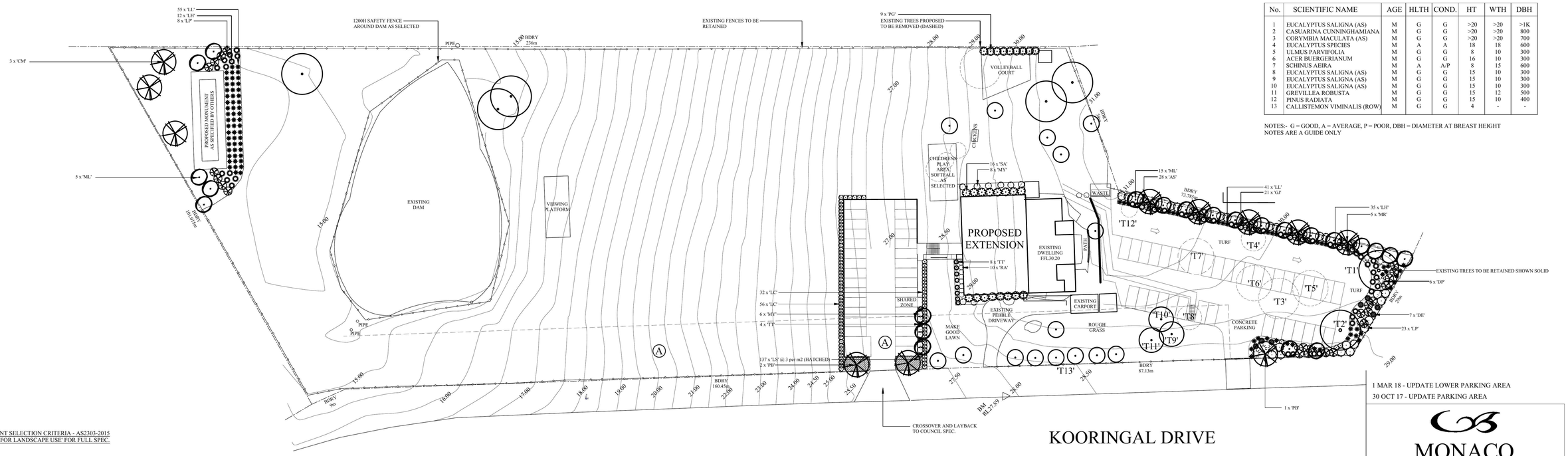
BOTANIC NAME	KEY	QTY	POT SIZE	HT (M)
TREES				
CORYMBIA MACULATA (SPOTTED GUM)*	CM	3	45L	10+
LAGERSTROEMIA 'TUSCAROA' (CREPE MYRTLE)	LT	3	45L	5-10
PYRUS 'BRADFORD' (FLOWERING PEAR)	PB	3	45L	5-10
MELALEUCA LINARIFOLIA (SNOW IN SUMMER)*	ML	20	45L	5-10
SHRUBS				
ACMENA 'SUBLIME' (LILLY PILLY)*	AS	28	200MM	3-5
TRACHELOSPERMUM TRICOLOUR	TT	12	150MM	GC
DORYANTHES EXCELSA (GYMEA LILY)*	DE	7	200MM	1.5
DORYANTHES PALMERI (GIANT SPEAR LILY)*	DP	6	200MM	2
GREVILLEA JUNIPERIANA (GREVILLEA)*	GJ	21	200MM	1.5
LEPTOSPERMUM PETERSONII (LEMON SCENTED TEA TREE)*	LP	31	200MM	4
LIRIOPE 'SAMANTHA' (LIRIOPE)	LS	137	150MM	0.3
LOMANDRA HYSTRIX (FLOWERING MAT RUSH)*	LH	47	150MM	1.5
LOMANDRA LONGIFOLIA (MAT RUSH)*	LL	96	150MM	1.2
MELALEUCA 'GREEN REVOLUTION' (PAPERBARK)*	MR	5	200MM	3
LEPTOSPERMUM 'CARDWELL' (TEA TREE)*	LC	88	200MM	1
MYOPORUM PARVIFOLIUM (CREEPING BOOBIALLA)*	MY	12	150MM	0.1
PHOTINIA GLABRA 'RUBENS' (PHOTINIA)	PG	9	200MM	2.5
RAPHIOLEPSIS 'APPLE BLOSSOM'	RA	10	150MM	1.5
SYZYGIUM 'AUSSIE COPPER' (LILLY PILLY)*	SA	16	200MM	3

* = NATIVE SPECIES

SCHEDULE OF EXISTING TREES

No.	SCIENTIFIC NAME	AGE	HLTH	COND.	HT	WTH	DBH
1	EUCALYPTUS SALIGNA (AS)	M	G	G	>20	>20	>1K
2	CASUARINA CUNNINGHAMIANA	M	G	G	>20	>20	800
3	CORYMBIA MACULATA (AS)	M	G	G	>20	>20	700
4	EUCALYPTUS SPECIES	M	A	A	18	18	600
5	ULMUS PARVIFOLIA	M	G	G	8	10	300
6	ACER BUERGERIANUM	M	G	G	16	10	300
7	SCHINUS AEIRA	M	A	A/P	8	15	600
8	EUCALYPTUS SALIGNA (AS)	M	G	G	15	10	300
9	EUCALYPTUS SALIGNA (AS)	M	G	G	15	10	300
10	EUCALYPTUS SALIGNA (AS)	M	G	G	15	10	300
11	GREVILLEA ROBUSTA	M	G	G	15	12	500
12	PINUS RADIATA	M	G	G	15	10	400
13	CALLISTEMON VIMINALIS (ROW)	M	G	G	4	-	-

NOTES:- G = GOOD, A = AVERAGE, P = POOR, DBH = DIAMETER AT BREAST HEIGHT
NOTES ARE A GUIDE ONLY



KOORINGAL DRIVE

1 MAR 18 - UPDATE LOWER PARKING AREA
30 OCT 17 - UPDATE PARKING AREA

TYPICAL PLANT SELECTION CRITERIA - AS2303-2015
'TREE STOCK FOR LANDSCAPE USE' FOR FULL SPEC.

ENSURE GOOD HEALTH AND VIGOUR. ENSURE FREEDOM FROM PESTS, DISEASES AND INJURY.

SPECIMENS SHOULD BE SELF SUPPORTING AT TIME OF PLANTING - STAKING ONLY TO BE USED WHEN NECESSARY - 1 GROWING SEASON MAX.

ENSURE EVIDENCE OF STEM TAPER - (INCREASE IN CALIPER DOWN THE STEM).

PRUNING:-
*ENSURE CLEAN STEM HEIGHT DOES NOT EXCEED 40% OF PLANT HEIGHT.
*ENSURE CUTS ARE AT BRANCH COLLAR ARE CLEAN WITH NO TEARS.

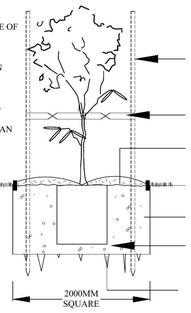
ENSURE APICAL DOMINANCE FOR TREES WITH TYPICAL EXCURRENT FORM - LEADER DEVIATION <15%.

ENSURE GOOD CROWN SYMMETRY AND SOUND STEM JUNCTIONS - NO INCLUDED BARK.

ENSURE SPECIMENS / BATCHES ARE CLEARLY LABELED - NOTING SPECIES CULTIVAR / VARIETY.

ENSURE SPECIMENS ARE FREE OF GIRDLING AND SUCKERING ROOTS.

ENSURE TRUNK POSITION IS WITHIN 10% OF POT CENTRE. IF TREE IS GRAFTED ENSURE SCION AND ROOTSTOCK ARE SOUND.



TYPICAL PLANTING CRITERIA

*SEEK ADVICE BEFORE SUBSTITUTING SPECIES
*REPLACEMENTS TO BE MADE WITHIN 12 MONTHS

3 x 40MM HARDWOOD STAKES AS REQUIRED. DON'T PIERCE ROOT BALL

(NOTE:- ONLY REQUIRED IN WINDY ENVIRONMENTS, VERY SANDY SOIL AND VERY WET CLAY - IF STAKING REQUIRED - REMOVE AS SOON AS PRACTICALLY POSSIBLE).

50MM WIDE JUTE WEBBING - TWIST ONCE AND GAL. STAPLE TO OUTSIDE OF STAKE. ENSURE TREE HAS AMPLE MOVEMENT

75 - 100MM SELECTED MULCH - DISH AROUND BASE OF TRUNK. TOP OF ROOT BALL TO FINISH FLUSH WITH TOP OF SOIL

SELECTED EDGING - REFER TO DETAIL

EXCAVATE HOLE AND INCORPORATE SOIL AMENDMENTS TO 30% MAX. IF REQUIRED.

TAMP SOIL GENTLY AROUND AND BENEATH ROOT BALL SO ROOT BALL DOES NOT MOVE - WATER WEEKLY FOR MINIMUM 4 WEEKS TO ESTABLISH.

SCARIFY SUB SOIL AND SIDES TO 100MM MINIMUM IN HEAVY CLAY SOILS. MAY BE REQUIRED TO MOUND PLANT.

45-75LTR TYPICAL PLANTING (NTS)

REFER TO HYDRAULICS ENGINEERS PLAN FOR OSD / DWARF WALL DETAILS - MULCH OSD WITH NON FLOATABLE DECORATIVE GRAVEL. ALL FINISHED GROUND LEVELS AS PER HYDRAULICS ENGINEERS DETAILS.

GENERAL NOTES:-

* LANDSCAPE CONTRACTOR TO CHECK DA CONDITIONS AND STAMPED LANDSCAPE PLAN BEFORE COMMENCING WORKS TO ENSURE NO ADDITIONS / AMENDMENTS TO PLAN.
* GARDEN BEDS IN OSD BASIN TO CONSIST OF NON FLOATABLE DECORATIVE GRAVEL.
* REFER TO HYDRAULICS ENGINEERS PLAN FOR OSD DETAILS / FINAL LEVELS.
* MULCHED PLANTING BEDS TO BE A MINIMUM DEPTH OF 75MM AS SELECTED.
* CONTRACTORS RESPONSIBILITY TO CHECK AND ADJUST SOIL pH AS REQUIRED.
* PROVIDE TIMBER EDGE AS A MINIMUM BENEATH FENCING / GATES TO DEFINE TURF AND GARDEN BEDS / PATHWAYS. EDGING TO BE PROVIDED TO ALL AREAS WHERE DIFFERING MATERIALS MEET, ie TURF / GARDEN, TURF / GRAVEL PATH ETC.
* WEED MAT BENEATH GRAVEL PATHWAYS REQUIRED TO LIMIT MUD TRACKING.
* PREMIUM ORGANIC GARDEN MIX TO BE USED.
* ALL PLANTS TO BE HEALTHY AND VIGOROUS.
* CONTRACTOR TO MAKE GOOD TURF ON NATURE STRIP POST CONSTRUCTION.
* DO NOT SCALE ARCHITECTURAL SETOUT FROM LANDSCAPE DRAWING.
* EXISTING TREE SPREAD APPROXIMATE ONLY. REFER TO TREE REPORT WHEN APPLICABLE.
* SITE SURVEY PROVIDED BY OTHERS.
* BUFFALO TURF PREFERRED OVER KIKUYU.

ALL FENCING SURROUNDING THE POOL / OSD BASIN ARE TO COMPLY WITH THE SWIMMING POOLS ACT 1992 AND AS.1926.1-2012

STREET TREES AND TURF TO BE PROTECTED DURING CONSTRUCTION (NOT SHOWN ON CONTOUR PLANS PROVIDED). ANY DAMAGE TO TURF AND STREET TREE TO BE RECTIFIED AS PART OF THE LANDSCAPE WORKS. THE METHODS OF TREE PROTECTION SHALL COMPLY WITH AUSTRALIAN STANDARD 4970-2009 – 'PROTECTION OF TREES ON DEVELOPMENT SITES' (IF NO DETAILED ARBORICULTURAL IMPACT REPORT IS REQUIRED).

MONACO DESIGNS PL
14 York Street, Glenbrook NSW, 2773
ph & fax: 0247395136 mb: 0409123200
email: paul@monaco.net.au

PROJECT:
PROPOSED CULTURAL CENTRE

ADDRESS:
682 CASTLREAGH ROAD,
AGNES BANKS

CLIENT:
C/o- MR RICK SHAH

TITLE: DA
LANDSCAPE CONCEPT

DATE:	SCALE:	SHEET No:
25 MAY 17	1 : 500 - A1	1 OF 1
JOB No.	DRAWN:	
4675	CJ / PM	

TREE REPORTS
LANDSCAPE PLANS
VEGETATION MANAGEMENT PLANS

NOTE:- MONACO DESIGNS PL RESERVES THE RIGHT NOT TO UNDERTAKE NOR SUPPLY CERTIFICATION FOR OCCUPATION CERTIFICATE.
NOTE:- TO AID COMPLIANCE WITH BASIX LEGISLATION, PLANTS (WHERE APPLICABLE) HAVE BEEN SELECTED FROM THE LOCAL CITY COUNCIL / SHIRE PLANT LISTS.
NOTE:- LOCATION OF SEWER MAINS / LINES, WATER PIPES, UNDERGROUND ELECTRICITY AND OTHER SERVICES MUST BE OBTAINED PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. DIAL BEFORE YOU DIG 1100.

DIAL 1100 BEFORE YOU DIG

STORMWATER MANAGEMENT PLAN
PROPOSED COMMUNITY FACILITY
682 CASTLEREAGH RD, CASTLEREAGH, NSW (PCC LGA)

GENERAL

- THESE DRAWINGS CAN BE USED IN CONJUNCTION WITH ARCHITECTS AND OTHER CONSULTANTS DRAWINGS.
  ANY DIFFERENCES ARE TO BE REFERRED TO THE ENGINEER PRIOR TO PROCEEDING WORK.
- ALL MATERIALS AND WORKMANSHIP MUST MEET AS/NZS 3500.3:2003 STORMWATER DRAINAGE, BCA AND LOCAL COUNCIL DEVELOPMENT POLICIES, CONSENTS AND REQUIREMENTS.
- ALL DIMENSIONS AND LEVELS TO BE VERIFIED BY THE BUILDER PRIOR TO COMMENCEMENT OF WORKS. THIS INCLUDES EXISTING SERVICES AND/OR OTHER STRUCTURES THAT MAY AFFECT/BE AFFECTED BY THIS DESIGN PRIOR TO CONSTRUCTION.
- ALL SURVEY INFORMATION, PROPOSED BUILDING LEVELS, FINISHED SURFACE LEVELS AND SITE DETAILS SHOWN IN THESE DRAWINGS ARE BASED UPON LEVELS OBTAINED FROM DETAILS BY OTHERS.
- THESE DRAWINGS DEPICT THE DESIGN OF SURFACE STORMWATER RUNOFF DRAINAGE SYSTEMS ONLY AND DO NOT DEPICT ROOF DRAINAGE OR SUBSOIL DRAINAGE SYSTEMS UNLESS NOTED OTHERWISE. THE DESIGN OF ROOF AND SUBSOIL DRAINAGE SYSTEMS ARE THE RESPONSIBILITY OF OTHERS.
- IT IS THE BUILDERS RESPONSIBILITY TO LOCATE AND LEVEL ALL EXISTING SERVICES OR OTHER STRUCTURES WHICH MAY AFFECT/BE AFFECTED BY THIS DESIGN PRIOR TO COMMENCEMENT OF WORKS.
- UNLESS NOTED OTHERWISE, ALL LEVELS ARE IN METRES AND DIMENSIONS IN MILLIMETRES.
- ANY SUBSTITUTION OF MATERIALS SHALL BE APPROVED BY THE ENGINEER AND INCLUDED IN THE DEVELOPMENT APPLICATION.
- THIS DRAWING IS NOT TO BE USED FOR SET-OUT PURPOSES. REFER TO ARCHITECTURAL DRAWINGS.
- CONTRACTOR TO INVESTIGATE ALL EXISTING SERVICES AND APPLY FOR "DIAL BEFORE YOU DIG" BEFORE CONSTRUCTION COMMENCES.

COMPLIANCE

- THESE PLANS WERE PREPARED IN ACCORDANCE WITH COUNCIL'S POLICIES AND REQUIREMENTS, AS 3500:2013, BASIX REQUIREMENTS, ARR(1997), ARQ (2006), RELEVANT LEGISLATION, AND NSW MUSIC MODELLING GUIDELINES.
- THE OSD SYSTEM DESIGN PRESENTED HAS BEEN MODELLED TO LIMIT THE POST-DEVELOPMENT RUNOFF TO PRE-DEVELOPMENTS RUNOFF FOR ALL DESIGN STORM EVENTS (1 IN 1YR ARI TO 1 IN 100YR ARI)

SCOPE OF WORKS

- DETAILED DESIGN, MODELLING AND DOCUMENTATION FOR THE FOLLOWING (WHERE APPLICABLE): ROOFED, IMPERVIOUS AND PERVIOUS AREAS; RAINWATER REUSE SYSTEM; OSD; AND STORMWATER DISPOSAL.

ROOFING

- EAVES GUTTERS & DOWNPIPES TO BE CONSTRUCTED ACCORDINGLY TO AS 3500. IT IS THE RESPONSIBILITY OF THE PLUMBER AND/OR BUILDER TO COMPLY.
- ROOF GUTTERS TO HAVE OVERFLOW PROVISION SET IN ACCORDANCE WITH AS/NZS 3500.3:2003 AND SECTIONS 3.5.3, 3.7.5.
- DOWNPIPES SHALL BE Ø100mm uPVC MINIMUM U.N.O.
- EAVES GUTTERS SHALL BE A MINIMUM OF 125W X 100D COLORBOND OR ZINCALUME STEEL.

TREES

- IT IS THE RESPONSIBILITY OF THE BUILDER TO OBTAIN ANY PRIOR APPROVAL REQUIRED FROM COUNCIL WITH RESPECT TO POTENTIAL IMPACT ON TREES.

RAINWATER RE-USE TANK

- SIZE: MIN. 1 X 11.566kL RAINWATER TANK
- INSTALL TO MANUFACTURES SPECIFICATIONS, AS3500 AND COUNCIL REQUIREMENTS
- FOR RE-USE AS SPECIFIED BY BASIX CERTIFICATE
- TANK TO BE INSTALLED BY LICENSED PLUMBER IN ACCORDANCE WITH AS/NZS 3500:2003 AND NSW CODE OF PRACTICE PLUMBING AND DRAINAGE 2006

MINIMUM PIPE COVER

TOP OF PIPE TO FINISHED SURFACE LEVEL

LOCATION	MINIMUM COVER (mm) CAST IRON DUCTILE IRON GALV. STEEL	MINIMUM COVER (mm) OTHER AUTHORISE PRODUCTS×
1. NOT SUBJECT TO VEHICULAR LOADING:		
(a) WITHOUT PAVEMENT –		
(i) FOR SINGLE DWELLINGS	0	100
(ii) FOR ITEMS OTHER THAN (i)	0	300
(b) WITH PAVEMENT OF BRICK/ UNREINFORCED CONCRETE	0 (†)	50 (†)
2. SUBJECT TO VEHICULAR LOADING:		
(a) OTHER THAN ROADS		
(i) WITHOUT PAVEMENT	300	450
(ii) WITH PAVEMENT OF:		
- REINFORCED CONCRETE FOR HEAVY VEHICULAR LOADINGS	0 (†‡)	100 (†‡)
- BRICK/UNREINFORCED CONCRETE FOR LIGHT VEHICULAR LOADING	0 (†‡)	75 (†‡)
(b) ROADS		
(i) SEALED	300	500 (‡)
(ii) UNSEALED	300	500 (‡)
3. SUBJECT TO CONSTRUCTION EQUIPTMENT OR IN EMBANKMENT CONDITIONS	300	500 (‡)

× INCLUDES OVERLAY ABOVE TOP OF THE PIPE OF NOT LESS THAN 50mm THICK
† BELOW THE UNDERSIDE OF THE PAVEMENT
‡ SUBJECT TO COMPLIANCE WITH AS 1762, AS 2033, AS/NZS 2566.1, AS 3725, AS 4060

MODELLING AND CALCULATIONS

- SEE ATTACHED DRAINS MODEL AND OUTPUT DATA (ELECTRONIC COPY ONLY)

DRAINAGE LINES

- ALL DRAINAGE LEVELS TO BE CONFIRMED ON SITE, PRIOR TO COMMENCING CONSTRUCTION.
- TRENCH BACKFILL IN ROADWAYS TO COMPRISE OF SHARP, CLEAN GRANULAR BACKFILL IN ACCORDANCE WITH LOCAL AUTHORITY SPEC.
- SUBSOIL DRAINAGE SHALL BE PROVIDED TO ALL RETAINING WALLS AND EMBANKMENTS WITH THE LINES FEEDING INTO THE STORMWATER DRAINAGE SYSTEM.

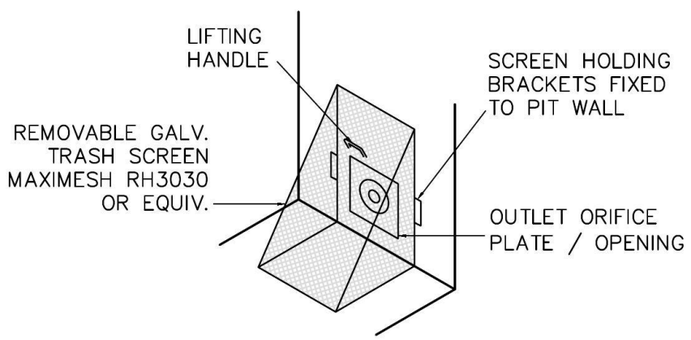
MINIMUM PIPE Ø (U.N.O)	mm
a) WHERE THE LINE ONLY RECIEVES ROOFWATER	90
b) WHERE THE LINE RECIEVES RUN -OFF FROM PAVED/UNPAVED AREAS OF THE SITE	100

MINIMUM STORMWATER DRAIN GRADIENT (U.N.O)	
NOMINAL SIZE Ø (mm)	MIN. GRADE
90 to < 225	1:100 (1%)
225 to < 300	1:200 (0.5%)
300 to < 375	1:250 (0.4%)
375 +	1:300 (0.33%)

PITS

- ALL PITS WITHIN DRIVEWAYS TO BE 150mm THICK CONCRETE OR EQUIVALENT.
- PIT CONSTRUCTION WITHIN THE SUBJECT PROPERTY ARE TO BE OF THE FOLLOWING:
  a) PRECAST STORMWATER PITS
  b) CAST INSITU MASS CONCRETE
  c) CEMENT RENDERED 230mm BRICKWORK
  ALL PIT CONSTUCTION IS SUBJECT TO RELEVANT LGA SPEC.
- ALL PITS ARE TO BE FITTED WITH APPROVED GALAVANISED STEEL GRATES:
  a) LIGHT DUTY FOR LANDSCAPED AREAS
  b) HEAVY DUTY WHERE SUBJECT TO VEHICULAR TRAFFIC
- ALL PITS IN ROADWAYS ARE TO BE FITTED WITH LOCKING BOLTS AND CONTINUOUS HINGE.
- PROVIDE STEP IRONS TO STORMWATER PITS > 1200mm IN DEPTH.
- ALL PIPES SHOULD BE CUT FLUSH WITH THE WALL OF THE PITS.
- THE GRATED COVERS OF PITS LARGER THAN 600 X 600mm ARE TO BE HINGED.
- THE BASE OF THE DRAINAGE PITS SHOULD BE THE SAME LEVEL AS THE INVERT OF THE OUTLET PIPE.
- RAINWATER SHOULD NOT BE PERMITTED TO POND WITHIN THE STORMWATER SYSTEM.

MINIMUM INTERNAL DIMENSIONS FOR STORMWATER/INLET PITS				
DEPTH TO INVERT OF OUTLET			INTERNAL WIDTH	INTERNAL LENGTH
	≤ 600		450	450
> 600	≤ 900		600	600
> 900	≤ 1200	600	900	
> 1200		900	900	



TYPICAL TRASH SCREEN DETAIL
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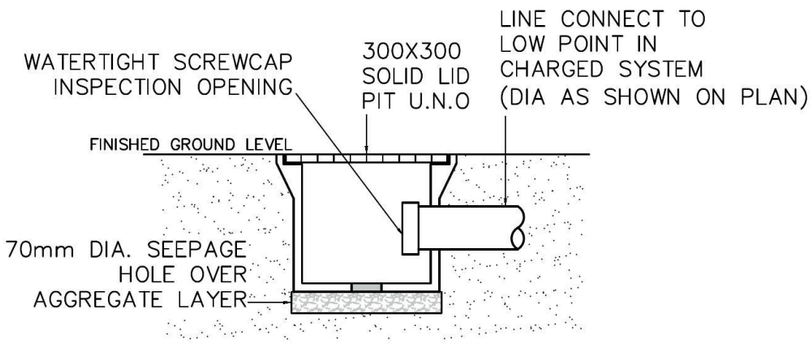

CHARGED LINE CLEANOUT PIT DETAIL
N.T.S.

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TITLE: STORMWATER MANAGEMENT PLAN NOTES

PROJECT: PROPOSED COMMUNITY FACILITY
682 CASTLEREAGH RD, CASTLEREAGH, NSW (PCC LGA)

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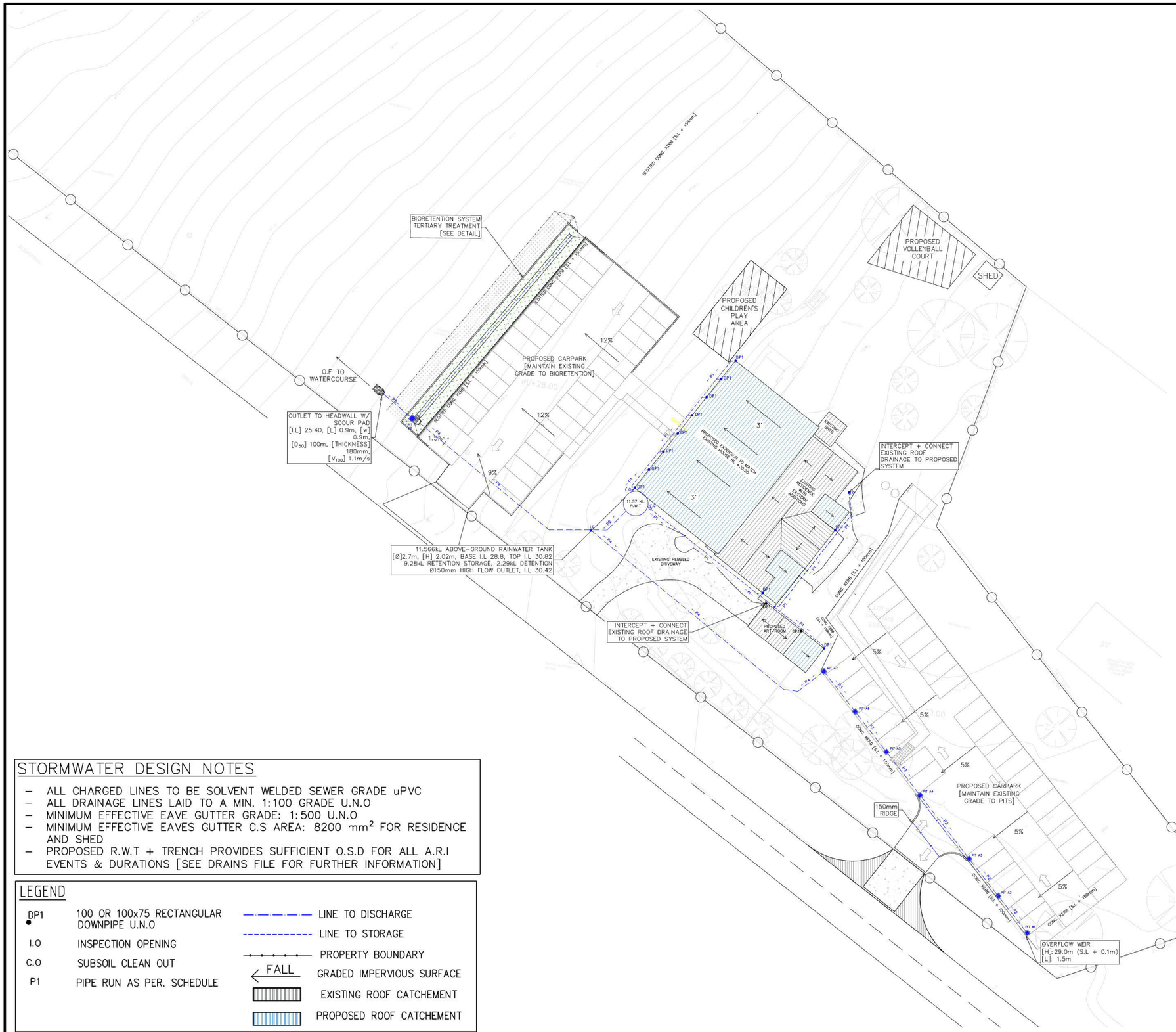

PIT SCHEDULE

NO.	DIMENSIONS (MM)	TYPE	SURFACE LEVEL [S.L]	INVERT LEVEL [I.L]
A1	450x450	CLASS–C GRATED	28.90	28.440
A2	450x450	CLASS–C GRATED	29.00	28.354
A3	450x450	CLASS–C GRATED	29.15	28.268
A4	450x450	CLASS–C GRATED	29.48	28.133
A5	450x450	CLASS–C GRATED	29.70	28.036
A6	450x450	CLASS–C GRATED	29.80	27.944
A7	450x450	CLASS–C GRATED	30.05	27.852
A8	600x600	CLASS–A GRATED	25.977	25.177

NOTE: PITS A1–A7 FITTED WITH ECOSOL 1500um LITTER BASKETS

PIPE SCHEDULE

NO.	MATERIAL	DIAMETER (MM)	GRADE
P1	uPVC	100	1% MINIMUM (1:100)
P2	uPVC	150	1% MINIMUM (1:100)
P3	uPVC	225	1% (1:100)
P4	uPVC	225	3% (1:33)
P5	uPVC	300	1% (1:100)

STORMWATER DESIGN NOTES

- ALL CHARGED LINES TO BE SOLVENT WELDED SEWER GRADE uPVC
- ALL DRAINAGE LINES LAID TO A MIN. 1:100 GRADE U.N.O
- MINIMUM EFFECTIVE EAVE GUTTER GRADE: 1:500 U.N.O
- MINIMUM EFFECTIVE EAVES GUTTER C.S AREA: 8200 mm^2 FOR RESIDENCE AND SHED
- PROPOSED R.W.T + TRENCH PROVIDES SUFFICIENT O.S.D FOR ALL A.R.I EVENTS & DURATIONS [SEE DRAINS FILE FOR FURTHER INFORMATION]

LEGEND

DP1 ●	100 OR 100x75 RECTANGULAR DOWNPIPE U.N.O
I.O	INSPECTION OPENING
C.O	SUBSOIL CLEAN OUT
P1	PIPE RUN AS PER. SCHEDULE
——·——·——	LINE TO DISCHARGE
----------	LINE TO STORAGE
·-·-·-·-·-	PROPERTY BOUNDARY
FALL ←	GRADED IMPERVIOUS SURFACE
▨	EXISTING ROOF CATCHEMENT
▨	PROPOSED ROOF CATCHEMENT

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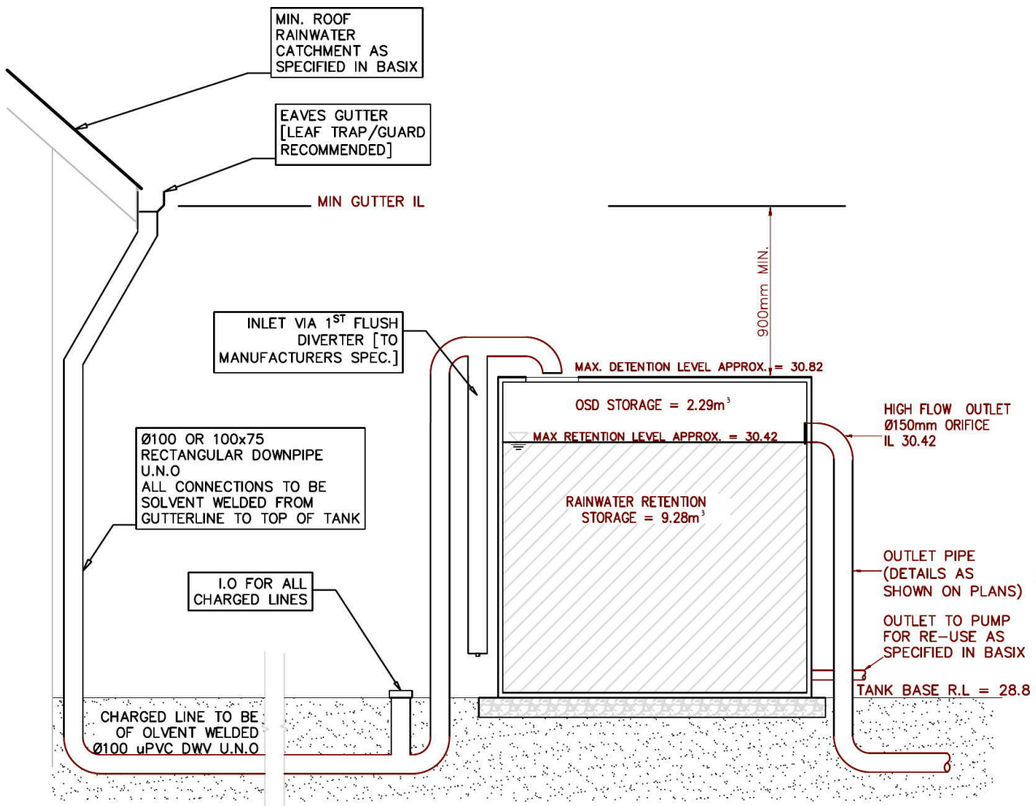
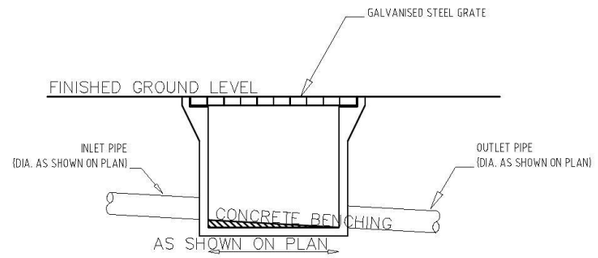


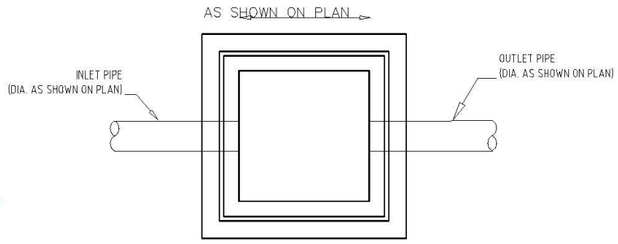
TYPICAL DETAIL – CHARGED LINE TO RAINWATER TANK

N.T.S.



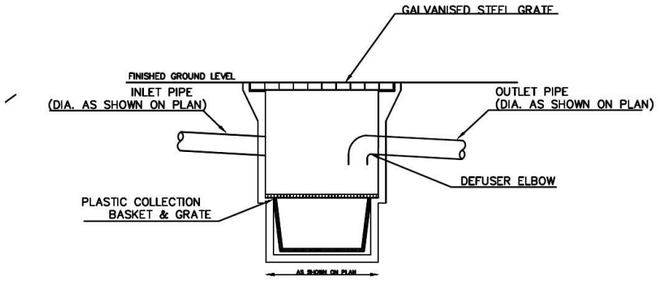
TYPICAL STORMWATER PIT SECTION

N.T.S



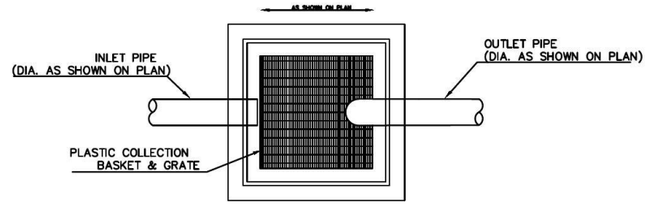
TYPICAL STORMWATER PIT PLAN (WITHOUT GRATE)

N.T.S



TYPICAL STORMWATER SILT ARRESTOR SECTION

NOT TO SCALE



TYPICAL STORMWATER SILT ARRESTOR PLAN (WITHOUT PRIMARY GRATE)

NOT TO SCALE

RAINWATER TANKS IN DETENTION/RETENTION SYSTEMS – MAINTENANCE CHECKLIST

Regular maintenance shall include clean–out of First flush devices and control pits, removal of leaves and debris from inlet & outlet leaf guards and litter/orifice screens, and clean–out of downpipes and gutters. Rainwater tanks and detention systems are to be inspected and maintained to ensure no sediment and debris accumulates on the base/floor of impedes outlet orifices.

ITEM INSPECTED	CHECKED		MAINTENANCE NEEDED		INSPECTION FREQUENCY
	Y	N	Y	N	
FIRST FLUSH DEVICE / CONTROL PITS					
clear of debris and not blocked					2M
DEBRIS CLEANOUT					
Basin/tank surfaces clear of debris					6M
Inlet & outlets areas clear of debris					6M
Overflow pipe/weirs clear of debris					6M
INLET SCREENS					
Leaves and debris on surface					6M
ROOF GUTTERS & DOWNPIPES					
Leaves and debris in gutters					6M
SEDIMENT LEVEL IN TANK					
Sediment level					6M
Presence of debris					6M
TANK/DETENTION STRUCTURES					
Check for corrosion					2A
Check footings					2A
Check access grates					6M
OUTLET PIPES & ORIFICES					
Evidence of blockages					A
Pipe conditions					A
Orifice plate condition					A

GROSS POLLUTANT TRAPS/SILT ARRESTORS– MAINTENANCE CHECKLIST

To be inspected and maintained regularly, particularly after major storm events for accumulation of debris and sediment. Routine maintenance ensures trapping efficiency and prevents remobilisation of debris and sediment that can occur when GPTs/Silt Arrestors are over storage capacity. Smaller GPTs/Silt Arrestors may be serviced via manual handling and removal whilst larger systems may require vacuum clean–out or mechanically assisted basket/net removal. Clean–out & maintenance shall be conducted outside of rain predicted periods.

ITEM INSPECTED	CHECKED		MAINTENANCE NEEDED		INSPECTION FREQUENCY
	Y	N	Y	N	
FIRST FLUSH DEVICE / CONTROL PITS					
clear of debris and not blocked					2M
DEBRIS CLEANOUT					
Basin/tank surfaces clear of debris					6M
Inlet & outlets areas clear of debris					6M
Overflow pipe/weirs clear of debris					6M
INLET SCREENS					
Leaves and debris on surface					6M
ROOF GUTTERS & DOWNPIPES					
Leaves and debris in gutters					6M
SEDIMENT LEVEL IN TANK					
Sediment level					6M
Presence of debris					6M
TANK/DETENTION STRUCTURES					
Check for corrosion					2A
Check footings					2A
Check access grates					6M
OUTLET PIPES & ORIFICES					
Evidence of blockages					A
Pipe conditions					A
Orifice plate condition					A

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TITLE: R.W.T AND PIT DETAILS

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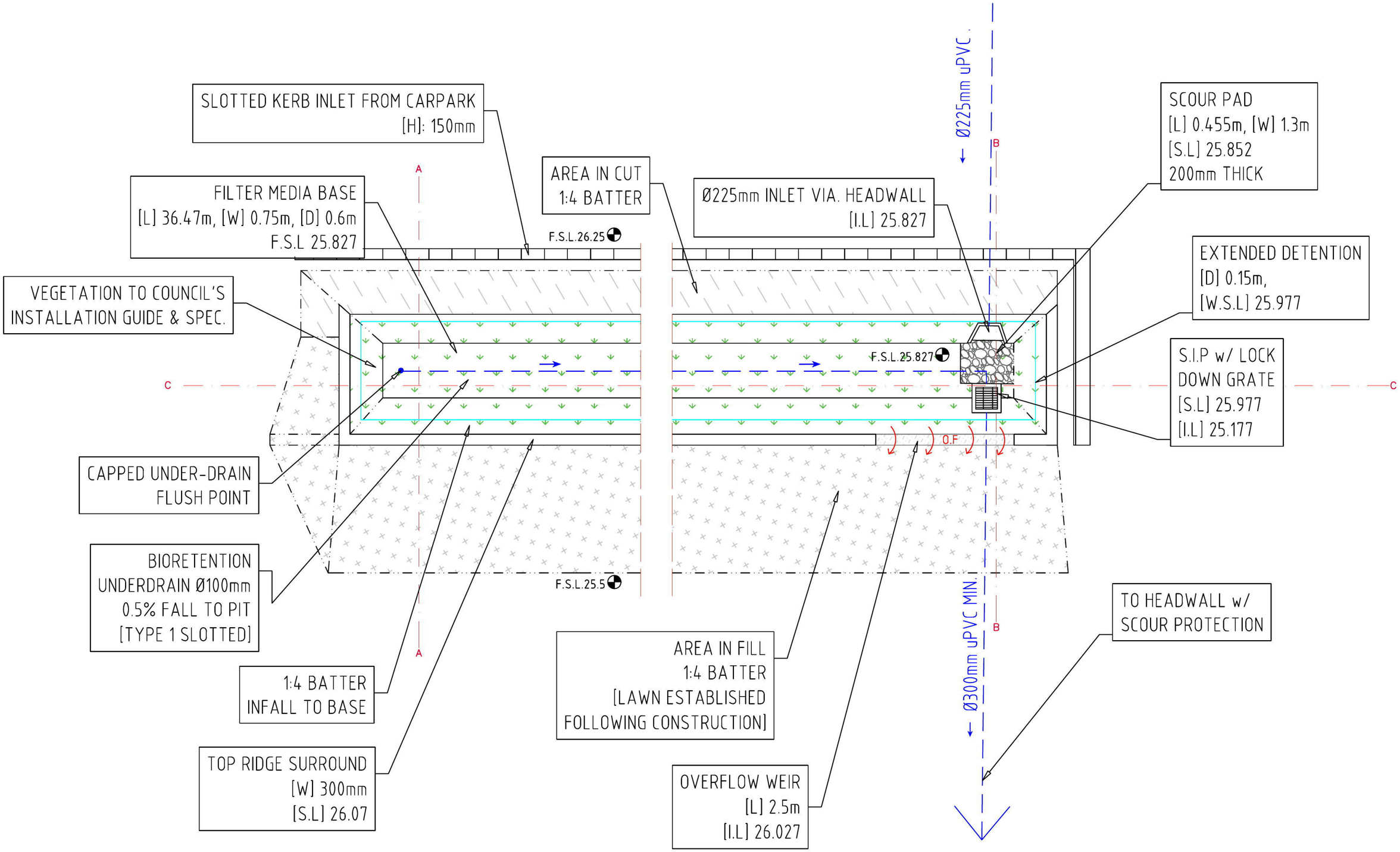

Bioretention Basin – PLAN VIEW

N.T.S.

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TITLE: BIORETENTION BASIN - PLAN VIEW

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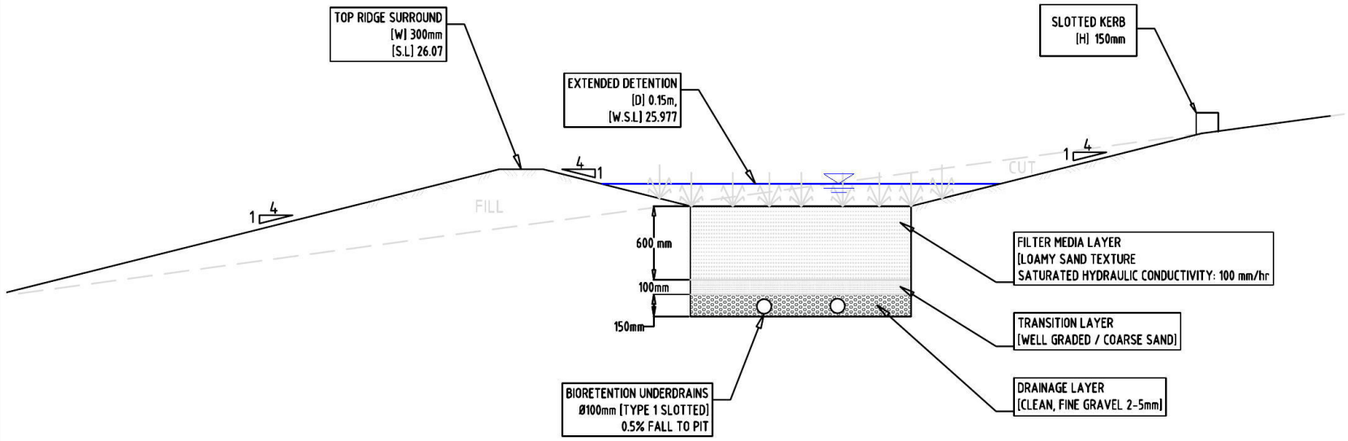

Bioretention Basin – Section A–A
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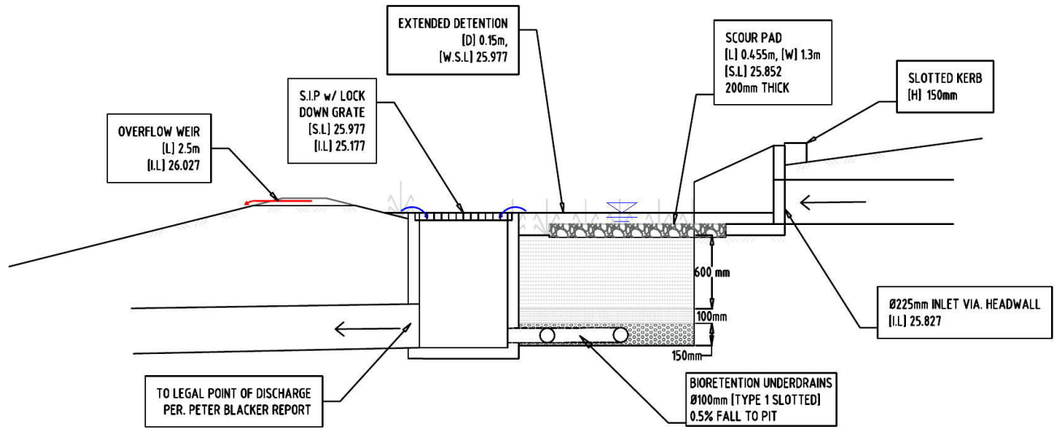

Bioretention Basin – Section B–B
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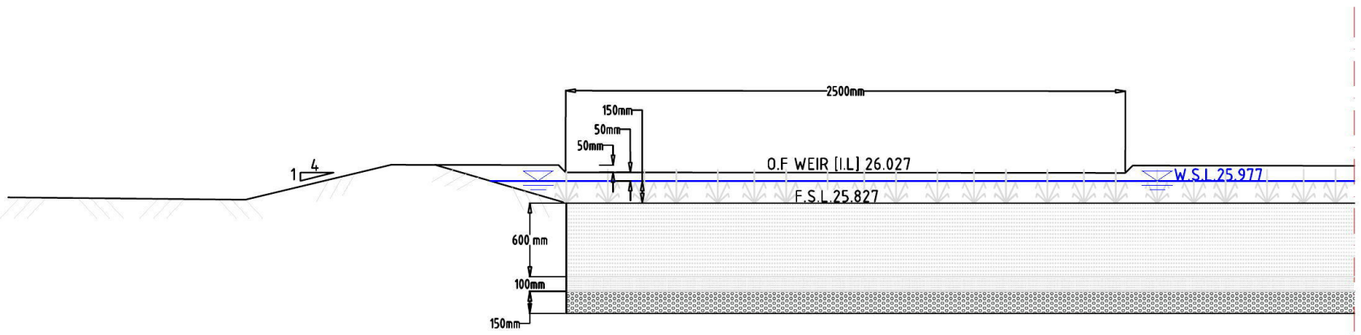

Bioretention Basin – Section C–C
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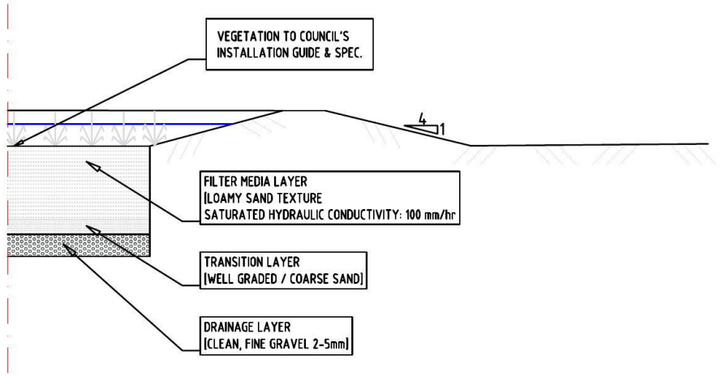

Bioretention Systems – MAINTENANCE CHECKLIST

Frequent maintenance and removal of fine clogging particles is essential to extend filter media life and reduce long–term replacement costs. Maintenance is to ensure flow to–and–through systems, maintenance of surface vegetation, prevent weed growth or vegetation overgrowth, remove accumulated sediment and debris.

ITEM INSPECTED	CHECKED		MAINTENANCE NEEDED		INSPECTION FREQUENCY
	Y	N	Y	N	
DEBRIS CLEANOUT					
Surface clear of drebris					6M
Inlet area clear of debris					6M
Overflow clear of debris					6M
SURFACE VEGETATION					
Vegetation condition					6M
Vegetation trimming / maintenance					6M
Weed infestation					6M
Evidence of erosion					6M
DEWATERING					
Bioretention dewatering between storms					6M
Top soil layer require replacement?					6M
Entire filter media require replacement?					6M
OUTLET / OVERFLOW CHANNEL OR PIT					
Pit, grate, weir or outlet condition					A
Evidence of cracking or spalling of concrete structures					A
Evidence of erosion in downstream channel					A

LANDSCAPE DEVELOPMENTS – MAINTENANCE CHECKLIST

Landscaped areas in the site are to be inspected and maintained to ensure that any damaged vegetation is repaired / replaced, mulch is applied and reapplied as required, watering / irrigation is practiced appropriately and as needed and any surface erosion or scouring identified and repaired.

ITEM INSPECTED	CHECKED		MAINTENANCE NEEDED		INSPECTION FREQUENCY
	Y	N	Y	N	
PLANT SURVIVAL					
Dead plants identified and replaced					3M
Alternate species used if soil moisture unsuitable					3M
IRRIGATION SYSTEM CHECK					
Plants show no evidence of moisture stress					3M
Repair / replace any damaged components					
Adjust irrigation program if necessary					3M
DRAINAGE PATTERN					
Subsurface drainage required to prevent waterlogging					3M
Modification to surface drainage required to direct stormwater to planted areas					3M

Filter Media Material Requirements

- Loamy Sand Texture
- Saturated Hydraulic Conductivity = 100mm/hr
- pH 5.5–7.5 & Electrical Conductivity (EC) <1.2dS/m
- Particle Size Distribution:
  - Clay & Silt (<3%) (<0.05mm)
  - Very Fine Sand (5% to 30%) (0.05mm to 0.15mm)
  - Fine Sand (10% to 20%) (0.15mm to 0.25mm)
  - Medium to Course Sand (40% to 60%) (0.25mm to 1.00mm)
  - Course Sand (7% to 20%) (1.00mm to 2.00mm)
  - Fine Gravel (<3%) (2.00mm to 3.4mm)

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TITLE: BIORETENTION BASIN DETAILS

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STORMWATER QUALITY MANAGEMENT

The stormwater management system for the site is to be reviewed and treated accordingly with the proposed treatment measures detailed within this report.The measures proposed comply with the LGA Development Control Plan and NSW MUSIC Modelling Guidelines.

OBJECTIVES

The objective of the development with respect to stormwater quality is to treat the discharge to obtain the environmental objectives as stated within the LGA Development Control Plan. The objective for stormwater quality improvement is a reduction in the exported average annual pollutant loads as follows:

- 90% Reduction of Gross Pollutant
- 85% Reduction of Total Suspended Solids
- 65% Reduction of Total Phosphorous
- 45% Reduction of Total Nitrogen

PROPOSED TREATMENT MEASURES

Stormwater quality treatment devices include:

- 11.566KL General use Rainwater Tank as he proposed facility's non-potable water source and for irrigation purposes
- Ecosol litter basket traps (1500μm) for all eastern carpark pits
- A vegetated Bioretention Basin to receive all development run-off for the removal of pollutants.

WATER QUALITY MODELLING

Stormwater quality modelling was undertaken using the software package Model for Urban Stormwater Improvement Conceptualisation (MUSIC). The program models the total amounts of gross pollutants, suspended solids and nutrients produced within various types of catchment. Modifications of treatment nodes can be implemented within the model to reduce expected growth of nutrient levels on a proposed development.

The model MUSIC V6.1 has been used to assess the water quality improvement measures for the development. The modelling was undertaken using 6-minute time-step local rainfall data and Potential Evapotranspiration Data sourced from the Bureau of Meteorology via climate data requests.

Music-Data: penrithdevelopment.mlb

MUSIC MODELLING RESULTS

The figures on the following page represents the MUSIC modelling source, treatment and receiving nodes used for this site.

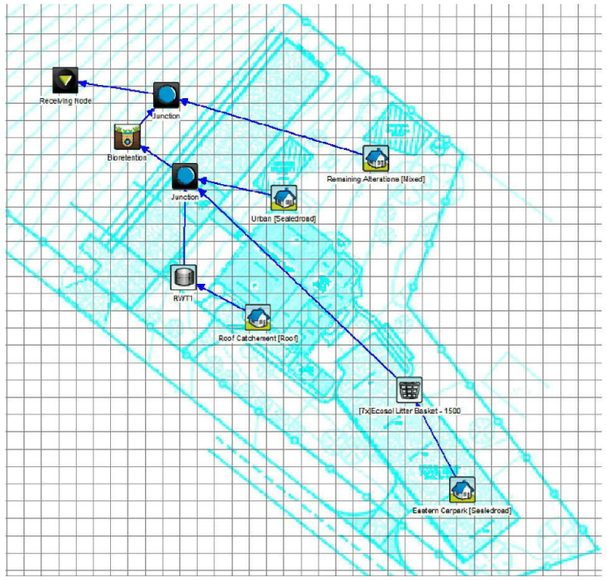

Figure 1. – Treatment Train Schematic

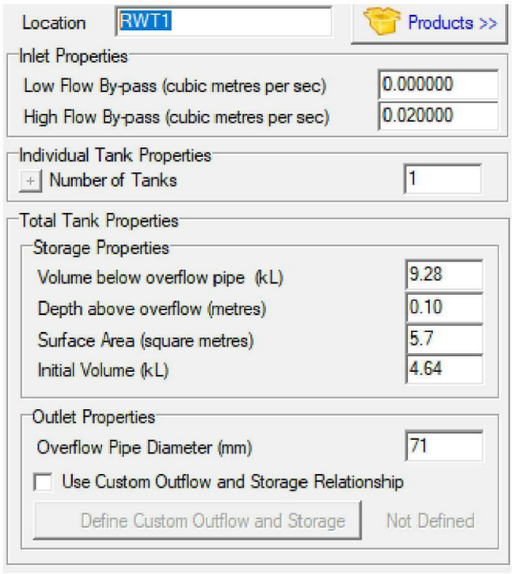

Figure 2. – 11.56kl reuse R.W.T

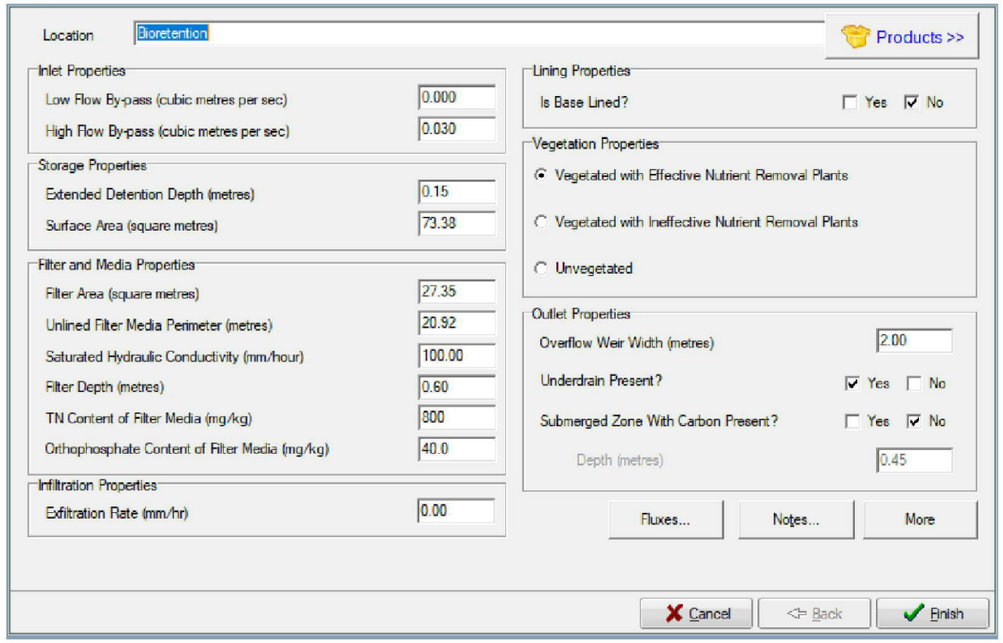

Figure 3. – Bioretention Basin

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Table 4. – 7x Ecosol Litter Baskets [1500um] Treatment Train Effectiveness

	Sources	Residual Load	% Reduction
Flow (ML/yr)	0.621	0.621	0
Total Suspended Solids (kg/yr)	219	218	0.4
Total Phosphorus (kg/yr)	0.366	0.366	0
Total Nitrogen (kg/yr)	1.49	1.49	0
Gross Pollutants (kg/yr)	17.4	0.522	97

Table 1. – 11.56kl Reuse R.W.T Treatment Train Effectiveness

	Sources	Residual Load	% Reduction
Flow (ML/yr)	0.408	0.407	0.1
Total Suspended Solids (kg/yr)	10.7	7.82	27.1
Total Phosphorus (kg/yr)	0.0613	0.0573	6.5
Total Nitrogen (kg/yr)	0.906	0.821	9.4
Gross Pollutants (kg/yr)	11.4	0.00804	99.9

Table 5. – Bioretention Basin Treatment Train Effectiveness

	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.54	1.48	3.7
Total Suspended Solids (kg/yr)	408	43.7	89.3
Total Phosphorus (kg/yr)	0.724	0.177	75.5
Total Nitrogen (kg/yr)	3.6	1.8	50
Gross Pollutants (kg/yr)	43.1	0.3	99.3

Table 6. – Receiving Node Treatment Train Effectiveness

	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.61	1.55	3.5
Total Suspended Solids (kg/yr)	421	56.8	86.5
Total Phosphorus (kg/yr)	0.745	0.199	73.4
Total Nitrogen (kg/yr)	3.76	1.96	47.9
Gross Pollutants (kg/yr)	45.6	2.83	93.8

The results highlight that the proposed treatment devices will satisfy the objectives of reducing sediments and pollution concentration runoff within the property. The quality of the water flowing out from the development will meet water quality targets and will not have a negative effect on the receiving stormwater node outside of the allowable thresholds. The tables presented illustrate the level of pollution concentrations at the receiving node and the principle treatment nodes.

RECOMMENDATIONS

The stormwater treatment system for the site is to be constructed as per this report and the associated stormwater management plan drawings.

REFERENCES

NSW MUSIC Modelling Guidelines Urban Stormwater Best Practice Environmental Management Guidelines (BPEMG)

National Water Commission (2008). Rainwater Tank Design and Installation Handbook

Australian Runoff Quality: Guide to Water Sensitive Design (2006)

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Limitations Statement
EnviroTech Pty. Ltd. has undertaken the following report in accordance with the scope of works set out between EnviroTech Pty. Ltd. and the client. The impacts of future events may require future investigation of the site and subsequent data analysis, together with a re-evaluation of the conclusions and recommendations of this report.

In preparing this report, EnviroTech Pty. Ltd has relied upon, and assumed accurate, certain site information provided by the client and other persons. Except as otherwise stated in the report, we have not attempted to verify the accuracy or completeness of any such information. EnviroTech Pty. Ltd. accepts no liability or responsibility whatsoever for or in respect to any use or reliance upon this report by any third party.

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Wastewater Stormwater Bushfire
Contamination Ecology Acoustic & Noise
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TITLE
STORMWATER MANAGEMENT PLAN NOTES

PROJECT
PROPOSED COMMUNITY FACILITY
682 CASTLEREAGH RD, CASTLEREAGH, NSW (PCC LGA)

envirotech
Consulting Group

APPROVED ON BEHALF OF ENVIROTECH PTY. LTD
Jacob Madden
B.E. (Civil)(Const.)

JOB No.	DWG No.	SCALE.
17-5222-A3	8 / 8	N.T.S