**Guide Notes for Completing Safety in Design Checklist**

Version 2.0 – 20 May 2020

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| 1.0 | N/A | N/A | First Version |
| 1.1 | 1 June 2018 | Sam Hatzivalsamis | Re-formatted document |
| 2.0 | 20 May 2020 | Sam Hatzivalsamis | Minor text amendments and new format |

# Preface

**This checklist has been developed by applying the hierarchy of control – in order of priority**:

1. **Eliminate** – design the hazard out of the building or structure.
2. **Substitute –** less hazardous materials, fixtures, fittings, plant or construction methods.
3. **Isolate** – use guards or barriers to limit access to hazard.
4. **Engineering** – minimise risk by engineering means, eg provide a permanent building maintenance.
5. **Administrative controls** – recommend the establishment of systems of work or signage, where required, to control residual risks.
6. **Personal protective equipment** – recommend suitable personal protective equipment and training, where required, to control residual risks.

A combination of these measures has been applied when no single measure is enough to eliminate or minimise the risk.

| **Items for consideration (how will it be built in a safe way, how will it be used in a safe way)** | **Potential design issues during construction** | **Potential design issues during occupancy** | **Comments / actions / applying the hierarchy of control\*** |
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| **Common Items** | | | |
| ***Site layout / Location*** | | | |
| Have overhead power/underground services been located?  *Eg. Dial before you dig.* | **Yes  No  N/A** | **Yes  No  N/A** | Underground services identification should include resources such as dial before you dig. The design is to include and advise of underground or potential underground services to minimise risk to construction personnel, and works from the disruption and damage of underground cables. Documentation shall include both above and below ground infrastructure. The design of a structure can also help to avoid this type of injury by designing so as to reduce the need for construction workers to dig or drill close to known power cables, and reduce the need to use lifting machinery near overhead lines. This will necessitate dialogue and coordination between the designer and construction personnel. |
| Will materials and equipment be stored in a convenient location? | **Yes  No  N/A** | **Yes  No  N/A** | The movement of large equipment and materials poses a manual handling risk from injury caused through the weight of the object, distance it needs to be handled, or through handling at awkward angles. Safe designs should consider the storage areas in relation to the area of use for the end user, and also during the construction phase. The design of a structure should be considerate of where storage areas are able to be placed during construction to ensure safe working methods for construction personnel. |
| Are there any other specific site layout issues that need to be considered? | **Yes  No  N/A** | **Yes  No  N/A** | Site layout should be considered in terms of the logistics of constructing the structure as designed. In the same way as one would not design an object that is too large to fit on a truck to be transported to site, the safety issues involved with placement on site should be carefully thought of during the design of a structure and its elements. |
| ***Heights*** | | | |
| Can anyone be injured by falling a distance of 1.8 meters from either an elevation or into an excavation?  Consider raised road surfaces and trenching / excavations during construction and after practical completion. | **Yes  No  N/A** | **Yes  No  N/A** | Working at heights poses risks to construction personnel, maintenance personnel, and members of the public. The risk lies in both the fall and being fallen upon, and the design must allow for precautions against this during construction ie. Design for prefabrication on the ground before lifting into place; allow for the necessary anchor points for barriers, ropes, netting and scaffolding. It is also preferable that the maintenance regime should include as little of exposure to this risk as possible, and strategies such as the provision of permanent and safe access should, or locating high maintenance elements on lower levels should be considered. |
| Can anyone be injured by objects falling from a height?  *Eg. Work platforms, ladders, above a pit.* | **Yes  No  N/A** | **Yes  No  N/A** | Consideration to all personnel working below other workers or below ground level need to consider objects falling. |
| ***Timing*** | | | |
| Has the effect of the environment been considered when planning the sequence of construction for long term jobs?  *Eg. wet weather, high temperatures* | **Yes  No  N/A** | **Yes  No  N/A** | Harm to construction personnel arising from exposure to the elements is an identified hazard under the Occupation al Health and Safety Regulation 2001, and it is a responsibility therefore to ensure that working conditions do not become unsafe due to natural events. |
| ***Access/Egress*** | | | |
| Will vehicles / mobile plant have easy access to the site? | **Yes  No  N/A** | **Yes  No  N/A** | Ease of site access for trucks minimises the need for handling of materials and risk of associated injury. Disruption of surrounding traffic and traffic accidents are also minimised. |
| ***Environmental Conditions*** | | | |
| What flora and fauna need to be considered in the local environment? | **Yes  No** | **Yes  No  N/A** | Has the environmental plan specified any endangered specifies with the working area. |
| Are there approvals and sufficient resources for gravel and water extraction? | **Yes  No** | **Yes  No  N/A** | The construction of road works can be undermined if the gravel and water resources are not found or are not from an approved source. |
| What sediment and erosion control issues exist in the local environment?  *i.e. table drains, run off, waterways, drainage?* | **Yes  No** | **Yes  No  N/A** | Sediment from construction and maintenance is to be considered. Designs are to take appropriate considerations. |
| Will dust suppression be an issue during the works and after practical completion? | **Yes  No** | **Yes  No  N/A** | All earthworks construction has a dust hazard. Has appropriate attention during the design taken into consideration the dust hazard during construction and maintenance? |
| Will the noise during construction significantly disrupt surrounding businesses/residents?  *Consider nearby sensitive receptors such as schools, hospitals etc.* | **Yes  No  N/A** | **Yes  No  N/A** | If construction noise has high potential to disrupt surrounding areas, consider managing time of works so that this is minimal and providing hoardings or other sound barriers to minimise disruption. The design of the structure should take this into account and allow for placement of such barriers. |
| ***Public Security / Traffic Control*** | | | |
| Will access to the site by members of the public be restricted to prevent injury and vandalism?  *Eg barricades or fences, locked access ways* | **Yes  No  N/A** | **Yes  No  N/A** | Trespassing upon a construction site poses a safety risk to the intruder, as they are often not qualified or inducted site professionals. In addition, movement of items on site may pose a safety risk to construction personnel when they next resume work. Prevention of access by unauthorized personnel reduces liability of the site and also prevents damage to property. |
| Will traffic need to be controlled around the site? | **Yes  No  N/A** | **Yes  No  N/A** | Any point of contact between members of the public and construction conditions should be managed by qualified co-ordinators. It is not possible to control what members of the public do or how they act, so the control must be managed from the perspective of the construction site to minimise risk to the public. |
| Will loading or unloading of materials and equipment be needed on site? | **Yes  No** | **Yes  No  N/A** |  |
| Traffic control sufficient to provide access emergency vehicles?  *I.e. Fire, police and ambulance?* | **Yes  No** | **Yes  No  N/A** |  |
| ***HAZCHEM*** | | | |
| Could members of the public be exposed to hazardous material, dust, vapours etc? | **Yes  No  N/A** | **Yes  No  N/A** | The design should consider the toxicity of materials used in construction, or generated by demolition, as these are difficult to control and often cannot be confined to within the boundaries of the site. Avoidance of methods which involve toxic materials is desirable, however, if this is not possible then a safety methodology should be enacted, and should take into account the areas outside of the site and the effect of the weather and other dynamic conditions. |
| Could anyone be injured due to exposure to asbestos, lead or other hazardous materials? | **Yes  No  N/A** | **Yes  No  N/A** | Minimising the use of hazardous substances through specifying safer alternatives in the design is preferable; however, if hazardous substances must be used, the correct methodology for handling must be deployed. |
| Will hazardous/flammable substances/chemicals be stored correctly?  *Eg. appropriate type and size of containers* | **Yes  No  N/A** | **Yes  No  N/A** | The provision of appropriate storage is necessary to minimise risk of injury through exposure to hazardous substances. Many substances have specific conditions under which they may be stored, so knowledge of these is essential when planning for storage areas on site |
| Will there be adequate ventilation available? | **Yes  No  N/A** | **Yes  No  N/A** | Adequate ventilation must be provided for so that sufficient oxygen levels are maintained and also to prevent the accumulation of vapours which may pose a risk of fire or explosion. |
| ***Fire/Explosion*** | | | |
| Will surfaces finishes be fire resistant?  Material used, can they be destroyed by fire? | **Yes  No  N/A** | **Yes  No  N/A** | The use of fire-resistant surfaces as a safety strategy may be an appropriate strategy to allow occupants to address fire hazards before the fire takes hold, minimising the inhalation of smoke and harmful toxins in small fire events, and preventing a fire from escalating into a large event.  Materials that are susceptible to fire may become a maintenance issue. Types of materials used for road furniture are to be considered for their appropriateness. |
| ***Working Environment*** | | | |
| Is there sufficient ventilation to meet requirements for the work to be performed on the project site? | **Yes  No** | **Yes  No  N/A** |  |
| What will be the weather conditions on site be?  i*e: extreme hot or cold weather, dusty or windy conditions, storms.* | **Yes  No** | **Yes  No  N/A** | The contractor is responsible for developing a safe work method for working in site weather conditions to provide safe work conditions. |
| Is there potential for the site to flood or be subject to inundation of water? | **Yes  No** | **Yes  No  N/A** |  |
| Is there a risk to workers from flora or fauna? | **Yes  No** | **Yes  No  N/A** | There are a number of dangerous fauna and as such may need to be considered during the design stage to ensure construction and maintenance can be performed safely. |
| Will the workers have access to amenities and facilities such as storage, first aid rooms, rest rooms, meal and accommodation areas and drinking water? | **Yes  No** | **Yes  No  N/A** | On large sites design is to consider where the contractor can set up camp. The contractor is to ensure that adequate facilities are provided. |
| Will workers be exposed to noise from plant or aspects at the project site? | **Yes  No** | **Yes  No  N/A** |  |
| ***Utilities and Services*** | | | |
| Will the location to, access to and egress from, and work space in the plant room / switch room be considered? | **Yes  No  N/A** | **Yes  No  N/A** | The design of circulation space should consider pedestrian access as well as access to maintain the facilities. This contributes to the provision of a safe workplace for both maintenance staff as well as the end user. |
| ***Building Materials*** | | | |
| Will the structural strength and stability be enough to hold permanent and temporary loads? | **Yes  No  N/A** | **Yes  No  N/A** | Consider the specific end user of the building and design accordingly. This includes acknowledging their day to day activities and anticipating anything that may be out of the ordinary eg. sharp corners hazardous generally, and particularly in workplaces such as laboratories where skin wounds can have far greater consequences; is the floor slab thick enough to accommodate safes, document storage etc, if this is a likely use for the space |
| Will there be procedures for disposal of waste? | **Yes  No** | **Yes  No  N/A** | Procedures are to be developed for the temporary on site storage of materials, and the transportation and disposal methods. |
| ***Confined Spaces*** | | | |
| Will anyone need to work in a confined space? | **Yes  No  N/A** | **Yes  No  N/A** | The provision of adequate environment and services to confined spaces is necessary in the interest of general health and wellbeing. Consider also providing control to the occupant for aspects such as local lighting and air circulation to ensure adequacy and safety. |
| Will adequate ventilation be provided in confined spaces? | **Yes  No  N/A** | **Yes  No  N/A** |  |
| ***Emergency Procedures*** | | | |
| Will evacuation and emergency procedures be developed and clearly communicated? | **Yes  No  N/A** | **Yes  No  N/A** | Design of a space that functions well in emergency use may only be advantageous if it is used correctly. It is therefore necessary that correct emergency procedures be known by all and practised regularly. Any changes should also be communicated clearly and without delay. |
| ***Site Access*** | | | |
| Will site lines provide adequate visibility for trucks/cars entering/exiting the site? | **Yes  No  N/A** | **Yes  No  N/A** | Visibility for vehicles entering and exiting the site is a necessary feature to enable the driver to make decisions based upon circumstances. It reduces the risk of error in interpretation of a traffic controller’s instruction, and also allows passing traffic to see the vehicle and avoid any incidents from their side. |
| Will the access road have adequate stability for trucks/equipment? | **Yes  No  N/A** | **Yes  No  N/A** | The additional mass of oversized vehicles and their cargo must be considered in the provision of access roads |
| Has adequate turning room been provided for large vehicles and trucks? | **Yes  No  N/A** | **Yes  No  N/A** | Turning room must be sufficient to prevent crowding of the site. All work requires adequate and appropriate space to enable the work, and crowding brings more personnel into close proximity of danger. |
| Will the strength and stability of the road or bridge structure be enough to hold permanent and temporary loads? | **Yes  No** | **Yes  No  N/A** |  |
| ***Dams*** | | | |
| Has the stability of walls been checked and support provided where required? | **Yes  No  N/A** | **Yes  No  N/A** | Design should take into account the existing structures, and enable the continued access and maintenance of these as well as any new structures. The design should also be aware of the construction methodology that is required to build the new structure, and ensure that this will not compromise the integrity of existing structures. |
| Is there a safe manual access point for sample collection? | **N/A** | **Yes  No  N/A** |  |
| Will adequate covers and railings be provided to prevent falls? | **Yes  No** | **Yes  No  N/A** |  |
| ***Pipelines*** | | | |
| Will equipment such as pipes be securely stored to prevent rolling, theft etc? | **Yes  No  N/A** | **Yes  No  N/A** | Designers should consider the specific materials in use during the construction of a project, and ensure that any which have special characteristics are stored appropriately. The physical provision of this storage should also be ensured during the design phase, for example, ensure that there is flat ground close by. Consultation of specialist contractors may be necessary to gain this information. |
| Was the location of the pipeline selected to minimise disruption to congested or public areas during construction and/or maintenance? | **Yes  No  N/A** | **Yes  No  N/A** | Construction works should be aiming to minimise impact to surrounding facilities in order to reduce the exposure of the public to risk of injury. |
| Have the distance / proximity to other existing services be considered during the selection of the location of the pipeline? | **Yes  No  N/A** | **Yes  No  N/A** | All existing services close by should be considered prior to the pipeline layout both in terms of the pipeline’s impact on surrounding services (eg. what if the pipe bursts) and the surrounding services’ impact on the pipeline (eg. will their presence make maintenance on the pipeline difficult). Also ensure that other services’ maintenance schedules don’t cause the work site to become overcrowded and therefore unsafe. |
| Are supports required in excavations? | **Yes  No  N/A** | **Yes  No  N/A** | Despite investigations prior to construction, sometimes it is not possible to anticipate ground conditions, or the effect that weather may have in destabilisation. An emergency plan and resources should be on standby when conducting risky work just in case |
| If old pipelines are being replaced, will old pipelines be removed or remain capped in the ground? | **Yes  No  N/A** | **Yes  No  N/A** | Strategy for dealing with redundant services should be understood prior to the beginning of works and any finishing off or disabling work must be carried out in the interest of long term safety. |

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| ***Other Issues*** | | | |
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**What are the next steps when the Checklist has been completed?** *(what do I do with this information?)*

1. Where hazards are identified, make changes to the design whenever reasonably practicable. In identifying changes, apply the hierarchy of control so that the risk is eliminated or, if not reasonably practicable to do so, minimised to the lowest level reasonably practicable.
2. Provide a completed copy of this review checklist to the Project Manager, who will then include the hazards in the Project Risk Register.

This information will also be included in the contract documentation so that the hazards are brought to the attention of tenderers/the contractor and addressed in their Safety Management Plan. This is done by including the hazards in the Contract Preliminaries clause for Occupational Health and Safety.

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| Name of Reviewer |  | Position held by reviewer |  | Signature of Reviewer |  | Date of Review |