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Design Safety Report

Project Maui – Oncology Centre

Revision	2
Date	11 December 2019
Project Stage	DA

Prepared By: VM
Signoff: ZA

Introduction

This report covers proposed works for Project Maui an Oncology medical centre consisting of patient and staff facilities including 4 levels of underground parking, consulting suites, Linear Accelerator bunker, MRIs and patient treatment bays. The report covers foreseeable risks at the present stage of the design (as noted on cover page) and is intended to be revisited at milestone stages throughout the design process.

This report is provided in accordance with the NSW WHS Regulation 2011 to communicate known hazards relating to the design that Team 2 Architects are aware of that may create risk to the health and safety of a person.

This report summarises the risk assessment process undertaken by Team 2 Architects at various stages of the design including controls that have been designed into the structure as well as residual risks that will require controls to be established by others during construction and throughout the life cycle of the structure.

The full design risk assessment is included in Appendix A of this report and should be reviewed by the contractor and the end user.

Methodology

Hazards associated with the design are identified through design safety workshops. These workshops are held at various stages of the design and typically include architects, engineers and relevant specialist consultants such as BCA, fire, access etc.

Team 2 Architects use a risk assessment methodology that considers both the likelihood and consequence of a hazard to establish the level of risk that exists. The risk matrix used for this calculation is included in Appendix B of this report.

After hazards have been identified and their level of risk assessed, the hierarchy of controls is used to consider design options that may eliminate or reduce the level of risk associated with the structure.

High Risks

As a result of the risk assessment, the following high risks were identified and have been considered in the design:

Patient Safety for Patient and Staff:

General Safety - Responsibility: Operator/ Architect/ Electrical Engineer

- Sightlines for better staff monitoring of ward especially in areas patients are likely to be utilising. Curved mirrors have been provided and some corridors to improve line of site to additional areas requested by users.
- Security lighting around the building
- Areas to have security overlay established on CCTV, locking, etc. Operational strategy to review user access to locked areas.
- Client to propose preferences for lock requirements and access to different areas
- Measures to protect staff safety within the ward and in areas where staff will be alone with patients, with emergency calls, duress alarms and staff only areas having swipe card access.

Electrical Safety:

Overhead electrical cables - Responsibility: Contractor

As there are existing overhead cables, the Site Management Plan is to identify safe locations for delivery and unloading of items. Contractor to have relevant safety procedures in place to ensure safe working condition when on the roof during the construction of the courtyard as it may impact existing overhead services.

Protection of leads and cables - Responsibility: Contractor

Any power tool cables to be made safe, taped to floor. Contractor to have relevant safety procedures in place to ensure safe handling. Any power tool cables in areas of hospital with public access to be tagged made safe, taped to floor in bright coloured tape with appropriate warning signs

Sub Station – Responsibility: Fire Consultant, Electrical Engineer, BCA Certifier

Any new Substation service additions to be designed as per consultants' recommendations, with appropriately fire rating and shielding as required.

Existing Services - Responsibility: Contractor

All construction to be undertaken with reference to site surveys, due diligence reports and on site investigation. Contractor to carry out services audit prior to commencing work.

Fire and Emergencies:

Emergency routes and exits during construction - Responsibility: Contractor

Contractor and Operator to create and display evacuation management plan during construction and occupation, and ensure that appropriate escape routes are provided in the event of an emergency.

Emergency routes and exits during operation - Responsibility: Architect, Fire Consultant, Certifier, Operator

Emergency exit signage and evacuation plan displayed. Stairwell and Fire exit distances compliant with codes and standards with engineered solutions as required.

Firefighting during construction - Responsibility: Contractor

Provide portable and temporary fire extinguishers at appropriate locations during construction. Limit or eliminate welding and similar trades.

Spread of fire to nearby/connecting buildings - Responsibility: Architect/ BCA/ Fire consultant

Appropriate fire measures to be adopted in conjunction with suitable separation between any new and existing structures.

Future Works - Responsibility: Contractor/ Operator

Any future works are to avoid compromising smoke and fire separation as indicated on current plans and by statutory signage provided by the contractor. Any penetrations in smoke or fire walls or removal of smoke/fire rated doors are to be approved by a suitably qualified person prior to commencement of works and an alternative line of separation put in place.

Movement of People and Materials:

Vehicular and pedestrian access to and around site during construction - Responsibility: Operator/Contractor

Any disruption of pedestrians, traffic by delivery vehicles to be managed safely by a traffic controller where required. Protective hoardings and diversions to be provided where needed. Should footpath be required to close during construction, clear signage and pedestrian detour paths to be provided, whilst path closed in a manner to discourage usage. Site Management Plan to include alternative access for vehicles and pedestrians to the business park while works take place as well as managing access to the neighbouring buildings visitors and workers navigate past the building site with appropriate OH+S procedures to be put in place.

Accessibility - Responsibility: Contractor/ Architect/ Access Consultant

Architect to ensure design is verified to comply with all relevant Australian Standards in terms of accessibility by a suitably qualified access consultant. Door clearance designed for required with and latch offsets, performance solutions were developed where space restrictions impacted access.

Future Demolition:

Disconnection of Electrical - Responsibility: Contractor

All structures for demolition to be isolated, made safe prior to commencement of demolition. Construction Management Plan to reflect.

Hazardous Materials - Responsibility: Contractor

Contractor to conduct a Hazardous Building Materials Survey prior to demolition and ensure any hazardous materials on site is removed and disposed of safely by qualified subcontractor. Contractor/ Specialist Consultant to conduct hazardous material inspection on the site.

Demolition / end of life cycle - Responsibility: Contractor/ Structural Engineer

Contractor to ensure site hoarding prevents trespassing. Safety procedures in place to ensure all demolition works are undertaken safely. Load bearing structure allows careful removal of materials to occur (floor by floor) without impact on structural stability thus allowing future reconfiguration or demolition to be safely undertaken.

Confided Spaces - Responsibility: Contractor

Confined space training to be provided and safe working environment to be maintained.

Replacing Medical Equipment – Responsibility: Operator/Contractor/Architect

For future upgrades to medical equipment, the building has been designed to allow easier access to the Level 1 bunker through the façade system with only minor intrusion on the exterior and interior. Operator and contractor to ensure all relevant safety procedures when moving equipment in and out through the building and removing walls internally and externally.

Working Environment:

Manual Tasks - Responsibility: Contractor

All site personnel to be trained in manual handling.

Overhead Structures - Responsibility: Contractor

Contractor to ensure work area is away from overhead structures. Contractor to have relevant safety procedures in place to ensure safe working condition when working on the roof during the construction as it may impacted by overhead services and structure.

Underground Structures and Services - Responsibility: Contractor

Due to the presence of several easements and underground tanks all construction to be undertaken with reference to site surveys, due diligence reports and on site investigation. Contractor to carry out services audit prior to commencing work. Care should be taken when working under or next to these structures and services to avoid injury and damage.

Security - Responsibility: Contractor

Contractor to ensure no unauthorised access to works areas. Contractor to include in safe work management plan.

Plant:

Maintenance access to rooftop services - Responsibility: Contractor/ Operator

Proprietary fall arrest system with anchor points and PPE (harness) equipment required, review roof safety system and implement safe working practices.

Tower crane / mobile crane operation, access and locations - Responsibility: Contractor

Contractor and crane operators to ensure correct procedures for the siting and operation of the cranes are undertaken at all times. Statement to form part of Construction management Plan.

Amenities and Facilities;

Slip risks in wet areas - Responsibility: Architect

Architect selection to provide appropriate floor materials for the different uses in the building. Architect has referred to the Australian Standards for slip ratings and selected materials which conform to the relevant uses. Architect has nominated appropriate junctions where materials change.

Hazardous Substances:

Exposure to volatile organic compounds and off gassing - Responsibility: Contractor

Hazardous substances have been identified as a high risk during construction. Low VOC paint to be used generally, but where not possible, appropriate ventilation and time to be provided for off gassing prior to occupation.

Falls Prevention:

Window Heights and Cleaning - Responsibility: Architect/ Operator

Window cleaning to be carried out by abseiling contractors, cherry pickers, or a mixture of both to be determined by building operator. Operator to instigate safe work policy and induct all window cleaning staff.

Lifts - Responsibility: Contractor

Contractor to ensure all lift shaft openings are suitable protected through the construction process to avoid falls from accidental access, etc.

Roof Access - Responsibility: Contractor/ Operator

Roof access must have fall arrest system and access restricted to trained approval personal/contractors only.

Light Fittings - Responsibility: Operator

Client to have building maintenance plan that outlines safe procedures to change a light in tall spaces, such as that of the under croft and lobby areas. Safe procedures required for maintenance of high level lighting and equipment

Guard Rails - Responsibility: Architect/Contractor/Operator

Suitable guard rails, hand rails, gantries, lanyards and restraint systems to be installed as required. Contractor to install in accordance with statutory requirements and operator to adequately instruct and induct maintenance personnel.

Noise Exposure:

Acoustic comfort for surrounding buildings, users and workers during construction - Responsibility: Contractor

Contractor to liaise with neighbours and client to ensure noise does not exceed a certain decibel limit, or coordinate loud works to occur at certain times. All works to be carried out as per council requirements and to acoustic engineer's recommendations.

Operation of loud machinery – Responsibility: Contractor

Contractor to ensure that all site personnel are trained in the correct use of machinery and wear appropriate PPE when operating loud machinery/working near loud machinery.

An acoustic engineer will need to be engaged to review requirements and provide a detailed acoustic specification to ensure Health Infrastructure design criteria are met.

Medical Equipment: Responsibility: Contractor, Architect, and Structural Engineer

Exposure to radiation and lasers Linac Bunker and MRI is a risk associated with the likely use of the spaces. The following steps must be taken to mitigate risk:

- Client and specialist subcontractors to confirm what equipment will be installed in the Linac bunker and MRI and the radiation levels associated with the equipment.
- Appropriate wall lining and wall and floor thickness for radiation to specialist subcontractor specification.
- Appropriate treatment of doors and windows for laser use to be implemented including warning light system during use.

Operational manual:

The contractor will implement a safe work schedule or the duration for the construction and maintenance period.

The end user will prepare an operation manual for the approved method of addressing the risks identified above and other risks which may become apparent once the building is occupied.

Conclusion and General Comments

Although every effort has been made by Team 2 Architects to identify hazards and specify controls, there may be other unforeseen hazards that exist with the structure, the client, contractor, building manager and occupants have obligations relating to work health and safety and must complete their own risk assessments. This report should be used as an input to these risk assessments and not as a stand-alone substitute.

Team 2 Architects are not builders and hence the contractor must identify specific controls in accordance with current codes and standards as part of their project risk assessment and safe work method statement processes.

Appendix A: Design Risk Register

Design Risk Register

Project: 856 Project Maui Frenchs Forest

Date: 11/12/2019

Project Status: DA

Guideword	Hazard	is there are BCA or AS requirement	Likelihood	Consequence	Risk Rating	Risk Mitigation	Action / Responsibility
Staff and Patient Safety	General Safety	No	Likely	Major	High	Measures taken in design to sightlines down and across the building for better security monitoring Areas to have security overlay established on CCTV, locking, etc. Operational strategy to review user access to off locked areas.	Architect, Operator, Electrical Engineer
	Building Access	No	Likely	Major	High	Client to propose preferences for lock requirements and access to different areas. Measures to protect staff safety within the ward and in areas where staff will be alone with patients, with emergency calls, duress alarms and staff only areas having swipe card access	Architect, Operator
Electrical Safety	Overhead electrical cables	No	Likely	Major	High	Due to any overhead cables, the Site Management Plan is to identify safe locations for delivery and unloading of items.	Contractor
	Protection of leads and cables	No	Likely	Major	High	Any power tool cables to be made safe, taped to floor. Contractor to have relevant safety procedures in place to ensure safe handling. Any power tool cables in areas of hospital with public access to be tagged made safe, taped to floor in bright coloured tape with appropriate warning signs	Contractor
	Sub Station	Yes	Unlikely	Major	High	Any new Sub station service additions to be designed as per consultants recommendations, with appropriately fire rating and shielding as required.	Fire Consultant, Electrical Engineer, BCA Certifier.
	Existing Services	No	Likely	Major	High	*All construction to be undertaken with reference to site surveys, due diligence reports and on site investigation.* *Contractor to carry out services audit prior to commencing work*	Contractor
	Emergency routes and exits during construction	No	Likely	Major	High	Create and display evacuation management plan during construction	Contractor
	Emergency routes and exits during operation	No	Likely	Major	High	Emergency exit signage and evacuation plan displayed. Stairwell and fire distances compliant with codes and standards	Architect, Fire Consultant, Certifier, Operator

Fire and Emergencies	Fire fighting during construction	No	Very Unlikely	Major	Medium	Provide portable and temporary fire extinguishers at appropriate locations during construction. Limit or eliminate welding and similar trades.	Contractor
	Spread of fire to nearby/connecting buildings	Yes	Unlikely	Major	High	Appropriate fire measures to be adopted in conjunction with suitable separation between new an existing structures.	Architect/BCA/ Fire Consultant
	Future Works	No	Unlikely	Major	High	Any future works are to avoid compromising smoke and fire separation as indicated on current plans and by statutory signage provided by the contractor.	Contractor/Operator
Movement of People and Materials	Vehicular and pedestrian access to / around site during construction	No	Very Likely	Significant	High	Any disruption of pedestrians, traffic by delivery vehicles to be managed safely by a traffic controller where required. protective hoardings and diversions to be provided where needed. Should footpath be required to close during construction, clear signage and pedestrian detour paths to be provided, whilst path closed in a manner to discourage usage.	Contractor
	Accessibility	Yes	Likely	Minor	Medium	Architect to ensure design is verified to comply with all relevant Australian Standards in terms of accessibility by a suitably qualified access consultant.	Contractor / Architect / Access Consultant
Future Demolition	Disconnection of electrical	Yes	Very Likely	Significant	High	All structures for demolition to be isolated, made safe prior to commencement of demolition. Construction Management Plan to reflect.	Contractor
	Hazardous Material removal		Unlikely	Major	High	Contractor to conduct a Hazardous Building Materials Survey prior to demolition and ensure any hazardous materials on site is removed and disposed of safely by qualified subcontractor. Contractor/ Specialist Consultant to conduct hazardous material inspection on the site.	Contractor
	Demolition / end of life cycle	Yes	Likely	Major	High	Load bearing structure allows careful removal of materials to occur (floor by floor) without impact on structural stability thus allowing future reconfiguration or demolition to be safely undertaken. Contractor to ensure site hoarding prevents trespassing. Safety procedures in place to ensure all demolition works are undertaken safely.	Contractor/Structural Engineer
	Confined spaces	Yes	Unlikely	Major	High	Confined space training to be provided and safe working environment to be maintained	Contractor
	Ventilation for air comfort and general air quality while works are being performed	No	Likely	Minor	Medium	Provide temporary ventilation if required during construction	Contractor

Working environment	Manual tasks.	Yes	Very Likely	Minor	High	All site personnel to be trained in manual handling.	Contractor
	Floor surface to prevent slips and trips	Yes	Likely	Minor	Medium	Appropriate flooring materials and detailing of junctions between flooring materials to be taken into consideration during detailed design	Contractor/Architect
	Maintenance of faculty and providing a safe working environment	No	Unlikely	Significant	Medium	Contractor to provide safe working environment for all site workers and visitors including but not limited to the provision of suitable PPE etc. observe safe working practices and end user to draw up operational manual for maintenance, specifically in high fall risk areas.	Contractor/ Operator
	Accessibility of and methods of handling materials	No	Unlikely	Significant	Medium	Contractor to ensure instigate safe work management plan	Contractor
	Overhead Structures	No	Likely	Major	High	Contractor to ensure work area is away from overhead structures	Contractor
	Security	No	Likely	Significant	High	Contractor to ensure no unauthorised access to works areas. Contractor to include in safe work management plan	Contractor
	Medical Equipment		Likely	Significant	High	Appropriate wall lining and wall and floor thickness for radiation to specialist subcontractor specification for medical equipment required. And appropriate treatment of doors and windows for laser use to be implemented including warning light system during use.	Contractor
Plant	Maintenance access to rooftop services	Yes	Very Likely	Major	Extreme	Proprietary fall arrest system with anchor points and PPE (harness) equipment required, review roof safety system and implement safe working practices	Contractor and operator.
	Tower crane / mobile crane operation, access and locations	Yes	Very Likely	Major	Extreme	Contractor and crane operators to ensure correct procedures for the siting and operation of the cranes are undertaken at all times. Statement to form part of Construction management Plan.	Contractor
Amenities and Facilities	Hygiene and water	Yes	Unlikely	Insignificant	Low	Contractor to provide necessary amenities during construction for on site workers. Client responsible for amenities upkeep.	Contractor/Operator
	Slip risks in wet areas	Yes	Likely	Significant	High	Tiles and floor finishes with a suitable slip rating have been specified.	Architect
Structural Safety	Structural adequacy	Yes	Very Unlikely	Major	Medium	The structural elements have been designed by a suitably qualified structural engineer.	Engineer

Substance	Exposure to volatile organic compounds and off gassing through the use of composite wood products	No	Likely	Significant	High	Low VOC paint to be used generally, but where not possible, appropriate ventilation and time to be provided for off gassing prior to occupation	Architect/Contractor
	Exposure to irritant dust and fumes	Yes	Likely	Minor	Medium	Suitable dust abatement measures to be adopted during construction. Statement to form part of Construction management Plan.	Contractor
Falls Prevention	Window Heights & Cleaning	Yes	Likely	Major	High	Window cleaning to be carried out by abseiling contractors, cherry pickers, or a mixture of both to be determined by building operator. Operator to instigate safe work policy and induct all window cleaning staff.	Architect , Operator
	Lifts		Likely	Major	High	Contractor to ensure all lift shaft openings are suitable protected through the construction process to avoid falls from accidental access, etc.	Contractor
	Roof Access		Unlikely	Major	High	Roof access must have fall arrest system and access restricted to trained approval personal/contractors only.	Contractor, Operator
	Falling objects		Very Unlikely	Major	Medium	All items, particularly those suspended above public footpath, to be securely fixed, and maintained.	Contractor/Operator
	Light fittings		Very Likely	Significant	High	Client to have building maintenance plan that outlines safe procedures to change a light in tall spaces, such as that of the under croft and lobby areas.	Operator
	Guard Rails	Yes	Unlikely	Major	High	Suitable guard rails, hand rails, gantries, lanyards and restraint systems to be installed as required. Contractor to install in accordance with statutory requirements and operator to adequately instruct and induct maintenance personnel.	Architect, Contractor, Operator.
	Voids in floors	No	Unlikely	Significant	Medium	Contractor to adequately cover / protect any penetrations in floors to prevent trip/fall injury	Contractor
Noise Exposure	Acoustic comfort during construction	No	Likely	Significant	High	Contractor to liaise with neighbours/client to ensure noise does not exceed a certain decibel limit, or coordinate loud works to occur at certain times. All works to be carried out as per council requirements and to acoustic engineer's recommendations.	Contractor, Acoustic Engineer
	Operation of loud machinery		Very Likely	Minor	High	Contractor to ensure that all site personnel are trained in the correct use of machinery and wear appropriate PPE when operating loud machinery/working near loud machinery.	Contractor
	Noise exposure during construction	Yes	Likely	Significant	High	Contractor to provide suitable PPE measures for all on site workers	Contractor

Appendix B: Risk Matrix

Likelihood	Consequence			
	Major Death or permanent disability	**Significant** Serious injury, lost time	**Minor** Medical treatment required	**Insignificant** Minor scratch, bruise
Very Likely Expected in most circumstances	Extreme	High	High	Medium
Likely Could occur	High	High	Medium	Medium
Unlikely Could occur but low probability	High	Medium	Medium	Low
Very Unlikely Not expected to occur	Medium	Medium	Low	Low

Hierarchy of controls	
1. Elimination	Can we remove the hazard from the design or eliminate the need to conduct the activity
2. Substitution	Can we substitute the hazard with a less hazardous activity such as specifying LED lights that require less maintenance/changing.
3. Isolation	Can we design it so the activity occurs remotely
3. Engineering	Can we install guards, barriers etc.
4. Administration	Can we document procedures, safe work instructions, use signage etc.
5. PPE	Can we use PPE (e.g. heights anchor points, hearing protection ect)