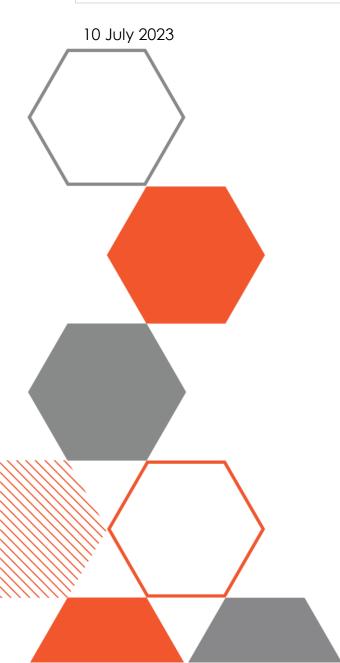
Independent Pricing and Regulatory Tribunal (IPART)

Austral & Leppington North Draft Contributions Plan

Review of Stormwater Works - Nexus and Costs

FINAL REPORT







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1 EXECUTIVE SUMMARY

The Austral, Leppington North (ALN) precinct is part of the South West Priority Land Release Area and was rezoned in March 2013 to support urban development. The technical studies prepared in support of the rezoning proposed an 'end of pipe' WSUD solution for the precinct whereby the traditional urban street drainage network delivered flow to the bottom of the catchment and gross pollutant traps and bio-retention filters (raingardens) would ensure that Development Control Plan (DCP) pollution removal targets were met.

As a result of a change in stormwater management approach, which now proposes streetscape raingardens rather than end of pipe devices, the draft *Liverpool Contributions Plan 2021 Austral and Leppington North (ALN) Precincts* (ALN CP21) includes a cost of more than \$290M for drainage works which represents an increase of over 82% on this component of the adopted plan.

Due to these significant increases in stormwater infrastructure costs, the Independent Pricing and Regulatory Tribunal (IPART) has sought assistance from J. Wyndham Prince to undertake a review and respond to the following four questions.

This review was undertaken in February and March 2022, and the costs derived and reported herein are based on the best available construction cost estimates at that time. In accordance with IPART's instructions, the reported costs have not been further adjusted to align with the date of issue of the final report. It is noted that the ABS Producer Index for Road and Bridge Construction in NSW (Index 3101) has increased by 8.5% between March 2022 and March 2023.

1. Review the stormwater works schedules in the plan and establish whether the costs from this list are reasonable.

A review of the construction costs of a range of typical stormwater elements across the precinct shows that costs in the draft plan are likely underestimated by around **\$179 M** (\pm 15 % certainty). The key contributors to this difference in costs were identified as:

- Further cost increases for stormwater works in the Sydney market since 2021.
- Inadequate consideration of the cost of staging the implementation of the streetscape raingardens.
- Omission of the additional cost of the adjusted utility service works necessary to accommodate streetscape raingardens.
- Several on-cost assumptions and exclusions.

There are also some additional cost considerations (not allowed in the above estimate) relating to the proposal to adopt a streetscape based Water Sensitive Urban Design (WSUD) approach that don't appear to have been considered:

- A traditional street drainage system incorporates regularly spaced pits and a pipe network (typically 2m deep) that ensure that flow widths and depths within the road reserve are safe for pedestrians and vehicles. The alternate streetscape strategy relies upon the collection of stormwater runoff for treatment in a shallow treatment device at each intersection before connection to a pipe network. For large catchments, this will likely result in unsafe flow widths and depths upstream of these devices. To address this shortfall, additional streetscape treatment devices (to the 1519 devices currently proposed) regularly spaced throughout the catchment will be required.
- The significant additional maintenance burden required to maintain the proposed 1519 streetscape devices (compared to the 35 devices in the adopted plan)
- The increased unit rate maintenance costs for streetscape raingardens are estimated to be 3 times the cost of maintaining the equivalent end of pipe solutions.

The unit rate cost of constructing streetscape raingardens is estimated to be around 5 times more than the traditional end of pipe solutions. A cost-benefit assessment of adopting this approach over other potential options was beyond the scope of this review but may be worth considering.

2. Review whether the costs are consistent with the respective plan's stormwater technical studies.

The stormwater works costs are not consistent with the costs listed in the technical studies prepared by SMEC in 2019. A schedule showing significantly increased costs was prepared by SMEC and issued to Council in 2021. Council appears to have adopted both the construction costs and the associated contingencies from this schedule, but different project on-costs were applied and then costs were indexed from 2018 to 2021 before adoption in ALN CP21. It is noted that there is consistency in the nomenclature applied to the drainage works components and the mapping of the works across both the CP and the supporting technical studies. The stormwater works proposed in the technical studies appear to have been adopted but were costed independently in ALN CP21.

3. If a cost is not reasonable, recommend an alternative cost.

The alternative estimate of likely total stormwater works costs identified for the ALN Draft Contributions Plan is presented in Table 1-1:

	CP14 Costs	Draft CP21 Costs	2022 Indicative Estimate (JWP)	Cost Change to Draft CP21	Cost Change %
ALN CP21	\$159.7 M (\$9,901 / lot)	\$290.5 M (\$17,107 / lot)	\$469.9 M (\$27,673 / lot)	\$179.4 M	+61.8%

Table 1-1 – Total Stormwater Works Costs Summary
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It should be noted that these are Indicative estimates of the likely changes as they are based on a highlevel review only. A more detailed assessment would be needed before the amended contributions plans are adopted.

Further details of each cost component are provided in Section 4 of this report.

4. Make a judgement as to whether nexus has been established in both plans (i.e. whether the proposed infrastructure is required as a result of the planned development).

The proposed development in the ALN precinct will result in a significant increase in impervious areas resulting in an increased rate of stormwater runoff, the concentration of runoff and the deterioration in water quality. These changes necessitate additional stormwater infrastructure to ameliorate the impacts. The cost of delivering the required infrastructure should be part of a contributions plan so that its cost is more equitably shared by the new community.

While there is a clear nexus for stormwater works for ALN there are no clear reasons given as to whether the only viable alternative to the former strategy is to pursue the substantially more expensive approach of using streetscape based WSUD. The capital cost increase of the streetscape raingarden works alone is substantial at **an additional \$145.2 M** (which represents an extra \$8,546/lot). It appears that the SMEC strategy does not fully account for all the streetscape controls required to ensure the system operates safely and effectively. It also imposes a substantial additional maintenance burden that may be unaffordable and unachievable for Council.

2 INTRODUCTION

The Austral, Leppington North (ALN) precinct is part of the Southwest Priority Land Release Area and was rezoned in March 2013 to support urban development. As part of the precincts' development, a series of public infrastructure items including roads, parks, culvert crossings, stormwater quantity and quality (Water Sensitive Urban Design – WSUD) management devices are needed to support the precincts' development. These public infrastructure devices are to be funded through a Local Infrastructure Contributions Plan under Section 7.11 of the *Environmental Planning and Assessment Act 1979 No 203*.

At the time of rezoning in 2011, the technical studies prepared by Cardno for the WSUD devices proposed an 'end of pipe' solution for both precincts whereby the traditional urban street drainage network delivered flow to the bottom of the catchment and gross pollutant traps and bio-retention filters (raingardens) would ensure that Development Control Plan (DCP) pollution removal targets were met. Flow from (and more than) the capacity of these filtration devices was to be delivered to a detention basin where storm flows are collected and released slowly into the receiving watercourse to ensure that peak flows due to the urban development were no greater than existing conditions in the 0.5 EY (2yr ARI) and 1% AEP (100-year ARI) storm events.

Preliminary costing for the proposed stormwater management devices were prepared to inform the *Liverpool Contributions Plan 2014 Austral and Leppington North Precincts* which lists a cost in the order of \$159.7M for drainage works.

In 2018, Liverpool City Council commissioned SMEC to prepare a concept design report for the Austral and Leppington North precincts. Importantly, in part due to challenges discovered related to tailwater levels in downstream watercourses (i.e., Kemps Creek, Scalabrini Creek, Bonds Creek), the WSUD strategy moved from an 'end of pipe' approach to localised street-level controls. There are inherent inefficiencies with street-level controls from a treatment perspective which tend to result in the need for additional and/or larger devices to deliver comparable growth centre developments pollution reductions.

As a result of the change in stormwater management approach, the draft *Liverpool Contributions Plan 2021 Austral and Leppington North Precincts* now includes a cost for drainage works more than \$290M (an increase in the cost of over 82%).

The change in stormwater management costs is summarised in Table 2-1 below. It has been noted that the number of lots delivered does vary between the plans. However, this is not a significant factor in the cost calculations.

Drainage Item	Current ALN CP 2014 (16,133 lots)	Proposed ALN CP 2021 (16,981 lots)		
Works	\$159,738,847 (\$9,901 per lot)	\$290,496,427 (\$17,107 per lot)		
Land	\$61,008,788 (\$3,782 per lot)	\$144,195,081 (\$8,492 per lot)		
Total	\$220,747,635 (\$13,683 per lot)	\$434,691,508 (\$25,599 per lot)		

Table 2-1 – Contributions Plan Drainage Cost Changes

Due to these significant increases in stormwater infrastructure costs, the Independent Pricing and Regulatory Tribunal (IPART) has sought assistance from J. Wyndham Prince to:

- 1. Review the stormwater works schedules and establish whether the costs from this list are reasonable.
- 2. Review whether the costs are consistent with the associated stormwater technical studies.
- 3. If a cost is not reasonable, recommend an alternative cost.

4. Make a judgement as to whether nexus has been established (i.e., whether the proposed infrastructure is required because of the planned development).

Details of our investigation are provided below.

3 SUMMARY OF TECHNICAL STUDIES

3.1 Austral and Leppington North Studies

The following section is a summary of a review of the technical studies associated with ALN which highlights key aspects of the strategy change and the basis upon which the contributions plan has resulted in cost increases. Our review has also highlighted some technical concerns with the alternate street-level control strategy for ALN which are discussed in more detail in Section 6.2.

3.1.1 ALN Precincts WCM WSUD Report (Cardno, April 2011)

The Austral & Leppington North Precincts Water Cycle Management WSUD Report was prepared for the Department of Planning & Infrastructure by Cardno in April 2011 to support the rezoning of these precincts.

The stormwater quality and quantity management adopted an 'end of pipe' approach whereby stormwater is delivered to the bottom of the catchment via the street drainage network to a neighbourhood scale Gross Pollutant Trap (GPT) (primary treatment devices) to ensure that gross pollutants were removed before discharge to secondary treatment devices such as stormwater quality ponds or raingardens. Appendix A.6 of the WCM report (Cardno, April 2011) indicates that vortex style GPTs would be provided. In addition to gross pollutant removal, vortex style GPTs also remove some nutrients which assist in reducing the size of the downstream raingardens. Outflow from the stormwater quality devices together with the overland flows that are more than the pipe system capacity is collected in detention basins to ensure peak flows in the receiving watercourses is no greater than existing conditions.

The stormwater quality modelling (Cardno, 2011) indicated that the 'end of pipe' raingarden filter areas would need to be 0.3% of the contributing catchment they are servicing, which is likely to be undersized considering current water quality modelling techniques. Our experience in other Growth Centre Precincts is that where vortex style GPTs are provided upstream of the raingarden, filter areas are typically in the order of 0.7% - 1.0% of the catchment they treat. The strategy proposed a total of 35 raingardens with a combined filter area of $34,770 \text{ m}^2$.

Most of the proposed detention basin volumes listed in Table 4-1 of the WCM report (Cardno, April 2011) are in the range of $350 - 480 \text{ m}^3$ /ha which is consistent with our experience of detention management in Western Sydney. The strategy proposed a total of 35 detention basins with a combined detention volume of 42,339 m³.

3.1.2 ALN WSUD Concept and Masterplan (SMEC, 2019-2021)

The Austral and Leppington North Design of Water Management Infrastructure Detailed Concept Report was prepared for Liverpool City Council by SMEC in March 2019. The report documents the detailed concept design of the stormwater management infrastructure within the Austral Precinct and the portion of the Leppington North Precinct that is located within the Liverpool City Council LGA.

The associated *Development of Streetscape Raingarden Master Plan for Austral and Leppington North* report was prepared for Liverpool Council by SMEC in February 2021 (SMEC, Feb 2021) and details the design procedures and considerations adopted for the master plan.

The adoption of the AR&R 2016 procedures in the basin optimisation assessment (stormwater quantity management) resulted in a reduced number of detention basins being required, and some detention basins only being required to manage minor storm events (i.e. up to the 50% AEP storm). The concept report (SMEC, 2019) proposes eight (8) 1% AEP detention basins and eleven (11) 50% AEP detention basins.

The stormwater quality management approach changed significantly from an 'end of pipe' approach to an 'at source' approach whereby street-level stormwater quality management devices (bioretention raingardens) provide primary and secondary treatment for catchments that do not have detention basins. Plate 2-1 on the following page provides an overview of a typical street-level raingarden arrangement at a four-way intersection.

Furthermore, the concept report (SMEC, 2019) indicates that some catchments that do have basins had limited space for raingardens, and therefore street-level stormwater quality management devices in these catchments cascade into an 'end of pipe' GPT and raingarden.

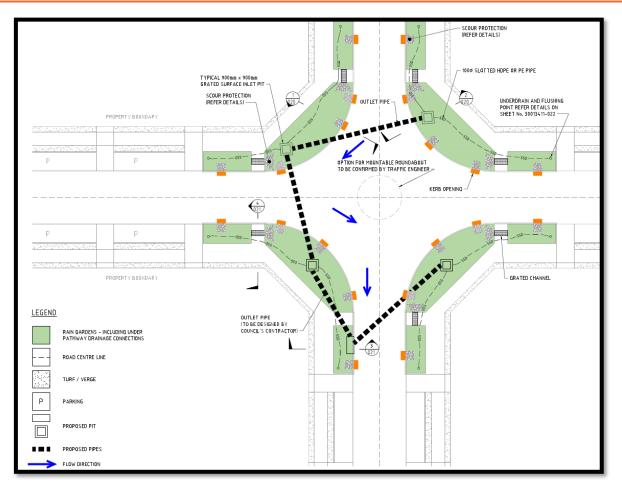


Plate 3-1 - Raingarden General Arrangement at Intersection (SMEC 2021)

Table 7.48 of the Concept Report (SMEC, 2019) indicates that for catchments with streetscape raingardens only, the minimum raingarden footprint areas required are:

- 120 m²/ha for 85% impervious residential catchment (1.2% of catchment)
- 150 m²/ha for 100% impervious commercial catchment (1.5% catchment)
- 155 m²/ha for 90% impervious industrial catchment (1.55% catchment)

While the above device sizes are not unreasonable for streetscape systems, our experience in delivering regional S7.11 stormwater quality management infrastructure within the Sydney Growth Centre Precincts suggests that an 'end of pipe' vortex GPT and raingarden filter area in the order of 0.7% to 1.0% of the catchment is sufficient to deliver the statutory pollution reduction targets. Typically, the land take required for the raingarden is in the order of 2% of the catchment to account for batters, maintenance access etc.

For catchments with detention basins, Section 7.4.1 of the Concept Report (pg. 172 SMEC, 2019) indicates that the total bio-filter footprint (streetscape + 'end of pipe' bio-filter) would need to be 1.5% of the treated catchment. The 'end of pipe' bio-filters (except for System B11) is generally around 1% of the catchment (which, in our experience is reasonable), and thus it could be expected that the streetscape controls in these catchments would need a bio-filter area of 0.5% of the treated catchment.

The Development of Streetscape Raingarden Master Plan for Austral and Leppington North (SMEC, Feb 2021) indicates that for the total catchment area of 1675.24 ha, the bio-filter areas specified in Table 3-1 below are required. It is noted that a fixed raingarden size per type of intersection has been allocated in the masterplan, hence the allocated areas are larger than the areas required.

Туре	Required Area (m²)	Allocated Area (m²)
Streetscape Bio-filter	109,756	109,883 (+0.07%
Co-located biofilters in basins	24,144	29,044 (+20.30%)
Total	133,900	138,927 (+3.75%)

Table 3-1 – SMEC (2021) Bio-filter Areas

The alternate streetscape approach has increased the total amount of bio-filter area required by 385% when compared to the 34,770 m² documented in the original strategy (Cardno, 2011), which leads to a significant increase in the cost to deliver the stormwater quality management infrastructure. However, this needs to be balanced with the validity of the smaller (0.3% catchment) devices put forward in the original WCM report (Cardno, 2011) which suggests that the original S7.11 Contributions Plan was potentially under-valued.

Non-vortex style GPTs were proposed on the nineteen (19) drainage systems with basins.

4 COST REVIEW

This costs review does not undertake a detailed review of all the cost calculations that supported the Contributions Plans as that was beyond the scope of this assessment. Alternatively, we have focused on costs for average or typical devices in each category across the ALN Contributions Plan as being representative of the likely impact across the precinct. In deriving totals, we have applied the estimated cost variances we have derived for each typical device across all the line items in the primary cost schedule.

In addition to the noted key aspects, the cost review considers a range of other factors that impact the cost of the stormwater works within the respective Contributions Plans. These are presented utilising responses to the specific questions raised by IPART which represent the scope of this review.

4.1 Establish whether the costs from works schedules are reasonable

The assessment of whether costs are reasonable looks at costs for ALN independently in the following subheadings:

4.1.1 Cost Assumptions and Exclusions

As part of the SMEC 2019 analysis and reporting, cost estimates were developed for the proposed water management infrastructure based on detailed concept designs. Separate costs estimate spreadsheets provided a detailed breakdown of expected construction costs for basins and drainage systems without basins.

Our high-level review of the cost schedules confirmed that the breakdown and listing of items and quantities are quite detailed.

Overall, we have identified that the rates used to develop the costs are wide-ranging values that are, in some cases not indicative of current market rates. This can be attributed to the age of the data and the location of the sites adopted. The overall result therefore potentially undervalues the cost of the works.

The assumptions and exclusions applicable to the cost estimates were also reviewed and comments on each are provided below. Many of the exclusions relate to items or works that would be required and it is unclear whether this gap was covered by suitable contingency allowances.

SMEC has rightly acknowledged the inherent uncertainty around quantities and costings for this new approach to stormwater management in Section 9.3 of their report.

Assumption.			JWP Comment						
Estimated quantities are based on SMEC detailed concept design drawings, as specified for each individual costing		Noted							
Rates are generally based on information from th Construction Handbook (Rawlinsons Quantity Su Construction Cost Consultants, 2018)			the cons provi	table b iderably.	elow fro It was no	d, up to 10 om cost s ted that SM tation of cc	, spreadshe 1EC indexe	ets). Th ed rates f	ese vary to at least
	RATE 1	RATE	2	RATE 3	RATE 4	RATE 5	RATE 6	RATE 7	RATE 8
	Rawlinsons 2011	Flood	ampton Levee Stimate	Amalfi Park Cost Estimate (2013)	Menangle Basins Cost Estimate (2018)	Austral & Leppington Estimated Schedule of Quantities (2012)	Humes (2018)	Gabion walls and sandstone	Rawlinsons 2018
Costings are in Australian dollars (2018) and do not all inflation.	ow for fut	ure	Note	d					
All pipes/culverts are concrete Class 4 rubber ring jointed.		Agree, this is council standard							
GPTs are costed at the unit price only.		insta	Ilation co	sts and al	ble if they ow for som erage over	e degree o	of conting	gency that	

Assumption.	JWP Comment
Total cut to disposal is assumed, with contaminated soil transported to an approved landfill (Low-level contamination, i.e. General Solid Waste) within 10 km, with an allowance for an additional 10 km of cartage to Eastern Creek Landfill in line with the Phase 1 Contamination Assessment Report (SMEC, 2018b).	Some degree of contamination will have to be dealt with over the many stormwater devices and a suitable allowance for this should be included in the costs.
Rates for dewatering assume "average duration" for the required period, assumed to be 6 months.	If this is for dewatering of sedimentation ponds before becoming basins with raingardens, then the period should be about 3 years to allow for approx. 95% of housing to be established
Temporary site fencing is assumed to be required for a period of 6 months.	If this is for the duration of sedimentation ponds before becoming basins with raingardens, then the period should be about 3 years to allow for approx. 95% of housing to be established
Junction pits are assumed 900 mm x 900 mm x 900 mm deep with 150 mm base and walls, with an additional rate required per additional 100 mm of depth in excess of 900 mm. The rate for the pit includes excavation, backfilling, benching, channels, step irons and connections to pipes.	Precast pits should be considered for cost savings & reduced construction times. A raingarden bed is 1350mm depth which would result in deeper pits.
The rate for soil for disposal is assumed as excavated to reduce levels in clay and deposit in spoil heaps within 1 km.	It is assumed this relates to topsoil that will be respread
All soil required for fill is assumed to be won from the cut on site.	An allowance should be made for some import
Subsoil drainage has been included but will need to be confirmed in Detailed Design.	Agreed but at least an allowance attempts to provide some cost cover
Assumed no 'heath' or soft ground conditions encountered, removed and/or replaced.	Agreed
All quotes provided are indicative only and will need to be confirmed prior to refining the cost estimate.	Agreed

Exclusion	JWP Comment
Consultants fees	This is an essential element, and an estimate should be included to inform EP&A Act S7.11 costs and hence give an accurate probable cost for the infrastructure project
Utility/services investigation relocation protection	It is essential to include all aspects of utility relocation and/or protection associated with the street-based bioretention systems
Geotechnical investigations	An allowance should be included for professional consulting fees to inform EP&A Act S7.11 costs
GPT testing before construction;	An allowance should be included for all professional consulting fees needed to deliver the works to inform EP&A Act S7.11 costs
Detailed topographic survey;	The cost of the survey should be included for all stormwater devices other than for streetscape raingardens
Rock, clay or waterlogged soils in bulk earthworks encountered, removed and/or replaced;	Agreed. Part of contingency allowances
Statutory and consultancy fees for all approvals (e.g., environmental etc.);	Needed for EP&A Act S7.11 costs
Construction setout and survey;	An allowance should be included
Work as executed survey & documentation;	A necessary item to be included
Site insurances;	Needed to inform EP&A Act S7.11 costs

Exclusion	JWP Comment
Internal road drainage;	Agreed, Consideration in designs should lead to minimal additional works being required
All landscaping and planting (excluding bioretention basin) for distribution channel batter slopes;	Agreed
Management or maintenance of the basins;	Agreed. This would be an ongoing cost, not a construction cost. However, should allow for the establishment of planting over 2 years.
Preparation of a Site Management Plan or Environmental Management Plan;	Agreed. This is usually a minimal contractor's expense depending on client requirements
Rates for demolition do not include an allowance for disposal of material off-site, or disposal of contaminated waste;	Reasonable allowances are needed as costs could be significant. It is likely to be encountered at ALN and EL
Traffic management only covers the cost of the Traffic management plan and excludes the cost for traffic controlling during construction	An estimate should be included
Sandstone block unit rates do not allow for delivery costs.	Allowance for delivery cost should be included

4.1.2 Streetscape raingardens

The SMEC Design Report – Development of Streetscape Raingarden Masterplan for ALN, 10 February 2021 contains the indicative concept designs for streetscape raingardens at a 4-way Intersection, T junction and road bend. Cost estimates of the raingardens for the intersection, T junction and bend were also provided.

A review of the estimates has revealed that many rates adopted were not suitable examples or were significantly under-priced when compared to the costs we derived from the construction cost database that J. Wyndham Prince maintains for the estimation of civil works. Our assessment is summarised on annotated copies of the cost estimate derived for the 4-way intersection obtained from the SMEC report which is provided in Table 4-4. The suggested changes to the cost schedule, including those relating to additional line items, adjusted cost rates and recommended allowances are indicated in blue text. We have also reorganised the SMEC schedule for the street-based raingarden works so that the required works staging sequence and associated costs are more clearly delineated.

It is noted that our indicative analysis of the cost of streetscape raingardens suggests the cost is around **250 %** higher than Council's allowances in the contributions plan.

The following allowances were either excluded or overlooked in the SMEC cost estimate. Each of these will directly affect the cost of delivery of the stormwater works and should be specifically accommodated in their respective cost schedules.:

- Site establishment
- Survey/setout
- Traffic control
- Erosion & sediment controls
- Waste classification and disposal at a licenced facility
- Utility service design and construction impacts (deeper and realigned mains to avoid raingardens at intersections)
- Staging or works
- Decommissioning of stage 1 construction i.e. silt traps at end of use
- Landscaping establishment
- Project on costs of delivery agency and design

It is not clear whether these exclusions were accommodated by suitable adjustments to the recommended contingencies. Nevertheless, their inclusion would help provide a clearer representation of overall costs and they have been added to the updated cost estimates presented in Table 4-4. In addition, Council's approach of indexing construction costs from the time of reporting (2019) to late 2020 would likely underestimate costs due to some larger than CPI changes in construction costs that have occurred recently.

In summary, the review undertaken identifies that streetscape raingarden costs presently applied in the Contributions Plan are likely underestimated by **around \$100M**. Refer to further details of this assessment in Section 4.3.2 below.

To provide a more appropriate estimation of costs for stormwater items it is suggested that consideration be given to updating all the cost estimates that informed the draft contributions plan to incorporate amended quantities, expand on some on-cost components and include up to date cost rates for the works.

4.2 Are costs consistent with contributions plans technical studies

A review of the following documents was undertaken to confirm consistency between the technical studies and ALN CP21

- ALN Detail Design of Water management Infrastructure Detailed Concept Design Report (SMEC 2019)
- Development of Streetscape Raingarden Master Plan for ALN (SMEC 2021)
- ALN works schedules (Excel) (SMEC 2021) particularly "Drainage Con" worksheet
- ALN SMEC Council adjusted cost sheets for IPART application (email from NH dated 9/3/21)

It is noted that there is consistency in the nomenclature applied to the drainage works components and the mapping of the works across both the CP and the supporting technical studies.

It appears Council has adopted both the construction costs and the associated contingencies from SMEC's updated emailed schedule. However, different project on-costs were applied and then costs were indexed from 2018 to 2021 by Council before adoption in ALN CP21.

It is noted that there are also four creek culverts listed in Table 9.1 of the SMEC Concept Design Report that are not costed in the plan, nor the updated SMEC cost schedules emailed on 9/2/21. There is no discussion about why these have been removed so it is unclear whether their omission was intended.

4.3 If a cost is not reasonable, recommend an alternative cost

The approach adopted was to review costs for average or typical stormwater management devices across the ALN Contributions Plan as being representative of the likely impact across the precinct. In deriving the cost totals, we have applied the estimated cost variances we have derived for each typical device across all the line items in the primary cost schedule.

4.3.1 Representative stormwater works

Representative basins (B22 and B8), a drainage system without a basin (NB33) and a culvert (B_FOURTH) were selected to assess and compare costs and provide an indication of likely cost changes for ALN. For the representative drainage elements, the quantities listed by SMEC were not adjusted as there were no concept design plans available. Cost rates were reviewed and adjusted where there was a significant rate difference identified.

The original SMEC sheets are provided in Appendix A. The adjusted cost schedules, with adjusted rates, are presented in red text are provided in Appendix B. A table of the estimated cost of items that were excluded by SMEC has also been provided in Appendix B where it was felt that the items should be included. The following Table 4-1 summarises the findings of this cost review. All costs exclude GST.

Drainage system	SMEC cost estimate	JWP cost estimate	Indicative cost change	Indicative cost change %		
1%AEP basin - B22	\$8,682,075	\$11,305,881	\$2,623,806	130.2%		
50%AEP basin - B8	\$5,152,081	\$6,814,591	\$1,662,510	132.3%		
Without basin - NB33	\$1,010,720	\$1,768,926	\$758,206	175.0%		
Culvert B_Fourth	\$1,232,952	\$1,870,291,	\$637,339	151.7%		

Table 4-1 – ALN CP21 Revised Cost of Representative Stormwater Works Elements

4.3.2 Streetscape raingardens,

the cost review is aligned with the SMEC concept design for a 4-way intersection (refer to Plate 3-1) Cost rates were reviewed and adjusted where there was a significant rate difference identified. Some additional work components were added where this was deemed appropriate to fully define likely costs or to reflect the raingardens construction delivery staging.

The cost changes are summarised in Table 4-2 and are shown in detail in Table 4-4. All costs exclude GST. It is expected that similar cost increases would be experienced for the T Junction and road bend streetscape raingarden elements as their cost schedule structures and the works required are almost identical.

Item	SMEC total direct cost estimate	JWP total direct and indirect cost estimate	Indicative cost change	Indicative cost change %
4-way intersection	\$116,471	\$298,580	\$182,109	256%

When the project on-costs are included, the cost is \$343,366 which equates to \$1,196/sqm. This rate is consistent with the expected costs for these elements specified by Melbourne Water and more broadly across the Stormwater industry (see further discussion in Section 4.3.4).

4.3.3 Total indicative costs

To derive comparative cost totals across the ALN precinct, the above indicative percentage increases have been applied to the totals of the ALN works schedules which were prepared by SMEC in March 2021 These are summarised in Table 4-3 below.

ltem	Total works cost (indexed) based on SMEC	JWP indicative cost estimate based on % increase	Indicative cost change	Notes	
Drainage Systems with 1% AEP Basins	\$103,198,633	\$134,386,246	\$31,187,613	Adopt % increase for B22	
Drainage Systems with 50% AEP Basins	\$98,473,147	\$130,249,160	\$31,776,013	Adopt % increase for B08	
Drainage Systems without Basins	\$14,407,483	\$25,215,462	\$10,807,979	Adopt % increase for NB33	
Creek Culverts (stormwater works only)	\$10,230,592	\$15,519,002	\$5,288,410	Adopt % increase for B-Fourth	
Streetscape raingardens	\$64,186,572	\$164,545,797	\$100,359,225	Adopt % increase from intersection for T junction and bends (Table 4-4)	
Total	\$290,496,427	\$469,915,666	\$179,419,239	61.8% increase	

			Inte	ersec	ersection Cost Estimate							
				SME	C (2	021)	JWP (2022)					
Direct Costs	Quantity	Unit	Bas	æ Rate		Cost	Base Rate		0	Cost	J. Wyndham Prince	
Phase 1 - Sediment Basin (Construction during Sub								+	_		Comments	
Site Establishment	1	ltem					\$ 2,500.0		\$:	2 500 00	Portion of broader works	
Survey & Setout	1	ltem					\$ 1,750.0				Portion of broader works	
Traffic control	1	ltem					\$ 3,000.0	õ s	\$ 3	3,000.00	Portion of broader works	
Erosion & Sediment controls	1	ltem					\$ 750.0	0 9	\$	750.00	Portion of broader works	
Earthworks excavation (0.6 deep)	172.64	m3	\$	8.05	\$	1,389.72	\$ 8.0	\$	1	1,389.72	Split across 2 stages now. Excavate Trim & Compact an	
											cart surplus offsite	
Earth disposal	276.22	tonne	\$	54.18	\$	14,965.60	\$ 54.18	سساس		4,965.60	VENM or ENM disposal only	
15km Additional Cartage Over 10km	431.59	m3	\$	8.55	\$	3,690.09	\$ 8.5			3,690.09		
Waste Classification (VENM or ENM for disposal)	1	ltem					\$ 1,500.0			1,500.00		
Waste Classification (GSW for disposal) Saw Cutting Kerb (150mm depth)	1 20	ltem m	\$	69.10	\$	1,382.00	\$ 1,500.0 \$ 69.10			1,500.00		
Concrete Channel with Grate including excavation works	16	m		460.00	ې \$	7.360.00	\$ 460.00			7,360.00		
Inlet Scour Protection	10	m2	ې \$	72.00	ې \$	720.00	\$ 195.00				Amended Rate	
Cost associated with deeper watermain (2.5m depth)	10	item	Ŷ	72.00	\$	720.00	\$12,320.0				Allowed 4 bends, extra excavation & disposal, trench	
Cost associated with deeper watermain (z.5m depth)		item					φ12,320.0	U ¢	р I.	2,320.00	shoring, backfill, additional testing, based on 2 crossings per intersection	
Cost associated with electrical & comms in new alignme	1	ltem					\$ 9,700.0	0	\$ 9	9,700.00	Allowed extra bends for alignment, allowed extra depth of	
		14 a					640 500 5			0.500.00	road crossings in 2 locations per intersection	
Cost associated with alternate sewer arrangement	1	Item	L				\$12,500.0	U \$	5 1.	2,500.00	Contingency for additional manhole, concrete encasement or other fittings	
			1					+				
Phase 2 - Sediment Basin Maintenance (say 3 yrs)			1									
Site Establishment - Maintenance visit	12	each	L				\$ 250.0	0	\$ 3	3,000.00	12 times during maintenance period	
Site saftey fencing, signage & maintenance	1	ltem					\$ 6,300.0	0	\$ (6,300.00	During maintenance period, allowed 3 years	
Traffic control	12	each					\$ 250.0	0 3	\$ 3	3,000.00	12 times during maintenance period	
Flocculation, water testing & pumping after rain event	12	each					\$ 650.0	0	\$	7,800.00	12 rain events, includes minor traffic control	
Phase 3 - Raingarden Construction (at 95% Housing	complete											
Site Establishment	1	ltem					\$ 3,500.0				Establish contractor back on site	
Survey & Setout	1	Item					\$ 2,500.0	_			Includes WAE	
Traffic control	1	ltem					\$ 6,500.0	-		-	Works on Public Road	
Erosion & Sediment controls	1	Item					\$ 750.0		\$	750.00		
Sediment removal and disposal (0.3 deep)	86	m3	\$	-	\$	-	\$ 16.00			1,376.00	had a start of the local start with	
Disposal at licenced facility	164	tonne	\$	-	\$	-	\$ 370.00				Includes cartage to local facility	
Earthworks excavation extending from Phase 1 (1.5 deep Earth disposal	258.95 414.33	m3 tonne	\$ \$	8.05 54.18	\$ \$	2,084.58	\$ 8.0 \$ 54.1	- dowing		2,084.58 2,448.40	Excavate Trim & Compact and cart surplus offsite VENM or ENM disposal only	
S.G pit (900x900mm) surface finish tbc.	2	unit	ې 3	34.10	э S	22,440.40	\$ 2,500.00	سنساس		5,000.00	Additional for street pipe drainage connections	
375mm Diameter Pipes (assumed outlet)	64	m	· ·	210.00	\$	13,440.00	\$ 225.00			1,400.00	Includes excavation in revised rate	
S.G pit (900x900mm)/1.8m kerb inlet pit	4	unit		550.00	\$	10,200.00	\$ 2,550.00),200.00	Standard depth, no reinforcing steel	
Pit Cover	4	unit		340.00	\$	1,360.00	\$ 340.00	a ada ana a		1,360.00		
Filter Cloth	8	m2	\$	8.75	\$	70.00	\$ 8.75			70.00		
Impermeable Liner	410.32	m2	\$	21.67	\$	8,891.63	\$ 26.00	منساس			Amended Rate	
Drainage Layer (gravel)	43.068	m3	\$	75.00	\$	3,230.10	\$ 130.00				Amended Rate	
Underdrain Ag Pipe	270.4	m	\$	16.25	\$	4,394.00	\$ 28.00			7,571.20	Amended Rate	
Submerged Zone	86.136	m3	\$	49.00	\$	4,220.66	\$ 140.00	\$	12	2,059.04	Amended Rate	
Transition Layer (coarse sand)	28.712	m3	\$	49.00	\$	1,406.89	\$ 125.00	\$	3	3,589.00	Amended Rate	
Filter Media (sandy loam)	114.848	m3	\$	49.00	\$	5,627.55	\$ 105.00	\$	12	2,059.04	Amended Rate	
Surface Vegetation	287.1	m2	\$	24.00	\$	6,890.40	\$ 32.00	\$	9	9,187.20	Allowed 6 tubestock per square meter	
Pebble Mulch	28.712	m3	\$	94.00	\$	2,698.93	\$ 130.00	\$	3	3,732.56	Amended Rate	
								1				
Phase 4 - Post Works Establishment					L							
Establishment Maintenance of planting	24	months					\$ 287.00				Assumes \$1 /m2 / month	
Total Direct and Indirect Costs					\$	116,470.56		\$	298	3,579.59	SMEC values derives from Appendix D of Streetscape Raingarden Masterplan	
Brojact On Costa			 									
Project On Costs				0.0%			0%				A designed as the scheme decise share to send the scheme term to the scheme term of	
Contractor Indirect Costs Contractor Margin				2.0%			0%	+			Adopted rates already include contractor indirect costs and margin	
Council On-Costs (Delivery Agency)				0.0%			10%				and margin	
Council On-Costs (Design)				3.0%			5%	+				
Adjustment Factors			<u> </u>				570					
Distance Factor				1.0%			0%	+			Adopted rates already include similar distance and	
Congestion Factor				7.5%			0%				congestion allowances	
Total Project On Costs				3.5%	\$	73,958.81	15%	S	44	4,786.94	<u> </u>	
· · · · · · · · · · · · · · · · · · ·					<u> </u>	.,		Ť				
Total Base Costs including Adjustment Factors (exc	udes Cor	ntinaen	cv)		\$	190,429.36		\$	343	3,366.53		
Total base costs including Adjustment racions (exc												

Table 4-4 – ALN CP21 Streetscape Raingarden 4 -way Intersection Adjusted Cost Estimate

4.3.4 Cost relativities for on-street raingardens

While to date there have not been many streetscape raingardens constructed within Sydney, these are being implemented more broadly across other Australian cities. Melbourne Water prepared a summary of expected WSUD life cycle costs that includes streetscape raingardens in October 2013. A copy of the Melbourne Water October 2013 data is presented in Table 4-5 below.

ASSET	ASSET PARAMETERS	CONSTRUCTION ¹	MAINTE	ENANCE	RENEWAL
			ESTABLISHMENT (FIRST TWO YEARS)	ONGOING	
WETLANDS ²	< 500 m ² 500 to 10,000 m ² > 10,000 m ²	\$150/m² \$100/m² \$75/m²		\$10/m²/yr \$2/m²/yr \$0.5/m²/yr	No data
SEDIMENT BASINS ²	< 250 m ² 250 to 1000 m ² > 1000 m ²	\$250/m ² \$200/m ² \$150/m ²		\$20/m²/yr \$10/m²/yr \$5/m²/yr	Remove and dispose of: Dry waste = \$250/m ³ Liquid waste = \$1,300/m ³
ON-STREET RAINGARDENS ³	< 50 m ² 50 to 250 m ² > 250 m ²	\$2000/m ² \$1000/m ² \$500/m ²		\$30/m²/yr \$15/m²/yr \$10/m²/yr	Minor reset = \$50 to \$100/m ²
BIORETENTION BASINS ³	< 100 m ² 100 to 500 m ² > 500 m ²	\$1000/m² \$350/m² \$250/m²		\$5/m²/yr	No data
TREE PITS ³	< 10 m ² total 10 to 50 m ² total > 50 m ² total	\$8000/m ² \$5000/m ² \$1000/m ²	Two to five times ongoing maintenance cost	No access issues = \$150/asset/yr Traffic issues or specialist equipment required = \$500/asset/yr	No data

Table 4-5 – WSUD Life Cycle Costs (Melbourne Water 2013)

It is quite evident from the Melbourne Water data that streetscape raingardens are significantly more expensive to build and to maintain than traditional (end of pipe) raingardens. The streetscape raingardens proposed for ALN are typically within the size range of 50 to 250sqm compared to end of pipe bioretention basins which are typically greater than 500 sqm in bed area. Consequently, the streetscape treatment costs are likely to cost \$1000 /sq.m (\$1165/sq.m in Dec 2021) which is 4 times more than an end of pipe approach at \$250/sq.m (\$291 in Dec 2021). Where smaller streetscape raingardens are required to ensure safe gutter flows (refer to discussion at Section 6.2) the cost differential would be even greater.

As part of a recent engagement with NSW Department of Planning, Industry and Environment (DPIE) to advise on alternate WSUD strategies for new development in Wianamatta-South Creek, DesignFlow (a Brisbane and Adelaide based Water specialist consultancy) indicated that streetscape raingardens typically cost \$1350/sqm, and this compared to their expectations that precinct/regional raingardens typically cost \$500/sqm. It is also understood that Sydney Water is currently adopting \$480/sq.m for end of pipe raingarden costs.

Applying this broad perspective to ALN CP21 it is expected that there will be a notable cost increase in adopting the streetscape raingarden approach compared to the more traditional end of pipe approach originally proposed.

4.3.5 Utility services

The NSW Streets Opening Coordination Council provides the Guide to Codes and Practices for Streets Opening. The latest version is 2018 in which the agreed arrangements for utility services locations and depths are presented. These utility locations and depths clash with the proposed use of streetscape raingardens in road verges, which typically require excavation depths of around 1.4 m. The cost of utility adjustment to accommodate these intersection-based elements seems to be unaccounted in SMEC's estimates. Utility reconfiguration does add a significant additional cost. Allowances for these adjustments are included in the revised estimates for streetscape raingardens provided in Table 4-4.

4.3.6 Maintenance of streetscape raingardens

Whilst it doesn't directly affect capital costs, an important influence on the choice of stormwater treatment approach should be the long-term ongoing maintenance costs of any adopted system.

The SMEC Design Report – Development of Streetscape Raingarden Masterplan for ALN, 10 February 2021 a table that summarises routine maintenance requirements and costs for streetscape raingardens. A copy of the table, which is an extract from "Streetscape WSUD raingarden & tree pit design package for Moreland City Council. GHD, 2013" is provided in Table 4-6.

Table 7. Routine maintenance cost estimate (GHD, 2013)										
Routine Maintenance Task – Not Dependent on Surface Area	Frequency (/year)	Time Required (h/person)	Labour Cost/Fee (\$/year)							
Litter Removal	4	0.5	\$200							
Sediment Removal/Ameliorate Surface	4	1	\$400							
Raking to Reinstate Surface at Erosion Points	4	0.5	\$200							
Top-up Filter Media and Regrade Surface	1	2	\$200							
Infiltration Test	1 in 3 years		\$500							
Weeding	4	1	\$400							
Inspect and Flush-out Drainage	2	1	\$200							
Remove Debris from Inlets	4	0.5	\$200							
Remove Debris from Outlets	4	0.5	\$200							
Total			\$2,500							
Routine Plant replacement – Dependent on Surface Area	Frequency (/year)	Cost (\$/m²)	Labour Cost/Fee (\$/m²/year)							
Replace Plants where Dead	4	\$2	\$8							
Time Required	0.5 h/m ²	\$25	\$100							
Total			\$108							

Table 4-6 – Routine Maintenance Costs of Streetscape Raingardens

To highlight the extent of maintenance commitment that would be required the expected number of streetscape raingardens to be provided are summarised in Table 4-7.

Streetscape Item	Number of Items	Number of raingardens in each item	Total Number of streetscape raingardens		
4-way intersection	181	4	724		
T junction	383	2	766		
Road bend	29	1	29		
Total			1519		

Assuming there is 4 cleans/year/device there would be 6,076 cleans/year. With 240 working days/year and cleaning say 25 devices /day this would potentially require 3 - 4 work crews on a permanent basis. During periods of ongoing significant rainfall, it is likely that some additional surge capacity would be required to adequately maintain these devices.

It should also be noted that it is not possible to intercept gross pollutants in a separate trap upstream of each streetscape device. This means that unless the devices are maintained at the nominated frequency of at least 4 cleans /year they are likely to clog with coarse sediment and litter and fail to operate (rendering the original significant capital investment in water quality management effectively obsolete).

Another maintenance cost that seems underestimated is the cost of closing a traffic lane down while maintenance work is undertaken. This will add to the cost and has been factored into the updated costs for streetscape raingardens presented in Table 4-4.

It is not clear whether Council has fully considered the maintenance resource requirements and associated costs. It is noted that SMEC does not discuss these issues in their strategy report so Council may be unaware of the implications.

4.3.7 Interim Sedimentation Basins

Before the implementation of streetscape raingardens, the strategy proposed by SMEC is to configure each raingarden location as an interim silt trap (refer to SMEC interim silt plan 30013411-018- Rev 01). This would need to operate until 95% of housing construction is completed in the catchment upstream of each device, at which time the final raingarden can be constructed.

As the typical soils in the Precincts are dispersive clays, each of these interim basins will require flocculation and dewatering after all rainfall events which would likely require the pump out and de-silting of the 1519 devices, each consisting of 0.6m deep sediment basins. Maintenance would be required at least 4 times/year for each device, even in dry years. Depending on the rate of housing construction, the interim operation may extend for a few years.

The cost of undertaking this maintenance would be borne by the various land developers up until the handover of the public roads to Council. After that, the costs would be borne by Council as the asset owner unless alternative arrangements were defined in a Voluntary Planning Agreement (VPA) with the developer. The cost of this maintenance is extra over to, and equivalent to, those outlined in Section 4.3.6 above.

4.3.8 Gross Pollutant Traps

The SMEC Streetscape Strategy (SMEC 2019) considers 19 style GPT's on catchments with Basins. While catchment areas draining to each basin were not reported by SMEC (2019), we note that the Cardno (2011) strategy had adopted catchments of up to 110 Ha. draining to a single GPT. Additional GPT's may be required to reduce the catchment areas serviced by each device and to achieve alignment with Council's preferred cleaning frequencies for these devices (typically 3 – 6 months intervals).

However, since many of the upstream catchments now have streetscape raingardens, there is a question as to whether many of the proposed conventional GPTs will still be required. The streetscape raingardens will be very effective in the removal of gross pollutants, and this may allow for a reduction in size or the complete removal of some of the 19 devices proposed.

The detailed assessment of these impacts and how they affect CP21 costs was beyond the scope of this review.

4.3.9 Evolving raingarden design specifications

Another cost consideration is the recent standardised engineering design and construction specifications, published in the Western Sydney Engineering Design Manual (WSEDM) in 2020. This was prepared in collaboration with nine Western Sydney councils, including Liverpool Council, and we understand may be applied by each Council as part of the next round of updates to LEP's and DCP's.

[refer <u>https://www.wscd.sydney/planning-housing</u> under the heading of "P4 - Uniform local government engineering design standards and telecommunications planning"]

For Raingardens, the WSEDM adopts Blacktown City Council's recently revised standard specifications for these works. This involves the provision of a complex inflow and outflow drainage system, provides a full perimeter paved maintenance access road, and adopts a 3-phase construction process that will likely take many years to implement. Our recent experiences with end of pipe raingarden construction in Sydney's Northwest Growth Centre precincts within the Blacktown LGA has found that the costs of meeting this specification are in the order of \$1400 to \$1500 per sqm on average. This is around 3 times higher than the costs of raingardens in other western Sydney LGA's and those from other Australian jurisdictions.

It is unclear at this stage whether Liverpool Council will require this standard of construction for systems to be implemented across the ALN precinct as development proceeds over the next decades. It is important to note that this potential cost increase was not allowed in this cost review.

5 NEXUS

Nexus refers to the connection between the development and the demand created by that development. The requirement to satisfy nexus is based on ensuring that there is a link between the development and increased demand and cost for infrastructure.

In greenfield development areas which generally typify the Austral, Leppington North Precinct, the new development results in an increase in the impervious area resulting in an increased rate of stormwater runoff, a concentration of runoff and deterioration in water quality. These changes necessitate additional stormwater infrastructure to ameliorate the impacts and specifically to meet Development Control Plan water quality targets. The need for infrastructure is supported by technical studies which both establish and map the infrastructure items. There is consistency between the Contributions plan and the supporting technical study. Together it is a clear nexus.

While there is a nexus for ALN the question must be asked whether it is necessary to increase the total amount of bio-filter area required by 385% and to spend around 3-4 times the money on a cost per square meter basis to get the outcomes of closer to source WSUD controls in the streetscape. While there are generally accepted broader intangible benefits of achieving close to source water quality treatment, both systems would be configured to achieve the same specific water quality performance criteria and hence it would be appropriate to consider them in comparative cost terms.

The capital cost increase of the works alone is substantial (an extra \$36,765/lot) and it is still unclear whether the strategy change works in principle (that is the true costs may even be greater - refer to Section 6.2 for further discussion). The changed strategy also imposes substantial additional ongoing maintenance requirements that may be unaffordable for Council. Assessing the cost-benefit of this change in strategy as well as consideration of viable alternatives may be warranted but is beyond the scope of this review.

The draft *Liverpool Contributions Plan 2021 – Austral and Leppington North Precincts* (Liverpool City Council, A&LN CP21) contributions plan articulates that the expected increase in population with an equivalent net developable area of 1,217 ha across the precincts will require management of stormwater. Section 4.4.1 of the A&LN CP21 correctly notes that the increase of impermeable surfaces will exacerbate flooding issues and impact on the quality of stormwater and potentially affect the riparian corridors – these issues being directly caused by the development of the precinct. It is also noted that section 4.4.2 of the plan indicates that the amount of the contribution for stormwater infrastructure is calculated based on the equivalent net developable area (ha) that will generate demand for the facilities. On this basis, it is our opinion that nexus has been established for the Austral and Leppington North Contributions Plan 2021.

6 TECHNICAL REVIEW OF STORMWATER STUDIES

It is noted that the previous WCM Strategy for ALN (Cardno, 2011) has been superseded by the ALN CP21. However, our review of the technical studies highlighted some technical concerns regarding device sizing from the earlier Cardno Strategies (2011, 2013), and concerns regarding the safety and function of the alternate street-level control stormwater management approach proposed by SMEC (2019/2021).

6.1 **Previous WCM Strategies (Cardno, 2011 and 2013)**

Residential catchments are generally broken down into roads, roofs, and remaining urban pervious and impervious areas which have differing pollutant loadings.

In the ALN (Cardno, 2011) stormwater quality modelling analysis, the modelling appears to be very high level, with a single node representing each urban catchment. It is noted this approach was common at the time, however, is now inconsistent with modern modelling techniques required by most Councils in Western Sydney.

If the earlier Cardno strategies (2011, 2013) had adopted a more refined catchment breakdown, we expect the raingarden sizing would likely have been closer to the 0.7% to 1.0% of catchment generally delivered in the Sydney Growth Centre Precincts, rather than the adopted 0.3% catchment which is unlikely to achieve the statutory pollution reduction targets if modern modelling techniques were adopted.

It is our view that the undersized devices determined in these previous strategies (Cardno, 2011, 2013) have resulted in an underestimation of the costs required for stormwater works in ALN CP14. It is noted that for ALN CP21 the previous undersized devices are no longer a relevant concern (in terms of the achievement of the DCP water quality performance objectives).

6.2 SMEC Strategy 2019, 2021

Under the revised strategy (SMEC, 2019), GPTs are only required on the 19 catchments with basins. Given that these catchments also include streetscape raingardens which will collect the bulk of the gross pollutants, it is unclear what benefit the supplementary 'end of pipe' GPTs would provide, and we question whether these GPTs could be reduced or removed from the current WSUD strategy (SMEC, 2019).

The MUSIC model assumptions (SMEC, 2019) assume a typical 85% residential catchment. It is unclear how the surrounding roads have been considered, as only 10% of the catchment is assumed to be roads. In our experience, roads make up approximately 30% of a typical residential catchment, in addition to an assumed 10% of the lot areas to account for driveways. Notwithstanding, amending the modelling to include the roads (if not already considered) would only put upward pressure on the size of the devices required.

The streetscape masterplan (SMEC, 2021) provides a fixed amount of bio-filter area at each intersection which is more than the required filter area (refer to Table 3-1). There is no suggestion in the strategy (SMEC, 2019) that it would be okay to build smaller devices at each intersection if the catchments are smaller upstream of that location, rather it indicates that if the overall required bio-filter area is provided, the required pollution reduction targets are met.

The total allocated raingarden area (138,927 m²) is a significant increase when compared with the likely undersized raingarden filter areas (34,770 m²) under the previous (Cardno, 2011) strategy. These differences go some way in explaining the significant difference in the stormwater works costs reflected in ALN CP21 and ALN CP14.

6.2.1 Flow widths and road safety

It is uncertain as to whether the street level controls presented in the concept report (SMEC, 2019) or the masterplan (SMEC, 2021) have considered the safety aspects of managing flow widths within the local streets. The typical MUSIC (stormwater quality model) catchment in the Concept Report (SMEC, 2019) suggests that the bio-filters at intersections will cater for full upstream street catchments entering the raingardens as surface flow. In our experience as civil and stormwater design engineers, numerous pits and pipes are required within the street network to ensure gutter flow widths in the road comply with Council safety standards and that flow depths and velocities are safe for pedestrians and vehicles up to 1% AEP storm event. If these traditional road safety standards are to be complied with (which would be expected as part of any development application assessment), a traditional pit/pipe system upstream of each intersection would be needed to manage this

safety risk. This would render the street level treatment obsolete as the treatable stormwater would now be underground, below the at-surface raingardens.

The alternative approach would be to provide a streetscape raingarden at the location of every gully pit upstream of the intersections, which would further increase the maintenance burden applicable to Council as the ultimate asset owner. There would also be an increased capital cost in addressing this issue, as while intersection raingarden footprints could be reduced, the cost of providing a larger number of smaller devices would nevertheless increase substantially. This is demonstrated in the Melbourne Water WSUD cost schedule presented in Table 4-5 which indicates that smaller devices would likely cost around double that of the SMEC proposed devices on a costs per square metre basis.

6.2.2 Case study

As a case study, we have considered an example catchment from the Streetscape Masterplan (SMEC, 2021) which drains to the corner of Eighth Avenue and Pyncheon Street in Austral. The catchment has an area of approximately 2.1 ha and is bound by Polbar Street to the north, Eighth Avenue to the south, Pyncheon Street to the West and Edmondson Avenue to the east. Plate 5-1 below provides an overview of the location as shown in the Masterplan, and Plate 5-2 provides an overview of the catchment extent, elevation contours, and current land zoning.



Plate 6-1 – Case Study Catchment Drainage System NB11_P4_01 (SMEC 2021)

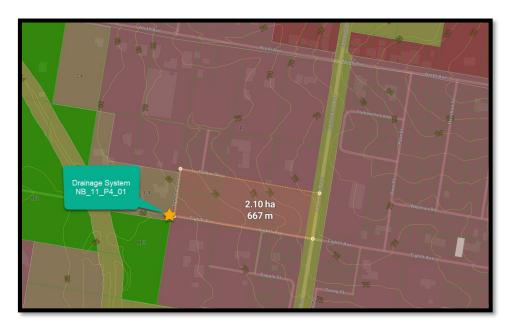


Plate 6-2 – Approximate Catchment Area System NB11_P4_01 (Mecone Mosaic)

Liverpool City Council's engineering guideline requires a maximum gutter flow width in the roads of 2.5 m in the 20% AEP (5-year ARI) storm event, and for the velocity x depth product to be less than 0.4 m²/s in a 1% AEP (100-year ARI) storm event which is a measurement indicative of pedestrian and vehicle safety. An assessment for a typical 9 m wide carriageway was undertaken. Details are provided in Table 6-1 below.

Typical 9 m Carriageway Assessment (Half Road)									
Catchment Area	2.1	Manning's Roughness	0.015						
Road Longitudinal Slope	3.0	%	Time of Concentration	10	minutes				
Road Crossfall	3.0	%	20% AEP Flow	490	L/s				
Gutter Crossfall	8.8	%	20% AEP Flow Width	4.3	m				
Gutter Height	0.150	m	1% AEP Flow	1030	L/s				
Gutter Width	0.450	m	1% AEP V x D	0.42	m²/s				

Table 6-1 – Typical Carriageway Flow Width and Velocity Depth Assessment

The assessment indicates that the half road gutter flow width would be approximately 4.3 m by the time surface flows reached intersection raingarden NB11_P4_01. This is well over the maximum 2.5 m gutter flow width required by Liverpool City Council's Engineering Guide for development. In a 1% AEP event, the velocity x depth (V x D) product would be just more than Council Standards.

To ameliorate these significant street flows, it is not possible to apply the normal practices of implementing additional pits and pipes upstream of the streetscape raingardens, as these would allow baseflows to bypass treatment. A potential solution would involve the introduction of additional streetscape devices in the upper catchment just ahead of the point at which a pit is required in the street to limit flow widths to the required 2.5 m. This approach has the potential to significantly increase the number of streetscape controls needed (additional to the 1519 devices proposed).

It was beyond the scope of the current review to estimate the number of additional devices required and to contemplate how the remaining devices could potentially be reduced in size. Consequently, there is no allowance for these factors in the updated cost estimates presented in this report.

7 CONCLUSIONS

This review of stormwater infrastructure costs with the draft contributions plan for ALN has considered cost, underlying assumptions, and stormwater management strategy approach, and identified a few technical issues. The key conclusions drawn from this review are summarised in the following groupings:

Key cost issues with ALN Contributions Plan are:

- Further cost increases for stormwater works in the Sydney market since 2021.
- The exclusion of a range of on-costs that should be included in determining likely overall costs for the delivery of the drainage infrastructure proposed.
- Insufficient consideration of costs of construction staging and utility design and construction requirements to accommodate streetscape raingardens.

The net cost impact represents a further **\$179 M shortfall in the proposed CP21 rates** for stormwater works. This equates to an additional \$10,566 /lot to be added to the \$25,599 /lot increases proposed by Council in the draft Contributions Plan.

Other Cost Considerations

Several additional factors affect the stormwater works costs in the draft ALN Contributions Plans that need to be considered. These are:

- Cost relativities for streetscape raingardens which are less efficient than end of pipe systems (requiring larger bed areas for the same performance) and cost around three times the rate, on a square metre basis, compared to the more traditional end of pipe solutions.
- Lack of consideration of the cost of additional streetscape controls needed to ensure compliance with normal design specifications for street drainage systems (public safety considerations).
- The evolving design specifications for raingardens (as embodied by the new Western Sydney Engineering Design Manual) that have the potential to double or even triple construction costs.
- The excessive maintenance costs required for the ALN streetscape raingardens (interim and final stages) are estimated to be around 3 times the cost of maintaining traditional end of pipe raingardens.
- The potential ability for streetscape raingardens to substitute for some of the separate 19 GPTs proposed in the ALN precinct. This is offset by the need to ensure each GPT has a catchment that limits GPT maintenance frequencies to a manageable level.

Nexus

The new development in the ALN precinct will increase impervious areas resulting in an increased rate of stormwater runoff, a concentration of runoff and deterioration in water quality. These changes necessitate additional stormwater infrastructure to ameliorate the impacts.

While there is a nexus for ALN the question must be asked whether it is necessary to increase the total amount of bio-filter area required by 385% and to spend around 3 times the cost on a square metre rate basis to get the outcomes of a close to source control in the streetscape. The capital cost increase of the works alone is substantial at an additional **\$145.2M** (an extra \$8,546/lot) and there is a question as to whether the SMEC strategy fully accounts for all the streetscape controls required to ensure the system operates safely and effectively. It also imposes a substantial additional maintenance burden that may be unaffordable and unachievable for Council. The cost-benefit equation of this alternate stormwater strategy needs to be considered, along with a closer look at viable alternatives.

APPENDIX A SMEC COST SCHEDULES (Basins B22, B08, drainage system without basins NB33 and Culvert b_fourth)

B22 Drainage System - Preliminary Construction Cost Estimate Drawing set: 30011388-DDR-1012 to 30011388-DDR-B2286			Thursday, 24 Ja	anuary 2019						
ITEM NO. DESCRIPTION OF WORK	QUANTITY	UNIT	BASE RATE	LOWEST	CONTI LOWEST COST	GENCY HIGHEST (%)	HIGHEST	COST	INHERENT CONTINGENCY	COST + CONTINGENCY
1.0 GENERAL AND PRELIMINARIES 1.1 Site establishment, facilities & de-establishment	1	item	\$100,000.00	76)	\$70,000	160%	\$160,000	\$100,000	\$15,000	\$115,000
1.2 Traffic management 1.3 Temporary site fencing incl gates, supports etc	1 1,500	item lin. m	\$5,000.00 \$16.25	70% 80%	\$3,500 \$19,506	160% 140%	\$8,000 \$34,135	\$5,000 \$24,383	\$750 \$2,437	\$5,750 \$26,820
1.4 Provision and maintenance of sediment & erosion control 1.5 Clean water diversions, per month	1 6	item months	\$40,000.00 \$10,000.00	70% 70%	\$28,000 \$42,000	160% 160%	\$64,000 \$96,000	\$40,000 \$60,000	\$6,000 \$9,000	\$46,000 \$69,000
SUBTOTAL 2.0 DEMOLITION, CLEARING AND GRUBBING 2.1 Clearing & grubbing incl. clearing of existing creek, tree removal etc	25.458		¢0.52	cov	200.93	180%	\$24,287	\$229,383 \$13,493	\$33,187 \$2,698	\$262,570 \$16,191
2.1 Clearing & grubbing incl. clearing of existing creek, tree removal etc 2.2 Demolish existing buildings 2.3 Demolish road/scocess paths/driveways within proposed footprint	2,385 850	sq. m sq. m sq. m	\$0.53 \$62.10 \$49.50	60% 70% 70%	\$8,096 \$103,676 \$29,453	160%	\$236,974 \$67,320	\$13,493 \$148,109 \$42,075	\$2,090 \$22,216 \$6,311	\$10,191 \$170,325 \$48,386
2.4 Strip topsoil, stockpile, respread as per landscape plans (excludes any topsoil improvement works.)	3,819	cu. m	\$18.00	80%	\$54,988	140%	\$96,230	\$68,736	\$6,873	\$75,609
2.5 Dispose of excess/unsuitable topsoil (nominal 10% allowance) 2.5 Cartage	420 7,637	tonne cu. m	\$54.18 \$0.57	80% 80%	\$18,207 \$3,483	140% 140%	\$31,863 \$6,095	\$22,760 \$4,354	\$2,275 \$435	\$25,035 \$4,789
SUBTOTAL 3.0 EARTHWORKS 3.4 Conta fills a disease of material						Г Г		\$299,527	\$40,808	\$340,335
3.1 Cut to fill or disposal in all classes of material 3.2 Basin Earthworks 3.2.1 Basin 22: Total cut to disposal (assume no contaminated)	23,654	cu. m	\$8.05	60%	\$114,249	180%	\$342,746	\$190,415	\$38,083	\$228,498
3.2.2 Basin 22: Total fill (assume all fill from cut) 3.2.3 Basin areas with no structures above (biofilter area excluded): Rolling of exposed surface	823	cu. m sq. m	\$13.55 \$5.00	60% 60%	\$6,691 \$26,125	180%	\$20,073 \$78,374	\$11,152 \$43,541	\$2,230 \$8,708	\$13,382 \$52,249
(vibrating smooth drum 10 t+, 8 passes minimum). 3.2.4 Basin areas with structures above: Rolling of exposed surface (vibrating smooth drum 10 t+, 8	8,708 3,163	sq. m	\$20.00	60%	\$37,954	180%	\$113,861	\$63,256	\$12,651	\$75,907
passes minimum). Place granular fill (DGB20 or similar) in layers <200 mm and compact with roller above). Place/compact clean fill in layers. Compact upper 500 mm of subgrade to min. DDR of 100%. Level 1 Earthworks Control used in fill placement										
3.3 Channel Earthworks 3.3.1 Total cut to disposal - channel earthworks (assume no contaminated)	6,660	cu. m	\$8.05	60%	\$32,168	180%	\$96,503	\$53,613	\$10,723	\$64,336
3.3.2 Total fill - channel earthworks (assume all fill from cut) 3.3.3 Rolling of exposed surface (vibrating smooth drum 10 t+, 8 passes minimum).	386 9,348	cu. m sq. m	\$13.55 \$5.00	60% 60%	\$3,138 \$28,044	180% 180%	\$9,415 \$84,132	\$5,231 \$46,740	\$1,045 \$9,348	\$6,276 \$56,088
3.4 Pipe Excavation 3.4.1 Total Cut 3.5 Disposal cost	0	cu. m	\$70.00	70%	\$-	160%	\$-	\$-	\$-	\$-
3.5.1 Cost of disposal of soil as "No Contamination" at an approved landfill within 10km	18528	cu.m	\$80.00 \$350.00	60% 60%	\$889,344 \$2,722,566	180% 180%	\$2,668,032 \$8,167,698	\$1,482,240 \$4,537,610	\$296,448 \$907,522	\$1,778,688 \$5,445,132
3.5.3 Additional allowance for cartage of contaminated soil to Eastern Creek Landfill an additional	12965 235720	tonne cu.m /	\$350.00	70%	\$2,722,500	160%	\$214,977	\$4,537,810	\$907,522	\$5,445,132
10km (i.e. 20km one-way total distance) Trim, consolidation and final shaping of batters, basins, berms, channels, swales, wetland etc	21,219	km sq. m	\$2.95	70%	\$43,817	160%	\$100,154	\$62,597	\$9,388	\$71,985
3.7 Installation and compaction of clay liner as specified 3.7.1 Clay liner provided to base and to top of batters of basin, compacted to specified density,	9,491	sq. m	\$21.67	70%	\$143,987	160%	\$329,112	\$205,696	\$30,853	\$236,549
thickness and permeability 3.8 Dewatering of existing onsite dams, including allowance for management of discharge water	620	sq. m	\$66.50	70%	\$28,861	160%	\$65,968	\$41,230	\$6,185	\$47,415
SUBTOTAL 4.0 BASIN INLET, OUTLET AND BIOFILTER DRAINAGE								\$6,877,682	\$1,353,338	\$8,231,020
4.1 Pipes/Culverts 4.1.1 2 x 1200 x 600 RCBC (GPT Outlet)	11	lin. m	\$1,000.00	70%	\$7,560	160%	\$17,280	\$10,800	\$1,620	\$12,420
4.1.2 2 x 1200 x 900 RCBC (Basin outlet pipes) 4.1.3 2 x 1200 x 300 RCBC (From CHN B22 to Junction Pit)	160 8	lin. m lin. m	\$1,270.00 \$550.00	70% 70%	\$142,240 \$3,080	160% 160%	\$325,120 \$7,040	\$203,200 \$4,400	\$30,480 \$660	\$233,680 \$5,060
4.1.4 2 x 1200 x 300 RCBC (From Junction Pit to GPT) 4.2 Headwall(s) with wingwalls to suit	45	lin. m	\$550.00	70%	\$17,402	160%	\$39,776	\$24,860	\$3,729	\$28,589
4.2.1 2 x 1200 x 900 RCBC (Basin outlet pipes) 4.4 Base stab(s) to suit 4.4 Base stab(s) to suit	2	each	\$12,000.00	70%	\$8,400	160%	\$19,200	\$12,000	\$1,800	\$13,800
4.4.1 2 x 1200 x 600 RCBC (OPT Outlet) 4.4.2 2 x 1200 x 900 RCBC (Basin outlet pipes) 4.4.3 2 x 1200 x 300 RCBC (From CHN B22 to Junction Pit)	2 36 2	cu. m cu. m cu. m	\$333.00 \$333.00 \$333.00	80% 80% 80%	\$9,590	140% 140% 140%	\$1,133 \$16,783 \$839	\$810 \$11,988 \$600	\$80 \$1,199 \$59	\$890 \$13,187 \$659
4.4.3 2 x 1200 x 300 RCBC (From Link b22 to suitation Fit) 4.4.4 2 x 1200 x 300 RCBC (From Junction Pit to GPT) 4.5 Bedding material to suit	10	cu. m	\$333.00	80%	\$480	140%	\$4,741	\$3,387	\$338	\$3,725
4.5.1 2 x 1200 x 600 RCBC (GPT Outlet) 4.5.2 2 x 1200 x 600 RCBC (GPT Outlet)	4 60	cu. m cu. m	\$63.00 \$63.00	80% 80%	\$204 \$3,024	140% 140%	\$357 \$5,292	\$256 \$3,780	\$25 \$378	\$281 \$4,158
4.5.3 2 x 1200 x 300 RCBC (From CHN B22 to Junction Pit) 4.5.4 2 x 1200 x 300 RCBC (From Junction Pit to GPT)	3 17	cu. m cu. m	\$63.00 \$63.00	80% 80%	\$151 \$854	140% 140%	\$265 \$1,495	\$189 \$1,068	\$19 \$107	\$208 \$1,175
4.6 Pits 4.6.1 Junction Pit (upstream of basin and GPT) - 0.8 m deep (Reinforced concrete junction pits (RMS))	1	each	\$2,550.00	70%	\$1,785	160%	\$4,080	\$2,550	\$383	\$2,933
Standard DRG R0220-35)) 4.6.2 Pit depth increments in excess of 900 mm 4.6.3 Pit cover	0	each each	\$152.00 \$340.00	70% 70%	\$- \$238	160% 160%	\$- \$544	\$- \$340	\$- \$51	\$- \$391
4.7 Gross Pollutant Trap(s) 4.7.1 GPT pit (treatment flow 2.07 m ³ /s)	1	each	\$175.000.00	80%	\$140,000	140%	\$245,000	\$175,000	\$17,500	\$192,500
4.8 Gabion Walls 4.8.1 n/a	0	cu. m	,	80%	\$-	140%	\$-	\$-	ş-	\$-
4.9 Channels 4.9.1 Rock lined pilot distribution channel	115	sq. m	\$72.00	70%	\$5,806	160%	\$13,271	\$8,295	\$1,244	\$9,539
4.9.2 High flow bypass channel 4.10 Biofiltration cells (0 m² total area)	0	cu. m	\$333.00	80%	\$-	140%	\$-	\$-	\$-	\$-
4.10.1 Filter media layer at 400 mm depth 4.10.2 Transition layer at 450 mm depth	0	cu. m cu. m	\$49.00 \$49.00	70% 70%	\$- \$-	160% 160%	\$- \$-	\$- \$-	\$- \$-	\$- \$-
4.10.3 Drainage layer at 150 nm depth 4.10.4 Biofilitation cells vegetation 4.10.5 Backflow/overflow weirs	0	cu.m sq.m cu.m	\$75.00 \$24.00 \$333.00	70% 80% 70%	\$- \$- \$-	160% 140% 160%	\$- \$- \$-	\$- \$- \$-	\$- \$- \$-	\$- \$- \$-
4.10.6 Welland Distribution channel batters vegetation 4.11 Maintenance Path	0	sq. m	\$333.00	80%	ş- \$-	140%	\$- \$-	ş- \$-	\$- \$-	ş- Ş-
4.11.1 Maintenance Fath - along crest of south batter of basin - concrete 4.12 Inlet Spillway	16	cu. m	\$333.00	80%	\$4,196	140%	\$7,343	\$5,245	\$524	\$5,769
4.12.1 Scour protection 4.12.2 Geotextile	270 270	sq. m sq. m	\$72.00 \$8.75	80% 80%	\$15,540 \$1,889	140% 140%	\$27,196 \$3,305	\$19,426 \$2,361	\$1,942 \$236	\$21,368 \$2,597
4.13 Outlet Spillway 4.13.1 Scour protection	69	sq. m	\$72.00	70%	\$3,478	160%	\$7,949	\$4,968	\$745	\$5,713
4.13.2 Geotextile 4.14 Multiple outlet structure	69	sq. m	\$8.75	80%	\$483	140%	\$845	\$604	\$60	\$664
4.14.1 Cylindrical structure to spillway level - concrete (10 m circumference, 150 mm thick, 1.9 m high) 4.14.2 Formwork (sides of walls)	3 38	cu. m sq. m	\$341.00 \$231.00	80% 80%	\$777 \$7,022	140% 140%	\$1,361 \$12,289	\$972 \$8,778	\$97 \$878	\$1,069 \$9,656
4.15 Sandstone Wall 4.15.1 Staggered sandstone stepwall 4.4.6 Evidenci Designer	832	cu. m	\$240.00	60%	\$119,808	180%	\$359,424	\$199,680	\$39,936	\$239,616
4.16 Subsoil Drainage 4.16.1 Subsoil drainage (slotted flexible coil pipe) linear along the length of the biofilter basin at 1 m spacings	960	lin. m	\$16.25	80%	\$12,480	140%	\$21,840	\$15,600	\$1,560	\$17,160
SUBTOTAL 5.0 STORMWATER DRAINAGE (U/S OF BASIN)	-							\$721,157	\$105,649	\$826,806
5.1 Pipes/Culverts 5.1.1 n/a	0	lin. m		80%	\$-	140%	\$-	\$-	\$-	\$-
5.2 Headwall(s) with wingwalls to suit 5.2.1 n/a 6.4 Base lab/e) to suit	0	each		80%	\$-	140%	\$-	\$-	\$-	\$-
5.4 Base slab(s) to suit 5.4.1 n/a 5.5 Pits	0	cu. m		80%	\$-	140%	\$-	\$-	\$-	\$-
5.5.1 Na 5.6.1 Channels										
5.6.1 Rock lined low flow channel 5.6.2 Geotextile under rock (2,448 m²)	2,448 2,448	sq.m sq.m	\$72.00 \$8.75	70% 80%	\$123,379 \$17,136	160% 140%	\$282,010 \$29,988	\$176,256 \$21,420	\$26,438 \$2,142	\$202,694 \$23,562
5.6.3 Vegetated channel (either side of rock lined lo-flow) (refer dwg B2286) assume grassed (half of vegetated channel area)	2,181	sq. m	\$14.80	70%	\$22,592	160%	\$51,639	\$32,275	\$4,841	\$37,116
5.6.4 Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) 5.6.5 Maintenance path/berm (390 m left bank length, 4.5 m width) - concrete	2,181 263	sq.m cum	\$108.00 \$333.00	70% 80%	\$164,861 \$70,130	160% 140%	\$376,825 \$122,727	\$235,516 \$87,663	\$35,327 \$8,765	\$270,843 \$96,428
SUBTOTAL	•						,	\$553,130	\$77,513	\$630,643

6.0	STORMWATER DRAINAGE (D/S OF BASIN)						1				
6.1	Pipes/Culverts										
6.1.1	n/a	0	lin. m		80%	\$-	140%	\$-	\$-	\$-	\$-
6.2	Headwall(s) with wingwalls to suit										
6.2.1	n/a	0	each		80%	\$-	140%	\$-	\$-	\$-	\$-
6.4	Base slab(s) to suit										
6.4.1	n/a	0	lin. m		80%	\$-	140%	\$-	\$-	\$-	\$-
6.5	Pits										
6.5.1	n/a	0	each		80%	\$-	140%	\$-	\$-	\$-	\$-
6.6	Channels										
6.6.1	n/a	0	sq. m		80%	\$-	140%	\$-	\$-	\$-	\$-
6.7	Scour Protection										
6.7.1	Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC)	17	sq. m	\$72.00	70%	\$837	160%	\$1,912	\$1,196	\$178	\$1,374
	SUBTOTAL								\$1,196	\$178	\$1,374
7.0	MINOR LANDSCAPING										
	SUBTOTAL	-							\$-	\$-	\$-
	·										
	CONSTRUCTIO	N TOTAL							\$8,682,075	\$1,610,674	\$10,292,749
8.0	PROJECT MANAGEMENT AND SUPERVISION										
8.1	15% construction cost								\$1,543,912		
9.0	CONTINGENCIES										
9.1	Inherent contingency									\$1,610,674	\$1,610,674
9.2				\$-	60%	\$-	180%	\$-	\$-	\$-	\$ -
9.3				\$-	70%	\$-	160%	\$-	\$-	\$-	\$-
-											
	CONSTRUCTION TOTAL, excluding GST										\$11,836,661
	GST										\$1,183,666
	CONSTRUCTION TOTAL, including GST										\$13,020,327
	CONSTRUCTION TOTAL, rounded										\$13,021,000

	rainage System - Preliminary Construction Cost Estimate			Thursday, 24 J	lanuary 2019)]	
Drawi	ng set: 30011388-DDR-2012 to 30011388-DDR-B0886 ITEM NO. DESCRIPTION OF WORK	QUANTITY	UNIT	BASE RATE	LOWEST	CONT LOWEST COST	IGENCY HIGHEST (%)	HIGHEST	COST	INHERENT CONTINGENCY	COST + CONTINGENCY
1.0 1.1	GENERAL AND PRELIMINARIES Site establishment, facilities & de-establishment	1	item	\$100,000.00	(%)	\$70,000		\$160,000	\$100,000	\$15,000	\$115,000
1.2	Traffic management Temporary site fencing incl gates, supports etc	1	item lin. m	\$5,000.00 \$16.25	70%	\$3,500		\$8,000 \$29,584	\$5,000	\$750	\$5,750
1.4	Provision and maintenance of sediment & erosion control Clean water diversions, per month	1 6	item months	\$40,000.00 \$10,000.00	70%	\$28,000	160%	\$64,000 \$96,000	\$40,000	\$6,000	\$46,000 \$69,000
2.0	DEMOLITION, CLEARING AND GRUBBING	Ŭ	monuto	\$10,000.00	10/0	¢ 12,000	100 %	\$00,000	\$226,132	\$32,862	\$258,994
2.1 2.2	Clearing & grubbing incl. clearing of existing creek, tree removal etc Demolish existing buildings	10,492 1,100	sq. m sq. m	\$0.53 \$62.10	60% 80%	\$3,336 \$54,648		\$10,009 \$95,634	\$5,561 \$68,310	\$1,112 \$6,831	\$6,673 \$75,141
2.2	Demolish access path/driveway across channel Strip topsoil, stockpile, respread as per landscape plans (excludes any topsoil	370	sq. m	\$49.50 \$18.00	70%	\$12,821 \$19,830	160% 160%	\$29,304 \$45,325	\$18,315 \$28,329	\$2,747	\$21,062 \$32,578
2.3	Dispose of excess/unsuitable topsoil (nominal 10% allowance, assume 150mm depth)	173	tonne	\$54.18	80%	\$7,504	140%	\$13,132	\$9,380	\$938	\$10,318
2.5	Cartage SUBTOTAL	3,148	cu. m	\$0.57	80%	\$1,435	140%	\$2,512	\$1,795 \$131,690	\$179 \$16,055	\$1,974 \$147,745
3.0 3.1	EARTHWORKS Cut to fill or disposal in all classes of material						1		¢101,000	¥10,000	V HI, H
3.1.1	Basin Earthworks Total Cut to disposal - Basin 08 (assume all contaminated)	12,444	cu. m	\$8.05	60%	\$60,105	180%	\$180,314	\$100,175	\$20,034	\$120,209
3.1.1.2		611 2,498	cu. m sq. m	\$13.55 \$5.00	60%	\$4,967	180%	\$14,902 \$22,484	\$8,280	\$1,655	\$9,935
3.1.1.3	surface (vibrating smooth drum 10 t+, 8 passes minimum).	4,460	sq. m	\$20.00	60%	\$53,517	180%	\$160,551	\$89,196	\$17,838	\$14,505
	drum 10 t+, 8 passes minimum). Place granular fill (DGB20 or similar) in layers <200 mm and compact with roller above). Place/compact clean fill in layers. Compact upper 500 mm of subgrade to min. DDR of 100%. Level 1 Earthworks Control used in fill placement	.,									
3.1.2 3.1.2.1		1,694	cu. m	\$8.05	80% 60%	\$- \$8,182	140% 180%	\$- \$24,546	\$- \$13,637	\$- \$2,727	\$- \$16,364
3.1.2.2 3.1.2.3	Rolling of exposed surface (vibrating smooth drum 10 t+, 8 passes minimum).	13 1,927	cu. m sq. m	\$13.55 \$5.00	60% 60%	\$106 \$5,781	180% 180%	\$317 \$17,343	\$177 \$9,635	\$34 \$1,927	\$211 \$11,562
3.1.3 3.1.3.1	Pipe Earthworks Total Cut - Pipe B8	2,911	cu. m	\$70.00	80% 80%	\$- \$163,016	140%	\$- \$285,278	\$- \$203,770	\$- \$20,377	\$- \$224,147
3.1.4 3.1.4.1	Disposal cost	8,427	cu.m	\$80.00	60%	\$404,496	180%	\$1,213,488	\$674,160	\$134,832	\$808,992
3.1.4.2	an approved landfill within 10km	6,282	tonne	\$350.00	60%	\$1,319,241	180%	\$3,957,723	\$2,198,735	\$439,747	\$2,638,482
3.1.4.3	Additional allowance for cartage of contaminated soil to Eastern Creek Landfill an additional 10km (i.e. 20km one-way total distance)	114,220	cu.m / km	\$0.57	70%	\$45,574	160%	\$104,169	\$65,106	\$9,765	\$74,871
3.2 3.3	Trim, consolidation and final shaping of batters, basins, berms, channels, swales, wetland etc Installation and compaction of clay liner	10,492	sq. m	\$2.95	70%	\$21,666	160% 140%	\$49,522	\$30,952	\$4,642	\$35,594
3.3.1	Clay liner provided to base and to top of batters of basin, compacted to specified density, thickness and permeability	7,001	sq. m	\$21.67	70%	\$106,213	160%	\$242,772	\$151,733	\$22,759	\$174,492
3.4	Dewatering of existing onsite dams, including allowance for management of discharge water	0	sq. m	\$66.50	70%	\$-	160%	\$-	\$-	\$-	\$-
4.0	SUBTOTAL BASIN INLET, OUTLET AND BIOFILTER DRAINAGE								\$3,558,048	\$678,835	\$4,236,883
4.1 4.1.1	Pipes/Culverts (2x) 900 x 300 RCBC (refer dwg B0803) - low flow outlet to biofilter	92	lin. m	\$457.00	70%	\$29,431	160%	\$67,270	\$42,044	\$6,307	\$48,351
4.1.1 4.1.3	DN900 RCP (refer dwg B0803) - upto 50% flows to basin DN225 pipe (biofilter connection)	16 26	lin. m lin. m	\$630.00 \$102.00	70% 70%	\$7,056 \$1,856	160% 160%	\$16,128 \$4,243	\$10,080 \$2,652	\$1,512 \$398	\$11,592 \$3,050
4.1.4 4.1.5	DN300 pipe (early discharge) DN600 pipe (biofilter outlet)	17 100	lin. m lin. m	\$170.00 \$340.00	70% 70%	\$2,023 \$23,800	160% 160%	\$4,624 \$54,400	\$2,890 \$34,000	\$434 \$5,100	\$3,324 \$39,100
4.1.6 4.1.7	DN525 (low flow outlet under spillway) DN300 pipe (submerged distribution pipes through gabions, 10 x 1 m lengths)	12 10	lin. m lin. m	\$290.00 \$170.00	70% 70%	\$2,436 \$1,190	160% 160%	\$5,568 \$2,720	\$3,480 \$1,700	\$522 \$255	\$4,002 \$1,955
4.2 4.1.1	Headwall(s) with wingwalls to suit: (2x) 900 x 300 RCBC (refer dwg B0803) - low flow outlet to biofilter	1	each	\$5,000.00	80% 70%	\$- \$3,500	140% 160%	\$- \$8,000	\$- \$5,000	\$- \$750	\$- \$5,750
4.1.1 4.4	DN900 RCP (refer dwg B0803) - upto 50% flows to basin Baseslab(s) to suit	1	each	\$3,500.00	60% 80%	\$2,151 \$-	180% 140%	\$6,454 \$-	\$3,586 \$-	\$717 \$-	\$4,303 \$-
4.4.1 4.5	(2x) 900 x 300 RCBC (refer dwg B0803) - low flow outlet to biofilter Bedding material to suit	12	cu. m	\$333.00	70% 80%	\$2,895 \$-	160% 140%	\$6,617 \$-	\$4,136 \$-	\$620 \$-	\$4,756 \$-
4.5.1	(2x) 900 x 300 RCBC (refer dwg B0803) - low flow outlet to biofilter DN900 RCP (refer dwg B0803) - upto 50% flows to basin	17 3	cu. m cu. m	\$63.00 \$63.00	70%	\$730	160%	\$1,669	\$1,044	\$156	\$1,200
4.5.3 4.5.4	DN225 pipe (biofilter connection) DN300 pipe (early discharge)	2	cu. m cu. m	\$63.00 \$63.00	70% 70%	\$83 \$56	160% 160%	\$189 \$129	\$118 \$81	\$18 \$11	\$136 \$92
4.5.5	DN600 pipe (biofilter outlet) DN525 (low flow outlet under spillway)	11	cu. m	\$63.00 \$63.00	70%	\$496 \$54	160%	\$1,134 \$122	\$709	\$106 \$11	\$815
4.5.7	DN300 pipe (submerged distribution pipes through gabions, 10 x 1 m lengths) Pits	1	cu. m	\$63.00	70%	\$33	160%	\$76	\$48	\$6 \$-	\$54 \$-
4.6.1	Reinforced concrete junction pits (RMS Standard DRG R0220-35) Diversion Pit (Pit B08.5) - 2.17 m deep	1	each	\$2,550.00	70%	\$- \$1,785	160%	\$- \$4,080	\$- \$2,550	\$- \$383	\$- \$- \$2,933
4.6.3	Pit depths in excess of 900 mm (100 mm increments) Pit Cover	13	each each	\$152.00 \$340.00	70% 70% 70%	\$1,351 \$238	160%	\$3,089	\$1,931 \$340	\$383 \$289 \$51	\$2,933 \$2,220 \$391
4.7	Gross Pollutant Trap(s)	1							-		
4.7.1 4.8	GPT pit (treatment flow 1.43 m ³ /s) Gabion Walls	1	each	\$55,000.00	60% 80%	\$33,000	180% 140%	\$99,000 \$-	\$55,000 \$-	\$11,000 \$-	\$66,000 \$-
4.8.1 4.8.2	1m x 1m x 1m depth gabion baskets for 112 m ² area Rock filling for baskets (112 m ³)	112 112	each cu. m	\$306.42 \$77.35	70% 70%	\$24,023 \$6,064		\$54,910 \$13,861	\$34,320 \$8,664	\$5,147 \$1,299	\$39,467 \$9,963
4.9 4.9.1	Channels Rock lined pilot distrubition channel (660 mm width x 50 mm depth x 156.6 m total longth)	5	cu. m	\$72.00	80% 70%	\$- \$260	140% 160%	\$- \$595	\$- \$373	\$- \$55	\$- \$428
4.9.2	length) High flow bypass channel (concrete, 150mm deep) Biofiltration cells (1607 m ² total area)	155	cu. m	\$333.00	70%	\$36,119	160% 140%	\$82,557	\$51,599	\$7,739	\$59,338 \$-
4.10	Filter media layer at 400 mm depth (Top Soil)	643 723	cu. m	\$49.00 \$49.00	70%	\$- \$22,048 \$24,804		\$- \$50,396 \$56,695	\$- \$31,498 \$35,435	\$- \$4,724 \$5,315	\$- \$36,222 \$40,750
4.10.2	Drainage layer at 150 mm depth (Blue metal)	241	cu. m	\$75.00	70%	\$12,655	160%	\$28,926	\$18,079	\$2,712	\$20,791
4.10.4 4.10.5	Backflow/overflow weirs (concrete, 150mm deep)	1,607 9	sq. m cu. m	\$24.00 \$333.00	80% 70%	\$30,854 \$2,203	140% 160%	\$53,995 \$5,035	\$38,568 \$3,147	\$3,857 \$472	\$42,425 \$3,619
4.10.6	Wetland Distribution channel batters vegetation (assume 0.6 * channel area of 171.5 m ²) (mix tube stock - 200 mm potted plants) Maintenance Path	103	sq. m	\$24.00	80%	\$1,976 \$-	140% 140%	\$3,457 \$-	\$2,470	\$247 \$-	\$2,717
4.11.1	Maintenance Path - concrete, within base of basin	167 43	cu. m	\$333.00 \$333.00	80% 70% 70%	\$38,846 \$9,911		\$88,791 \$22,654	\$- \$55,495 \$14,159	\$8,324 \$2,124	\$- \$63,819 \$16,283
4.11.2 4.12	Multiple outlet structure	43	cu. m	\$333.00		\$9,911	140%	\$22,654			
	Cylindrical structure to spillway level - concrete (5 m circumference, 150 mm thick, 1.22 m high)	1	cu. m sq. m	\$341.00	80%	\$250		\$437 \$3,945	\$313 \$2,819	\$30	\$343
4.12.1				\$72.00	80%	\$3,931	140%	\$8,986	\$-	\$-	\$6,458
4.12.2 4.12	Formwork (sides of walls) Inlet Spillway	78	sa. m		80%	\$546		\$956	\$683		\$751
4.12.2 4.12 4.12.1 4.12.2	Formwork (sides of walls) Inlet Spillway Scour protection	78 78	sq. m sq. m	\$8.75		\$-	140%	\$-	\$-	\$68 \$-	\$751
4.12.2 4.12 4.12.1 4.12.2 4.1 4.13.1	Formwork (sides of walls) Inlet Spillway Scour protection Geotextile Outlet Spillway Concrete 25 MPa (concrete spillway, 8.5 m length x 150 mm thick)	78	sq. m cu. m	\$333.00	80% 70%	\$- \$1,958	160%	\$4,476	\$- \$2,798	\$- \$419	\$- \$3,217
4.12.2 4.12 4.12.1 4.12.2 4.1 4.13.1 4.13.2 4.13.3	Formwork (sides of walls) Inlet Spillway Scour protection Geotextile Outlet Spillway Concrete 25 MPa (concrete spillway, 8.5 m length x 150 mm thick) Scour protection - rock mattress 230 mm depth thickness Scour protection - rock mattress 2 x 230 mm depth thickness	78 8 165 39	sq. m cu. m sq. m sq. m	\$333.00 \$72.00 \$144.00	80% 70% 70% 70%	\$- \$1,958 \$8,316 \$3,931	160% 160% 160%	\$4,476 \$19,008 \$8,986	\$- \$2,798 \$11,880 \$5,616	\$- \$419 \$1,782 \$842	\$- \$3,217 \$13,662 \$6,458
4.12.2 4.12 4.12.1 4.12.2 4.1 4.13.1 4.13.2 4.13.3 4.13.4 4.15	Formwork (sides of walls) Inlet Spillway Scour protection Geotextile Outlet Spillway Concrete 25 MPa (concrete spillway, 8.5 m length x 150 mm thick) Scour protection - rock mattress 230 mm depth thickness Scour protection - rock mattress 2 x 230 mm depth thickness Geotextile Subsoil Drainage	78 8 165 39 204	sq. m cu. m sq. m sq. m sq. m	\$333.00 \$72.00 \$144.00 \$8.75	80% 70% 70% 70% 80%	\$- \$1,958 \$8,316 \$3,931 \$1,428	160% 160% 160% 140%	\$4,476 \$19,008 \$8,986 \$2,499	\$- \$2,798 \$11,880 \$5,616 \$1,785	\$- \$419 \$1,782 \$842 \$179	\$- \$3,217 \$13,662 \$6,458 \$1,964
4.12.2 4.12 4.12.1 4.12.2 4.1 4.13.1 4.13.2 4.13.3 4.13.4	Formwork (sides of walls) Inlet Spillway Scour protection Geotextile Outlet Spillway Concrete 25 MPa (concrete spillway, 8.5 m length x 150 mm thick) Scour protection - rock mattress 230 mm depth thickness Scour protection - rock mattress 2 x 230 mm depth thickness Geotextile	78 8 165 39	sq. m cu. m sq. m sq. m	\$333.00 \$72.00 \$144.00	80% 70% 70% 70%	\$- \$1,958 \$8,316 \$3,931	160% 160% 160%	\$4,476 \$19,008 \$8,986	\$- \$2,798 \$11,880 \$5,616	\$- \$419 \$1,782 \$842	\$- \$3,217 \$13,662 \$6,458
4.12.2 4.12 4.12.1 4.12.2 4.1 4.13.1 4.13.2 4.13.3 4.13.4 4.15.1	Formwork (sides of walls) Inlet Spillway Scour protection Geotextile Outlet Spillway Concrete 25 MPa (concrete spillway, 8.5 m length x 150 mm thick) Scour protection - rock mattress 230 mm depth thickness Scour protection - rock mattress 2 x 230 mm depth thickness Geotextile Subsoil Drainage Subsoil drainage (slotted flexible coil pipe) linear along the length of the biofilter basin at 1 m spacings	78 8 165 39 204	sq. m cu. m sq. m sq. m sq. m	\$333.00 \$72.00 \$144.00 \$8.75	80% 70% 70% 70% 80%	\$- \$1,958 \$8,316 \$3,931 \$1,428	160% 160% 160% 140% 140%	\$4,476 \$19,008 \$8,986 \$2,499	\$- \$2,798 \$11,880 \$5,616 \$1,785 \$4,875 \$4,875	\$- \$419 \$1,782 \$842 \$179 \$488 \$488 \$488	\$- \$3,217 \$13,662 \$6,458 \$1,964 \$5,363 \$-
4.12.2 4.12 4.12.1 4.12.2 4.1 4.13.1 4.13.2 4.13.3 4.13.4 4.15 4.15.1 4.16 4.16.1 5.0	Formwork (sides of walls) Inlet Spillway Scour protection Geotextile Outlet Spillway Concrete 25 MPa (concrete spillway, 8.5 m length x 150 mm thick) Scour protection - rock mattress 230 mm depth thickness Scour protection - rock mattress 2 x 230 mm depth thickness Geotextile Subsoli Orainage Subsoli Orainage (slotted flexible coil pipe) linear along the length of the biofilter basin at 1 m spacings Sandstone Wall Staggered Sandstone stepwall - n/a	78 8 165 39 204 300	sq. m cu. m sq. m sq. m sq. m lin. m	\$333.00 \$72.00 \$144.00 \$8.75 \$16.25	80% 70% 70% 80% 80% 60%	\$- \$1,958 \$8,316 \$3,931 \$1,428 \$3,900	160% 160% 160% 140% 140% 140%	\$4,476 \$19,008 \$8,986 \$2,499 \$6,825	\$- \$2,798 \$11,880 \$5,616 \$1,785 \$4,875	\$- \$419 \$1,782 \$842 \$179 \$488	\$- \$3,217 \$13,662 \$6,458 \$1,964 \$5,363 \$-
4.12.2 4.12.1 4.12.2 4.12.4 4.13.1 4.13.2 4.13.3 4.13.4 4.15.1 4.15.1 4.16.1	Formwork (sides of walls) Inlet Spillway Socur protection Geotextile Outlet Spillway Concrete 25 MPa (concrete spillway, 8.5 m length x 150 mm thick) Socur protection - rock mattress 230 mm depith thickness Socur protection - rock mattress 2 x 230 mm depith thickness Geotextile Subsoil Drainage Subsoil Orainage (slotted flexible coil pipe) linear along the length of the biofilter basin at 1 m spacings Sandstone Wall Staggered sandstone stepwall - n/a SUBTOTAL STORMWATER DRAINAGE (U/S OF BASIN)	78 8 165 39 204 300	sq. m cu. m sq. m sq. m sq. m lin. m	\$333.00 \$72.00 \$144.00 \$8.75 \$16.25	80% 70% 70% 80% 80%	\$- \$1,958 \$8,316 \$3,931 \$1,428 \$3,900 \$-	160% 160% 160% 140% 140% 140% 180%	\$4,476 \$19,008 \$8,986 \$2,499 \$6,825 \$-	\$- \$2,798 \$11,880 \$5,616 \$1,785 \$4,875 \$4,875 \$501,658	\$- \$419 \$1.782 \$842 \$179 \$488 \$488 \$488 \$55,587	\$- \$3,217 \$13,662 \$6,458 \$1,964 \$5,363

5.1.3	2700 x 900 RCBC Class 4 - Pipe B8.4	53	lin. m	\$1,900.00	70%	\$70,490	160%	\$161,120	\$100,700	\$15,105	\$115,805
5.1.3	2700 x 900 RCBC Class 4 - Pipe Bo.4 2700 x 900 RCBC Class 4 - Pipe B8.5	64	lin. m	\$1,900.00	70%	\$70,490 \$85,120	160%	\$194,560	\$100,700	\$15,105	\$139,840
5.2	Headwall(s) with wingwalls to suit:	01		\$1,000.00	80%	\$-	140%	\$-	\$-	\$-	\$-
0.2	2700 x 900 RCBC Class 4 - Pipe B8.5	1	each	\$17.000.00	70%	\$11,900	160%	\$27,200	\$17,000	\$2,550	\$19,550
5.4	Baseslab(s) to suit				80%	\$-	140%	\$-	\$-	\$-	\$-
5.1.1	1800 x 900 RCBC Class 4 - Pipe B8.1	19	cu.m	\$333.00	80%	\$5,073	140%	\$8,878	\$6,342	\$633	\$6,975
5.1.2	2100 x 900 RCBC Class 4 - Pipe B8.2	22	cu.m	\$333.00	80%	\$5,874	140%	\$10,280	\$7,343	\$734	\$8,077
5.1.3	2100 x 900 RCBC Class 4 - Pipe B8.3	22	cu.m	\$333.00	80%	\$5,874	140%	\$10,280	\$7,343	\$734	\$8,077
5.1.2	2700 x 900 RCBC Class 4 - Pipe B8.4	21	cu.m	\$333.00	80%	\$5,718	140%	\$10,007	\$7,148	\$715	\$7,863
5.1.3	2700 x 900 RCBC Class 4 - Pipe B8.5	26	cu.m	\$333.00	80%	\$6,905	140%	\$12,084	\$8,632	\$862	\$9,494
5.5	Bedding material to suit										
5.1.1	1800 x 900 RCBC Class 4 - Pipe B8.1	22	cu.m	\$63.00	70%	\$980	160%	\$2,239	\$1,400	\$210	\$1,610
5.1.2	2100 x 900 RCBC Class 4 - Pipe B8.2	25	cu.m	\$63.00	70%	\$1,111	160%	\$2,540	\$1,588	\$238	\$1,826
5.1.3	2100 x 900 RCBC Class 4 - Pipe B8.3	25	cu.m	\$63.00	70%	\$1,111	160%	\$2,540	\$1,588	\$238	\$1,826
5.1.2	2700 x 900 RCBC Class 4 - Pipe B8.4	24	cu.m	\$63.00	70%	\$1,052	160%	\$2,404	\$1,503	\$225	\$1,728
5.1.3	2700 x 900 RCBC Class 4 - Pipe B8.5	29	cu.m	\$63.00	70%	\$1,270	160%	\$2,903	\$1,815	\$272	\$2,087
5.6	Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35)				80%	\$-	140%	\$-	\$-	\$-	\$-
4.6.1 4.6.2	Junction Pit (Pit B08.1) - 2.56 m deep	4	each	\$2,550.00	70%	\$1,785	160%	\$4,080	\$2,550	\$383	\$2,933
4.6.2	Junction Pit (Pit B08.2) - 2.39 m deep Junction Pit (Pit B08.2) - 2.39 m deep	1	each	\$2,550.00	70%	\$1,785	160%	\$4,080	\$2,550	\$383	\$2,933
4.6.2	Junction Pit (Pit B08.2) - 2.39 m deep Junction Pit (Pit B08.3) - 3.08 m deep	1	each	\$2,550.00	70%	\$1,785	160%	\$4,080	\$2,550	\$383	\$2,933
4.6.2	Junction Pit (Pit B08.3) - 3.38 m deep	1	each	\$2,550.00	70%	\$1,785	160%	\$4,080	\$2,550	\$383	\$2,933
7.0.2	Pit depths in excess of 900 mm (100 mm increments)	78	each	\$2,550.00	70%	\$1,765	160%	\$4,080	\$2,550	\$363	\$13,652
4.6.3	Pit Cover	4	each	\$340.00	70%	\$952	160%	\$2,176	\$1,360	\$204	\$1,564
5.7	Channels		ouon	¢010.00	80%	\$-	140%	\$-	\$-	\$-	\$-
	n/a				0070	+		+	Ŧ	+	Ŧ
	SUBTOTAL								\$651,229	\$95,838	\$747,067
6.0	STORMWATER DRAINAGE (D/S OF BASIN)										
6.1	Pipes/Culverts				80%	\$-	140%	\$-	\$-	\$-	\$-
6.1.1	n/a		lin. m		70%	\$-	160%	\$-	\$-	\$-	\$-
6.2	Headwall(s) with wingwalls to suit:				80%	\$-	140%	\$-	\$-	\$-	\$-
	n/a				80%	\$-	140%	\$-	\$-	\$-	\$-
6.4	Baseslab(s) to suit				80%	\$-	140%	\$-	\$-	\$-	\$-
5.4.1	n/a		cu. m	\$333.00	80%	\$-	140%	\$-	\$-	\$-	\$-
5.5	Bedding material to suit										
5.5.1	n/a		cu. m	\$63.00	70%	\$-	160%	\$-	\$-	\$-	\$-
5.6	Pits				80%	\$-	140%	\$-	\$-	\$-	\$-
	n/a		each				4.400/				
5.7	Channels	540		¢70.00	80%	\$-	140%	\$-	\$-	\$-	\$-
5.7.1	Rock lined low flow channel (refer dwg B0886)	519 519	sq. m	\$72.00 \$8.75	70% 80%	\$26,163	160% 140%	\$59,802	\$37,377 \$4,543	\$5,605 \$453	\$42,982
5.7.2	Geotextile under rock Vegetated channel (either side of rock lined lo-flow) (refer dwg B0886), grassed (half	850	sq. m	\$8.75		\$3,634 \$10,064	140%	\$6,359 \$17,612	\$4,543	\$453	\$4,996 \$13,838
5.7.3	of vegetated channel area)	650	sq. m	\$14.00	80%	\$10,004	140%	\$17,012	\$12,500	\$1,250	\$13,030
5.7.4	Channel batters vegetation, assumed half of area vegetated, other than grassed (mix	850	sq. m	\$24.00	80%	\$16,320	140%	\$28,560	\$20,400	\$2,040	\$22,440
	tube stock - 200 mm potted plants)										
5.7.5	Maintenance path/berm - concrete	0	cu. m	\$333.00	70%	\$-	160%	\$-	\$-	\$-	\$-
6.8	Scour Protection	447		¢70.00		65.007	4009/	640.470	60 404	64.004	* 0.000
6.8.1	Scour protection at Basin Outlet Pipes SUBTOTAL	117	sq. m	\$72.00	70%	\$5,897	160%	\$13,478	\$8,424 \$83.324	\$1,264 \$10.621	\$9,688 \$93.945
<u> </u>	JUDIVIAL			I					əo 3,32 4	\$10,621	ə ə 3,945
7.0	MINOR LANDSCAPING										
7.0	MINOR LANDOGAPING										
	SUBTOTAL		1						\$-	\$-	\$-
<u> </u>									4 -	+-	Ψ-
	CONSTRUC	TION TOTAL							\$5,152,081	\$909,799	\$6,061,880
8.0	PROJECT MANAGEMENT AND SUPERVISION										
	15% construction cost								\$909,281.94		
9.0	CONTINGENCIES										
9.1	Inherent contingency									\$909,799	
9.2				\$-	60%	\$-	180%	\$-	\$-	\$-	\$-
9.3				\$-	70%	\$-	160%	\$-	\$-	\$-	\$-
	CONSTRUCTION TOTAL, excluding GST										\$6,971,162
	GST	r –									\$697,116
	CONSTRUCTION TOTAL, including GST										\$7,668,278
L	CONSTRUCTION TOTAL, rounded										\$7,669,000

NB33	Drainage System - Preliminary Construction Cost Estimate Drawing sets:			Thursday, 24	January 2019	9					
	ITEM NO. DESCRIPTION OF WORK	QUANTITY	UNIT	BASE RATE	LOWEST	CONT LOWEST COST	GENCY HIGHEST (%)	HIGHEST	COST	INHERENT CONTINGENCY	COST + CONTINGENCY
1.0	GENERAL AND PRELIMINARIES				(70)		(//				
1.1	Site establishment, facilities & de-establishment	1	item	\$100,000.00	70%	\$70,000	160%	\$160,000	\$100,000	\$15,000	\$115,000
1.2	Traffic management Temporary site fencing incl gates, supports etc	1 2,412	item lin. m	\$5,000.00 \$16.25	70%	\$3,500 \$31,362	160% 140%	\$8,000 \$54,883	\$5,000 \$39,203	\$750 \$3,919	\$5,750 \$43,122
1.3	Provision and maintenance of sediment & erosion control	2,412	item	\$10.25	70%	\$28,000	140%	\$64,000	\$39,203	\$5,919	\$46,000
1.4	Clean water diversions, per month	3	months	\$10,000.00	70%	\$21,000	160%	\$48,000	\$30,000	\$4,500	\$34,500
	SUBTOTAL	-		÷,		+= :,= = =			\$214,203	\$30,169	\$244,372
2.0	DEMOLITION, CLEARING AND GRUBBING										
2.1	Clearing & grubbing incl. clearing of existing creek, tree removal etc	573	sq. m	\$0.53	60%	\$182	180%	\$547	\$304	\$60	\$364
2.2	Demolish existing buildings	0	sq. m	\$62.10	70%	\$-	160%	\$-	\$-	\$-	\$-
2.3	Demolish roads/access paths/driveways within proposed footprint	80 86	sq. m	\$49.50 \$18.00	70%	\$2,772 \$1,238	160% 140%	\$6,336 \$2,166	\$3,960 \$1,548	\$594 \$154	\$4,554 \$1,702
2.4	Strip topsoil, stockpile, respread as per landscape plans (excludes any topsoil improvement works.)	00	cu. m		80%					\$15 4	
2.5	Dispose of excess/unsuitable topsoil (nominal 10% allowance)	9	tonne	\$54.18	80%	\$410	140%	\$717	\$513	\$50	\$563
2.6	Cartage	172	cu.m/	\$0.57	80%	\$78	140%	\$137	\$98	\$10	\$108
	SUBTOTAL		km						\$6,423	\$869	\$7,292
3.0	EARTHWORKS										
3.1	Cut to fill or disposal in all classes of material										
3.2	Basin Earthworks										
	Ob served E settlementes										
3.3 3.3.1	Channel Earthworks Channel NB33 Total cut to disposal - channel earthworks (assume all contaminated)	459	cu. m	\$8.05	6004	\$2,217	180%	\$6,651	\$3,695	\$739	\$4,434
3.3.1	Channel NB33 I otal cut to disposal - channel earthworks (assume all contaminated) Channel NB33 Total fill - channel earthworks (assume all fill from cut)	459	cu.m cu.m	\$8.05	60% 60%	\$2,217	180%	\$6,651 \$-	\$3,695 \$-	\$739 \$-	\$4,434
3.3.3	All channels: Rolling of exposed surface	5	sq. m	\$5.00	60%	\$15	180%	\$45	\$25	\$5	\$30
3.4	Disposal cost	-		12.00	0070	÷10		÷ io		<i>\$</i> 0	¢00
3.4.1	Cost of disposal of soil as "No Contamination" at an approved landfill within 10km	0	cu.m	\$80	80%	\$-	140%	\$-	\$-	\$-	\$-
3.4.2	Cost of disposal of soil as "Low Level Contamination" (i.e. General Solid Waste) at an	829	tonne	\$350	80%	\$232,232	140%	\$406,406	\$290,290	\$29,029	\$319,319
3.4.3	approved landfill within 10km Additional allowance for cartage of contaminated soil to Eastern Creek Landfill an additional	15080	cu.m /	\$0.57	80%	\$6,876	140%	\$12,034	\$8,596	\$859	\$9,455
5.4.5	10km (i.e. 20km one-way total distance)	13000	km	\$0.57	80%	<i>\$0,070</i>	14070	φ12,00 4	\$0,550	\$0 0 5	\$5,400
3.5	Pipe Excavation										
3.5.1	Total Cut from 12D model	295	cu. m	\$70.00	70%	\$14,455	160%	\$33,040	\$20,650	\$3,098	\$23,748
3.6	Trim, consolidation and final shaping of batters, basins, berms, channels, swales, wetland etc	459	sq. m	\$3.55	70%	\$1,141	160%	\$2,607	\$1,630	\$244	\$1,874
3.7	Installation and compaction of clay liner as specified										
3.8	Dewatering of onsite dams, including allowance for management of discharge water										
	SUBTOTAL								\$324,886	\$33,973	\$358,859
									+	\$00,010	\$555,555
4.0	STORMWATER DRAINAGE								,	400,010	\$000,005
4.1	Pipes/Culverts	180	lin m	\$1,000,00	70%	\$126.000	160%	\$288.000			
4.1 4.1.1	Pipes/Culverts 2x2400x600 mm RCBC	180	lin. m	\$1,000.00	70%	\$126,000	160%	\$288,000	\$180,000	\$27,000	\$207,000
4.1	Pipes/Culverts	180	lin. m	\$1,000.00	70%	\$126,000	160%	\$288,000			
4.1 4.1.1 4.2 4.2.1 4.3	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit	1		\$12,000.00		\$8,400	160%	\$19,200	\$180,000 \$12,000	\$27,000 \$1,800	\$207,000 \$13,800
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC								\$180,000	\$27,000	\$207,000
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit	1 27	no cu. m	\$12,000.00	70%	\$8,400 \$7,193	160% 140%	\$19,200 \$12,587	\$180,000 \$12,000 \$8,991	\$27,000 \$1,800 \$899	\$207,000 \$13,800 \$9,890
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.4.1	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall (s) and wingwall(s) to suit Base slab(s) to suit Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC	1	no	\$12,000.00	70%	\$8,400	160%	\$19,200	\$180,000 \$12,000	\$27,000 \$1,800	\$207,000 \$13,800
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.3.1 4.4 4.4.1 4.5	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Bases lab (s) to suit Bases lab (s) to suit Bases lab (s) to suit Bases lab (s) to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits	1 27 180	no cu. m cu. m	\$12,000.00 \$333.00 \$63.00	70% 80%	\$8,400 \$7,193 \$9,072	160% 140% 140%	\$19,200 \$12,587 \$15,876	\$180,000 \$12,000 \$8,991 \$11,340	\$27,000 \$1,800 \$899 \$1,134	\$207,000 \$13,800 \$9,890 \$12,474
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.4.1 4.5 4.5.1	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab (s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35)	1 27	no cu. m	\$12,000.00	70%	\$8,400 \$7,193	160% 140%	\$19,200 \$12,587	\$180,000 \$12,000 \$8,991	\$27,000 \$1,800 \$899	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.4.1 4.5 4.5.1 4.5.2	Pipes/Culverts 2x2400x600 mm RCBC Headwall(5) and wingwall(5) to suit Headwall to suit 2x2400x600 RCBC Baseslab to suit 2x2400x600 RCBC Baseslab to suit 2x2400x600 RCBC Bedding material to suit Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m)	1 27 180 2 8	no cu. m cu. m each each	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00	70% 80% 80% 70% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802	160% 140% 140% 160%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147	\$27,000 \$1,800 \$899 \$1,134 \$765 \$171	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.4.1 4.5 4.5.1 4.5.2 4.5.3	Pipes/Culverts 2x2400x600 mm RCBC 4keadvall(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Base slab(s) to suit Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit over	1 27 180 2	no cu. m cu. m each	\$12,000.00 \$333.00 \$63.00 \$2,550.00	70% 80% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570	160% 140% 140% 140%	\$19,200 \$12,587 \$15,876 \$8,160	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100	\$27,000 \$1,800 \$899 \$1,134 \$765	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.4.1 4.5 4.5.1 4.5.2 4.5.3 4.5.4	Pipes/Culverts 2x2400x600 mm RCBC Headwall(5) and wingwall(5) to suit Headwall to suit 2x2400x600 RCBC Bases lab(s) to suit Bases lab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit over Channels	1 27 180 2 8 2 2	no cu. m cu. m each each each	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00	70% 80% 80% 70% 70% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476	160% 140% 140% 160% 160% 160%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680	\$27,000 \$1,800 \$1,134 \$765 \$171 \$102	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.4.1 4.5 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5	Pipes/Culverts 2x2400x600 mm RCBC Headvall(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Base slab(s) to suit Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel	1 27 180 2 8 2 1,600	no cu. m cu. m each each each sq. m	\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00	70% 80% 80% 70% 70% 70% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640	160% 140% 140% 160% 160% 160%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200	\$27,000 \$1,800 \$1,134 \$1,134 \$765 \$1771 \$102 \$17,280	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480
$\begin{array}{c} 4.1 \\ 4.1.1 \\ 4.2 \\ 4.2.1 \\ 4.3 \\ 4.3.1 \\ 4.4 \\ 4.4.1 \\ 4.5 \\ 4.5.1 \\ 4.5.2 \\ 4.5.3 \\ 4.5.4 \\ 4.5.5 \\ 4.5.6 \end{array}$	Pipes/Culverts 2x2400x600 mm RCBC Headwall (s) and wingwall(s) to suit Headwall (s) and wingwall(s) to suit Base slab(s) to suit 2x2400x600 RCBC Bases lab(s) to suit Bases lab (s) to suit Bedding material to suit Bedding to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pits Performed concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²)	1 27 180 2 8 2 1,600 1,600	no cu. m cu. m each each each sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00	70% 80% 80% 70% 70% 70% 70% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476	160% 140% 140% 160% 160% 160%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680	\$27,000 \$1,800 \$1,134 \$765 \$171 \$102	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.4.1 4.5 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5	Pipes/Culverts 2x2400x600 mm RCBC Headwall (s) and wingwall(s) to suit Headwall (s) and wingwall(s) to suit Bases lab(s) to suit 2x2400x600 RCBC Bases lab(s) to suit Bedding material to suit Bedding to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pitagetin increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit coptin increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel rea)	1 27 180 2 8 2 1,600 1,600 1,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,000 \$8,750	\$27,000 \$1,800 \$899 \$1,134 \$765 \$171 \$102 \$17,280 \$1,400 \$1,313	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$132,480 \$15,400 \$10,063
$\begin{array}{c} 4.1 \\ 4.1.1 \\ 4.2 \\ 4.2.1 \\ 4.3 \\ 4.3.1 \\ 4.4 \\ 4.4.1 \\ 4.5 \\ 4.5.1 \\ 4.5.2 \\ 4.5.3 \\ 4.5.4 \\ 4.5.5 \\ 4.5.6 \end{array}$	Pipes/Culverts 2x2400x600 mm RCBC Headwall(5) and wingwall(5) to suit Headwall(5) and wingwall(5) to suit Bases lab(s) to suit Bases lab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit over Channels Recklined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel area)	1 27 180 2 8 2 1,600 1,600	no cu. m cu. m each each each sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75	70% 80% 80% 70% 70% 70% 70% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200	160% 140% 140% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,000	\$27,000 \$1,800 \$899 \$1,134 \$765 \$171 \$102 \$17,280 \$1,400	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400
$\begin{array}{c} 4.1 \\ 4.1.1 \\ 4.2 \\ 4.2.1 \\ 4.3.1 \\ 4.4 \\ 4.4.1 \\ 4.5 \\ 4.5.1 \\ 4.5.2 \\ 4.5.3 \\ 4.5.4 \\ 4.5.5 \\ 4.5.6 \\ 4.5.6 \\ 4.5.7 \\ \end{array}$	Pipes/Culverts 2x2400x600 mm RCBC Headwall (s) and wingwall(s) to suit Headwall (s) and wingwall(s) to suit Bases lab(s) to suit 2x2400x600 RCBC Bases lab(s) to suit Bedding material to suit Bedding to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pitagetin increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit coptin increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel rea)	1 27 180 2 8 2 1,600 1,600 1,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,000 \$8,750 \$108,000	\$27,000 \$1,800 \$899 \$1,134 \$765 \$171 \$102 \$17,280 \$1,400 \$1,313 \$10,800	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$10,063 \$118,800
$\begin{array}{c} 4.1 \\ 4.1.1 \\ 4.2 \\ 4.2.1 \\ 4.3.1 \\ 4.4 \\ 4.4.1 \\ 4.5 \\ 4.5.1 \\ 4.5.2 \\ 4.5.3 \\ 4.5.4 \\ 4.5.5 \\ 4.5.6 \\ 4.5.6 \\ 4.5.7 \\ \end{array}$	Pipes/Culverts 2x2400x600 mm RCBC Headwall (s) and wingwall(s) to suit Headwall (s) and wingwall(s) to suit Base slab (s) to suit Base slab (s) to suit Bases slab (s) to suit Badding material to suit Bedding to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel tatters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants)	1 27 180 2 8 2 1,600 1,600 1,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,000 \$8,750	\$27,000 \$1,800 \$899 \$1,134 \$765 \$171 \$102 \$17,280 \$1,400 \$1,313	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$132,480 \$15,400 \$10,063
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.5.1 4.5.2 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Baseslab(s) to suit 2x2400x600 RCBC Baseslab to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pitd cybit increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel tarea) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL MINOR LANDSCAPING	1 27 180 2 8 2 1,600 1,600 1,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,000 \$8,750 \$108,000 \$465,208	\$27,000 \$1,800 \$899 \$1,134 \$765 \$171 \$102 \$1,7280 \$1,400 \$1,313 \$10,800 \$62,664	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$132,480 \$15,400 \$10,063 \$118,800 \$527,872
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.5.1 4.5.2 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8	Pipes/Culverts 2x2400x600 mm RCBC Headwall(5) and wingwall(5) to suit Headwall(5) and wingwall(5) to suit Base slab(s) to suit 2x2400x600 RCBC Base slab(s) to suit Badding material to suit Bedding naterial to suit Bedding not event Bedding not event Bedding not event Bedding not event Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel Batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL	1 27 180 2 8 2 1,600 1,600 1,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,000 \$8,750 \$108,000	\$27,000 \$1,800 \$899 \$1,134 \$765 \$171 \$102 \$17,280 \$1,400 \$1,313 \$10,800	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$10,063 \$118,800
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.5.1 4.5.2 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab (s) to suit Baseslab to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pitd gmaterial to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel tots vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL MINOR LANDSCAPING SUBTOTAL	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$11,147 \$680 \$115,200 \$14,000 \$115,200 \$1465,208 \$-	\$27,000 \$1,800 \$1,300 \$1,134 \$1,134 \$102 \$17,1280 \$1,400 \$1,313 \$10,800 \$62,664 \$-	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$10,063 \$118,800 \$527,872 \$-
4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4 4.5.1 4.5.2 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Baseslab(s) to suit 2x2400x600 RCBC Baseslab to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pitd cybit increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel tarea) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL MINOR LANDSCAPING	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,000 \$8,750 \$108,000 \$465,208	\$27,000 \$1,800 \$899 \$1,134 \$765 \$171 \$102 \$1,7280 \$1,400 \$1,313 \$10,800 \$62,664	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$132,480 \$15,400 \$10,063 \$118,800 \$527,872
4.1 4.2 4.2.1 4.3 4.4 4.4 4.4.1 4.5 4.5.1 4.5.2 4.5.3 4.5.4 4.5.6 4.5.7 4.5.8 5.0	Pipes/Culverts 2x2400x600 mm RCBC 2x2400x600 mm RCBC Headvail(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Base slab(s) to suit Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11.549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel earea) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL MINOR LANDSCAPING SUBTOTAL CONSTRUCTION 1	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$11,147 \$680 \$115,200 \$14,000 \$115,200 \$1465,208 \$-	\$27,000 \$1,800 \$1,300 \$1,134 \$1,134 \$102 \$17,1280 \$1,400 \$1,313 \$10,800 \$62,664 \$-	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$10,063 \$118,800 \$527,872 \$-
4.1 4.2 4.2 4.2.1 4.3 4.3 4.3 4.3 4.5 4.5.1 4.5.2 4.5.5 4.5.6 4.5.7 4.5.8 5.0 6.0	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab (s) to suit Baseslab to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pitd gmaterial to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel tots vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL MINOR LANDSCAPING SUBTOTAL	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$11,147 \$680 \$115,200 \$14,000 \$115,200 \$1465,208 \$-	\$27,000 \$1,800 \$1,300 \$1,134 \$1,134 \$102 \$17,1280 \$1,400 \$1,313 \$10,800 \$62,664 \$-	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$10,063 \$118,800 \$527,872 \$-
4.1 4.2 4.2 4.2.1 4.3 4.3 4.3 4.3 4.5 4.5.1 4.5.2 4.5.5 4.5.6 4.5.7 4.5.8 5.0 6.0	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab (s) to suit Baseslab to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pitd gmaterial to suit Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel tots vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	cu. m cu. m cu. m each each each sq. m sq. m	\$12,000.00 \$333.00 \$63.00 \$2,550.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75	70% 80% 80% 70% 70% 70% 80% 70%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125	160% 140% 140% 160% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$1,088 \$184,320 \$19,600 \$14,000	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,000 \$1,15,200 \$108,000 \$465,208 \$- \$1,010,720	\$27,000 \$1,800 \$1,300 \$1,134 \$765 \$171 \$102 \$1,400 \$1,313 \$10,800 \$62,664 \$- \$127,675	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$10,063 \$118,800 \$527,872 \$-
4.1 4.2 4.2 4.2.1 4.3 4.3 4.3 4.4 4.4 4.5 5.5 5.0 6.0 6.1 7.1	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Base slab(s) to suit 2x2400x600 RCBC Base slab(s) to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pitdig material to suit Pitdig material to suit Pitdig material to suit Pitdig material to suit Pedding material to suit Pedding material to suit Pitdig material Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pitd cover Channels Rock lined low flow channel Geotextile under rock (11,549 m²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL MINOR LANDSCAPING SUBTOTAL CONSTRUCTION 1 </td <td>1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000</td> <td>no cu.m each each sq.m sq.m sq.m</td> <td>\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75 \$18.00</td> <td>70% 80% 70% 70% 70% 70% 80% 80%</td> <td>\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125 \$86,400</td> <td>160% 140% 140% 160% 160% 160% 160% 140%</td> <td>\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$10,88 \$184,320 \$19,600 \$14,000 \$151,200</td> <td>\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$1,147 \$1,010,000 \$8,750 \$1,010,720 \$1,010,720 \$1,010,720 \$1,010,720 \$1,010,000 \$1,000\$1,000 \$1,000\$1,0</td> <td>\$27,000 \$1,800 \$1,809 \$1,134 \$765 \$171 \$102 \$17,280 \$17,280 \$11,400 \$1,313 \$10,800 \$62,664 \$- \$127,675</td> <td>\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$15,400 \$10,063 \$10,063 \$1118,800 \$527,872 \$- \$- \$1,138,395</td>	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	no cu.m each each sq.m sq.m sq.m	\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75 \$18.00	70% 80% 70% 70% 70% 70% 80% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125 \$86,400	160% 140% 140% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$10,88 \$184,320 \$19,600 \$14,000 \$151,200	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$1,147 \$1,010,000 \$8,750 \$1,010,720 \$1,010,720 \$1,010,720 \$1,010,720 \$1,010,000 \$1,000\$1,000 \$1,000\$1,0	\$27,000 \$1,800 \$1,809 \$1,134 \$765 \$171 \$102 \$17,280 \$17,280 \$11,400 \$1,313 \$10,800 \$62,664 \$- \$127,675	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$15,400 \$10,063 \$10,063 \$1118,800 \$527,872 \$- \$- \$1,138,395
4.1 4.2 4.2 4.2 4.2 4.3 1 4.3 4 4.3 1 4.5 4.5 4.5 4.5 4.5 5.0 6.0 6.1 7.0 7.1 7.2	Pipes/Culverts 2x2400x600 mm RCBC 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall(s) to suit Bases sale(s) to suit Bases sale(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pit Bedding to suit 2x2400x600 RCBC Pit Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit over Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL NINOR LANDSCAPING NINOR LANDSCAPING SUBTOTAL CONSTRUCTION 1 DROconstruction cost CONTINGENCIES	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	no cu.m each each each sq.m sq.m no	\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00 \$87.75 \$8.75 \$8.75 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$15.	70% 80% 70% 70% 70% 70% 80% 80% 80% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125 \$86,400	160% 140% 140% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$10,888 \$184,320 \$19,600 \$14,000 \$14,000 \$151,200 \$151,200 \$5-	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,500 \$14,500 \$14,500 \$108,000 \$465,208 \$- \$1,010,720 \$170,759 \$-	\$27,000 \$1,800 \$899 \$1,134 \$1,134 \$10,800 \$1,280 \$17,280 \$17,280 \$14,200 \$1,313 \$10,800 \$62,664 \$- \$127,675 \$127,675 \$127,675 \$127,675 \$127,675	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$115,400 \$10,063 \$118,800 \$10,063 \$118,800 \$118,800 \$527,872 \$- \$- \$1,138,395
4.1 4.1 4.2 4.2 4.2 4.3 4.3 4.3 4.3 4.3 4.5 4.5 4.5 4.5 5.0 5.0 6.1 7.0	Pipes/Culverts 2x2400x600 mm RCBC 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall(s) to suit Bases sale(s) to suit Bases sale(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pit Bedding to suit 2x2400x600 RCBC Pit Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit over Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL NINOR LANDSCAPING NINOR LANDSCAPING SUBTOTAL CONSTRUCTION 1 DROconstruction cost CONTINGENCIES	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	no cu. m cu. m each each sq. m sq. m sq. m no	\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00 \$8.75 \$8.75 \$18.00	70% 80% 70% 70% 70% 70% 80% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125 \$86,400	160% 140% 140% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$10,88 \$184,320 \$19,600 \$14,000 \$151,200	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$115,200 \$110,000 \$8,750 \$10,000 \$465,208 \$- \$1,000,720 \$170,759	\$27,000 \$1,800 \$1,809 \$1,134 \$765 \$171 \$102 \$17,280 \$17,280 \$11,400 \$1,313 \$10,800 \$62,664 \$- \$127,675	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$15,400 \$10,063 \$10,063 \$118,800 \$527,872 \$- \$- \$- \$- \$- \$- \$- \$-
4.1.1 4.2.1 4.2 4.2.1 4.3.1 4.3.1 4.4 4.3.1 4.5 4.5.1 4.5.2 4.5.3 4.5.4 4.5.8 5.0 6.0 6.1 7.0 7.1 7.2	Pipes/Culverts 2x2400x600 mm RCBC 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall(s) to suit Bases sale(s) to suit Bases sale(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pit Bedding to suit 2x2400x600 RCBC Pit Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit over Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL NINOR LANDSCAPING NINOR LANDSCAPING SUBTOTAL CONSTRUCTION 1 DROconstruction cost CONTINGENCIES	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	no cu.m each each each sq.m sq.m no	\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00 \$87.75 \$8.75 \$8.75 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$15.	70% 80% 70% 70% 70% 70% 80% 80% 80% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125 \$86,400	160% 140% 140% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$10,888 \$184,320 \$19,600 \$14,000 \$14,000 \$151,200 \$151,200 \$5-	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,500 \$14,500 \$14,500 \$108,000 \$465,208 \$- \$1,010,720 \$170,759 \$-	\$27,000 \$1,800 \$899 \$1,134 \$1,134 \$10,800 \$1,280 \$17,280 \$17,280 \$14,200 \$1,313 \$10,800 \$62,664 \$- \$127,675 \$127,675 \$127,675 \$127,675 \$127,675	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$115,400 \$10,063 \$118,800 \$10,063 \$118,800 \$118,800 \$527,872 \$- \$- \$1,138,395
4.1.1 4.2.1 4.2 4.2.1 4.3.1 4.3.1 4.4 4.3.1 4.5 4.5.1 4.5.2 4.5.3 4.5.4 4.5.8 5.0 6.0 6.1 7.0 7.1 7.2	Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Baseslab(s) to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pitigent increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel low-flow) assume grassed (half of vegetated channel low-flow) assume grassed (half of vegetated channel low-flow) assume grassed (mix tube stock - 200 mm potted plants) SUBTOTAL CONSTRUCTION TOTAL, excluding GST CONSTRUCTION TOTAL, excluding GST	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	no cu. m cu. m each each sq. m sq. m sq. m no	\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00 \$87.75 \$8.75 \$8.75 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$15.	70% 80% 70% 70% 70% 70% 80% 80% 80% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125 \$86,400	160% 140% 140% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$10,888 \$184,320 \$19,600 \$14,000 \$14,000 \$151,200 \$151,200 \$5-	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,500 \$14,500 \$14,500 \$108,000 \$465,208 \$- \$1,010,720 \$170,759 \$-	\$27,000 \$1,800 \$899 \$1,134 \$1,134 \$10,800 \$1,280 \$17,280 \$17,280 \$14,200 \$1,313 \$10,800 \$62,664 \$- \$127,675 \$127,675 \$127,675 \$127,675 \$127,675	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$10,063 \$118,800 \$527,872 \$- \$1,138,395 \$- \$1,138,395 \$- \$- \$- \$- \$- \$- \$- \$- \$- \$- \$- \$- \$-
4.1 4.2 4.2 4.2 4.2 4.3 1 4.3 4 4.3 1 4.5 4.5 4.5 4.5 4.5 5.0 6.0 6.1 7.0 7.1 7.2	Pipes/Culverts 2x2400x600 mm RCBC Headvail(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Headvall(s) to suit Bases lab(s) to suit Bases lab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geolextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL NINOR LANDSCAPING NINOR LANDSCAPING Ib% construction cost CONSTRUCTION TOTAL, excluding GST CONSTRUCTION TOTAL, excluding GST	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	no cu. m cu. m each each sq. m sq. m sq. m no	\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00 \$87.75 \$8.75 \$8.75 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$15.	70% 80% 70% 70% 70% 70% 80% 80% 80% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125 \$86,400	160% 140% 140% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$10,888 \$184,320 \$19,600 \$14,000 \$14,000 \$151,200 \$151,200 \$5-	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,500 \$14,500 \$14,500 \$108,000 \$465,208 \$- \$1,010,720 \$170,759 \$-	\$27,000 \$1,800 \$899 \$1,134 \$1,134 \$10,800 \$1,280 \$17,280 \$17,280 \$14,200 \$1,313 \$10,800 \$62,664 \$- \$127,675 \$127,675 \$127,675 \$127,675 \$127,675	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$115,400 \$10,063 \$118,800 \$10,063 \$118,800 \$118,800 \$527,872 \$ \$ \$ \$1,138,395 \$ \$ \$,1,138,395 \$ \$ \$,1,309,154 \$130,915
4.1 4.2 4.2 4.2 4.2 4.3 1 4.3 4 4.3 1 4.5 4.5 4.5 4.5 4.5 5.0 6.0 6.1 7.0 7.1 7.2	Pipes/Culverts 2x2400x600 mm RCBC Headvall(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Baseslab(s) to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit over Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL NINOR LANDSCAPING SUBTOTAL CONSTRUCTION TOTAL, excluding GST CONSTRUCTION TOTAL, including GST	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	no cu. m cu. m each each sq. m sq. m sq. m no	\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00 \$87.75 \$8.75 \$8.75 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$15.	70% 80% 70% 70% 70% 70% 80% 80% 80% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125 \$86,400	160% 140% 140% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$10,888 \$184,320 \$19,600 \$14,000 \$14,000 \$151,200 \$151,200 \$5-	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,500 \$14,500 \$14,500 \$108,000 \$465,208 \$- \$1,010,720 \$170,759 \$-	\$27,000 \$1,800 \$899 \$1,134 \$1,134 \$10,800 \$1,280 \$17,280 \$17,280 \$14,200 \$1,313 \$10,800 \$62,664 \$- \$127,675 \$127,675 \$127,675 \$127,675 \$127,675	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$15,400 \$10,063 \$118,800 \$527,872 \$- \$- \$- \$- \$- \$- \$- \$- \$- \$- \$- \$- \$-
4.1 4.2 4.2 4.2 4.2 4.2 4.2 4.3.1 4.3 4.3 4.3.1 4.3 4.3.1 4.4 4.5 4.5.7 4.5.8 5.0 6.0 6.1 7.0 7.2	Pipes/Culverts 2x2400x600 mm RCBC Headvail(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Headvall(s) and wingwall(s) to suit Headvall(s) to suit Bases lab(s) to suit Bases lab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m; 2.14 m; 2.60 m; 1.78 m; 1.84 m) Pit cover Channels Rock lined low flow channel Geolextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL NINOR LANDSCAPING NINOR LANDSCAPING Ib% construction cost CONSTRUCTION TOTAL, excluding GST CONSTRUCTION TOTAL, excluding GST	1 27 180 2 8 2 1.600 1.600 1.600 1.600 6,000	no cu. m cu. m each each sq. m sq. m sq. m no	\$12,000.00 \$333.00 \$63.00 \$152.00 \$340.00 \$72.00 \$87.75 \$8.75 \$8.75 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$18.00 \$15.	70% 80% 70% 70% 70% 70% 80% 80% 80% 80%	\$8,400 \$7,193 \$9,072 \$3,570 \$802 \$476 \$80,640 \$11,200 \$6,125 \$86,400	160% 140% 140% 160% 160% 160% 160% 140%	\$19,200 \$12,587 \$15,876 \$8,160 \$1,834 \$10,888 \$184,320 \$19,600 \$14,000 \$14,000 \$151,200 \$151,200 \$5-	\$180,000 \$12,000 \$8,991 \$11,340 \$5,100 \$1,147 \$680 \$115,200 \$14,500 \$14,500 \$14,500 \$108,000 \$465,208 \$- \$1,010,720 \$170,759 \$-	\$27,000 \$1,800 \$899 \$1,134 \$1,134 \$10,800 \$1,280 \$17,280 \$17,280 \$14,200 \$1,313 \$10,800 \$62,664 \$- \$127,675 \$127,675 \$127,675 \$127,675 \$127,675	\$207,000 \$13,800 \$9,890 \$12,474 \$5,865 \$1,318 \$782 \$132,480 \$115,400 \$10,063 \$118,800 \$527,872 \$ \$118,8395 \$1,138,395 \$ \$ \$,1,138,395 \$ \$ \$,1,309,154 \$130,915

B_Fourth	Draft Detailed concept design culverts Drawing sets:			Thursday, 29 N	November 20)18					
	Drawing sets.	QUANTITY	UNIT	BASE RATE		CONTI	GENCY		COST		COST +
	ITEM NO. DESCRIPTION OF WORK				LOWEST (%)	LOWEST COST	HIGHEST (%)	HIGHEST COST		CONTINGENCY	CONTINGENCY
1.0	GENERAL AND PRELIMINARIES Site establishment, facilities & de-establishment	0	item	\$100,000.00	70%	¢	460%	¢	¢	¢	¢
1.1 1.2	Traffic management	0	item item	\$100,000.00	70% 70%	\$- \$-	160% 160%	\$- \$-	\$- \$-	\$- \$-	\$- \$-
1.3	Temporary site fencing incl gates, supports etc	0	lin. m	\$16.25	80%	\$-	140%	\$-	\$-	\$-	\$-
1.4	Provision and maintenance of sediment & erosion control	0	item	\$40,000.00	70%	\$-	160%	\$	\$-	\$-	\$-
1.5	Clean water diversions, per month	0	months	\$10,000.00	70%	\$-	160%	\$-	\$-	\$-	\$-
	SUBTOTAL								\$-	\$-	\$-
2.0 2.1	DEMOLITION, CLEARING AND GRUBBING Clearing & grubbing incl. clearing of existing creek, tree removal	0	sq. m	\$0.53	60%	\$-	180%	\$-	\$-	\$-	\$-
	etc	-			00,0	Ţ		Ť	Ť		
2.2	Demolish existing buildings	0	sq. m	\$62.10	70%	\$-	160%	\$-	\$-	\$-	\$- ¢
2.3	Demolish roads/access paths/driveways within proposed footprint	U	sq. m	\$49.50	70%	\$-	160%	\$-	\$-	\$-	\$-
2.4	Strip topsoil, stockpile, respread as per landscape plans (excludes any topsoil improvement works.)	0	cu. m	\$18.00	80%	\$-	140%	\$-	\$-	\$-	\$-
2.5	Dispose of excess/unsuitable topsoil (nominal 10% allowance)	0	tonne	\$54.18	80%	\$-	140%	\$-	\$-	\$-	\$-
2.5	Cartage SUBTOTAL	0	cu.m / km	\$0.57	80%	\$-	140%	\$-	\$- \$-	\$- \$-	\$- \$-
3.0	EARTHWORKS								Ţ,	Ť	· · ·
3.1	Cut to fill or disposal in all classes of material Basin Earthworks										
3.2											
3.3	Channel Earthworks										
<u> </u>	Dine Execution										
3.4 3.4.1	Pipe Excavation Total Cut (estimate)	1,374	cu. m	\$5.00	70%	\$4,809	160%	\$10,991	\$6,870	\$1,030	\$7,900
	Trim, consolidation and final shaping of batters, basins,				70%	\$-	160%	\$-	\$-	\$-	\$-
3.5	berms, channels, swales, wetland etc									!	
3.6	Installation and compaction of clay liner as specified										
	Dewatering of onsite dams, including allowance for	0		\$66.50		\$-	180%	\$-	\$-	\$-	\$-
3.7	management of discharge water	0	sq. m	\$00.50	60%	φ-	100 %	φ-	φ-	φ-	3-
	SUBTOTAL								\$6,870	\$1,030	\$7,900
	SUBTOTAL								\$6,670	\$1,030	\$7,900
4.0	STORMWATER DRAINAGE										
4.1	Pipes/Culverts				i I						
4.1.1	3 x 3300 x 2400 mm RCBC	81	lin. m	\$7,170.00	70%	\$404,431	160%	\$924,414	\$577,759	\$86,663	\$664,422
4.1.2		54	lin. m	\$3,000.00	70%	\$-	160% 160%	\$-	\$-	\$-	\$-
4.1.3 4.1.4	2 x 3300 mm link slab	54	lin. m cu.m.	\$985.00 \$456.00	70% 60%	\$37,040 \$-	180%	\$84,663 \$-	\$52,915 \$-	\$7,936 \$-	\$60,851 \$-
4.2	Headwall(s) and wingwalls to suit										
4.2	2 headwalls with wingwalls to suit	2	no	\$25,000.00	60%	\$30,000	180%	\$90,000	\$50,000	\$10,000	\$60,000
4.3	Wingwall(s) to suit										
4.4	Base slab(s) to suit										
4.4.1 4.4.2	2 x base slab to support 1x3300x2400 1 x base slab to support 1 x 3300 x 2700 mm RCBC and 2 x	27 40	cu. m	\$333.00 \$333.00	70%	\$6,198 \$9,298	160% 160%	\$14,168 \$21,252	\$8,855 \$13,283	\$1,328 \$1,992	\$10,183 \$15,275
4.4.2	3300 link slab	40	cu. m	φ333.00	70%	ψ3,230	100 %	ψ21,202	ψ13,203	ψ1,352	\$13,273
4.5	Pits									ļ	
4.6 4.6.1	Channels Scour protection - rock mattress 230 mm thickness at 16.5 m	1,634	sq.m	\$144.00	70%	\$164,657	160%	\$376,358	\$235,224	\$35,284	\$270,508
	length and 50 m	1,001	oq	¢111.00	7078	\$101,001	100 /0	¢070,000	\$200,22 T	\$00,201	\$270,000
	SUBTOTAL								\$938,036	\$143,203	\$1,081,239
5.0	DISPOSAL COSTS										
5.1	Cost of disposal of soil as "No Contamination" at an approved landfill within 10km	811	cu.m	\$80	80%	\$51,897	140%	\$90,820	\$64,872	\$6,486	\$71,358
	Cost of disposal of soil as "Low Level Contamination" (i.e.	619	tonne	\$350	80%	\$173,404	140%	\$303,457	\$216,755	\$21,676	\$238,431
5.2 5.3	General Solid Waste) at an approved landfill within 10km Additional allowance for cartage of contaminated soil to	11260	cu.m / km	\$0.57	80%	\$5,135	140%	\$8,985	\$6,419	\$641	\$7,060
0.0	Eastern Creek Landfill an additional 10km (i.e. 20km one-way total distance)	11200	SG.(II / NII	φ0.07	60%	φ3,133	140 %	40,900	ψ0,419	φ04 I	φ <i>ι</i> ,000
	SUBTOTAL		I						\$288,046.00	\$28,802.75	\$316,848.75
6.0	MINOR LANDSCAPING										
	SUBTOTAL								\$-	\$-	\$-
	CO	NSTRUCTION	TOTAL						\$1,232,952	\$173,036	\$1,405,988
	PROJECT MANAGEMENT AND SUPERVISION								A		
7.1 8.0	15% construction cost CONTINGENCIES								\$210,898		
	Inherent contingency			44777						\$173,036	
8.1		1	tonne	\$350.00	80%	\$-	140%	\$-	\$-	\$-	\$- \$-
8.1 8.2 8.3			cu.m / km	\$0.57	80%	\$-	140%	\$-	\$-	\$-	
8.2		T		\$0.57	80%	\$-	140%	\$-	\$-	\$-	
8.2	CONSTRUCTION TOTAL, excluding GS	Г		\$0.57	80%	\$-	140%	\$-	\$- 	\$- 	\$1,616,886 \$161,689
8.2		Г		\$0.57	80%	\$-	140%	\$-	δ- -	\$- 	\$1,616,886 \$161,689 \$161,689 \$1,778,575 \$1,779,000

APPENDIX B JWP MODIFIED COSTS OF REPRESENTATIVE BASINS (B22, B08, Drainage System Without Basins Nb33 And Culvert B_Fourth).

	B22 Drainage System - Preliminary Construction Cost			Thursday, 24 Ja	nuary 2019]	
	Drawing set: 30011388-DDR-1012 to 30011388-DDR					CONTIG	ENCY				INHERENT	COST +
	ITEM NO. DESCRIPTION OF WORK	QUANTITY	UNIT	BASE RATE	LOWEST (%)	LOWEST COST	HIGHEST (%)		IGHEST COST	COST	CONTINGENCY	CONTINGENCY
1.0 1.1	GENERAL AND PRELIMINARIES Site establishment, facilities & de-establishment	1	item	\$ 100,000.00	70%	\$ 70,000	160%	\$	160,000	\$ 100,000	\$ 15,000	\$ 115,000
1.2	Traffic management	1	item	\$ 10,000.00	70%	\$ 7,000	160%	\$	16,000	\$ 10,000	\$ 1,500	\$ 11,500
1.3 1.4	Temporary site fencing incl gates, supports etc Provision and maintenance of sediment & erosion control	1,500 1	lin. m item	\$ 20.00 \$ 50.000.00	80%	\$ 24,000 \$ 35,000	140% 160%	\$ \$	42,000 80,000		\$ 3,000 \$ 7,500	
1.5	Clean water diversions, per month	6	months	\$ 15,000.00	70%	\$ 63,000	160%	\$	144,000	\$ 90,000	\$ 13,500	\$ 103,500
2.0	SUBTOTAL DEMOLITION, CLEARING AND GRUBBING									\$ 280,000	\$ 40,500	\$ 320,500
2.1	Clearing & grubbing incl. clearing of existing creek, tree removal etc	25,458	sq. m	\$ 2.50	60%	\$ 38,186	180%	\$	114,559	\$ 63,644	\$ 12,729	
2.2 2.3	Demolish existing buildings Demolish roads/access paths/driveways within proposed footprint	2,385 850	sq.m sq.m	\$ 62.10 \$ 49.50	70%	\$ 103,676 \$ 29,453	160% 160%	\$ \$	236,974 67,320	\$ 148,109 \$ 42,075	\$ 22,216 \$ 6,311	\$ 170,325 \$ 48,386
2.4	Strip topsoil, stockpile, respread as per landscape plans (excludes any topsoil improvement works.)	3,819	cu. m	\$ 18.00	80%	\$ 54,988	140%	\$	96,230	\$ 68,736	\$ 6,873	\$ 75,609
2.5	Dispose of excess/unsuitable topsoil (nominal 10% allowance)	420	tonne	\$ 54.18	80%	\$ 18,207	140%	\$	31,863	\$ 22,760	\$ 2,275	\$ 25,035
2.5	Cartage SUBTOTAL	7,637	cu. m	\$ 0.80	80%	\$ 4,888	140%	\$	8,554	\$ 6,110 \$ 351,434	\$ 611 \$ 51,015	
3.0	EARTHWORKS									÷ 001,404	• 01,010	• +02,+13
3.1 3.2	Cut to fill or disposal in all classes of material Basin Earthworks											
3.2.1	Basin 22: Total cut to disposal (assume no contaminated)	23,654	cu. m	\$ 8.05	60%	\$ 114,249	180%	\$	342,746		\$ 38,083	
3.2.2 3.2.3	Basin 22: Total fill (assume all fill from cut) Basin areas with no structures above (biofilter area excluded): Rolling	823	cu.m sq.m	\$ 13.55 \$ 5.00	60% 60%	\$ 6,691 \$ 26,125	180% 180%	\$ \$	20,073 78,374	\$ 11,152 \$ 43,541	\$ 2,230 \$ 8,708	
3.2.4	of exposed surface (vibrating smooth drum 10 t+, 8 passes minimum). Basin areas with structures above: Rolling of exposed surface	8,708 3,163		\$ 27.00		\$ 51,237	180%	\$	153,712	\$ 85,396		
	(vibrating smooth drum 10 t+, 8 passes minimum). Place granular fill (DGB20 or similar) in layers <200 mm and compact with roller above). Place/compact clean fill in layers. Compact upper 500 mm of subgrade to min. DDR of 100%. Level 1 Earthworks Control used in fill placement	3, 103	sq. m	\$ 27.00	60%	\$ 51,237	180%	ð	153,712	\$ 60,396	\$ 17,079	\$ 102,475
3.3 3.3.1	Channel Earthworks Total cut to disposal - channel earthworks (assume no contaminated)	6,660	cu. m	\$ 8.05	60%	\$ 32,168	180%	\$	96,503	\$ 53,613	\$ 10,723	\$ 64,336
3.3.2	Total fill - channel earthworks (assume all fill from cut)	386	cu. m	\$ 13.55	60%	\$ 3,138	180%	\$	9,415	\$ 5,231	\$ 1,045	\$ 6,276
3.3.3	Rolling of exposed surface (vibrating smooth drum 10 t+, 8 passes minimum).	9,348	sq. m	\$ 5.00	60%	\$ 28,044	180%	\$	84,132	\$ 46,740	\$ 9,348	\$ 56,088
3.4 3.4.1	Pipe Excavation Total Cut	0	cu. m	\$ 70.00	70%	\$-	160%	\$	_	\$ -	s -	s -
3.5	Disposal cost											•
3.5.1	Cost of disposal of soil as "No Contamination" at an approved landfill within 10km	18528	cu.m	\$ 80.00	60%	\$ 889,344	180%	\$	2,668,032	\$ 1,482,240	\$ 296,448	\$ 1,778,688
3.5.2	Cost of disposal of soil as "Low Level Contamination" (i.e. General Solid Waste) at an approved landfill within 10km	12965	tonne	\$ 370.00	60%	\$ 2,878,141	180%	\$	8,634,424	\$ 4,796,902	\$ 959,380	\$ 5,756,282
3.5.3	Additional allowance for cartage of contaminated soil to Eastern Creek Landfill an additional 10km (i.e. 20km one-way total distance)	235720	cu.m / km	\$ 0.80	70%	\$ 132,003	160%	\$	301,722	\$ 188,576	\$ 28,286	\$ 216,862
3.6 3,7	Trim, consolidation and final shaping of batters, basins, berms, Installation and compaction of clay liner as specified	21,219	sq. m	\$ 2.95	70%	\$ 43,817	160%	\$	100,154	\$ 62,597	\$ 9,388	\$ 71,985
3.7.1	Clay liner provided to base and to top of batters of basin, compacted to	9,491	sq. m	\$ 21.67	70%	\$ 143,987	160%	\$	329,112	\$ 205,696	\$ 30,853	\$ 236,549
3.8	specified density, thickness and permeability Dewatering of existing onsite dams, including allowance for	620	sq. m	\$ 66.50	70%	\$ 28,861	160%	\$	65,968	\$ 41,230	\$ 6,185	\$ 47,415
4.0	SUBTOTAL BASIN INLET, OUTLET AND BIOFILTER DRAINAGE									\$ 7,213,329	\$ 1,417,757	\$ 8,631,086
4.1	Pipes/Culverts					_				-		
4.1.1 4.1.2	2 x 1200 x 600 RCBC (GPT Outlet) 2 x 1200 x 900 RCBC (Basin outlet pipes)	11 160	lin. m lin. m	\$ 2,000.00 \$ 2,500.00	70%	\$ 15,120 \$ 280,000	160% 160%	\$ \$	34,560 640.000		\$ 3,240 \$ 60,000	
4.1.3	2 x 1200 x 300 RCBC (From CHN B22 to Junction Pit)	8	lin. m	\$ 1,000.00	70%	\$ 5,600	160%	\$	12,800	\$ 8,000	\$ 1,200	\$ 9,200
4.1.4	2 x 1200 x 300 RCBC (From Junction Pit to GPT) Headwall(s) with wingwalls to suit	45	lin. m	\$ 1,000.00	70%	\$ 31,640	160%	\$	72,320	\$ 45,200	\$ 6,780	\$ 51,980
4.2.1	2 x 1200 x 900 RCBC (Basin outlet pipes)	1	each	\$ 18,000.00	70%	\$ 12,600	160%	\$	28,800	\$ 18,000	\$ 2,700	\$ 20,700
4.4	Base slab(s) to suit	-										
4.4.1 4.4.2	2 x 1200 x 600 RCBC (GPT Outlet) 2 x 1200 x 900 RCBC (Basin outlet pipes)	2 36	cu. m cu. m	\$ 750.00 \$ 750.00	80% 80%	\$ 1,458 \$ 21,600	140% 140%	\$ \$	2,552 37,800	\$ 1,823 \$ 27,000	\$ 182 \$ 2,700	
4.4.3	2 x 1200 x 300 RCBC (From CHN B22 to Junction Pit)	2	cu. m	\$ 750.00	80%	\$ 1,080	140%	\$	1,890		\$ 135	
4.4.4 4.5	2 x 1200 x 300 RCBC (From Junction Pit to GPT) Bedding material to suit	10	cu. m	\$ 750.00	80%	\$ 6,102	140%	\$	10,679	\$ 7,628	\$ 762	\$ 8,390
4.5.1 4.5.2	2 x 1200 x 600 RCBC (GPT Outlet) 2 x 1200 x 900 RCBC (Basin outlet pipes)	4 60	cu. m cu. m	\$ 63.00 \$ 63.00	80% 80%	\$ 204 \$ 3,024	140% 140%	\$ \$	357 5,292	\$ 256 \$ 3,780	\$ 25 \$ 378	
4.5.3	2 x 1200 x 300 RCBC (From CHN B22 to Junction Pit)	3	cu. m	\$ 63.00	80%	\$ 151	140%	\$	265	\$ 189	\$ 19	\$ 208
4.5.4 4.6	2 x 1200 x 300 RCBC (From Junction Pit to GPT) Pits	17	cu. m	\$ 63.00	80%	\$ 854	140%	\$	1,495	\$ 1,068	\$ 107	\$ 1,175
4.6.1	Junction Pit (upstream of basin and GPT) - 0.8 m deep (Reinforced concrete junction pits (RMS Standard DRG R0220-35))	1	each	\$ 2,550.00	70%	\$ 1,785	160%	\$	4,080	\$ 2,550	\$ 383	\$ 2,933
4.6.2	Pit depth increments in excess of 900 mm	0	each	\$ 200.00	70%	\$-	160%	\$	-	\$-	Ŧ	\$-
4.6.3	Pit cover	1	each	\$ 340.00	70%	\$ 238	160%	\$	544	\$ 340	\$ 51	\$ 391
4.7	Gross Pollutant Trap(s)									*		-
4.7.1 4.8	GPT pit (treatment flow 2.07 m ³ /s) Gabion Walls	1	each	\$ 175,000.00	80%	\$ 140,000	140%	\$	245,000	\$ 175,000	\$ 17,500	\$ 192,500
4.8.1	n/a	0	cu. m		80%	\$-	140%	\$	-	\$-	\$-	\$-
4.9 4.9.1	Channels Rock lined pilot distribution channel	115	sq. m	\$ 195.00	70%	\$ 15,725	160%	\$	35,942	\$ 22,464	\$ 3,370	\$ 25,834
4.9.2 4.10	High flow bypass channel	0	cu. m	\$ 333.00	80%	\$-	140%	\$	-	\$ -	\$-	\$-
4.10.1	Biofiltration cells (0 m ² total area) Filter media layer at 400 mm depth	0	cu. m	\$ 105.00	70%	\$-	160%	\$	-	\$-	\$-	\$-
4.10.2 4.10.3	Transition layer at 450 mm depth Drainage layer at 150 mm depth	0	cu. m cu. m	\$ 125.00 \$ 130.00	70% 70%	\$ - \$ -	160% 160%	\$ \$	-	\$- \$-	\$ - \$ -	\$ - \$ -
4.10.4	Biofiltration cells vegetation	0	sq. m	\$ 32.00	80%	\$-	140%	\$	-	\$-	\$-	\$-
4.10.5	Backflow/overflow weirs Wetland Distribution channel batters vegetation	0	cu.m sq.m	\$ 333.00 \$ 32.00	70% 80%	\$ - \$ -	160% 140%	\$	-	\$- \$-	\$ - \$ -	\$ - \$ -
4.10.6		-		. 01.00		<u> </u>		Ť				
4.10.6	Maintenance Path							-				
	Maintenance Path Maintenance Path - along crest of south batter of basin - concrete Inlet Spillway	16	cu. m	\$ 780.00	80%	\$ 9,828	140%	\$	17,199	\$ 12,285	\$ 1,229	\$ 13,514
4.11 4.11.1	Maintenance Path - along crest of south batter of basin - concrete	16 270 270	cu. m sq. m sq. m	\$ 780.00 \$ 195.00 \$ 8.75	80% 80% 80%	\$ 9,828 \$ 42,089 \$ 1,889	140% 140% 140%	\$	17,199 73,655 3,305	\$ 12,285 \$ 52,611 \$ 2,361	\$ 1,229 \$ 5,261 \$ 236	\$ 57,872

4.132 Contaction 00 9, m 8 0.00 1 4.14 Multiple outlet structure (c) protein structure structure (1.14) 00 10, m 1 770.00 100% 8 5.00 8 00 8 00 8 00 8 00 8 00 100% </th <th></th> <th></th> <th></th> <th>1</th> <th></th> <th>1</th> <th></th>				1		1										
1-10 Multiple outlet solution to glamp lawer - concrete (from 3 1<	4.13.2	Scour protection	69	sq. m	\$ 195.00	70%	\$	9,419	160%	\$	21,528			2,018	\$	15,473
4.14.1 Convolutional attainum explained interval controls (UPI or Marked Interval Marked Interva			69	sq. m	\$ 8.75	80%	\$	483	140%	\$	845	\$ 604	\$	60	\$	664
4.142 Formuck colors dowlay (main) 93 91 93 91 7700 9 7700 9 7700 9 7700 9 7700 9 7700 9 7700 9 7700 9 7700 9 9 7700 9 9 7700 9 9 9000 9 9 9000 9 9 9 9 9 9 9 9 9 9 9 9 9 9 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>																
1101101100110010 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Ŷ</td><td>2,351</td></th<>															Ŷ	2,351
11:10 Singlend survices relayed 652 0.10 87.2000 end 87.2000 end 97.200 97.			38	sq. m	\$ 231.00	80%	\$	7,022	140%	\$	12,289	\$ 8,778	\$	878	\$	9,656
140Shand Damage (and regarding the part of p	4.15															
Attes Subal arrange (allot familes cold p(a)) lower along the length of a point of a state of a point of a state of a s	4.15.1		832	cu. m	\$ 240.00	60%	\$	119,808	180%	\$	359,424	\$ 199,680	\$	39,936	\$	239,616
4.10of the indiminant of a propertyof the indiminant	4.16	Subsoil Drainage														
BUTOTAL State <	4.16.1		960	lin. m	\$ 49.00	80%	\$	37,632	140%	\$	65,856	\$ 47,040	\$	4,704	\$	51,744
5.0 STORMANDE (UB OF BASIN) Image: Control of Con				1								\$ 1.075.200	s	154.065	ŝ	1,229,265
1.1Propertorement Propertorement 1.1Propertorement 1.1Propertorement 1.1Propertorement 1.1Propertorement 1.1Propertorement 	5.0											• .,•,=••	Ť	,	•	.,,
5.1. na										1						
6.2 Headwall(s) with wingwalls to sult 0 each 0 each 0 each 0 each 0 each 0 each 0			0	lin. m		80%	\$	-	140%	\$	-	\$ -	s	-	s	-
12.1 nin							Ť			Ť		·	Ť		÷	
6.4.1 n/a 0 ou.m 89% \$ 140% \$ \$ \$ \$ \$ 5.5 Pts - 140% \$ - 140% \$	5.2.1	n/a	0	each		80%	\$	-	140%	\$	-	\$-	\$	-	\$	-
6.4.1 n/a 0 ou.m 89% \$ 140% \$ \$ \$ \$ \$ 5.5 Pts - 140% \$ - 140% \$		Peee elek/e) to quit					_			-			<u> </u>			
5.5 Pils Image: Channels			0	CIL III		900/	¢		140%	¢		¢	¢		¢	
5.5.1 Na			U	cu. m		80%	¢	-	140%	φ	-	φ -	Ŷ	-	ې	
5.6 Channels 2.444 sq. m s 1 0 7				ļ						1			 			
5.6.1 Rock lined low flow channel 2.448 sq. m 5 195.0 3.31.52 100% \$ 7.37.776 \$ 7.17.80 \$ 7.18.80 3.02.77 \$ 4.3.81 10.00 \$ 7.18.80 3.02.77 \$ 4.3.81 10.78 \$ 2.2.50 \$ 5.1.5													_			
6.5.2 Centrolls under rock (2.48 m ²) 2.448 aq. m s aq. m aq. m aq. m aq. m			0.440	ļ				004 155	40001	*	700 770	A 477 AC			<u>^</u>	F 40 00 -
5.5.3 Viogetaid channel (ether side of rock lined local) (refer dwg that of ansate orgetaid channel area) 2.181 aq. m \$ 14.80 70% \$ 22.592 160% \$ 51.839 \$ 32.275 \$ 4.841 \$ 5.5.4 Channel batters vegetation, assume half of area vegetated, other than areas (mix tube sock. 200 m poted plants) 2.181 aq. m \$ 100.00 70% \$ 104.661 160% \$ 37.825 \$ 22.551 \$ 35.227 \$ 2.255 5.6.5 Maintenance pathbern (380 m left bank length, 4.5 m width) - 2283 cu \$ 750.00 80% \$ 157.950 140% \$ 27.6413 \$ 197.433 \$ 19.743 \$ 2.55 5.0 Tork WATER DRAINAGE (DIS OF BASIN) Image and mix tube south Image																548,964
B2289) assume grassed (half of veggated channel area) V		Geotextile under rock (2,448 m ²)		sq. m												23,562
Image and grade (mix (ube stock - 200 mm potted plants)) Set, m Set,		B2286) assume grassed (half of vegetated channel area)		sq. m											-	37,116
courrent courrent courrent courrent source source <th< td=""><td></td><td>than grassed (mix tube stock - 200 mm potted plants)</td><td></td><td>sq. m</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>270,843</td></th<>		than grassed (mix tube stock - 200 mm potted plants)		sq. m												270,843
6.0 STORHWATER DRAINAGE (DIS OF BASIN) 0	5.6.5	concrete	263	cu m	\$ 750.00	80%	\$	157,950	140%	\$	276,413				\$	217,181
6.1 Pipes/Cutwerts 0 lin.m 80% \$ 140% \$ \$ \$ \$ 6.1.1 n'a 0 lin.m 80% \$ 140% \$ \$ \$ \$ 6.2. Headwall(s) with wingwalls to suit 0 each 80% \$ 140% \$	1	SUBTOTAL										\$ 964,009	\$	133,657	\$	1,097,666
6.1.1 n'a 0 in, m 80% \$ - 140% \$	6.0															
6.2 Headwall(s) with wingwalls to suit 0 each 80% \$ 140% \$																
6.2.1 m/a 0 each 80% \$ - 140% \$	6.1.1	n/a	0	lin. m		80%	\$		140%	\$	-	\$	ŝ	-	¢	-
6.4 Base slab(s) to suit 0 In. m 80% \$ 140% \$															Э	-
A.1 N/a O lin. m 80% \$ 140% \$ \$ \$ \$ 6.4.1 n/a O lin. m 80% \$ 140% \$	6.2	Headwall(s) with wingwalls to suit											Ċ		¢	-
6.5 Pits 6.6 Pits 6.7 Scour Protection 6.8 80% \$ 140% \$ - \$			0			80%	\$	-	140%	\$	-	\$-		-		-
6.5.1 n/a 0 each 80% \$ 140% \$	6.2.1	n/a	0			80%	\$	-	140%	\$	-	\$-		-		-
6.6 Channels 0 sq. m 80% \$ 140% \$ \$ \$ \$ 6.6.1 n'a 0 sq. m 80% \$ - 140% \$ - \$	6.2.1 6.4	n/a Base slab(s) to suit		each				-			-		\$		\$	-
6.6.1 n/a 0 sq. m 80% \$ 140% \$	6.2.1 6.4 6.4.1	n/a Base slab(s) to suit n/a		each				-			-		\$	-	\$	-
6.7 Scour Protection 17 sq. m \$ 195.00 70% \$ 2,266 160% \$ 5,179 \$ 3,237 \$ 486 \$ 6.7.1 Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) 17 sq. m \$ 195.00 70% \$ 2,266 160% \$ 5,179 \$ 3,237 \$ 486 \$ SUBTOTAL \$ 3,237 \$ 486 \$ \$ 3,237 \$ 486 \$ 7.0 MINOR LANDSCAPING \$ 3,237 \$ 486 \$ \$ \$ 3,237 \$ 486 \$ SUBTOTAL \$ 3,237 \$ 486 \$ \$ \$ \$ 3,237 \$ 486 \$ SUBTOTAL \$ 3,237 \$ 486 \$ \$ \$ \$ 3,237 \$ 486 \$ SUBTOTAL \$ 3,237 \$ 486 \$ \$ \$ \$ 3,237 \$ 486 \$ SUBTOTAL \$ 3,237 \$ 486 \$ \$ \$ \$ 3,237 \$ 486 \$ SUBTOTAL \$ \$ 0 \$ 0 \$ 0 \$ \$ \$ 0 \$ 1797,479 \$ 11,60 \$	6.2.1 6.4 6.4.1 6.5	n/a Base slab(s) to suit n/a Pits	0	each lin. m		80%	\$	-	140%	\$	-	\$ -	\$		\$	-
6.7.1 Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) 17 sq. m \$ 195.00 70% \$ 2,266 160% \$ 5,179 \$ 3,237 \$ 486 \$ SUBTOTAL SUBTOTAL \$ 3,237 \$ 486 \$ SUBTOTAL SUBTOTAL \$ 3,237 \$ 486 \$ CONSTRUCTION TOTAL \$ 9,887,209 \$ 1,797,479 \$ 11,66 SUBTOTAL \$ 1,752,70	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6	n/a Base slab(s) to suit n/a Pits n/a Channels	0	each lin. m		80%	\$	-	140%	\$	-	\$ - \$ -	\$ \$ \$		\$ \$ \$	-
SUBTOTAL \$ 3,237 \$ 486 \$ 7.0 MINOR LANDSCAPING - - - - SUBTOTAL SUBTOTAL \$ 3,237 \$ 486 \$ SUBTOTAL SUBTOTAL \$ 3,237 \$ 486 \$ SUBTOTAL SUBTOTAL \$ 3,237 \$ 486 \$ SUBTOTAL SUBTOTAL \$ 5 \$ \$ SUBTOTAL SUBTOTAL \$ 9,887,209 \$ 1,797,479 \$ 11,66 8.0 PROJECT MANAGEMENT AND SUPERVISION \$ \$ 1,752,703 + 8.1 15% construction cost \$ 1,752,703 \$ + 9.0 CONTINGENCIES \$ \$ 1,797,479 \$1,7 9.1 Inherent contingency \$ \$ 180% \$ - \$ \$ \$ \$ \$ \$ \$ \$ 9.3 \$ \$ - \$ 70% \$ - \$ 180% \$ - \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6	n/a Base slab(s) to suit n/a Pits n/a Channels	0	each lin. m each		80%	\$		140%	\$		\$ - \$ -	\$ \$ \$		\$ \$ \$	-
7.0 MINOR LANDSCAPING Image: construction cost Image	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6 6.6.1	n/a Base slab(s) to suit n/a Pits n/a Channels n/a	0	each lin. m each		80%	\$		140%	\$	-	\$ - \$ -	\$ \$ \$		\$ \$ \$	-
SUBTOTAL \$<	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6 6.6.1 6.7	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC)	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$		140% 140% 140%	\$	- - - 5,179	\$ - \$ - \$ 3,237	\$ \$ \$ \$	486	\$ \$ \$	
CONSTRUCTION TOTAL \$ 9,887,209 \$ 1,797,479 \$ 11,6 8.0 PROJECT MANAGEMENT AND SUPERVISION \$ 1,797,479 \$ 11,6 8.1 15% construction cost \$ 1,792,703 \$ 1,792,703 \$ 1,792,703 9.0 CONTINGENCIES \$ 1,792,703 \$ 1	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6 6.6.1 6.7	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC)	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$	- - - 2,266	140% 140% 140%	\$		\$ - \$ - \$ 3,237	\$ \$ \$ \$ \$	486	\$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -
CONSTRUCTION TOTAL \$ 9,887,209 \$ 1,797,479 \$ 11,6 8.0 PROJECT MANAGEMENT AND SUPERVISION \$ 1,797,479 \$ 11,6 8.1 15% construction cost \$ 1,797,479	6.2.1 6.4 6.5 6.5 6.5 6.6 6.6 6.6 6.7 6.7 1	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$	- - - 2,266	140% 140% 140%	\$	- - - 5,179	\$ - \$ - \$ 3,237	\$ \$ \$ \$ \$	486	\$ \$ \$ \$ \$	
8.0 PROJECT MANAGEMENT AND SUPERVISION 5 6 5 6 6 7 7 7 7 7 7 7 9.0 CONTINGENCIES \$ \$ 1 <t< td=""><td>6.2.1 6.4 6.5 6.5 6.5 6.6 6.6 6.6 6.7 6.7 1</td><td>n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL</td><td>0 0 0</td><td>each lin. m each sq. m</td><td>\$ 195.00</td><td>80% 80% 80%</td><td>\$</td><td></td><td>140% 140% 140%</td><td>\$</td><td>- - - 5,179</td><td>\$ - \$ - \$ 3,237</td><td>\$ \$ \$ \$ \$</td><td> 486</td><td>\$ \$ \$ \$ \$</td><td></td></t<>	6.2.1 6.4 6.5 6.5 6.5 6.6 6.6 6.6 6.7 6.7 1	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$		140% 140% 140%	\$	- - - 5,179	\$ - \$ - \$ 3,237	\$ \$ \$ \$ \$	486	\$ \$ \$ \$ \$	
8.0 PROJECT MANAGEMENT AND SUPERVISION 5 6 5 6 6 7 7 7 7 7 7 7 9.0 CONTINGENCIES \$ \$ 1 <t< td=""><td>6.2.1 6.4 6.5 6.5 6.5 6.6 6.6 6.6 6.7 6.7 1</td><td>n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING</td><td>0 0 0</td><td>each lin. m each sq. m</td><td>\$ 195.00</td><td>80% 80% 80%</td><td>\$</td><td></td><td>140% 140% 140%</td><td>\$</td><td>- - - 5,179</td><td>\$ \$ \$ 3,237 \$ 3,237</td><td>\$ \$ \$ \$ \$ \$ \$</td><td> 486</td><td>\$ \$ \$ \$ \$ \$ \$</td><td></td></t<>	6.2.1 6.4 6.5 6.5 6.5 6.6 6.6 6.6 6.7 6.7 1	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$		140% 140% 140%	\$	- - - 5,179	\$ \$ \$ 3,237 \$ 3,237	\$ \$ \$ \$ \$ \$ \$	486	\$ \$ \$ \$ \$ \$ \$	
8.1 15% construction cost \$ 1,752,703 \$ 9.0 CONTINGENCIES \$ \$ 9.1 Inherent contingency \$ \$ 9.2 \$<	6.2.1 6.4 6.5 6.5 6.5 6.6 6.6 6.6 6.7 6.7 1	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$	2,266	140% 140% 140% 160%	\$		\$ - \$ - \$ 3,237 \$ 3,237 \$ 3,237 \$ 3,237	\$ \$ \$ \$ \$		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	3,723
9.0 CONTINGENCIES S	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6 6.6.1 6.7 6.7.1 7.0	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING SUBTOTAL	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$		140% 140% 140% 160%	\$		\$ - \$ - \$ 3,237 \$ 3,237 \$ 3,237 \$ 3,237	\$ \$ \$ \$ \$		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	
9.1 Inherent contingency \$1,797,479 \$1,77 9.2 \$ <td>6.2.1 6.4 6.4.1 6.5 6.5.1 6.6 6.6.1 6.7 6.7.1 7.0 8.0</td> <td>n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour protection Scour protection SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION</td> <td>0 0 0</td> <td>each lin. m each sq. m</td> <td>\$ 195.00</td> <td>80% 80% 80%</td> <td>\$</td> <td></td> <td>140% 140% 140% 160%</td> <td>\$</td> <td></td> <td>\$ - \$ - \$ 3,237 \$ 3,237 \$ 3,237 \$ 3,237 \$ 9,887,209</td> <td>\$ \$ \$ \$ \$</td> <td></td> <td>\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$</td> <td>3,723</td>	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6 6.6.1 6.7 6.7.1 7.0 8.0	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour protection Scour protection SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$		140% 140% 140% 160%	\$		\$ - \$ - \$ 3,237 \$ 3,237 \$ 3,237 \$ 3,237 \$ 9,887,209	\$ \$ \$ \$ \$		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	3,723
9.2 \$ 60% \$ 180% \$<	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6 6.6.1 6.7 6.7.1 7.0 8.0 8.1	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$		140% 140% 140% 160%	\$		\$ - \$ - \$ 3,237 \$ 3,237 \$ 3,237 \$ 3,237 \$ 9,887,209	\$ \$ \$ \$ \$		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	3,723
9.3 \$ - 70% \$ - \$ 13.4 GST \$	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6 6.6.1 6.7 6.7.1 7.0 7.0 8.0 8.1 9.0	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0 0 0	each lin. m each sq. m	\$ 195.00	80% 80% 80%	\$		140% 140% 140% 160%	\$		\$ - \$ - \$ 3,237 \$ 3,237 \$ 3,237 \$ 3,237 \$ 9,887,209	\$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	3,723
CONSTRUCTION TOTAL, excluding GST \$13,4 GST \$1,3	6.2.1 6.4 6.4.1 6.5 6.5.1 6.6 6.5.1 6.7 6.7.1 6.7 6.7.1 8.0 8.1 9.0 9.1	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0 0 0	each lin. m each sq. m		80% 80% 80% 70%	\$ \$ \$ \$		140% 140% 140% 160%	\$ \$ \$ \$ \$ \$		\$ \$ \$ 3,237 \$ 3,237	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	\$ \$ \$ \$ \$ \$ \$ \$ \$	3,723
GST \$1,3	6.2.1 6.4 6.4.1 6.5 6.5.1 6.5 6.5.1 6.7 6.7.1 7.0 8.0 8.1 9.0 9.1 9.2	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0 0 0	each lin. m each sq. m	\$ -	80% 80% 70%	\$ \$ \$ \$ \$		140% 140% 140% 160% CONSTR	\$ \$ \$ \$ \$	ON TOTAL	\$ \$ \$ 3,237 \$ 3,277 \$ 3,277	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	3,723
	6.2.1 6.4 6.4.1 6.5 6.5.1 6.5 6.5.1 6.7 6.7.1 7.0 8.0 8.1 9.0 9.1 9.2	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0 0 0	each lin. m each sq. m	\$ -	80% 80% 70%	\$ \$ \$ \$ \$		140% 140% 140% 160% CONSTR	\$ \$ \$ \$ \$	ON TOTAL	\$ \$ \$ 3,237 \$ 3,237	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	3,723 - 11,684,688 \$1,797,479 -
CONSTRUCTION TOTAL, Including GST \$14,7	6.2.1 6.4 6.4.1 6.5 6.5.1 6.5 6.5.1 6.7 6.7.1 7.0 8.0 8.1 9.0 9.1 9.2	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0 0 0	each lin. m each sq. m	\$ -	80% 80% 70%	\$ \$ \$ \$ \$		140% 140% 140% 160% CONSTR	\$ \$ \$ \$ \$	ON TOTAL	\$ \$ \$ 3,237 \$ 3,237	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	3,723 - 11,684,688 \$1,797,479 - - 13,437,391
CONSTRUCTION TOTAL, rounded \$14,7	6.2.1 6.4 6.4.1 6.5 6.5.1 6.5 6.5.1 6.7 6.7.1 7.0 8.0 8.1 9.0 9.1 9.2	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0 0 0	each lin. m each sq. m	\$ -	80% 80% 70%	\$ \$ \$ \$ \$		140% 140% 140% 160% CONSTR	\$ \$ \$ \$ \$	ON TOTAL	\$ \$ \$ 3,237 \$ 3,237	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	486 486 488 1,797,479 \$1,797,479 excluding GST GST	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	3,723 - 11,684,688 \$1,797,479 - - - - - - - - - - - - - - - - - - -
CONSTRUCTION TOTAL, rounded \$14,7	6.2.1 6.4 6.4.1 6.5 6.5.1 6.5 6.5.1 6.7 6.7.1 7.0 8.0 8.1 9.0 9.1 9.2	n/a Base slab(s) to suit n/a Pits n/a Channels n/a Scour Protection Scour Protection Scour protection at Basin Outlet Pipes (2 x 1200 x 900 RCBC) SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0 0 0	each lin. m each sq. m	\$ -	80% 80% 70%	\$ \$ \$ \$ \$	- - - 2,266	140% 140% 140% 160% CONSTR	\$ \$ \$ \$ \$	ON TOTAL	\$ \$ \$ 3,237 \$ 3,237 \$ 3,237 \$ - \$ 9,887,209 \$ 9,887,209 \$ 1,752,703 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	3,723 - 11,684,688 \$1,797,479 - - 13,437,391

	E	08 Drainage System - Preliminary Construction Cost Estimate			Thursday, 24 Ja	anuary 2019					1	
Image: Antione and the set of th		Drawing set: 30011388-DDR-2012 to 30011388-DDR-B0886 ITEM NO. DESCRIPTION OF WORK	QUANTITY	UNIT	BASE RATE		CONTI		HIGHEST	COST		
Dis Discription Dis Value of the probability of the p			1	itom	£ 100.000.00	2011201 (14)	¢ 70.000		£ 160.000	¢ 100.000		
1 1	1.2	Traffic management	1	item	\$ 10,000.00	70%	\$ 7,000	160%	\$ 16,000	\$ 10,000	\$ 1,500	\$ 11,500
DetWork DetWork <t< td=""><td>1.4</td><td>Provision and maintenance of sediment & erosion control</td><td>1</td><td>item</td><td>\$ 50,000.00</td><td>70%</td><td>\$ 35,000</td><td>160%</td><td>\$ 80,000</td><td>\$ 50,000</td><td>\$ 7,500</td><td>\$ 57,500</td></t<>	1.4	Provision and maintenance of sediment & erosion control	1	item	\$ 50,000.00	70%	\$ 35,000	160%	\$ 80,000	\$ 50,000	\$ 7,500	\$ 57,500
Description of an observation of a sector o		SUBTOTAL	6	months	\$ 15,000.00	70%	\$ 63,000	160%	\$ 144,000			\$ 103,500 \$ 316,100
12 Name 100 <td>2.1</td> <td></td> <td>10,492</td> <td>sq. m</td> <td></td> <td>60%</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>\$ 31,476</td>	2.1		10,492	sq. m		60%						\$ 31,476
14 15 15 14 15<			,									\$ 75,141 \$ 21,062
Interval												\$ 32,578 \$ 10,318
Image: second	2.5		3,148	cu. m	\$ 0.80	80%	\$ 2,014	140%	\$ 3,525			\$ 2,770 \$ 173.345
Image Image <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td> </td><td>+;</td><td>· · · · · · · ·</td></th<>									1		+;	· · · · · · · ·
1111 1111 111 111 111 </td <td>3.1.1</td> <td>Basin Earthworks</td> <td>12 ///</td> <td>cu m</td> <td>\$ 8.05</td> <td>60%</td> <td>\$ 60.105</td> <td>180%</td> <td>\$ 180 314</td> <td>\$ 100.175</td> <td>\$ 20.034</td> <td>\$ 120.200</td>	3.1.1	Basin Earthworks	12 ///	cu m	\$ 8.05	60%	\$ 60.105	180%	\$ 180 314	\$ 100.175	\$ 20.034	\$ 120.200
Image of a consist of an analysis of a consist consist of a consist of a consist of a consist of a	3.1.1.2	Total Fill - Basin 08 (assume all fill from cut)	611	cu. m	\$ 13.55	60%	\$ 4,967	180%	\$ 14,902	\$ 8,280	\$ 1,655	\$ 9,935
No. No. P 1017 P	3.2.3	Basin areas with structures above: Rolling of exposed surface (vibrating smooth drum 10	2,490	sq. III	φ <u>3.00</u>	00%	φ 1,495	100 %	φ 22,404	φ 12,432	φ 2,437	φ 14,505
11.1 0000 000000 000000 00000 0		compact with roller above). Place/compact clean fill in layers. Compact upper 500 mm of subgrade to min. DDR of 100%. Level 1 Earthworks Control used in fill placement	4,460	sq. m	\$ 27.00				\$ 216,744	\$ 120,414	\$ 24,082	\$ 144,496
1133 No.	3.1.2.1	Total Cut to disposal - Channel 08-1 (assume all contaminated)				60%	\$ 8,182	180%				\$ - \$ 16,364
11.1 000000000000000000000000000000000000		Rolling of exposed surface (vibrating smooth drum 10 t+, 8 passes minimum).						180%				\$ 211 \$ 11,562
1.1.0 Second column construction frame constructin frame construction frame construction frame constructio			2,911	cu. m	\$ 70.00		\$ - \$ 163,016		\$ - \$ 285,278	\$ - \$ 203,770	\$ - \$ 20,377	\$ - \$ 224,147
11.10 Contrigue of an e. A. contrigue of an e. Contrigue of an	3.1.4											\$ 808,992
110 Control Allow of Macron Works and Works Stately, employed and Works Stately emp	3.1.4.2	Cost of disposal of soil as "Low Level Contamination" (i.e. General Solid Waste) at an approved landfill within 10km	6,282				\$ 1,394,626	180%	\$ 4,183,879	\$ 2,324,377	\$ 464,875	\$ 2,789,252
100 100 <td>3.1.4.3</td> <td>additional 10km (i.e. 20km one-way total distance)</td> <td></td> <td>cu.m/km</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>· · · ·</td> <td></td> <td>\$ 105,082</td>	3.1.4.3	additional 10km (i.e. 20km one-way total distance)		cu.m/km						· · · ·		\$ 105,082
13.1 Sharp provide law set big oblig dama of parameters of parameter		swales, wetland etc	10,492	sq. m	\$ 2.95					\$ 30,952		\$ 35,594
1.4. Converting of latting allocate the management of management of latting allocate the management of latting alloc		Clay liner provided to base and to top of batters of basin, compacted to specified density,	7,001	sq. m	\$ 21.67					\$ 151,733	Ŧ	\$ - \$ 174,492
Interfal. Interfal. <t< td=""><td>3.4</td><td>Dewatering of existing onsite dams, including allowance for management of</td><td>0</td><td>sq. m</td><td>\$ 66.50</td><td>70%</td><td>\$-</td><td>160%</td><td>\$-</td><td>\$-</td><td>\$-</td><td>\$-</td></t<>	3.4	Dewatering of existing onsite dams, including allowance for management of	0	sq. m	\$ 66.50	70%	\$-	160%	\$-	\$-	\$-	\$-
1.1 Processme	4.0	SUBTOTAL							•	\$ 3,741,178	\$ 714,149	\$ 4,455,327
14.1 DOND RDF Inter des galons)	4.1	Pipes/Culverts	92	lin m	\$ 600.00	70%	\$ 38.640	160%	\$ 88.320	\$ 55.200	\$ 8,280	\$ 63.480
14.10 Story is nearly decay minimage 17 In. n 5 7000 18 4.44 5 2000 18 4.440 5 2000 18 4.440 5 2000 18 5 4.400 5 4.400 5 4.400 5 4.400 5 4.400 5 4.400 5 4.400 5 4.400 5 4.400 5 4.400 5 4.400 5 4.400 5 4.400 5 5 6 6 4.400 5 5 6 6 6 6 6 6 6 6 6 6 4.400 5 5 6 </td <td>4.1.1</td> <td>DN900 RCP (refer dwg B0803) - upto 50% flows to basin</td> <td>16</td> <td>lin. m</td> <td>\$ 630.00</td> <td>70%</td> <td>\$ 7,056</td> <td>160%</td> <td>\$ 16,128</td> <td>\$ 10,080</td> <td>\$ 1,512</td> <td>\$ 11,592</td>	4.1.1	DN900 RCP (refer dwg B0803) - upto 50% flows to basin	16	lin. m	\$ 630.00	70%	\$ 7,056	160%	\$ 16,128	\$ 10,080	\$ 1,512	\$ 11,592
110 Ch32 (get mode or get mode get mode) 12 Nn 5 2000 70% 5 2.600 10% 5 5.800 5 -0.200 3 -0.200 </td <td>4.1.4</td> <td>DN300 pipe (early discharge)</td> <td>17</td> <td>lin. m</td> <td>\$ 170.00</td> <td>70%</td> <td>\$ 2,023</td> <td>160%</td> <td>\$ 4,624</td> <td>\$ 2,890</td> <td>\$ 434</td> <td>\$ 3,324</td>	4.1.4	DN300 pipe (early discharge)	17	lin. m	\$ 170.00	70%	\$ 2,023	160%	\$ 4,624	\$ 2,890	\$ 434	\$ 3,324
12. Prove the incidence of the indication is the number of the standard is based on the indication is the number of the indication is the in	4.1.6	DN525 (low flow outlet under spillway)	12	lin. m	\$ 290.00	70%	\$ 2,436	160%	\$ 5,568	\$ 3,480	\$ 522	\$ 4,002
11.1 BUOK RCP pairs ong BUOKS) upday Style has been hann. 1 bank 5 3.000 60% 5 2.051 100% 5 6.041 5 5.000 5 6.011 5 5 6 6 5 6.011 5 6.01 <t< td=""><td></td><td></td><td>10</td><td>lin. m</td><td>\$ 240.00</td><td></td><td></td><td></td><td></td><td></td><td>\$ 360 \$ -</td><td>\$ 2,760 \$ -</td></t<>			10	lin. m	\$ 240.00						\$ 360 \$ -	\$ 2,760 \$ -
4.4. 0.300 x 300 RCBC (refr or ga B0003): but would to buffer 12 a.u.m 9 7060 x 6 6.217 100% x 6 4.300 x 8 4.301 x 8 1.307 x 1.307 x 1.307 x 1.307 x			1									\$ 5,750 \$ 4,303
4.3 Bedding material to suff. Image: Second Se			12	cu. m	\$ 750.00						\$ - \$ 1.397	
Endots RCP pair and S0033 - upo S015 area 3 a n n s 64.00 Processing 1 c n s 64.00 Processing 1 c n s 64.00 Processing n s n s n s n s n s n s n s n s n s n </td <td>4.5</td> <td>Bedding material to suit</td> <td></td> <td></td> <td></td> <td>80%</td> <td>\$-</td> <td>140%</td> <td>\$-</td> <td>\$ -</td> <td>\$-</td> <td>\$-</td>	4.5	Bedding material to suit				80%	\$-	140%	\$-	\$ -	\$-	\$-
4.5.4 DR300 ppc (party, discharge) 1 o.u.m \$ 4.5.0 DR300 ppc (party, discharge) 1.11 0.u.m \$ 4.5.0 DR300 ppc (party, discharge) 1.11 0.u.m \$ 1.10 1 1.11 1 0.00 1.11 0.00 \$ 1.11 1 0.00 1.11 0.00 1.11 0.00 1 0.00 1.11 0.00 1 0.00 1.11 0.00 1.11 0.00 1 0.00 1.00 1 0.00 1.00 1 0.00 1.00 1 0.00 1 0.00 1.00 1.00 0.00 1.00 1.00 0.00 1.00 1.00 0.00 1.00 0.00 1.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.		DN900 RCP (refer dwg B0803) - upto 50% flows to basin	3	cu. m	\$ 63.00							
4.5.0 DNO25 (nor how under under spänway) 1 ou.m \$ 6.300 PNN \$ 6.46 100% \$ 112 \$ 7.7 \$ 1.1 \$ 8.46 \$ 4.6 \$ 4.6 \$ 4.6 \$ 4.6 \$ 4.6 \$ 4.6 \$ 4.6 \$ \$ 4.6 \$ \$ 4.6 \$ \$ 4.6 \$ \$ 5 . \$ \$ 5 . \$	4.5.4	DN300 pipe (early discharge)	1	cu. m	\$ 63.00	70%	\$ 56	160%	\$ 129	\$ 81	\$ 11	\$ 92
4.6. Pile 0 </td <td>4.5.6</td> <td>DN525 (low flow outlet under spillway)</td> <td>1</td> <td>cu. m</td> <td>\$ 63.00</td> <td>70%</td> <td>\$ 54</td> <td>160%</td> <td>\$ 122</td> <td>\$ 77</td> <td>\$ 11</td> <td>\$ 88</td>	4.5.6	DN525 (low flow outlet under spillway)	1	cu. m	\$ 63.00	70%	\$ 54	160%	\$ 122	\$ 77	\$ 11	\$ 88
44.2. Develop. PP (PE 056):-217.m deep 1 exch \$ 2.800.0 70% \$ 1.786 100% \$ 4.004 \$ 2.800 \$ 3.81 \$ 2.222 44.3. Pit Oper 1 exch \$ 3.000 70% \$ 5.238 100% \$ 4.044 \$ 2.800 \$ 5 3.000 100% \$ 6.404 \$ 2.800 \$ 5 3.000 100% \$ 6.404 \$ 5 3.000 100% \$ 6.404 \$ 6.400 \$ 5 5 10.000 \$ 6.500 5 5 10.000 \$ 6.500 \$ 5 5 10.000 \$ 6.500 5 5 10.000 \$ 6.500 5 5 10.000 \$ 6.500 5 5 10.000 \$ 6 6.500 7.000 \$ 5 6.064 100% \$ 5 1.000 \$ 1.500 \$ 0.500 7.000 \$ 7.000 \$ 6 <td< td=""><td>4.6</td><td>Pits</td><td>1</td><td>cu. m</td><td>\$ 63.00</td><td>80%</td><td>\$ -</td><td>140%</td><td>\$ -</td><td>\$ -</td><td>\$ -</td><td>\$-</td></td<>	4.6	Pits	1	cu. m	\$ 63.00	80%	\$ -	140%	\$ -	\$ -	\$ -	\$-
44.3 PC Over 1 each \$ 3400 700 \$ 238 100% \$ 544 \$ 340 \$ 515 \$ 99 4.7.1 Gross Politant Tago) 1 each \$ 5000 \$ 00% \$ 33,000 10%% \$ 5000 \$ 5000 \$ 5000 \$ 11,000 \$ 6600 4.8 Gablem Wals - - 1122 each \$ 3042 70% \$ 24,023 10%% \$ 54,010 \$ 34,200 \$ 5,147 \$ 3946 4.8.1 Im x Im x Im digit pakein baskets for 112m ² man 1122 each \$ 77,38 70% \$ 24,023 10%% \$ 13,681 \$ 6,664 \$ 1,729 \$ 99,60 4.9.1 Gobit insi fill pakein baskets for 112m ² m \$ 77,38 70% \$ 6,020 \$ 10,6% \$ 1,812 1,008 \$ 1,173 \$ 13,381 \$ 4,173 \$ 39,416 4.9.1 Bord instation channel (som width x 50 m loaph x 156 m load) 5 c.u.m \$ 186,00 70% \$ 6,324 160% \$ 11,820 7,071 \$ 13,81 \$ 14,353 \$ 13,351 \$ 4,003 \$ 30,355 \$ 10,503 \$ 5 \$ \$ \$ \$ \$ \$ \$ \$		Diversion Pit (Pit B08.5) - 2.17 m deep	1			70%	\$ 1,785	160%	\$ 4,080	\$ 2,550	\$ 383	\$ 2,933
4.7.1 OPT aff treatment (box 14.3 m/s) 1 each \$ 5000 5 33.000 10%% \$ 9000 \$ 5000 \$ 1000 \$ 6000 4.8 Gabon Wals 112 each \$ 5004 70% \$ 24.03 16%% \$ 34.00 \$ 34.30 \$ 5.74 \$ 39.80 4.4.1 Inx 1m xtm dept brakeds 112 m ² m \$ 77.35 50% \$ 0.64 16%% \$ 1.381 \$ 4.62 16.864 \$ 1.299 \$ 9.98 4.9 Cohandis 1 0 50% \$ 0.147% \$ 1.612 \$ 1.1741 \$ 1.381 \$ 1.612 \$ 1.1741 \$ 1.381 \$ 1.612 \$ 1.1741 \$ 1.381 \$ 1.612 \$ 1.1741 \$ 1.381 \$ 1.1741 \$ 1.3864 4.01 Badin mote place shares 155 cum \$ 756.00 20% \$ 81.340 160% \$ 1162.13 \$ 1.1743 \$ 1.381 \$ 1.1743 \$ 1.3864 4.01 Badin mote and on motels and on on some		Pit Cover										
4.8.1 Im x Im x Im den daskin pakken parken par	4.7.1	GPT pit (treatment flow 1.43 m ³ /s)	1	each	\$ 55,000.00							\$ 66,000
4.9. Channels model S I I Normality S I I Normality S I I I Normality S I I I Normality S I <	4.8.1					70%	\$ 24,023	160%	\$ 54,910	\$ 34,320	\$ 5,147	\$ 39,467
Implibition			112	cu. m	\$ 77.35					\$ 8,664 \$ -	\$ 1,299 \$ -	\$ 9,963 \$ -
4.10 Biofitration cells (1907 m* total area)		length)										
4.10.2 Transition layer at 450 mm depth (Sum methal) 273 cu.m \$ 12.00 70% \$ 63.276 160% \$ 01.33 50.138 \$ 13.337 \$ 47.03 27.09 \$ 21.936 160% \$ 50.138 \$ 13.337 \$ 47.00 \$ 63.037 \$ 13.037 \$ 47.04 \$ 55.696 41.05 \$ 51.240 \$ 51.421 \$ 56.566 4.10.4 Bolfitzation charnel baters/updan charnel baters/updation (assume 0.6 * channel area of 171.5 m) 103 \$ 7.80.0 \$ 4.901 \$ 7.028 \$ 10.32 \$ 7.80.0 \$ 4.901 \$ 3.233	4.10	Biofiltration cells (1607 m ² total area)				80%	\$ -	140%	\$ -	\$ -	\$-	\$-
4.104 Bolftration cales vegetation (inits tube stock - 200 nm potted plants) 1.007 \$ 7.80.00 700% \$ 4.061 160% \$ 7.1944 \$ 5.1424 \$ 5.6.666 4.10.5 Backflow/overflow weirs (soncrete, 150mm deep) 9 cu.m \$ 7.80.00 700% \$ 4.061 160% \$ 11.340 \$ 7.1088 \$ 1.063 \$ 8.515 4.10.6 Weitand Distribution channel batters vegetation (assume 0.6 * channel area of 171.5 m²) 103 sq.m \$ 3.2.00 80% \$ 2.654 140% \$ 1.4030 \$ 7.2088 \$ 1.063 \$ 8.72.72 4.11.1 Maintenance Path - concrete, within base of basin 167 cu.m \$ 750.00 70% \$ 87.491 160% \$ 199.960 \$ 12.9.988 \$ 18.748 \$ 14.37.33 4.11.12 Maintenance Path - concrete, within base of basin 167 cu.m \$ 750.00 70% \$ 87.491 160% \$ 199.960 \$ 12.9.988 \$ 18.748 \$ 14.37.33 4.12.12 Multiple outlet structure 5 750.00 70% \$ 2.2.32 160% \$ 9.667 \$ 687 \$ 687 \$ 687 \$ 687 \$ 687 \$ 687 \$ 688 775 <td>4.10.2</td> <td>Transition layer at 450 mm depth - Sand media (General Notes)</td> <td>723</td> <td>cu. m</td> <td>\$ 125.00</td> <td>70%</td> <td>\$ 63,276</td> <td>160%</td> <td>\$ 144,630</td> <td>\$ 90,394</td> <td>\$ 13,559</td> <td>\$ 103,953</td>	4.10.2	Transition layer at 450 mm depth - Sand media (General Notes)	723	cu. m	\$ 125.00	70%	\$ 63,276	160%	\$ 144,630	\$ 90,394	\$ 13,559	\$ 103,953
4.105 Backflow/verflow weis (concrete, 150mm dep) 9 cu,m \$ 750.00 70% \$ 4.961 100% \$ 11,340 \$ 7.088 \$ 1.063 \$ 8.1053 4.106 Matubal backs, 200 nm ootide (dants) 103 \$ 9, m \$ 32.00 80% \$ 2.634 140% \$ 4.610 \$ 3.293 \$ 3.293 \$ 3.623 4.11 Maintenance Path concrete, within base of basin 167 cu,m \$ 7760.00 70% \$ 8.7,491 160% \$ 199.980 \$ 124.988 \$ 18,748 \$ 143,737 4.112 Maintenance Path - concrete, within base of basin batter 43 cu,m \$ 7760.00 70% \$ 22,322 160% \$ 51.023 \$ 31.800 \$ 4.783 \$ 3.607 4.124 Maintenance Path - concrete (5 m cincumference, 150 mm thick, 1.22 1 cu,m \$ 750.00 80% \$ 2.255 140% \$ 3.945 \$ 2.819 \$ 2.813 \$ 3.001 4.121 fordifical structure - - 80% \$ 2.255 140% \$ 3.945 \$ 2.819 \$ 3.100 4.122 fordifical structure - 80% \$ 548 140% \$		Biofiltration cells vegetation (mix tube stock - 200 mm potted plants)										+
4.10 Minitube sock - 200 mm ooted data?	4.10.5	Backflow/overflow weirs (concrete, 150mm deep)	9	cu. m		70%	\$ 4,961	160%	\$ 11,340	\$ 7,088	\$ 1,063	\$ 8,151
4.112 Maintenance Path - concrete around top of basin batter 4.3 cu.m \$ 750.00 70% \$ 22,322 160% \$ 51,023 \$ 31,890 \$ 4,783 \$ 36,673 4.12 Multiple outlet structure		(mix tube stock - 200 mm potted plants)										
4.12 Multiple outlet structure m m m m m m m m m m m 4.12.1 Cylindical structure to spilway level - concrete (5 m circumference, 150 mm thick, 1.22 1 cu, m \$ 750.00 80% \$ 549 140% \$ 961 \$ 687 \$ 688 \$ 755 4.12.2 Formwork (sides of walls) 12 sq. m \$ 231.00 80% \$ 2.255 140% \$ 3.945 \$ 2.819 \$ 3.100 4.12.1 Indet Spillway 0 78 sq. m \$ 195.00 70% \$ 10.647 160% \$ 2.436 \$ 15.210 \$ 2.282 \$ 17.492 4.12.1 Socur protection 78 sq. m \$ 8.75 80% \$ - 140% \$ 956 \$ 683 \$ 683 \$ 752 4.12.1 Concrete 25 MPa (concrete spilway, 8.5 m lengh x 150 mm thick) 8 cu. m \$ 750.00 70% \$ 4.410 160% \$ 10.080 \$ 6.300 \$ 95.2 \$ 7.244 4.13.1 Concrete 25 MPa (concrete spilway, 8.5 m lengh x 150 mm thick) 8 cu. m \$ 750.00 70% \$ 2.4223 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>\$ 143,736 \$ 36,673</td></t<>												\$ 143,736 \$ 36,673
-1.21 minoh 122 Formwork (sides of walls) 12 sq. m \$ 196.00 80% \$ 140% \$ 2.819 \$ 2.819 \$ 2.819 \$ 3.00 4.121 Inlet Spillway 78 sq. m \$ 196.00 70% \$ 10.647 160% \$ 2.2436 \$ 15.210 \$ 2.689 \$ 2.689 \$ 2.689 \$ 2.689 \$ 2.689 \$ 2.689 \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ - 5 - \$ - 5 - \$ - 5 - \$ 5 - \$ 5 - \$ - 5 - \$ - 5 - \$ - 5 - 5 -	4.12	Multiple outlet structure										
A12 Inet Spilway met Spilway source 30% \$ 140% \$		m high)										\$ 3,100
4.12.2 Geolexile 78 sq. m \$ 8.75 80% \$ 546 140% \$ 956 \$ 683 \$ 752 \$ 140% \$ \$ 6300 \$ 9 \$ 7.241 4100% \$ 32.175 \$ 4.826 \$ 37.001 4.133 Gour protection - rock matterss 2x230 mm depth thickness 393 sq. m<\$		Inlet Spillway				80%			\$-	\$ -	\$-	\$-
4.13.1 Concrete 25 MPa (concrete 25 MPa (concrete spilway, 8.5 m length x 150 mm thick) 8 cu.m \$ 750.00 70% \$ 4.410 160% \$ 10,080 \$ 6,300 \$ 945 \$ 7,244 4.13.2 Socur protection - rock mattress 230 mm depth thickness 165 sq.m \$ 195.00 70% \$ 22,523 160% \$ 51.480 \$ 32,175 \$ 4.826 \$ 37,000 4.13.3 Socur protection - rock mattress 2 x 230 mm depth thickness 39 sq.m \$ 195.00 70% \$ 5.324 160% \$ 1.161 \$ 32,175 \$ 4.826 \$ 37,000 4.13.3 Goot protection - rock mattress 2 x 230 mm depth thickness 39 sq.m \$ 195.00 70% \$ 5.324 160% \$ 1.161 \$ 8,75 \$ 10,800 \$ 5.638 \$ 1,141 \$ 8,75 \$ 10,800 \$ 5.638 \$ 1,141 \$ 8,75 \$ 10,800	4.12.2	Geotextile				80%	\$ 546	140%	\$ 956	\$ 683		\$ 751
4.13.3 Socur protection - rock mattress 2 x 230 mm depth thickness 39 sq. m \$ 195.00 70% \$ 5.324 160% \$ 12.168 \$ 7.605 \$ 1.141 \$ 8.74 4.13.4 Geolexille 204 sq. m \$ 8.75 80% \$ 1.428 140% \$ 2.499 \$ 1.785 \$ 1.785 \$ 1.96 4.15 Subsoil Drainage	4.13.1	Concrete 25 MPa (concrete spillway, 8.5 m length x 150 mm thick)				70%	\$ 4,410	160%	\$ 10,080	\$ 6,300		\$ 7,245
4.15 Subsoil Drainage Image (slotted flexible coll pipe) linear along the length of the biofilter basin at 1 m spacings 300 lin. m \$ 49.00 80% \$ 11,760 140% \$ 20,580 \$ 14,700 \$ 1,470 \$ 1,470 \$ 1,670 4.16.1 Sandstone Wall 0 <td>4.13.3</td> <td>Scour protection - rock mattress 2 x 230 mm depth thickness</td> <td>39</td> <td>sq. m</td> <td>\$ 195.00</td> <td>70%</td> <td>\$ 5,324</td> <td>160%</td> <td>\$ 12,168</td> <td>\$ 7,605</td> <td>\$ 1,141</td> <td>\$ 8,746</td>	4.13.3	Scour protection - rock mattress 2 x 230 mm depth thickness	39	sq. m	\$ 195.00	70%	\$ 5,324	160%	\$ 12,168	\$ 7,605	\$ 1,141	\$ 8,746
4.16.1 1m spacings 300 mi.111 \$ 49.00 60% \$ 117.00 140% \$ 20.300 \$ 147.00	4.15	Subsoil Drainage										
4.16.1 Staggered sandstone stepwall - n/a 0 cu. m \$ 240.00 60% \$ -		1 m spacings	300	lin. m	\$ 49.00	80%	\$ 11,760	140%	\$ 20,580	\$ 14,700	\$ 1,470	\$ 16,170
5.0 STORMWATER DRAINAGE (U/S OF BASIN) Storm		Staggered sandstone stepwall - n/a	0	cu. m	\$ 240.00	60%	\$-	180%	\$-	\$ -	\$ -	\$ -
		STORMWATER DRAINAGE (U/S OF BASIN)				000/	¢	4.408/		•		
			71	lin. m	\$ 1,750.00							

				-										10.050	
5.1.2	2100 x 900 RCBC Class 4 - Pipe B8.2	70	lin. m	\$	1,900.00	70%	\$	93,100	160% 160%	\$	212,800 212,800	\$ 133,000			\$ 152,950 \$ 152,950
5.1.2 5.1.3	2100 x 900 RCBC Class 4 - Pipe B8.3 2700 x 900 RCBC Class 4 - Pipe B8.4	70 53	lin. m lin. m	>	2,300.00	70% 70%	\$ \$	93,100 85,330	160%	\$ \$	195,040	\$ 133,000 \$ 121,900			\$ 152,950 \$ 140,185
5.1.3	2700 x 900 RCBC Class 4 - Pipe B8.5		lin. m	\$	2,300.00		\$ \$	103,040	160%	s S	235,520	\$ 121,900 \$ 147,200			\$ 140,185 \$ 169,280
5.1.5		64	un. m	>	2,300.00	70%		103,040	140%		235,520	\$ 147,200	\$ \$		\$ 169,280
5.2	Headwall(s) with wingwalls to suit: 2700 x 900 RCBC Class 4 - Pipe B8.5		eeeb		20,000.00		\$	- 14,000	160%	\$ \$	32,000		-		Ŧ
5.4	Baseslab(s) to suit	1	each	>	20,000.00	70%	\$	14,000	140%		32,000	\$ 20,000 \$ -	\$		
5.4	1800 x 900 RCBC Class 4 - Pipe B8.1	10			750.00	80%	\$ \$	- 11,426	140%	\$ \$	- 19,995	\$ 14,283		- 1,428	\$ - \$ 15,711
	2100 x 900 RCBC Class 4 - Pipe B8.2	19	cu.m	\$		80%									
5.1.2		22	cu.m	\$	750.00	80%	\$	13,230	140%	\$	23,153	\$ 16,538		.,	÷
5.1.3	2100 x 900 RCBC Class 4 - Pipe B8.3	22	cu.m	\$	750.00	80%	\$	13,230	140%	\$	23,153	\$ 16,538		1,653	\$ 18,191
5.1.2	2700 x 900 RCBC Class 4 - Pipe B8.4	21	cu.m	\$	750.00	80%	\$	12,879	140%	\$	22,538	\$ 16,099		1,610	\$ 17,709
5.1.3	2700 x 900 RCBC Class 4 - Pipe B8.5	26	cu.m	\$	750.00	80%	\$	15,552	140%	\$	27,216	\$ 19,440	\$	1,944	\$ 21,384
5.5	Bedding material to suit								1000/						
5.1.1	1800 x 900 RCBC Class 4 - Pipe B8.1	22	cu.m	\$	63.00	70%	\$	980	160%	\$	2,239	\$ 1,400		210	\$ 1,610
5.1.2	2100 x 900 RCBC Class 4 - Pipe B8.2	25	cu.m	\$	63.00	70%	\$	1,111	160%	\$	2,540	\$ 1,588		238	\$ 1,826
5.1.3	2100 x 900 RCBC Class 4 - Pipe B8.3	25	cu.m	\$	63.00	70%	\$	1,111	160%	\$	2,540	\$ 1,588		238	\$ 1,826
5.1.2	2700 x 900 RCBC Class 4 - Pipe B8.4	24	cu.m	\$	63.00	70%	\$	1,052	160%	\$	2,404	\$ 1,503			\$ 1,728
5.1.3	2700 x 900 RCBC Class 4 - Pipe B8.5	29	cu.m	\$	63.00	70%	\$	1,270	160%	\$	2,903	\$ 1,815		272	\$ 2,087
5.6	Pits					80%	\$	-	140%	\$	-	\$-	\$	-	\$-
4.6.1	Reinforced concrete junction pits (RMS Standard DRG R0220-35)								1000/	L	1.00-		1		
4.6.2	Junction Pit (Pit B08.1) - 2.56 m deep	1	each	\$	2,550.00	70%	\$	1,785	160%	\$	4,080	\$ 2,550		383	\$ 2,933
4.6.2	Junction Pit (Pit B08.2) - 2.39 m deep	1	each	\$	2,550.00	70%	\$	1,785	160%	\$	4,080	\$ 2,550			\$ 2,933
4.6.2	Junction Pit (Pit B08.3) - 3.08 m deep	1	each	\$	2,550.00	70%	\$	1,785	160%	\$	4,080	\$ 2,550		383	\$ 2,933
4.6.2	Junction Pit (Pit B08.4) - 3.38 m deep	1	each	\$	2,550.00	70%	\$	1,785	160%	\$	4,080	\$ 2,550			\$ 2,933
	Pit depths in excess of 900 mm (100 mm increments)	78	each	\$	200.00	70%	\$	10,934	160%	\$	24,992	\$ 15,620		2,343	\$ 17,963
4.6.3	Pit Cover	4	each	\$	340.00	70%	\$	952	160%	\$	2,176	\$ 1,360			\$ 1,564
5.7	Channels					80%	\$	-	140%	\$	-	\$-	\$	-	\$ -
	n/a														
	SUBTOTAL											\$ 796,500	\$	115,325	\$ 911,825
6.0	STORMWATER DRAINAGE (D/S OF BASIN)									-					
6.1	Pipes/Culverts					80%	\$	-	140%	\$	-	\$ -	\$	-	\$-
6.1.1	n/a		lin. m			70%	\$	-	160%	\$	-	\$ -	\$		\$-
6.2	Headwall(s) with wingwalls to suit:					80%	\$	-	140%	\$	-	\$ -	\$		\$-
	n/a					80%	\$	-	140%	\$	-	\$ -	\$		\$-
6.4	Baseslab(s) to suit					80%	\$	-	140%	\$	-	\$ -	\$	-	\$-
5.4.1	n/a		cu. m	\$	333.00	80%	\$	-	140%	\$	-	\$ -	\$	-	\$-
5.5	Bedding material to suit														
5.5.1	n/a		cu. m	\$	63.00	70%	\$	-	160%	\$	-	\$ -	\$	-	\$-
5.6	Pits					80%	\$	-	140%	\$	-	\$ -	\$	-	\$-
	n/a		each												
5.7	Channels					80%	\$	-	140%	\$	-	\$ -	\$	-	\$-
5.7.1	Rock lined low flow channel (refer dwg B0886)	519	sq. m	\$	195.00	70%	\$	70,859	160%	\$	161,963	\$ 101,227		15,184	\$ 116,411
5.7.2	Geotextile under rock	519	sq. m	\$	8.75	80%	\$	3,634	140%	\$	6,359	\$ 4,543		453	\$ 4,996
5.7.3	Vegetated channel (either side of rock lined lo-flow) (refer dwg B0886), grassed (half of	850	sq. m	\$	14.80	80%	\$	10,064	140%	\$	17,612	\$ 12,580	\$	1,258	\$ 13,838
	vegetated channel area)	050		_		000/		04 700	140%	^	00.000	a 07.000	<u>^</u>	0.700	â 00.000
5.7.4	Channel batters vegetation, assumed half of area vegetated, other than grassed (mix	850	sq. m							\$	38,080	\$ 27,200	э	2,720	\$ 29,920
	tube stock - 200 mm potted plants)			*	32.00	80%	\$	21,760	11070						
575	tube stock - 200 mm potted plants)		-	۰ د			ə S	21,700		s		s -	s		\$ -
5.7.5 6.8	tube stock - 200 mm potted plants) Maintenance path/berm - concrete	0	cu. m	\$	750.00	70%		- 21,700	160%	\$	-	\$ -	\$	-	\$-
6.8	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection	0	cu. m	* \$ \$	750.00	70%	\$	-	160%	\$	-	\$ -	\$ \$	- 3 422	\$ - \$ 26 237
	tube stock - 200 mm potted plants) Maintenance path/bern - concrete Scour Protection Scour protection at Basin Outlet Pipes		-	* \$ \$				- 15,971		\$ \$	- 36,504	\$			\$ - \$ 26,237 \$ 191 403
6.8 6.8.1	tube stock - 200 mm potted plants) Maintenance pathberm - concrete Scour Protection Scour protection at Basin Outlet Pipes UBTOTAL UBTOTAL	0	cu. m	* \$ \$	750.00	70%	\$	-	160%	\$ \$	- 36,504	\$ \$ 22,815 \$ 168,365			\$ - \$ 26,237 \$ 191,403
6.8	tube stock - 200 mm potted plants) Maintenance path/bern - concrete Scour Protection Scour protection at Basin Outlet Pipes	0	cu. m	* \$ \$	750.00	70%	\$	-	160%	\$ \$	- 36,504	\$ 168,365			
6.8 6.8.1	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING	0	cu. m	\$ \$	750.00	70%	\$	-	160%	\$	- 36,504		\$ \$	23,038	\$ 191,403 \$ -
6.8 6.8.1	tube stock - 200 mm potted plants) Maintenance pathberm - concrete Scour Protection Scour protection at Basin Outlet Pipes UBTOTAL UBTOTAL	0	cu. m	\$	750.00	70%	\$	-	160% 160%	- 		\$ 168,365 \$ - \$ -	\$ \$ \$	23,038 - -	\$ 191,403 \$ - \$ -
6.8 6.8.1 7.0	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL	0	cu. m	\$	750.00	70%	\$	-	160% 160%	- 	- 36,504 ON TOTAL	\$ 168,365 \$ - \$ -	\$ \$ \$	23,038	\$ 191,403 \$ - \$ -
6.8 6.8.1 7.0 8.0	tube stock - 200 mm potted plants) Maintenance pathberm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION	0	cu. m	\$ \$	750.00	70%	\$	-	160% 160%	- 		\$ 168,365 \$ - \$ 5,976,313	\$ \$ \$	23,038 - -	\$ 191,403 \$ - \$ -
6.8 6.8.1 7.0 8.0 8.1	tube stock - 200 mm potted plants) Maintenance pathberm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost	0	cu. m	\$	750.00	70%	\$	-	160% 160%	- 		\$ 168,365 \$ - \$ -	\$ \$ \$	23,038 - -	\$ 191,403 \$ - \$ -
6.8 6.8.1 7.0 8.0 8.1 9.0	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0	cu. m	\$	750.00	70%	\$	-	160% 160%	- 		\$ 168,365 \$ - \$ 5,976,313	\$ \$ \$	23,038 - - 1,038,199	\$ 191,403 \$ - \$ -
6.8 6.8.1 7.0 8.0 8.1 9.0 9.1	tube stock - 200 mm potted plants) Maintenance pathberm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost	0	cu. m		750.00	70%	\$	-	160% 160% CONSTR	UCTI		\$ 168,365 \$ - \$ 5,976,313 \$ 1,052,176.77	\$ \$ \$ \$	23,038 - -	\$ 191,403 \$ - \$ -
6.8 6.8.1 7.0 8.0 8.1 9.0 9.1 9.2	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0	cu. m	\$	750.00	70% 70% 60%	\$	-	160% 160% CONSTR	UCTI		\$ 168,365 \$ - \$ 5,976,313 \$ 1,052,176.77 \$ -	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	23,038 - - 1,038,199	\$ 191,403 \$ - \$ -
6.8 6.8.1 7.0 8.0 8.1 9.0 9.1	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0	cu. m		750.00	70%	\$	-	160% 160% CONSTR	UCTI		\$ 168,365 \$ - \$ 5,976,313 \$ 1,052,176.77	\$ \$ \$ \$	23,038 - - 1,038,199	\$ 191,403 \$ - \$ -
6.8 6.8.1 7.0 8.0 8.1 9.0 9.1 9.2	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0	cu. m	\$	750.00	70% 70% 60%	\$	-	160% 160% CONSTR	UCTI	ON TOTAL	\$ 168,365 \$ - \$ 5,976,313 \$ 1,052,176.77 \$ - \$ - \$ -	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	23,038 - - - 1,038,199 \$1,038,199 - - -	\$ 191,403 \$ - \$ - \$ 7,014,512 \$ - \$ - \$ -
6.8 6.8.1 7.0 8.0 8.1 9.0 9.1 9.2	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0	cu. m	\$	750.00	70% 70% 60%	\$	-	160% 160% CONSTR	UCTI	ON TOTAL	\$ 168,365 \$ - \$ 5,976,313 \$ 1,052,176.77 \$ - \$ - \$ -	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	23,038 - - 1,038,199 \$1,038,199 - - - - - excluding GST	\$ 191,403 \$ - \$ 7,014,512 \$ 7,014,512 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -
6.8 6.8.1 7.0 8.0 8.1 9.0 9.1 9.2	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0	cu. m	\$	750.00	70% 70% 60%	\$	-	160% 160% CONSTR	UCTI	ON TOTAL	\$ 168,365 \$	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	23,038 - - 1,038,199 \$1,038,199 - - - - - - - - - - - - - - - - - -	\$ 191,403 \$ - \$ 7,014,512 \$ 7,014,512 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -
6.8 6.8.1 7.0 8.0 8.1 9.0 9.1 9.2	tube stock - 200 mm potted plants) Maintenance path/berm - concrete Scour Protection Scour protection at Basin Outlet Pipes SUBTOTAL MINOR LANDSCAPING SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	0	cu. m	\$	750.00	70% 70% 60%	\$	-	160% 160% CONSTR	UCTI	ON TOTAL	\$ 168,365 \$ \$ 5,976,313 \$ 1,052,176.77 \$.	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	23,038 - - 1,038,199 \$1,038,199 - - - - - excluding GST	\$ 191,403 \$ - \$ 7,014,512 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -

NB33	Brainage System - Preliminary Construction Cost			Sur	day, 24 March 2	2019								
	Drawing sets: ITEM NO. DESCRIPTION OF WORK						CONTIC	GENCY					INHERENT	COST +
		QUANTITY	UNIT	BASE RATE	LOWEST (%))	OWEST	HIGHEST (%		OPET		COST	CONTINGENCY	CONTINGENCY
	GENERAL AND PRELIMINARIES				-				1.					
	Site establishment, facilities & de-establishment	1	item	\$ 100,000.00	70%	\$	70,000	160% 160%	\$	160,000	\$	100,000	\$ 15,000	
	Traffic management Temporary site fencing incl gates, supports etc	1 2,412	item lin. m	\$ 10,000.00 \$ 20.00	70%	\$	7,000 38,588	160%	\$ \$	16,000 67,529	\$ \$	10,000 48,235	\$ 1,500 \$ 4,823	\$ 11,500 \$ 53,058
	Provision and maintenance of sediment & erosion control	1	item	\$ 50,000.00	70%	\$	35,000	160%	\$		\$	50,000	\$ 7,500	\$ 57,500
	Clean water diversions, per month	3	months	\$ 15,000.00	70%	\$	31,500	160%	\$	72,000	\$	45,000	\$ 6,750	\$ 51,750
	SUBTOTAL										\$	253,235	\$ 35,573	\$ 288,808
2.0 2.1	DEMOLITION, CLEARING AND GRUBBING	573		\$ 2.50	60%	¢	960	180%	¢	2,579	\$	1,433	\$ 286	\$ 1,719
2.1	Clearing & grubbing incl. clearing of existing creek, tree removal etc	575	sq. m	\$ 2.50	6U%	\$	860	100%	\$	2,579	æ	1,435	φ 200	\$ 1,719
	Demolish existing buildings	0	sq. m	\$ 62.10	70%	\$	-	160%	\$	-	\$	-	\$ -	\$-
	Demolish roads/access paths/driveways within proposed footprint	80	sq. m	\$ 49.50	70%	\$	2,772	160%	\$	6,336	\$	3,960	\$ 594	\$ 4,554
	Strip topsoil, stockpile, respread as per landscape plans (excludes	86	cu. m	\$ 18.00	80%	\$	1,238	140%	\$	2,166	\$	1,548	\$ 154	\$ 1,702
	Dispose of excess/unsuitable topsoil (nominal 10% allowance) Cartage	9 172	tonne	\$ 54.18 \$ 0.80	80% 80%	\$ \$	410 110	140% 140%	\$ \$	717 193	\$ \$	513 138	\$ 50 \$ 13	\$ 563 \$ 151
	SUBTOTAL	172	cu.m/km	ə 0.00	80%	φ	110	140 /0	φ	195	\$	7,592	\$ 1,098	\$ 8,690
3.0	EARTHWORKS										Ť	1,002	• 1,000	• 0,000
3.1	Cut to fill or disposal in all classes of material													
	Basin Earthworks													
	Channel Earthworks	450		¢ 0.07	C004	¢	0.047	4000/	¢	6.054	¢	0.005	e 700	e 4.404
3.3.1	Channel NB33 Total cut to disposal - channel earthworks (assume all contaminated)	459	cu. m	\$ 8.05	60%	\$	2,217	180%	\$	6,651	\$	3,695	\$ 739	\$ 4,434
3.3.2	Channel NB33 Total fill - channel earthworks (assume all fill from cut)	0	cu. m	\$ 13.55	60%	\$	-	180%	\$	-	\$	-	\$	\$-
3.3.3	All channels: Rolling of exposed surface	5		\$ 5.00	60%	\$	15	180%	\$	45	\$	25	\$ 5	\$ 30
	Disposal cost	5	sq. m	φ 3.00	00%	Ŷ	13	10070	Ŷ	40	Ψ	20	÷ 5	÷ 30
	Cost of disposal of soil as "No Contamination" at an approved landfill	0	cu.m	\$ 80	80%	\$	-	140%	\$	-	\$	-	\$ -	\$ -
	within 10km		cu.m				0.45 500	1 100/	<u>^</u>	400.000	<u>^</u>	000 070	*	
3.4.2	Cost of disposal of soil as "Low Level Contamination" (i.e. General Solid Waste) at an approved landfill within 10km	829	tonne	\$ 370	80%	\$	245,502	140%	\$	429,629	\$	306,878	\$ 30,688	\$ 337,566
	Additional allowance for cartage of contaminated soil to Eastern	15080		\$ 0.80	80%	\$	9,651	140%	\$	16,890	\$	12,064	\$ 1,206	\$ 13,270
	Creek Landfill an additional 10km (i.e. 20km one-way total distance)		cu.m / km											
3.5	Pipe Excavation													
3.5.1	Total Cut from 12D model	295	cu. m	\$ 70.00	70%	\$	14,455	160%	\$	33,040	\$	20,650	\$ 3,098	\$ 23,748
3.6	Trim, consolidation and final shaping of batters, basins, berms,	459	sq. m	\$ 21.67	70%	\$	6,963	160%	\$	15,914	\$	9,947	\$ 1,492	\$ 11,439
3.7	channels. swales. wetland etc Installation and compaction of clay liner as specified					-			-					
	Dewatering of onsite dams, including allowance for management													
3.8	of discharge water											252 250	¢ 97.997	¢ 200.486
3.8	of discharge water SUBTOTAL								<u>t</u>		\$	353,259	\$ 37,227	\$ 390,486
3.8 4.0	of discharge water										\$	353,259	\$ 37,227	\$ 390,486
3.8 4.0 4.1 4.1.1	of dischare water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC	180	lin. m	\$ 2,000.00	70%	\$	252,000	160%	\$	576,000	\$ \$	353,259 360,000	\$ 37,227 \$ 54,000	\$ 390,486 \$ 414,000
3.8 4.0 4.1 4.1.1 4.2	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit									576,000	\$	360,000	\$ 54,000	\$ 414,000
3.8 4.0 4.1 4.1.1 4.2 4.2.1	of discharde water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC	180	lin. m no	\$ 2,000.00 \$ 18,000.00	70%	\$	252,000	160% 160%	\$ \$ \$		\$ \$ \$			
3.8 4.0 4.1 4.1.1 4.2 4.2.1 4.3	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit	1	no	\$ 18,000.00	70%	\$	12,600	160%	\$	576,000 28,800	\$	360,000 18,000	\$ 54,000 \$ 2,700	\$ 414,000 \$ 20,700
3.8 4.0 4.1 4.1.1 4.2 4.2.1 4.3 4.3.1	of discharde water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC									576,000	\$ \$	360,000	\$ 54,000	\$ 414,000
3.8 4.0 4.1 4.2 4.2.1 4.3 4.3.1 4.4	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x800 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC	1	no	\$ 18,000.00	70%	\$	12,600	160%	\$	576,000 28,800	\$ \$	360,000 18,000	\$ 54,000 \$ 2,700	\$ 414,000 \$ 20,700
3.8 4.0 4.1 4.1 4.2 4.2.1 4.3 4.3.1 4.3.1 4.4 4.5	of discharace water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pits	1 27 180	no cu. m cu. m	\$ 18,000.00 \$ 750.00 \$ 63.00	70% 80% 80%	\$ \$ \$ \$	12,600 16,200 9,072	160% 140% 140%	\$ \$ \$	576,000 28,800 28,350 15,876	\$ \$ \$ \$	360,000 18,000 20,250 11,340	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474
3.8 4.0 4.1 4.1 4.2 4.2.1 4.3 4.3.1 4.4 4.4.1 4.5 4.5.1	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35)	1 27 180 2	no cu. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00	70% 80% 80% 70%	\$ \$ \$ \$ \$	12,600 16,200 9,072 3,570	160% 140% 140% 160%	\$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160	\$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865
3.8 4.0 4.1 4.1 4.2 4.2.1 4.3 4.3.1 4.4 4.4.1 4.5 4.5.1	of discharace water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pits	1 27 180	no cu. m cu. m	\$ 18,000.00 \$ 750.00 \$ 63.00	70% 80% 80%	\$ \$ \$ \$	12,600 16,200 9,072	160% 140% 140%	\$ \$ \$	576,000 28,800 28,350 15,876 8,160	\$ \$ \$ \$	360,000 18,000 20,250 11,340	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474
3.8 4.0 4.1 4.2 4.2.1 4.3 4.3.1 4.4 4.5 4.5.1 4.5.2 4.5.3	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m)	1 27 180 2	no cu. m cu. m each	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00	70% 80% 80% 70%	\$ \$ \$ \$ \$	12,600 16,200 9,072 3,570	160% 140% 140% 160%	\$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160	\$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865
3.8 4.0 4.1 4.2 4.2 4.2 4.2 4.3 4.3 4.3 4.4 4.4 4.4 4.5 1 4.5 2 4.5 2 4.5 3 4.5 4.5	of discharace water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bodding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels	1 27 180 2 8 2 2	no cu. m cu. m each each each	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 2,550.00 \$ 200.00 \$ 340.00	70% 80% 80% 70% 70% 70%	\$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476	160% 140% 140% 160% 160%	\$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088	\$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782
3.8 4.0 4.1 4.2 4.2.1 4.2 4.3 4.3 4.3 4.3 4.3 4.5 4.5 4.5 5 4.5 5	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and vingwall(s) to suit Headwall to suit 2x2400x600 RCBC Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel	1 27 180 2 8 2 1,600	no cu. m cu. m each each each sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00	70% 80% 80% 70% 70% 70% 70%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400	160% 140% 140% 160% 160% 160% 160%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200	\$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 226 \$ 102 \$ 46,800	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800
3.8 4.0 4.1 4.1.1 4.2 4.3.1 4.3 4.3.1 4.4 4.5 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.5 4.5.5	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²)	1 27 180 2 8 2 1,600 1,600	no cu. m cu. m each each each sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00	70% 80% 80% 70% 70% 70% 80%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200	160% 140% 140% 160% 160% 160% 160% 140%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600	\$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,000	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102 \$ 46,800 \$ 1,400	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400
3.8 4.0 4.1 4.2 4.2.1 4.2 4.3 4.3 4.3 4.3 4.3 4.5 4.5 4.5 5 4.5 5	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grasse(half) of vegetated channel area)	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80	70% 80% 70% 70% 70% 70% 80% 70%	· \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 140% 160% 160% 160% 160%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,000 14,800	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102 \$ 46,800 \$ 1,400 \$ 2,220	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 17,020
3.8 4.0 4.1 4.1.1 4.2 4.3.1 4.3 4.3.1 4.4 4.5 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.5 4.5.5	of discharace water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.76 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel Suffers vegetation, assumed half of area vegetated, other	1 27 180 2 8 2 1,600 1,600	no cu. m cu. m each each each sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00	70% 80% 80% 70% 70% 70% 80%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200	160% 140% 140% 160% 160% 160% 160% 140%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600	\$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,000	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102 \$ 46,800 \$ 1,400	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400
3.8 4.0 4.1 4.1.1 4.2.1 4.3.1 4.3.1 4.3.1 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grasse(half) of vegetated channel area)	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each sq. m sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80	70% 80% 70% 70% 70% 70% 80% 70%	· \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 140% 160% 160% 160% 160%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,000 14,800	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102 \$ 46,800 \$ 1,400 \$ 2,220	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 17,020
3.8 4.0 4.1 4.1.1 4.2 4.3 4.3.1 4.3 4.4.4 4.5.1 4.5.2 4.5.3 4.5.5 4.5.6 4.5.7 4.5.8	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (reither side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetation, assumed half of area vegetated, other than grassed (half of wix tube stock - 200 mm potted plants)	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each sq. m sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80	70% 80% 70% 70% 70% 70% 80% 70%	· \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 140% 160% 160% 160% 160%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,800 192,000	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 226 \$ 102 \$ 1,400 \$ 1,400 \$ 2,220 \$ 19,200	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 17,020 \$ 211,200
3.8 4.0 4.1 4.1.1 4.2 4.3.1 4.3 4.3.1 4.3 4.4.1 4.5 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8 5.0	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and vingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bdding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geolextile under rock (11.549 m ²). Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetated, name half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL MINOR LANDSCAPING	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each sq. m sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80	70% 80% 70% 70% 70% 70% 80% 70%	· \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 140% 160% 160% 160% 160%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680 268,800	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,800 192,000 949,678	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,020 \$ \$ 1,400 \$ \$ 2,220 \$ \$ 1,400 \$ \$ 1,400 \$ \$ 2,220 \$ \$ 19,200 \$ \$ 130,572 \$	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 17,020 \$ 211,200 \$ 1,080,250
3.8 4.0 4.1 4.2 4.2 4.3 4.3 4.3 4.4 4.4 4.5 1 4.5 2 4.5 5 4.5 5 0	of discharae water strormWATER DRAINAGE Pipes/Culverts 2x2400x500 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Bases slab(s) to suit Basedian to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11.549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel balters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each sq. m sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80	70% 80% 70% 70% 70% 70% 80% 70%	· \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 160% 160% 160% 160% 160% 140%	5 5 5 5 5 5 5 5 5 5 5 5	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680 268,800	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,000 14,800 14,800 14,800 14,800 -	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102 \$ 102 \$ 46,800 \$ 1,400 \$ 1,400 \$ 2,220 \$ 19,200 \$ 130,572 \$.	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 17,020 \$ 211,200 \$ 211,200 \$ 211,200 \$ 2,215,400 \$ 21,080,250 \$ 2,000,000 \$ 2,000,000 \$ 2,000,000 \$ 2,000,000 \$ 2,000,000 \$ 2,000,000 \$ 3,000,000 \$ 3,000,000,000 \$ 3,000,000 \$ 3,000,000,000 \$ 3,000,000,000 \$ 3,000,000,000,000 \$ 3,000,000,000,000,000,000,000,000,000,0
3.8 4.0 4.1 4.1.1 4.2 4.2 4.3 4.3 4.3 4.3 4.3 4.5 4.5 4.5 5 4.5 5 0	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Cuiverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel Satters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL.	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each sq. m sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80	70% 80% 70% 70% 70% 70% 80% 70%	· \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 160% 160% 160% 160% 160% 140%	5 5 5 5 5 5 5 5 5 5 5 5	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680 268,800	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 5,100 1,508 680 312,000 14,000 14,800 14,800 14,800 14,800 949,678	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,020 \$ \$ 1,400 \$ \$ 2,220 \$ \$ 1,400 \$ \$ 1,400 \$ \$ 2,220 \$ \$ 19,200 \$ \$ 130,572 \$	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 17,020 \$ 211,200 \$ 211,200 \$ 211,200 \$ 2,215,400 \$ 21,080,250 \$ 2,000,000 \$ 2,000,000 \$ 2,000,000 \$ 2,000,000 \$ 2,000,000 \$ 2,000,000 \$ 3,000,000 \$ 3,000,000,000 \$ 3,000,000 \$ 3,000,000,000 \$ 3,000,000,000 \$ 3,000,000,000,000 \$ 3,000,000,000,000,000,000,000,000,000,0
3.8 4.0 4.1 4.1.1 4.2 4.3.1 4.3 4.3.1 4.3 4.4 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8 5.0 6.0	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geolextile under rock (11.549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel batters vegetatedn, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL MINOR LANDSCAPING PROJECT MANAGEMENT AND SUPERVISION	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each sq. m sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80	70% 80% 70% 70% 70% 70% 80% 70%	· \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 160% 160% 160% 160% 160% 140%	5 5 5 5 5 5 5 5 5 5 5 5	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680 268,800	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,800 192,000 949,678 1,563,764	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102 \$ 102 \$ 46,800 \$ 1,400 \$ 1,400 \$ 2,220 \$ 19,200 \$ 130,572 \$.	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 17,020 \$ 211,200 \$ 211,200 \$ 211,200 \$ 2,215,400 \$ 2,215,400 \$ 2,255 \$ 2,255 \$ 2,275 \$ 2,275 \$ 2,275 \$ 2,275 \$ 2,275 \$ 2,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 5,865 \$ 1,734 \$ 5,865 \$ 1,734 \$ 358,800 \$ 15,400 \$ 17,000 \$ 2,215 \$ 2,275 \$ 3,000 \$ 1,734 \$ 3,000 \$ 1,000 \$ 1,000 \$ 2,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 3,000 \$ 1,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 3,000 \$ 2,000 \$ 3,000 \$ 3,0000 \$ 3,000 \$ 3,0000 \$ 3,0000
3.8 4.0 4.1 4.1.1 4.2 4.2.1 4.3 4.3.1 4.4.1 4.5 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8 5.0 6.0 6.1	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Cuiverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel Satters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL.	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each sq. m sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80	70% 80% 70% 70% 70% 70% 80% 70%	· \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 160% 160% 160% 160% 160% 140%	5 5 5 5 5 5 5 5 5 5 5 5	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680 268,800	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,000 14,800 14,800 14,800 14,800 -	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102 \$ 102 \$ 46,800 \$ 1,400 \$ 1,400 \$ 2,220 \$ 19,200 \$ 130,572 \$.	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 17,020 \$ 211,200 \$ 211,200 \$ 211,200 \$ 2,215,400 \$ 2,215,400 \$ 2,255 \$ 2,255 \$ 2,275 \$ 2,275 \$ 2,275 \$ 2,275 \$ 2,275 \$ 2,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 5,865 \$ 1,734 \$ 5,865 \$ 1,734 \$ 358,800 \$ 15,400 \$ 17,000 \$ 2,215 \$ 2,275 \$ 3,000 \$ 1,734 \$ 3,000 \$ 1,000 \$ 1,000 \$ 2,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 3,000 \$ 1,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 3,000 \$ 2,000 \$ 3,000 \$ 3,0000 \$ 3,000 \$ 3,0000 \$ 3,0000
3.8 4.0 4.1 4.1.1 4.2 4.3.1 4.3.1 4.3.1 4.3.1 4.4 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8 5.0 6.0 6.1 7.1	of discharace water SUBTOTAL STORMWATER DRAINAGE Pipes/Culverts 2x2400x600 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding to suit 2x2400x600 RCBC Pits Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m ; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geoletatile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel Datters vegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL PROJECT MANAGEMENT AND SUPERVISION 15% construction cost	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each sq. m sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80 \$ 32.00	70% 80% 70% 70% 70% 70% 80% 70%	· \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 140% 160% 160% 160% 160% 160% 140% 200%	5 5 5 5 5 5 5 5 5 5 5 5	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680 268,800	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,800 192,000 949,678 1,563,764	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102 \$ 102 \$ 46,800 \$ 1,400 \$ 1,400 \$ 2,220 \$ 19,200 \$ 130,572 \$.	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 17,020 \$ 211,200 \$ 211,200 \$ 211,200 \$ 2,212,00 \$ 2,2275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 358,800 \$ 15,400 \$ 17,020 \$ 2,2175 \$ 2,2275 \$ 3,000 \$ 1,734 \$ 3,000 \$ 1,734 \$ 3,000 \$ 1,734 \$ 3,000 \$ 1,734 \$ 3,000 \$ 1,734 \$ 3,000 \$ 1,000 \$ 2,000 \$ 2,000 \$ 1,000 \$ 2,000 \$ 3,000 \$ 3,000 \$ 3,000 \$ 3,000 \$ 3,000 \$ 3,000 \$ 3,000 \$ 5,000 \$ 5,0000 \$ 5,0000 \$ 5,0000 \$ 5,0000 \$ 5,0000 \$ 5,0000 \$ 5,00000 \$ 5,00000 \$ 5,00000 \$ 5,000000000000000000000000000000000000
3.8 4.0 4.1 4.2 4.2.1 4.2 4.3 4.3.1 4.4.1 4.5 4.5.1 4.5.2 4.5.3 4.5.5 4.5.5 4.5.5 4.5.5 4.5.5 4.5.5 4.5.5 4.5.7 4.5.8 5.0 6.0 6.1 7.2	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Cuiverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel Satter svegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL. PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each sq. m sq. m sq. m no	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 350.00 \$ 350.00 \$ 350.00	70% 80% 70% 70% 70% 70% 80% 80%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 140% 160% 160% 160% 160% 140% 140%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 23,680 268,800 2668,800	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,800 192,000 949,678 1,563,764	\$ 54,000 \$ 2,700 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 2266 \$ 1,134 \$ 5 2,220 \$ 1,400	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 15,400 \$ 17,020 \$ 211,200 \$ 211,200 \$ 1,080,250 \$ 1,768,234 \$.
3.8 4.0 4.1 4.1.1 4.2 4.3.1 4.3.1 4.3.1 4.3.1 4.4 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8 5.0 6.0 6.1 7.1	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Cuiverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel Satter svegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL. PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each each each sq. m sq. m sq. m	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 340.00 \$ 195.00 \$ 8.75 \$ 14.80 \$ 32.00	70% 80% 70% 70% 70% 70% 80% 80% 80%	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 140% 160% 160% 160% 160% 160% 140% 200%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 23,680 268,800 2668,800	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,800 192,000 949,678 1,563,764	\$ 54,000 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 1,144 \$ 1,	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 1,7020 \$ 211,200 \$ 211,200 \$ 1,080,250 \$. \$. \$ 1,768,234
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3.8 4.0 4.1 4.1.1 4.2.1 4.3.1 4.4.1 4.5 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8 5.0 6.0 6.1 7.2	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Cuiverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel Satter svegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL. PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each sq. m sq. m sq. m no	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 350.00 \$ 350.00 \$ 350.00	70% 80% 70% 70% 70% 70% 80% 80%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 140% 160% 160% 160% 160% 140% 140%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680 268,800 268,800 0N TOTAL	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,800 192,000 949,678 - - - - - - - - - - - - -	\$ 54,000 \$ 2,700 \$ 2,700 \$ 2,025 \$ 1,134 \$ 765 \$ 226 \$ 102 \$ 46,800 \$ 102 \$ 46,800 \$ 122 \$ 204,470 \$ 2,220 \$ 130,572 \$ 204,470 \$ 2,04,470 \$ 2,04,	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 15,400 \$ 15,400 \$ 15,400 \$ 17,020 \$ 211,200 \$ 211,200 \$ 1,080,250 \$ 1,768,234 \$ 5 \$ - \$ 2,033,469 \$ 2,033,469
3.8 4.0 4.1 4.1.1 4.2.1 4.3.1 4.4.1 4.5.1 4.5.1 4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8 5.0 6.0 6.1 7.2	of discharae water SUBTOTAL STORMWATER DRAINAGE Pipes/Cuiverts 2x2400x800 mm RCBC Headwall(s) and wingwall(s) to suit Headwall to suit 2x2400x600 RCBC Base slab(s) to suit Baseslab to suit 2x2400x600 RCBC Bedding material to suit Bedding to suit 2x2400x600 RCBC Pits Reinforced concrete junction pits (RMS Standard DRG R0220-35) Pit depth increments in excess of 900 mm (Depths : 2.13 m ; 2.14 m ; 2.60 m; 1.78 m ; 1.84 m) Pit cover Channels Rock lined low flow channel Geotextile under rock (11,549 m ²) Vegetated channel (either side of rock lined low-flow) assume grassed (half of vegetated channel area) Channel Satter svegetation, assumed half of area vegetated, other than grassed (mix tube stock - 200 mm potted plants) SUBTOTAL. PROJECT MANAGEMENT AND SUPERVISION 15% construction cost CONTINGENCIES	1 27 180 2 8 2 1,600 1,600 1,000	no cu. m cu. m each each sq. m sq. m sq. m no	\$ 18,000.00 \$ 750.00 \$ 63.00 \$ 2,550.00 \$ 200.00 \$ 340.00 \$ 195.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 340.00 \$ 350.00 \$ 350.00 \$ 350.00	70% 80% 70% 70% 70% 70% 80% 80%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	12,600 16,200 9,072 3,570 1,056 476 218,400 11,200 10,360	160% 140% 140% 160% 160% 160% 160% 140% 140%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	576,000 28,800 28,350 15,876 8,160 2,413 1,088 499,200 19,600 23,680 23,680 CON TOTAL	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	360,000 18,000 20,250 11,340 5,100 1,508 680 312,000 14,800 14,800 192,000 949,678 - - 1,563,764 - - - TRUCTION T	\$ 54,000 \$ 2,700 \$ 2,700 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 226 \$ 1,134 \$ 765 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$ 204,470 \$	\$ 414,000 \$ 20,700 \$ 22,275 \$ 12,474 \$ 5,865 \$ 1,734 \$ 782 \$ 358,800 \$ 1,768,234 \$ 1,768,234 \$ 1,768,234 \$ 5 \$ 2,033,469 \$ 203,347

B_Fou	th Draft Detailed concept design culverts Drawing sets:			Thursda	ay, 29 N	lovember 20	018										
	ITEM NO. DESCRIPTION OF WORK	QUANTITY	UNIT	BASE	RATE	LOWEST		OWEST	ITIGENCY HIGHEST (%)		IGHEST		COST				DST + INGENCY
1.0	GENERAL AND PRELIMINARIES					(%)		COST			COST						
1.1 1.2	Site establishment, facilities & de-establishment Traffic management	0	item item	\$ 100,0 \$ 5,0	00.000	70% 70%	\$ \$	-	160% 160%		-	\$ \$	-	\$	-	\$ \$	-
1.2	Temporary site fencing incl gates, supports etc	0	lin. m	\$ 5,0	16.25	80%	\$	-	140%		-	\$	-	\$ \$	-	\$	-
1.4	Provision and maintenance of sediment & erosion control	0	item	\$ 40,0	00.000	70%	\$		160%	\$	-	\$	-	\$	-	\$	-
1.5	Clean water diversions, per month	0	months	\$ 10,0	00.00	70%	\$	-	160%	\$	-	\$	-	\$	-	\$	-
	SUBTOTAL											\$	-	\$	-	\$	-
2.0	DEMOLITION, CLEARING AND GRUBBING	-														_	
2.1	Clearing & grubbing incl. clearing of existing creek, tree removal etc	0	sq. m	\$	0.53	60%		-	180%		-	\$	-	\$	-	\$	-
2.2	Demolish existing buildings Demolish roads/access paths/driveways within	0	sq. m sq. m	\$ \$	62.10 49.50	70%	\$ \$	-	160% 160%		-	\$ \$	-	\$	-	\$ \$	-
	proposed footprint Strip topsoil, stockpile, respread as per landscape	0		\$	18.00	80%	\$	-	140%	\$	-	\$	-	\$	-	\$	-
2.4	plans (excludes any topsoil improvement works.)		cu. m														
2.5	Dispose of excess/unsuitable topsoil (nominal 10% allowance)	0	tonne	\$	54.18	80%	\$	-	140%	\$	-	\$	-	\$	-	\$	-
2.5	Cartage SUBTOTAL	0	cu.m / km	\$	0.57	80%	\$	-	140%	\$	-	\$ \$	-	\$ \$	-	\$ \$	-
3.0	EARTHWORKS											Ψ	-	Ŷ	-	Ψ	-
3.1	Cut to fill or disposal in all classes of material																
3.2	Basin Earthworks																
3.3	Channel Earthworks						-					-					
							F			_		F					
3.4 3.4.1	Pipe Excavation Total Cut (estimate)	1,374	cu. m	s	8.05	70%	\$	7,742	160%	\$	17,696	\$	11,060	\$ 1	,659	\$	12,719
	Trim, consolidation and final shaping of batters,	1,374	cu. III	Ŷ	0.05	70%	э \$	-			-	э \$	-	\$ \$	-	\$ \$	-
3.5	basins, berms, channels, swales, wetland etc																
3.6	Installation and compaction of clay liner as																
	specified																
	Dewatering of onsite dams, including allowance for	0		\$	66.50	60%	\$	-	180%	\$	-	\$	-	\$	-	\$	-
3.7	management of discharge water		sq. m														
	SUBTOTAL STORMWATER DRAINAGE											\$	11,060	\$ 1	,659	\$	12,719
4.0																	
4.1	Pipes/Culverts					1	[1					
4.1.1	3 x 3300 x 2400 mm RCBC	81	lin. m		250.00	70%	_	578,162			1,321,512	\$	825,945		,892	\$	949,837
4.1.2 4.1.3	2 x 3300 mm link slab	54	lin. m lin. m		000.00 400.00	70% 70%	\$ \$	- 52,646	160% 160%	\$ \$	120,333	\$ \$	75,208	\$ \$ 11	- ,281	\$ \$	86,489
4.1.4 4.2	Headwall(s) and wingwalls to suit		cu.m.	\$ 4	456.00	60%	\$	-	180%	\$	-	\$	-	\$	-	\$	-
4.2	2 headwalls with wingwalls to suit	2	no	\$ 35,0	00.00	60%	\$	42,000	180%	\$	126,000	\$	70,000	\$ 14	,000	\$	84,000
4.3	Wingwall(s) to suit																
4.4	Base slab(s) to suit																
4.4.1	2 x base slab to support 1x3300x2400	27	cu. m		750.00	70%		13,960	160%		31,910	\$	19,944		,991	\$	22,935
4.4.2	1 x base slab to support 1 x 3300 x 2700 mm RCBC and 2 x 3300 link slab	40	cu. m	\$ 1	750.00	70%	\$	20,941	160%	\$	47,865	\$	29,916	\$ 4	,487	\$	34,403
4.5	Pits		<u> </u>														
4.6 4.6.1	Channels Scour protection - rock mattress 230 mm thickness at	1,634		\$ ·	195.00	70%	\$	222,973	160%	\$	509,652	\$	318,533	\$ 47	,779	\$	366,312
	16.5 m length and 50 m		sq.m									L		•	45		
5.0	SUBTOTAL DISPOSAL COSTS											\$	1,339,546	\$ 204	,430	\$	1,543,976
5.1	Cost of disposal of soil as "No Contamination" at an approved landfill within 10km	811	cu.m	\$	80	80%	\$	51,897	140%	\$	90,820	\$	64,872	\$6	,486	\$	71,358
	Cost of disposal of soil as "Low Level Contamination"		tonne	\$	370	80%	\$	183,313	140%	\$	320,797	\$	229,141	\$ 22	,914	\$	252,055
5.2	(i.e. General Solid Waste) at an approved landfill within 10km	619															
5.3	Additional allowance for cartage of contaminated soil to	11260	cu.m / km	\$	0.80	80%	\$	7,206	140%	\$	12,611	\$	9,008	\$	901	\$	9,909
L	Eastern Creek Landfill an additional 10km (i.e. 20km one-way total distance)			L													
6.0	SUBTOTAL MINOR LANDSCAPING											\$	303,021.00	\$ 30,30	1.13	\$	333,322.13
6.0																	
							<u> </u>					<u> </u>					
	SUBTOTAL											\$	-	\$	-	\$	-
7.0	PROJECT MANAGEMENT AND SUPERVISION	CONSTR	UCTION TO	DTAL								\$	1,653,627	\$ 236	,390	\$	1,890,017
7.1	15% construction cost											\$	283,503				
8.0 8.1	CONTINGENCIES Inherent contingency													\$ 236	,390		
8.2			tonne		350.00	80%		-	140%		-	\$ ¢	-	\$	-	\$ ¢	-
8.3			cu.m / km	\$	0.57	80%	\$	-	140%	φ	-	\$	-	\$	-	\$	-
										-	CONS	TRU	ICTION TOT	AL, excluding	GST GST	\$ \$	2,173,519 217,352
														AL, including	GST	\$	2,390,871
												CO	NSTRUCTIO	N TOTAL, rou	nded	\$	2,391,000
1																	

ALN representative stormwater infrastructure - Additional costs inclusion

			B22 1% AEP		B08 50% AEP	N	NB33 IB System		B Fourth C Removed	Notes
	JWP Revised Construction Cost		9,887,209	-	5,976,313		1,563,764			Based on adjustment of rates (only) in SMEC cost sheet
SMEC		E	stimated	E	stimated	E	stimated		stimated	· · · ·
Item	Previously Excluded Items from Spreadsheet List	A	dditional	A	Additional	A	dditional	A	dditional	
Nunber			Cost		Cost		Cost		Cost	
1	Consultant's fees	\$	741,541	\$	448,223	\$	117,282	\$	124,022	Based on 7.5% of construction cost
2	Utility/services investigation, relocation or protection	\$	74,154	\$	44,822	\$	11,728	\$	12,402	DBYD searches & Vacuum truck investigation only
3	Geotechnical investigations	\$	49,436	\$	29,882	\$	7,819	\$	8,268	Preliminary reports & investigation only, no testing
5	Detailed topographic survey	\$	29,662	\$	17,929	\$	4,691	\$	4,961	Estimated on known quantity & scope of works
7	Statutory and consultancy fees for all approvals (e.g. environmental etc.)	\$	98,872	\$	59,763	\$	15,638	\$	16,536	Based on 1% of construction cost
8	Construction setout & survey	\$	49,436	\$	29,882	\$	7,819	\$	8,268	Establish controls, pegging & electronic data
9	Work as executed survey & documentation	\$	24,718	\$	14,941	\$	3,909	\$	4,134	Survey pick up & marked drawings
12	All landscaping and planting (excluding bio-retention basin) for distribution channel batter slopes and trunk channel batter slopes	\$	138,421	\$	83,668	\$	21,893	\$	23,151	Estimated on known quantity & scope of works
13	Allowance for management or maintenance of the basins & structures	\$,	\$	35,858		9,383		,	Estimated on 4 inspections & minor maintenance tasks
14	Preparation of a Site Management Plan or Environmental Management Plan	\$	5,000	\$	5,000	\$	5,000	\$	5,000	Estimate for preparing construction documentation
15	Rates for demolition do not include allowance for disposal of material off site, or disposal of contaminated waste	\$	148,109	\$	68,310	\$	-	\$	-	Provisional amount equivelent to demolition cost provided
			1,418,672	\$	838,278	\$	205,162	\$	216,664	
	Construction Cost with previously excluded Items added (JWP opinion)	\$1	1,305,881	\$	6,814,591	\$	1,768,926	\$	1,870,291	