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Town of Port Hedland Sporting Facilities Structural Review

Turf Club, Port Hedland

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1 Introduction

RSA visited Port Hedland on 9th - 11th June 2010. During this period the Town of Port Hedland sporting facilities buildings were inspected by Peter Baldwin and Robin Salter of RSA. This report outlines the review carried out in respect to the current state of the structural integrity of the buildings with particular respect to Region D category 2 wind loading requirements AS1170-2002.

The report provides an outline of any particular aspects of the buildings that are a structural concern along with commenting on suggested remediation works that should occur to rectify the issues. The photos provided act as a visual aid to highlight problem areas that require remedial measures.

The “Turf Club” has 16 separate structures, most of which are in a poor condition. Many Issues will need to be addressed.

2 Port Hedland Turf Club

2.1 Location

The turf club complex is located on the North side of the racecourse in Port Hedland. In total 13 buildings were inspected and various other additional structures which are listed in Appendix A.

2.2 Overview of inspection

A detailed summary of all the buildings and various structures at the Town of Port Hedland Turf Club complex has been outlined in Table 1. Please refer to this for all buildings. All photographs referenced are in appendix B.

2.3 Requirement of AS1170.2-2002– Impact Loading from Windborne Debris

For regions C and D the resistance to impact loading required in order to neglect internal pressures resulting from a dominant opening are likely to be increased. The present requirement is given in the following extracts taken from (Standards Australia, 2002)

2.3.1 Extract from AS/NZS 1170.2-2002 - *5.3.2 Openings* [CURRENT]:

"Combinations of openings shall be assumed to give internal pressures, which together with external pressures give the most adverse wind actions. Potential openings include doors, windows and vents.

In regions C and D, internal pressure resulting from the dominant opening shall be applied, unless the building envelope (windows, doors and cladding) can be shown to be capable of resisting impact loading equivalent to a 4 kg piece of timber of 100 mm × 50 mm cross section, projected at 15 m/s at any angle."

2.3.2 Example of Impacting Loading Requirements for Region D, Importance Level 2:

For Region D, Importance Level 2, the difference in impact resistance required in order to neglect internal pressures resulting from a dominant opening are compared as follows:

"4kg piece of timber of 100 mm × 50 mm cross section, projected at 15 m/s at any angle. This is approximately equivalent to dropping a 15.3kg missile from a height of 3m."

The Town of Port Hedland has the added dilemma that to upgrade such facilities to the 2002 version may not satisfy the likely changes to the revised wind code in the near future.

3 Building Summary

Please refer to table 1 for full details of defects and structural issues for the individual buildings.

3.1 PHTC-B1

- The main turf club building shows severe deterioration around all of the eaves.
- The internal structural steel and timber is on good condition
- Masonry brickwork is in good condition.
- There are signs of termite intrusions internally and the full extent of any damage to the timber purlins in inaccessible areas will not be known until the roof sheet is replaced.

3.2 PHTC-B2

- The transportable toilet block has is not tied down sufficiently
- James Hardie product which may have been manufactured to region D2 originally. However this may not now comply with the current AS1170.2-2002.
- The rear window screens are damaged and not suitable for the AS1170.2-2002 impact load requirements, therefore during a cyclonic event the building cannot be neglected of internal pressures. This increase in pressure is likely to cause structural damage to the building.
- The building needs all windows to be effectively sealed.
- The roof sheet edge flashing needs replacing.
- Any internal cosmetic remediation measures are only worth completing once the building has been made structurally sound.

3.3 PHTC-B3

- Extensive corrosion to roof sheets around eaves
- Strap bracing corroded on roof sheets
- Edge beam fixing along front face of roof line is unsecure.

3.4 PHTC-B4

- Extensive cracking to underside of concrete roof along brickwork due to shrinkage cracking and foundation settlement.

3.5 PHTC-B5

- Building is not sufficiently tied-down
- Mild corrosion to chassis
- Cladding tekscrews are corroded
- Window openings are not sufficiently sealed to class neglect internal pressure build-up under cyclonic conditions.
- Internal condition of building is very much neglected.
- Suggest removed off site.

3.6 PHTC-B6

- This building requires considerable rectification measures. Primarily it needs tie-downs to prevent overturning and sliding under high winds loads. RSA would suggest the economic cost of this would not be suitable for such a poor standard of building therefore the building should be removed from the site.

3.7 PHTC-B7

- Building has been tied-down to concrete slab at 8 points along chassis perimeter beam, this is sufficient.
- Steel mesh and plate covers protect window openings, all mesh screens must comply with AS1170.2-2002 requirements for impact loading for internal pressures to be neglected.

3.8 PHTC-B8

- Building is not tied-down
- Does not appear to be in use
- Building openings are not sealed effectively.

3.9 PHTC-B9

- Transportable office 6x3m building is not tied down effectively
- Window Mesh screens need to comply with AS1170.2-2002 requirements for impact loading for internal pressures to be neglected.

3.10 PHTC-B10

- The main stables for the race track.
- The roof sheet shows multiple signs of corrosion and requires replacement.
- Steel frame work whilst rusty is deemed OK. It is common for such frames to rust out at the base soil level, so this should be reviewed periodically.

3.11 PHTC-B11

- Wall cladding requires additional fixing along the top line of the sheet at 300mm centres minimum
- Roof sheet edge flashing requires additional fixing at 200mm centres minimum.
- Apply protective paint to corroded internal steel framework.

3.12 PHTC-B12

- Windows do not have suitable screen for the AS1170.2-2002 impact load requirements, therefore during a cyclonic event the building cannot be neglected of internal pressures. This increase in pressure is likely to cause structural damage to the building.
- Internal water damage to ceiling lining, suggest integrity of roof sheeting is fully inspected to determine condition.

3.13 PHTC-B13

- Extensive corrosion to several welded connection of the Z-purlins, this need replacement or structural reinforcing measures.

3.14 PHTC-S1-3

- Additional steel structures to provide viewing boxes and platforms over the racecourse do not comply with the requirements of the BCA part 3.9.1 wit regards for access and stairways.
- Several areas of the steel work are severely corroded and require extensive remediation measures.

4 Conclusions

Following RSAs inspection of the Town of Port Hedland Turf Club facilities we have found there to be many areas of all buildings that are of a structural concern. The defects have been documented and commented on throughout the report with the photographic evidence outlined in Appendix B acting to highlight the many problem areas.

The actual site may have weathered Cyclone George in 2007 where max wind speed reached approx 180 - 200km/h (source: Bom.gov.au). RSA doubt that many of the structures will survive the full impact of a region D category 2 storm event where design winds applied are up to 317km/h. This represents a 150% increase in wind speeds.

The TOPH face significant problems in our view which we list:

1. Many structures will break up in a full strength cyclonic event creating a vast source of debris and missiles which could hit nearby buildings. Insurance companies will go looking to recover expenses when they realise the missiles come from an identifiable source.
2. As the local authority its own structures must meet the standards it requires of the community to work to!

The turf club complex is reaching the end of its design life and the decision needs to be made by the TOPH whether the remediation measures to ensure the complex complies to the required wind rating are economically viable, as this will be a laborious process and not easily achievable. The best approach may be to demolish and rebuild many of the assets.

A detailed scope of work would be needed to be created to enable the extent of remediation actions to be defined. RSA would need to agree a programme of activity once such discussions were made in principle by the TOPH in conjunction with the Turf Club.

Best Regards

Peter Baldwin MEng (Hons) GradIEAust
30 June 2010

Robin Salter BE (Hons) MIEAust CPEng

Appendix A

Building List

Name	Code	Description
Port Hedland Turf Club Building 1	PHTC-B1	Main building for the Turf Club
Port Hedland Turf Club Building 2	PHTC-B2	Male/Female toilet block 12 x3m (Transportable)
Port Hedland Turf Club Building 3	PHTC-B3	Food Kiosk and store/kitchen (Permanent)
Port Hedland Turf Club Building 4	PHTC-B4	M/F toilet block (Permanent)
Port Hedland Turf Club Building 5	PHTC-B5	M/F Toilet block (Transportable)
Port Hedland Turf Club Building 6	PHTC-B6	Ticket booth at entrance (Transportable)
Port Hedland Turf Club Building 7	PHTC-B7	TAB betting kiosk (Transportable)
Port Hedland Turf Club Building 8	PHTC-B8	Disused TAB betting unit (Transportable)
Port Hedland Turf Club Building 9	PHTC-B9	Office room(Transportable)
Port Hedland Turf Club Building 10	PHTC-B10	Main Stable
Port Hedland Turf Club Building 11	PHTC-B11	Storage Shed
Port Hedland Turf Club Building 12	PHTC-B12	Transportable toilet for jockeys
Port Hedland Turf Club Building 13	PHTC-B13	Secondary Stable
Port Hedland Turf Club Structure 1	PHTC-S1	Viewing platform Box A
Port Hedland Turf Club Structure 2	PHTC-S2	Viewing platform Box B
Port Hedland Turf Club Structure 3	PHTC-S3	Viewing platform for finish line

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TABLE 1

Building	Type	Use	Photograph Figure Number	Comments/Defects	Severity/Conditon	Structural Rectification (If Required)	OTHER REMARKS
PHTC-B1	Permanent	Main Club Building	16-17	Roof sheeting over eaves shows widespread signs of corrosion.	severe	Replace roof sheets where appropriate, ensure installed to manufacturers recommendations for cyclonic conditions	A detailed Brief needs creating to do this work
			18	Signs of termite intrusions internally	Inspect		
			19	Shade sails installed over veranda area	-	All sails to be removed and stored in high wind conditions	
			20	Disused electrical cables hanging loose	severe	If no longer in use they should be completely remove or restored to purpose	Licensed electrical contractors to check
			21	Where visible the internal timber purlins appear to be in good condition. The main UB rafters are in very good condition.	Good	Remain adequate	
			22-23	Window screens are suitable on front of building, the rear screens require testing or a certification evidence if they are to comply with AS1170.2-2002	-	Replace or test to check structure	A check on the building being capable of internal pressure is valid
PHTC-B2	Transportable	Male/Female toilet block	24	Building has been positioned on concrete pads foundations with cast in plates. The chassis has not been welded to the plates to achieve sufficient tie down.	Severe	Weld chassis beam to cast in plates at all available locations	Must be fixed by November 19th. The overall degradation may have resulted in it not being able to cope with internall pressurisation.
			25	The rear windows have cyclonic impact screens	Check	Ensure window screens comply with testing requirements of AS1170.2-2002, or replace with a suitably certified product.	
			29	Some of the windows have been damaged or are missing glass.		Any damaged window openings should be effectively sealed	
			30	The doors are of solid construction	Good		
			26	Floor joist to chassis welded connections appear to be in good condition	Good		
			26	Floor panels are tekscrewed into joist at approx 400 centres	Good		it is usual to have fixings at 200 centress this needs checking
			27	The edge flashing is corroded	Severe	Replace	
			28	Shade sail has been fixed to the corner of building	Low winds only	Remove all shade sails in high wind conditions	
PHTC-B3	Permanent	Food Kiosk and store/kitchen	31	Roof Sheeting and edge flashing is extensively corroded around eaves	Severe	Replace roof sheets where appropriate, ensure installed to cyclonic conditions	A detailed Brief needs creating to do this work
			32	possible termite damage to timber rafters	Extent unknown	When replacing the roof sheet inspect the integrity of the timber rafters for termite damage.	A detailed Brief needs creating to do this work
			33-35	Window screens are suitable	OK	-	
			3	Steel plate doors of solid construction are in good condition	OK	-	
			31	Strap bracing on roof sheets has corroded	Severe	When replacing the sheets install new strap bracing	A detailed Brief needs creating to do this work
			36-37	Timber edge beam on front face of building in damaged and needs rectification measures	Severe	Replace	Detailed sketch needs to be provided
PHTC-B4	Permanent	M/F toilet block	38-39	Extensive cracking to masonry wall underneath concrete roof	Mild	Likely caused by thermal movement shrinkage of concrete over time the foundation may also have settled as well. Seems normal degradation.	

Building	Type	Use	Photograph Figure Number	Comments/Defects	Severity	Structural Rectification (If Required)	OTHER REMARKS
PHTC-B5	Transportable	M/F Toilet block	40	Building is not tied down, the main building sits on hard-wood sleepers.	Severe	The building will not survive a cyclonic event unless tied-down	Details need to be specified
			41	2No. Disabled access ramps are located at the ends of the unit but do not appear to be tied into the building.	-		
			-	Corrosion to Chassis	Mild	Apply rust protective paint to manufacturers specifications	
			42-43	Windows are broken and Cladding teks shows signs of corrosion and their fixity capacity are be significantly reduced	Severe	The lack of windows and cyclonic screens results increased localised internal pressures. During a cyclonic event these pressures will cause structural deformation of wall frames and cladding. The reliability of the corroded tekscrews further reduces the structures strength capacity.	A detailed Brief needs creating to do this work and for TOPH to decide if its woth keeping the buillding onsite
PHTC-B6	Transportable	Ticket booth at entrance	44	Building is not tied down	Severe	This building requires considerable rectification measures. Primarily it needs tie-downs to prevent overturning and sliding under high winds loads. RSA would suggest the economic cost of this would not be suitable for such a poor standard of building therefore the building should be removed from the site.	
			6	All windows are broken/missing	Severe		
			6	Building is not in good structural and cosmetic shape	Severe		
PHTC-B7	Transportable	TAB Betting kiosk	45	Building is tied down to veranda slab at 8 points	OK		
			7 & 45	Building has steel mesh over windows	Check	Ensure window screens comply with testing requirements of AS1170.2-2002, or replace with a suitably certified product.	
PHTC-B8	Transportable	Disused TAB betting unit	46	Building is not tied down	Severe	This building requires considerable rectification measures. Primarily it needs tie-downs to prevent overturning and sliding under high winds loads. RSA would suggest the economic cost of this would not be suitable for such a poor standard of building therefore the building should be removed from the site.	
			8	Some windows are broken/missing	Severe		
			47	Internal condition shows widespread damage/ degradation	cosmetic		
PHTC-B9	Transportable	Office room	48	Extent of tie down need further investigation. The building sits on concrete pads but the connection to the chassis rail appears to have been neglected. Cast in threaded bolts are available but no keeper plates were visible.	Severe	Install keeper plates to cast in threaded bar to tie down the building	
			49	Mesh window screens were installed over all window openings	Compliance	Ensure window screens comply with testing requirements of AS1170.2-2002, or replace with a suitably certified product.	
			-	It was not possible to view the integrity and fixing of the roof sheets	-	Check roof sheet has cyclonic washers assemblies installed	
			50	Temporary seacontainer and caravan positioned behind building are not tied-down	Severe	Tie down or remove	Caravans are not usually a region D2 structure. It could be a liability
PHTC-B10	Permanent	Main Stable	51	Several areas of the Klip Lock roof sheets have corroded at the connection point to the timber purlins.	Severe	Replace corroded roof sheets	A detailed Brief needs creating to do this work
			52	The steel frame work is in a good condition for its age.	Good		
			53	Area of roof sheet near stable NO.28 has pulled away from the purlin	Severe	Rectify	A detailed Brief needs creating to do this work
			54	Missing roof sheets at the West end of the stables	Severe	Potential for edge peeling now that the sheets have been compromised, replace missing sheets	A detailed Brief needs creating to do this work
			55	Connection damaged at stable No.36	Mild	Repair Timber Connections	
			56	Where visible the kliplok fixing system was extensively corroded and the integrity of the nailed connections in the timber purlins are significantly corroded	Severe	Replace connections and roof sheets where corroded	A detailed Brief needs creating to do this work

Building	Type	Use	Photograph Figure Number	Comments/Defects	Severity	Structural Rectification (If Required)	OTHER REMARKS
PHTC-B11	Permanent	Storage Shed	57	Roof sheet is securely crest fastened with cyclonic washers to all steel purlins	Good		
			58	Internal steel framework is in good condition, some minor signs of corrosion due to lack of paint	Minor	Apply protective system to any black steel	
			59	Top of wall sheets requires additional fixings	Severe	Fix sheets to internal wall beam along top of sheets using 14G teks	
			59	Edge flashing requires more fixing	Severe	Ensure edge flashing is fixed at approx 300mm centres into roof and wall sheets	
PHTC-B12	Transportable	Toilet Block	12	Kliplok roof sheets damaged at edges and flashing need to be checked to ensure it is securely fixed	Inspect	Inspect and repair where necessary	A detailed Brief needs creating to do this work
			62	Windows do not have cyclonic mesh screens	Severe	Install screens rated to AS1120.2-2002 requirements	
			60	Internal water damage to ceiling lining would suggest that the integrity of the roof has been compromised.	Severe	Replace internal cladding	A detailed Brief needs creating to do this work
			61	Chassis has been effectively tied-down to concrete strip footings	OK		
PHTC-B13	Permanent	Secondary Stable	63-64	Z-purlins are extensively corroded	Severe	Several of the welded connection on the purlins have corroded away and need fixing. Suggest a coat of protective paint is applied to any black steel following rectification measures to increase longevity of structure.	A detailed Brief needs creating to do this work
			13	Roof sheet is in good condition	OK		
PHTC-S1	Permanent	Racecourse Viewing Box 1	65-66	Access stairs do not comply with BCA requirements. Part 3.9.1	Severe	Access Stairways are not compliant with BCA. Replace	No signage was present to indicate whether access was restricted to Turf Club staff, or to indicate no public access. Nor were any significant barriers to prevent unauthorised access to platforms.
			67	Hand rail extensively corroded	Severe	Hand rail is not compliant with BCA. Replace	A detailed Brief needs creating to do this work
			67	Hand rail balustrade does not comply with BCA part 3.9.2	Severe	Hand rail is not compliant with BCA. Replace	
PHTC-S2	Permanent	Racecourse Viewing Box 2	68	Severe corrosion to lower stair treads	Severe	Access Stairways are not compliant with BCA. Replace	No signage was present to indicate whether access was restricted to Turf Club staff, or to indicate no public access. Nor were any significant barriers to prevent unauthorised access to platforms.
			69	Access stairs do not comply with BCA requirements. Part 3.9.1	Severe	Access Stairways are not compliant with BCA. Replace	A detailed Brief needs creating to do this work
			70	3x3m unit is tied down to framework with U-Bolts	OK		
			71	Internal structure of 3x3m unit	OK		
			71	Klip lok roof spanning 1.5m	Severe	Wind pressures for region D cat 2 on wall panels and roof sheet for this structure exceed the design capacities of the sheeting. Deformation of the sheets is likely to occur if cyclonic winds are experienced.	Add fixings. A detailed Brief needs creating to do this work
PHTC-S2	Permanent	Racecourse Finish line viewing platform	72	Access stairs do not comply with BCA requirements. Part 3.9.1	Severe	Access Stairways are not compliant with BCA. Replace	No signage was present to indicate whether access was restricted to Turf Club staff, or to indicate no public access. Nor were any significant barriers to prevent unauthorised access to platforms.