Option 1 - Plan

Golden Beach WSUD

Earnshaw Street Basin Landscape Concepts

DesignFlow

DFS GROUP

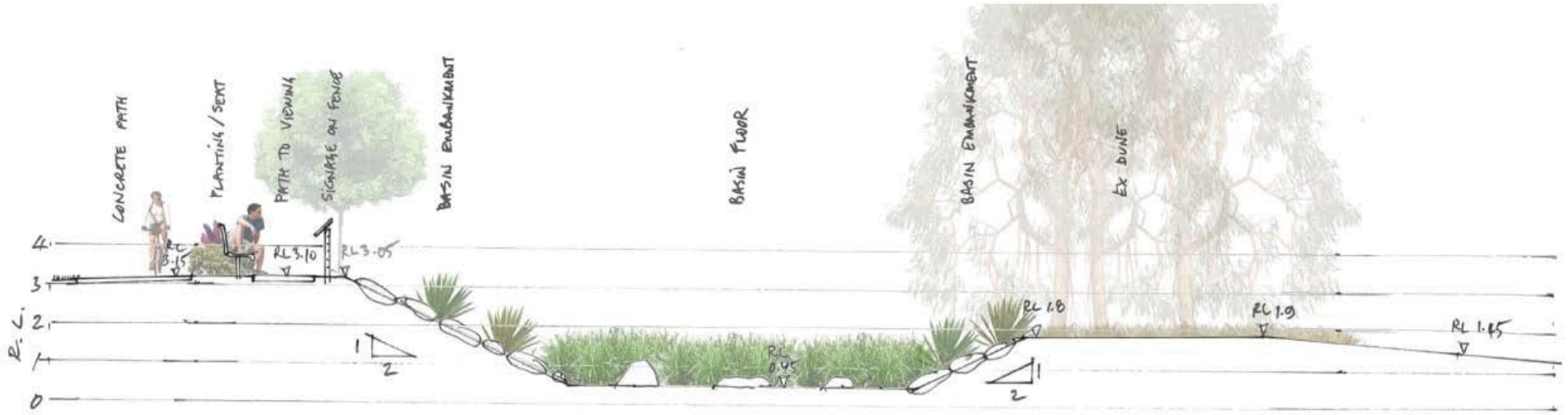
Option 2 - Plan

Golden Beach WSUD

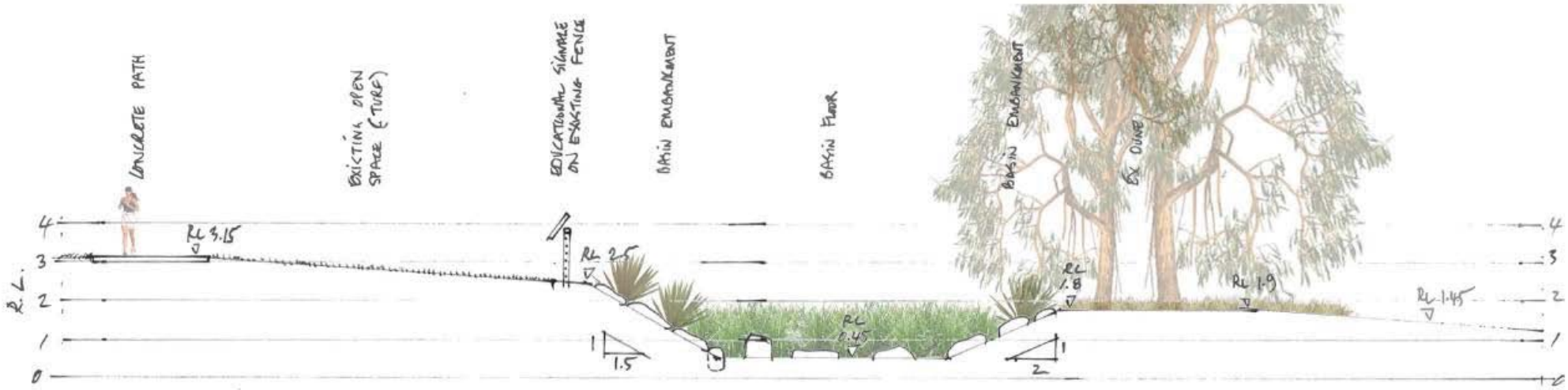
Earnshaw Street Basin Landscape Concepts

DesignFlow

DFS GROUP



Section A-A



Section B-B

DesignFlow
DFS GROUP

Plan

Golden Beach WSUD

Gregory Street Basin Landscape Concepts

DesignFlow

DFS GROUP

Plan

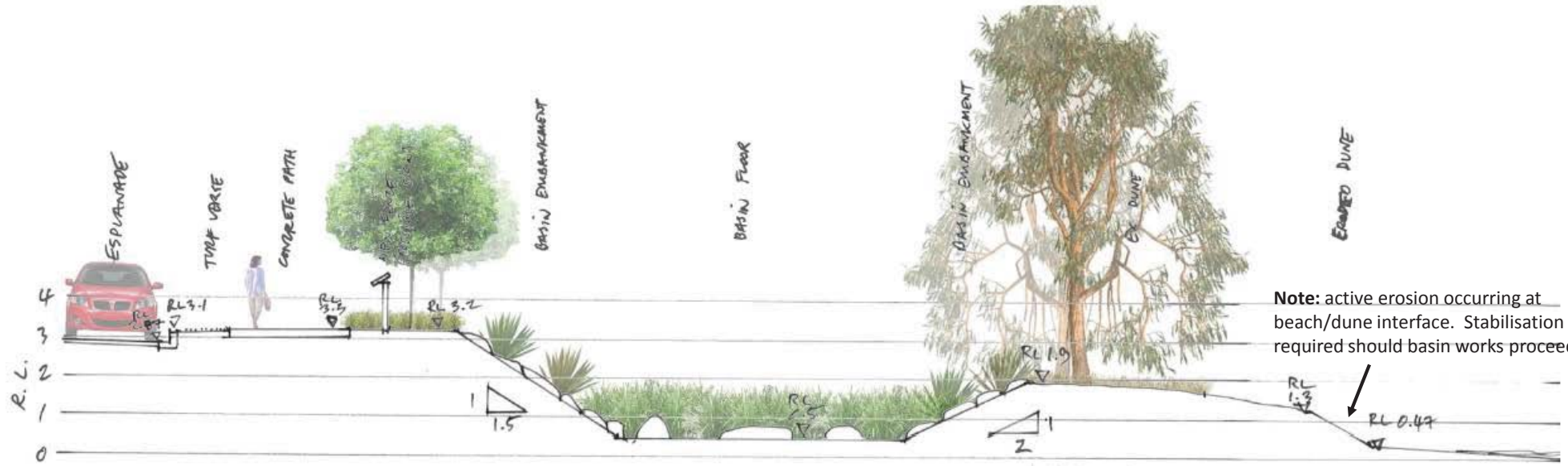
Golden Beach WSUD

Wills Avenue Basin Landscape Concepts

DesignFlow

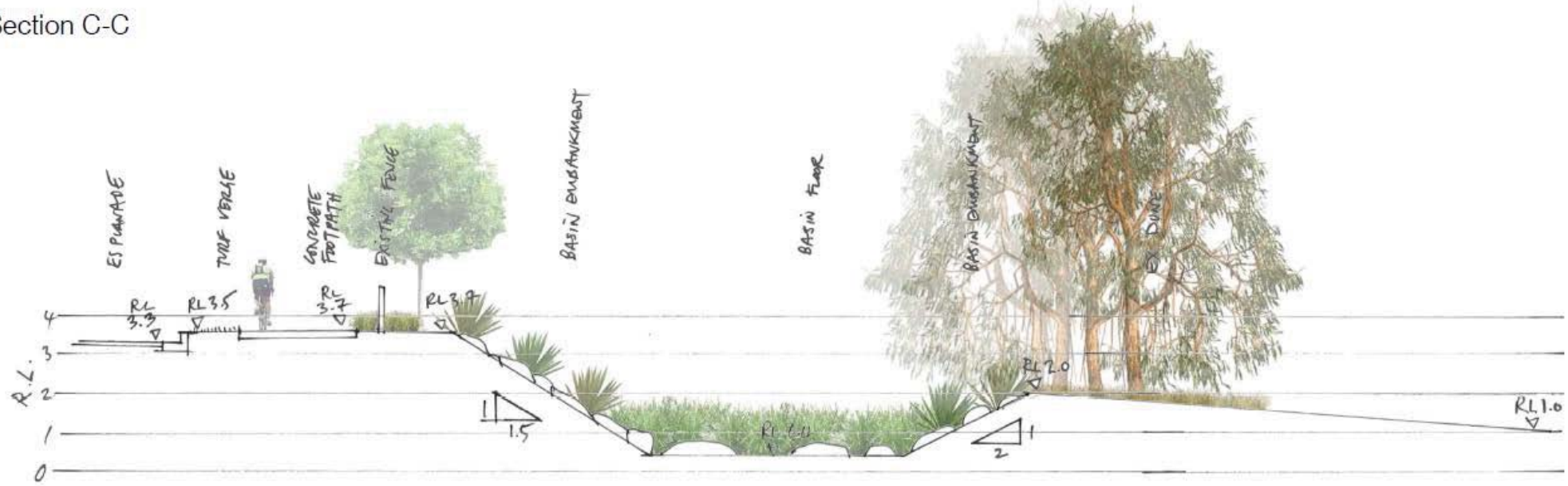
scale 1:250 @ A3
project number 13090
drawing number SD - 05 [0]
date 14.02.2014

DFS GROUP



Note: active erosion occurring at beach/dune interface. Stabilisation required should basin works proceed

Section C-C



Section D-D

DesignFlow

Golden Beach WSUD

Gregory Street & Wills Avenue Basin Landscape Concepts

DFS GROUP

Summary of Golden Beach basins

- Earshaw Street basin - most feasible
  - Good open space available
  - Limited impact on vegetation – re-vegetation works will improve vegetation outcomes
  - Diversion point feasible in park zone – limited impact on traffic
  - Good demonstration site and educational opportunities – link with park zone including interpretive signage

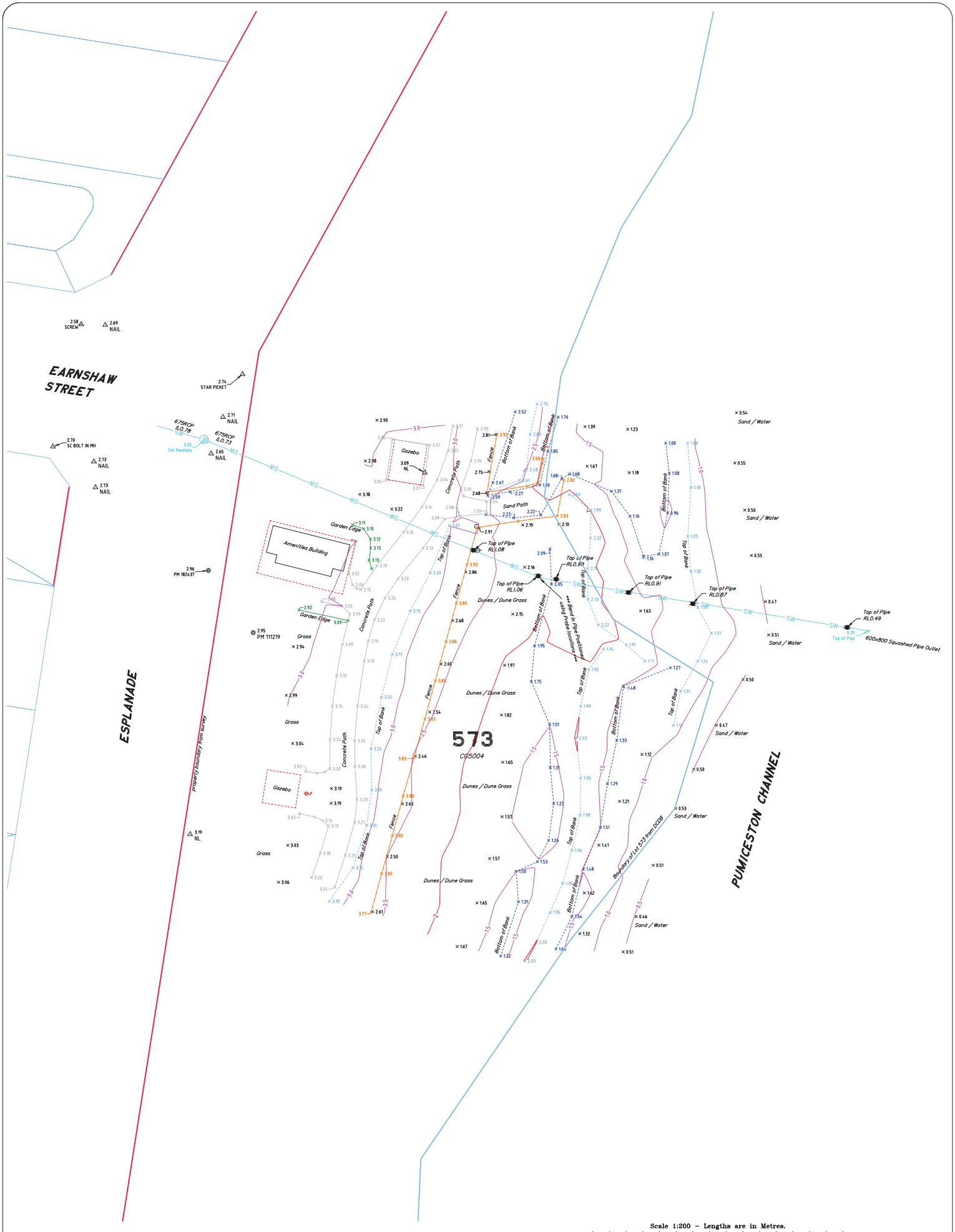
- Gregory Street basin – marginal
  - Highly constrained site - limited open space available
  - High impact on vegetation
  - Diversion required at road - costly
  - Coastal erosion issues of high concern

- Wills Ave basin – marginal
  - Vegetation impacts will occur but could be offset with revegetation works
  - Diversion can occur adjacent to footpath
  - Site topography will result in depths to approximately 3.5m to basin floor – visual integration and potential safety issues

Recommendations

- Complete detail functional designs for Earshaw Street basin
- Install a monitoring well to 3 m depth at the proposed Earshaw street basin
  - Monitor seasonal groundwater levels
  - Test in-situ pH and EC
  - Perform a falling head test
- Complete updated concept designs only for Gregory St and Wills Ave basins
  - Both sites are marginal due to site constraints and would not be recommended to be built at this stage

APPENDIX B - FEATURE SURVEY



Scale 1:200 – Lengths are in Metres.

2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

0 50mm 100mm 150mm

Client: **DESIGN FLOW**

CONTOUR AND DETAIL SURVEY

Earnshaw Street outfall
Golden Beach Esplanade & Water Front

PARISH: **BRIBIE** COUNTY: **Canning**

Plan No: 6134DET.Sheet 1/3	Scale: 1:200@A1
Prepared By: TJ/AWJ	Date: 21/01/2014

Skyline Surveyors

Suite 8, Dwyer House
256 Nicklin Way
WARANA QLD 4575

PHONE 07 5493 4877
FAX 07 5493 4899

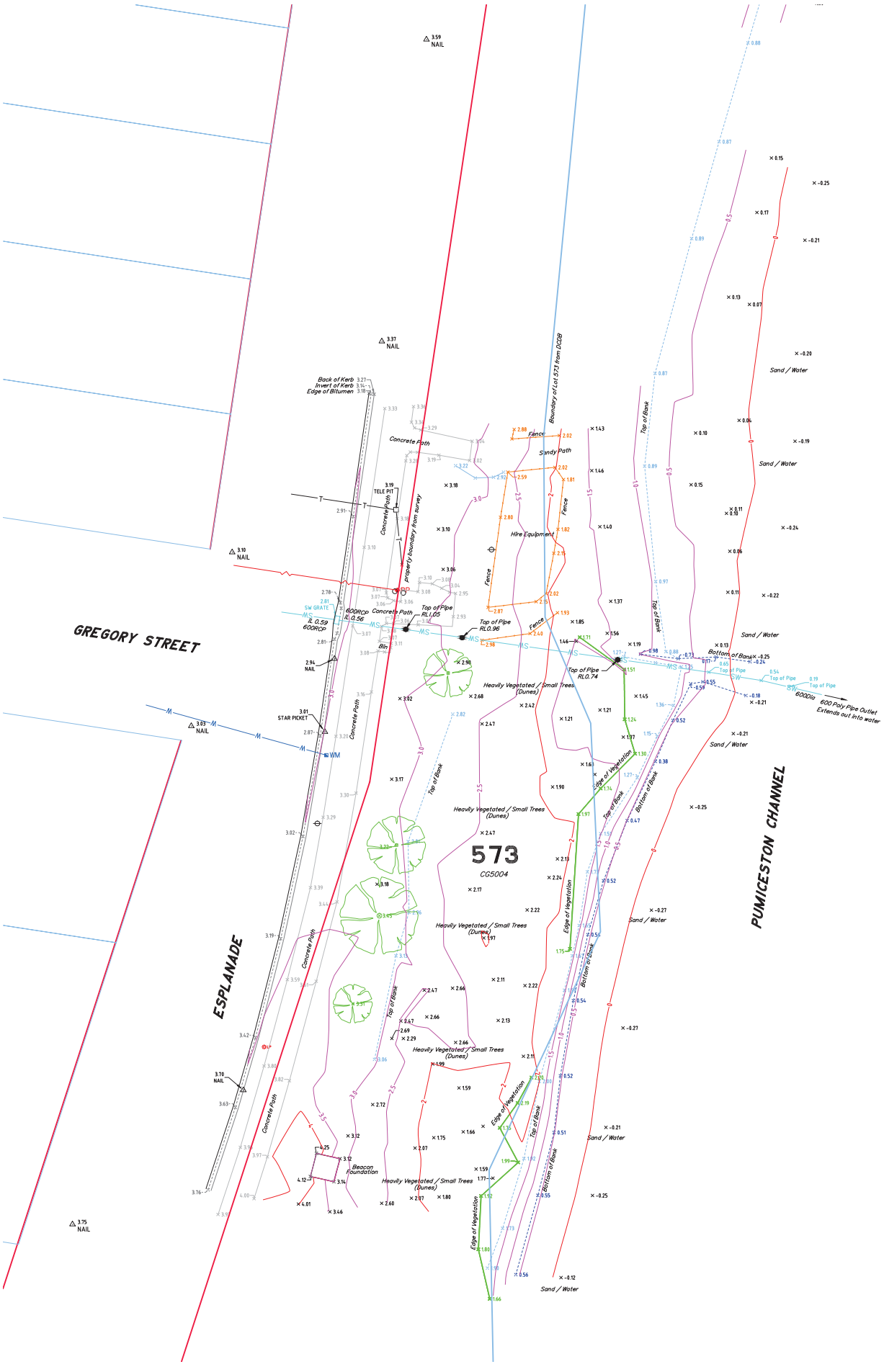
Note: Levels are to AHD Derived from PSM111219

Services shown hereon have been located where possible by field survey.
Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.

N

LEGEND

- SW STORM WATER
- S SEWER MAIN
- G GAS MAIN
- W WATER MAIN
- C COMMUNICATION CABLES
- T TELSTRA CONDUIT
- ELECTRICITY
- FIRE HYDRANT
- SIGN
- PALM TREE
- TREE
- WM WATER METER
- SURVEY STN
- PERMANENT SURVEY MARK
- PP POWER POLE
- SLP STREET LIGHT
- E ELECTRICITY MARKER
- ELP ELECTRICITY PILLAR
- T TELECOMMUNICATIONS MARKER
- G GAS LINE MARKER
- W WATER LINE MARKER
- STORMWATER M/H
- WATER VALVE
- S SEWER MANHOLE
- TRAFFIC LIGHTS
- TRAFFIC SIGNAL CONTROL BOX
- T TELSTRA PIT



Scale 1:200 – Lengths are in Metres.

2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

0 50mm 100mm 150mm

Client: **DESIGN FLOW**

CONTOUR AND DETAIL SURVEY

Gregory Street outfall
Golden Beach Esplanade & Water Front

PARISH: **BRIBIE** COUNTY: **Canning**

Plan No: 6134 DET Sheet 2/3 Scale: 1:200@A1

Prepared By: TJ/AWJ Date: 21/01/2014

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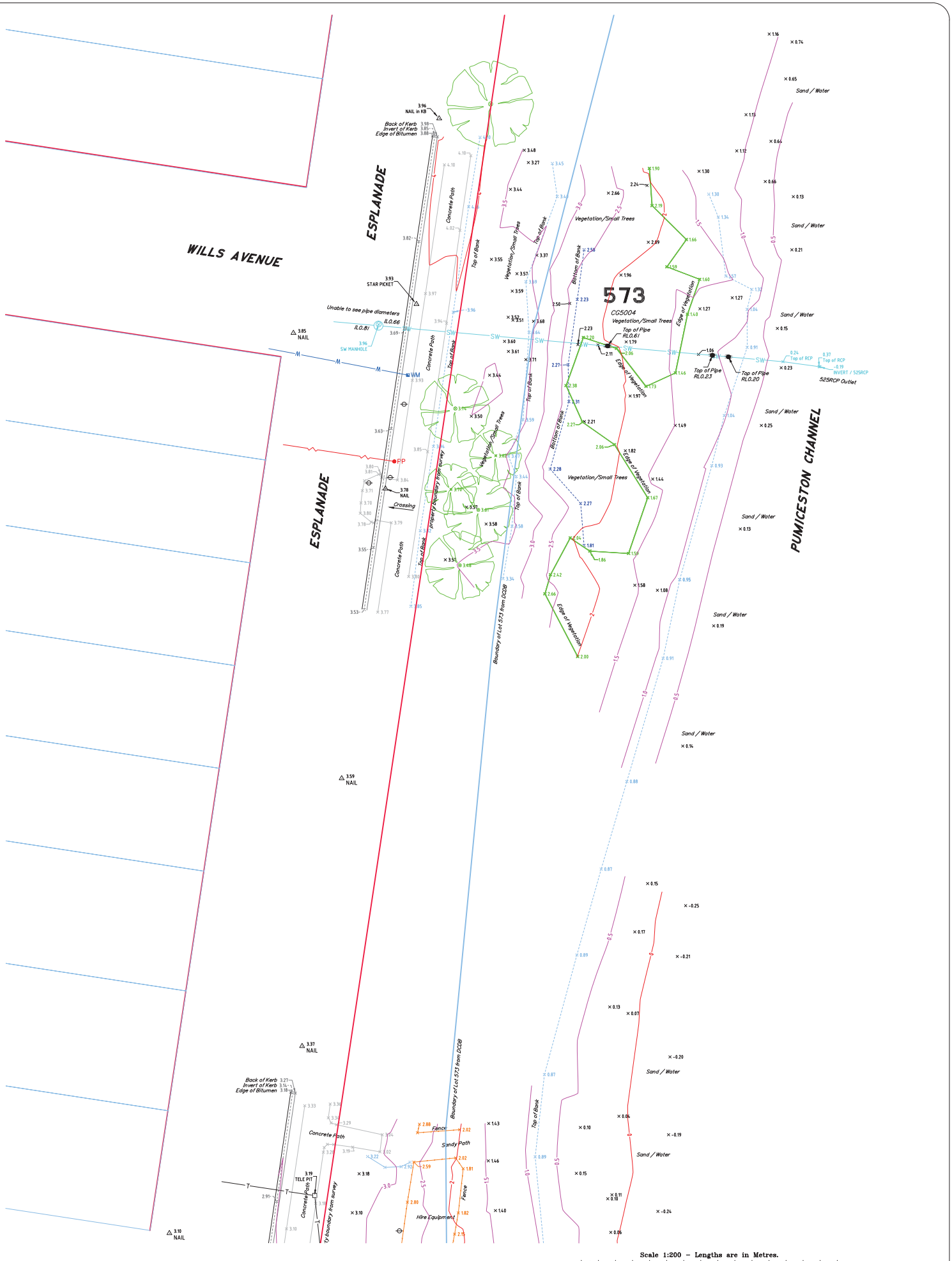

Client: **DESIGN FLOW**

CONTOUR AND DETAIL SURVEY

Wills Ave outfall

Golden Beach Esplanade & Water Front

PARISH: **BRIBIE** COUNTY: **Canning**

Plan No: 6134DET.Sheet 3/3 Scale: 1:200@A1

Prepared By: TJ/AWJ Date: 21/01/2014

Skyline Surveyors

Suite 8, Dwyer House
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WARANA QLD 4575

PHONE 07 5493 4877
FAX 07 5493 4899

Note: Levels are to AHD Derived from PSM111219

Services shown hereon have been located where possible by field survey.

Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.

N

LEGEND

- SW STORM WATER
- S SEWER MAIN
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- TELSTRA PIT

APPENDIX C - PIEZOMETER INSTALLATION AND GROUNDWATER MONITORING

13 May 2014 Project No. 147633012-001-L-Rev0

Mr. Cory Josland
Sunshine Coast Council
Lock Bag 72
Sunshine Coast Mail Centre
NAMBOUR QLD 4560

Email: cory.josland@sunshinecoast.qld.gov.au

PIEZOMETER INSTALLATION AND GROUNDWATER MONITORING – GOLDEN BEACH

Dear Cory

1.0 INTRODUCTION

Golder Associates Pty Ltd (Golder) was commissioned by the Sunshine Coast Council (SCC), to install a piezometer (ST1) and undertake groundwater quality monitoring at Golden Beach, Caloundra. We are pleased to present the installation details and water quality monitoring results at the above site.

2.0 METHODOLOGY

A single piezometer (ST1) was installed using a 4WD mounted Drill Rig. The construction of the standpipe is detailed on the attached borehole report with the installation location shown on Figure 1.

Following installation a falling head test was performed on 20 March 2014 at high tide. Water level was recorded at regular intervals following twenty litres of water being poured into the piezometer. The results of the water level and time interval are presented in Table 1.

Additional water quality monitoring was undertaken at ST1 as requested by SCC. A total of 5 groundwater monitoring events were undertaken between 20 March 2014 and 7 May 2014.

Monitoring consisted of recording standing water level, salinity, pH, conductivity, redox, dissolved oxygen and temperature (refer to Table 2). Water samples were tested in the field using an Aquaread '*Aquaprobe*' AP 2000-D model water quality analyser. In-situ groundwater testing was performed in accordance with the Department of Environment and Heritage Protection *Monitoring and Sampling Manual 2009* Version 2 September 2010.

All works outlined above was undertaken in the presence of or by an experienced environmental scientist from Golder.

3.0 GROUNDWATER RESULTS

A summary of groundwater monitoring results from all events are presented below Table 1 and Table 2.

Table -1: ST1 Falling Head Test Results (20 March 2014)

Test 1 – 11:05am		**Test 2 – 11:15am**	
Volume of Water	20 Litres	Volume of Water	20 Litres
Time (seconds)	**Depth to water (mm)**	**Time (seconds)**	**Depth to water (mm)**
0	2520	0	2380
10	2550	10	2470
20	2560	20	2520
30	2560	30	2550
40	2565	40	2550
50	2565	50	2550
60	2570	60	2550
70	2570	70	2555
80	2570	80	2555
90	2570	90	2560
100	2570	100	2560
110	2575	110	2560
120	2580	120	2560
130	2580	130	2560
140	2580	140	2565
150	2580	150	2565
160	2580	160	2565
170	2580	170	2565
180	2580	180	2565
190	2580	190	2565
200	2580	200	2565
210	2580	210	2565
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300	2580	300	2565
310	2580	310	2565
320	2580	320	2565
330	2580	330	2565
340	2580	340	2565
350	2580	350	2565
360	2580	360	2570
370	2580	370	2570
380	2580	380	2570
390	2580	390	2570
400	2580	400	2570
410	2580	410	2570
420	2580	420	2570
430	2580	430	2570
440	2580	440	2570
450	2580	450	2570
460	2580	460	2570

Table -2: ST1 Water Quality Monitoring Results

Sampling Location										
Location	**Date**	**Sampling Time**	**Tide**	**Water Level** (RL m AHD)	**pH**	**Conductivity (µs)**	**Salinity (PPT)**	**Redox (MV)**	**DO (mg/L)**	**Temp**
ST1	20/03/2014	10:45am	High @ 10:45am - 1.59m	0.247	6.5	309	0.13	-	-	25.7
ST1	31/03/2014	8:00am	High @ 8:17am - 1.84m	0.594	6.6	266	0.13	66.8	3.36	25.5
ST1	31/03/2014	2:00pm	Low @ 2:27pm - 0.15m	0.407	6.5	296	0.15	39.6	3.21	25.8
Adjacent surface water	31/03/2014	8:30am	High @ 8:17am - 1.84m	-	6.1	58100	29.15	51.1	7.52	26.0
ST1	23/04/2014	3:30pm	High @ 3:25pm - 1.80m	0.451	6.6	463	0.23	42.1	4.10	25.4
ST1	05/5/2014	12.30pm	High @ 12.32pm – 1.60m	0.237	7.2	155	0.05	81.1	5.2	24.6

4.0 CLOSURE

Should you require any further information please contact the undersigned. We draw your attention to the document Limitations, attached.

GOLDER ASSOCIATES PTY LTD

Daniel Joyce BSc. ENV. CEnvP (0291)
Senior Environmental Scientist

Ian Wallace BSc (Agric)(Hons), MEnvMgt, CPSS
Senior Environmental Scientist

DJJ/IW/djj

Attachments: Figure 1
Report of Borehole and Explanatory Notes
Limitations
Invoice

j:\2014\contam\147633012 - scc-stormwater - golden beach\correspondence out\147633012-001-l-rev0.docx

STORMWATER, GOLDERN BEACH ESPLANADE

SUNSHINE COAST COUNCIL

SITE PLAN

LEGEND

Standpipe Location

COPYRIGHT

SCALE

0 1.5 3 6 9 12 15 metres

1:400 (at A3)

DATUM GDA 94, PROJECTION MGA Zone 56

PROJECT: **147633012**
DATE: **13 MAY 2014**
DRAWN: **BAL**
CHECKED: **DJ**

FIGURE 1

Golder Associates

File Location: J:\2014\Contam\147633012 - SCC-stormwater - Golden beach\PHASE 1000\Figures Drawings\GIS\Workspaces\147633012-001-R-F001-Rev0 Site plan.mxd

REPORT OF BOREHOLE: BH1

SHEET: 1 OF 1

CLIENT: Sunshine Coast Council
PROJECT: Stormwater
LOCATION: Golden Beach Esplanade
JOB NO: 147633012

COORDS: 512099.0 m E 7034005.0 m N MGA94 56
SURFACE RL: 2.15 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: 50 mm HOLE DEPTH: 3.00 m

DRILL RIG:
CONTRACTOR: Contract Drilling
LOGGED: DJJ DATE: 19/3/14
CHECKED: LG DATE: 7/5/14

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS
ADT		SWL AT 1.70 M DEPTH ON 19/03/2014	-1.0									RL 2.837
			-0.5									Stickup
			0.0	2.15								RL 2.149
				0.10					SAND			Concrete
				2.05					fine to medium grained, pale yellow, trace organics			Bentonite plug
			0.5						no organics	D		Backfill
			1.0									
			1.5							D - M		
			2.0							M		Slotted Screen
			2.5							W		Sand filter pack
			3.0	-0.85					END OF BOREHOLE @ 3.00 m TARGET DEPTH GROUNDWATER MONITORING WELL INSTALLED			RL -0.583
			3.5									
			4.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01d
RL3

EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT REPORTS

DRILLING/EXCAVATION METHOD

AS*	Auger Screwing	RD	Rotary blade or drag bit	NQ	Diamond Core - 47 mm
AD*	Auger Drilling	RT	Rotary Tricone bit	NMLC	Diamond Core - 52 mm
*V	V-Bit	RAB	Rotary Air Blast	HQ	Diamond Core - 63 mm
*T	TC-Bit, e.g. ADT	RC	Reverse Circulation	HMLC	Diamond Core – 63mm
HA	Hand Auger	PT	Push Tube	BH	Tractor Mounted Backhoe
ADH	Hollow Auger	CT	Cable Tool Rig	EX	Tracked Hydraulic Excavator
DTC	Diatube Coring	JET	Jetting	EE	Existing Excavation
WB	Washbore or Bailer	NDD	Non-destructive digging	HAND	Excavated by Hand Methods

PENETRATION/EXCAVATION RESISTANCE

L **Low resistance.** Rapid penetration possible with little effort from the equipment used.

M **Medium resistance.** Excavation/possible at an acceptable rate with moderate effort from the equipment used.

H **High resistance** to penetration/excavation. Further penetration is possible at a slow rate and requires significant effort from the equipment.

R **Refusal or Practical Refusal.** No further progress possible without the risk of damage or unacceptable wear to the digging implement or machine.

These assessments are subjective and are dependent on many factors including the equipment power, weight, condition of excavation or drilling tools, and the experience of the operator.

WATER

▽	Water level at date shown	◁	Partial water loss
▷	Water inflow	◀	Complete water loss

GROUNDWATER NOT OBSERVED	The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.
GROUNDWATER NOT ENCOUNTERED	The borehole/test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/test pit been left open for a longer period.

SAMPLING AND TESTING

SPT	Standard Penetration Test to AS1289.6.3.1-2004
4,7,11 N=18	4,7,11 = Blows per 150mm. N = Blows per 300mm penetration following 150mm seating
30/80mm	Where practical refusal occurs, the blows and penetration for that interval are reported
RW	Penetration occurred under the rod weight only
HW	Penetration occurred under the hammer and rod weight only
HB	Hammer double bouncing on anvil
DS	Disturbed sample
BDS	Bulk disturbed sample
G	Gas Sample
W	Water Sample
FP	Field permeability test over section noted
FV	Field vane shear test expressed as uncorrected shear strength (s_v = peak value, s_r = residual value)
PID	Photoionisation Detector reading in ppm
PM	Pressuremeter test over section noted
PP	Pocket penetrometer test expressed as instrument reading in kPa
U63	Thin walled tube sample - number indicates nominal sample diameter in millimetres
WPT	Water pressure tests
DCP	Dynamic cone penetration test
CPT	Static cone penetration test
CPTu	Static cone penetration test with pore pressure (u) measurement

Ranking of Visually Observable Contamination and Odour (for specific soil contamination assessment projects)

R = 0	No visible evidence of contamination	R = A	No non-natural odours identified
R = 1	Slight evidence of visible contamination	R = B	Slight non-natural odours identified
R = 2	Visible contamination	R = C	Moderate non-natural odours identified
R = 3	Significant visible contamination	R = D	Strong non-natural odours identified

ROCK CORE RECOVERY

TCR = Total Core Recovery (%)

$$= \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100$$

SCR = Solid Core Recovery (%)

$$= \frac{\sum \text{Length of cylindrical core recovered}}{\text{Length of core run}} \times 100$$

RQD = Rock Quality Designation (%)

$$= \frac{\sum \text{Axial lengths of core} > 100 \text{ mm}}{\text{Length of core run}} \times 100$$

METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT REPORTS


FILL


GRAVEL (GP or GW)


SAND (SP or SW)


SILT (ML or MH)


CLAY (CL, CI or CH)


ORGANIC SOILS (OL or OH or Pt)


COBBLES or BOULDERS

Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay.

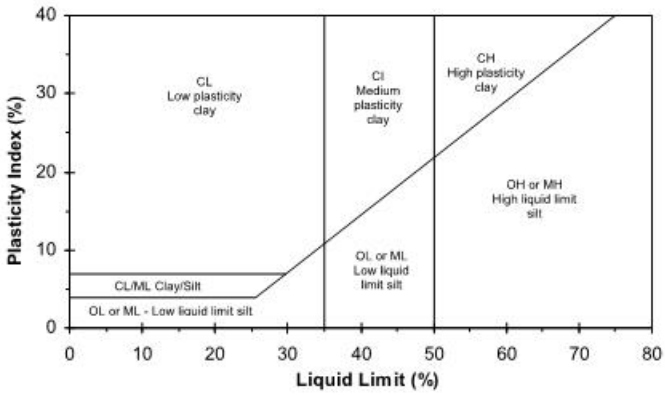
CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726 – 1993, (Amdt1 – 1994 and Amdt2 – 1994), Appendix A. The material properties are assessed in the field by visual/tactile methods.

Particle Size

Major Division	Sub Division	Particle Size
BOULDERS		> 200 mm
COBBLES		63 to 200 mm
GRAVEL	Coarse	20 to 63 mm
	Medium	6.0 to 20 mm
	Fine	2.0 to 6.0 mm
SAND	Coarse	0.6 to 2.0 mm
	Medium	0.2 to 0.6 mm
	Fine	0.075 to 0.2 mm
SILT		0.002 to 0.075 mm
CLAY		< 0.002 mm

Plasticity Properties



MOISTURE CONDITION

AS1726 - 1993

Symbol	Term	Description
D	Dry	Sands and gravels are free flowing. Clays & Silts may be brittle or friable and powdery.
M	Moist	Soils are darker than in the dry condition & may feel cool. Sands and gravels tend to cohere.
W	Wet	Soils exude free water. Sands and gravels tend to cohere.

CONSISTENCY AND DENSITY

AS1726 - 1993

Symbol	Term	Undrained Shear Strength
VS	Very Soft	0 to 12 kPa
S	Soft	12 to 25 kPa
F	Firm	25 to 50 kPa
St	Stiff	50 to 100 kPa
VSt	Very Stiff	100 to 200 kPa
H	Hard	Above 200 kPa

Symbol	Term	Density Index %	SPT "N" #
VL	Very Loose	Less than 15	0 to 4
L	Loose	15 to 35	4 to 10
MD	Medium Dense	35 to 65	10 to 30
D	Dense	65 to 85	30 to 50
VD	Very Dense	Above 85	Above 50

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material.

SPT correlations are not stated in AS1726 – 1993, and may be subject to corrections for overburden pressure and equipment type.

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APPENDIX D - DESIGN DRAWINGS

EARNSHAW STREET - GOLDEN BEACH
INFILTRATION BASIN

DRAWING LIST	
DWG No	DESCRIPTION
D0001	SITE LOCALITY PLAN AND DRAWING LIST
D0002	NOTES
D0003	DEMOLITION PLAN
D0101	GENERAL ARRANGEMENT PLAN
D0102	SECTIONS AND DIVERSION PIT DETAILS
D0103	OUTFALL AND CONCRETE DETAILS
D0301	COVER SHEET
D0302	LANDSCAPE PLAN
D0303	LANDSCAPE DETAILS

ALL DRAWINGS TO BE PRINTED IN COLOUR!

DFS GROUP

DesignFlow

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www.todconsulting.com
ABN 39 128 805 336

Drawn	Verified	Tod Consulting Dwg No.
BLH	GAJ	13671-D0001
Designed BLH	Verified D Reynolds	Revision C
Approved Doug Reynolds	RPEQ No 9072	
Signed	Date 23/07/14	

Rv	DATE	REVISIONS	REC.	APPR.
E				
D				
C	22/10/14	FINAL NOT FOR CONSTRUCTION		
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Sunshine Coast COUNCIL

EARNSHAW ST - GOLDEN BEACH
PROPOSED INFILTRATION BASIN
SITE LOCALITY PLAN AND DRAWING LIST

Project Number: 24228
Sheet No. - Revision No.: D0001 . C

FILE:J:\2013\13671_Wills_Ave_Golden_Beach_Design_Flow\Cad\13671 CIVIL (B).dwg DATE:22/Oct/2014 BY:admin

GENERAL NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL PROVIDE TO THE SUPERINTENDENT A COPY OF THE CONSTRUCTION PROGRAM DETAILING THE DATES OF COMMENCEMENT AND COMPLETION FOR EACH STAGE.
3. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL PREPARE AND FORWARD TO THE SUPERINTENDENT A REPORT ON THE CONDITION OF EXISTING INFRASTRUCTURE IN THE VICINITY OF THE WORKS SITE. THE REPORT SHALL LIST THE LOCATION AND EXTENT OF ANY EXISTING DAMAGE. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGED ASSETS THAT ARE NOT REPORTED PRIOR TO THE COMMENCEMENT OF WORKS.
4. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL PREPARE AND FORWARD AN EROSION AND SEDIMENT CONTROL PLAN TO THE SUPERINTENDENT FOR APPROVAL. THE CONTRACTOR SHALL COMPLY WITH THIS PLAN, AND AUGMENT AS REQUIRED DURING THE CONSTRUCTION PHASE.
5. DO NOT SCALE OFF THE DRAWINGS
6. ALL DIMENSIONS AND LEVELS ARE TO BE SITE CHECKED AND ANY DISCREPANCY REPORTED TO THE SUPERINTENDENT.
7. ANY VARIATION TO THE DETAILS SHOWN IN THE DRAWING MUST BE AUTHORISED BY THE SUPERINTENDENT PRIOR TO FABRICATION AND/OR CONSTRUCTION.
8. CONSTRUCTION WORK SHALL BE CARRIED OUT IN STRICT ACCORDANCE WITH THE HEALTH AND SAFETY ACT 2011.
9. ALL PROPRIETARY PRODUCTS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
10. ALL REDUCED LEVELS AND FINISHED SURFACE LEVELS ARE IN METRES TO AUSTRALIAN HEIGHT DATUM.
11. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING SERVICES WITH THE RELEVANT AUTHORITIES BEFORE COMMENCING CONSTRUCTION.
12. ALL ASSETS MODIFIED OR DAMAGED BY THE PROPOSED WORKS SHALL BE REINSTATED TO THE SATISFACTION OF THE SUPERINTENDENT.
13. THE CONTRACTOR SHALL REMOVE ALL STRUCTURES, DEBRIS AND FENCES FROM THE SITE TO THE SATISFACTION OF THE SUPERINTENDENT.
14. THE CONTRACTOR SHALL NOTIFY THE SUPERINTENDENT PRIOR TO COMMENCEMENT OF DEMOLISHING ANY EXISTING STRUCTURES WITHIN THE SITE AREAS

INSPECTIONS

THE CONTRACTOR SHALL REQUEST THAT THE SUPERINTENDENT ARRANGE INSPECTIONS BY THE DESIGN TEAM AT THE FOLLOWING MILESTONES:

1. INITIAL POT-HOLE SURVEY OF PIPE INVERT AT PROPOSED DIVERSION POINT.
2. AT THE COMPLETION OF BULK EARTHWORKS AND ALL CIVIL STRUCTURES, TO CONFIRM COMPLIANCE WITH DESIGN DRAWINGS (CONTRACTOR TO PROVIDE AS CONSTRUCTED SURVEY PRIOR TO THESE INSPECTIONS).

HIGH FLOW CONTINGENCIES

1. CONTINGENCIES TO MANAGE RISKS ASSOCIATED WITH FLOOD EVENTS DURING THE CONSTRUCTION PERIOD ARE REQUIRED.
2. ADEQUATE EROSION AND SEDIMENT CONTROLS MUST BE IN PLACE AT THE END OF EACH DAY AND THE SITE MUST BE STABILISED AGAINST SOIL EROSION AS SOON AS POSSIBLE.
3. ALL MACHINERY SHALL BE STORED ABOVE ACCEPTABLE FLOOD LEVELS AND A MECHANISM FOR DEWATERING THE CONSTRUCTION SITE MADE AVAILABLE.

EARTHWORKS

1. NOTWITHSTANDING THE LIMITS OF CUTTING AND FILLING SHOWN ON THE DRAWINGS, THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE SUPERINTENDENT DURING CONSTRUCTION. SIMILARLY, THE FINISHED SURFACE LEVELS MAY BE ADJUSTED BY THE WRITTEN DIRECTION OF THE SUPERINTENDENT DURING CONSTRUCTION.
2. THE EXISTING SURFACE IS TO BE CLEAR OF VEGETATION MATTER PRIOR TO THE START OF FILLING.
3. PRIOR TO THE PLACEMENT OF ANY FILL, THE EXPOSED SUBGRADE SHALL BE COMPACTED IN ACCORDANCE WITH AS 1289, TO THE APPROVAL OF THE SUPERINTENDENT AND ANY SOFT SPOTS SHALL BE REMOVED AND REPLACED WITH APPROVED FILL AND COMPACTED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEWATERING OF ALL TRENCHES AND EXCAVATIONS.
5. THE CONTRACTOR SHALL DISPOSE OF ANY EXCESS SPOIL AS DIRECTED BY THE SUPERINTENDENT.

TOLERANCES

1. FINISHED EARTHWORKS LEVELS MUST BE WITHIN 50mm OF THE DESIGN LEVEL.
2. HYDRAULIC STRUCTURE LEVELS (EG PITS CREST, WEIRS) SHALL BE WITHIN 10mm OF DESIGN LEVELS.

CONCRETE:

1. CONCRETE WORKS TO BE IN ACCORDANCE WITH *AS3600 CONCRETE STRUCTURES*
2. CONCRETE STRENGTH, REINFORCEMENT COVER, SLUMP AND SURFACE FINISH SHALL BE AS FOLLOWS:

ITEM	EXPOSURE	f'c (mpA)/ AGGRAGATE SIZE (mm)	REO COVER (mm) - ALL FACES	TARGET SLUMP (mm)	FINISH TO TOP SURFACE	COLOUR
PIT WALLS	U	S40/20	75	100	OFF FORM	NIL
KERBS	B2	S40/20	50	100	OFF FORM	NIL
PATHS	B2	S40/20	50	100	REFER LANDSCAPE ARCHITECT	NIL

3. CONCRETE TO BE VIBRATED, EXCEPT EXTRUDED KERBS & CHANNELS.
4. PROVIDE HOLES OR CHASES ONLY WHERE SHOWN ON STRUCTURAL DRAWINGS. OBTAIN RPEQ ENGINEER APPROVAL FOR ANY ADDITIONAL HOLES OR CHASES BEFORE CARRYING OUT WORK.
5. SUPPORT REINFORCEMENT ON *PLASTIC CHAIRS AND SPACERS* TO GIVE CORRECT CONCRETE COVER.
6. PROVIDE JOINTS WHERE SHOWN ON THE DRAWINGS. OBTAIN RPEQ ENGINEER APPROVAL FOR ANY JOINT CHANGES BEFORE CARRYING OUT WORK.
7. THE FACE OF ALL CONCRETE AGAINST WHICH NEW CONCRETE IS TO BE POURED SHALL BE THOROUGHLY SCABBLED. CLEAN OFF DUST AND CONTAMINANTS BEFORE NEW POUR.
8. FORMWORK TO REMAIN IN POSITION FOR FOLLOWING MINIMUM TIMEFRAMES AFTER FINISHING OPERATIONS COMPLETE, UNO:
   BUILDINGS AND GENERAL STRUCTURES
   - *SIDEFORMS: 18 HOURS AND COMPRESSIVE STRENGTH TO EXCEED 0.5 x f'c*
   - CONCRETE STRENGTH TO BE PROVEN BY TESTING AND APPROVED BEFORE STRIPPING FORMWORK
9. CONCRETE TO BE CURED IN ACCORDANCE WITH *AS3600 CONCRETE STRUCTURES* (REFER CONCRETE NOTE 1):

PREFERRED CURING METHOD:

- COMMENCE CURING TOP SURFACE OF SLABS ONCE FINISHING OPERATIONS COMPLETE. COMMENCE CURING ALL OTHER SURFACES WITHIN 1 HOUR OF STRIPPING FORMWORK.
- CURE CONCRETE UNDER PLASTIC, LAPPED AND TAPED. HOSE WITH WATER ONCE DAILY UNDER PLASTIC AND RETAPE.

MINIMUM CURING PERIODS:
- CURE TOP SURFACE OF SLABS: 7 DAYS DURATION
- CURE ALL OTHER SURFACES: 7 DAYS DURATION

REQUIRED CURING PERFORMANCE (CONTRACTOR'S RESPONSIBILTY): CRACKS IN CONCRETE (90 DAYS AFTER PLACEMENT) SHALL NOT EXCEED THE FOLLOWING LIMITS:
- DECORATIVE CONCRETE: NOT GREATER THAN 0.1mm (BARELY VISIBLE). DECORATIVE CONCRETE WITH CRACKS EXCEEDING LIMIT MAY BE REJECTED
- ALL OTHER CONCRETE: 0.3mm (DURABILTY LIMIT). CONCRETE CRACKS EXCEEDING LIMIT MUST BE REPLACED OR REPAIRED. OBTAIN APPROVAL FOR REPAIR METHODS BEFORE COMMENCING WORK.

PROVISION FOR TRAFFIC

1. THE CONTRACTOR SHALL SUPPLY AND MAINTAIN TRAFFIC BARRICADES, WARNING SIGNS, FLASHING LIGHTS AND OTHER DEVICES REQUIRED BY THE SUNSHINE COAST COUNCIL TO PREVENT PUBLIC ACCESS ONTO THE WORKS AND TO PROTECT THE PUBLIC.
2. THE CONTRACTOR SHALL PROVIDE NECESSARY TRAFFIC CONTROL MEASURES TO FACILITATE THE WORKS. TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE REQUIREMENTS OF THE DEPARTMENT OF TRANSPORT AND MAIN ROADS (TMR) - MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND SUCH OTHER ADDITIONAL STANDARDS AS MAY BE ISSUED BY TMR FROM TIME TO TIME.

REINFORCEMENT:

1. REINFORCEMENT SHALL CONFORM WITH *AS4671 STEEL REINFORCING MATERIALS.*
2. ALL REINFORCEMENT TO BE ACRS (AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEEL) CERTIFIED. THE DESIGN ENGINEER RESERVES THE RIGHT TO REQUEST ACRS CERTIFICATES AT ANY TIME.
3. REINFORCEMENT SHALL BE GRADE D500N HOT ROLLED HIGH YIELD BARS TO AS 4671. U.N.O. WHERE "R" BARS ARE SPECIFIED, THESE SHALL BE ROUND BARS GRADE R250N
4. DO NOT CUT REINFORCEMENT TO CLEAR PENETRATIONS, SLEEVES OR H.D BOLTS. DISPLACE REINFORCEMENT SLIGHTLY AS NECESSARY AND PROVIDE CORRECT COVER TO THE PENETRATIONS, SLEEVES OR H.D BOLTS.
5. REINFORCEMENT LAP SPLICE LENGTHS (MILLIMETRES) (U.N.O ON DRAWINGS)

BAR LOCATION	D500N BAR DIAMETER (mm)					
	12	16	20	24	28	32
	LAP LENGTH (mm)					
ALL OTHER BARS (BOTTOM STEEL, COLUMNS, WALLS)*	450	600	850	1200	1400	1750
WELDED MESH	225mm LAP					

DRAINAGE PITS AND PIPES

1. ALL PIPE PENETRATIONS IN PITS TO BE SEALED FROM BOTH SIDES
2. DRAINS TO BE INSPECTED AND APPROVED BY THE SUPERINTENDENT PRIOR TO BACK FILLING.
3. ALL CONSTRUCTED PIPEWORK SHALL BE FLUSHED AND CLEANED AT THE COMPLETION OF WORKS TO THE SUPERINTENDENT'S APPROVAL.
4. ALL PITS SHALL HAVE MASS CONCRETE SHAPED BASES TO THE SUPERINTENDENT'S APPROVAL UNLESS STATED OTHERWISE.
5. ALL PITS DEEPER THAN 600mm SHALL BE INSTALLED WITH CRANKED GALVANISED STEP IRONS.
6. ALL STORMWATER PIPES SHALL BE CLASS "2" R.C.P. UNLESS NOTED OTHERWISE. BULK FILLING REQUIREMENTS SHALL BE IN STRICT ACCORDANCE WITH THE COUNCILS' REQUIREMENTS.
7. THE STORMWATER PIPE CLASSES HAVE BEEN DESIGNED FOR SERVICE LOADS ONLY AND THE CONTRACTOR SHALL ASSES ANTICIPATED CONSTRUCTION LOADS AND UPGRADE THE PIPE CLASSES IF NECESSARY IN ACCORDANCE WITH AS 3725-1989. ANY UPGRADE SHALL BE AT THE CONTRACTOR'S COST.
8. MINIMUM PIPE GRADES ARE TO COMPLY GENERALLY WITH AS 3500,NATIONAL PLUMBING AND DRAINAGE CODE PART 3 STORMWATER EXCEPT WHERE SPECIFICALLY NOTED.
9. CONCRETE TO BE N25 UNLESS NOTED OTHERWISE.

REHABLILITATION

1. PRE-DISTURBANCE SOIL PROFILES AND COMPACTION LEVELS ARE TO BE REINSTATED.
2. ALL DISTURBED AREAS ARE TO BE LEFT IN A STABLE CONDITION. SLOPES SHOULD BE STABLISED USING APPROPRIATE EROSION CONTROL MEASURES.
3. UPON COMPLETION OF WORKS, THE CONTRACTOR SHALL ENSURE THAT THE SITE IS CLEAN AND TIDY WITH ALL RUBBISH AND OTHER MATERIALS REMOVED TO THE SATISFACTION OF THE SUPERINTENDENT.

DFS GROUP

DesignFlow

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Designed	Verified	Revision
BLH	D Reynolds	C
Approved	RPEQ No	
Doug Reynolds	9072	
Signed	Date	
	23/07/14	

ALL DRAWINGS TO BE PRINTED IN COLOUR!

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