21 – Safety in Design Report

21

GHDWOODHEAD

Memorandum

14 July, 2017

To	Sam Werner, Department of Education, Bridge Street, Sydney		
Copy to	Ian Guthrie, TSA Management, 207 Kent Street, Sydney (cc. internally: Paulo Macchia / Mike Dean / Michael Abbott / all SiD workshop participants)		
From	Steve Mellor	Tel	9239 7065
Subject	**Safety in Design (SiD) Scheme Design stage, Waitara Public School**	Project no.	21.26108.46

Dear Sam / Ian,

Safety in Design (SiD) is a strategy aimed at preventing injuries by considering hazards as early as possible in the planning and design process, enhancing safety through choices in the design process. A Safety in Design (SiD) approach considers the safety of those who construct, operate, use, maintain, clean, repair and demolish an asset (includes building, structure, plant or equipment). Parties involved in the planning and design stage of a project are in a position to reduce the risks that arise during the life cycle of the asset.

At each design stage “designers” can make a significant contribution by identifying and eliminating hazards, and reducing likely risks from hazards where elimination is not possible. Often the most cost effective and practical approach is to avoid introducing a hazard to the workplace in the first place, by eliminating hazards at the design stage.

The definition of “designer” not only affects the actual designer but also those who are connected with the design (e.g. during construction), including parties where the end product is to be used, or could reasonably be expected to be used, for the intended function as a School facility. Furthermore, the “designer” must ensure, so far as is reasonably practicable, that the structure and associated facilities are designed to be without risks to the health and safety of end users, including those charged with maintaining the facility.

It is therefore reasonable to consider the wider practical definition of “designer” to include:

- Design professionals, such as architects, civil, building services, electrical, acoustic, environmental, mechanical and structural engineers, landscape architects, interior designers, drafters and industrial designers;
- Head contractors, developers, builders, owners, project managers, purchasers, clients, end- users and workers;
- Quantity surveyors, insurers, quality assurance staff, work safety professionals and ergonomics practitioners; and
- Suppliers including manufacturers, importers, those who hire plant, constructors, installers and trades and maintenance people.

GHDWoodhead have been engaged to provide design services for the new school building at Waitara PS. In this role GHDWoodhead have identified and mitigated a number of potential risks within the limitations of our scope, in consultation with other members of the design team.

GHD
Level 15, 133 Castlereagh Street Sydney NSW 2000 Australia
T 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

In accordance with our SiD obligations in NSW, GHDWoodhead and stakeholders have prepared the attached Safety in Design risk assessment. This document embraces our scope of works for the design of new school buildings at the mid-point of our Scheme Design Stage for Waitara PS, as shown on the GHDWoodhead drawings referenced in the table below.

ARCHITECTURAL	
0000 SERIES	(KEY DWGS & EXIST CONDITIONS)
2126108-WA-DA-AR-0000	COVER SHEET AND LIST OF DRAWINGS (INCLUDE LOCATION PLAN)
2126108-WA-DA-AR-0050	NOTIFICATION ISSUE DRAWING
2126108-WA-DA-AR-0110	SITE DEMOLITION PLAN
2000 SERIES	PLANS
2126108-WA-DA-AR-2000	GENERAL ARRANGEMENT - LEVEL 1
2126108-WA-DA-AR-2001	GENERAL ARRANGEMENT - LEVEL 2
2126108-WA-DA-AR-2002	GENERAL ARRANGEMENT - LEVEL 3
2126108-WA-AD-AR-2003	GENERAL ARRANGEMENT - LEVEL 4
2126108-WA-DA-AR-2010	GENERAL ARRANGEMENT - ROOF
3000 SERIES	BUILDING ELEVATIONS SECTIONS
2126108-WA-DA-AR-3001	EAST & WEST ELEVATIONS 1:100
2126108-WA-DA-AR-3100	BUILDING SECTIONS 1:100
9000 SERIES	SITE SHADOW DIAGRAMS
2126108-WA-DA-AR-9000	SITE SHADOW DIAGRAMS

Please find attached the worksheet for your review, comment and/or further mitigation as appropriate. This represents a summary of the risks identified that are unique to this type of work on this particular site (i.e. In addition to the types of risks that would typically be present on a construction site for similar projects).

This memo serves to formally issue the summary of identified safety risks for your review, acknowledgement and acceptance. As the safety in design process will continue through each design stage, GHDWoodhead will continue to lead the process of monitoring and maintaining a register of SiD risks up to the appointment of the Head Contractor. We then expect to continue to participate in the SiD process (led by the Head Contractor) through to the completion of the project.

This memo and the attached register of SiD risks should be provided to each of the parties who may be identified as being able to influence the design. Should you have any further questions, please contact the undersigned.

Yours faithfully,

Steve Mellor
Principal | Architecture
GHDWoodhead

HSE 040 SiD Risk Assessment,

Design Life Cycle:	Investigation and Design	Setup, Construction and Commissioning	Operation	Maintenance	Disposal		**Date:**	July 12, 2017	**Revision No:**	**Schematic Design**
Job Name:	7 Schools New and Upgrade Works - **Waitara Public School**		**Job No:**	21.26108	**Client**	**NSW Department of Education**	**Design:**	**GHD Woodhead**		
People involved in Risk Assessment:	GHD representatives as HDC. Steve Mellor (Arch) Harry Mitchell (QA/Eng/Arch) Matt Preswell (Civil) Terance Lai (RLB - Quantity Surveyors) Alister Maclean (QA) Massoud Shaban (Structural) Michael Abbott (QA) Stacy Bugeja (Hydr) Tejash Contractor (Mech) Melissa Stajanovic (Arch/PM) Cambell Griffin (Elec) Tony Murace (Arch) Neell Raja Duarte (Mech) Ian Guthrie (TSA)									

Design Ref or Risk category	Design Life Cycle Stage (Select from Drop Down Box)	Hazards What could cause injury or ill health, damage to property or damage to the environment	Risk What could go wrong and w	Existing Control Measures	Initial Risk Rating C	L	RR	Potential Control Measures (Consider Hierarchy of Control - Elimination, Substitution, Isolation, Engineering Controls, Administrative Controls, PPE)	Responsibility	By When	Decision / Status	Residual Risk Rating C	L	RR	Comments
Safety	Setup, Construction and Commissioning	Finding unknown services in ground during excavation activities	Injury to workers from coming in contact with live services. Possible electrocution, gas explosion, exposure to	In Ground Services survey COMPLETED and issued to Contractor (via TSA)	C	4	Moderate	Contractor to carry out Dial Before you Dig enquiries before comencement	Head Contractor	Site Establishment	Open	C	2	Low	
Safety	Setup, Construction and Commissioning	Unauthorised access to construction zone (by DoE, School staff, Kids,parents,others)	Injury on a hazardous construction site	Fence off school and works areas, construction zone clearly identified on plans	C	3	Moderate	DoE will need to request access from Contractor to work site, INCLUDE IN CONDITIONS OF CONTRACT. Construct solid hoarding around construction zone	Head Contractor	Site Establishment	Open	B	3	Low	
Safety	Setup, Construction and Commissioning	Earthworks and excavator operations	Injury due to toppling over, piling collapse, hitting power or striking persons	Fence off school and works areas, construction zone clearly identified on plans - employ after hours security	D	2	Moderate	Qualified operators, identify hazards and services prior to starting work, spotter used to barricade and control work area, battered or shored slopes	Head Contractor	ongoing	Open	D	2	Moderate	
Safety	Operation	Access to school site during construction - directly past constrcution activities. Particular issues at signalised crossing cnr Edgeworth David & Myra Streets where people will walk directly adjacent to the construction zone	Child / adult / vehicle / construction interface results in injury	Mutiple entry points as alternatives	D	3	Significant	Further identify construction zones and child access areas. Work with school to update their child management arrangements durnig the construction period. Work with head contractor to plan operation over footpath outside of peak times	GHD / School Management / Head Contractor	ongoing	Open	D	2	Moderate	

Design Ref or Risk category	Design Life Cycle Stage (Select from Drop Down Box)	Hazards What could cause injury or ill health, damage to property or damage to the environment	Risk What could go wrong and w	Existing Control Measures	Initial Risk Rating			Potential Control Measures (Consider Hierarchy of Control - Elimination, Substitution, Isolation, Engineering Controls, Administrative Controls, PPE)	Responsibility	By When	Decision / Status	Residual Risk Rating			Comments
					C	L	RR					C	L	RR	
Cost	Investigation and Design	Hazardous materials found on site, either residual in-ground, or resulting from demolition activities	Long term - danger to construction workers / Long Term - on-going danger to school children and staff if found elsewhere on site	GHD to ensure design consultant brief includes the conduct of site investigations to confirm hazardous materials or contamination at the proposed sites and implement management plans accordingly. Review School's Asbestos Register with regard to existing buildings to be demolished	C	5	Significant	AT completion of Contamination Investigation, typically in conjunction with Geotechnical Investigation. Hazardous materials require careful removal, method to be identified in Contam Assessment report. Early identification and remediation can eliminate the long term risks. Contam report to be issued to Contractor for action.	GHD / Contractor / TSA to coordinate	Site Establishment	Open	C	2	Low	
	Investigation and Design	Steps to terrace learning space only have hand rail on one side	Slips, trips and falls resulting in injuries	Nill	C	3	Moderate	Raising level of colour contrasting to stair nosing. Operational controls for access. Consider soft fall floor finishes. Handrail to be installed at top of the opening	GHD	Now - scheme design stage	Open	C	2	Low	Engineered alternative solution required to address BCA Issues
Safety	Setup, Construction and Commissioning	Traffic Hazards / potential Construction Vehicle - public conflict. Congestion, limited parking, complaints, car accidents, issues with construction vehicles getting to site / potential for pedestrian injuries.	Persons injured or involved in a fatal accident	Traffic Management Plan to be included in Construction Mgmt Plan	D	4	Significant	Continues into D&C management of site. Contractor to provide detailed Site / Construction Management plan to outline the expected construction limitations and controls such as work hours, truck movements and dust. Contractor also to give consideration to Constructin zones, Protectove overhead hoardings, sheds, site access and arrangements for deliveries, concrete pumps, cranes etc	GHD / Head Contractor / TSA Mgmt	RFT	Open	D	2	Moderate	
Safety	Setup, Construction and Commissioning	Working at heights	Falling of workers. Death/injury	Safety line at roof level, Statutory regulations, Contractors safety plans.	E	2	Significant	GHD to design permanent anchor points on architectural documentation, safety lines and certification of anchor points.Identify clear access way around building for maintenance activities	GHD / Contractor / DoE Maintenance staff	RFT	Open	E	1	Moderate	
Safety	Setup, Construction and Commissioning	Construction personnel coming in contact with live electrical services	Electrocution, injury and distruption to services in the locatity	GHD to identify locations and specify contractor to confirm site survey of services	E	1	Moderate	Contractor to undertake Dial Before you Dig application, and review all evidence of IG Services prior to commencment	Head Contractor	Site Establishment	Open	D	2	Moderate	
Safety	Setup, Construction and Commissioning	Structural collapse of temporary propping	Falling of workers. Death/injury	detail design to reduce reliance on temporaty props	E	2	Significant	GHD to work with Head Contractor to develop safe work methods/sequences to reduce need to temporary props	Head Contractor	Site Establishment	Open	D	1	Moderate	
Safety	Operation	Poor Lighting	Slips, trips and falls resulting in injuries	Design to BCA and Min. Standards	C	3	Moderate	Carry over to schematic design phase drawings and specifications. Both indoor and exterior lighting to be designed to allow for night access given that the building will be used by OOSH up to 6:30pm	GHD	ongoing	Open	C	3	Moderate	

Design Ref or Risk category	Design Life Cycle Stage (Select from Drop Down Box)	Hazards What could cause injury or ill health, damage to property or damage to the environment	Risk What could go wrong and w	Existing Control Measures	Initial Risk Rating			Potential Control Measures (Consider Hierarchy of Control - Elimination, Substitution, Isolation, Engineering Controls, Administrative Controls, PPE)	Responsibility	By When	Decision / Status	Residual Risk Rating			Comments
					C	L	RR					C	L	RR	
Safety	Operation	Access to switchboards by unauthorised persons	Electrocution resulting in fatality	Lockable switch boards	D	1	Moderate	Carry over to schematic design phase drawings and specifications. Locks on switchboards as well	GHD	ongoing	Open	D	1	Moderate	
Safety	Operation	Poor Ventilation	"Sick building" syndrome, sick occupants	Challenge design standards if found lacking	C	2	Low	Undertake detailed analysis of ESD principles (this will occur as pert of SSD Application) and apply results to design	GHD	ongoing	Open	C	2	Low	
safety	Operation	Lack of cooling on hot days	Overheating of occupants, resulting in heat stress	Assess air flow and maximise ventilation, including ceiling fans	B	4	Low	Further review of air flow and comfort levels required to assess the need for mechanical assistance	GHD	ongoing	Open	B	4	Low	School P & C may opt to install Air Conditioning at a later date
Safety	Operation	Falls from Atria, stairwells and the like	Falls from height resulting in severe injury	Design of balustrades etc. to stop fall or reduce height of falls	E	1	Moderate	Carry over to schematic design phase drawings and specifications. Give consideration to increasing ballustrade heights over required minumum heights (suggest min 1500mm)	GHD	ongoing	Open	C	1	Low	
Safety	Operation	Poor sight lines to alcoves, nooks, corners create reduced supervision of kids	Bullying, injury and stress	Concept room layouts give some consideration to this	C	3	Moderate	Carry over to schematic design phase drawings and specifications. Further discussions with DoE EFSG Group to close out this issue	GHD	ongoing	Open	B	3	Low	
Safety	Operation	Steep and un-even surfaces	Slips, trips and falls	Coordinate civil and architectural design to reduce grades	B	4	Low	Carry over to schematic design phase drawings and specifications	GHD	ongoing	Open	B	3	Low	
Safety	Operation	Floor Covering creates a slippery floor when wet	Slips, trips and falls resulting in injuries	Comply with standards	B	3	Low	Exceed code requirements for slip resistance, For Example, R9 uplift to R10	GHD	ongoing	Open	B	3	Low	
Safety	Operation	Poor quality or in-appropriate furniture selections	Injury due to pinching, falls or crushing	FURNITURE MEETS DOE REQUIREMENTS , Provide samples for approval, Supplier by DoE approved suppliers	B	3	Low	Carry over to schematic design phase drawings and specifications	GHD	ongoing	Open	B	3	Low	
Safety	Operation	Fire reslts in persons being unable to evacuate the building in a timely manner	Building collapse and or smoke inhalation/trapped occupants	GHD design to code requirements	E	1	Moderate	Ensure fire safety measures are well in excess of minumum safety requirements	GHD	ongoing	Open	E	1	Moderate	

Design Ref or Risk category	Design Life Cycle Stage (Select from Drop Down Box)	Hazards What could cause injury or ill health, damage to property or damage to the environment	Risk What could go wrong and w	Existing Control Measures	Initial Risk Rating			Potential Control Measures (Consider Hierarchy of Control - Elimination, Substitution, Isolation, Engineering Controls, Administrative Controls, PPE)	Responsibility	By When	Decision / Status	Residual Risk Rating			Comments
					C	L	RR					C	L	RR	
Safety	Operation	Operable walls or bifold doors are heavy they break and cause injuries	Injury	Sliding doors used in preference to bi-fold / multi-fold type	C	2	Low	Carry over to schematic design phase drawings and specifications. Investigate ease of operation for any sliding or folding doors	GHD	Schematic	Open	C	2	Low	
Safety	Operation	Maintenance of glass (windows) up to 4 levels external façade	Falling of workers. Death/injury	Design in fall arrestors or ways to clean areas	E	1	Moderate	Allow access for sissor lift around building or ensure that windowns can be cleaned using an extened cleaning pole	GHD	Schematic	Open	E	1	Moderate	
Safety	Operation	Roof access, including access to ventilators, lights, solar panels etc for maintenance	Falls from height resulting in severe injury	Design in fall arrestors or ways to clean areas	E	1	Moderate	Carry over to schematic design phase drawings and specifications. Give consideration to spacing of solar panels for easy access. Roof access via ladder and roof hatch identified on plans. Include a catwalk around solar panels area & continuous tether for entire roof area to provide access to all roof mounted	GHD	Schematic	Open	E	1	Moderate	
Safety	Operation	Open unfenced footpaths near school boundaries - Kids running out to kiss & drop zone after school day not aware of surroundings. Particular around the Edgeworth David Rd frontage which is very busy.	Kids (and distracted adults) get hit/run over by vehicle	Recess gates from footpath to create safe zone set back from road frontage	E	3	Extreme	School operational procedures to be identified. Signaised crossing outside the school to be monitored. Design of gates and fencing to control numbers of kids able to leave the site at one time, also created recessed plaza type area at exit points.	GHD / School Management	Schematic	Open	E	2	Significant	
Safety	Operation	Wash trough lid not secured and slams shut on kids while in use	Falling lid hits person or lid removed leaving sharp edges	Signage for lid to be locked open during use	B	4	Low	Carry over to schematic design phase drawings and specifications	GHD	Schematic	Open	B	4	Low	
Safety	Operation	Stair Width not enough given the numbers of kids running up & down - especially during recess, lunch & end of day	Large number of students using stairs at same time result in congestion and falls, slips and trips	Wider stairs for main access routes - agreed 1500mm min clear all stairs	B	5	Moderate	Carry over to schematic design phase drawings and specifications	GHD	Schematic	Open	B	5	Moderate	
Safety	Operation	Balustrade Height allows kids to climb over & fall from height	Kids use low height handrails to climb up and over balustrade and fall from height	Balustrade heights as p-er BCA	D	3	Significant	Increase height of balustrade to minimum 1500mm	GHD	Schematic	Open	D	2	Moderate	
Safety	Operation	Student access stairs	Fall from height, slips, trips, children climbing ballusrades and handrails	BCA compliance	D	2	Moderate	Increase ballusrade heights or fully enclose external stairs with screen mesh	GHD	Schematic	Open	D	1	Moderate	

Design Ref or Risk category	Design Life Cycle Stage (Select from Drop Down Box)	Hazards What could cause injury or ill health, damage to property or damage to the environment	Risk What could go wrong and w	Existing Control Measures	Initial Risk Rating			Potential Control Measures (Consider Hierarchy of Control - Elimination, Substitution, Isolation, Engineering Controls, Administrative Controls, PPE)	Responsibility	By When	Decision / Status	Residual Risk Rating			Comments
					C	L	RR					C	L	RR	
Safety	Operation	Students unsupervised in toilet areas	Kids being harrassed / bullied / intimidated in toilets	Sight lines considered	B	3	Low	Remove second door from air-lock to allow greater teacher supervision to toilet areas - GHD to discuss design further with EFSG (DoE)	GHD	Schematic	Open	B	2	Negligible	
Safety	Maintenance	Inaccessible services in ceiling space on level 4 at excessive height in tradesmen "over-reaching" on ladders and the like	Injury from falls	Nill	D	2	Moderate	Access hatches to be carefully located to facilitate maintenance, long life LED lighting to reduce maintenance demand	GHD	Schematic	Open	D	1	Moderate	
Safety	Investigation and Design	Falls from top of terraces in playground & external areas	Falls, slips, trips, children being injured	BCA compliance with terraces under 900mm drop	D	2	Moderate	Add handrail to top tier of terrace	GHD	Schematic	Open	D	1	Moderate	
Safety	Maintenance	Maintenance of OSD tanks IF REQUIRED and Deep Stormwater pits requires entry into "confined space"	Injury in confined space makes extraction difficult, could result in permanent injury	Compliance with Aust. Standards for confined space	D	2	Moderate	Opertaional controls	GHD to give further consideration in consultation with Head Contractor	Schematic	Open	A	1	Negligible	Pending Councils advice re OSD and stormwater design requirements
Safety	Maintenance	Maintenance of OSD tanks requires vehicle access nearby for deployment of equipment	Difficulty in deploying equipment from road to OSD Tank could result in permanent injury when man-handling equipment	Nill	D	2	Moderate	Access for heavy maintenance vehicles to clean out OSD tanks to be considered once Council OSD requirements understood	GHD (Civil Eng)	Schematic		A	1	Negligible	Pending Councils Decision
Safety	Maintenance	Electrical & comms room doors opening inwards	Someone gets trapped in this area (say if elecrocuted), falls against door, and door can't be opened	Nill	D	3	Significant	Redesign rooms so that doors always open OUT from Electrical & comms rooms	GHD	Schematic	Open	C	1	Low	
Safety	Operation	Falling limbs from trees in major storm events smash to the ground or through windows/roof of building	Serious injury or fatality	Schools review all trees on site and conduct hazard reports annually	D	3	Significant	Landscape architects undertake further review & impact statement	GHD	Schematic	Open	D	1	Moderate	
Safety	Operation	Lightning strikes	Serious injury or fatality	Review and assess risk by Electrical team	E	2	Significant	Halt outdoor work in the case of a thunderstorm	GHD / Head Contractor	Schematic and Ongoing	Open	E	1	Moderate	
Safety	Operation	Strangers entering site from side gates	Kids being assulted by strangers	Nill	C	3	Moderate	Review access gate requirements and Nos, limit access points to those able to be observed by school staff. Administrative controls by electonic locking of gates after school day has commenced. Thereby, only access to school site is via Admin precinct	GHD / School Admin	Schematic	OPen	C	2	Low	