



**CHAND ENGINEERING CONSULTANTS LTD.**

**CONSULTING ENGINEERS & PROJECT MANAGERS**

**CYCLONE WINSTON PRELIMINARY ASSESSMENT  
SCHOOLS, HEALTH FACILITIES AND PUBLIC BUILDINGS  
FOR  
FIJI INSTITUTION OF ENGINEERS &  
DEPARTMENT OF NATIONAL PLANNING  
(MINISTRY OF FINANCE)**



NAME OF FACILITY: Nabau District School  
TYPE: Primary School  
LOCATION: Rakiraki  
DATE OF ASSESSMENT: 21 March 2016

JOB NO: 16-109  
GOVERNMENT FACILITY NUMBER: GFN-118

# RAPID ASSESSMENT TEMPLATE: CYCLONE WINSTON DAMAGED BUILDINGS SCHOOLS, PUBLIC BUILDINGS & HEALTH FACILITIES

**INSPECTOR:** AAC/ AAD/ RK  
**FIRM/COMPANY:** CHAND ENGINEERING CONSULTANTS LIMITED

## GENERAL INFORMATION

**Building Name:** Nabau District School  
**Type:** School Block  
**Location:** Kings Highway, Rakiraki  
**No. of Buildings:** 5  
**Ariel Plan Available:** YES / NO

## REPORT

**Page No. :** 1  
**Building No. :** 1  
**Building Approx Age:** 60 years + ( established 1949)  
**No. of Storeys:** 2

## Extent of Damage Rating Description

1	Minor/Cosmetic/Water
2	Some Damage
3	Extensive but Repairable
4	Irreparable

## Types of Buildings

School Block

Staff Quarters

Toilet Block

Utility Building (FEA, Services, etc)

Divisional Hospital

Sub-Divisional Hospital

Health Centre

Nursing Station

Public Building or Facility

## EVALUATION

Type of Construction	Description	Build Quality		Damage	Extent of Damage Rating	Photo No.
Floor	reinforced concrete slab on ground	1 2 3	Good Average Poor	No visible damage	0	N/A
Foundations	Not Visible	1 2 3	Good Average Poor	No visible damage- concealed	0	N/A
Walls	150mm blockwall with part of RC structure with columns and beam for verandah roof support.	1 2 3	Good Average Poor	Cracks observed	2	1,2
Rafters	150x50 timber rafters with	1 2 3	Good Average Poor	Damaged	4	3
Purlins	75x50 timber purlins blown away from the school.	1 2 3	Good Average Poor	Damaged	4	3
Roof	corrugated roof cladding	1 2 3	Good Average Poor	80% of the roof damaged	4	N/A
Electrical	typical standard switches, GPO's and fluorescent tubelights and bulbs.	1 2	Good Average	No damage known- FEA power not available at the time of inspection	0	N/A

		3	Poor			
Hydraulics	None	1	Good	N/A	N/A	N/A
		2	Average			
		3	Poor			
Windows/Doors	louver windows on standard carriers typically for all windows and timber doors.	1	Good	Doors have water damage	2	1,2,3
		2	Average	Louvers shattered		
		3	Poor			
Shutters	none	1	Good	No damage	0	1,2,3
		2	Average			
		3	Poor			
Ceilings	Ply board ceiling typically throughout- 80% of the ceiling blown out and the remainin of the ceiling is water damaged-painted	1	Good	Damaged	4	3
		2	Average			
		3	Poor			
Terraces/Verandah	typically concrete floor with 50mm steel post and 200mm x 50mm timber beam on the terraces with 50mm steel post and RC beam on the verandah.	1	Good	80% of the terrace roof beam	4	4
		2	Average	damaged		
		3	Poor			
Tiles/Floor Covering	Ceramic tiles	1	Good	water damage	2	N/A
		2	Average			
		3	Poor			
Gutters	Standard PVC gutters with proprietary PVC straps fixed to the outside of the gutter.	1	Good	At least 90% guttering and down-	3	1,2
		2	Average	pipes damaged		
		3	Poor			
Downpipes	100mm PVC downpipes with PVC straps fixed to the columns at 9m crs.	1	Good	At least 90% guttering and down-	3	1,2
		2	Average	pipes damaged		
		3	Poor			
Fascia Boards	250x30mm timber fascia board.	1	Good	90% damage	4	N/A
		2	Average			
		3	Poor			
Furniture/Desks etc.		1	Good			
		2	Average			
		3	Poor			
<b>Possible Intermediate Solution</b>	Remove the existing timber beam and replace it. Totally new roof construction in accordance with NBCF with new roof trusses, purlins, new guttering, downpipes, flashings, fascia boards. Replace all broken glass panes and louver blades and repair with grout crack in walls.					
<b>Possible Long Term Solution</b>	Detailed investigation for roof framing recommended along with checks on wall capacity for uplift/lateral loads for more tolerance towards Cat.4. Much dependent upon detailed investigation by an Engineer. Considering the building age and with the most roof blown out, possibly re-build the whole roof to comply with NBCF. Option also exist to retrofit cost permitting, existing wall structure by possibly introducing new columns and footings for a higher level of uplift capacity. Estimated cost currently around \$180,000.00 (new roof with retrofit) to \$300,000.00 (new construction) for long term solution.					

**Damage Assessment (\$)** \$120,000.00 Intermediate

**Basis of Calculation** Engineers Estimate-TBC (note can be QS assisted)

**FEES ESTIMATE:**

Design/Documentation: TBC

Tender/Approval: TBC

Inspection/End Construction:

TBC

## RAPID ASSESSMENT TEMPLATE: CYCLONE WINSTON DAMAGED BUILDINGS SCHOOLS, PUBLIC BUILDINGS & HEALTH FACILITIES

**INSPECTOR:** AAC/ AAD/ RK  
**FIRM/COMPANY:** CHAND ENGINEERING CONSULTANTS LIMITED

### GENERAL INFORMATION

**Building Name:** Nabau District School  
**Type:** Utility Building ( Dining & Kitchen)  
**Location:** Kings Highway, Rakiraki  
**No. of Buildings:** 5  
**Ariel Plan Available:** YES / NO

### REPORT

**Page No. :** \_\_\_\_\_ 2  
**Building No. :** \_\_\_\_\_ 2  
**Building Approx Age:** \_\_\_\_\_ 60 years + ( established 1949)  
**No. of Storeys:** \_\_\_\_\_ 1

### Extent of Damage Rating Description

1	Minor/Cosmetic/Water
2	Some Damage
3	Extensive but Repairable
4	Irreparable

### Types of Buildings

**School Block**  
**Staff Quarters**  
**Toilet Block**  
**Utility Building (FEA, Services, etc)**  
**Divisional Hospital**  
**Sub-Divisional Hospital**  
**Health Centre**  
**Nursing Station**  
**Public Building or Facility**

### EVALUATION

Type of Construction	Description	Build Quality		Damage	Extent of Damage Rating	Photo No.
		1	2			
Floor	reinforced concrete slab on ground	1 Good 2 Average 3 Poor		No visible damage	0	N/A
Foundations	Not Visible	1 Good 2 Average 3 Poor		No visible damage- concealed	0	N/A
Walls	150mm blockwall for the dining and corrugated roof cladding for the kitchen	1 Good 2 Average 3 Poor		Cracks observed	2	5
Rafters	Not Visible	1 Good 2 Average 3 Poor		No visible damage- concealed	0	5,6
Purlins	Not Visible	1 Good 2 Average 3 Poor		No visible damage- concealed	0	5,6
Roof	corrugated roof cladding	1 Good 2 Average 3 Poor		80% of the roof damaged	4	5,6
Electrical	typical standard switches, GPO's and fluorescent tubelights and bulbs.	1 Good 2 Average 3 Poor		No damage known- FEA power not available at the time of inspection	0	N/A
Hydraulics	None	1 Good 2 Average		N/A	N/A	n/A

		3	Poor			
Windows/Doors	louver windows on standard carriers typically for all windows and timber doors.	1 2 3	Good Average Poor	Doors have water damage Lourves shattered	3	5,6
Shutters	none	1 2 3	Good Average Poor	No damage	0	5,6
Ceilings	corrugated roof	1 2 3	Good Average Poor	No damage	0	N/A
Terraces/Verandah	50mm steel post and the entire verandah roof has blown out.	1 2 3	Good Average Poor	100% of the terrace roof blown out.	4	6
Tiles/Floor Covering	Ceramic tiles	1 2 3	Good Average Poor	water damage	2	6
Gutters	Standard PVC gutters with proprietary PVC straps fixed to the outside of the gutter.	1 2 3	Good Average Poor	At least 90% guttering and down-pipes damaged	3	6
Downpipes	100mm PVC downpipes with PVC straps fixed to the columns at 9m crs.	1 2 3	Good Average Poor	At least 90% guttering and down-pipes damaged	3	6
Fascia Boards	250x30mm timber fascia board.	1 2 3	Good Average Poor	90% damage	4	5,6
Furniture/Desks etc.		1 2 3	Good Average Poor			N/A
<b>Possible Intermediate Solution</b>	Re-construct the entire kitchen roof in accordance with NBCF with new roof trusses, purlins, new guttering, downpipes, flashings, fascia boards. Demolish the kitchen and re-construct using concrete blockwall in accordance with the NBCF.					
<b>Possible Long Term Solution</b>	Detailed investigation for roof framing recommended along with checks on wall capacity for uplift/lateral loads for more tolerance towards Cat.4. Much dependent upon detailed investigation by an Engineer. Considering the building age and with the washing area roof blown out possibly re-build the whole roof to comply with NBCF. Option also exist to retrofit cost permitting, existing wall structure for a higher level of uplift Estimated cost currently around \$80,000.00 (new roof with retrofit) to \$150,000.00 ( new construction) for long term solution					

**Damage Assessment (\$)** \$30,000.00 Intermediate  
**Basis of Calculation** Engineers Estimate-TBC (note can be QS assisted)

**FEES ESTIMATE:**

Design/Documentation: TBC  
Tender/Approval: TBC  
Inspection/End Construction: TBC

**RAPID ASSESSMENT TEMPLATE: CYCLONE WINSTON DAMAGED BUILDINGS  
SCHOOLS, PUBLIC BUILDINGS & HEALTH FACILITIES**

**INSPECTOR:** AAC/ AAD/ RK  
**FIRM/COMPANY:** CHAND ENGINEERING CONSULTANTS LIMITED

**GENERAL INFORMATION**

**Building Name:** Nabau District School  
**Type:** Utility Building ( Ablution)  
**Location:** Kings Highway, Rakiraki  
**No. of Buildings:** 5  
**Ariel Plan Available:** YES / NO

**REPORT**

**Page No. :** 3  
**Building No. :** 3  
**Building Approx Age:** 60 years + ( established 1949)  
**No. of Storeys:** 1

**Extent of Damage Rating Description**

1	Minor/Cosmetic/Water
2	Some Damage
3	Extensive but Repairable
4	Irreparable

**Types of Buildings**

- School Block
- Staff Quarters
- Toilet Block
- Utility Building (FEA, Services, etc)
- Divisional Hospital
- Sub-Divisional Hospital
- Health Centre
- Nursing Station
- Public Building or Facility

**EVALUATION**

Type of Construction	Description	Build Quality		Damage	Extent of Damage Rating	Photo No.
		1	2			
Floor	reinforced concrete slab on ground	1 2 3	Good Average Poor	No visible damage	0	N/A
Foundations	Not Visible	1 2 3	Good Average Poor	No visible damage- concealed	0	N/A
Walls	150mm blockwall	1 2 3	Good Average Poor	Cracks observed	2	7,8,9
Rafters	Not Visible	1 2 3	Good Average Poor	No visible damage- concealed	0	N/A
Purlins	Not Visible	1 2 3	Good Average Poor	No visible damage- concealed	0	N/A
Roof	corrugated roof cladding	1 2 3	Good Average Poor	slight damages	2	7,9
Electrical	typical standard switches, GPO's and fluorescent tubelights and bulbs.	1 2 3	Good Average Poor	No damage known- FEA power not available at the time of inspection	0	N/A
Hydraulics	None	1 2	Good Average	N/A	N/A	N/A

		3	Poor			
Windows/Doors	standard louver carriers without any louver blades for all windows and timber doors.	1 2 3	Good Average Poor	Doors have water damage	2	7,8,9
Shutters	none	1 2 3	Good Average Poor	N/A	0	7,8,9
Ceilings	Ply board ceiling typically throughout	1 2 3	Good Average Poor	water damage	4	8
Terraces/Verandah	typically concrete floor with 50mm steel post and 200mm x 50mm timber beam on the terraces with 50mm steel post and RC beam on the verandah.	1 2 3	Good Average Poor	100% of the terrace roof damaged	4	9
Tiles/Floor Covering	concrete plaster	1 2 3	Good Average Poor	N/A	N/A	9
Gutters	Not known-totally blown out and destroyed.	1 2 3	Good Average Poor	All guttering blown out.	3	7,9
Downpipes	Not known-totally blown out and destroyed.	1 2 3	Good Average Poor	All downpipes blown out.	3	7,9
Fascia Boards	250x30mm timber fascia board.	1 2 3	Good Average Poor	100% damaged for the walkway only	4	7,9
Furniture/Desks etc.		1 2 3	Good Average Poor			N/A
<b>Possible Intermediate Solution</b>	Replace all the louver frames with new louver blades and re-construct the entire ablation roof and the verandah roof in accordance with NBCF with new roof trusses, purlins, new gutterings, downpipes, flashings, fascia board.					
<b>Possible Long Term Solution</b>	Detailed investigation for roof framing recommended along with checks on wall capacity for uplift/lateral loads for more tolerance towards Cat.4. Much dependent upon detailed investigation by an Engineer. Considering the building age and with the verandah area roof blown out, possibly re-build the whole roof to comply with NBCF. Option also exist to retrofit cost permitting, existing wall structure for a higher level of uplift capacity. Estimated cost currently around \$100,000.00 (new roof with retrofit) to \$200,000.00 ( new construction) for long term solution.					

**Damage Assessment (\$)** \$50,000.00 Intermediate  
**Basis of Calculation** Engineers Estimate-TBC (note can be QS assisted)

**FEES ESTIMATE:**

Design/Documentation: TBC  
Tender/Approval: TBC  
Inspection/End Construction: TBC



**RAPID ASSESSMENT TEMPLATE: CYCLONE WINSTON DAMAGED BUILDINGS  
SCHOOLS, PUBLIC BUILDINGS & HEALTH FACILITIES**

**INSPECTOR:** AAC/ AAD/ RK  
**FIRM/COMPANY:** CHAND ENGINEERING CONSULTANTS LIMITED

**GENERAL INFORMATION**

**Building Name:** Nabau District School  
**Type:** Toilet Block  
**Location:** Kings Highway, Rakiraki  
**No. of Buildings:** 5  
**Ariel Plan Available:** YES / NO

**REPORT**

**Page No. :** 2  
**Building No. :** 4  
**Building Approx Age:** 60 years + ( established 1949)  
**No. of Storeys:** 1

**Extent of Damage Rating Description**

1	Minor/Cosmetic/Water
2	Some Damage
3	Extensive but Repairable
4	Irreparable

**Types of Buildings**

- School Block
- Staff Quarters
- Toilet Block
- Utility Building (FEA, Services, etc)
- Divisional Hospital
- Sub-Divisional Hospital
- Health Centre
- Nursing Station
- Public Building or Facility

**EVALUATION**

Type of Construction	Description	Build Quality		Damage	Extent of Damage Rating	Photo No.
		1	2			
Floor	reinforced concrete slab on ground	1 2 3	Good Average Poor	No visible damage	0	N/A
Foundations	Not Visible	1 2 3	Good Average Poor	No visible damage- concealed	0	N/A
Walls	100mm blockwall	1 2 3	Good Average Poor	No visible damage	0	10
Rafters	Not Visible	1 2 3	Good Average Poor	No visible damage- concealed	0	N/A
Purlins	Not Visible	1 2 3	Good Average Poor	No visible damage- concealed	0	N/A
Roof	corrugated roof cladding	1 2 3	Good Average Poor	Damaged	3	10
Electrical	typical standard switches, GPO's and fluorescent tubelights and bulbs.	1 2	Good Average	No damage known- FEA power not available at the time of inspection	0	N/A

		3	Poor			
Hydraulics	None	1	Good	N/A	N/A	N/A
		2	Average			
		3	Poor			
Windows/Doors	standard louver carriers with louver blades for all windows and timber doors.	1	Good	Doors have water damage	2	10
		2	Average			
		3	Poor			
Shutters	none	1	Good	N/A	0	10
		2	Average			
		3	Poor			
Ceilings	Ply board ceiling typically throughout and is water damaged	1	Good	water damage	4	11
		2	Average			
		3	Poor			
Terraces/Verandah	typically concrete floor with 50mm steel post and 200mm x 50mm timber beam on the terraces with 50mm steel post and RC beam on the verandah.	1	Good	40% of the terrace roof damaged	3	10
		2	Average			
		3	Poor			
Tiles/Floor Covering	Ceramic Tiles	1	Good	N/A	N/A	10
		2	Average			
		3	Poor			
Gutters	Not known-totally blown out and destroyed.	1	Good	All guttering blown out.	4	10
		2	Average			
		3	Poor			
Downpipes	Not known-totally blown out and destroyed.	1	Good	All downpipes blown out.	4	10
		2	Average			
		3	Poor			
Fascia Boards	250x30mm timber fascia board.	1	Good	20% damaged for the walkway only	2	10
		2	Average			
		3	Poor			
Furniture/Desks etc.		1	Good			N/A
		2	Average			
		3	Poor			
<b>Possible Intermediate Solution</b>	Replace all the louver frames with new louver blades and re-construct the entire ablation roof and the verandah roof in accordance with NBCF with new roof trusses, purlins, new gutterings, downpipes, flashings, fascia board.					
<b>Possible Long Term Solution</b>	Detailed investigation for roof framing recommended along with checks on wall capacity for uplift/lateral loads for more tolerance towards Cat.4. Much dependent upon detailed investigation by an Engineer. Considering the building age and with the verandah area roof blown out, possibly re-build the whole roof to comply with NBCF. Option also exist to retrofit cost permitting, existing wall structure for a higher level of uplift capacity. Estimated cost currently around \$100,000.00 (new roof with retrofit) to \$200,000.00 ( new construction) for long term solution.					

**Damage Assessment (\$)** \$50,000.00 Intermediate

**Basis of Calculation** Engineers Estimate-TBC (note can be QS assisted)

**FEES ESTIMATE:**

Design/Documentation: TBC

Tender/Approval: TBC

Inspection/End Construction: TBC

**GENERAL DAMAGE  
SCHOOLS, PUBLIC BUILDINGS & HEALTH FACILITIES**

INSPECTOR: AAC/AAD/RK  
 FIRM/COMPANY: Chand Engineering Consultants Limited

**GENERAL INFORMATION**

Building Name: Nabau District School  
 Location: \_\_\_\_\_  
 No. of Buildings: 12  
 Ariel Plan Available: **YES / NO**

1 FENCING / GATES / DRIVEWAY / RETAINING WALLS ETC (INCLUDE TYPE / LENGTH ETC)	
Walkway from the main highway to the school building has whole roof completely blown out (13.6m x 3.5m)	
Stairs leading from the ground floor to the top floor has roof completely blown out (7.5m x 3.5m)	
Walkway from the main school building to the toilet block is damaged ( 20m x 2.6m )	
Walkway at the rear of the main building has some damages ( 18m x 1.2)	
2 WATER TANKS/METERS/PLUMBING	
3 POWER LINES / METERS / WIRING	
power line is broken	
4 OTHER ITEMS	
Currently, all the classes are running in the ground floor and in the ablution blocks. Long term solution would require decent time of 6 to 9 months of staged construction depending on material availability for a complete long term solution subject to additional cost consideration. Depending on immediate need and capacity, minimum 6 months to construct the new roof for the main building for full use again and 1 month to construct the roof for the ablution block, 1 month for the re-construction of the dining block roof and 1 month to repair the walkway, and the 3 weeks to repair the staff quarters which only require minor repairs. Staff quarters has minor damages done such as flashings, gutters, downpipes, etc and repairing it will take 2 weeks. Re-construction of both the bus stops will take 1 month to complete.	

**TOTAL COST ESTIMATE:**

DESCRIPTION	FEE
School Building	\$120,000.00
Dining	\$30,000.00
Ablution	\$50,000.00
Walkway	\$10,000.00
Staff Quarters	\$5,000.00
General	\$20,000.00
<b>TOTAL:</b>	<b>\$235,000.00</b>

**TOTAL FEE ESTIMATE:**

DESCRIPTION	FEE
TBC	TBC
TBC	TBC
TBC	TBC
TBC	TBC
TBC	TBC
TBC	TBC
<b>TOTAL:</b>	

**PHOTOS- BUILDING 1**



**Photo 1:View of Building Frontage**



**Photo 2: View of Building Rear**



**Photo 3: Truss, “U” Bolt and Louvers View**



**Photo 4: Verandah View**

**PHOTOS- BUILING 2**



**Photo 5: Overall Dining View**



**Photo 6: Overall Kitchen, Dining and Verandah View.**

**PHOTO-BUILDING 3**



**Photo 7: View of Damaged Roof**



**Photo 8: View of the Water Damaged Ceiling**



**Photo 9: View of the Verandah**



**PHOTOS- BUILDING 4**



**Photo 10: View of the Toilet Block**



**Photo 11: Water Damaged Ceiling**

**PHOTOS- BUILDING 5**



**Photo 12: Showing Overall View of Staff Quarters- Very Minor Damage- Guttering, Downpipes ,Flashings**

**GENERAL SITE PHOTOS**



**Photo 13: Showing Damaged Walkway**



**Photo 14: Showing Damaged Walkway**



**Photo 15: Showing Overall View of the Bus-Stop**