2 Master Planning

This section of the report sets out the Ministry's requirements for the development of Redcliffs School based on their School Property Guide (SPG) and the existing floor areas listed on the Property Management Information System (PMIS).

A description is then provided for the key elements of the Bulk & Location Plans for the three development options. These architectural plans reflect the environmental and design considerations, access to and through the site, layout and the response to the required rockfall protection bund.

Key elements that are being addressed are:

- Whether the required facilities can be accommodated on site (including courts and playing fields), possible access arrangements and sufficient car parking; and
- Providing for potentially shared community facilities (such as halls / hard courts / fields) in a manner that is easily accessible by the community.

2.1 Ministry Requirements

The conceptual Bulk & Location Plans for the three development options are based on the Ministry's SPG for a roll of 300 and 400 respectively evenly distributed through years 1-8.

Table 2-1 highlights that by using existing buildings where possible, the existing site with a roll of 300 will be slightly over its net area entitlement for Admin and Library by 27m^2 and 18m^2 respectively. However, as the roll increases to a maximum of 400 only the Library area is over its net area entitlement by just 7m^2.

Table 2-2 sets out the allocation of floorspace where a school is designed to be compliant with the area entitlements for the respective rolls of 300 and 400 students.

Table 2-1: Floor Areas for School Buildings (Existing School)

Existing School		Gross Total	Net Total	Admin	Class rooms	Teaching	Library	Resource	Hall
Existing Areas	Area m^2	1505	1150	205	10	780	88	77	0
Add for 300 Roll	Area m^2	616	474	0	3	229	0	43	202
	Sub-total	2121	1624	205	13	1009	88	120	202
	Entitlement	**2052**	**1578**	**178**	**13**	**1009**	**70**	**120**	**202**
Add for 400 Roll	Area m^2	490	377	0	4	308	0	18	51
	Sub-total	2611	2001	205	17	1317	88	138	253
	Entitlement	**2593**	**1994**	**205**	**17**	**1317**	**81**	**138**	**253**

Table 2-2: Floor Areas for School Buildings (New Build)

New school		Gross Total	Net Total	Admin	Class rooms	Teaching	Library	Resource	Hall
300 Roll	Area m^2	2053	1579	178	13	1009	70	120	202
Add for 400 Roll	Area m^2	540	415	27	4	308	11	18	51
	Entitlement	**2593**	**1994**	**205**	**17**	**1317**	**81**	**138**	**253**

For the purpose of this study the Bulk & Location Plan for the new school present a combined gross floor area for Classrooms and Resource areas.

2.2 Option 1 - Existing Buildings Site Development Plan (along bund)

Refer **Appendix A** Drawing Existing Buildings

2.2.1 Environmental and Design Considerations

The site is aligned in a northwest orientation bordering Main Road to the northeast. The southwest and northwest boundaries now border an area considered to be unsafe to occupy due to the unstable nature of the cliffs and a 4m high rockfall protection bund is required along these boundaries. The prevailing winds are the nor'easter and Sou'wester.

2.2.2 Proposed Access

Access to the site remains unchanged in the existing buildings scheme.

2.2.3 Landscaping, Hardcourts and Playing Fields

The requirement for an additional 3 Classrooms to meet the 300 roll requirement has no impact on the existing hard and soft landscaping as the location of the additional classrooms is the same as previous classrooms.

The hardcourt area is reduced by 30% due to the proposed location of the rockfall protection bund, while one of the playing fields is reduced to accommodate the new location of the school Hall. The hardcourt area would be further reduced by the additional 4 Classrooms required to meet the roll growth to 400 students. This eliminates the ability to accommodate netball courts.

2.2.4 Existing Building Coverage

The area lost to the rock fall zone is approximately 4,500m^2 or 24% of the overall site area which leaves approximately 18,732m^2 (1.87ha) of the site for redevelopment of the existing school, including the space requirements for the rockfall protection bund. The area lost to rockfall included the school Hall and five Classrooms. A new Hall is proposed at the existing vehicle entry to the School grounds. This location is recommended as it is adjacent to the existing carparking to enable easy access and way finding for community events as well as being centrally located between the playing fields for sporting activities.

The Gross Floor Area (GFA) of 2,121m^2 or 11% of the available safe site area does not include other areas such as a canteen or implement shed which would increase the actual footprint further.

New Classrooms are single storey in keeping with the existing school character and is more cost effective than 2 storey buildings at this scale.

2.2.5 Staging/Future Growth

The existing building stock already has the entitled floor areas for Admin and Library to accommodate a growth in roll from 300 to 400 students. To accommodate future growth in teaching space an additional 4 Classrooms and associated Resource areas are required as well as an increase in entitlement for additional Hall space. This increases the GFA from 2,121m^2 to 2,611m^2 or 14% of the available safe site area. The additional 4 Classrooms form an extension of the classrooms along the south western boundary by turning their back to the rockfall protection bund and mitigating the visual impact on the school.

With regard to the increase in Hall area of 51m^2 net, it may be more practical and cost effective to construct the Hall in its final size from day one.

2.2.6 Key Findings

A single level primary school with a roll of 400 can be constructed on the site utilizing the existing buildings, car parking and site entries within the available safe land area, with minimal loss to playing field areas to accommodate 17 Classrooms and a new Hall. With the proposed location for additional classrooms for a roll of 400 the remaining hard court areas would be too small to accommodate a netball court but these could be re-established elsewhere on the site.

2.3 Option 1A - Existing Buildings Site Development Plan (away from bund)

Refer **Appendix A** Drawing Existing Buildings

2.3.1 Environmental and Design Considerations

The site influences are identical to Option 1.

2.3.2 Proposed Access

Access to the site remains unchanged in the existing buildings scheme.

2.3.3 Landscaping, Hardcourts and Playing Fields

The location of buildings away from the rockfall protection bund requires the existing 3 Classrooms located in the southern corner of the site to be relocated. These have now been located adjacent to the new Hall with the ability to be extended to accommodate future growth. This has reduced the available Playing Field area. New Classrooms 11-15 are aligned with the existing Library with the existing Playground relocated along the south western boundary. This layout enables 2 netball courts.

2.3.4 Existing Building Coverage

Building coverage for Option 1A is the same as Option 1.

2.3.5 Staging/Future Growth

As per Option 1, to accommodate future growth in teaching space an additional 4 Classrooms and associated Resource areas are required as well as an increase in entitlement for additional Hall space. The additional Classrooms have been sited to form a natural extension of the blocks they join onto an create plying zones between the buildings and the bund.

2.3.6 Key Findings

A single level primary school with a roll of 400 can be constructed on the site utilizing the existing buildings, car parking and site entries within the available safe land area, with a reduction playing field areas and an increase in hard court areas including the ability to accommodate two netball courts and relocation of the existing playground.

2.4 Option 2 - New Site Development Plan

Refer **Appendix A** Drawing New Buildings

2.4.1 Environmental and Design Considerations

For the greenfield approach the available safe site area of 18,732m^2 and orientation remain unchanged, with the site aligned in a north-west orientation bordering Main Road to the north-east. This option includes the same rockfall protection bund along the southwest and northwest boundaries as the Existing Buildings site development option.

The greenfield approach enables a more consolidated site layout to be developed with larger playing areas, both grass and hardcourt. The single storey Classrooms have been located along the south east and southwest boundaries to form courtyards and visual screening of the rockfall protection bund – note that the Resource areas have been included in the Teaching space footprints. The Admin block has been located centrally within the school and close to the road to provide a "face " to the street and passive surveillance of those entering the site. Passive surveillance is also provided to the rest of the school as the buildings have been laid out in such a way as to be visible from the street right through to the back of the site.

The Hall has the opportunity to interact with the community and is therefore easily visible from the street and entry to the site, adjacent to parking and the playing field.

Future growth continues the theme of creating courtyards with the ability to be constructed with minimum impact on the operation of the school.

2.4.2 Proposed Access

The existing vehicle access to the site has moved south along Main Road to accommodate a large playing field and locate the parking in close proximity to the Hall and Admin block. The existing pedestrian crossing remains unchanged.

2.4.3 Landscaping, Hardcourts and Playing Fields

A single playing field has been provided that can accommodate soccer and rugby fields as well as a 200m running track and accounts for all of the soft landscaping (being 40% of the site). Hardcourt areas have been provided as courtyards adjacent to Classrooms with the provision of 4 netball courts.

2.4.4 Building Coverage

As noted above, the area of the site lost to the rockfall zone is approximately 4,500m^2 or 24% of the overall site area which leaves approximately 18,732m^2 (1.87ha) of the site for redevelopment of a new school, including the space requirements for the rockfall protection bund.

With a roll of 300 the entitled GFA is 2,053m^2 would occupy 11% of the available safe site area.

2.4.5 Staging/Future growth

To accommodate future growth for a roll increase from 300 to 400 students requires an increase in floor area for all the buildings, including an additional 4 Classrooms. The increase in floor area for Admin, Library, Resource and Hall is less than $50m^2$ each and it would be more economical to be included in the first stage of development.

This increases the total GFA from $2,053m^2$ to $2,593m^2$ and amounts to 14% of the available safe site area.

2.4.6 Key Findings

A single level primary school with a roll of 400 can be constructed on the site and provide a larger playing field and more netball court size hardcourt areas.

3 Cost Comparison

3.1 Overview of the Process

This initial comparative assessment of the cost estimates has been compiled based on the following information:

- The area data referenced within the Ministry's New Schools Cost Template;
- Rates for school construction; and
- The following drawings contained in Appendix A:
  - Redcliffs School – Option 1 Existing Buildings 300 & 400 Roll Revision 2
  - Redcliffs School – Option 1A Existing Buildings Alternative Layout 300 & 400 Roll Revision 1
  - Redcliffs School – Option 2 New Buildings for 300 & 400 Roll Revision 2

Data from the MoE New Schools Template has been extracted and presented along with functional area data contained within the drawings.

As this site study is to provide a comparative assessment, we have used the same rates for a number of components, such as the school construction costs and the infrastructure and landscaping costs. Where external site constraints have been identified additional line items have been introduced to identify these differences.

The effects of construction economics (materials specification), building shape and form and design have not been addressed as part of this comparative option study.

Cost evaluations have been prepared in the same format for ease of comparison and to identify key differences.

3.2 Assumptions

The following assumptions have been made in preparing these cost estimates:

- All buildings are single storey;
- No allowance has been made for provision of Sprinklers;
- Land assumed to be good ground - we have made some provision for raft or similar minor Geotechnical stabilisation of land. Full geotechnical assessment of the site should be undertaken to mitigate potential increased costs;

- Land is assumed to be level and suitable for development, no significant bulk earthworks allowed for;
- Parking areas where allowed are assumed to be asphalt or similar car parking with kerb and channel edging and line marking. Drainage via soak pits or similar;
- Connections to basic services have been included for power, lighting and ventilation. Existing WC facilities are retained with new connections to site services;
- Net areas taken from drawings are converted to gross area using a x1.3 factor;
- Ministry of Education rates of $2,400/m^2 have been used, reflecting single storey classroom facilities;
  - Contingency of 15% has been allowed for separately;
- Further allowances are included as per MoE calculator under:
  - Innovation Design / ESD (10%);
- Allowance has been made for demolishing the Hall block and adjacent class room (outside of safe zone);
- Allowance has been made for making safe of hazardous site area while demolishing;
- Allowance has been made for removing soft landscape/trees;
- Allowance has been made for removing existing hardstand;
- Allowance has been made for refurbishing existing buildings - typically minor repairs and redecorations;
- No demolition costs have been allowed for buildings marked on site plan as previously demolished and those outside of work scope;
- The new building areas are as per Table 3-1 below:

Table 3 -1 Comparative New Building Areas

Description	m^2
Existing Buildings 300 Roll – OPTION 1	630
Existing Buildings 400 Roll – OPTION 1	1130
Existing Buildings 300 Roll – OPTION 1A	630
Existing Buildings 400 Roll – OPTION 1A	1130
New Build 300 Roll – OPTION 2	2095
New Build 400 Roll – OPTION 2	2670

- Allowance has been made for repairs to existing water/drainage services;
- Allowance has been made for new water services;
- Allowance has been made for connecting sewer drainage to existing services;
- Furniture costs estimated at net area of classrooms applied to each option;
- Provisional IT costs estimated at $40,000 for existing buildings with roll increases and $50,000 for a new build school of 300 and 400 roll options.

3.3 Preliminary Cost Estimates

3.3.1 Preliminary Cost Estimates

As the site study is conceptual, there remain a number of risks within each of the designs. These are offset by a contingency percentage. At present the contingency allowance is 15%.

The cost estimate has been prepared to provide a comparative assessment of the three options. Once a preferred option is selected, it is recommended that a further more detailed cost estimate is prepared based on a preliminary design with further evaluation of the (design and environmental) risks.

3.4 Findings

The full cost estimates are attached in **Appendix B** while **Table 3.2** below provides a summary of the **Preliminary cost Estimate**.

In summary the school options, ranked in order of cost are as follows:

OPTION 1	300 Roll	**$4M - $5M**	**Lowest**
	400 Roll	**$6M - $7M**	
OPTION 1A	300 Roll	**$5M - $6M**	
	400 Roll	**$7M - $8M**	
OPTION 2	300 Roll	**$11M - $12M**	
	400 Roll	**$13M - $14M**	**Highest**

It is apparent that it will be more cost effective comparatively for the school to retain the existing buildings; OPTION 1 range of $4m-$7m (depending upon rolls).

Where buildings are relocated, this will incur additional relocation and services costs, as well as refurbishment after moving; OPTION 1A range of $5m-$8m (depending upon rolls).

The most expensive option is to rebuild. This option will potentially attract further continuing costs associated with temporary class rooms/school relocation/phasing on top of the costs identified; OPTION 2 range of $11m-$14m.

Table 3-2: Preliminary Cost Estimate Summary

	OPTION 1		OPTION 1A		OPTION 2	
Item	**Existing Buildings 300 Roll**	**Existing Buildings 400 Roll**	**Existing Buildings 300 Roll**	**Existing Buildings 400 Roll**	**New Build 300 Roll**	**New Build 400 Roll**
Demolition	$140,000	$140,000	$166,500	$166,500	$935,000	$935,000
Siteworks	$31,500	$56,500	$54,000	$79,000	$443,250	$472,000
Construct Buildings	$1,578,000	$2,798,000	$1,578,000	$2,798,000	$5,087,500	$6,482,000
Refurbish existing buildings	$1,216,000	$1,216,000	-	-	Excluded	Excluded
Refurbish and relocate existing buildings	-	-	$1,328,500	$1,328,500	Excluded	Excluded
On-Costs	$158,000	$280,000	$158,000	$280,000	$509,000	$648,000

Item	OPTION 1		OPTION 1A		OPTION 2	
	Existing Buildings 300 Roll	Existing Buildings 400 Roll	Existing Buildings 300 Roll	Existing Buildings 400 Roll	New Build 300 Roll	New Build 400 Roll
Lifts	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
Fit-out Costs	$38,846	$77,308	$58,846	$107,308	$194,231	$238,462
Foundation/ Geotech impacts	$211,938	$365,063	$330,063	$467,563	$660,594	$836,688
Flood plain impacts	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
Land Purchase Costs	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
Rebuild Infrastructure/ Structures	-	-	$225,200	$240,200	459,550	459,550
Infrastructure Services	$215,783	$220,783	$257,083	$267,083	$246,225	$306,600
Contingency, Consent & PM Fees	$1,084,000	$1,534,000	$1,247,000	$1,701,000	$2,508,000	$3,038,000
Rounding	$-66	$347	$-191	$-153	$650	$701
Total Development Cost	**$4,674,000**	**$6,688,000**	**$5,403,000**	**$7,435,000**	**$11,044,000**	**$13,417,000**
Range	**$4m-$5m**	**$6m-$7m**	**$5m-$6m**	**$7m-$8m**	**$11m-$12m**	**$13m-$14m**

3.4.1 Exclusions

The following were excluded from the cost estimate:

- GST;
- Construction escalation beyond date of report;
- Legal fees;
- Land purchase costs, legal and finance costs (except where specifically noted);
- Cost of borrowing / interest costs;
- Design, consenting and property costs associated with temporary infrastructure;
- Development Contributions (if any);
- Previously incurred damage costs following the earthquake sequence;
- Cost of rockfall protection bund and fence (previously reported at $1.3m to $1.4m).

3.5 Common Cost Related Risks

No specific risk assessment exercise has been undertaken at this stage. The level of contingency included in this cost estimate is judged appropriate based on the level of design information available, confidence surrounding potential for residual cost risk, omission and design development and our professional experience.

The main risks identified at this stage and considered pertinent to this project's cost performance are as follows:

- Ground conditions and site topography requiring additional soft spot excavation and imported fill or additional foundation requirements;
- Rock fall protection bund; the design of this is subject to detailed geotechnical advice. Works are within a high hazard zone (this is excluded from our estimate, but MoE will need to make appropriate allowances);
- Ground contamination;
- Existing live or redundant services not identified;
- Connections to existing infrastructure services;
- Programme / delays / weather;
- Market conditions;
- Fire Engineering / reports which may require additional Fire protection requirements such as sprinklers / tanks etc;
- Building consent conditions – requiring additional modifications to existing classrooms / buildings; and
- Access for removal of Hall block and adjacent class room (outside safe zone) – Risk assessments may indicate that these buildings' proximity to rock fall faces present a significant hazard for operatives. Either mitigating protection may be required, or works may not be permitted.

All of these risks could present financial risks to the overall cost of relocating the buildings.We would therefore recommend that an additional risk contingency be allowed for within the budget / business case, to cover land / risk encumbrances.

4 Conclusion

4.1 Key Findings

The following table provides a comparative assessment relating to site design, access and cost criteria. Table 4-1 has been presented in a traffic light form with:

- Green representing no major issues or risks;
- Amber representing a medium level risk to address; and
- Red representing potentially significant costs to mitigate and/or significant risks.

Table 4-1: Comparison of Key Findings for Each Site

Criteria	Subcriteria	Existing Buildings OPTION 1	Existing Buildings OPTION 1A	New Buildings OPTION 2
Site Design	Access	Existing access points retained	Existing access points retained	New vehicle access point
	Playing field area	Playing area reduced to accommodate hall	Playing area reduced to accommodate hall and classrooms	Large single playing field able to accommodate 200m running track
	Hardcourt area	Hard court areas reduced, need to relocate accommodate netball courts	Hard court areas increased of a size that can accommodate 2 netball courts	Hardcourt areas of a size that can accommodate 4 netball courts
	Modern Learning Environment	Existing classrooms thus limited in converting to MLE	Existing classrooms thus limited in converting to MLE	New design able to accommodate all the MLE requirements
	Accommodate growth	Can accommodate growth to 400 roll	Can accommodate growth to 400 roll	Can accommodate growth to 400 roll
Cost	Development cost	$4 - $7 million	$5 - $8 million	$11 – $14 million

4.2 Recommendation

All three development options, using the existing buildings or a total new build are capable of accommodating a school with a roll of 400 students on the reduced site area.

While developing a new school on a greenfield site will deliver all the requirements for a Modern Learning Environment with a large playing field and 4 netball courts, this comes at a cost premium of approximately $7m when compared with the costs of redeveloping the existing school.

The redevelopment of the existing school site will also allow Redcliffs to return to their original site much earlier than if a total rebuild is required. Re-using the existing buildings also retains the existing character of the school site.

We recommend developing the existing school, either Option 1 or Option 1A to accommodate a roll of 400 students as the most cost effective solution for returning Redcliffs School to their original site..