APPENDIX 5 – CIVIL DESIGN PLANS

WARNERS BAY PRIVATE HOSPITAL, WARD EXTENTION
42 FAIRFAX ROAD, WARNERS BAY 2282
STORMWATER DRAINAGE MANAGEMENT PLAN

DWG No.	SHEET INDEX
C1.01	COVER SHEET, NOTES AND LEGENDS
C2.01	STORMWATER MANAGEMENT PLAN - LOWER GROUND CARPARK
C2.02	STORMWATER MANAGEMENT PLAN - GROUND FLOOR
C3.01	CIVIL DETAILS
C4.01	SOIL EROSION AND SEDIMENT CONTROL PLAN AND DETAILS
C4.02	SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

CIVIL LEGEND

- K&G — KERB AND GUTTER
- KO — KERB ONLY
- DD900 — DISH DRAIN 900 WIDE
- + Ex 11.00 — EXISTING LEVEL
- + 11.00 — PROPOSED LEVEL
- RL 11.00 — REDUCED LEVEL OF PITS
- FFL 11.63 — FINISHED FLOOR LEVEL
- SW — STORMWATER DRAINAGE LINE
- RW — RAINWATER DRAINAGE LINE
- EXISTING STORMWATER DRAINAGE LINE TO BE DEMOLISHED
- Ø100 SW — DENOTES STORMWATER PIPE DIAMETER. MINIMUM GRADE 1% U.N.O.
- RETAINING WALL
- DP — DOWN PIPE
- IR — INTERMEDIATE RISER
- STORMWATER PIT
- DENOTES RAINWATER TANK
- DENOTES ON SITE DETENTION TANK
- FINISHED SURFACE CONTOUR
- FIRST FLUSH INFILTRATION SYSTEM
- HEADWALL WITH SCOUR PROTECTION

SITEWORKS NOTES

1. ORIGIN OF LEVELS :- AUSTRALIAN HEIGHT DATUM (A.H.D.)
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK.
3. ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS, THE SPECIFICATIONS AND THE DIRECTIONS OF THE PRINCIPAL'S REPRESENTATIVE.
4. EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE PRINCIPAL'S REPRESENTATIVE. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
5. WHERE NEW WORKS ABUT EXISTING FEATURES THE CONTRACTOR SHALL ENSURE THAT A SMOOTH, EVEN PROFILE FREE FROM ABRUPT CHANGES IS OBTAINED.
6. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
7. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATIONS OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
8. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH AN APPROVED NON-NATURAL GRANULAR MATERIAL AND COMPACTED TO 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS.1289.5.1.1.
9. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
10. ON COMPLETION OF PIPE INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS, AND ROAD PAVEMENTS.
11. PROVIDE 10mm WIDE ABLEFLEX JOINTS BETWEEN CONCRETE PAVEMENTS AND ALL BUILDINGS , WALLS, FOOTINGS, COLUMNS, KERBS, DISH DRAINS, GRATED DRAINS, BOLLARD FOOTINGS ETC
12. CONTRACTOR TO OBTAIN ALL AUTHORITY APPROVALS.
13. ALL BATTERS TO BE GRASSED LINED WITH MINIMUM 100 TOPSOIL AND APPROVED COUCH LAID AS TURF.
14. MAKE SMOOTH TRANSITION TO EXISTING SERVICES AND MAKE GOOD.
15. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY DIVERSION DRAINS AND MOUNDS TO ENSURE THAT EXPOSED SURFACES ARE FREE DRAINING, AND EXCAVATE SUMPS AND PROVIDE PUMPING EQUIPMENT TO DRAIN EXPOSED AREAS WHERE NECESSARY.
16. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED ARCHITECTURAL, STRUCTURAL, HYDRAULIC AND MECHANICAL DRAWINGS AND SPECIFICATIONS.
17. TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MIN 50mm IN BITUMINOUS PAVING.
18. ON COMPLETION OF WORKS ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION INCLUDING, BUT NOT LIMITED TO, KERBS, FOOTPATHS, CONCRETE AREAS, GRASS AND LANDSCAPED AREAS.

STORMWATER NOTES

1. ALL 300 DIA. DRAINAGE PIPES AND LARGER SHALL BE CLASS "2" APPROVED SPIGOT AND SOCKET FRC PIPES WITH RUBBER RING JOINTS. (U.N.O.) ALL DOWNPIPE DRAINAGE LINES SHALL BE SEWER GRADE uPVC WITH SOLVENT WELD JOINTS. (U.N.O.)
2. EQUIVALENT STRENGTH REINFORCED CONCRETE PIPES MAY BE USED.
3. ALL PIPE JUNCTIONS UP TO AND INCLUDING 450 DIA. AND TAPERS SHALL BE VIA PURPOSE MADE FITTINGS.
4. MINIMUM GRADE TO STORMWATER LINES TO BE 1%. (U.N.O.)
5. CONTRACTOR TO SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.
6. ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
7. PRECAST PITS SHALL NOT BE USED UNLESS WRITTEN APPROVAL IS OBTAINED FROM THE SUPERINTENDENT.
8. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. 50MM CONCRETE BED (OR 75MM THICK BED OF 12MM BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK. IN MATERIAL OTHER THAN ROCK, PIPES SHALL BE LAID ON A 75MM THICK SAND BED. IN ALL CASES BACKFILL THE TRENCH WITH SAND TO 200MM ABOVE THE PIPE. WHERE THE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH WITH SAND OR APPROVED GRANULAR BACKFILL COMPACTED IN 150MM LAYERS TO 98% STANDARD MAX. DRY DENSITY.
9. BEDDING SHALL BE TYPE H1 (U.N.O.), IN ACCORDANCE WITH CURRENT RELEVANT AUSTRALIAN STANDARDS.
10. WHERE STORMWATER LINES PASS UNDER FLOOR SLABS SEWER GRADE RUBBER RING JOINTS ARE TO BE USED.
11. WHERE SUBSOIL DRAINAGE LINES PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS UNSLOTTED UPVC SEWER GRADE PIPE SHALL BE USED.
12. PROVIDE 3.0M LENGTH OF 100 DIA. SUBSOIL DRAINAGE PIPE WRAPPED IN FABRIC SOCK, AT UPSTREAM END OF EACH PIT.

EXISTING SERVICES AND FEATURES

1. THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION, REMOVAL AND DISPOSAL IF REQUIRED OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
2. THE CONTRACTOR SHALL ENSURE THAT SERVICES TO BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED AT ALL TIMES.
3. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN WRITTEN APPROVAL OF THE PROPOSED PROGRAM FOR THE RELOCATION/CONSTRUCTION OF TEMPORARY SERVICES.
4. EXISTING BUILDINGS, EXTERNAL STRUCTURES, AND TREES SHOWN ON THESE DRAWINGS ARE FEATURES EXISTING PRIOR TO ANY DEMOLITION WORKS.
5. CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
6. INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE TO THE PRINCIPAL. CONTRACTOR TO GAIN APPROVAL OF SUPERINTENDENT FOR TIME OF INTERRUPTION.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

1. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ENGINEERING PLANS, AND ANY OTHER PLANS OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED AND RELATING TO DEVELOPMENT AT THE SUBJECT SITE.
2. THE SITE SUPERINTENDENT WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AND UNDERTAKEN AS INSTRUCTED IN THIS SPECIFICATION.
3. ALL BUILDERS AND SUB-CONTRACTORS WILL BE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSTREAM LANDS AND WATERWAYS.
4. SITE ACCESS AND MANAGEMENT TO SUPERINTENDANTS SPECIFICATION.

CONSTRUCTION SEQUENCE

5. THE SOIL EROSION POTENTIAL ON THIS SITE SHALL BE MINIMISED. HENCE WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE :
   a. INSTALL SEDIMENT FENCES.
   b. INSTALL TEMPORARY CONSTRUCTION EXIT,SEDIMENT BASIN,DIVERSION PIPE, CUT OFF DRAINS AND SANDBAG KERB INLET SEDIMENT TRAPS.
   c. UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS. PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.
   d. UNDISTURBED GROUND TO BE MAINTAINED AS NO ACCESS AREA TO SUPERINTENDANTS DIRECTION.

EROSION CONTROL

6. DURING WINDY CONDITIONS, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.
7. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE AND WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.

FENCING

8. STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSTREAM WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.
9. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
10. WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.
11. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED. CONTRACTOR TO DETAIL SITE REHABILITATION SCHEDULES AND REVEGETATION PROGRAM.

OTHER MATTERS

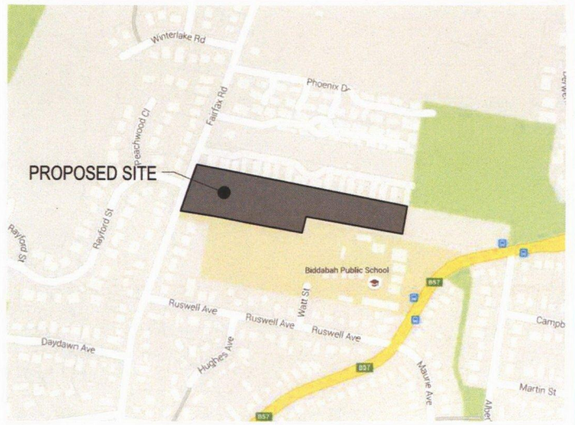
12. ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER.
13. RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER ARE TO BE EMPTIED AS NECESSARY. DISPOSAL OF WASTE SHALL BE IN A MANNER APPROVED BY THE SITE SUPERINTENDENT.

SITE INSPECTION & MAINTENANCE

14. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AFTER RAINFALL EVENTS TO ENSURE THAT THEY OPERATE EFFECTIVELY AND TO REMOVE CAPTURED SEDIMENT, REPAIR AND OR MAINTENANCE SHALL BE UNDERTAKEN BY THE CONTRACTOR AS REQUIRED, AT THEIR COST. MAINTENANCE FREQUENCY AND SCHEDULE TO BE DETAILED BY CONTRACTOR

SEDIMENT BASIN

15. WATER TO BE TREATED TO MEET WATER RELEASE CRITERIA OF 50mg/l OF TOTAL SUSPENDED SOLIDS (TSS) AS PER BLUE BOOK (LANDCOM 2004).
16. CONTRACTOR TO FLOCCULATE WATER TO MEET WATER RELEASE CRITERIA AS DETAILED ABOVE.
17. PUMP OUT SEDIMENT IN LINE WITH THE RECOMMENDATIONS OF BLUE BOOK (LANDCOM 2004).
18. CONTRACTOR TO SPECIFY TREATMENT METHODS INCLUDING DISCHARGE POINTS, FLOCCULATION DISPOSAL AREAS, DISPOSAL OF SEDIMENT, DETAILS OF MAJOR ITEMS EQUIPMENT USED EG. PUMPS/SPRAYS ETC.,IDENTIFY INSPECTION PROCEDURES AND INSPECTORS AND ANY OTHER RELEVANT MATTERS. ALL METHODOLOGY TO BE UNDERTAKEN IN LINE WITH RECOMMENDATIONS OF BLUE BOOK (LANDCOM 2004).



LOCALITY PLAN
N.T.S.

DIAL BEFORE YOU DIG

DIAL BEFORE YOU DIG www.1100.com.au

IMPORTANT: THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "DIAL BEFORE YOU DIG" DRAWINGS ON SITE AT ALL TIMES.

SOIL EROSION AND SEDIMENT CONTROL LEGEND-PROPOSED WORKS

- SEDIMENT FENCE
- WRAP INLET GRATE IN FILTER FABRIC. PROVIDE AT ALL EXISTING SURFACE STORMWATER PITS, RAINWATER OUTLETS AND TRENCH DRAINS.
- SAND BAG SEDIMENT TRAP
- STABILISED CONSTRUCTION EXIT
- STORMWATER BYPASS DRAINAGE LINE
- CLEAN WATER CUT OFF DRAIN
- DIRTY WATER CUT OFF DRAIN
- LEVEL SPREADER
- SEDIMENT BASIN

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	RE-ISSUE FOR DA SUBMISSION	08.06.16	RS	GK
B	RE-ISSUE FOR DA SUBMISSION	21.04.16	DW	JS
A	ISSUE FOR DA SUBMISSION	30.11.15	KR	GK

North

Client: RAMSAY HEALTH CARE
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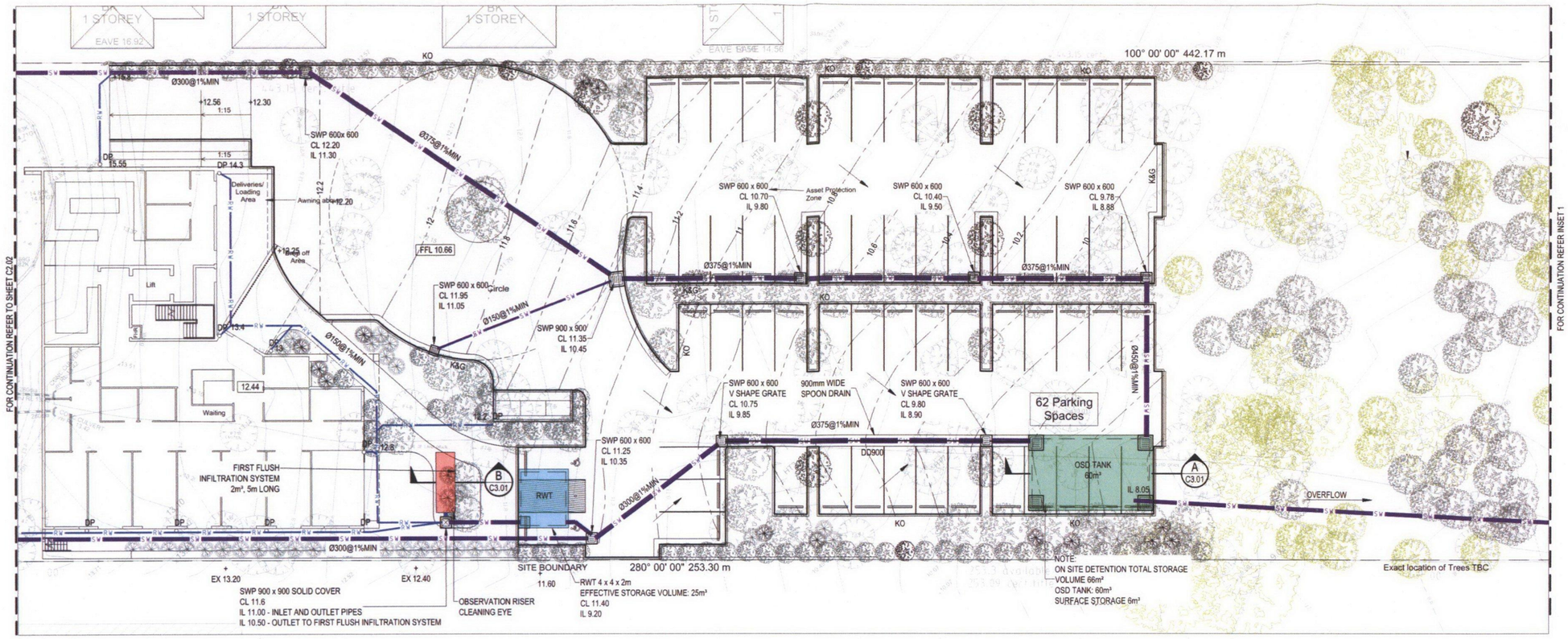
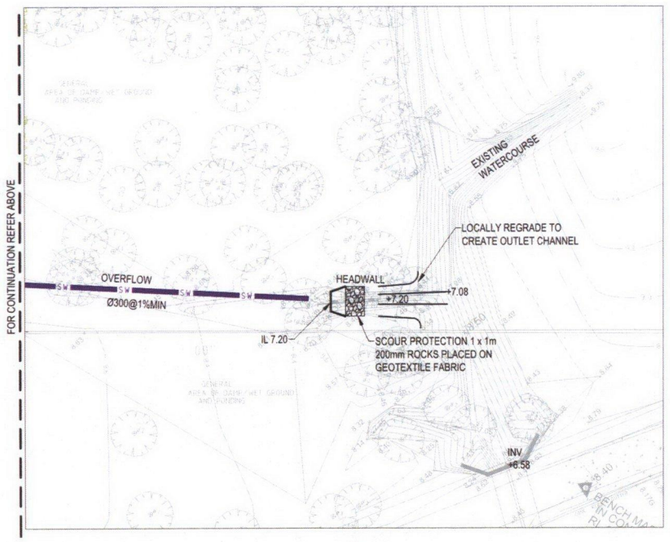
Project: WARNERS BAY PRIVATE HOSPITAL MENTAL HEALTH UNIT EXTENSION
42 FAIRFAX RD
WARNERS BAY NSW 2282

Drawing Title: COVER SHEET, NOTES AND LEGENDS

Drawn	Date	Scale	A1	Q.A. Check	Date
KR	NOV 2015	NTS		JRH	08.06.16
Designed	Project No.			Dwg. No.	Issue



LOWER GROUND FLOOR



INSET 1

NOT FOR CONSTRUCTION

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C	RE-ISSUE FOR DA SUBMISSION - NEW ARCHITECTUAL	21.07.16	RS	GK
B	RE-ISSUE FOR DA SUBMISSION	08.06.16	RS	GK
A	ISSUE FOR DA SUBMISSION - ARCHITECTURAL CHANGES	08.06.16	RS	GK

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Project
WARNERS BAY PRIVATE HOSPITAL
MENTAL HEALTH UNIT EXTENSION
42 FAIRFAX RD
WARNERS BAY NSW 2282

Drawing Title
STORMWATER MANAGEMENT PLAN
LOWER GROUND CARPARK

Drawn	Date	Scale A1	Q.A. Check	Date
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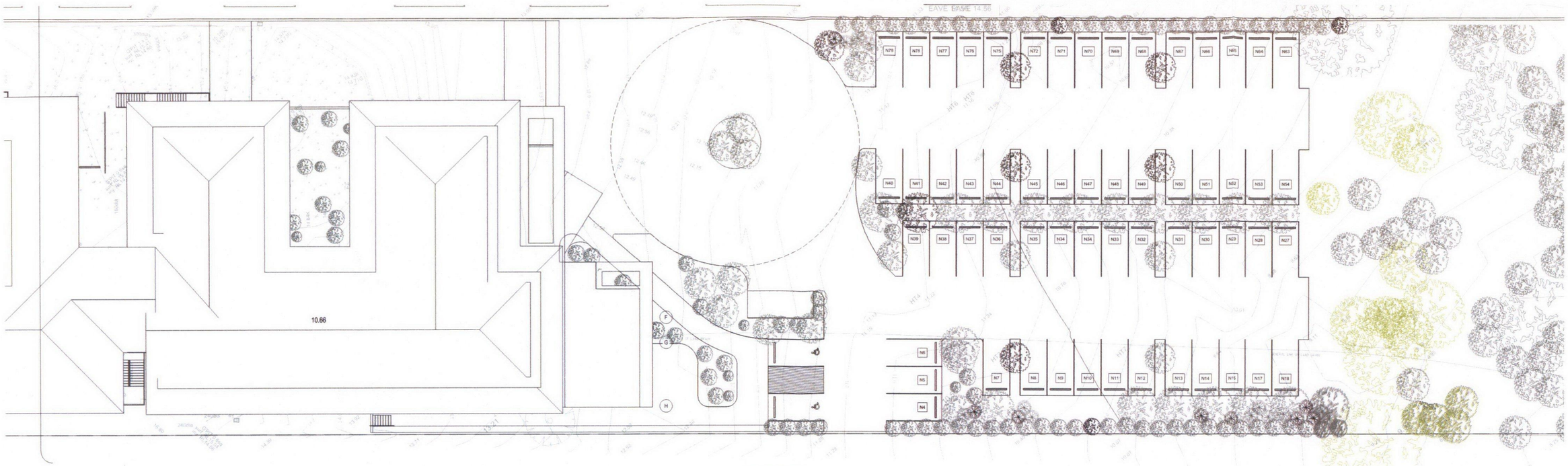
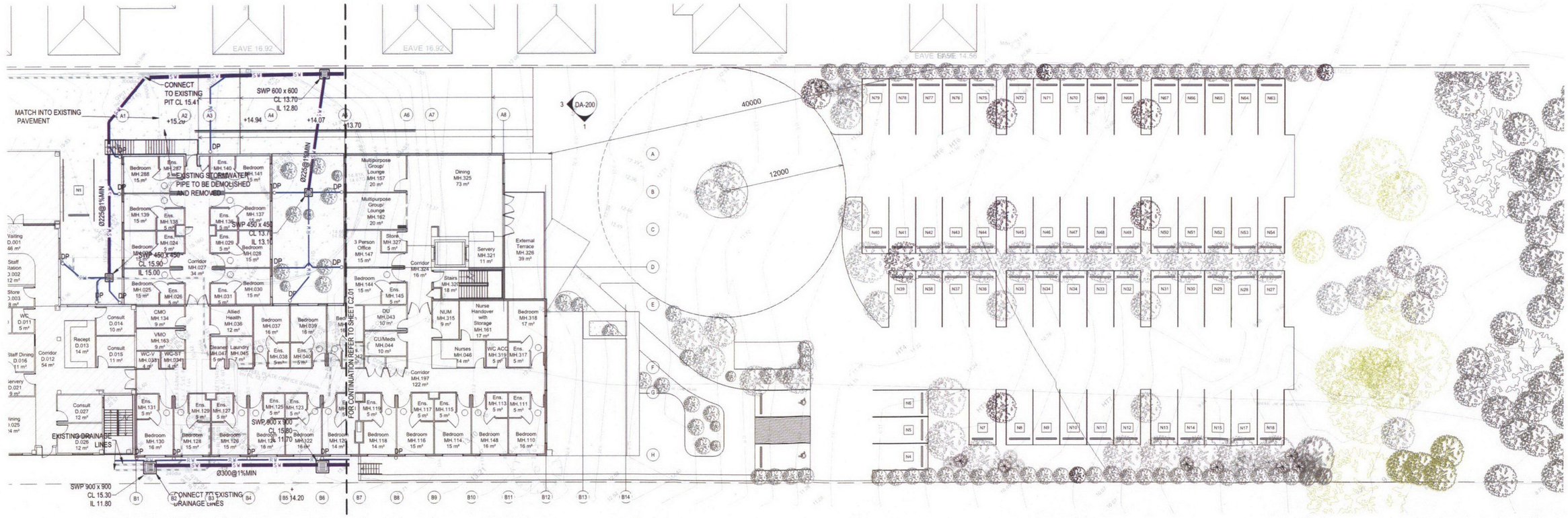
Designed	Project No.		Dwg. No.	Issue
GK	SY150079		C2.01	C



ROOF PLAN



GROUND PLAN

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

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B	RE-ISSUE FOR DA SUBMISSION	08.06.16	RS	GK
A	ISSUE FOR DA SUBMISSION	30.11.15	RS	GK

0 0 1cm at full size 10cm 20cm

North

NOT FOR CONSTRUCTION

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Project
WARNERS BAY PRIVATE HOSPITAL
MENTAL HEALTH UNIT EXTENSION
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WARNERS BAY NSW 2282

Drawing Title
STORMWATER MANAGEMENT PLAN
GROUND FLOOR

Drawn	Date	Scale A1	Q.A. Check	Date
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Designed	Project No.		Dwg. No.	Issue
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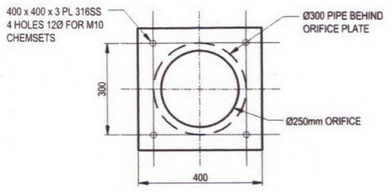
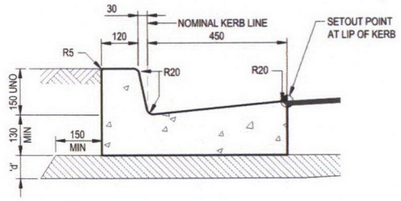
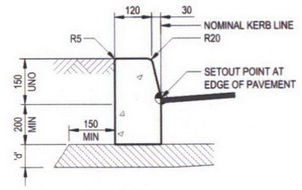


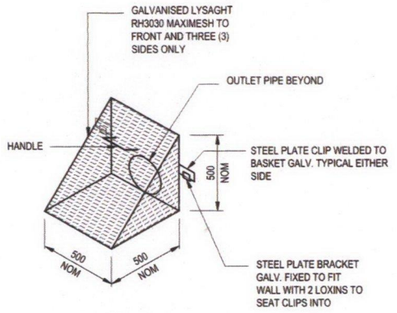
DETAIL 2 - ORIFICE PLATE
SCALE 1:10



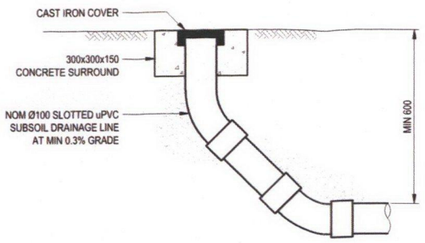
KERB AND GUTTER (K&G)
SCALE 1:10
NOTE:
'd' = SUBBASE THICKNESS TO MATCH DEPTH OF PAVEMENT SUBBASE, BUT NOT LESS THAN 75



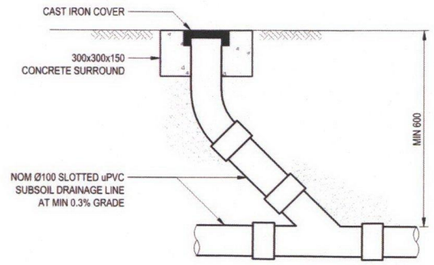
KERB ONLY (KO)
SCALE 1:10
NOTE:
'd' = SUBBASE THICKNESS TO MATCH DEPTH OF PAVEMENT SUBBASE, BUT NOT LESS THAN 75



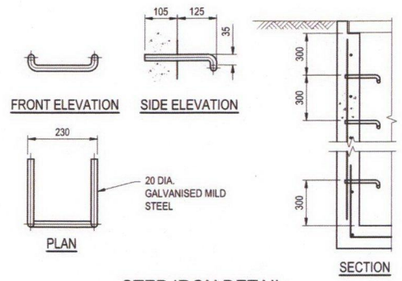
MAXIMESH DETAIL
N.T.S.



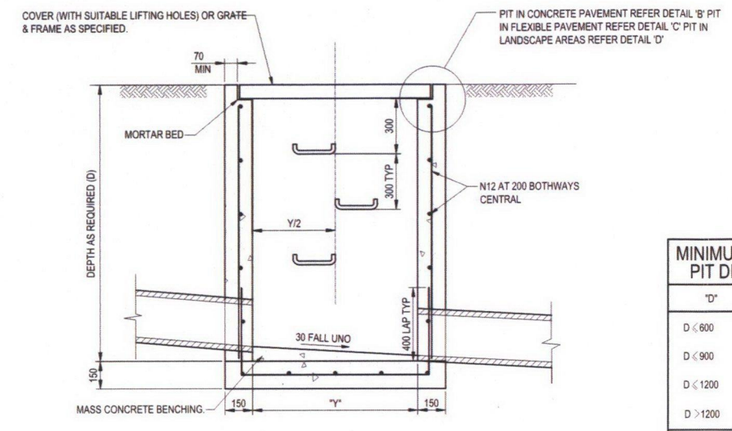
HIGH END RISER
SCALE 1:10



INTERMEDIATE RISER
SCALE 1:10



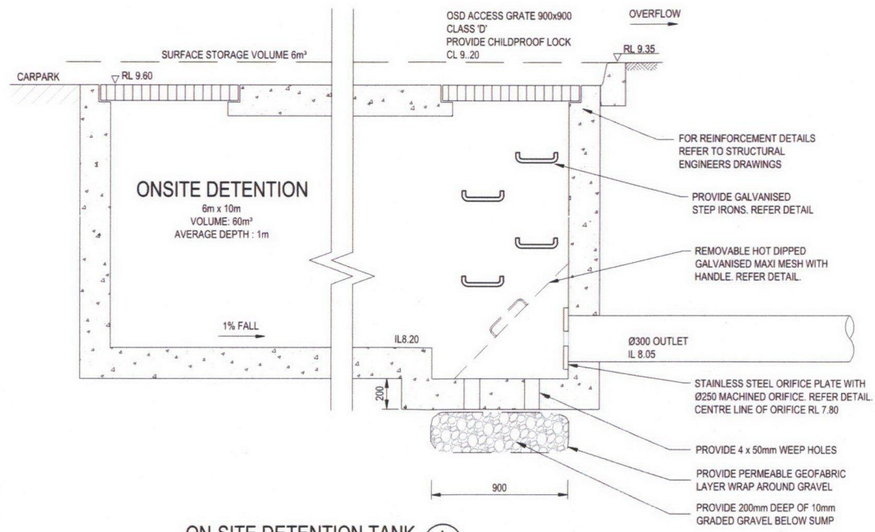
STEP IRON DETAIL
N.T.S.



SECTION 2
SCALE 1:20

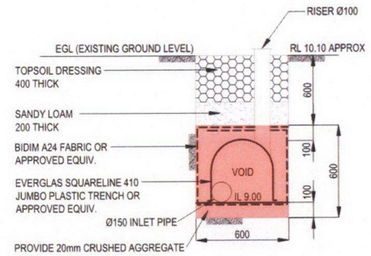
MINIMUM INTERNAL PIT DIMENSIONS		
"D"	"X"	"Y"
D ≤600	450	450*
D ≤900	600	600*
D ≤1200	600	900
D >1200	900	900

NOTE: PITS DENOTED * SHALL BE USED ONLY WHERE SPECIFIED IN DRAINAGE SCHEDULE OR ON PLAN.

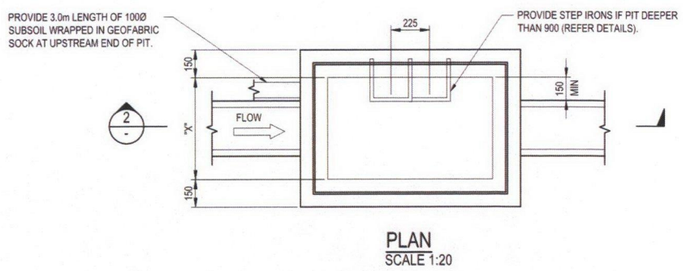


ON-SITE DETENTION TANK A / C2.01
NTS

OSD NOTES:
OSD VOLUME REQUIRED : 46m³
EXISTING OSD TANK VOLUME : 25m³
(EXISTING OSD TANK TO BE DEMOLISHED AND REMOVED)
RAINWATER TANK VOLUME : 25m³
(20% VOLUME TO OFFSET OSD REQUIREMENTS)
OSD VOLUME PROVIDED : 46m³ + 25m³ - 5m³
OSD : 66m³



SECTION B / C2.01
SCALE 1:10



PLAN
SCALE 1:20

SURFACE INLET/JUNCTION PIT
PIT TYPE "A"

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	RE-ISSUE FOR DA SUBMISSION	21.07.16	RS	GK
B	ISSUE FOR DA SUBMISSION	08.06.16	KR	GK
A	ISSUE FOR DA SUBMISSION	30.11.15	KR	GK

North

0 5 1cm at full size 10cm 20cm

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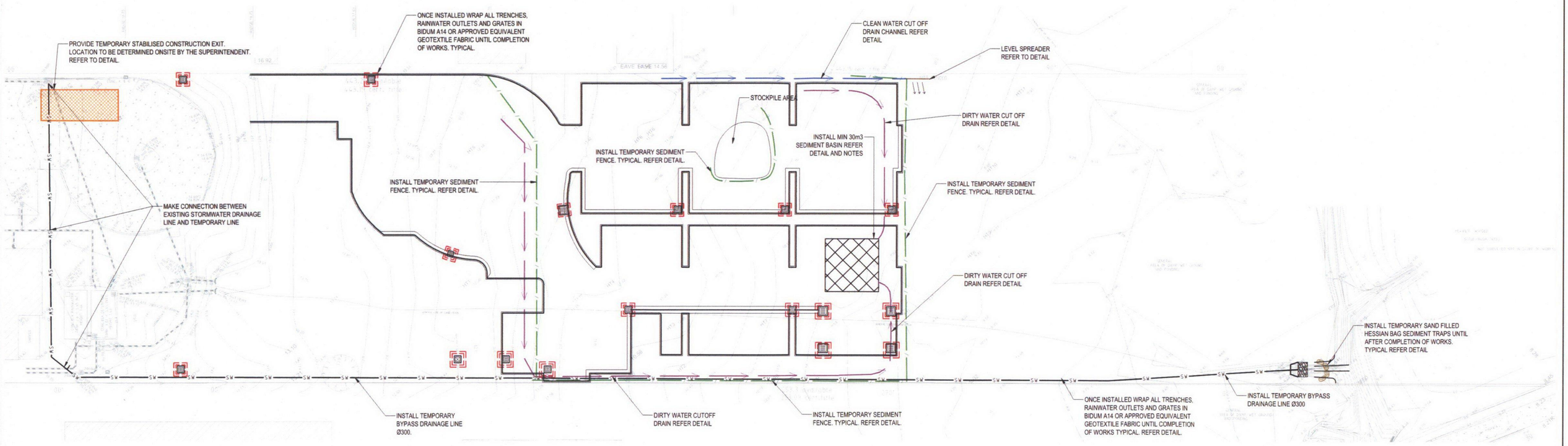
Project
WARNERS BAY PRIVATE HOSPITAL
MENTAL HEALTH UNIT EXTENSION
42 FAIRFAX RD
WARNERS BAY NSW 2282

Drawing Title
CIVIL DETAILS

Drawn	Date	Scale A1	Q.A. Check	Date
KR	NOV 2015	AS SHOWN	JRH	08.06.16
Designed	Project No.		Dwg. No.	Issue
GK	SY150079		C3.01	C



NOT FOR CONSTRUCTION

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Issue	Description	Date	Drawn	Approved
D	RE-ISSUE FOR DA SUBMISSION	21.07.16	RS	GK
C	RE-ISSUE FOR DA SUBMISSION	06.06.16	RS	GK
B	RE-ISSUE FOR DA SUBMISSION	21.04.16	DW	JS
A	ISSUE FOR DA SUBMISSION	30.11.15	KR	GK

1cm at full size 0 10cm 20cm

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Drawing Title
SOIL EROSION AND SEDIMENT CONTROL PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
KR	NOV 2015	1:250	JRH	08.06.16
Designed	Project No.		Dwg. No.	Issue
GK	SY150079		C4.01	C

SEDIMENT BASIN VOLUME

SOIL TYPE :D
BASIN VOLUME = SETTLING ZONE VOLUME + SEDIMENT STORAGE ZONE VOLUME

THE SETTLING ZONE VOLUME FOR TYPE D SOILS IS CALCULATED TO PROVIDE CAPACITY TO CONTAIN ALL RUNOFF EXPECTED FROM UP TO THE 80th PERCENTILE RAINFALL EVENT. THE SETTLING ZONE VOLUME (V) CAN BE DETERMINED BY THE FOLLOWING EQUATION:

$$V = 10 \times Cv \times A \times R \quad \text{80th ile, 2 day} \quad (m^3)$$

WHERE:

		DESCRIPTION	VALUE
10	=	A UNIT CONVERSION FACTOR	10
Cv	=	THE VOLUMETRIC RUNOFF COEFFICIENT, DEFINED AS THAT PORTION OF RAINFALL THAT RUNS OFF AS STORMWATER OVER THE 5-DAY PERIOD	0.25 { AS RECOMMENDED
R	=	IS THE 2-DAY TOTAL RAINFALL DEPTH (mm) WHICH IS NOT EXCEEDED IN 80% OF RAINFALL EVENTS.	17.6 { ADOPT FIGURE
A	=	AREA OF CATCHMENT IN HECTARES (ha)	0.421

$V = 10 \times Cv \times A \times R$ 80th ile, 2 day
$V = 10 \times 0.25 \times 0.421 \times 17.6$
$V = 18.73\ m^3$

THEREFORE THE SETTLING ZONE VOLUME IS V = 19 m³

TOTAL BASIN VOLUME = SETTLING ZONE VOL. + SEDIMENT STORAGE ZONE VOL.

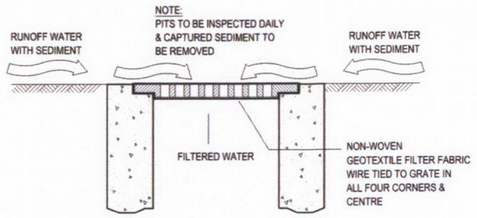
SOIL LOSS = 83 t/ha/yr

THE SEDIMENT STORAGE ZONE VOLUME SHALL BE CALCULATED AS 25% OF SETTLING ZONE

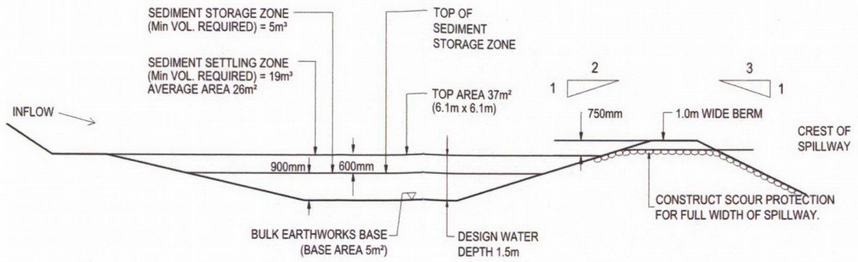
TOTAL BASIN VOLUME = 19 + 5

TOTAL BASIN VOLUME = 24 m³ ∴ SURFACE AREA = 37m WITH 900 DEEP SEDIMENTATION ZONE AND 600 DEEP SEDIMENT SETTLING ZONE

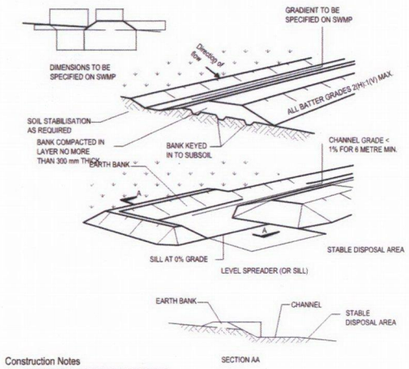
- FLOCCULATION SHOULD BE PROVIDED TO BLUE BOOK (LANDCOM 2004) SPECIFICATIONS
- PUMP OUT SEDIMENT IN LINE WITH RECOMMENDATIONS OF BLUE BOOK (LANDCOM 2004)



INLET TRAP
NTS

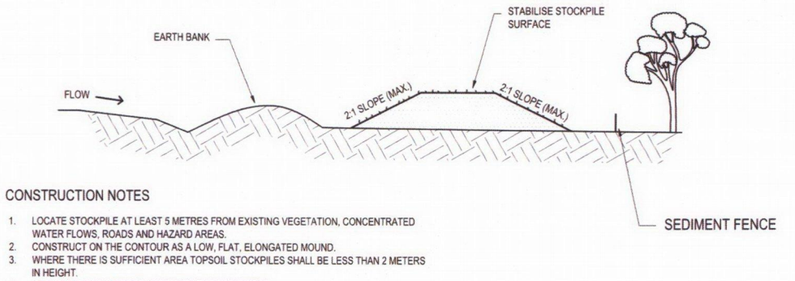


SEDIMENT BASIN CROSS SECTION
N.T.S.



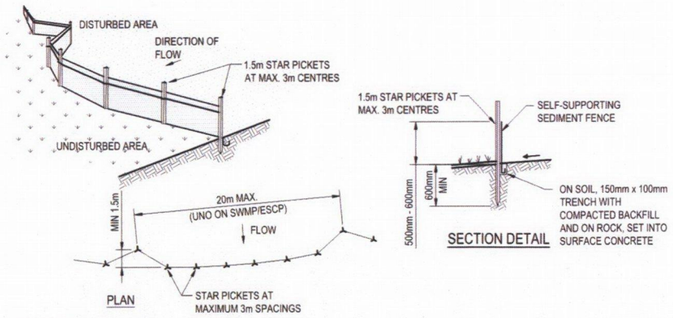
Construction Notes
1. CONSTRUCT ALONG GRADIENT AS SPECIFIED.
2. AVOID REMOVING TRESS AND SHRUBS IF POSSIBLE.
3. DRAINS TO BE OF PARABOLIC OR TRAPEZOIDAL CROSS SECTION AS OPPOSED TO V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. PERMANENT OR TEMPORARY STABILISATION OF EARTH BANK TO BE COMPLETED WITH IN 10 DAYS OF CONSTRUCTION.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO A SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL SITE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT WITH A SUITABLE IMPLEMENT IN SITUATION WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.

EARTH BANK (LEVEL SPREADER)



CONSTRUCTION NOTES

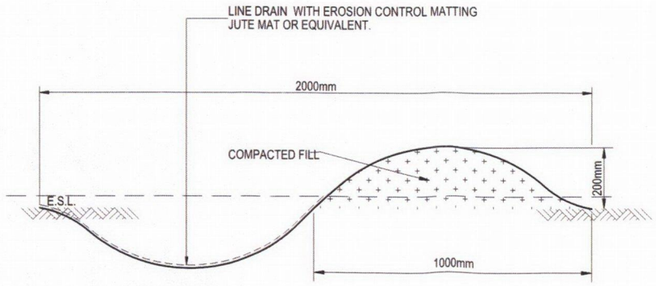
1. LOCATE STOCKPILE AT LEAST 5 METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOWS, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS A LOW, FLAT, ELONGATED MOUND.
3. WHERE THERE IS SUFFICIENT AREA TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METERS IN HEIGHT.
4. REHABILITATE IN ACCORDANCE WITH THE SWMP/ESCP.
5. CONSTRUCT EARTH BANK (STANDARD DRAWING 5-2) ON THE UPSLOPE SIDE TO DIVERT RUN OFF AROUND THE STOCKPILE AND A SEDIMENT FENCE (STANDARD DRAWING 6-7) 1 TO 2 METRES DOWNSLOPE OF STOCKPILE.



CONSTRUCTION NOTES

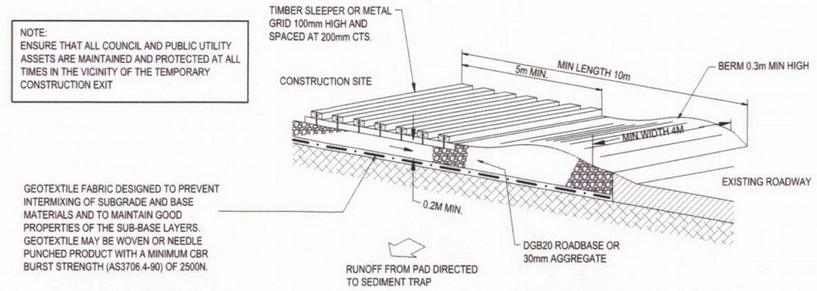
1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5m LONG STAR PICKETS INTO GROUND, 3 METRES APART.
3. DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING SEDIMENT FENCE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY SEDIEMNT FENCE MANUFACTURER.
6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.

SEDIMENT CONTROL FENCE
NTS



CUT-OFF DRAIN - 2.0m WIDE
N.T.S
PROVIDE ROCK CHECK DAM AT MIN 3m INTERVALS. REFER DETAIL.

NOTE:
ENSURE THAT ALL COUNCIL AND PUBLIC UTILITY ASSETS ARE MAINTAINED AND PROTECTED AT ALL TIMES IN THE VICINITY OF THE TEMPORARY CONSTRUCTION EXIT



CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP WHERE SEDIMENT IS COLLECTED AND REMOVED.

MAINTENANCE NOTES

THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT OFF THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OFF THE CONSTRUCTION SITE MUST BE REMOVED IMMEDIATELY.

TEMPORARY STABILISED CONSTRUCTION EXIT
NTS

NOT FOR CONSTRUCTION

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C	RE-ISSUE FOR DA SUBMISSION	22.07.16	RS	GK
B	RE-ISSUE FOR DA SUBMISSION	08.06.16	RS	GK
A	ISSUE FOR DA SUBMISSION	21.04.16	DW	JS

0 10m at full size 10cm 20cm

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WARNERS BAY NSW 2282

Drawing Title
SOIL EROSION AND SEDIMENT CONTROL PLAN AND DETAILS

Drawn	Date	Scale	A1	Q.A. Check	Date
KR	NOV 2015	NTS		Q.A.	Q.A. DATE
Designed	Project No.			Dwg. No.	Issue
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WARNERS BAY PRIVATE HOSPITAL

MENTAL HEALTH UNITS AND CARPARK

STORMWATER DRAINAGE MANAGEMENT REPORT

July 2016

ACOR CONSULTANTS PTY LTD

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MANAGERS

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Revision No.
V3
Date:
July 2016
Prepared:
George Krzywda

CONTENTS

1. INTRODUCTION

ACOR Consultants P/L has been engaged by Warners Bay Private Hospital to design civil engineering works for the proposed development. The works include design of driveway and car parking, roof and surface drainage, a rainwater tank and a detention tank.

2. SITE OVERVIEW

The development site, Lot 1 in DP34935, No 42 Fairfax Street Warners Bay has a total site area of approx. 2.2ha. The proposed development extent forms an area of approx. 0.421ha within the site. The site falls from west to the south-east.

A portion of the site was previously redeveloped and as such has an existing on-site detention tank (OSD). This on-site detention tank is sized at $25m^3$.

3. CATCHMENT AND DETENTION MODELLING

In line with the Lake Macquarie Handbook On Site Drainage Design Guidelines, detention tanks with storage volumes sized over $50m^3$ are to be calculated using recognised runoff routing methods. The following calculations use the ILSAX runoff routing methods through the DRAINS hydrological modelling software.

The proposed site stormwater drainage system has been modelled in DRAINS using the catchment details as shown in Appendix A. The proposed stormwater drainage system, including location of the detention and rainwater tanks, is shown in the Stormwater Management Plan C2.01 and C2.02 included in Appendix A. Rainfall information was generated by DRAINS and is based on parameters supplied to DRAINS from Australian Rainfall and Runoff Volume 2.

The fundamental DRAINS model parameters used are:

1 - Soil is type 3 (Sandy Clay)
2 – AMC (Antecedent Moisture Condition) is 3 for 100 year ARI
3 - Pre-development Catchments are 0% impervious, 100% pervious
4 – Post-development Catchments are 80% impervious, 0% supplementary and 20% pervious
5 – Storms IDFs as per AR&R (4th edition) Zone 1

The results are as follows:

Recurrence interval	Pre-development Flow	Post-development Flow
100 Year ARI	0.184 m^3/s	0.184 m^3/s

Table 3.1 – Flow Data Proposed Detention Tank

Storage	Approx. Required Volume	Approx. Orifice Diameter
Detention Tank (OSD)	40 m³	Φ250mm
Surface Storage	6 m³	Above OSD tank, in the carpark

Table 3.2 – Preliminary Detention Storage Volume

The existing site OSD tank will be demolished and equivalent additional volume will be added to the proposed detention storage value to compensate. Refer to calculations below.

One 25KL rainwater tank will also be provided. In line with the Lake Macquarie City Council Engineering Guidelines, a 20% credit of the rainwater tank volume (5m3) may be given as to reduce the size of a dedicated OSD facility. Refer to calculations below.

Tank	Approx. Required Volume	Credit or Debit
Detention Tank (OSD)	40 m³	Credit (+)
Surface Storage	6 m³	Credit (+)
Existing Site OSD volume	25 m³	Credit (+)
Rainwater Tank Offset	5 m³	Debit (-)
Total OSD Volume:	Approx. Required Volume	Approx. Orifice Diameter
Detention Tank (OSD)	60 m³	Φ250m
Surface Storage	6 m³	Above OSD tank, in the carpark

Table 3.3 – Final Detention Tank Volume Calculations

DRAINS model is shown in Appendix B.

A first flush infiltration device is to be provided to treat stormwater prior to entry into the rainwater re-use tank.

The site outlet is to discharge stormwater from the OSD tank into a natural drainage channel at the rear of the property through a headwall. Scour protection is to be provided. The natural drainage channel drains south into an existing culvert below Medcalf Street. The proposed stormwater drainage system outlet, is shown in the Stormwater Management Plan C2.01 included in Appendix A.

4. SUMMARY

The proposed site stormwater drainage system consists of roof drainage and surface drainage systems connected to a rainwater tank and an onsite detention tank. Site stormwater discharges into a natural stormwater drainage channel in easement in the South Eastern corner of the site.

The stormwater drainage system has been designed to partially capture and convey roof water into a 25,000Lt rainwater tank. Roof water collected in the rainwater tank will be reused for surface irrigation. Stormwater drainage and the rainwater tank overflow will be connected/discharge into a detention tank. The detention tank has been designed to reduce the post-development flow rates to the 100% pervious pre-development levels for the100 year ARI rainfall event.

This stormwater drainage system will meet the site runoff requirements as stipulated by Lake Macquarie City Council.

APPENDIX A – STORMWATER DRAINAGE MANAGEMENT PLANS

WARNERS BAY PRIVATE HOSPITAL, WARD EXTENTION

42 FAIRFAX ROAD, WARNERS BAY 2282

STORMWATER DRAINAGE MANAGEMENT PLAN

DWG No.	SHEET INDEX
C1.01	COVER SHEET, NOTES AND LEGENDS
C2.01	STORMWATER MANAGEMENT PLAN - LOWER GROUND CARPARK
C2.02	STORMWATER MANAGEMENT PLAN - GROUND FLOOR
C3.01	CIVIL DETAILS
C4.01	SOIL EROSION AND SEDIMENT CONTROL PLAN AND DETAILS
C4.02	SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

CIVIL LEGEND

- K&G — KERB AND GUTTER
- KO — KERB ONLY
- OD900 — DISH DRAIN 900 WIDE
- + Ex 11.00 — EXISTING LEVEL
- + 11.00 — PROPOSED LEVEL
- RL 11.00 — REDUCED LEVEL OF PITS
- FFL 11.63 — FINISHED FLOOR LEVEL
- SW — STORMWATER DRAINAGE LINE
- RW — RAINWATER DRAINAGE LINE
- EXISTING STORMWATER DRAINAGE LINE TO BE DEMOLISHED
- Ø100 — DENOTES STORMWATER PIPE DIAMETER. MINIMUM GRADE 1% U.N.O.
- RETAINING WALL
- DP — DOWN PIPE
- IR — INTERMEDIATE RISER
- STORMWATER PIT
- DENOTES RAINWATER TANK
- DENOTES ON SITE DETENTION TANK
- FINISHED SURFACE CONTOUR
- FIRST FLUSH INFILTRATION SYSTEM
- HEADWALL WITH SCOUR PROTECTION

SITEWORKS NOTES

1. ORIGIN OF LEVELS :- AUSTRALIAN HEIGHT DATUM (A.H.D.)
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK.
3. ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS, THE SPECIFICATIONS AND THE DIRECTIONS OF THE PRINCIPAL'S REPRESENTATIVE.
4. EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE PRINCIPAL'S REPRESENTATIVE. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
5. WHERE NEW WORKS ABUT EXISTING FEATURES THE CONTRACTOR SHALL ENSURE THAT A SMOOTH, EVEN PROFILE FREE FROM ABRUPT CHANGES IS OBTAINED.
6. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
7. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATIONS OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
8. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH AN APPROVED NON-NATURAL GRANULAR MATERIAL AND COMPACTED TO 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS.1289.5.1.1.
9. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
10. ON COMPLETION OF PIPE INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS, AND ROAD PAVEMENTS.
11. PROVIDE 10mm WIDE ABLEFLEX JOINTS BETWEEN CONCRETE PAVEMENTS AND ALL BUILDINGS , WALLS, FOOTINGS, COLUMNS, KERBS, DISH DRAINS, GRATED DRAINS, BOLLARD FOOTINGS ETC.
12. CONTRACTOR TO OBTAIN ALL AUTHORITY APPROVALS.
13. ALL BATTERS TO BE GRASSED LINED WITH MINIMUM 100 TOPSOIL AND APPROVED COUCH LAID AS TURF.
14. MAKE SMOOTH TRANSITION TO EXISTING SERVICES AND MAKE GOOD.
15. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY DIVERSION DRAINS AND MOUNDS TO ENSURE THAT EXPOSED SURFACES ARE FREE DRAINING, AND EXCAVATE SUMPS AND PROVIDE PUMPING EQUIPMENT TO DRAIN EXPOSED AREAS WHERE NECESSARY.
16. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED ARCHITECTURAL, STRUCTURAL, HYDRAULIC AND MECHANICAL DRAWINGS AND SPECIFICATIONS.
17. TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MIN 50mm IN BITUMINOUS PAVING.
18. ON COMPLETION OF WORKS ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION INCLUDING, BUT NOT LIMITED TO, KERBS, FOOTPATHS, CONCRETE AREAS, GRASS AND LANDSCAPED AREAS.

STORMWATER NOTES

1. ALL 300 DIA. DRAINAGE PIPES AND LARGER SHALL BE CLASS "2" APPROVED SPIGOT AND SOCKET FRC PIPES WITH RUBBER RING JOINTS. (U.N.O.) ALL DOWNPIPE DRAINAGE LINES SHALL BE SEWER GRADE uPVC WITH SOLVENT WELD JOINTS. (U.N.O.)
2. EQUIVALENT STRENGTH REINFORCED CONCRETE PIPES MAY BE USED.
3. ALL PIPE JUNCTIONS UP TO AND INCLUDING 450 DIA. AND TAPERS SHALL BE VIA PURPOSE MADE FITTINGS.
4. MINIMUM GRADE TO STORMWATER LINES TO BE 1%. (U.N.O.)
5. CONTRACTOR TO SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.
6. ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
7. PRECAST PITS SHALL NOT BE USED UNLESS WRITTEN APPROVAL IS OBTAINED FROM THE SUPERINTENDENT.
8. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. 50MM CONCRETE BED (OR 75MM THICK BED OF 12MM BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK. IN MATERIAL OTHER THAN ROCK, PIPES SHALL BE LAID ON A 75MM THICK SAND BED. IN ALL CASES BACKFILL THE TRENCH WITH SAND TO 200MM ABOVE THE PIPE. WHERE THE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH WITH SAND OR APPROVED GRANULAR BACKFILL COMPACTED IN 150MM LAYERS TO 98% STANDARD MAX. DRY DENSITY.
9. BEDDING SHALL BE TYPE H1 (U.N.O.), IN ACCORDANCE WITH CURRENT RELEVANT AUSTRALIAN STANDARDS.
10. WHERE STORMWATER LINES PASS UNDER FLOOR SLABS SEWER GRADE RUBBER RING JOINTS ARE TO BE USED.
11. WHERE SUBSOIL DRAINAGE LINES PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS UNSLOTTED UPVC SEWER GRADE PIPE SHALL BE USED.
12. PROVIDE 3.0M LENGTH OF 100 DIA. SUBSOIL DRAINAGE PIPE WRAPPED IN FABRIC SOCK, AT UPSTREAM END OF EACH PIT.

EXISTING SERVICES AND FEATURES

1. THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION, REMOVAL AND DISPOSAL IF REQUIRED OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
2. THE CONTRACTOR SHALL ENSURE THAT SERVICES TO BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED AT ALL TIMES.
3. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN WRITTEN APPROVAL OF THE PROPOSED PROGRAM FOR THE RELOCATION/CONSTRUCTION OF TEMPORARY SERVICES.
4. EXISTING BUILDINGS, EXTERNAL STRUCTURES, AND TREES SHOWN ON THESE DRAWINGS ARE FEATURES EXISTING PRIOR TO ANY DEMOLITION WORKS.
5. CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
6. INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE TO THE PRINCIPAL. CONTRACTOR TO GAIN APPROVAL OF SUPERINTENDENT FOR TIME OF INTERRUPTION.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

1. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ENGINEERING PLANS, AND ANY OTHER PLANS OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED AND RELATING TO DEVELOPMENT AT THE SUBJECT SITE.
2. THE SITE SUPERINTENDENT WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AND UNDERTAKEN AS INSTRUCTED IN THIS SPECIFICATION.
3. ALL BUILDERS AND SUB-CONTRACTORS WILL BE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSTREAM LANDS AND WATERWAYS.
4. SITE ACCESS AND MANAGEMENT TO SUPERINTENDANTS SPECIFICATION.

CONSTRUCTION SEQUENCE

5. THE SOIL EROSION POTENTIAL ON THIS SITE SHALL BE MINIMISED. HENCE WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE :
   a. INSTALL SEDIMENT FENCES.
   b. INSTALL TEMPORARY CONSTRUCTION EXIT,SEDIMENT BASIN,DIVERSION PIPE, CUT OFF DRAINS AND SANDBAG KERB INLET SEDIMENT TRAPS.
   c. UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS. PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.
   d. UNDISTURBED GROUND TO BE MAINTAINED AS NO ACCESS AREA TO SUPERINTENDANTS DIRECTION.

EROSION CONTROL

6. DURING WINDY CONDITIONS, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.
7. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE AND WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.

FENCING

8. STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSTREAM WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.
9. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
10. WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.
11. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED. CONTRACTOR TO DETAIL SITE REHABILITATION SCHEDULES AND REVEGETATION PROGRAM.

OTHER MATTERS

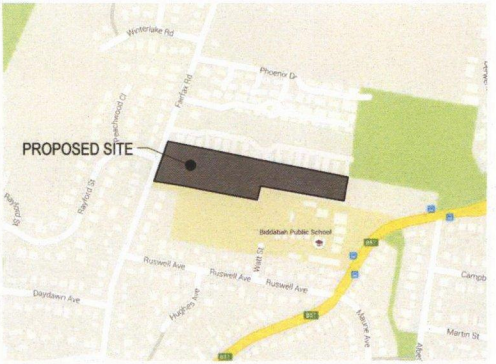
12. ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER.
13. RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER ARE TO BE EMPTIED AS NECESSARY. DISPOSAL OF WASTE SHALL BE IN A MANNER APPROVED BY THE SITE SUPERINTENDENT.

SITE INSPECTION & MAINTENANCE

14. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AFTER RAINFALL EVENTS TO ENSURE THAT THEY OPERATE EFFECTIVELY AND TO REMOVE CAPTURED SEDIMENT, REPAIR AND OR MAINTENANCE SHALL BE UNDERTAKEN BY THE CONTRACTOR AS REQUIRED, AT THEIR COST. MAINTENANCE FREQUENCY AND SCHEDULE TO BE DETAILED BY CONTRACTOR

SEDIMENT BASIN

15. WATER TO BE TREATED TO MEET WATER RELEASE CRITERIA OF 50mg/l OF TOTAL SUSPENDED SOLIDS (TSS) AS PER BLUE BOOK (LANDCOM 2004).
16. CONTRACTOR TO FLOCCULATE WATER TO MEET WATER RELAESE CRITERIA AS DETAILED ABOVE.
17. PUMP OUT SEDIMENT IN LINE WITH THE RECOMMENDATIONS OF BLUE BOOK (LANDCOM 2004).
18. CONTRACTOR TO SPECIFY TREATMENT METHODS INCLUDING DISCHARGE POINTS, FLOCCULATION DISPOSAL AREAS, DISPOSAL OF SEDIMENT, DETAILS OF MAJOR ITEMS EQUIPMENT USED EG. PUMPS/SPRAYS ETC.,IDENTIFY INSPECTION PROCEDURES AND INSPECTORS AND ANY OTHER RELEVANT MATTERS. ALL METHODOLGY TO BE UNDERTAKEN IN LINE WITH RECOMMENDATIONS OF BLUE BOOK (LANDCOM 2004).



LOCALITY PLAN
N.T.S.

DIAL BEFORE YOU DIG

DIAL BEFORE YOU DIG www.1100.com.au

IMPORTANT: THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "DIAL BEFORE YOU DIG" DRAWINGS ON SITE AT ALL TIMES.

SOIL EROSION AND SEDIMENT CONTROL LEGEND-PROPOSED WORKS

- SEDIMENT FENCE
- WRAP INLET GRATE IN FILTER FABRIC. PROVIDE AT ALL EXISTING SURFACE STORMWATER PITS, RAINWATER OUTLETS AND TRENCH DRAINS.
- SAND BAG SEDIMENT TRAP
- STABILISED CONSTRUCTION EXIT
- STORMWATER BYPASS DRAINAGE LINE
- CLEAN WATER CUT OFF DRAIN
- DIRTY WATER CUT OFF DRAIN
- LEVEL SPREADER
- SEDIMENT BASIN

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

C	RE-ISSUE FOR DA SUBMISSION	08.06.16	RS	GK	
B	RE-ISSUE FOR DA SUBMISSION	21.04.16	DW	JS	
A	ISSUE FOR DA SUBMISSION	30.11.15	KR	GK	

North

Client: RAMSAY HEALTH CARE
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Architect: TEAM 2 ARCHITECTS
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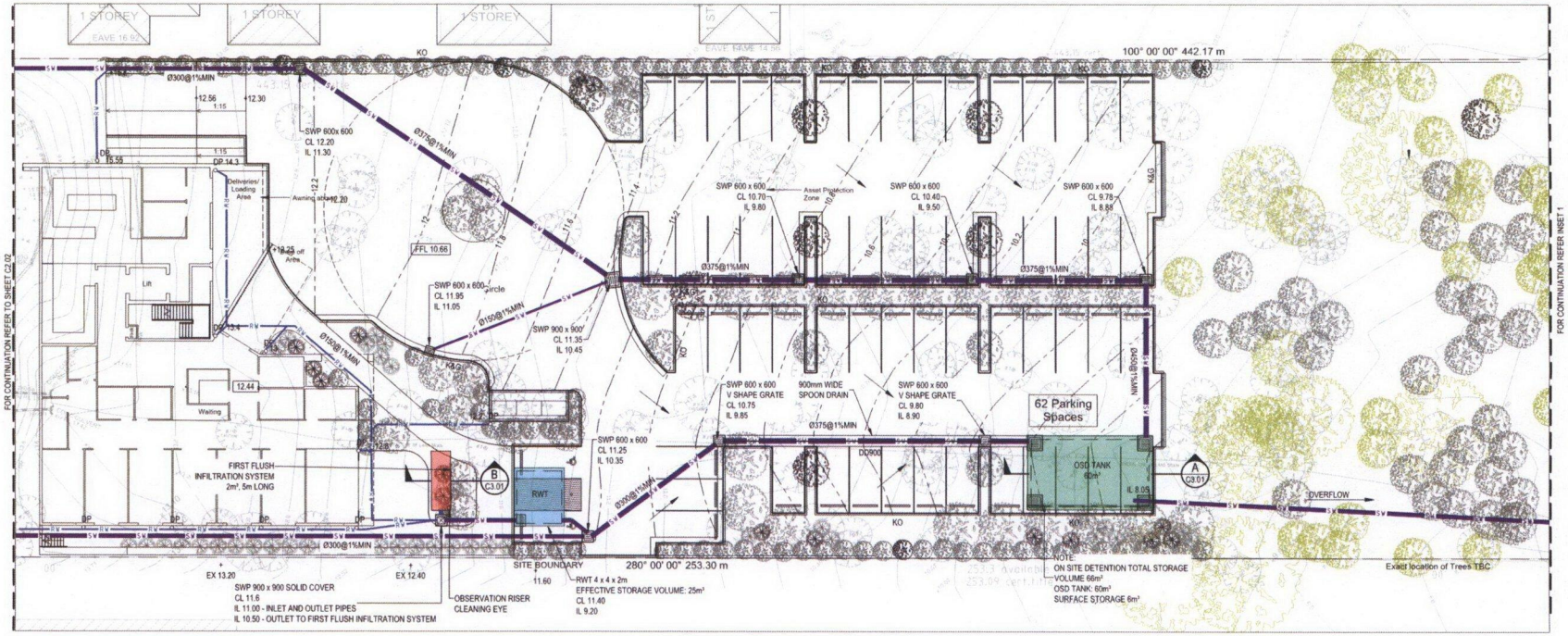
42 FAIRFAX RD

Project: WARNERS BAY PRIVATE HOSPITAL MENTAL HEALTH UNIT EXTENSION

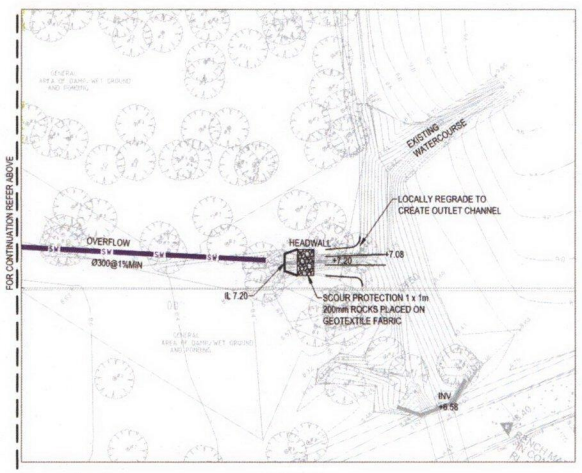
Drawing Title: COVER SHEET, NOTES AND LEGENDS

Drawn	Date	Scale	A1	Q.A. Check	Date
KR	NOV 2015	NTS		JRH	08.06.1

NOT FOR CONSTRUCTION



LOWER GROUND FLOOR



INSET 1

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	RE-ISSUE FOR DA SUBMISSION - NEW ARCHITECTUAL	21.07.16	RS	GK
B	RE-ISSUE FOR DA SUBMISSION	08.06.16	RS	GK
A	ISSUE FOR DA SUBMISSION - ARCHITECTURAL CHANGES	08.06.16	RS	GK

North

NOT FOR CONSTRUCTION

Client
RAMSAY HEALTH CARE
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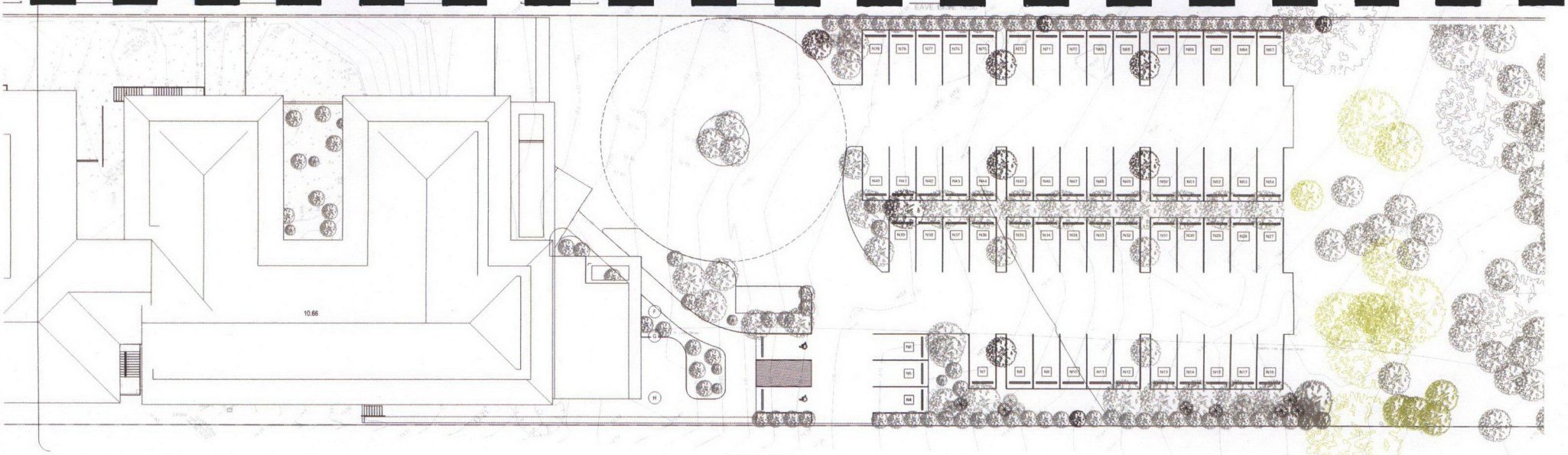
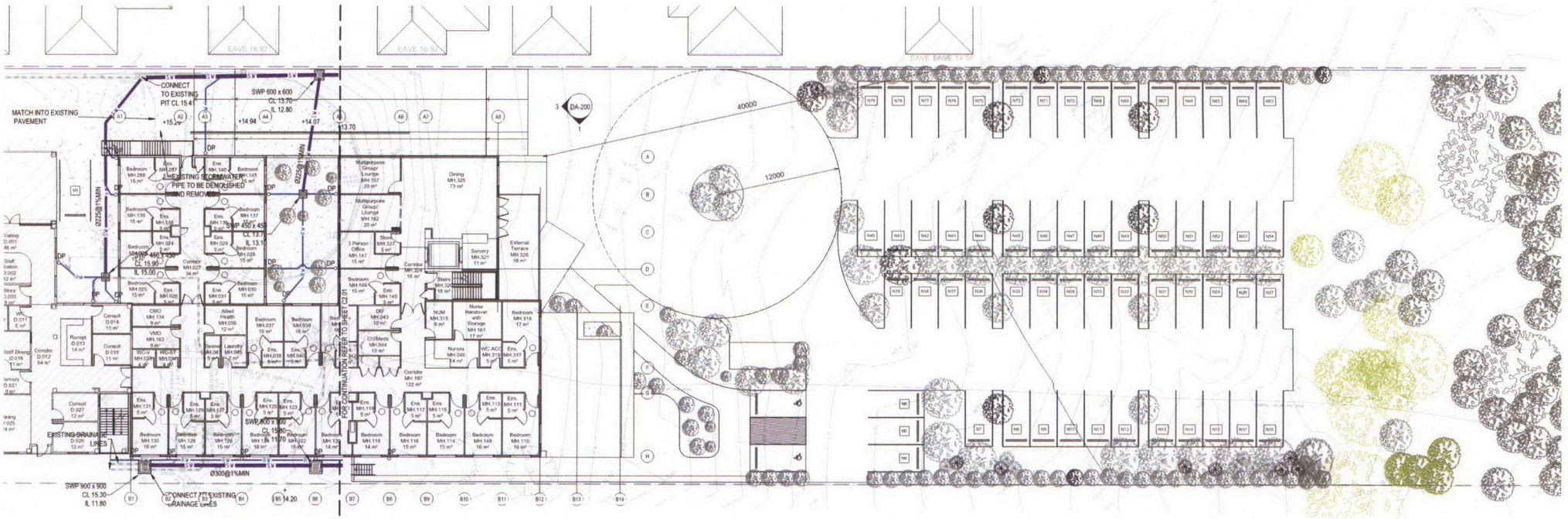
Project
WARNERS BAY PRIVATE HOSPITAL
MENTAL HEALTH UNIT EXTENSION
42 FAIRFAX RD
WARNERS BAY NSW 2282

Drawing Title
STORMWATER MANAGEMENT PLAN
LOWER GROUND CARPARK

Drawn	Date	Scale	A1	Q.A. Check	Date
KR	NOV 2015	1:250		JRH	08.06.16
Designed	Project No.			Dwg. No.	Issue



ROOF PLAN



GROUND PLAN

NOT FOR CONSTRUCTION

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C	RE-ISSUE FOR DA SUBMISSION	21.07.16	RS	GK
B	RE-ISSUE FOR DA SUBMISSION	08.06.16	RS	GK
A	ISSUE FOR DA SUBMISSION	30.11.15	RS	GK

North

Client
RAMSAY HEALTH CARE
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Project
WARNERS BAY PRIVATE HOSPITAL
MENTAL HEALTH UNIT EXTENSION
42 FAIRFAX RD
WARNERS BAY NSW 2282

Drawing Title
STORMWATER MANAGEMENT PLAN
GROUND FLOOR

Drawn	Date	Scale	A1	Q.A. Check	Date
RS	NOV 2015	1:200		JRH	08.06.1
Designed	Project No.			Dwg. No.	Issue
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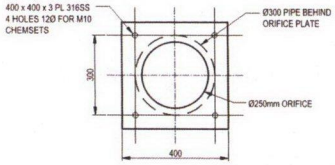
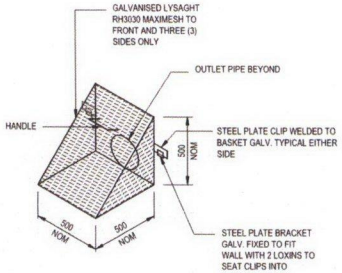
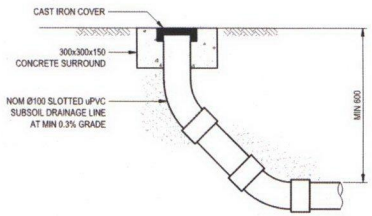


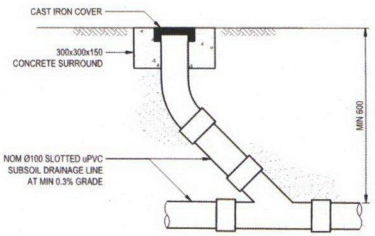
DETAIL 2 - ORIFICE PLATE
SCALE 1:10



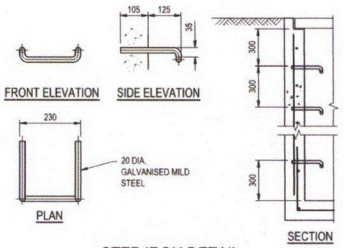
MAXIMESH DETAIL
N.T.S.



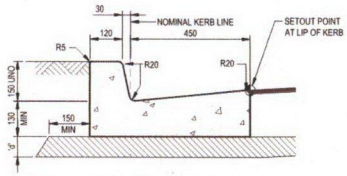
HIGH END RISER
SCALE 1:10



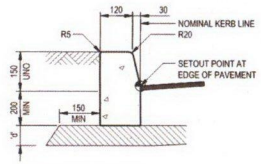
INTERMEDIATE RISER
SCALE 1:10



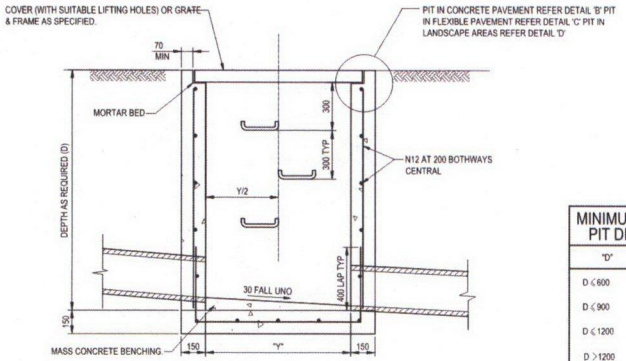
STEP IRON DETAIL
N.T.S.



KERB AND GUTTER (K&G)
SCALE 1:10
NOTE:
'd' = SUBBASE THICKNESS TO MATCH DEPTH OF PAVEMENT SUBBASE. BUT NOT LESS THAN 75



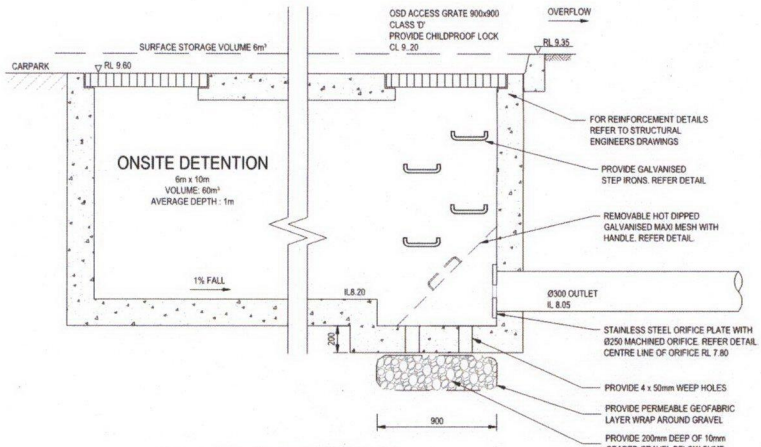
KERB ONLY (KO)
SCALE 1:10
NOTE:
'd' = SUBBASE THICKNESS TO MATCH DEPTH OF PAVEMENT SUBBASE. BUT NOT LESS THAN 75



SECTION 2
SCALE 1:20

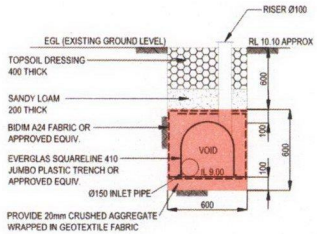
MINIMUM INTERNAL PIT DIMENSIONS		
"D"	"X"	"Y"
D ⩽ 600	450	450*
D ⩽ 900	600	600*
D ⩽ 1200	600	900
D > 1200	900	900

NOTE: PITS DENOTED * SHALL BE USED ONLY WHERE SPECIFIED IN DRAINAGE SCHEDULE OR ON PLAN.

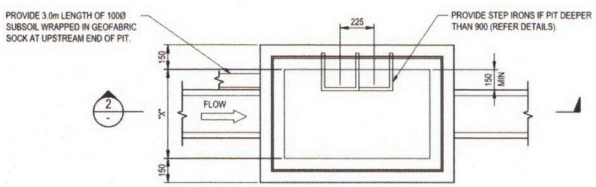


ON-SITE DETENTION TANK A C2.01
NTS

OSD NOTES:
OSD VOLUME REQUIRED : 46m³
EXISTING OSD TANK VOLUME : 25m³
(EXISTING OSD TANK TO BE DEMOLISHED AND REMOVED)
RAINWATER TANK VOLUME : 25m³
(20% VOLUME TO OFFSET OSD REQUIREMENTS)
OSD VOLUME PROVIDED : 46m³ + 25m³ - 5m³
OSD : 66m³



SECTION B C2.01
SCALE 1:10



PLAN
SCALE 1:20

SURFACE INLET/JUNCTION PIT
PIT TYPE "A"

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	RE-ISSUE FOR DA SUBMISSION	21.07.16	RS	GK
B	ISSUE FOR DA SUBMISSION	08.06.16	KR	GK
A	ISSUE FOR DA SUBMISSION	30.11.15	KR	GK

North

NOT FOR CONSTRUCTION

Client
RAMSAY HEALTH CARE
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Project
WARNERS BAY PRIVATE HOSPITAL
MENTAL HEALTH UNIT EXTENSION
42 FAIRFAX RD
WARNERS BAY NSW 2282

Drawing Title
CIVIL DETAILS

Drawn	Date	Scale A1	Q.A. Check	Date
KR	NOV 2015	AS SHOWN	JRH	08.06.1
Designed	Project No.		Dwg. No.	Issue
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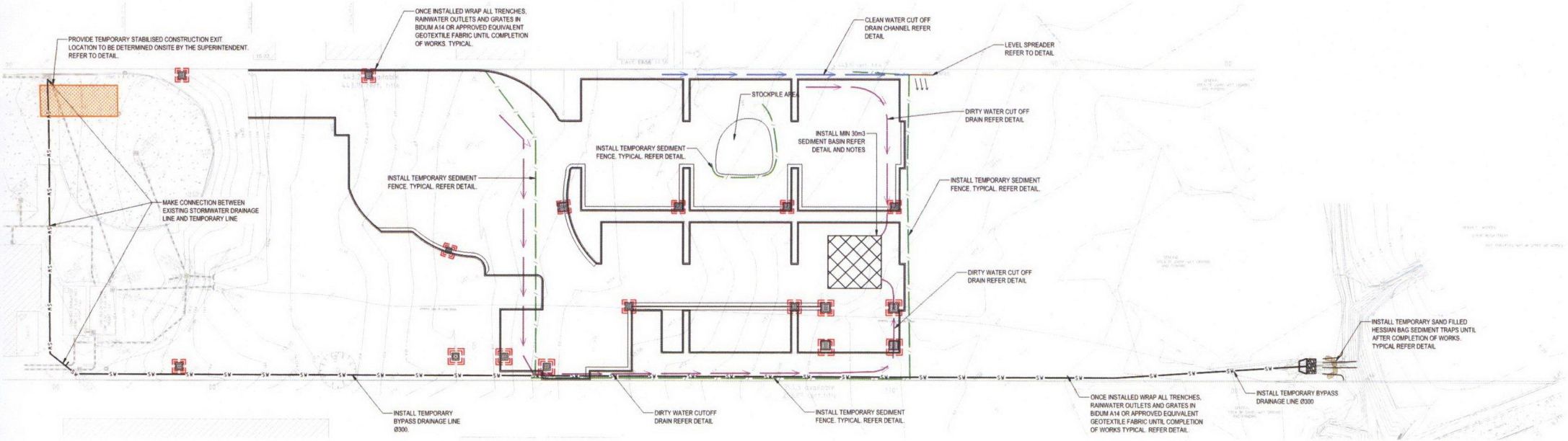

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Issue	Description	Date	Drawn	Approved
D	RE-ISSUE FOR DA SUBMISSION	21.07.16	RS	GK
C	RE-ISSUE FOR DA SUBMISSION	06.06.16	RS	GK
B	RE-ISSUE FOR DA SUBMISSION	21.04.16	DW	JS
A	ISSUE FOR DA SUBMISSION	30.11.15	KR	GK

North

NOT FOR CONSTRUCTION

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NORTHBRIDGE NSW 2063

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Project
WARNERS BAY PRIVATE HOSPITAL
MENTAL HEALTH UNIT EXTENSION
42 FAIRFAX RD
WARNERS BAY NSW 2282

Drawing Title
SOIL EROSION AND SEDIMENT CONTROL PLAN

Drawn	Date	Scale	A1	Q.A. Check	Date
KR	NOV 2015	1:250		JRH	08.06.1
Designed	Project No.			Dwg. No.	Issue
	SY150079				

SEDIMENT BASIN VOLUME

SOIL TYPE :D
BASIN VOLUME = SETTLING ZONE VOLUME + SEDIMENT STORAGE ZONE VOLUME

THE SETTLING ZONE VOLUME FOR TYPE D SOILS IS CALCULATED TO PROVIDE CAPACITY TO CONTAIN ALL RUNOFF EXPECTED FROM UP TO THE 80th PERCENTILE RAINFALL EVENT. THE SETTLING ZONE VOLUME (V) CAN BE DETERMINED BY THE FOLLOWING EQUATION:

$$V = 10 \times Cv \times A \times R \quad \text{80th ile, 2 day} \quad (m^3)$$

WHERE:

		DESCRIPTION	VALUE
10	=	A UNIT CONVERSION FACTOR	10
Cv	=	THE VOLUMETRIC RUNOFF COEFFICIENT, DEFINED AS THAT PORTION OF RAINFALL THAT RUNS OFF AS STORMWATER OVER THE 5-DAY PERIOD	0.25 ⟨ AS RECOMMENDED
R	=	IS THE 2-DAY TOTAL RAINFALL DEPTH (mm) WHICH IS NOT EXCEEDED IN 80% OF RAINFALL EVENTS.	17.6 ⟨ ADOPT FIGURE
A	=	AREA OF CATCHMENT IN HECTARES (ha)	0.421

$V = 10 \times Cv \times A \times R$ 80th ile, 2 day
$V = 10 \times 0.25 \times 0.421 \times 17.6$
$V = 18.73\ m^3$

THEREFORE THE SETTLING ZONE VOLUME IS V = 19 m³

TOTAL BASIN VOLUME = SETTLING ZONE VOL. + SEDIMENT STORAGE ZONE VOL.

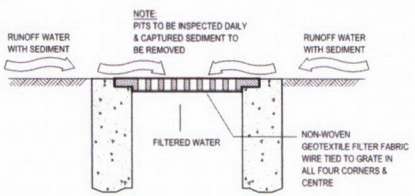
SOIL LOSS = 83 t/ha/yr

THE SEDIMENT STORAGE ZONE VOLUME SHALL BE CALCULATED AS 25% OF SETTLING ZONE

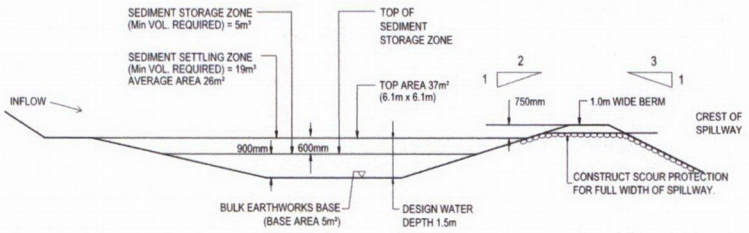
TOTAL BASIN VOLUME = 19 + 5

TOTAL BASIN VOLUME = 24 m³ ∴ SURFACE AREA = 37m WITH 900 DEEP SEDIMENTATION ZONE AND 600 DEEP SEDIMENT SETTLING ZONE

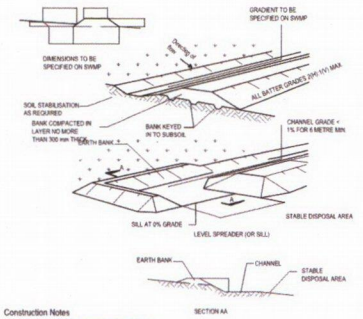
- FLOCCULATION SHOULD BE PROVIDED TO BLUE BOOK (LANDCOM 2004) SPECIFICATIONS
- PUMP OUT SEDIMENT IN LINE WITH RECOMMENDATIONS OF BLUE BOOK (LANDCOM 2004)



INLET TRAP
NTS

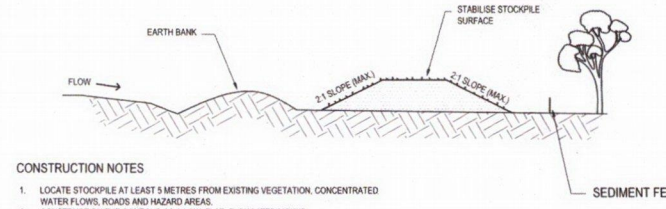


SEDIMENT BASIN CROSS SECTION
N.T.S.

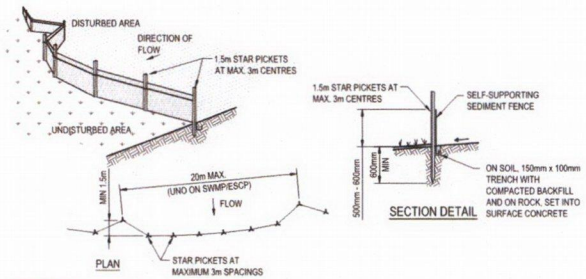


Construction Notes
1. CONSTRUCT ALONG GRADIENT AS SPECIFIED
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE
3. DRAINS TO BE OF PARABOLIC OR TRAPEZOIDAL CROSS SECTION AS OPPOSED TO V-SHAPED
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE
5. PERMANENT OR TEMPORARY STABILISATION OF EARTH BANK TO BE COMPLETED WITH IN 10 DAYS OF CONSTRUCTION
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO A SEDIMENT BASIN OR SIMILAR
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL SITE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED
8. COMPACT WITH A SUITABLE IMPLEMENT IN SITUATION WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW

EARTH BANK (LEVEL SPREADER)

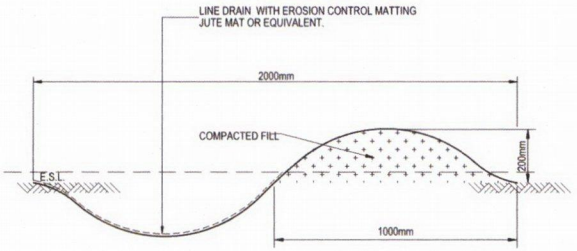


CONSTRUCTION NOTES
1. LOCATE STOCKPILE AT LEAST 5 METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOWS, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS A LOW, FLAT, ELONGATED MOUND.
3. WHERE THERE IS SUFFICIENT AREA TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METERS IN HEIGHT.
4. REHABILITATE IN ACCORDANCE WITH THE SWMP/ESCP.
5. CONSTRUCT EARTH BANK (STANDARD DRAWING 5-2) ON THE UPSLOPE SIDE TO DIVERT RUN OFF AROUND THE STOCKPILE AND A SEDIMENT FENCE (STANDARD DRAWING 6-7) 1 TO 2 METRES DOWNSLOPE OF STOCKPILE.



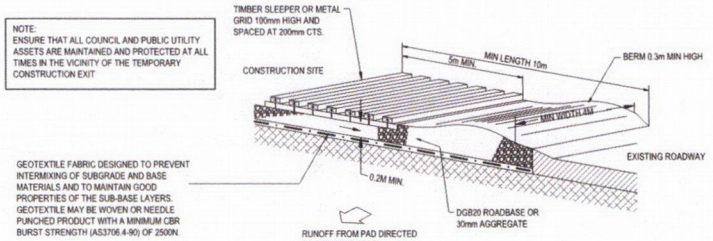
CONSTRUCTION NOTES
1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5m LONG STAR PICKETS INTO GROUND, 3 METRES APART.
3. DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING SEDIMENT FENCE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY SEDIEMNT FENCE MANUFACTURER.
6 JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.

SEDIMENT CONTROL FENCE
NTS



CUT-OFF DRAIN - 2.0m WIDE
N.T.S
PROVIDE ROCK CHECK DAM AT MIN 3m INTERVALS. REFER DETAIL.

NOTE:
ENSURE THAT ALL COUNCIL AND PUBLIC UTILITY ASSETS ARE MAINTAINED AND PROTECTED AT ALL TIMES IN THE VICINITY OF THE TEMPORARY CONSTRUCTION EXIT



CONSTRUCTION NOTES
1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP WHERE SEDIMENT IS COLLECTED AND REMOVED.

MAINTENANCE NOTES
THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT OFF THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OFF THE CONSTRUCTION SITE MUST BE REMOVED IMMEDIATELY.

TEMPORARY STABILISED CONSTRUCTION EXIT
NTS

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	RE-ISSUE FOR DA SUBMISSION	22.07.16	RS	GK
B	RE-ISSUE FOR DA SUBMISSION	08.06.16	RS	GK
A	ISSUE FOR DA SUBMISSION	21.04.16	DW	JS

North

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Project: WARNERS BAY PRIVATE HOSPITAL MENTAL HEALTH UNIT EXTENSION
42 FAIRFAX RD
WARNERS BAY NSW 2282

Drawing Title: SOIL EROSION AND SEDIMENT CONTROL PLAN AND DETAILS

Drawn	Date	Scale	A1	Q.A. Check	Date
KR	NOV 2015	NTS		Q.A.	Q.A. DAT

Designed | Project No. [redacted]50070 | Dwg. No. | Issue

APPENDIX B – DRAINS LAYOUT PLAN AND RESULTS FOR THE 1 IN 100 YEARS ARI