



Guidance Paper

Safety in Design & WHS in the Digital Billboard Environment

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01 Background

The purpose of this Guidance Paper is to identify issues specific and unique to the digital billboard environment and to explore measures to reduce Workplace Health and Safety issues for digital advertising installers and operators within the outdoor advertising industry.

This Guidance Paper should be used in conjunction with the OMA's existing Guidance Paper (refer attachment) entitled *Safe Working Guidelines for Out-of-Home Industry Workers, (May 2014)*. The *Guidelines* detail current hazards and measures for risk control within the industry. The Guidance Paper should be used in conjunction with the Guidance Paper for all persons involved in the commissioning, design, fabrication and ongoing management of Out-of-Home (OOH) digital advertising structures.

This paper has been written by Dominic Weir of Coresafe with guidance from the Outdoor Media Association's (OMA) Work Place Health & Safety Committee. The Committee is made up of representatives from the OMA's member companies involved in the installation of traditional format and digital billboards.

02 Overview

Digital structures designed and constructed for the OOH market range from poster size panels, up to stadium size panels with dimensions in excess of 20 metres by 4 metres.

Regardless of size, there are fundamental WHS considerations required for those persons building, servicing and maintaining digital structures, and also for the general public near and around the structures.

This paper considers ways to forward plan and minimise WHS issues surrounding digital structures.

This paper should be considered as a 'living' document that is continually added to and improved as more information becomes available on relevant WHS issues.

03 What Does the Law Say?

Across each State and Territory there is a duty to provide a safe workplace and safe working systems.

Safe Work Australia is the national policy body responsible for development and evaluation of the Model Work Health and Safety (WHS) Laws. The Model WHS Laws are the basis for harmonised laws across Australia, and to be legally binding they need to be enacted or passed by the Parliament in each State or Territory jurisdiction.

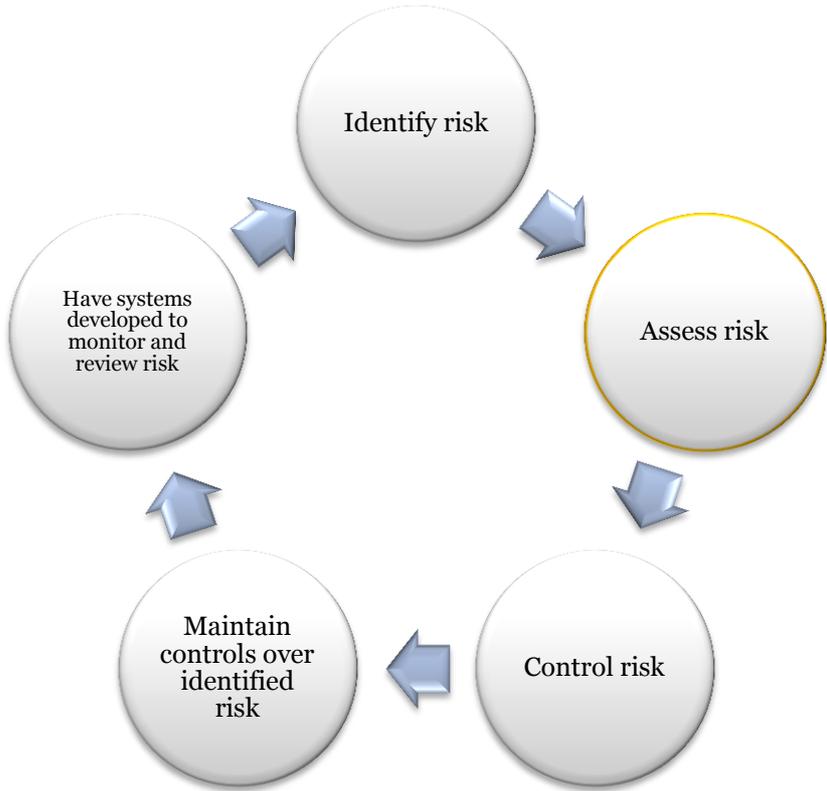
At the time of preparing this paper the Safe Work Australia Model WHS Laws had not been implemented in Victoria or Western Australia. Western Australia however, was at the time consulting on options for implementing elements of the model.

The Model WHS Laws comprise the Model WHS Act and Model WHS Regulations. The Act and Regulations are supported by Model Codes of Practice. The Model Codes offer practical guidance to achieve suitable levels of WHS controls for particular activities.

The reader of this paper within each State and Territory must consider the requirements under the relevant WHS legislation and ensure, where applicable, the specific Codes of Practice are consulted to achieve the standards specified.

It is the obligation of the reader to use this paper only as a guide and to ultimately ensure that the regulatory requirements applicable to each States or Territories are complied with. It is also the obligation of the reader to stay 'up-to-date' with any regulatory changes that may occur.

Broadly speaking, the fundamental principle requirements within the model WHS Regulations in relation to risk management is summarised in the diagram below. This is taken from the requirements of part 3.1 of the Model WHS Regulations 2011 (clauses 34 to 38).



04 Examples of Digital Structures



05 Planning and Design Considerations

Design is one of the most crucial considerations for all sign builds, including digital structures. Sharing of information by all parties involved in the process can greatly help the designer to consider all foreseeable risks for the end user and the public.

The design phase allows for the commissioner of the structure to consult with the designer of the structure and share known and foreseeable risks based on experience and understanding within the industry. The location where the structure is to be placed also needs to be taken into account.

The designer should also consider how the structure will be used and maintained, by consulting with the builder and the end user of the structure.

If the designer is unfamiliar with installation and operational work practices for advertising devices, then the designer could visit existing structures to gain a better appreciation for WHS requirements.

06 Model Codes of Practice & Standards (Relevant to the Planning & Design Phase)

The Safe Work Australia Model Codes of Practice are relevant to the planning phase of a project and continue to apply during the lifecycle phase (the operation and maintenance) of the structure.

The following list of Model Codes is not exclusive. The reader should also consult any Model Codes of Practice relevant to their State and Territory and implement the requirements as appropriate. The following overview of each Code is drawn from, or copied from the individual Codes description¹.

Safe Design of Structures

This Code has been developed to provide practical guidance to persons conducting a business or undertaking which designs structures that will be used, or could reasonably be expected to be used, as a workplace. This includes architects, building designers and engineers. This Code is also relevant for anyone making decisions that influence the design outcome, such as clients, developers and builders.

How to Manage Work Health and Safety Risks

This Code has been developed to provide practical guidance for persons who have a duty to manage risks to health and safety under the WHS Legislation. The WHS duty is placed on persons conducting a business and includes all persons responsible for the management or control of a workplace, as well as manufacturers, importers and suppliers of plant, substances or structures that are used for work.

¹ <http://www.safeworkaustralia.gov.au/sites/swa/model-whs-laws/model-cop/a-z-cop/pages/a-z>

Managing the Risk of Falls at Workplaces

This Code applies to all workplaces covered by the WHS Legislation where there is a risk of a fall by a person from one level to another that is reasonably likely to cause injury. It has been developed to provide practical guidance to persons conducting a business (and persons who design, construct, import, supply or install plant or structures) on how to manage health and safety risks arising from falls. It also includes information on a range of control measures to eliminate or minimise the risks.

Hazardous Manual Tasks

This Model Code of Practice has been developed to explain how to identify hazardous manual tasks, assess the risks of musculoskeletal disorders and eliminate or minimise those risks. This guidance is also relevant for designers, manufacturers, importers or suppliers of equipment, materials and tools used for work, as well as designers of workplaces where manual tasks are carried out.

Australian Standard 1657-2013 Fixed Platforms, Walkways, Stairways and Ladders - Design, Construction and Installation ²

Australian Standard 1657-2013 sets out the requirements for the design, construction and installation of fixed platforms, walkways, stairways and ladders that are intended to provide safe access to places used by operating, inspection, maintenance and servicing personnel.

This standard is written to cover a broad range of industries and access needs and should be used in the design phase. However, it is acknowledged that it may not be possible or practical to strictly follow these standards for the design, construction and installation of digital advertising structures. A variation from a specific requirements of this standard is acceptable as long as the variation does not add a significant risk to the end user.

07 Access for Workers and Equipment

Any structure, large or small has the likelihood of parts needing to be replaced at some point during its operational life. The structure will also need to be periodically serviced and maintained by workers.

While the structures are generally designed to last in excess of 15 years, the parts within the structures may need to be replaced or upgraded. This is particularly foreseeable with the rapid advances foreseen in digital technology.

Some of the more common parts requiring replacement include power packs, modules and cards. For this reason access and maintenance is a major consideration that is required when planning and designing any structure.

² <http://infostore.saiglobal.com/store/details.aspx?ProductID=1694271>

There is a responsibility on the worker to be adequately trained and to be competent in accessing the structure for repairs and maintenance. The worker's employer should make available suitable equipment to access and work on the structure, after the structure is installed.

The designer and commissioner of the structure should consider the following:

1. What type of installation and maintenance works will be required and how frequently. This information can help both parties consider what would be a reasonable and practical approach to the access requirements. For example, if the sign is in a stairwell and it requires regular servicing it may not be practical to set up a mobile scaffold each time. Whereas, if the sign gets accessed less regularly, this arrangement may be considered following a risk assessment of the structure and surrounding environment.
2. What design considerations can be added to the structure to allow the worker greater access. For example, should eyebolts or other types of tie off points or lifting points be added? Knowing how the structure will be accessed and what parts will need to be replaced can help determine the types of additions to the structure that are required to assist ongoing access and maintenance. This may avoid additional costs such as machine hire at a future stage.

o8 Walk-In Digital Panels

Large equipment is required for the servicing and maintenance of 'walk-in' digital panels. Some consumable elements within these structures can weigh in excess of 300kg. The requirement to manually move large, awkward and even bulky objects can lead to worker injuries including crush injuries and musculoskeletal injuries. These risks are amplified within a restricted space such as a digital structure.

Consideration should be given at the design stage to the following issues:

1. How can equipment and replacement parts be safely transported to and installed within the structure. For example, can the structure have a Davit Arm or other form of lifting tool to mechanically lift the required materials into the structure?
2. How do the materials get moved in and around the structure, including the following considerations:
 - Does the structure need running tracks or other means to mechanically move the consumable objects to the required locations within the structure?
 - Can the worker easily transfer the old and new parts with minimal physical exertion?
 - Is there space for the workers to move around during the changeover of consumable?

09 Heat within the Advertising Structure

The traditional 'walk-in' advertising structures known as 'light boxes' have safety issues with heat build-up, particularly during the summer months.

The digital advertising structures, with a 'closed-in' design can have similar or increased issues with heat, due to both the design and the heat generated by the electrical components.

The designers of the advertising structure should factor in heat build-up during warmer months and the time that workers are required to be in the structure performing maintenance and repair works.

Excessive heat conditions can affect the human body in relatively short periods of time and this safety factor is a key consideration in the design and maintenance processes.

Consideration should be given to the following issues at the design stage:

1. Has the potential working temperature within the structure been assessed? For example, what heat sources are in the structure and what is the potential for heat build-up within the structure?
2. How long are the working times required within the structure? Has the minimum and maximum working timeframes been assessed during expected lifecycle maintenance and repair of the advertising structure?
3. If it is foreseeable that heat can build up within the structure, can the design be modified to factor in heat reduction techniques? For example, can air vents, opening panels or fans be designed into the structure to reduce the temperature during work periods?

010 Stairs and Escalators

Advertising panels in public areas such as shopping centres and railway stations can sometimes be difficult to access, particularly if they are installed above or along stairwells and escalators.

The placement of signs above stairs and escalators makes for valuable product placement, and for this reason stairwells and escalators will continue to be an area where signs are installed in the future.

Safe access for the installation and maintenance of advertising signs placed in stairwells and above escalators must be considered within the design phase and the access information must be passed onto the sign owner/end user.

011 Electrical Requirements

The electrical safety of each advertising structure must be considered as part of the safe workplace assessment and the unit must be subject to ongoing safety checks. Typically each unit will have a 240 volt power input power supply, with a conversion to a lower voltage power supply inside the unit.

Safe Work Australia has developed a Model Code of Practice for Managing Electrical Risks at Workplaces, as follows:

Model Code of Practice - Managing Electrical Risks at the Workplace³

This Model Code of Practice has been developed to provide practical guidance for persons conducting a business or undertaking electrical tasks in the workplace. It applies to all workplaces where a person has management or control of electrical equipment, including electrical installations, or carries out electrical work on or near energised electrical equipment, including electrical installations.

This Code of Practice details what consideration should be given to areas of importance including the following:

1. Identification of stakeholders with responsibility.
2. Low voltage isolation and access.
3. Tag out processes.
4. Requirements for Residual Current Devices (RCDs).
5. Risk controls – working near energised electrical parts.
6. Training and instructional requirements for workers.
7. Tools and equipment requirements around electrical sources.
8. Emergency planning.

At the time of writing this paper the States of Victoria and Western Australia had not implemented the harmonised Safe Work Australia Model WHS Laws.

In Victoria, regulations covering electrical equipment safety and efficiency are administered by Energy Safe Victoria (ESV). The key functions of ESV include:

- Overseeing the design, construction and maintenance of electricity, gas and pipeline networks.
- Licensing and registering electricians.
- Issuing and auditing Certificates of Electrical Safety.

³ <http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/managing-electrical-risks-in-the-workplace>)

In Western Australia, Energy Safety oversees all electrical regulatory matters including electrical licensing, equipment safety, installations, inspections and supply.

A list of Australia Standards covering electrical wiring practices is provided below:

- AS/NZS 3000:2007 Wiring Rules.
- AS/NZS 3019:2007 Electrical installations - Periodic Verification.
- AS/NZS 3017:2007 Electrical installations - Verification Guidelines.

Any person responsible for electrical works should be qualified and ensure all regulatory and licensing requirements are followed in relation to electrical works and maintenance.

012 Warning signs

For all electrical parts or areas where other hazards are present it is recommended that signage is installed that complies with **AS 1319-1994 Safety Signs for the Occupational Environment**.

While these are considered as administrative controls they serve to warn the user and those unfamiliar to the work environment of hazards or dangers. In particular electrical or fall hazards which are relevant to the out of home industry.

013 Maintenance and Testing

13.1 Structural

There should be a regular maintenance schedule in place for both the main structure and its components to prevent WHS issues from arising. The components of the structure will require ongoing assessment by suitably qualified persons. This assessment should include the internal and externals of the structure, particularly at the holding points to which the structure is attached.

The designers of the structure should set an inspection schedule for the structure and the installation location. In setting the schedule they should consider local environmental conditions. For example a structure close to a marine environment or subject to vibration may require more frequent and rigorous inspection than one in an enclosed place not subjected to harsh environmental conditions.

13.2 Electrical and Digital Components

Electrical safety relies in the first instance on safe design, and then ensuring that a system is in place for the checking and maintenance of the electrical equipment, including Residual Current Devices (RCD). The purpose of an RCD is to cut power in the event of a fault, stopping the risk of an electrical injury occurring.

From the **Safe Work Australia Model Work Health and Safety Regulations 2011** the following electrical clauses have significance:

Clause 150 - Inspection and Testing of Electrical Equipment

(1) *A person conducting a business or undertaking at a workplace must ensure that the electrical equipment is regularly inspected and tested by a competent person if the electrical equipment is:*

(a) *supplied with electricity through an electrical socket outlet; and*

(b) *used in an environment in which the normal use of electrical equipment exposes the equipment to operating conditions that are likely to result in damage to the equipment or a reduction in its expected life span, including conditions that involve exposure to moisture, heat, vibration, mechanical damage, corrosive chemicals or dust.*

Whilst clause 150 specifies that testing must occur if electricity is supplied through an electrical socket outlet, this should not preclude regular testing if the electricity supply is hard wired. There is an overarching requirement for all reasonable steps to be taken to ensure work place safety throughout the life of the electrical components, both hard wired and plug fitted, as is clarified in the following clause:

Clause 147 General Risk Management

A person conducting a business or undertaking at a workplace must manage risks to health and safety associated with electrical risks at the workplace.

This includes electrical risks associated with the design, construction, installation, protection, maintenance and testing of electrical equipment and electrical installations at a workplace.

The Australian Standard AS/NZS 3760:2010 *'In-Service Safety Inspection and Testing of Electrical Equipment'* offers guidance on testing protocol and includes a table which specifies interval times for testing.

014 Safety to the Public

Advertising panels of all format types are placed in highly visible areas, which are frequented by the public in car, on public transport or by foot.

All stakeholders of the structure including the commissioner, designer, fabricator, installers and maintenance workers have responsibility for safety to the public. There is a legal responsibility with Workplace Health and Safety Legislation in Australia to not only protect the worker, but also to maintain a safe environment for members of the public within the vicinity of the structure. This duty extends not only during the periods when workers are on or in the structure but at all other times, for the life of that structure.

During the design phase consideration should be given to whether the structure needs to be tethered with back up restraints if the fixing points fail or are hit. For example, RMS controlled bridge style structures over roadways in NSW are required to have a system of steel cable secondary restraints attached to both the structure and bridge, to stop the structure falling to the roadway if dislodged.

During the operations and maintenance phase considerations should include:

- What equipment will be taken onto the structure?
- Does it need to be tethered to prevent falling?
- Does the area need to be barricaded off during works?
- Will road or footpath closures be required?

015 Environmental Conditions

Environmental conditions are a factor in the health and safety of workers and the public. Environmental conditions include the following:

- Physical location of the structure
 - Pedestrian or vehicle traffic in the vicinity of the advertising structure means higher controls for the securing of the structure and equipment. Designers and commissioners can greatly reduce risk through pre-construction controls and the end user must also have in place safe systems of work to prevent items falling from the structure.
- Is the structure easily accessible
 - The structure needs to be easily accessible for authorised persons to access it whilst also being secured from other persons gaining unauthorised access, to protect the safety of the public.
- Does it need one or more isolation switches
 - Designs where there is a greater electrical risk to the user or unauthorized persons accessing the structure should include a mechanism to isolate or terminate power in the event of an access panel opening.
- Does it have exposure to hostile conditions?
 - Vibration, water penetration, high winds and salt air can all add to the degradation and corrosion of key elements of the structure. Design selection of suitable components and regular maintenance can avoid failure and costly repairs.
- Is it indoors or outside?
 - The components for an indoor structure may differ greatly from an outdoor structure. Components need to be weatherproofed for outdoor works. Some indoor structures may also be located in hostile environments such as an area with high humidity and will still require weather resistant ratings.

016 Digital Compliance Requirements

The development of digital structures is rapidly expanding within the outdoor advertising industry. It is possible that some imported components for digital structures will fail to meet Australian or International Standards and may present a risk at the construction or end use phases.

With this in mind it is important that stakeholders in Australia involved in the commission, manufacturing, design, importation and maintenance phases source electrical components that meet all required standards.

The ***Model WHS Act 2011 Division 3 'Further duties of persons conducting businesses or undertakings'*** outlines the particular responsibilities of each stakeholder to ensure, amongst other things, that components used within the structure must be safe and pose no threat to any persons in the vicinity of the structure.

The stakeholder should consult requirements in relation to existing Australian or International Standards.

A list of digital standards, additional to those already mentioned in this paper, is presented below. This list is not exclusive.

Safety:

- UL⁴ 48:2011/09/02 ED:15 / Rev:2012/10/02
- CSA-C22.2 No. 207-M89:1989
- IEC 60950-1:2005 / EN 60950-1:2006 / CB Cert
- IEC 60950-22:2005 / EN 60950-1:2006 / CB Cert

Electro Magnetic Compatibility (EMC):

- CISPR22:2008 / EN 55022:2010 / AC:2011 - Class A2)
- EN 61000-3-2:2006+A1:2009+A2:2009
- EN 61000-3-3:2008
- EN 55024:2010
- FCC Title 47 CFR, part 15 Class A / ICES-003, Issue 4

Whilst the digital billboard industry is still relatively young, future standards are likely to be introduced that are Australian Specific. At this stage it is recommended that international standards are reviewed and used for guidance purposes.

⁴ UL (Underwriters Laboratories) is a safety standard in the United States.

017 Training for Workers

General industry training requirements have been detailed in the OMA's Guidance Paper, "***Safe Working Guidelines for Out-of-Home Industry Workers***", May 2014 (refer attachment).

In addition to the training detailed in the guidance paper, additional levels of competency and licencing will be required for works on digital structures, as follows:

- Electrical works will require trade certified electrical licensing and training into the specific safe systems of works required.
- General non-electrical maintenance works may not require specialised training but adequate training and safe systems of work should be provided to the worker for working on digital structures, including basic training in electrical awareness.
- Some training organisations are now running low voltage specific emergency training that is drawn from the following National units of competency.
 - I. UETDRRFo6B - Perform rescue from a live LV panel
 - II. HLTAID001 - Provide cardiopulmonary resuscitation

While not currently a mandatory training requirement, for those workers involved in low voltage work, the training may be beneficial to both the worker and the worker's employer.

018 Conclusion

This paper has highlighted WHS considerations for those members of the industry with responsibility for the commissioning, design and installation of digital structures and the management of workers.

There have been ongoing and significant WHS improvements across the industry in the past decade. As technology improves and lessons learnt are applied there should be further improvements occur to WHS practices within the OOH industry.

This document was written by Dominic Weir of Coresafe with ongoing consultation and review by the OMA's industry members involved in the installation of digital advertising structures.

Attachment

To view this attachment in full go to:

http://oma.org.au/data/assets/pdf_file/0018/9612/OMA-WHS-Guidance-Paper-2014_FINAL_for-website.pdf
http://oma.org.au/data/assets/pdf_file/0018/9612/OMA-WHS-Guidance-Paper-2014_FINAL_for-website.pdf

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