

Designer of play and sports areas





CONTENTS

SCOPE	1
BACKGROUND	1
OPTIONS UNDER CONSIDERATION	2
OPTION A - Old Rocket Refurbished as Sculptural Element OPTION B - New Rocket with Salvage Original Parts OPTION C - New Rocket (1960's Inspired Reproduction) OPTION D - New Rocket (2022 Model Rocket)	
SAFETY & COMPLIANCE	3
HERITAGE VALUE	3
PLAY PROVISION & VALUE FOR MONEY	3
OPTIONS REVIEW : Options A - D	4
CONCLUSIONS & RECOMMENDATIONS	13







SCOPE

Waverley Council have engaged Proludic to carry out a high-level feasibility assessment of the Waverley Park Playground and the creation of a new inclusive play space at the site.

The scope of this feasibility report concerns the new works to the existing play area adjacent to the 1960's rocket-ship play area (only). This area is part of a broader play area enhancement for Waverley Park which also includes the redevelopment of the existing junior / low level play area and embankment area which will be incorporated into the final design for a new cohesive, district level play space.

This includes the options for including or re-interpreting the existing 1960's era metal rocket-ship structure

BACKGROUND

This feasibility study follows both an Engineering / Compliance Assessment of the Waverley Park Rocket-ship structure and a Precedent Study of similar Sydney based projects.

Engineering / Compliance Assessment

A non-destructive inspection and engineering report was carried out by Civil Structural Engineering Design Services Pty. Ltd. in January 2022. The report outlined significant areas of structural concern and corrosion as well as areas of non-compliance.

Precedent Study

A precedent study of similar projects was also carried out by Proludic and presented to council February 2022. This identified costs, challenges, strengths and weaknesses of different approaches of re-use or re-interpretation of the existing 1960's era playground structures.

Project precedents included:

- Lions Park, Long Jetty
- Muston Park, Willoughby
- Blackheath Soldiers Memorial Park



OPTIONS UNDER CONSIDERATION

Following initial investigations and engineering assessment, four options were identified for further investigation and feasibility.

Options to be considered are outlined below. These include a new multi-play / tower play equipment and varying degrees of re-use or re-interpretation of the existing 1960's metal rocket structure.

- OPTION A Old Rocket Refurbished as Sculptural Element (non-playable).
- OPTION B New Rocket with Salvage Original Parts
- OPTION C New Rocket (1960's Inspired Reproduction)
- OPTION D New Rocket (2022 Model Rocket)

For each option, a high level assessment has been completed in the form of a matrix with High / Medium / Low scores.

Scores have been assigned with regard to Council's key value criteria for the project:

- Play Features (experiences) Achievable within Budget.
- Safety of Play Environment
- Protection / Celebration of Historical Values
- Value for Money



SAFETY & COMPLIANCE

This feasibility assessment includes consideration of viability and costs associated with the structural engineering certification and redesign / modifications that would be required in order to achieve compliance with relevant Australian Standards for Playgrounds and Playground Equipment, namely Australian Standard AS 4685 Playground equipment and surfacing.

Significant challenges are presented by the existing structure given that it was constructed before the adoption of modern playground standards and given its age and condition.

Safety and compliance issues are elaborated on further re. Options B and C.

HERITAGE VALUE

The existing rocket-ship is not a heritage listed item but has stood on the site for many years. As part of the grant funded upgrade of the broader Waverley Park district play space, Waverley Council have expressed a strong desire to preserve or reinterpret its heritage value in some way that is safe and cost effective for the local community.

For this reason, all options considered within this report celebrate and interpret this heritage in some way.

PLAY PROVISION & VALUE FOR MONEY

Any further works undertaken to remove, transport & test or repair the existing Waverley Park structure would incur significant costs and divert the project budget away from modern playground equipment and new play provision. Further investigations may be abortive and simply confirm that the existing structure cannot be reused safely, without a majority of components being replaced.

This feasibility attempts to weigh up play outcome vs. value for money for the four options considered and predict the likelihood of achieving a successful outcome based on the information provided in the January 2022 Structural Engineer's Report.

It is hoped that this approach will prevent a situation that would result in abortive works that divert project budget away from the provision of new equipment. High quality, inclusive play opportunities are a priority of the project and modern, inclusive playground equipment would ensure compliance with modern playground standards as well as associated warranties and guarantees for a long design life.



OPTIONS REVIEW: Options A - D

In this section of the report the following options are outlined and discussed:

- OPTION A Old Rocket Refurbished as Sculptural Element (non-playable).
- OPTION B New Rocket with Salvage Original Parts
- OPTION C New Rocket (1960's Inspired Reproduction)
- OPTION D New Rocket (2022 Model Rocket)

A discussion of risks and benefits for each option is also presented for consideration.



OPTION A - Old Rocket Refurbished as Sculptural Element

DESCRIPTION

This option involves removing the existing rocket-ship structure form site and associated costs and time to carry out further investigations of the partly-corroded structure with a view to carrying out works required to achieve Structural Certification, refurbishment and reinstatement on site as a piece of non-playable sculpture.

The addition of artistic and play interactive elements (ground level) could be considered to engage children with the existing structure.

	LOW	MED	HIGH
Play Features Achievable within Budget.			
Rope Climbing Nets (Hanging, Climbing)		MED	
Bridge or Tunnel Connection (Crawling / Swaying / Balancing)	·	MED	
Slide Types / Variety (Sliding)		MED	
Puzzles (Cognitive)	8	MED	
Gathering Spaces (Social)	LOW		
Mission Control Manipulative Elements (Interactive / Sensory)	ķ.		HIGH
Interpretive Artwork & Elements (Imaginative)			HIGH
Safety of Play Environment	*		
Compliance of New Equipment with relevant Australian Standards			POSSIBLE
Compliance of Repaired Equipment with relevant Australian Standards	NOT POSSIBLE		
Protection / Celebration of Historical Values			
Retention of Original Design Concept		MED	
Retention of Original Materials		MED	-
Value for Money	5		
Percentage of Budget available to Create New Play Experiences	9	MED	
Percentage of Budget dedicated to restoring old item.		MED	

Estimated Feasibility / What is Required to Proceed	Low / Further Destructive Investigation Required
	Med / Further Destructive Investigation Required
	High / No Further Investigation Necesarry

BENEFITS

- The benefit of this approach is that (subject to above), some of the existing form and materiality of the original rocket could be adapted and re-used on site.
- Potentially less work would be required to modify in this way compared to modifying the rocket-ship as a play structure.

RISKS

- The structural engineers report identified major structural issues with the existing structure so major replacement works would be anticipated (central column, decks, vertical bars etc).
- This option would not achieve compliance with relevant playground standards. Access to the structure would still need to be controlled by some means to prevent any type of access to the structure and mitigate the risk of injury.
- The viability of this option is still unknown further destructive testing may reveal that major structural modification is required in order to structurally certify the sculptural element.

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OPTION A - Old Rocket Refurbished as Sculptural Element











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OPTION B - New Rocket with Salvage Original Parts

DESCRIPTION

This option involves removing the existing rocket-ship structure from site and associated costs and time to carry out further investigations of the partly-corroded structure with a view to carrying out works required to achieve Structural Certification and Playground Compliance.

Refurbishment and reinstatement on site as a piece of certified playground equipment.

	LOW	MED	HIGH
Play Features Achievable within Budget.	7		
Rope Climbing Nets (Hanging, Climbing)		MED	
Bridge or Tunnel Connection (Crawling / Swaying / Balancing)	LOW		
Slide Types / Variety (Sliding)	LOW		
Puzzles (Cognitive)	LOW		
Gathering Spaces (Social)	X	MED	
Mission Control Manipulative Elements (Interactive / Sensory)		MED	
Interpretive Artwork & Elements (Imaginative)		MED	
Safety of Play Environment			0
Compliance of New Equipment with relevant Australian Standards	Š		POSSIBLE
Compliance of Repaired Equipment with relevant Australian Standards	NOT POSSIBLE		A.
Protection / Celebration of Historical Values			
Retention of Original Design Concept	· ·		HIGH
Retention of Original Materials	LOW		
Value for Money			
Percentage of Budget available to Create New Play Experiences	LOW		
Percentage of Budget dedicated to restoring old item.			HIGH

Estimated Feasibility / What is Required to Proceed	Low / Further Destructive Investigation Required
	Med / Further Destructive Investigation Required
	High / No Further Investigation Necesarry

BENEFITS

• The benefit of this approach is that (subject to above), some of the existing form and materiality of the original rocket could be adapted and re-installed on site.

RISKS

- The structural engineers report identified major corrosion and structural issues with the existing components so as a minimum, major replacement works are anticipated (central column, decks, vertical bars all need replacement).
- In order to ensure compliance with relevant playground standards, much of the original structure would require replacement or modification (new vertical bars, modification of deck levels, new ladders, reconfigured access etc.).
- The viability of this option is still unknown further destructive testing would incur costs and simply reveal that major structural modification is required in order to structurally certify the structure to a level where compliance with relevant Australian Standards could be ensured.
- It may not be possible to salvage any part of the existing structure with this approach, in which case, the structure would need to be fabricated (Refer Option C).

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OPTION B - New Rocket with Salvage Original Parts









Lions Park, Long Jetty. Image: Playing in Puddles

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9

OPTION C - New Rocket (1960's Inspired Reproduction)

DESCRIPTION

This option involves using the current design as a template to fabricate a brand new compliant rocket with increased play value, decommissioning of the old rocket and installation of a new rocket.

Seek opportunities to repurpose or recycle old rocket.

	LOW	MED	HIGH
Play Features Achievable within Budget.		2	3
Rope Climbing Nets (Hanging, Climbing)			HIGH
Bridge or Tunnel Connection (Crawling / Swaying / Balancing)	,	MED	
Slide Types / Variety (Sliding)		MED	
Puzzles (Cognitive)			HIGH
Gathering Spaces (Social)		MED	
Mission Control Manipulative Elements (Interactive / Sensory)	<u> </u>	MED	
Interpretive Artwork & Elements (Imaginative)	1		HIGH
Safety of Play Environment			2
Compliance of New Equipment with relevant Australian Standards			POSSIBLE
Compliance of Rocket Ship Structure with relevant Australian Standards			POSSIBLE
Protection / Celebration of Historical Values			
Retention of Original Design Concept		*	HIGH
Retention of Original Materials	NONE		1
Value for Money			
Percentage of Budget available to Create New Play Experiences	8	MED	
Percentage of Budget dedicated to restoring old item.		W.	HIGH

Estimated Feasibility / What is Required to Proceed	Low / Further Destructive Investigation Required
	Med / Further Destructive Investigation Required
	High / No Further Investigation Necesarry

BENEFITS

- The benefit of this approach is that the existing form of the original rocket will be reinstated without any potentially sacrificial cost.
- Fabricating a new rocket would also ensure than Structural Certification and Playground Compliance could be easily achieved.
- The new rocket would also be supplied with comprehensive warranties and guarantee.
- Play value could be maximised at the design stage.
- New opportunities for integrating the new tower with other new equipment could be easily investigated at the design stage.

RISKS

There is less risk and more certainty with this option.



OPTION C - New Rocket (1960's Inspired Reproduction)









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OPTION D - New Rocket (2022 Model Rocket)

DESCRIPTION

Fabricate an entirely new compliant rocket with increased play value, decommissioning of the old rocket-ship and installation of a new rocket at the same time while seeking opportunities to repurpose or recycle the old rocket.

	LOW	MED	HIGH
Play Features Achievable within Budget		-2	3
Rope Climbing Nets (Hanging, Climbing)			HIGH
Bridge or Tunnel Connection (Crawling / Swaying / Balancing)	,	- X-1	HIGH
Slide Types / Variety (Sliding)			HIGH
Puzzles (Cognitive)	Y		HIGH
Gathering Spaces (Social)	ė.	- 53	HIGH
Mission Control Manipulative Elements (Interactive / Sensory)	ļ.	- X-	HIGH
Interpretive Artwork & Elements (Imaginative)			HIGH
Safety of Play Environment	·	C.	Y Comments
Compliance of New Equipment with relevant Australian Standards		Ø.	POSSIBLE
Compliance of Rocket Ship Structure with relevant Australian Standards	X		NA
Protection / Celebration of Historical Values			
Retention of Original Design Concept	LOW		
Retention of Original Materials	NONE		
Value for Money			,
Percentage of Budget available to Create New Play Experiences			HIGH
Percentage of Budget dedicated to restoring old item.	NA		

Estimated Feasibility / What is Required to Proceed	Low / Further Destructive Investigation Required
	Med / Further Destructive Investigation Required
	High / No Further Investigation Necesarry

BENEFITS

- The benefit of this approach is that the new equipment will be reinstated without any potentially sacrificial cost.
- Structural Certification and Playground Compliance could be easily achieved.
- A contemporary (new design) would allow for play value to be maximised at the design stage.
- All equipment to be supplied with comprehensive warranties and guarantee.

RISKS

- There is less risk and more certainty with this option.
- Different interpretation of heritage ('Rocket' themed retained but not a direct replica)

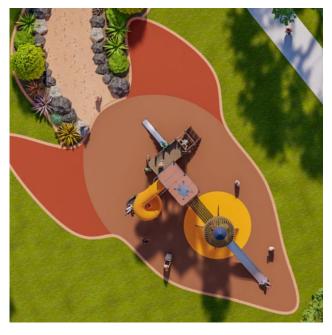
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OPTION D - New Rocket (2022 Model Rocket)









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CONCLUSIONS & RECOMMENDATIONS

Based on the information presented above, our recommendation is to pursue either Option C or Option D and to decommission the existing structure.

Both Options would achieve significant advantages in terms of new play provision, safety and longevity. Both options could be delivered from this point with certainty around lead times, works required and play value achieved. The options of either recreating a (replica) rocket-ship with proportions matching the original OR an entirely new rocket-ship would provide certainty and guarantee a great outcome for the project.

Both Options C and D interpret and celebrate the historical theme, with Option C recreating the form of the original rocket-ship in a safe and compliant way and Option D reinterpreting the rocket theme in a different (new) way. Both would be supplied and installed with a compliance certification and comprehensive manufacturer's warranty.

It is our professional opinion that both option A and B would at best, achieve a compromised play solution relative to the total project budget. Works to transport, dismantle, modify, repair or alter the existing structure as a sculpture or useable play structure would (most likely) be costly or not possible at all.

Given that the Structural Engineer's Report has already identified major corrosion and structural uncertainty, as well as significant areas of non-compliance with relevant Playground Standards these solutions are in our opinion, unfeasible and not worth pursuing.





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15th February 2022 Doc: D-QU-0452_REVB

TO: Proludic Pty. Ltd. 16-18 Tepko Road TERREY HILLS NSW 2084

Regarding:

<u>Structural Engineering Visual Assessment Report - Existing Waverley Park Rocket Ship Structure</u> (insitu).

INTRODUCTION

I, Edward Bennett, practicing civil, structural, geotechnical & environmental engineer, hereby confirm that our company has been requested to inspect and assess the existing Rocket Ship Structure in place at Waverley Park.

I understand that the remaining structure is 40-50 years old and has been closed-off for use to the public for several years.

It is my understanding that Council is also reviewing the existing tower in regards to a significant new playground project with a desire to modify, augment or reuse the existing structure either as a piece of playground equipment or as a site sculpture.

I note that this style of 1960-70's rocket-ship was used in several playgrounds during that period and the Waverley Park structure has been a popular item.

TEST METHOD

This was a visible inspection with a photographic record. Non-destructive testing was recommended at this stage.

OBSERVATIONS:

Refer photographic record Appendix "A"

REPORT:

As little maintenance has been afforded this structure over much time, estimated as fifteen years, since closed-off for public use, and therefore left to corrode in close proximity to the coast at Bondi.

I consider that the corrosion is severe, as the oxidation formed, from the exposure to an extreme salt sea air environment has reduced its pure metal content to approximately 50% remaining over its fifty (50) years life, which is remarkable longevity, when no recent repainting has been carried out.

The corrosion of foundations below ground should also be considered irrespective of whether the structure is to be reused as a sculpture or play structure. While this assessment did not include inspection of the underground footings, there is significant corrosion visible at ground level and on the central post.

In my opinion, the structure, in its present condition:

- Is unable to be signed off as structurally safe and sound (By a Structural Engineer).
- Furthermore, my opinion is that it is a structure that NO engineer would sign-off as structurally adequate and /or safe (stable).
- If the existing tower is subjected to a new wind code analysis, it may not pass.

I consider that this rocket ship structure to be a large fully welded steel structure that would have been too large for it to have been effectively galvanized originally, and so painting appears to have been its only form of corrosion protection.

Usual treatment for repair of a corroded structure of this type would include grinding back the corroded steel, rebuilding back with weld material under strict supervision, then priming and then repainting where necessary. Corrosion protection should be a minimum of heavy-duty galvanizing and three (3) coats of rust proofing paint layers. However, due to the severity of the corrosion to the existing structure, this method is not considered effective for this structure.

COMPLIANCE WITH RELEVANT PLAYGROUND STANDARDS

This review also considered the Rocket ship Structure in relation to the safety requirements of relevant Australian Standards for Playgrounds and Playground Equipment. Specifically;

- Australian Standard AS 4685: Playground equipment and surfacing
- Australian Standard AS 4422: Playground surfacing Specifications, requirements and test method

As well as the structural concerns, I consider that there exists within the Rocket Ship Structure, many areas of non-compliance which present an unacceptable risk. The structure does not comply with relevant standards and significant re-design would be required to eliminate these issues which include but are not limited to:

- o Numerous potential head entrapments between vertical bars & ladders.
- o Numerous potential finger entrapments.
- Non-confirming ladder rungs.
- o Inadequate impact attenuation on decks and at base of structure.
- Sharp edges to horizontal and vertical members.

CONCLUSION:

Structural sign-off of the structure is considered unattainable in its present form.

Playground compliance with relevant Playground standards is also unattainable in its present form.

I also consider that it is unsafe for the structure to remain and should be removed regardless due to the uncertainty of its structural integrity. The rusted components also give rise to accidental injury by its exposed rusted members, that if a child or an adult for that matter, were to climb on it or accidently run or fall into this structure, apart from bruising, there is the chance of "tetanus" infection should the injured sustain an open and bleeding wound.

RECOMMENDATION:

To suitably repair and renovate the structure would require a complete re-fabrication in its entirety with appropriate structural certification and corrosion protection. This option could be considered further, using the existing rocket as a template to preserve its heritage value whilst ensuring safety.

Yours faithfully,

Ease et

E.A. Bennett M.I.E. Aust. Cp Eng. NPER 198230, Member AGS, BDC 0820



FIG 1. Corrosion (Deck).

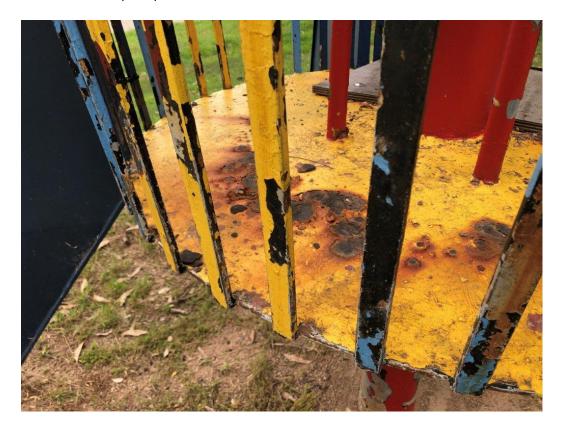


FIG 2. Corrosion (Deck).



FIG 3. Corrosion (Deck / Bar Connection).



FIG 4. Corrosion (Side Stays at Ground Level).

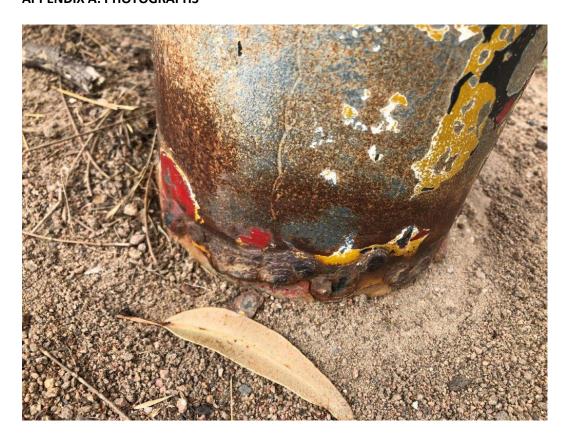


FIG 5. Corrosion (Central Post).



FIG 6. Corrosion (Central Post / Deck Connection).



FIG 7. Corrosion (Vertical Bar).



FIG 8. Corrosion (Vertical Bar).



FIG 9. Corrosion (Deck)



FIG 10. Corrosion (Deck).



FIG 11. Corrosion (Ladder)



FIG 12. Corrosion (Central Post).

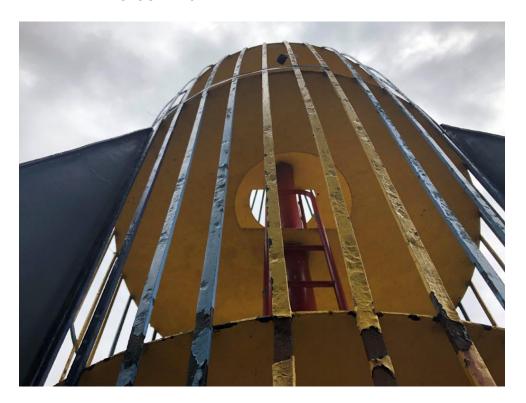


FIG 13. Corrosion (Vertical Bar).





FIG 14. Tower Insitu (from North East)

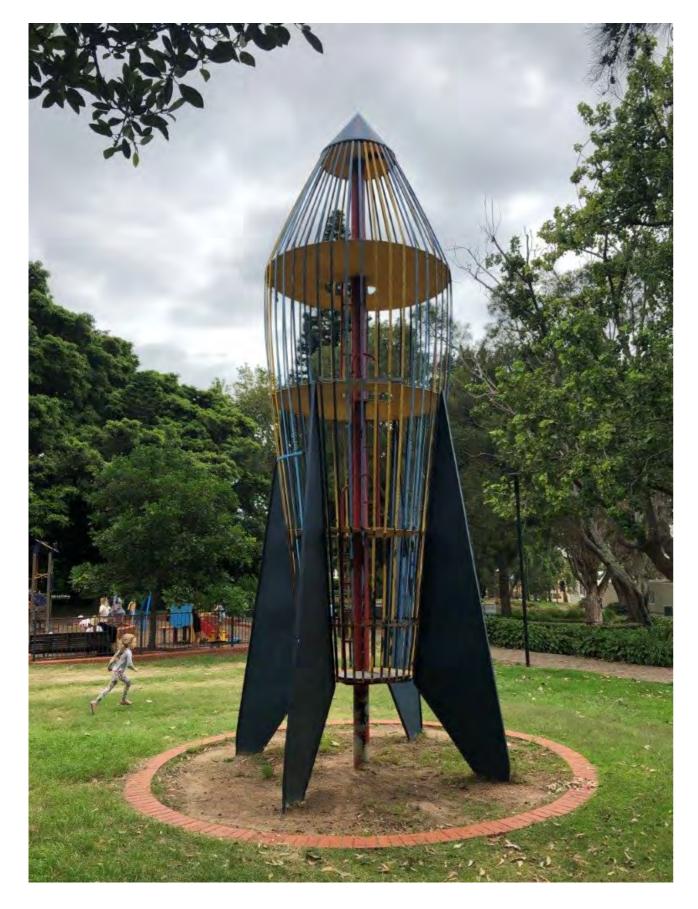
FIG 15. Tower Insitu (from South East)



Designer of play and sports areas



Waverley Park Rocket Ship - Next Steps.







Waverley Park Rocket Ship - Project Objectives.

Objectives -

1. Preserve heritage -

Sculptural Form / Materiality / Original Design Intent?

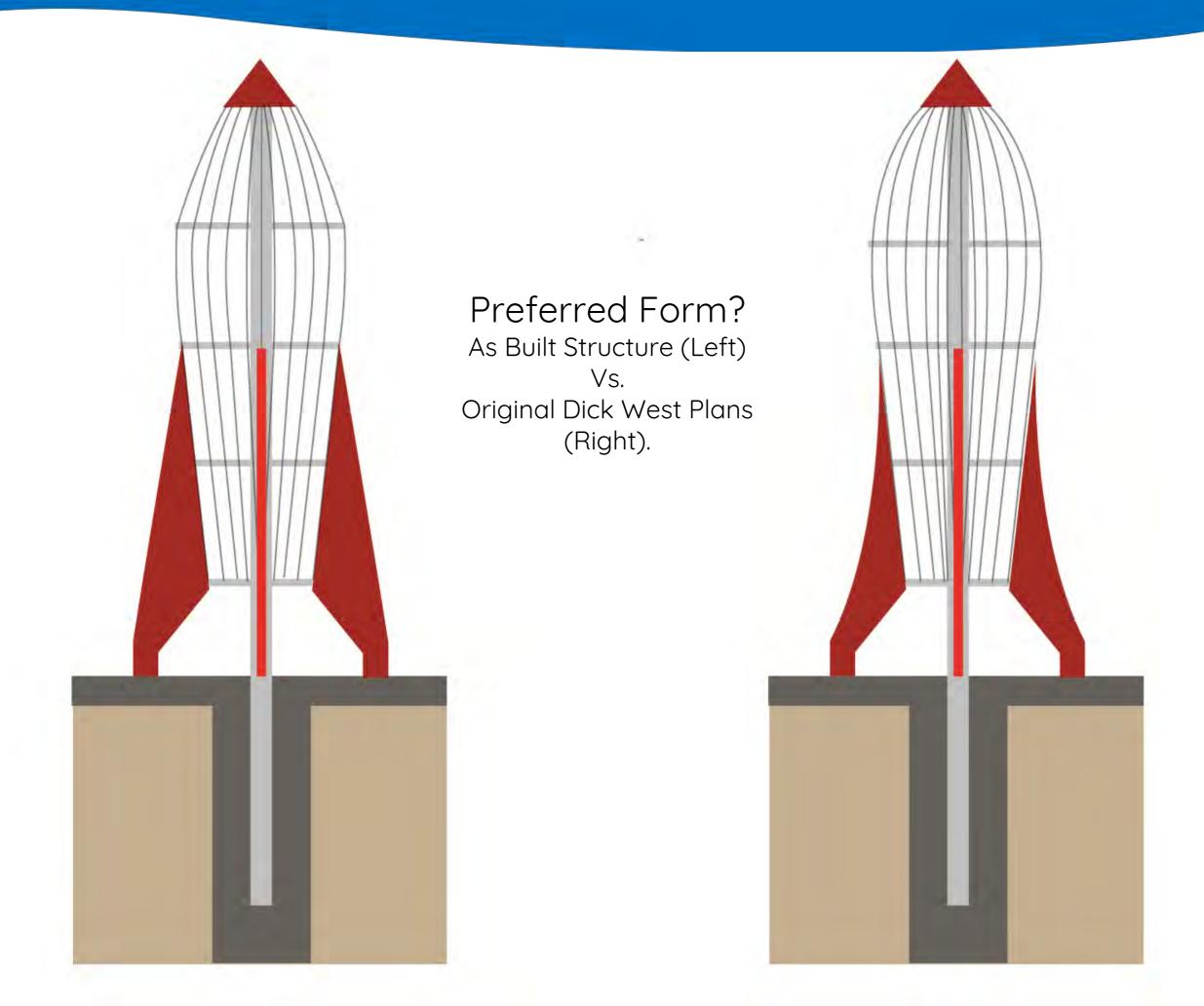
2. Ensure Safety -

Playground safety, compliance & best practice. Structural Integrity & longevity.

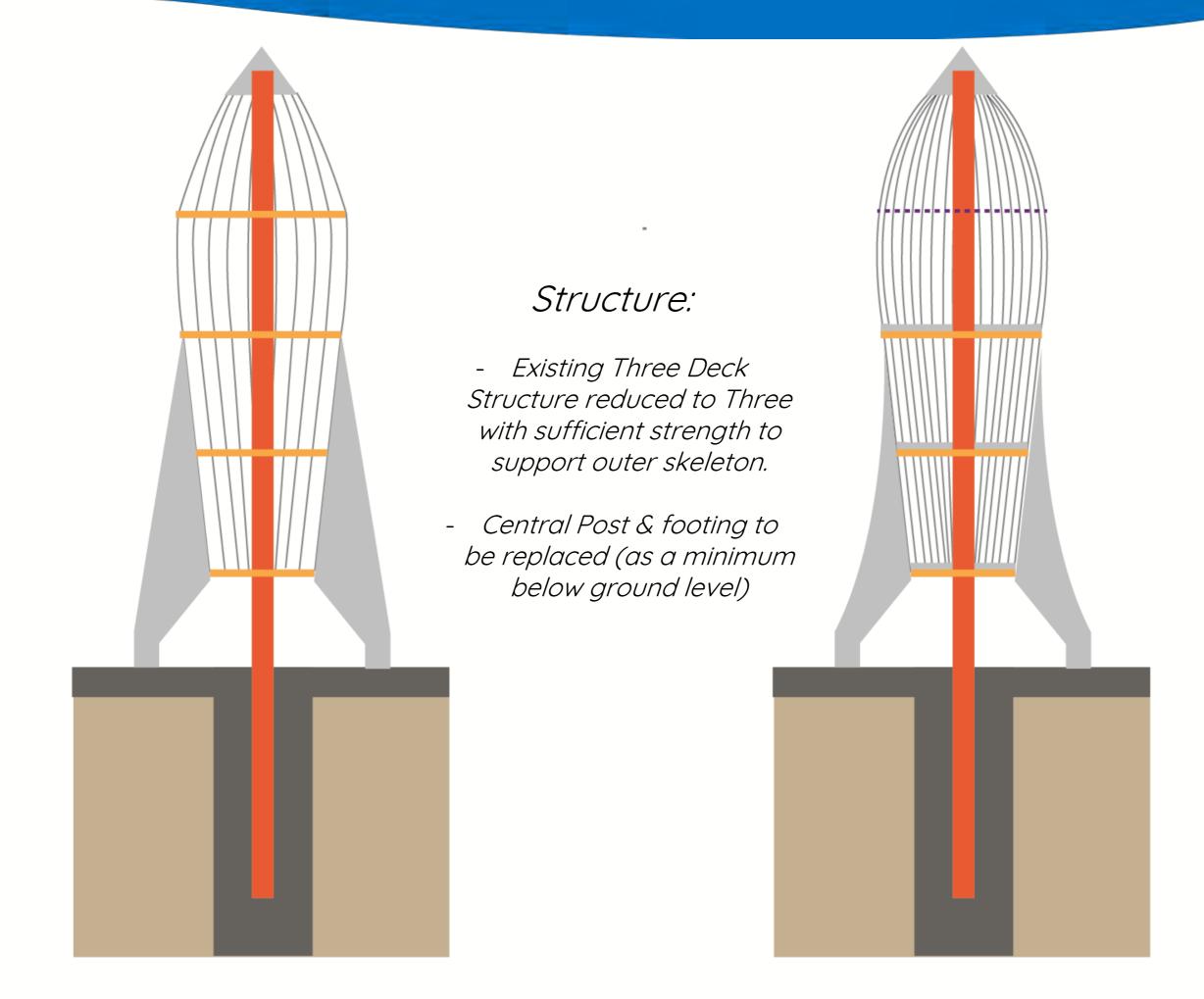
3. Enhance Play Value -

Improve play opportunities for a wide range of ages and abilities. Embody the 'Everyone Can Play' best practice guidelines.

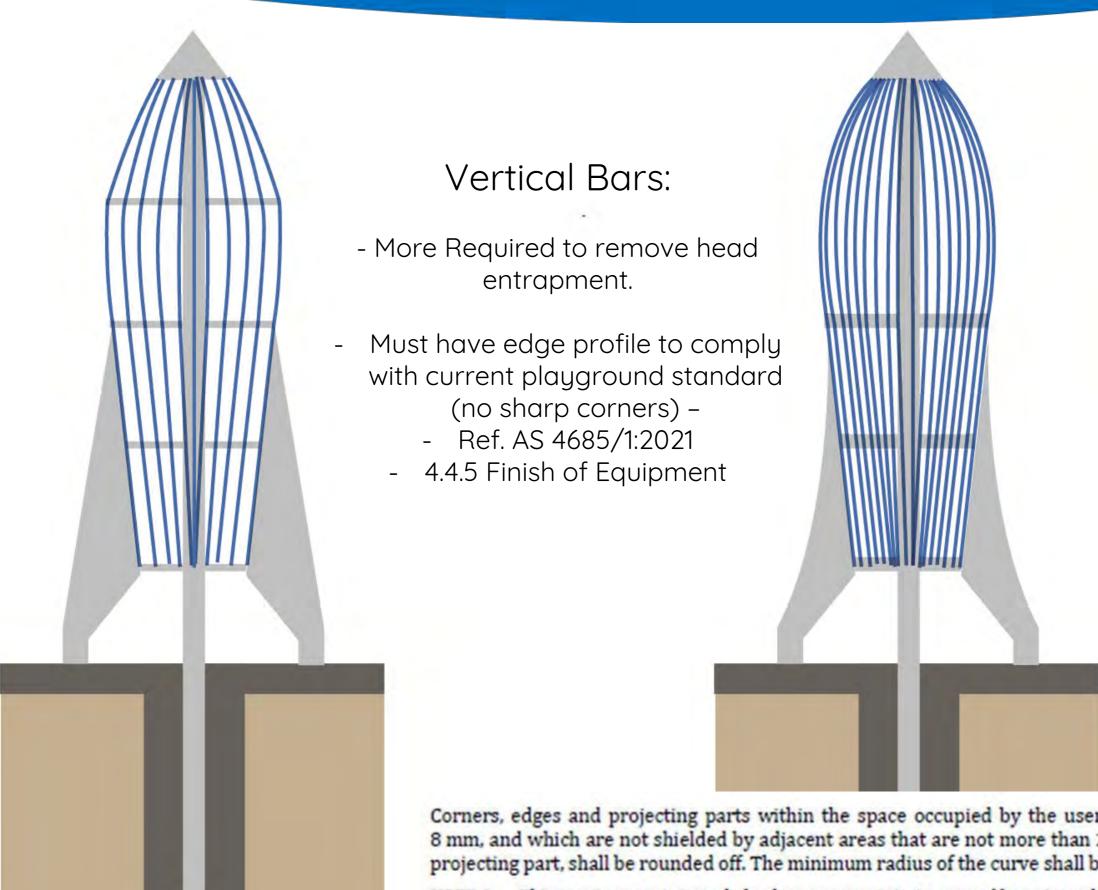








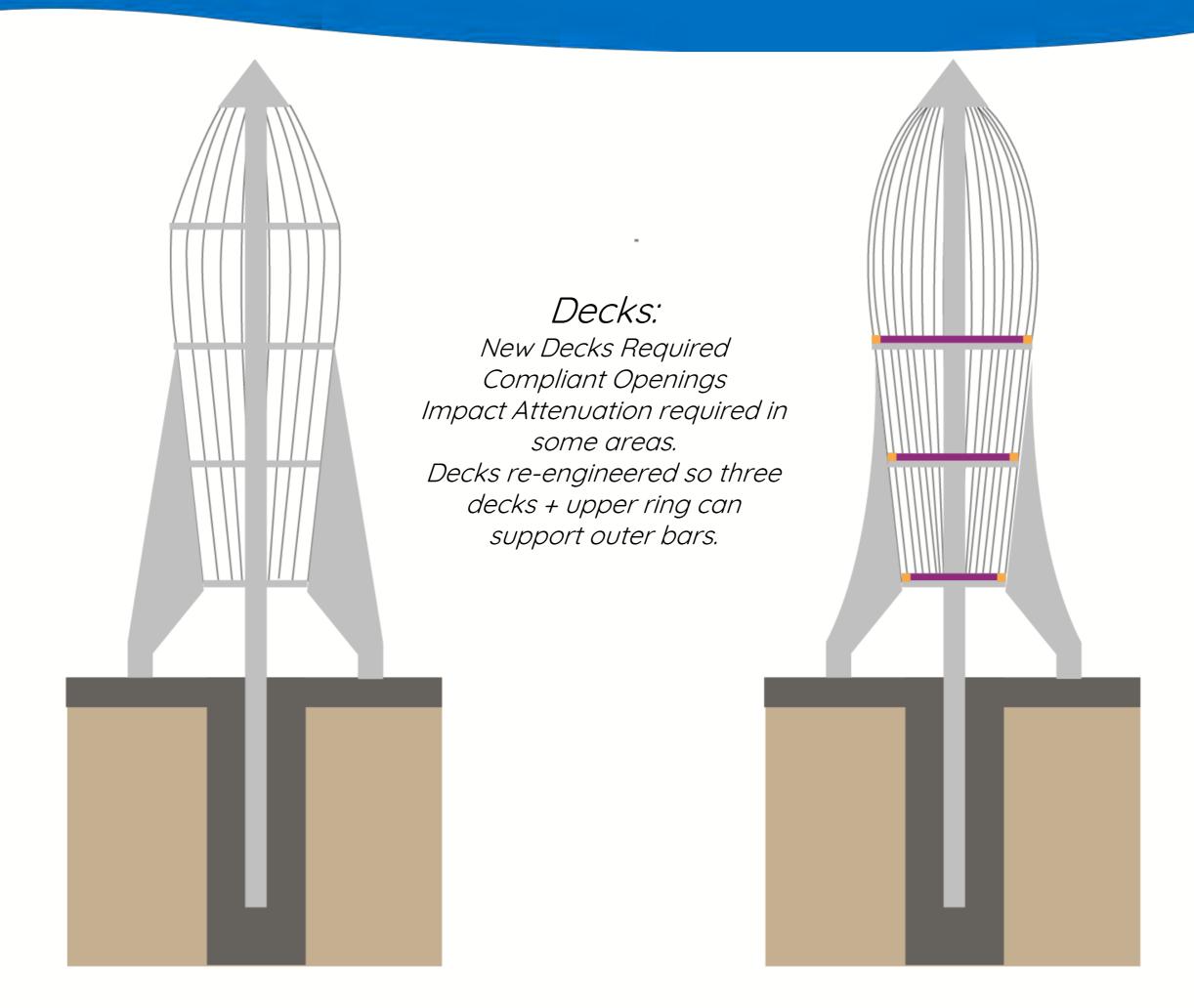




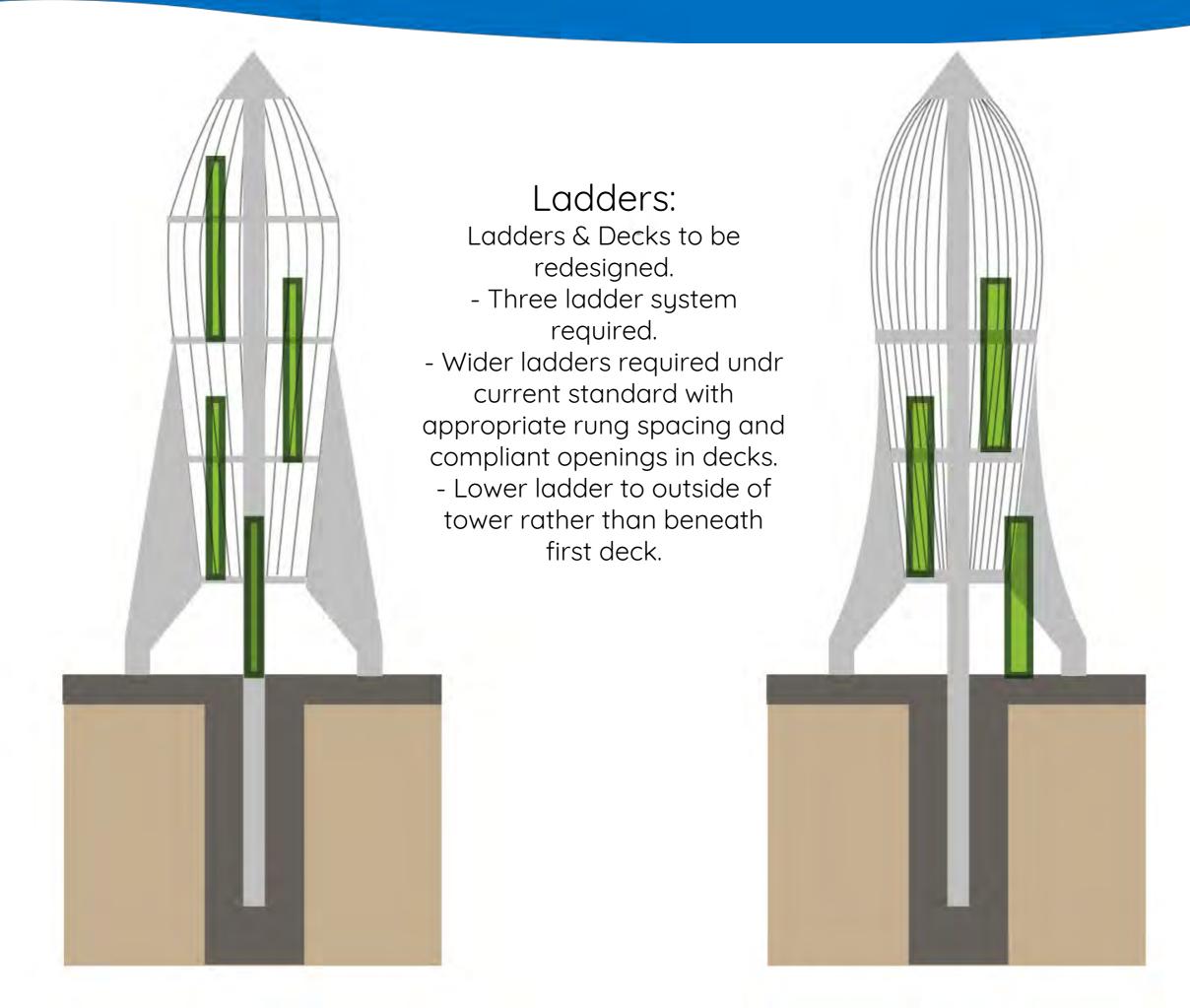
Corners, edges and projecting parts within the space occupied by the user that protrude more than 8 mm, and which are not shielded by adjacent areas that are not more than 25 mm from the end of the projecting part, shall be rounded off. The minimum radius of the curve shall be 3 mm.

This requirement is intended only to prevent injuries caused by unintended contact with components.

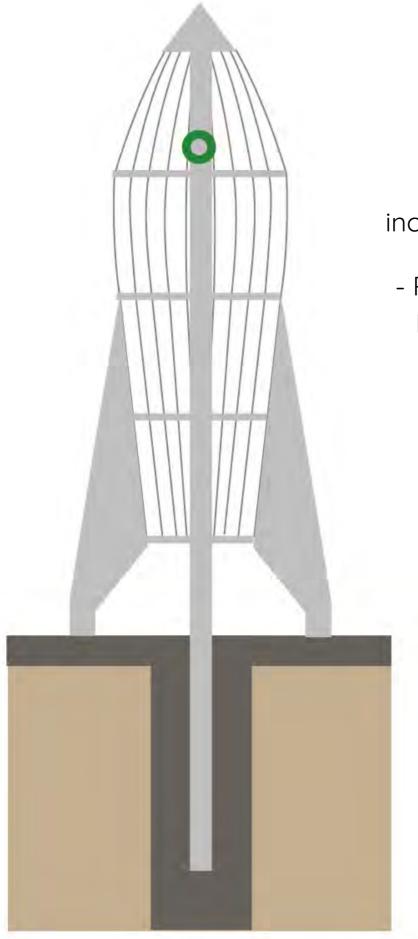
Corners, edges and projections with a radius less than 3 mm may be in other accessible parts of the equipment only if they are not sharp.









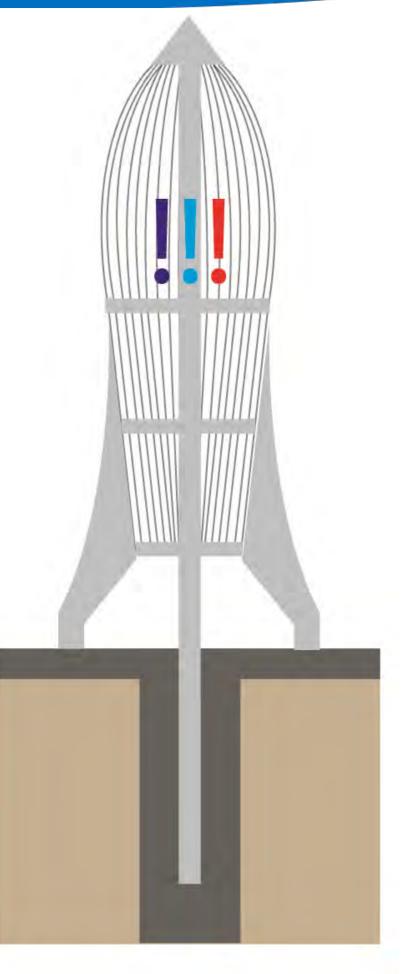


Play Features?

- Original Rocket Ship included one steering wheel feature (missing).

 Redesigned rocket could potentially incorporate multiple Proludic Play Features. Eg.

Talk Tubes.
Play Panels.
Telescope etc.







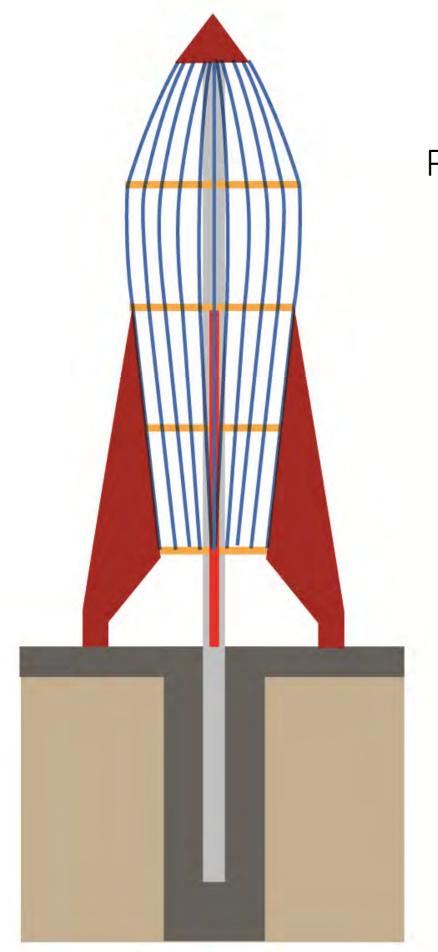




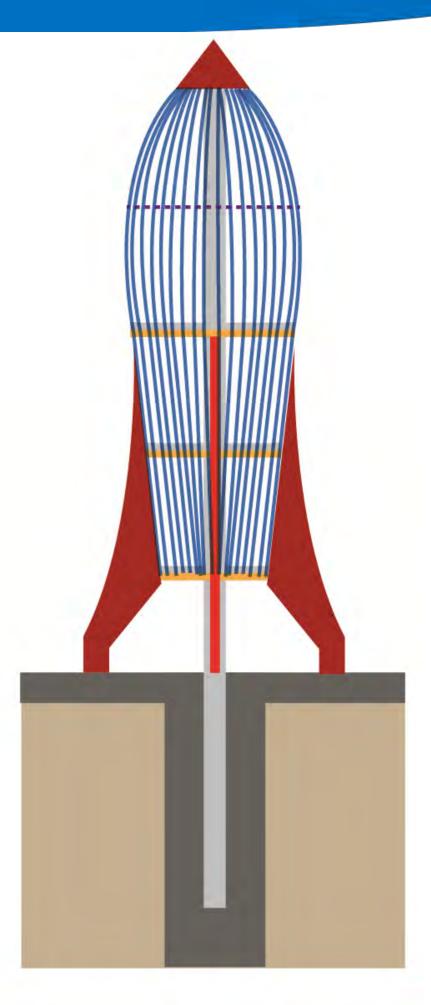






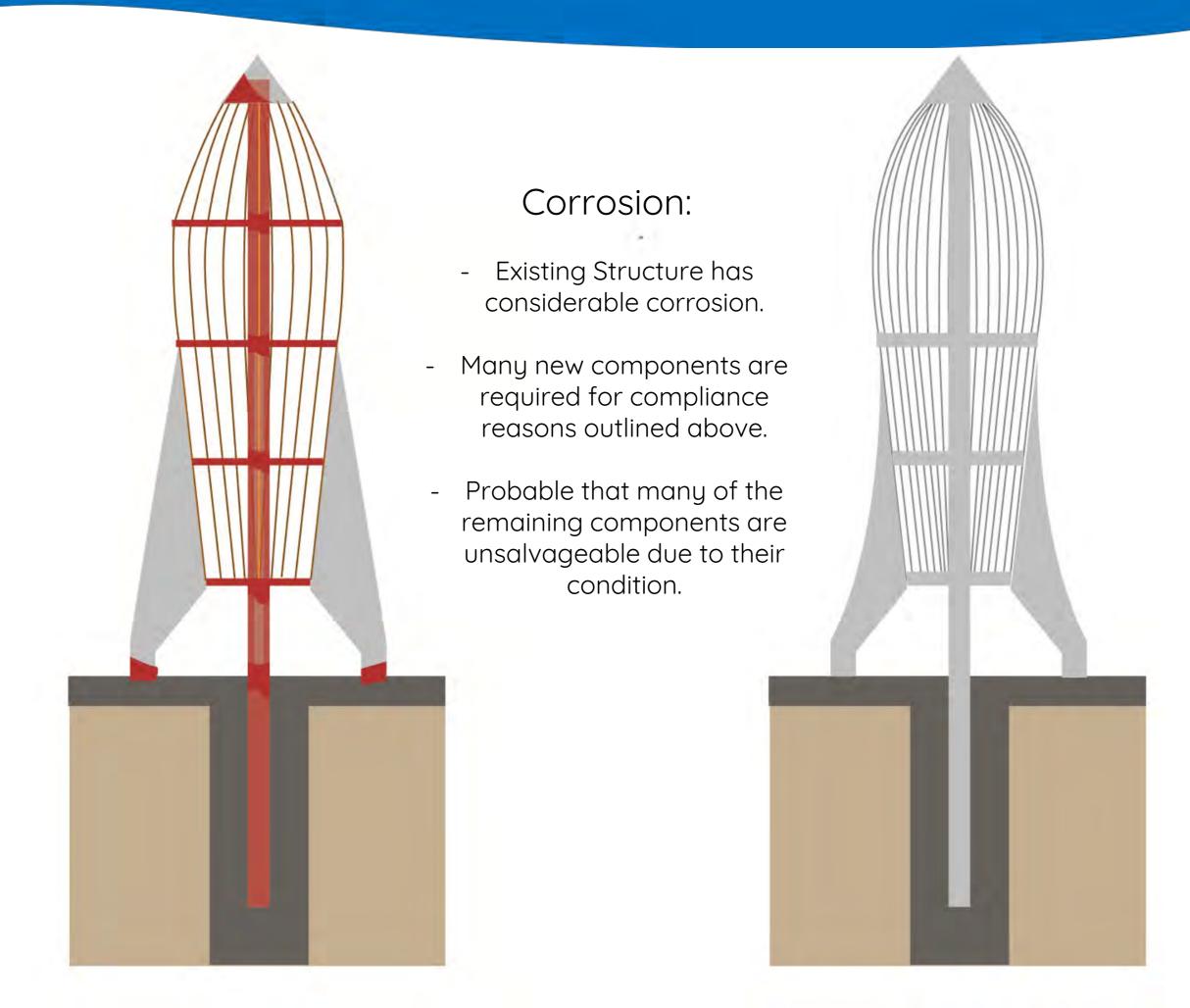


Preferred Colour Scheme?



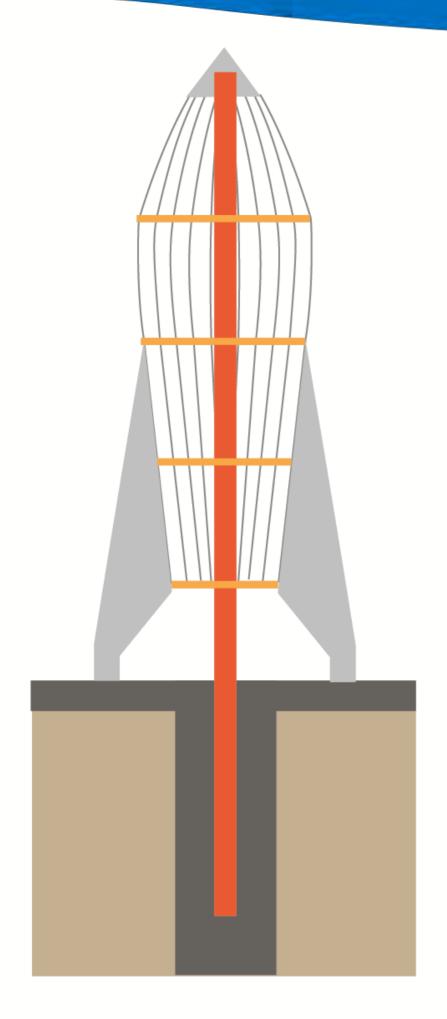


Waverley Park Rocket Ship - Salvageability?





Waverley Park Rocket Ship - Salvageability?



Central Column / Footing & Decks



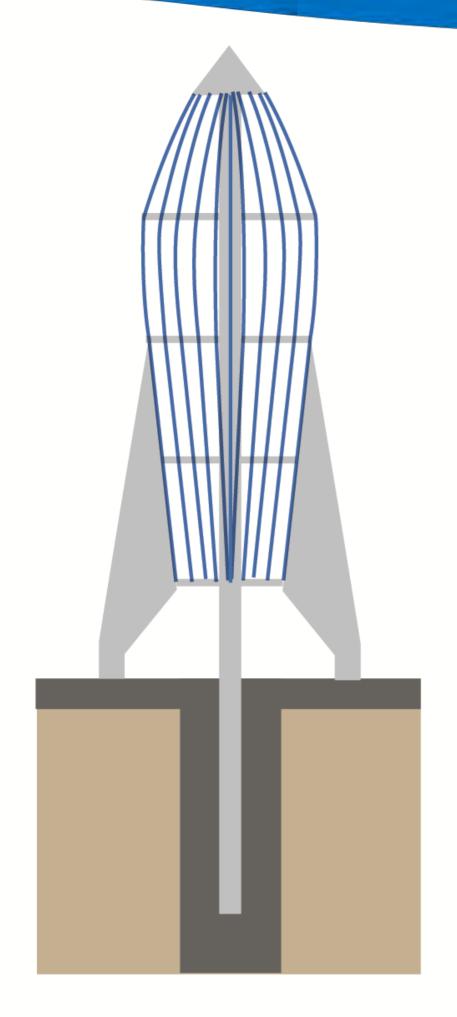








Waverley Park Rocket Ship - Salvageability?



Vertical Bars & Connections

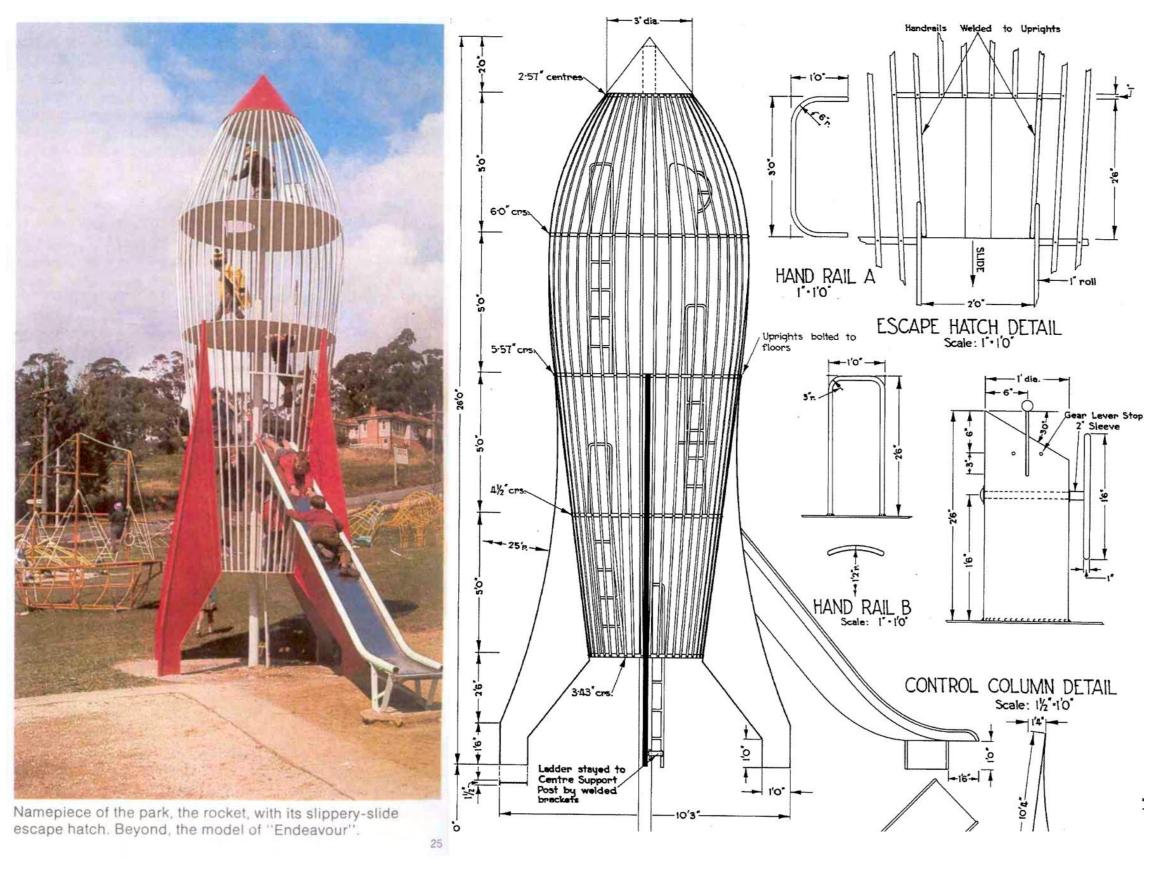












Dick West Design.

- Note Shape / Form of original design elevation with curved sides. (differs from asbuilt).
- Original stainless steel slide from second deck (without sides).

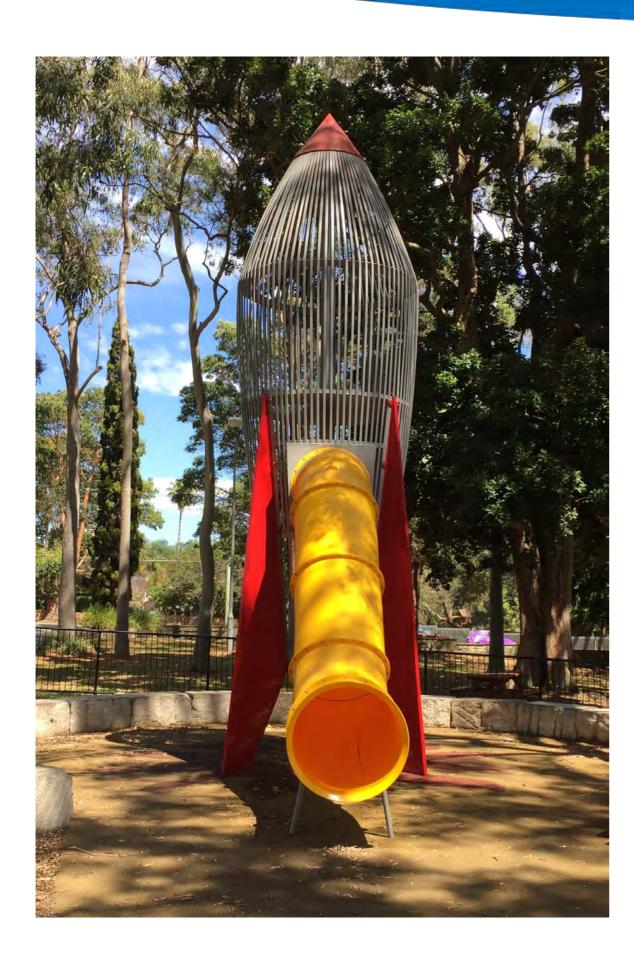




Lions Park, Long Jetty.

- Original Tower.
- Appears to have original outer bar-spacing, hence head entrapments.
- Replacement (?) Slide with high-sides.

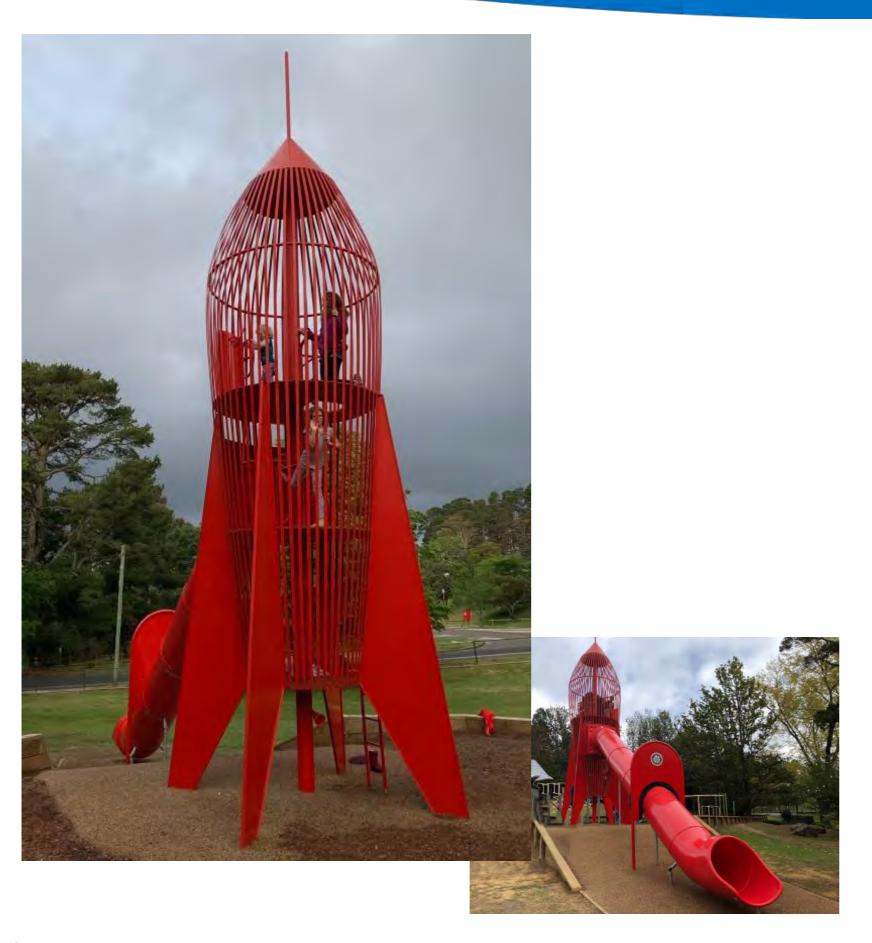




Muston Park, Willoughby

- Former Blackheath Dick West Rocket.
 - Top Deck Cut Out.
- Poor Quality Slide added (non-original).
- Assitional Vertical Bars added.
- External Ladder to lower deck.
 - Drab colour scheme (original).





Blackheath Soldiers Memorial Park

- Rotary Club of Blackheath's rocket ship installed in March 2018.
 - Compliant and Certified.
- Three decks, support ring installed in place of top deck.
- Tube Slide added, ladder external.
- Curved form and antenna added as per original design intent.
- Inspired by the original Rocketship installed in this park (1962).



Waverley Park Rocket Ship - Retained as Sculpture?



Sculpture?

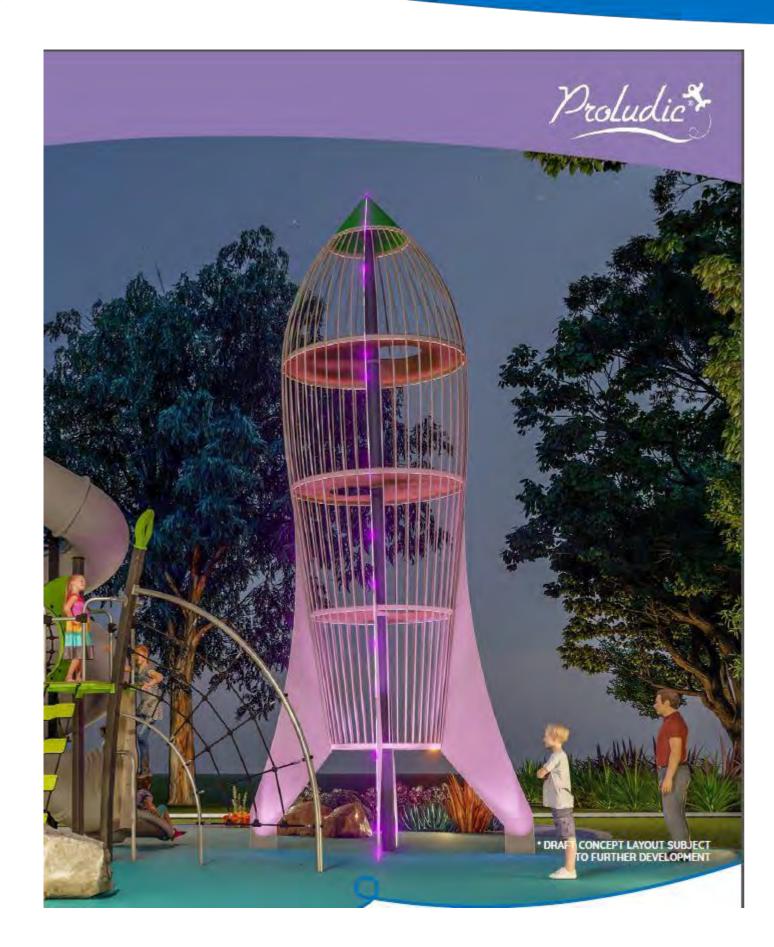
- Can existing tower be reinstalled as a site sculpture to retain a higher percentage of the original material?
 - Viability TBC subject to a destructive, post removal investigation
- Changes required for standards compliance not necessary (no additional bars, new ladders, impact attenuation etc. required) **however** due to the high level of corrosion, the existing rocket would still require significant %age of new components for Structural Certification (new post, footing, decks etc.).

Potential issues -

- A sculpture installed in a playground area may need to comply with play standards.
- How would council stop people using the sculpture as a play item prevent unintended climbing on the structure etc.?
- Potential solutions for Council to consider Put in a different location away from the playground / Signage / Surrounded by prickly plants / Fenced / Height of structure raised above ground to make it inaccessible / covered in fine-weld mesh to prevent climbing etc.?



Waverley Park Rocket Ship - Retained as Sculpture?



Would an entirely new (replica) sculpture be considered as an interpretation of heritage item?

Scaled down version?

Integrated Lighting Elements to activate space at night?



WAVERLEY PARK PLAYGROUND

LIGHT AND SOUND INTERACTIVE PLAY





Waverley Park Rocket Ship - Layout.



Layout.

- Footprint assumed to be level / as per concept plan.
 - Existing Casuarina to be removed?
 - Edge along path to be built up / retained.
- Footing design to work with existing TPZ & RPZs.
- We can design the tower arrangement with some placeholder standard items in existing playground location for scale (swing, carousel etc.).





