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CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

February 2020 J161921

Hutchinson Builders Mainsbridge School

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Construction Environmental Management Plan

Hutchinson Builders

Mainsbridge School

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Construction Environmental Management Plan

Hutchinson Builders

Mainsbridge School

1 DOCUMENT CONTROL

Documentation and document control for this Construction Environmental Management Plan (CEMP), including issue of any amendments will be made in accordance with the Hutchinson Builders document control procedure.

Where subcontractors' environmental control measures are submitted to Hutchinson Builders, these will be treated as controlled documents.

The QS&E Manager in consultation with the Project Manager will arrange for environmental records to be filed as part of the project quality records.

This CEMP is maintained by Hutchinson Builders and kept up to date through regular reviews carried out initially three months from project commencement then six monthly as a minimum or as required to suit the phase of the project, after a significant change to the project risk/design risk assessment, a project audit, project, or legislation requirements. The review shall include any attachments or appendices referred to in this plan.

This review will be aimed at verifying the suitability and effectiveness of this CEMP in ensuring compliance with legislative, contractual and best practice requirements.

This CEMP shall also be reviewed if:

- There is a significant change in the project scope;
- There are significant and relevant changes in applicable legislation during the life of the project;
- Environmental impacts (associated with project activities) changed due to any other reason;
- Major omission or non-conformance identified by relevant regulatory agencies;
- A major incident or emergency event has occurred on the project site.

A current copy of this plan shall be kept on site and made available to all employees and contractors involved in the project. Amendments that are made to this document are recorded on the register of amendments above and shall be approved by the QS&E Manager in consultation with the Project Manager and site management. Superseded versions of this document shall be maintained for a period of 7 years to demonstrate record of environmental management and compliance.

This document shall be created prior to commencement of the project and a controlled copy shall be supplied to all interested parties. Distribution of controlled copies shall be recorded on the distribution register above (controlled hardcopy only). When changes are made to this document, parties listed above shall be provided with updates.

General documentation relating to environmental management on site shall be controlled through use of issue dates and version numbering as applicable.



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2 INTRODUCTION AND BACKGROUND

This CEMP meets the requirements of DA condition B.18, relating specifically to the preparation of a CEMP.

The Mainsbridge School is to be relocated to the northern portion of the Warwick Farm Public School, Lawrence Hargrave Road, Warwick Farm NSW 2170. Refer to Figure 1 and 2 of the Figures section of this report for site location, site boundaries and proposed construction area. Results of environmental assessments conducted by Environmental Investigation Services (EIS) in November 2017 identified lead and asbestos (bonded and friable) within the proposed development zone report ref: *E29918KPrpt2_rev1 EIS 2017*. Additional assessment of surface soils within the investigation area identified delineated the presence of lead in surface soils ref: *E29918kPrpt3 EIS 2017*. A remediation action plan (RAP) has been developed for the site the site, prepared by EIS ref: *E29918KPropt-RAP Rev1 EIS 2018*. A RAP Addendum has been completed by EIS confirming remediation and validation requirements ref: *E29918KPrpt – RAPADD Warwick Farm*.

An asbestos management plan (AMP) for the site identifies the appropriate site management and personal protective equipment required for remediation of asbestos containing materials (ACM) ref: *PS113561_WarwickFarmPS_AMP_RevB*. The management requirements of the AMP for ACM work are also considered applicable for lead management on the site.

Based on the information provided by the client, Greencap understand that excavation and off-site disposal of contaminated fill and cut-and-fill activities will occur on the site. The proposed school development includes construction of the following:

- Learning spaces;
- Offices;
- A pool and pool store building;
- Car park;
- Landscaping; and
- A sports field to be shared between Mainsbridge School and Warwick Farm Public School.

It is to be noted that no Review of Environmental Factors (REF) was supplied to Greencap at the time of this report having been created.

This Construction Environmental Management Plan (CEMP) provides the system to manage and control environmental aspects of the project during pre-construction and construction. It identifies all requirements applicable to the activities outlined in Section 3 of this report. It also provides the overall framework for the system and procedures to ensure environmental impacts are minimised and legislative and other requirements are fulfilled.

This CEMP establishes the system for implementation, monitoring and continuous improvement to minimise impacts from the project on the environment.

This CEMP is consistent with:

- AS/NZS ISO 14001:2016, Environmental Management Systems Requirements with Guidance for Use; and
- Department of Infrastructure, Planning and Natural Resources (2004), *Guideline for the Preparation of Environmental Management Plans*.

2.1 Purpose of this CEMP

The purpose of this CEMP is to provide a structured approach to the management of environmental issues during construction of the project. Implementing this CEMP effectively will ensure that the project team meets regulatory and policy requirements in a systematic manner and continually improves its performance. In particular, this CEMP and its sub-plans:



- Describes the project in detail including activities to be undertaken;
- Provides specific mitigation measures and controls that can be applied on-site to avoid or minimise negative environmental impacts;
- Provides specific mechanisms for compliance with applicable policies, approvals, licences, permits, consultation agreements and legislation;
- Describes the environmental management related roles and responsibilities of project personnel;
- States objectives and targets for issues that are important to the environmental performance of the project; and
- Outlines a monitoring regime to check the adequacy of controls as they are implemented during construction.

This CEMP meets the requirements of DA condition B.18, relating specifically to the preparation of a CEMP. The Development Approval Conditions (DAC) requirements and where they are met in the CEMP are shown in the table below:

Table 1: Site Details						
DAC Item	Requirement	Reference				
B.8	Unexpected Contamination Procedure	Appendix O				
B.12	Community Communication Strategy	Section 5				
B.17 - 18	A CEMP shall be prepared prior to commencement of construction which addresses the following as a minimum:	This Document				
B.20	Construction Traffic and Pedestrian Sub-Plan	Appendix G				
B.21	Construction Noise and Vibration Management Sub-Plan	Appendix K				
B.22	Construction Waste Management Sub-plan	Appendix F				
B.23 Construction Soil and Water Management Plan		Appendix E				
B.24 Biodiversity Management Sub-Plan		Appendix M				
B.25	B.25 Flood Emergency Response Sub-Plan					
The CEMP s	hall also:					
 i) Comply with the DAC, conditions of any licences, permits or other approvals issued by government authorities for the project, all relevant legislation and regulations, and accepted best practice management 		Section 3				
ii)	Comply with the relevant requirements of <i>Guideline for Preparation of</i> <i>Environmental Management Plans</i> (Department of Infrastructure, Planning and Natural Resources, 2004)	This Document				
iii)	Include an Environmental Policy	Section 10				

2.2 Project Location

The site is located at the Warwick Farm Public School, located on Lawrence Hargrave Road, Warwick Farm NSW 2170. Specific details are provided in **Table 2** and site boundaries provided in Figure 1 in Figures section of this report.



Table 2: Site Location and Details

Item	Details		
Site Address	Lawrence Hargrave Road, Warwick Farm NSW 2170		
Site Owners	Department of Education & Communities		
Lat and Deposited Plan (DD)	Lot	DP	
Lot and Deposited Plan (DP)	22	715287	
Lot Size	3.047ha		
Zoning	R2 – Low Density Residential		
Local Authority	City of Liverpool		

2.3 Project Description

The project consists of remediation of contaminated land and construction of a new school infrastructure. The project comprises the following key elements:

- Excavation and validation of areas identified with lead and bonded asbestos contamination;
- Excavation and validation of areas identified with friable asbestos contamination;
- On-site treatment and validation of areas identified with bonded asbestos contamination;
- Cut and fill activities to level the site;
- Construction of new site buildings for learning spaces and offices;
- Construction of car parking locations;
- Development of soft-landscaping areas including sensory gardens and fenced play areas;
- Demolition of existing toilet blocks and construction of a new toilet block; and
- Development of a sports playing field.

The project will provide a new school campus for children with special needs. The existing buildings for Warwick Farm Public School will remain on site, excluding the toilet block to be demolished. A new toilet block is to be constructed adjacent the remaining structures. Following excavation and site-specific remediation activities, land scaping for the new sports field and construction of the new site buildings will be conducted.

2.4 Key Construction Activities and Staging

The key activities and anticipated staging for carrying out the works presented in Section 2.1 of this CEMP are detailed in **Table 3**.

Table 3: Project Staging for Key Activities					
Stage of Works	Activities				
Site establishment and enabling works (Stage	 Establish the site compound (erect fencing, tree protection zones, site offices, amenities and plant/material storage areas); Establish temporary facilities as required (e.g. temporary pedestrian access to station, temporary toilets, etc.); 				
±,,,	 Remove vegetation to allow for earth works; 				
	 Installation of temporary roads for site vehicles; and 				



Table 3: Project Staging for Key Activities					
Stage of Works	Activities				
	Services relocation.				
Demolition and construction of toilet blocks (Stage 1B and 1C)	 Construction of new toilet amenities adjacent existing school buildings; and Demolition of existing toilet block and removal of waste from site. 				
Remediation of contamination (Stage 1D)	 Excavation of materials to be removed from site; Validation of excavation; On-site treatment of bonded asbestos and; Validation of treated areas; and Validation of remaining site soils. 				
 Cut and fill of site to design level following soil removes remediation; and Bulk earthworks and landscaping for the sports field areas. 					
 Detailed excavation following base compaction; Deep and detailed excavation for footing and edge beams; Installation of slab; and Construction of buildings. 					
 Electrical and power supply upgrade works; and Replanting/landscaping, fencing adjustments and bollards. 					
Testing and commissioning	• Various activities to test and commission power supply, lighting, new services, communication and security systems.				

The plant and equipment likely to be required to undertake the above works include:

•	Trucks (tippers and semi-trailers)	٠	Scissor lift	٠	Concrete truck
•	Demolition saw	•	Mobile/franna crane	•	Hydreama and/or hirail
•	Generator	•	Hand tools	٠	Wacker packer
•	Jack hammer	•	Lighting tower	•	Nail gun
•	Excavator (with auger)	•	Mulcher	٠	Mini excavator

• Chainsaw

- Grinder
- Bobcat
 Concrete pump

The majority of works required to complete the project would be undertaken during standard NSW Environmental Protection Authority (NSW EPA) approved construction hours (i.e. 07:00 to 18:00 Monday to Friday and 08:00 to 13:00 Saturdays). The Hutchinson Builders Environmental Management Plan ref: *Hutchinson Builders (2019) Environmental Management Plan: Mainsbridge Public School,* indicates the proposed working times will be 07:00 to 17:00 Monday to Friday and 08:00 to 2:00pm on Saturdays. No work will be conducted on Sunday or public Holidays.

• Grader

Certain activities may require out of hours works to take place (including night works and works during routine track possessions). Any out of hours works will require prior approval from the Department of Education.



2.5 Compound Facilities

Temporary compound facilities are required to support construction of the project. The prime site compound will be established to the immediate south of the vehicle entrance gate off William Crescent.

This site will accommodate the majority of the project management and administrative personnel and will include:

- Office space and parking;
- Staff amenities;
- Storage containers;
- Material and chemical storage; and
- Waste storage.

2.6 Outdoor Lighting

Outdoor lighting is be compliant with the Australian Standard (AS 4282-2019) as presented in Table 1.

Table 4: AS4282-197 Lighting Criteria							
Time Period	Commercial\residential areas	Residential – Light Surrounds*	Residential – Dark Surrounds [#]				
Pre-curfew (7am-6pm)	25 lux	10 lux	10 lux				
Post-curfew (6pm-7am)	4 lux	2 lux	1 lux				

* Where the affected property abuts roads that are lit to Category V5 or higher in accordance with AS/NZS 1158.1.1 (Lighting for roads and public spaces – Vehicular traffic (Category V) lighting – Performance and design requirements).

Where the affected property abuts roads that are lit to Category B1 or lower in accordance with AS 1158.1.1, or where there is no lighting.

The applicable criterion is Residential – Light surrounds as there is street lighting on Williamson Crescent.

The follow controls will be implemented to ensure that the site is compliant with the standard:

- All external fixed lights are to be fitted so that they do not shine above the horizontal;
- Light shields to direct light where required could be installed on all permanent lighting fixtures such as site sheds and site entrance;
- Lighting is to be focused towards where the light is actually required and be as down facing or facing away from residential buildings as much as possible;
- All lighting systems should be designed to minimise their impacts at the sites boundary;
- Lighting is to be placed only where it is required and not where it is unnecessary;
- Any temporary\mobile lighting that may be required from time to time must also follow the principles outlined above; and
- The choice of luminaire should match the intended lighting requirements and the environment it is to be located in.

3 PLANNING REQUIREMENTS

This section of the CEMP provides a summary of the statutory planning context of the project including consideration of the relevant provisions of Part 5 of the NSW EP&A Act, the environmental planning instruments that apply to it as well as additional approval requirements.



Hutchinson Builders will ensure compliance with all relevant environmental legislation and contractual environmental requirements and aims to employ best practice environmental management procedures for the construction of the project.

3.1 Project Environmental Obligations

All construction personnel working on the project have the following general environmental related obligations:

- Minimise pollution of land, air and water;
- Preserve the natural and cultural heritage environment;
- Give notice to the Department of Education of a non-Indigenous or Indigenous heritage discovery;
- Minimise the occurrence of offensive noise;
- Be a good neighbour to surrounding land users;
- Keep the community informed of project milestones, upcoming activities and duration of relevant aspects of works;
- Use equipment with noise control features where available and ensure that it is properly maintained; and
- Take all feasible and reasonable steps to ensure compliance with the requirements of this CEMP and any sub-plans associated with this plan.

3.2 Environmental Legislation

A register and other requirements for the project is presented below in **Table 5**. This register will be reviewed by the Hutchinson Builders QS&E Manager and updated with any applicable changes. Any changes made to the legal requirements register will be communicated to all personnel working on or affiliated with the construction of the project where necessary through toolbox talks, specific training and other methods detailed in Section 6 of this CEMP.



Table 5: Regulatory Compliance Requirements							
Regulatory Instrument	Licence/Permit/ Approval/Guideline/ Plan	Responsible Regulatory Body	Responsibility for Ongoing Compliance Monitoring	Reporting Frequency/ Milestones	Report Content		
Environmental Planning and Assessment Act 1979	CEMP complying with Parts 4 and 5 of Act and Guidelines for the Preparation of Environmental Management Plans	Department of Planning	QS&E Manager	N/A	N/A		
Heritage Act 1977	Potential impacts during construction are to be managed through the implementation of the CEMP.	Heritage Branch of Department of Planning	QS&E Manager	N/A	N/A		
National Parks and Wildlife Act 1974	Project is located within the Darug Local Aboriginal Land Council area. No recorded Aboriginal sites are located on the site.	Office of Environment and Heritage	QS&E Manager	N/A	N/A		
Biodiversity Conservation Act	Potential impacts to environmentally significant land are to be managed through the implementation of the CEMP.	Office of Environment and Heritage	QS&E Manager	As provided in the Biodiversity Management Plan (Appendix M)	N/A		

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Table 5: Regulatory Compliance Requirements					
Regulatory Instrument	Licence/Permit/ Approval/Guideline/ Plan	Responsible Regulatory Body	Responsibility for Ongoing Compliance Monitoring	Reporting Frequency/ Milestones	Report Content
Native Vegetation Conservation Act 1997	N/A	Office of Environment and Heritage	QS&E Manager	N/A	N/A
Fisheries Management Act 1994	N/A	State Fisheries	QS&E Manager	N/A	N/A
Soil Conservation Act 1938	N/A	Department of Water and Energy	QS&E Manager	N/A	N/A
Rivers and Foreshores Improvement Act 1948	N/A	Department of Water and Energy	QS&E Manager	N/A	N/A
Water Management Act 2000	N/A	Department of Water and Energy	QS&E Manager	N/A	N/A
Protection of the Environment Operations Act 1997	Hutchinson Builders is not obligated to hold an Environmental Protection Licence for the site or site activities but is responsible for the management and disposal of waste on the site.	Environment Protection Authority	QS&E Manager	All materials to be disposed off-site are to be removed under appropriate waste classification documentation to a suitably licenced facility	As per the NSW EPA (2014) <i>Waste</i> <i>Classification Guidelines</i>
Protection of the Environment	Hutchinson Builders is not obligated to hold an Environmental Protection	Environment Protection Authority	QS&E Manager	All materials to be disposed off-site are to be removed under	As per the NSW EPA (2014) <i>Waste</i> Classification Guidelines

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Table 5: Regulatory Compliance Requirements					
Regulatory Instrument	Licence/Permit/ Approval/Guideline/ Plan	Responsible Regulatory Body	Responsibility for Ongoing Compliance Monitoring	Reporting Frequency/ Milestones	Report Content
<i>Operations (Waste)</i> <i>Regulation 2008</i>	Licence for the site or site activities but is responsible for the management and disposal of waste on the site			appropriate waste classification documentation to a suitably licenced facility	
Contaminated Land Management Act 1997	All site contamination is to be managed in accordance with the Act and associated guidance	Environment Protection Authority	QS&E Manager	Dependent on presence of contamination	As per Guidelines for Consultants Reporting on Contaminated Site
Waste Avoidance and Resource Recovery Act 2001	N/A	Environment Protection Authority	QS&E Manager	N/A	N/A
Environmentally Hazardous Chemicals Act 1985	N/A	Environment Protection Authority	QS&E Manager	N/A	N/A
Roads Act 1993	N/A	Roads and Transport Authority	QS&E Manager	N/A	N/A
Work Health and Safety Act 2011	Preparation and adherence to project- specific asbestos management plan and Code of Practice: How to Manage and Control	WorkCover NSW SafeWork	QS&E Manager	N/A	As per Code of Practice: How to Manage and Control Asbestos in the Workplace



Table 5: Regulatory Compliance Requirements					
Regulatory Instrument	Licence/Permit/ Approval/Guideline/ Plan	Responsible Regulatory Body	Responsibility for Ongoing Compliance Monitoring	Reporting Frequency/ Milestones	Report Content
	Asbestos in the Workplace				
Environment Protection and Biodiversity Conservation Act 1999	EPBC Act Protected Matters Report indicates presence of 20 threatened ecological communities, 25 threatened flora species, 32 threatened fauna species and 6 migratory species within the 5km of the site. Managed under the Biodiversity Management Plan (Appendix M)	Department of the Environment, Water, Heritage and the Arts	QS&E Manager	As provided in the Biodiversity Management Plan (Appendix M)	N/A
National Environmental Protection (Assessment of Site Contamination) Measure 1999 (2013 amendment)	Preparation and adherence to a site specific remediation action plan to remediate and validate the site for its intended use.	Environment Protection Authority	QS&E Manager	As per Section 107 of the CLM Act, all contaminated land investigations are to be undertaken as per the requirements of the NEPM	As per Guidelines for Consultants Reporting on Contaminated Site



3.3 Guidelines and Standards

It is Hutchison Builder's aim to employ best practice environmental management procedures for the implementation of the Project. Hutchinson Builders will also undertake the works in line with applicable components of the following guidelines and standards:

- AS/NZS ISO 14001:2004 "Environmental Management System";
- Managing Urban Stormwater Soils and Construction (NSW Landcom, 2004 The Blue Book);
- Waste Classification Guidelines (EPA, 2014);
- Guidelines for laying pipes and cables in watercourses on waterfront land (DP&I, 2012);
- Interim Construction Noise Guideline (DECCW, 2009);
- NSW Government's Industrial Noise Policy (INP) (NSW EPA, 2000);
- Storing and Handling Liquids: Environmental Protection Participants Manual;
- NSW Rural Fire Service's guideline, Planning for Bush Fire Protection (2006);
- NSW Department of Urban Affairs and Planning & EPA Managing Land Contamination Planning Guidelines – SEPP 55 Remediation of Land (1998); and
- A/NZ Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ 2000).

3.4 Conditions of the Planning Approval

NSW Department of Planning and Environment is the consent authority for this project and the Conditions of Approval listed in the *Development Consent – SSD 8792* will be adhered to.

These conditions are listed in the *Part A Administrative Conditions* document which forms Schedule 2 of the Development Consent. Resolution of the applicable sections presented in the CEMP are presented in Appendix Q.

This CEMP has been prepared to comply with aspects of the Conditions of Approval relevant to management of environmental issues related to the Project. Following approval of this CEMP the tracking of compliance will be undertaken under the internal and external auditing system discussed in Section 8 of this CEMP.

3.5 Environmental Policies

Hutchinson Builders policies are outlined at the time of induction for all employees and contract personnel and are displayed (as applicable) on all Hutchinson Builders notice boars in the Site Office and lunch areas. The Hutchinson Builders Environmental policy is included in Section 10 of this document.

4 RESPONSIBILITIES AND STAKEHOLDERS

Environmental responsibilities of key personnel are as set out in the following section, together with the nominated frequency of that specific responsibility.

The Hutchinson Builders Construction Manager shall be accountable for the implementation of this CEMP and shall be assisted in daily activities by the Hutchinson Builders nominated Environmental Representative.

4.1 Contact Details

The following project personnel have the authority to implement a 'stop work' order immediately in order to prevent environmental impact from construction activities.

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Table 6: Stop Work Contact Details			
Name	Position	Contact	
John Koumoukelis	Team Leader	Mob: 0416 616 464	
Dennis Denobrega	Site Manager	Mob: 0429 675 037	

The contact details for key project personnel with the responsibility to implement the CEMP and to respond to incidents and emergencies are detailed below. This CEMP will be amended as Hutchinson Builders staff are selected for site work.

Table 7: Key Project Personnel to Implement CEMP				
Name	Position	Contact		
John Koumoukelis	Team Leader	Mob: 0416 616 464		
Dennis Denobrega	Site Manager	Mob: 0429 675 037		
Melissa Stojanociv (GHD)Project Manager0405 210 434				







Figure 1: Organisational Structure of the Project



4.2 Hutchinson Builders

Hutchinson builders will conduct this project in such a manner as to:

- Ensure the construction workforce is aware of its responsibilities and personal liability with regard to protection of the environment,
- Undertake the project in such a manner as to minimise environmental impacts arising from construction,
- Bring to the operator's attention any aspect of the works that could cause environmental impact during operations, and
- Ensure the disposal of waste construction materials and spoil is conducted in an environmentally responsible manner.

Specific Environmental roles are included in Sections 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.2.5 and 4.2.7.

4.2.1 Hutchinson Builders Construction Manager/Team Leader

Table 8: Construction Manager Environmental Responsibilities				
Environmental Responsibilities	Frequency			
Visible commitment to Environmental Practices and ensures compliance to environmental legislation, associated industry Codes of Practice and advisory data.	Continually			
Visible commitment to Environmental Practices and ensure compliance to any client mandated Environmental Rules, the REF, project specific DS-100 Specifications and addendums.	Continually			
Responsible for site occupation and project delivery conformance to the CEMP including meeting all legislative requirements.	Continually			
Attend client meetings (as Management Representative).	As nominated			
Ensure that activities are assessed for environmental risk prior to commencement.	Continually			
Selection of subcontractors, assessment of environmental plans and on-going monitoring to verify that they meet Hutchinson Builders and environmental requirements.	Continually			
Conduct pre-start meetings with subcontractors.	Pre-mobilisation			
Participation in the investigation of environmental incidents.	On occurrence			
Provide appropriate resources to implement the processes defined in this CEMP.	Continually			
Review and determine training requirements in conjunction with the HR Adviser.	As nominated			
Review environmental incident statistical reports.	Monthly			
Conduct Senior Leadership Workplace Visits to ensure the CEMP specific requirements are being monitored and implemented.	Monthly			



4.2.2 Hutchinson Builders Project Manager

Table 9: Project Manager Environmental Responsibilities				
Environmental Responsibilities	Frequency			
Facilitating environmental induction and training of all employees, Subcontractors, Suppliers and Consultants.	As required			
Demonstrates commitment to Environmental Practices and ensure compliance with the REF, REF addendum, environmental legislation, associated industry Codes of Practice and advisory data.	Continually			
Visible commitment to Environmental Practices and ensure compliance to any client mandated Environmental Rules and other Standards.	Continually			
Review and implement this CEMP.	As required			
To ensure all approvals and license are obtained prior to any construction activity.	Pre-mobilisation			
Ensure all employees undertake CEMP defined induction and training.	Continually			
Ensure that foreseeable risks are identified, documented on Workplace Risk Assessments (or Aspects & Impacts Register) and controlled appropriately.	Pre-mobilisation			
Ensure plant & equipment is only used by licensed and/or trained and competent operators and that records of the operator's qualifications are available.	Continually			
Ensure that workforce understand and adhere to SWMS / JSEA's for assigned tasks.	Continually			
Provide appropriate resources to implement the processes defined in this CEMP.	As required			
Ensure appropriate amenities are provided for employees.	Continually			
Notification of and participation in the investigation of environmental incidents.	On occurrence			
Manage environmental incidents and rectification requirements including reporting in accordance with the Environmental Incident Management Plan (Appendix J).	On occurrence			
Review and determine training requirements in conjunction with the HR Adviser.	As nominated			
Selection of subcontractors, assessment of environmental plans and on-going monitoring to verify that they meet Hutchinson Builders requirements.	Continually			
Ensure all plant and equipment is inspected upon arrival to site, prior to use and then re-inspected on a monthly basis to ensure plant and equipment is in good working condition to avoid spills, leaks, noise and air pollution.	As required			
Conduct pre-start environmental alignment meetings with subcontractors.	Pre-mobilisation			
Review environmental statistical reports.	Monthly			
Collect environmental record data and distribute appropriately.	As defined			
Participate in scheduled audits of the environmental plan.	As per Audit Schedule			
Ensure safety/toolbox and pre-start meetings are conducted prior to works commencing.	Always			
Ensure a register of Hazardous Materials is available on site and that a MSDS is available for each substance.	Always			



4.2.3 Hutchinson Builders Project Supervisor

Table 10: Project Supervisor Environmental Responsibilities				
Environmental Responsibilities	Frequency			
Demonstrated commitment to Environmental Practices and ensures compliance with environmental legislation, associated industry Codes of Practice and advisory data.	Continually			
Ensure that foreseeable risks are identified, documented on Workplace Risk Assessments and controlled appropriately.	Pre-mobilisation			
Notification of and participation in the investigation of environmental incidents.	On occurrence			
Assist in environmental incident management and rehabilitation.	On occurrence			
Review and determine training requirements in conjunction with the Project Manager and / or the Construction Manager.	As nominated			
Ensure all plant and equipment is inspected upon arrival to site, prior to use & then re-inspected on a monthly basis to ensure plant and equipment is in good working condition to avoid spills, leaks, noise and air pollution.	As required			
Collect environmental record data and distribute appropriately.	As defined			
Respond to environmental incidents and rehabilitation.	On occurrence			
Participate in scheduled audits of the CEMP.	As per Audit Schedule			
Co-ordinate SWMS / JSEA activities for their area of responsibility.	All works			
Conduct Pre-start meetings.	Daily			
Conduct Toolbox meetings, which includes management of environmental risk.	Weekly			
Conduct formal / informal Workplace Hazard Inspections.	Monthly/Daily			
Ensure a register of Hazardous Materials is available on site and that a MSDS is available for each substance.	Always			
Be aware of Site Award conditions.	Ongoing			

4.2.4 Environmental Representative

Table 11: Environmental Representative Environmental Responsibilities				
Environmental Responsibilities	Frequency			
Demonstrated commitment to environmental procedures and instruction.	Continuously			
Ensuring the system of environmental management is planned, documented, implemented and maintained in accordance with the requirements of this CEMP.	Continuously			
Environmental Aspect and Impact identification.	Pre-Construction			
Ensuring the details of this CEMP accurately reflect Hutchinson Builder's construction activities.	As Defined			
Input to the formulation of EWMS (Appendix C).	As Requested			
Attend pre-start and toolbox meetings.	At Random			



Table 11: Environmental Representative Environmental Responsibilities			
Environmental Responsibilities	Frequency		
To review and participate in environmental incident investigation and nominated corrective measures.	On Occurrence		
Provide staff with training and inductions on environmental issues.	As Required		
Ensuring compliance with the Planning Approval Documents.	Continually		
Preparing and overseeing implementation of the CEMP.	Continually		
Undertaking Site inspections and audits and providing information on the results of the audits to Hutchison Builders.	Weekly and/or as deemed necessary by Hutchinson Builders		

4.2.5 Design/Engineering Support

Table 12: Design/Engineer Support Responsibilities				
Environment Responsibilities	Frequency			
Visible commitment to Environmental Practices.	Continuously			
Review of Engineering and Design activities to ensure environmentally responsible design.	All Design			
Formulation and participation – EWMS.	All Tasks			
Notify the occurrence of all environmental incidents to the Environmental Representative.	All Incidents			
Contribute to the overall project goal for zero environmental incidents by making suggestions for improvement where a better or more cost effective alternative can be identified.	Where Identified			
Assist management in the implementation of Environmental Systems, including policies, procedures and requirements within this CEMP.	At All Times			
Participate in any evacuation and emergency response procedure.	All			

4.2.6 Hutchinson Builders Workforce

Table 13: Hutchinson Builders Environmental Responsibilities			
Environmental Responsibilities	Frequency		
Visible commitment to Environmental procedures and instruction.	Continuously		
Participate in project specific inductions which covers environmental and safety aspects for the project.	Prior to commencement of works		
Actively participate in hazard identification.	Always		
Participate in the development of task specific SWMS / JSEA.	Always		
Adhere to defined task specific SWMS / JSEA controls.	Always		
Attend Pre-start meetings.	Daily		



Table 13: Hutchinson Builders Environmental Responsibilities			
Environmental Responsibilities	Frequency		
Attend Toolbox meetings.	Weekly		
Notify the occurrence of all hazards and incidents to the Hutchinson Builders Project Supervisor / Project Manager.	All Incidents		
Adhere to all environmental related instructions provided by supervision.	Always		

4.2.7 Hutchinson Builders Subcontractors

Table 14: Hutchinson Builders Subcontractors Environmental Responsibilities		
Environmental Responsibilities	Frequency	
Demonstrates commitment to Environmental Practices and ensure compliance to environmental legislation, associated industry Codes of Practice and advisory data.	Continuously	
Participate in environmental performance reviews with Hutchinson Builders Project Management.	As nominated	
Carry out environmental risk assessments for their scope of works.	All Works	
Conduct formal and informal work place hazard inspections.	Daily	
Participate in site induction as defined by CEMP.	As defined	
Conduct Pre-start meetings.	Daily	
Attend toolbox meetings.	Weekly	
Provide to Hutchinson Builders MSDS of all Hazardous Substances proposed for use.	All	
Provide other environmental related data to Hutchinson Builders as defined by this CEMP.	As defined	
Provide representation to all site meetings, when requested.	As nominated	
Ensure all plant and equipment is inspected upon arrival to site, prior to use and then re-inspected on a monthly basis to ensure plant and equipment is in good working condition to avoid spills, leaks, noise and air pollution.	As required	
Notify the occurrence of all hazards and incidents to the Hutchinson Builders Project Supervisor / Project Manager.	All Incidents	
Immediately investigate all incidents and report back findings & close out actions.	All Incidents	
Adhere to all environmental related instructions provided by Hutchinson Builders Management.	Always	



5 COMMUNICATION AND CONSULTATION

5.1 General

The table below outlines the methods and schedule for specific environmental communication processes identified for Hutchinson Builders employees and subcontractors.

Table 15: General Environmental Communication			
Communication Process	Schedule	Participants	Facilitator
Client Inductions (General and Site)	On commencement	All	Department of Education
Hutchinson Builders Inductions which covers environmental and safety aspects for the project (General and Site)	On commencement	All	Hutchinson Builders Project Engineer
Daily Pre Start meeting (Hazard Assessment Checklist)	Daily	All	Hutchinson Builders Project Supervisor
Toolbox Meeting	Weekly	All	Hutchinson Builders Project Supervisor
Client Environmental Meetings	As Required	Applicable Staff	Hutchinson Builders Project Supervisor
Client Progress Meeting	Monthly / As deemed necessary	Applicable Staff	Hutchinson Builders

5.2 Environmental Promotion

Environmental promotion and awareness for both Hutchinson Builders and subcontractor employees, begins during the induction process.

Further promotion is achieved by:

- Continuous improvement feedback;
- Toolbox Meetings;
- Posters;
- Memorandums and Incident Reports;
- Notice Board;
- SWMS / JSEA / EWMS;
- Ongoing environmental checks done completed by the Environment Representative;
- Overall environmental audits conducted by the Environment Representative;
- Communicate audit findings to works team.

Note: Environmental alerts issued by Hutchinson Builders, the client or subcontractors shall be posted on the Safety Notice Board and in all prominent places and discussed at the next scheduled meeting or training awareness session.



5.3 Communication with Project Stakeholders

All stakeholder consultation required for the project including complaints handling will be undertaken by the School Infrastructure NSW (SINSW).

Hutchinson Builders will continuously liaise with GHD and SINSW representatives as set out in Figure 1, Section 4.1 above, regarding project status, upcoming works and community liaison.

5.4 Consultation with Regulatory Authorities

Where required consultation with regulatory authorities will be undertaken by Hutchinson Builders in conjunction with the Environmental Representative to address any licence, approval or permit requirements prior to construction of the Project. Typical approvals which may be required during the construction of the Project include:

- Road Occupancy Licence (ROL);
- Works out side of normal construction hours;
- Temporary occupation of land for the purposes of construction activities; and
- Dewatering / discharge to sewer.

5.5 Community Consultation

Currently School Infrastructure NSW (SINSW) has a comprehensive community engagement strategy in place for construction at the site¹. Please refer to the strategy for further details regarding the community strategy.

The following communication channels will be used prior and during the construction period to provide information about the proposed works and to provide advance notice of construction activity. The key forms of communication for enquiries and complains are provided in information booths, sessions, and a 1300 number published on all communication materials and the SINSW email address.

Table 16 below provides the primary tools and techniques to keep stakeholders and local community involved and informed.

Table 16: Community Consultation Channels			
Channel	Purpose	Frequency	Responsibility
1300 Community Information Line	Call 1300 482 651 to contact SINSW for enquiries. All enquiries are referred to the appropriate SINSW Manager.	The number is available during the life of the project and for 12 months after construction has been completed.	SINSW
Advertising	Advertising in local newspapers is undertaken at least seven days prior to significant construction activities.	At project milestones.	SINSW
Community Contact Cards	Project team/contractors (including Hutchinson builders) are to hand out cards to stakeholder and community	Available during the life of the project and for 12 months after construction has been completed.	SINSW, GHD and Hutchinson Builders

¹ SINW (2019) Community Communication Strategy – Mainsbridge School for Specific Purposes. Available online: https://www.schoolinfrastructure.nsw.gov.au/content/dam/infrastructure/projects/m/mainsbridge_school/documents/CCS_Mainsbridge_SSP_April_2019.pdf. Accessed 21/05/2019.



Table 16: Community Consultation Channels				
Channel	Purpose	Frequency	Responsibility	
	members enquiring about the project. Cards are also located at the school administration office.			
Door Knocks &/or Letter Drops	Provide timely notification to nearby residents of upcoming construction works, changes to pedestrian movements, temporary bust stops, expected impacts and proposed mitigation.	As required.	Hutchinson Builders	
Information Booths	Information booths staffed by a project team will be held to answer questions, concerns or complaints of the project. Booths will be held within the school to align with parents arriving at the school and at local shopping/community areas during out of work hours and Saturdays.	As project milestones/as required.	SINS	
Information Sessions	Information sessions where information is presented on boards and screens and information packs are provided including project scope, planning approval, project timelines and FAQs.	As required.	SINSW	
Project Signage	Aluminium signage with high level project information are fixed to external fencing and entrances of the site.	During the life of the project and for 12 months after construction has been completed.	SINSW, GHD and Hutchinson Builders	

5.6 Complaints Handling

The SINSW community engagement plan has comprehensive management strategies for complaint management and handling. Complaints during construction include issues regarding:

- Safety;
- Dust;
- Noise;
- Traffic congestion;
- Loss of parking;
- Contamination;
- Hours of work;
- Property damage;
- Property access;



- Service disruption;
- Conduct of behaviour of construction workers; and
- Unplanned or uncommunicated disruption to the school.

Following receiving either a phone call, email or face-to-face complaint the complaint is to be logged notified to SINSW and logged into the management software and resolved by SINSW within 24-48 hours.

A complaint register is to be kept on site for phone calls face-to-face complaints made to Hutchinson Builders, following notification of the event to SINSW.

The complaints register is to include:

- The name and address of the complainant;
- The time and date the complaint was received;
- The description of the complaint;
- The activity/ies and any associated equipment that gave rise to the complaint;
- The action that was taken to resolve the issue that led to the complaint;
- The date the complaint was resolved and documentation of the complainant's level of satisfaction with the actions to resolve the issue.

For any complaints regarding environmental nuisances (particularly noise and dust) and the actions undertaken to resolve the complaint, and any non-conformances with eh CEMP that results in environmental nuisance.

6 TRAINING AND AWARENESS

Environmental awareness training will be provided to all personnel involved with the project (including all sub-contractors engaged) through the project induction process in order to ensure awareness of project environmental requirements and commitments. The environmental component of the induction may be tailored for each group to ensure that specific components of work and associated environmental risks are adequately covered.

This form of environmental awareness training will be directed at ensuring that all personnel are aware of:

- Their individual responsibility to conform to Hutchinson Builders and the client's environmental policies and procedures and the requirements of the CEMP;
- The significant environmental aspects of the project works in general;
- Risks associated with specific high environmental impact works; and
- The environmental benefits of improved work performance;
- The roles and environmental responsibilities for achieving conformance with environmental policy and procedures and with the CEMP including site emergency preparedness and response requirements, as well as:
 - Erosion and sediment controls;
 - Waste management;
 - Vegetation damage;
 - Heritage site damage;
 - Creek pollution;
 - Fauna management
- EPA and City of Liverpool Council site inspections; and
- Individual and company consequences of departure from specified operating procedures.

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The competency of those personnel performing tasks, which can cause significant environmental impact, may be assessed on the basis of experience, training and/or education.

6.1 Induction Process

The induction process for all employees and sub-contractors will include environmental awareness, and cover:

- An overview of the requirements of this CEMP and any previous revisions;
- An overview of site-specific environmental risks and control measures;
- The roles and responsibilities for managing environmental aspects of the works;
- Specific awareness training appropriate to site personnel assigned activities:
 - Presence of threatened flora species;
 - Aboriginal heritage areas;
 - > Specific noise mitigation measures required for the site;
 - > Location and identification of the construction corridor and no-go zones
- Provisions for all personnel on site to receive any additional environmental awareness training necessary to achieve a level of awareness and competence including training in any applicable EWMS and training in the CEMP; and
- Procedure for environmental emergency response and incident notification and management.

The Hutchinson Builders Project Manager shall ensure employee inductions are performed. Records shall be maintained in accordance with the site Quality Records procedures.

7 MANAGING THE IDENTIFIED ENVIRONMENTAL ISSUES

7.1 Environmental Aspects

The projects' environmental aspects are those activities that interact with the environment and may lead to impacts or larger scale change. The construction of the project will involve the following environmental aspects:

- Excavation and general soil disturbance;
- Material stockpiling;
- Sediment control measures;
- Noise level management;
- Surface and groundwater management;
- Resource and energy usage;
- Chemicals and fuel use;
- Procurement of materials;
- Placement and use of onsite amenities;
- Vegetation removal;
- Construction traffic, plant movement and road occupancy; and
- Heritage site damage



7.2 Environmental Impacts

Environmental impacts are changes to the environment caused by environmental activities. These changes can be both positive and negative. The construction of the project will or has the potential to have the following environmental impacts:

- Soil erosion, sedimentation and water quality;
- Impacts on aquatic ecosystems;
- Non-approved harm to aboriginal and non-aboriginal heritage;
- Non-approved harm to native vegetation;
- Weed spread;
- Harm of native fauna;
- Noise emissions;
- Waste generation and resource use;
- Air emissions and dust generation;
- Traffic congestion, delays and access restriction;
- Visual amenity impacts; and
- Community impacts.

7.3 Environmental Risk Assessment

The ongoing determination of environmental aspects and impacts will be achieved through the risk management process. This will result in the development of a list of environmental aspects and impacts, a corresponding mitigation strategy, and risk ranking for each activity.

Each environmental risk is categorised, based on the following:

- The environmental aspect;
- Type of potential impact;
- Relative scale of the potential impact consequence; and
- Likelihood of occurrence.

A matrix presenting a risk consequence ranking based on the likelihood and relative scale of potential impact is provided below. The aspects and impacts assessment, and summary mitigation measures for this project summarised in Appendix D provide additional detail for environmental protection procedures.

7.3.1 Risk Consequence Ranking

		CONSEQUENCE				
		Catastrophic Major Moderate Minor Insignificant				Insignificant
	Almost certain	25	20	15	10	5
DO	Likely	20	16	12	8	4
епно	Possible	15	12	9	6	3
LIKE	Unlikely	10	8	6	4	2
	Rare	5	4	3	2	1

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Consequence	Level of Environmental Impact
Catastrophic	Major impact to site or surrounds – immediate and/or long term harm, high risk of adverse publicity
Major	Offsite impact – OEH reportable incident
Moderate	Significant localised impact – OEH reportable
Minor	Minor level of impact – Localised, contained but required remedial work
Insignificant	Zero impact, minor inconvenience to workers or community
Likelihood	Frequency of Event Occurring
Almost certain	Very common or occurs frequently
Likely	Occur on occasions
Possible	Could occur
Unlikely	Not likely to occur
Rare	Practically impossible
Risk Rating	Action to Be Taken
Extreme	Do not commence work – assess situation and put in place significant measures to reduce the risk to a lower level.
High	Prepare robust WMS with the workers and evaluate if the work could be undertaken in an alternative manner. Ensure all staff understand and abide by the WMS
Medium	Ensure WMS has been prepared and is understood by all participating workers and that works are carried out in accordance with it.
Low	Supervisor to review and discuss at start-up

7.4 Environmental Control Measures

The control measures that will be implemented to mitigate the risk of environmental impact from the project works are detailed in the environmental risk assessment in Appendix D.

In addition to these measures, the following procedure and plans have been developed to assist in managing the project environmental aspects:

- Site Establishment Plan (Appendix A);
- Environmental Checklist (Appendix B);
- Environmental Work Method Statement (Appendix C);
- Environmental Risk Assessment (Appendix D);
- Soil and Water Contamination Plan (Appendix E);
- Construction Waste Management Plan (Appendix F);
- Traffic and Pedestrian Management Plan (Appendix G);
- Weed Management Plan (Appendix H);
- Erosion and Sediment Control Management Plan (Appendix I);
- Environmental Incident Response Plan (Appendix J);

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- Noise and Vibration Management Plan Appendix K);
- Tree and Fauna Management Plan Appendix L);
- Biodiversity Management Plan (Appendix M);
- Bush Fire and Flood Emergency Response Plan (Appendix N);
- Unexpected Finds Protocol Contamination (Appendix O); and
- Unexpected Finds Protocol Heritage (Appendix P).

8 ENVIRONMETNAL MONITORING AND REVIEW

8.1 Site Inspection

The Site Inspection Checklist, (integrated into the Hutchinson Builders Big 10) provided in Appendix B, will be used to record the results of planned inspections on a weekly basis, after rain and as environmental conditions change by the Project Manager, Environmental Representative or others.

8.2 CEMP Audit

The implementation of this CEMP will be audited throughout the construction stage. An environmental audit will be undertaken by the nominated Environmental Representative every six months or as required (e.g. following a significant environmental non-conformance).

8.3 Non Conformance and Corrective Action

Where the detection of any environmental impact exceeds specified limits, the auditor will investigate the incident to determine the extent of possible non-conformance. The non-conformance will then be corrected as soon as possible with necessary action taken to prevent recurrence. The auditor will document the nature and date of corrective action.

8.4 Records

The following records will be kept to demonstrate environmental due diligence and compliance with the CEMP:

- Licences, Permits as relevant;
- Site inductions;
- Weekly environmental inspections;
- Environmental audits;
- Non-conformance and evidence of corrective actions;
- Complaints;
- Environmental incidents and rectification actions taken;
- Waste dockets;
- Plant and equipment registers and daily checks;
- MSDSs and chemical registers; and
- Training and induction registers.



8.5 CEMP Review

Hutchinson Builders will conduct a formal review of this CEMP at a minimum of six monthly intervals or a lesser frequency if required by other factors such as the results of audit reports, complaints, incidents or changes in site conditions or scope of works. Reviews will be carried out by consulting documents such as:

- Subcontractor documentation;
- Work Method Statements;
- Incident Reports;
- Complaint registers;
- Variation orders to scope of works;
- Completed inspections and;
- Test Plans as appropriate.

Changes to the CEMP will be recorded and issued as per the document control at the start of this CEMP. The review will adequately address all sections of the CEMP and action them appropriately.

8.6 Continual Improvement

Continual improvement of the CEMP is achieved by continually evaluating environmental management performance against the environmental policies, objectives and targets as outlined within this document, for the purpose of identifying opportunities for improvement.

The continual improvement process for the scheme will:

- Identify areas of opportunity for improvement of environmental management which leads to improved environmental performance;
- Determine the root cause or causes of non-conformance or deficiencies;
- Develop and implement a plan of corrective and preventative action to address root causes;
- Verify the effectiveness of the corrective and preventative actions;
- Document any changes in procedures resulting from process improvement; and
- Make comparisons with objectives and targets.

Implementation of strategies/techniques to improve the environmental performance of the environmental management system is the responsibility of the Environmental Representative (Section 4.1). Actions and further opportunities for continual improvement will be discussed at periodic Management Review meetings.

8.7 Reporting

Environmental performance will be documented monthly and transmitted to the Hutchinson Builders Systems Manager utilising an Environmental Performance Report.

This report will capture:

- Any environmental incidents within the period;
- Any complaints;
- Comments on performance and effectiveness of waste management measures and;
- Environmental non-compliances and proposed corrective actions as well as effectiveness and adequacy of this CEMP.



9 ENVIRONMENTAL INCIDENT RESPONSE

An environmental incident is defined in the POEO Act (1997) as a "pollution incident" where actual or potential harm to the health or safety of human beings or to ecosystems has occurred. An incident is also defined as resulting in actual or potential loss or property damage exceeding \$10,000. Hutchinson Builders are required to notify EPA of any incident that occurs during the project.

Hutchinson Builders has established procedures to respond to environmental incidents. These procedures have been designed to prevent and mitigate the environmental impacts related to such events.

Environmental incidents may include but are not limited to:

- Oil, fuel or other contaminant or chemical spills;
- Flooding;
- Major equipment failure resulting in an environmental impact;
- Industrial accidents resulting in an environmental impact;
- Unauthorised clearing of vegetation;
- Damage to fauna;
- Pollution of a waterway; and
- Damage to a Heritage site.

Prior to the commencement of a task involving hazardous materials, the work group shall be instructed on the potential risk and required work methods documented in the EWMS.

The steps defined in an incident response must encompass these defensive principles in the following order:

- Preservation of human health and safety;
- Protection of plant and property; and
- Protection of the environment.

Environmental Incidents will be managed in accordance with the Environmental Incident Response Plan in Appendix J of this CEMP.

Table 17: External Emergency Contacts			
Issue	e Contact		
Life threatening emergencies Spills involving Mercury (call HAZMAT)	Fire Brigade (including HAZMAT), Ambulance or Police	000	
Complaints	School Infrastructure NSW	1300 482 651	
Pollution incidents	EPA	131 555 or 02 9995 5000 (24 hours)	
	Ministry of Health	9391 9000	
	SafeWork NSW	13 10 50	
	City of Liverpool	1300 362 170	
Electricity Supplier (NSW)	TransGrid Endeavour Energy	1800 027 253 131 003	

9.1 External Emergency Contacts



Table 17: External Emergency Contacts			
Issue	Contact	Number	
Loss of supply, fallen wires, or other electrical emergency			
Discovery of Aboriginal heritage items	OEH Aboriginal heritage division.	02 9873 5800	
Discovery of Non-Indigenous heritage items	Heritage Council	02 9873 5800	
Discovery of human skeletal remains	NSW Police	000	
Water and sewer mains	Sydney Water	13 20 90 (24 hours)	
Injured animals	WIRES – Sydney	02 8977 3333	





10 ENVIRONMETNAL POLICY





Environmental

Hutchinson Builders operates within the construction industry and is committed to the delivery of construction activities through environmentally responsible practices from inception to completion.

The leadership team is committed to the prevention of pollution, and recognises that the company's role in the protection of the environment, to the extent to which we can control it, is the comerstone of our success.

The leadership team demonstrates this commitment by:

- Donsidering the needs and expectations of interested parties, and complying with all relevant statutory duties, codes, standards, contractual requirements
- Establishing environmental objectives in alignment with strategic direction, project risk, and industry best practice.
- Understanding the exposure to environmental risk at each phase of a project, and implementing processes and procedures to identify, prevent, and mitigate undesirable environmental impacts
- Applying the appropriate evaluation techniques for enhancing continual improvement, with the benefit of learnings from historical challenges

This Environmental Policy will be communicated to all parsons working on behalt of Hutchinson Builders to provide an understanding of the environmental objectives of the business.

 \mathcal{U}_{ℓ} Managing Director

Date 1 March 2019 Version 6 Document NB-CO-Policy-0002-Environmental-06


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Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Figures

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		MCGIRR	HIOMEPERIDE ALEMAN	ANTE SCI HA	RGRAVE ROAD HARGE AVE PARK Deark Deark MCGI HUNKLER AVE	RR PARADE NUE	Hainen Park		
Legend:	Metres	CDEENICAD	Client Name	e:	Hutchinson	Builders	3		
Site Boundary		GREENCAP	Client Num	ber:	C123836		Project Number:	J161921	
	A	Going Further in Managing Kisk	Project Description: Mainsbridg			e School	shool CEMP		
Site Location	te Location	Level 2, 11-17 Khartoum Road North Ryde, NSW 2113	Address:		Warwick Fa Lawrence F	Farm Public School, e Hargrave Road, NSW 2170			
		Ph: 02-9889-1800	Prepared:	AC	Reviewed:	MB	Version Date:	24/05/2019	
		Fx: 02-9889-1811	Figure 1	Site Loc	ation and Re	egional (Context		
Disclaimer: Greencap-NAA Pty Ltd has produced this madamage or costs (including consequential damage) related	nap for the purpose of presenting a summary of relevant spatial information ting to any use of or reliance upon the data. Data must not be used for or	on and gives no warranty in relation to the data (including acc lirect marketing or be used in breach of privacy laws. Service	curacy, reliability, com a Layer Credits: © 20	mpleteness or s 019 NSW Land	uitability) and accep I and Property Inform	ots no liability (nation (Six Ma	including without limitation liabilit ps)	y for negligence) for any loss,	



Legend: Metres 0 15 30 45 60	GREENCAR	Client Nam	ne:	Hutchinsor	n Builders		
Site Boundary	Going Further in Managing Risk	Client Num	nber:	C123836		Project Number:	J161921
Construction Area		Project De	scription:	Mainsbridg	e School	CEMP	
	Level 2, 11-17 Khartoum Road North Ryde, NSW 2113	Address:		Warwick Fa Lawrence H	arm Publi Hargrave	c School, Road, NSW 2170	
	Ph: 02-9889-1800	Prepared:	AC	Reviewed:	МВ	Version Date:	24/05/2019
	Fx: 02-9889-1811	Figure 2	Lot Bou	ndary and C	onstructi	on Zone	
Disclaimer: Greencap-NAA Pty Ltd has produced this map for the purpose of presenting a summary of relevant spatial information and gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation liability for negligence) for any loss, damage or costs (including consequential damage) relating to any use of or reliance upon the data. Data must not be used for direct marketing or be used in breach of privacy laws. Service Layer Credits: © 2019 NSW Land and Property Information (Six Maps)							





Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix A: Site Establishment

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1. PURPOSE

May 2019

To address the requirements of the Development Consent in reference to Site Establishment for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the Project.

3. PROCEDURE

This Site Establishment Plan details how Hutchinson Builders will undertake works associated with the project in accordance with the CEMP.

3.1 Site Establishment Plan

The establishment of the site will involve the following:

- Dilapidation survey.
- Delineation of the construction corridor and vegetation to be removed or retained.
- Establishing the construction compound and works areas.
- Designating laydown areas for stockpiling equipment, materials and spoil.
- Installing erosion and sediment control measures.
- Implementing traffic management measures.
- Removal of vegetation.
- Construction of access tracks.
- Construction of a dewatering system.

3.1.1 Dilapidation Survey

Prior to site establishment a dilapidation survey is required to be carried out by a qualified and suitable contractor for the following:

- Road way entry points to the Warwick Farm Public School;
- Structures maintained throughout the proposal foot print; and
- Road ways/access ways within the Warwick Farm Public School i.e along access ways that fall outside of the proposal footprint.

The dilapidation survey will be used for information during the rehabilitation process of the site, post construction, in order to reduce long term impact on the surrounding environment.

3.1.2 Delineation of the Construction Corridor

The clear delineation of the approved construction corridor is to be performed using high visibility para-webbing or tape. No-Go zones are to be established anywhere outside of the clearly demarked construction corridor. No-Go zones associated with stockpiling areas and storage of materials is to be clearly fenced and signposted.

Prior to the commencement of clearing works the following is to be conducted:

- Vegetation to be removed for the works to be clearly marked.
- Vegetation to be retained for the works, including Hollow Bearing Trees to be clearly marked. Establish No-Go zones around vegetation areas to be retained.

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• All Heritage Areas to be defined as No-Go zones.

3.1.3 Construction Compound

The temporary construction compound, located to the north of the Warwick Farm Public School, is to be securely fenced and signposted clearly indicating the site is a construction zone and access is restricted.

Locations of any additional storage compounds and site offices are to be confirmed during construction planning and subject to additional environmental assessment.

Pre and post contamination assessments are to be carried out by a suitably qualified contractor to validate the activities undertaken by Hutchinson Builders has not degraded the site.

After use, each area is to be restored as close as possible to original condition.

3.1.4 Designated Laydown Areas

Designated laydown areas within the construction compound for stockpiling equipment, materials and spoil are to be established with the correct sediment control measures in place.

Establish temporary laydown areas within the construction zone for small stockpiles of materials likely associated with stabilisation works. Temporary laydown areas require appropriate sediment controls.

3.1.5 Installing Erosion and Sediment Controls

The erosion and sediment controls are to be designed, installed and maintained in accordance with Landcom's *Managing Urban Stormwater: Soils and Construction* (generally referred to as the "Blue Book") requirements may include the use of geofabrics, sediment floatation booms, sediment fences, and bunding. Refer to Appendix I of the CEMP (this document) for the Erosion and Sediment Management Plan.

3.1.6 Implementing Traffic Management

Traffic management measures will be implemented in accordance with the Traffic and Pedestrian Management Plan - Appendix G of the CEMP.

3.1.7 Vegetation Removal

Following establishment and delineation of the site boundary and securing the construction site, any vegetation requiring removal will be clearly identified and distinguished from the trees that are to remain. Identified vegetation is to be removed following a pre-clearance inspection by a qualified ecologist. All vegetation removal is to be completed by an experienced, qualified arborist and weed or other vegetation removal would be undertaken by an experienced, qualified bush regenerator.

3.1.8 Construction of Access Tracks

To be constructed in high traffic areas to provide access to the site for vehicles, plant and personnel. Access tracks are to be maintained to prevent erosion using necessary sediment control measures. All temporary access tracks are to be reinstated to natural bushland or to design on completion of works.





Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix B: Environmental Checklist

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Weekly Inspection – BIG 10

HB-HSEQ-F-048

Job Name: Job Number:		Dat	e:		
HB Pe	rson Completing: Subcontractor Completing:				
	***C – Compliant NI – Needs Improvement NC – Not Compliant N/A – Not Applicable				
KEY	TEMS	С	NI	NC	N/A
Hous	ekeeping (WHSMP)				
1.1	Is there an adequate waste removal process in place (i.e. enough bins that are emptied regularly)?				
1.2	Are there designated areas to store tools, equipment, materials, plant etc.?				
1.3	Are stacking / storage areas tidy and organised?				
1.4	Have work areas been kept clean, uncluttered and free of waste?				
1.5	Are all starter bars capped?				
1.6	Is dust being controlled during clean up? (Vacuum / misting / sweepers etc.)				
Acce	ss, Egress and Public Protection Controls (WHSMP)				
2.1	Are there at least 2 points of access to the working area?				
2.2	Are designated access ways free of any protruding objects, water hazards, rock, materials, trip hazards etc.?				
2.3	Are all areas affecting the public free of trip hazards and protruding objects (e.g. footpaths)				
2.4	Are there walkways to clearly separate workers from plant?				
2.5	Are exclusion zones in place for work occurring overhead? (e.g. formwork, EWP, scaffold erection etc.)				
2.6	Are designated access and emergency paths defined (e.g. tape/flagging/ barricade/signage)?				
2.7	Is the site perimeter secured and appropriate fencing/hoarding/gantries and signage maintained?				
Scaff	old (PRA – Scaffold , SWMS 21 & 22, Monthly Scaffold Checklist HB-HSEQ-F-061)				
3.1	Are scaffolds easily accessible and free of debris?				
3.2	Are the gaps between the scaffold and adjacent structure in general work areas less than 225mm?				
3.3	Are lap boards mechanically fixed where the overlap onto the scaffold is less than 300mm?				
3.4	Are kickboard / toe boards installed continuously with no gaps and fixed mechanically?				
3.5	Are scaffold deck heights not greater than 300mm above or below floor / soffit level?				
3.6	Has the containment screening been installed correctly to prevent falling objects with no gaps and not higher than 2m past the last tie point?				
3.7	Have scaffolds handover and monthly inspection been completed (& the records on site)?				
Pene	trations (PRA – Penetrations)				
4.1	Are all penetrations 100mm and over fitted with appropriate covers?				
4.2	Are any penetrations that are impracticable to cover surrounded by full edge protection?				
4.3	Are all lift shafts fitted with lockable gates / cages?				
Edge	Protection (PRA, SWMS 15, Work at Heights Permit HB-HSEO-F-077)			1	

HUTCHINSON BUILDERS Established 1912

Weekly Inspection – BIG 10

HB-HSEQ-F-048

KEY	Established 1912	С	NI	NC	N/A
5.1	Are physical barriers installed and secure for any exposed edges?				
5.2	Where an exclusion zone is established is it 2 metres back from the live edge?				
5.3	Are toe/kick boards in place on all live edges?				
5.4	Are wheel stops/ bump rails / visual barricades installed where EWPs & forklifts are being used near live edges?				
5.5	Has screening been implemented to ensure the protection of public and workers below?				
5.6	Where edge protection is impractical is a system in place for the use of harnesses and attachment points and are these certified by a competent person?				
Amer	nities (WHSMP , PRA – First Aid)				
6.1	Are amenities always clean, sealed and vermin proof with adequate appliances?				
6.2	Are there suitable toilets and crib areas on site for all workers?				
6.3	Are toilets located separately from the crib room, working, cleaned regularly and easily accessible?				
6.4	Is drinking water provided and accessible on all levels?				ļ
6.5	Are first aid facilities available, stocked, accessible and with adequate signage and trained person (s) on site?				
Temp	oorary Power (PRA – Electrical Supply)				
7.1	All switchboards have a weatherproof door free of damage that is lockable, secured to the ground, post or wall and does not have live parts exposed, or unnecessary gaps/ holes/ openings in the board?				
7.2	All switchboards have an insulated entry and tie bar that is large enough to loop cables through				
7.3	Are the circuit breakers within the switchboard lockable and only accessible by electricians?				
7.4	All switchboards have a clearly defined numbering system and location of where the board is distributed displayed on the board.				
7.5	Switchboards are accessible and not obstructed by plant or equipment				<u> </u>
7.6	Switchboard is located adjacent to emergency lighting or fitted with a tested emergency light				
7.7	Are electrical leads and tools tested and tagged to suit state requirements (3 monthly), no piggy backed or damaged leads in use?				
7.8	Cables and leads are hung from insulated hooks or lead stands and protected against mechanical damage?				
Light	ing (PRA – Lighting)				
8.1	Has access lighting been installed to all levels and at minimum 40 lux with records?				ļ
8.2	Emergency backup lights installed to provide a min 20 lux with 6 monthly test records on site?				
8.3	Are trades providing adequate task lighting of 160 lux to all work areas?				ļ
8.4	Are all stairwells lit with the minimum emergency lighting?				
8.5	Are luminaires protected against mechanical damage?				<u> </u>
Emer	gency Response (PRA – ERP)				
9.1	Are running man signs in place at all exit points?				
9.2	Are there emergency evacuation diagrams on all floors?				
9.3	Are emergency contacts on display?				
9.4	Are fire extinguishers located at all exits with signs erected at 2000 mm and tagged 6 monthly?				
9.5	Are fire boosters / hydrants / hose reels as per design operational from 2 levels below the working deck once the building is at an effective height of 12 metres? (**effective height is the height from the emergency exit point)				

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Weekly Inspection – BIG 10

HB-HSEQ-F-048

	Fatabilishard 1912				
KEY	ITEMS	С	NI	NC	N/A
Traf	Traffic Management (SWMS, PRA)				
10.1	Does the project have one or more approved Traffic Management Plan/s (TMP) on display?				
10.2	Is there a council and/or police permit required (for road and footpath) & on display?				
10.3	If there are devices to be temporarily installed as per TMP is there a suitably licenced traffic controller on site?				
10.4	Are all devices set out in accordance with the TMP?				
10.5	Are daily pre-starts / SWMS / checklists / toolboxes for traffic controllers completed?				
10.5	Is there a suitable number of licenced traffic controllers on the projects as per the TMP?				
10.7	Are all traffic controllers wearing the necessary PPE?				
10.8	Are there separate entry/exit points for vehicles and people?				

****S1-9 – Safety E1-9 - Environmental

WEE	WEEKLY HEALTH AND SAFETY AND ENVIRONMENTAL ITEMS			NC	N/A
S1	Formwork & falsework – Falls managed, exclusion signs & zones in place joists placed from below, single leading edge				
S2	Ladders and trestles - Suitable for the task, correct setup inspected prior to use, removed from service if damaged				
S3	Precast panels – Exclusion zones in place, documentation received, rigger in control of work				
S4	Excavations – Collapse controlled, barricades in place, safe access, stockpiles away from trenches				
S5	Cranes & lifting - Safe lifting practices near workers, warnings processes or exclusion zones in place, tag lines				
S6	Masonry walls – free standing walls braced where practical or excluded				
S7	Concrete pumps / trucks set up – Set up in agreed area clear of trenches and clear of obstructions, exclusion zones in place				
S8	Hazardous chemicals stored and maintained properly				
S9	High risk work activities – All workers completing high risk work have completed Permit for activity and suitable controls are in place.				
E1	Noise and vibration controlled - Ensure that noise and vibration is monitored, PPE being worn & working hours abided by				
E2	Dust - Monitor dust emissions visually and apply measures /controls dust suppression				
E3	Concrete washout areas- maintained and not overfilled				
E4	All Bunded areas empty of water -Remove ponded water from area				
E5	Spill kits on site and maintained – Contents are maintained and adequate, spills cleaned up and waste disposed of correctly				
E6	Sediment control - none leaving site - Sediment fences erected & maintained, no soil on roads or in gutters, Installed as per Civil DWG's				
E9	Weed removal – Weeds are maintained on a weekly basis, including vehicle inspections to prevent spreading				
E10	Terrain disturbance – Construction limited within designated corridor				
E11	Terrain disturbance – Appropriate sediment controls located at access routes				
E12	Erosion and stockpile - Stockpiles of soils covered or bunded and managed in an appropriate manner, away from the creek line and tree protection zones				
E13	Erosion and stockpile - Any identified contamination segregated				
E14	Erosion and stockpile - Less than 1/3 build-up in sediment trap				

Weekly Inspection – BIG 10

HB-HSEQ-F-048

HUTCHINSON BUILDERS

Established 1013

ND	ENVIRONMENTAL	ITEMS	

WEEI		С	NI	NC	N/A
E15	Erosion and stockpile - Stormwater and drainage lines protected and free of soil				
E16	Creek – No refuelling, decanting or vehicle maintenance within proximity of creek, only undertaken in designated areas				
E17	Creek – Any contamination including chemical/fuel spills identified in surface water				
E18	Flooding – Sediment controls in-place to manage erosion and sediment				
E19	Flooding – Work site stabilised after rainfall				
E20	Vegetation – Tree protection zones maintained appropriately				
E21	Traffic – Vehicle speed limits are adhered to and appropriate vehicle and pedestrian barriers in- place				
E22	Traffic – Access for emergency vehicles is maintained				
E23	Waste – Appropriate receptacles available and securely stored with appropriate classifications				



#	COMMENTS / RECOMMENDATIONS	PERSON RESPONSIBLE	DATE

Name and position of person closing out inspection:

Date:





Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix C: Environmental Work Method Statement

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1. PURPOSE

This Environmental Work Statement Method (EWSMS) aims to ensure the local environmental conditions at the site are protected during construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to construction-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. PROCEDURE

This Environmental Work Method Statement details how Hutchinson Builders will undertake works associated with the project in accordance with Local Council and Road and Maritime Authority requirements.

3.1 Site Location

Figure 2 of the figures section of the CEMP indicates the construction area at the Warwick Farm Public School.

3.2 Contact Numbers

The following project personnel have the authority to implement a 'stop work' order immediately in order to prevent environmental impact from construction activities.

Table 1: Stop Work Contact Details					
Name	Position	Contact			
John Koumoukelis	Team Leader	Mob: 0416 616 464			
Denobrega	Denobrega	Denobrega			

The contact details for key project personnel with the responsibility to implement the CEMP and to respond to incidents and emergencies are detailed below.

Table 2: Key Project Personnel to Implement CEMP				
Name	Position	Contact		
John Koumoukelis	Team Leader	Mob: 0416 616 464		
Denobrega	Denobrega	Denobrega		
Melissa Stojanovic (GHD)	Project Manager	Mob: 0405 210 434		

Table 3: External Emergency Contacts					
Issue	Contact	Number			
Life threatening emergencies Spills involving Mercury (call HAZMAT)	Fire Brigade (including HAZMAT), Ambulance or Police	000			

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Table 3: External Emergency Contacts							
Issue	Contact	Number					
Complaints	School Infrastructure NSW	1300 482 651					
Pollution incidents	EPA	131 555 or 02 9995 5000 (24 hours)					
	Ministry of Health	(02) 9391 9000					
	SafeWork NSW	13 10 50					
	City of Liverpool	1300 362 170					
Electricity Supplier (NSW)	TransGrid	1800 027 253					
Loss of supply, fallen wires, or other electrical emergency	Endeavour Energy	131 003					
Discovery of Aboriginal heritage items	OEH Aboriginal heritage division.	02 9873 5800					
Discovery of Non-Indigenous heritage items	Heritage Council	02 9873 5800					
Discovery of human skeletal remains	NSW Police	000					
Water and sewer mains	Sydney Water	13 20 90 (24 hours)					
Injured animals	WIRES – Sydney	02 8977 3333					

3.3 Methodology

The following procedure will be applied when conducting Environmental Works across the site.

3.3.1 Pre-Task Planning

Pre-task planning shall be based upon site activities at the time of the investigation and prevailing weather conditions. The following will be considered in planning the works program:

- Access to sites shall be confirmed with Hutchinson Builders;
- All new staff to the site must receive a formal site induction from Hutchinson Builders;
- Site inspections are to be conducted by qualified personnel, who will ensure that any damage to the environmental conditions at the site is minimised or eliminated as part of the inspections and associated works undertaken.



Table 4: Environmental Work Method Statement – Refer to CEMP Section 7.3 for Risk Ratings						
Environmental Aspect	Consequence	Initial Risk Rating	Management Method (Mitigation Controls)	Residual Risk Rating	Responsibility	
Soils – excavation Bisturbed sediments mobilising to waterways		esion mpaction turbed diments billising to	Erosion and sediment control measures to be consistent with those specified by OEH and the Blue Book.		Environmental Representative	
			Erosion and sediment control would be maintained throughout construction activities and be established prior to any works.		Project Supervisor	
	Erosion Compaction		Soil materials should be replaced in the same order that they are removed from the ground. It is particularly important that all subsoils are buried and topsoils are replaced on the surface at the completion of the works.	6		
	Disturbed sediments mobilising to		Disturbed areas would be stabilised progressively so that no areas remain unstable for any extended length of time.			
	waterways		Stockpiles of soils would be covered or bunded and managed in an appropriate manner to prevent dust, erosion and sediment runoff.			
			Excess excavated material that cannot be used in backfilling would be classified in accordance with the Waste Classification Guidelines (EPA 2014) prior to any off- site disposal at a suitably licensed waste facility.		Project Manager / Environmental Representative	



Table 4: Environmental Work Method Statement – Refer to CEMP Section 7.3 for Risk Ratings							
Environmental Aspect	Consequence	Initial Risk Rating	Management Method (Mitigation Controls)		Responsibility		
			Use sediment fencing as required to ensure surface erosion is managed.				
			Use sediment fencing as required to ensure stockpiles on site are managed.				
Soils –	Erosion and	16	Ensure stockpiled soil material is not left near or within the creek line.	8	Project Manager		
stockpiling Sedir move	movement		Battering of stockpiled material at 1:2 to reduce erosion.		Project Supervisor		
			Remove temporary works after they are no longer required to ensure area is left as it was found.	-			
		C-11	Coil		Work would cease in the immediate vicinity of any areas of suspected contamination that are identified prior to or during work.		
	contamination caused by disturbance of	Soil contamination caused by disturbance of asbestos	Should contamination be identified, preparation of a remediation action plan and notification of Council would be required prior to any remediation in accordance with the Contaminated Land Management Act 1997.				
	asbestos		Waste management procedures are outlined as part of the CEMP (Appendix F).				
Contamination	caontaining materials (ACM), oil, chemicals,	9	Any contaminated spoil would be disposed of to an approved facility following appropriate classification.	6	Project Manager / Project Supervisor / Environmental		
	grease or fuel spills or leaks		A functioning spill kit would be kept at all construction sites and site offices at all times to enable immediate clean-up of any chemical/fuel spills.		Representative		
	from machinery. Disturbance to contaminated land	rom machinery. Disturbance to contaminated	Incident response and management including emergency procedures for dealing with chemical / fuel spills will be undertaken in accordance with the Environmental Incident Response Plan in Appendix J of the CEMP.				
		land	Suspected ACM containing material and unexpected finds are to be managed under the existing AMP for the site, where an exclusion zone is to be constructed,				

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Table 4: Environmental Work Method Statement – Refer to CEMP Section 7.3 for Risk Ratings						
Environmental Aspect	Consequence	Initial Risk Rating	Management Method (Mitigation Controls)		Responsibility	
			with warning signs and tape. The material is to wet the area down with a fine mist and secure with geofabric. AMP ref: WSP Pty Ltd Asbestos Management Plan Warwick Farm Public School March 2019.			
Trenching watercour could resu erosion an sedimenta constructio	Trenching of watercourses		Erosion and sediment control measures will be consistent with those specified in the Blue Book. Appendix I of this CEMP details the erosion and sediment control measures that will be implemented for the project.		Environmental Representative	
	could result in soil erosion and sedimentation at construction sites.		Watercourse crossings would be trenched perpendicular to the normal flow of the watercourse			
			No refuelling, fuel decanting or vehicle maintenance work would take place within proximity of waterways			
	suspended		Refuelling to take place in designated areas in bunded and hardstand areas		Draiast Managar /	
Surface Water Quality Surface Water Quality Surface Water construction Pollution of waterway or chemic	sediment loads downstream of construction site	ediment loads lownstream of 16 onstruction site	A functioning spill kit would be kept at all construction sites and site offices at all times to enable immediate clean-up of chemical/fuel spills.	8	Project Manager / Project Supervisor	
	Pollution of waterways by fuel or chemicals and		Incident response and management including emergency procedures for dealing with chemical / fuel spills will be undertaken in accordance with the Incident Management Plan in Appendix J of the EMP.			
	wastewater		No work would occur during wet weather.			
	Loss of water quality during wet weather overflows	oss of water uality during wet reather	The clearing of vegetation is to be minimised where possible during the detailed design and construction planning phases.		Design Support	
			Should groundwater be encountered during construction activities, the management measures as detailed in Appendix I of the EMP 'Erosion and			



Table 4: Environmental Work Method Statement – Refer to CEMP Section 7.3 for Risk Ratings							
Environmental Aspect	Consequence	Initial Risk Rating	Management Method (Mitigation Controls)		Responsibility		
			Sediment Control Procedure' will be implemented to minimise the risk of polluting surface water.				
			If dewatering is required where groundwater is intercepted, the discharge volume will be monitored and recorded to evaluate compliance with the allowable threshold.		Project Manager / Project Supervisor		
	Following co		Following completion, sites will be backfilled and water tables will return to pre- construction levels.				
Flooding Flo	Localised flooding in heavy wet weather events resulting in soil erosion and	Localised flooding in heavy wet	Localised flooding in heavy wet		In the event of flooding, remedial action would occur in accordance with emergency response procedures as detailed in the Environmental Incident Response Plan in Appendix J of the CEMP.		
			Where significant rainfall is predicted site works should be reassessed and potentially postponed.		Project Manager /		
	sedimentation at construction sites	20	Personnel should not be allowed within the creek channel during periods of predicted high rainfall.	10	Project Supervisor		
	The site is located adjacent the Brickmakers Crook		Response to rainfall and potential flooding events are specified in Appendix N of the CEMP 'Bush Fire and Flood Emergency Response Plan'				
	with potential for flooding to occur.	Brickmakers Creek with potential for flooding to occur.	3rickmakers Creek with potential for Flooding to occur.		Sediment controls are to be installed to manage sediment and erosion issues as specified in Appendix I of the CEMP 'Erosion and Sediment Control'.		Environmental Representative / Project Manager



Table 4: Environmental Work Method Statement – Refer to CEMP Section 7.3 for Risk Ratings						
Environmental Aspect	Consequence	Initial Risk Rating	Management Method (Mitigation Controls)	Residual Risk Rating	Responsibility	
			Locate temporary infrastructure (plant sites and offices etc.) in cleared areas away from vegetation.		Project Manager / Design Support	
Vegetation Impacts Impacts Impacts Impacts to flora Impacts to fauna	Non approved		All hollow bearing trees tagged prior to construction occurring.		Environmental Representative	
	flora Impacts to native fauna	12	Accurately and clearly mark out the limits of clearing and trees/ vegetation to be retained including threatened ecological communities, hollow-bearing trees, and riparian vegetation where specified in Appendix M 'Biodiversity Management Plan'	4	Project Manager Project Supervisor Environmental	
			Regular inspections should be undertaken to clearly mark all retained vegetation/fauna habitat.		Representative	
Fauna Impacts impacts to fau habitat	Non approved impacts to fauna	n approved pacts to fauna 16 pitat	An ecologist should be present during the clearing of habitat trees to handle and relocate any injured fauna. WIRES should be consulted if any injured fauna are encountered.	4	Ecologist Environmental Representative	
	habitat		Timber felled for clearing should be retained on the ground as cover for terrestrial fauna where possible.		Project Supervisor	
Clearing of Native vegetation	Non approved Impacts to native	9	Avoid the removal of trees with hollows (alive or dead) where practicable. Where removal cannot be avoided for OH&S reasons, maintain the tree intact (as far as possible) and place it on the ground in adjoining vegetation.	3	Project Manager	
	vegetation		Where applicable, logs and hollows to be relocated to limit habitat destruction.			



Table 4: Environmental Work Method Statement – Refer to CEMP Section 7.3 for Risk Ratings					
Environmental Aspect	Consequence	Initial Risk Rating	Management Method (Mitigation Controls)		Responsibility
Noxious weed Spread of management Weeds			Establish a noxious weed management protocol that introduces an identification card for contractors (Refer to Appendix H of the CEMP – Weed Management Plan).		Environmental Representative
	Spread of Noxious	1.5	Weed removal is to be carried out prior to works commencing.	0	Project Manager Project Supervisor
	Weeds	10	All noxious weeds that are cleared as part of the project must be disposed of appropriately.	ð	
			Implement inspection/maintenance procedures to reduce the carriage of weed material on machinery.		
Management of threatened plant species	Impacts to threatened plant species		Any threatened plant species are to be flagged on the site, then accurately surveyed and marked on plans to inform the detailed design.	5	Project Manager Project Supervisor
		10	If substantial disturbance to the critical root zone of any larger trees is required, advice will be sought from a qualified arborist particularly where trees may pose a safety hazard.		

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Table 4: Environmental Work Method Statement – Refer to CEMP Section 7.3 for Risk Ratings						
Environmental Aspect	Consequence	Initial Risk Rating	Management Method (Mitigation Controls)		Responsibility	
Air quality Air quality Construct			Visual monitoring of dust generation would occur and dust suppression measures such as water spraying would be used, especially if windy.			
	Dust generation Emissions from		Manage spoil stockpiles to minimise the generation of dust. This would include minimising the time spoil is left uncovered and spraying stockpiles to minimise dust.	6	Project Manager / Project Supervisor	
	machinery, equipment and vehicles used during construction	12	All construction plant and machinery would be properly maintained and fitted with emission control devices complying with the Australian Design Standards.			
		during construction		All emission controls used on vehicles and construction equipment would comply with relevant NSW OEH standards as provided under Section 124 of the PoEO Act.		
			Vehicle use on unsealed surfaces would be avoided where possible.			
Noise and vibration Disturbance from increased vehicle and machinery movements			All construction must comply with both noise and vibration standards and guidelines including the Interim Construction Noise Guideline (DECCW, 2009) and the Sydney Water Noise Management Procedure (SWEMS0056).		Project Manager / Environmental Representative	
	Disturbance from increased vehicle and machinery	9	Construction would occur during standard construction hours: 7am – 6pm Monday to Friday and 8am – 1pm Saturday. No work on Sundays and public holidays.	6	Project Supervisor	
	movements		Potential vibration impacts would be limited to the construction period.			
			Quieter and lower vibration emitting construction methods would be used where practicable.			



Table 4: Environmental Work Method Statement – Refer to CEMP Section 7.3 for Risk Ratings						
Environmental Aspect	Consequence	Initial Risk Rating	Management Method (Mitigation Controls)		Responsibility	
			Local residents would be informed of construction activities via a letterbox drop two weeks prior to the commencement of construction.		Project Manager	
			Vibration levels not to exceed those recommended in the standards.		Environmental Representative	
			Waste will be managed in accordance with the Waste Management Procedure in Appendix F of the CEMP		Environmental Representative	
			Waste management will occur according to the hierarchy of avoidance, reuse, reuse, recycle, and finally disposal.			
			Waste unable to be reused or recycled will be classified and disposed in accordance with EPA 2014 Waste Classification Guidelines.			
	Incorrect disposal		Worksites would be kept in a clean and tidy condition at all times.	- 8		
Waste	of construction	16	Waste refuse bins would be provided on site.			
Management i	in contaminated land or water	Stes resulting To contaminated Portable toilets would be provided of appropriately licer id or water Contaminated waste would be separate removed to a licensed waste facility. Ref Manageme Manageme Risk assessments would be undertaken be to identify and manage environmental would be reviewed and revised (as require ensure they rem	Portable toilets would be provided on site with waste removed by an appropriately licensed contractor.		Project Manager Project Supervisor	
			Contaminated waste would be separated from non-contaminated waste and removed to a licensed waste facility. Refer to Appendix F 'Construction Waste Management Plan'			
			Risk assessments would be undertaken by the Contractor prior to construction to identify and manage environmental and safety risks for all works. These would be reviewed and revised (as required) during the construction phase to ensure they remain relevant.			

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Table 4: Environmental Work Method Statement – Refer to CEMP Section 7.3 for Risk Ratings						
Environmental Aspect	Consequence	Initial Risk Rating	Management Method (Mitigation Controls)		Responsibility	
			Bunds for any chemical storage would be provided at not less than 110% of the chemical storage tank sizes as per Australian Standards.			
			Material Safety Data Sheets would be available on site.			
Energy usage and Greenhouse Has Emissions (GHG) emissions during construction	Increased GHG		Energy use will be minimised by minimising excavation volumes, recycling top soil and turf to reduce transport, disposal and resource use, and ensuring plant and equipment is well maintained and turned off when not in operation. No burning of vegetation or other materials will be permitted on site.		Project Manager / Project Supervisor	
	emissions from construction	construction	Energy efficient plant and equipment will be utilised to perform works. All construction vehicles would be maintained, and emission reduction devices kept in good working order.	4		
			Vehicles and equipment would be operated in a manner that reduces energy and fuel consumption wherever possible			
Bushfire main during Los	Damage to equipment and machinery Loss of public and	Damage to equipment and		Check weather forecasts if hot work is expected so that proposed construction activities do not pose bushfire threats. In particular, hot work is not to be done on total fire ban days without having Rural Fire Service (RFS) approval.		
		bachinery back of public and	Suitable fire suppression equipment (extinguisher, pumps, hoses etc) to be available on site for the duration of site work.	10	Project Manager / Project Supervisor	
works	private property		Fuels and other flammable materials to be stored and maintained appropriately.			
	Human injury or death.	Human injury or death.		Provide adequate site supervision when undertaking activities that have the potential to cause fires.		



Table 5: Further Consequence Reduction Mitigation Controls Identification						
Task/Activity	Hazard	Consequence	Initial Risk Rating	Control Measures	Residual Risk Rating	Responsible Person



Table 6: Environmental Work Method Statement Record				
Job Number:	Date:	Location: Warwick Farm Public School		
The following persons ackr	nowledge they attended an induction for the Works to be undert	aken at the above location.		
Name	Signature	Date		
l acknowle	dge that I have completed the above induction for the persons li	sted above.		
Name:	Signature:	Date:		

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Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix D: Environmental Risk Assessment

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APPENDIX D – Environmental Risk Assessment

Aspect category	Potential Impact	Consequence	Likelihood	Risk Rating	Mitigation Measures	Mitigated Likelihood	Residual Risk Rating	Responsibility	Timing Requirements
Topography	Non approved disturbances to terrain and changes to topographical features from construction methods such as trenching.	3	3	9	Areas of disturbance would be minimised to only the directly affected areas through appropriate delineation of construction zones.	1	3	Project supervisor	Pre construction and construction
Soils	 Erosion of exposed soils and stockpiled material Compaction of soil by machinery and vehicle movements Disturbed sediments mobilising to waterways 		4	12	Erosion and sediment control measures to be consistent with those specified by OEH and in <i>Managing urban storm water (MUS): soils and</i> <i>construction vol. 1</i> (commonly known as the Blue Book). Erosion and sediment control would be maintained throughout construction activities and be established prior to any works.			Environmental Representative Project Supervisor	Construction Pre construction and construction
		3			Soil materials should be re-instated in the same order that they are removed from the ground. It is particularly important that all subsoils are buried and topsoils are replaced on the surface at the completion of the works.	2	6		Construction
					Disturbed areas would be stabilised progressively so that no areas remain unstable for any extended length of time.				
					Stockpiles of soils would be covered or bunded and managed in an appropriate manner to prevent dust, erosion and sediment runoff.				
					Excess excavated material that cannot be used in backfilling would be classified in accordance with the Waste Classification Guidelines (EPA 2014) prior to any off-site disposal at a suitably licensed waste facility.			Project Manager / Environmental Representative	
Contamination •	 Soil contamination caused by oil, chemicals, grease or fuel spills or leaks from machinery. Disturbance to contaminated land 		3	9	Work would cease in the immediate vicinity of any areas of suspected contamination that are identified prior to or during work.	2		Project Manager / Project Supervisor / Environmental	Construction
		3			Should additional contamination be identified, the existing remediation action plan is to be amended and notification of Council would be required prior to any remediation in accordance with the Contaminated Land Management Act 1997.		6	Representative	
					Waste management procedures are outlined as part of the CEMP (Appendix F).				
					Any contaminated spoil would be disposed of to an approved facility following appropriate classification.				





Aspect category	Potential Impact	Consequence	Likelihood	Risk Rating	Mitigation Measures	Mitigated Likelihood	Residual Risk Rating	Responsibility	Timing Requirements
					A functioning spill kit would be kept at all construction sites and site offices at all times to enable immediate clean-up of any chemical/fuel spills.				
					Incident response and management including emergency procedures for dealing with chemical / fuel spills will be undertaken in accordance with the Environmental Incident Response Plan in Appendix J of the CEMP.				
Surface Water Quality	 Increased suspended sediment loads downstream of construction site Pollution of waterways by fuel or chemicals and wastewater 				Erosion and sediment control measures will be consistent with those specified in Managing Urban Storm Water: soils and construction vol. 1 (the Blue Book). Appendix I of the EMP details the erosion and sediment control measures that will be implemented for the project.			Environmental Representative	Construction
	 Loss of water quality during wet weather overflows 				No refuelling, fuel decanting or vehicle maintenance work would take place within proximity of waterways			Project Manager / Project Supervisor	
					Refuelling to take place in designated areas in bunded and hardstand areas				
		3	4	12	A functioning spill kit would be kept at all construction sites and site offices at all times to enable immediate clean-up of chemical/fuel spills.	2	4		
					Incident response and management including emergency procedures for dealing with chemical / fuel spills will be undertaken in accordance with the Incident Management Plan in Appendix J of the EMP.				
					No work would occur during wet weather.				
					The clearing of vegetation is to be minimised where possible during the detailed design and construction planning phases. Proposed creek crossing technology and final designs would be consistent with Guidelines for laying pipes and cables in watercourses on waterfront land (DP&I, 2012)			Design Support	Design
Groundwater	 Impacts on water-tables Impacts on Groundwater quality 	3	2	6	Should groundwater be encountered during construction activities, the management measures as detailed in Appendix I of the EMP 'Erosion and Sediment Control Procedure' will be implemented to minimise the risk of polluting surface water.	2	6	Design support / Environmental Representative	Design
					If dewatering is required where groundwater is intercepted, the discharge volume will be				Construction



Aspect category	Potential Impact	Consequence	Likelihood	Risk Rating	Mitigation Measures	Mitigated Likelihood	Residual Risk Rating	Responsibility	Timing Requirements
					monitored and recorded to evaluate compliance with the allowable threshold.				
					Following completion, sites will be backfilled and water tables will return to pre-construction levels.				
Flooding	 Localised flooding may occur in certain locations due to heavy wet weather events This flooding could result in soil erosion and sedimentation at construction sites 				In the event of flooding, remedial action would occur in accordance with emergency response procedures as detailed in the Environmental Incident Response Plan in Appendix J of the CEMP.			Project Manager / Project Supervisor	Construction
			2		Where significant rainfall is predicted, site works should be reassessed and potentially postponed.	2	4		
		4	2	8	Personnel should not be allowed within the creek channel during periods of predicted high rainfall.	2			
					Sediment controls are to be installed to manage sediment and erosion issues as specified in Appendix I of the CEMP 'Erosion and Sediment Control'.			Environmental Representative / Project Manager	Design
Site Personnel	Site personnel operating not in accordance with CEMP	4	3	12	All staff working on the project will be made aware of the ecological sensitivity of the bushland and other environmental aspects by educating staff at the induction phase.	1	4	Project Manager	Construction
Site Planning	Non approved impacts to native flora				Site impacts are limited to clearly defined boundaries.			Project Manager	Construction
	Impacts to native fauna				Locate temporary infrastructure (plant sites and			Design Support	Design
					offices etc.) In cleared areas away from vegetation.			Project Manager	Construction
		4	3	12	All hollow bearing trees tagged prior to construction occurring.	1	4	Environmental Representative	Pre Construction
					Accurately and clearly mark out the limits of clearing and trees/ vegetation to be retained including threatened ecological communities, hollow-bearing trees, and riparian vegetation.			Project Manager Project Supervisor Environmental Representative	Design & Construction
					Regular inspections should be undertaken to clearly mark all retained vegetation/fauna habitat.				Construction
Pre Clearing Fauna Survey	Impacts to native fauna	4	3	12	All hollow bearing trees are identified prior to construction works and are to be avoided.	1	4	Environmental Representative	Pre construction
Riparian Areas	Non approved impacts to riparian areas	4	3	12	Minimise the area of disturbance in riparian zones, clearly mark out work zones in riparian areas and protect areas with para-web fencing or similar.	1	4	Project Manager Project Supervisor Environmental	Construction
					All works within close proximity to riparian zones to have adequate sediment and erosion control as			Representative	



Aspect category	Potential Impact	Consequence	Likelihood	Risk Rating	Mitigation Measures	Mitigated Likelihood	Residual Risk Rating	Responsibility	Timing Requirements
					specified in Appendix I of the CEMP ' Erosion and Sediment Control'.				
					Ongoing audits of site works.			Environmental Auditor	
Management of Fauna Habitat	Non approved impacts to fauna habitat	4	4	16	An ecologist should be present during the clearing of habitat trees to handle and relocate any injured fauna. WIRES should be consulted if any injured fauna are encountered.	1	4	Ecologist Environmental Representative Project Supervisor	Construction
Clearing of Native vegetation	Non approved Impacts to native vegetation				Where trees require felling, retain the timber as Coarse Woody Debris for enhancement of degraded habitats (where appropriate).			Project Manager	Construction
		3	3	9	Avoid the removal of trees with hollows (alive or dead) where practicable. Where removal cannot be avoided for OH&S reasons, maintain the tree intact (as far as possible) and place it on the ground in adjoining vegetation.	1	3		
					Where applicable logs and hollows to be relocated to limit habitat destruction.				
Noxious weed management	Spread of Noxious Weeds			9	Establish a noxious weed management protocol that introduces an identification card for contractors (Refer to Appendix H of the CEMP – Weed Management Plan).			Environmental Representative	Construction
			3		Weed removal is to be carried out prior to works commencing.			Project Manager Project Supervisor	
					All noxious weeds that are cleared as part of the project must be disposed of appropriately.				
		3			Implement inspection/maintenance procedures to reduce the carriage of weed material on machinery.	2			
		3			Rehabilitation should be undertaken in consultation with landowners, to determine any future development plans and identify areas where rehabilitation of native vegetation would be appropriate.	L			
					Rehabilitation should be part of any pre-planning works as there is considerable lead-up time (up to 6 months for growing native plants).				
					Other less critical areas disturbed by construction should be direct seeded or hand seeded with native grasses as part of the rehabilitation process.				



Aspect category	Potential Impact	Consequence	Likelihood	Risk Rating	Mitigation Measures	Mitigated Likelihood	Residual Risk Rating	Responsibility	Timing Requirements
Management of threatened plant species	Impacts to threatened plant species		2	10	Any threatened plant species are to be flagged on the site, then accurately surveyed and marked on plans to inform the detailed design.			Project Manager Project Supervisor	Construction
		5			 Wherever possible, clearing of native vegetation will be avoided. Stockpiles, storage and depot sites will be sited appropriately to avoid areas of native vegetation 	1	5		
					If substantial disturbance to the critical root zone of any larger trees is required, advice will be sought from a qualified arborist particularly where trees may pose a safety hazard.				
Aboriginal heritage	Disturbance to Aboriginal cultural heritage objects				Works which come into contact with Aboriginal artefacts or site significant areas will be stopped until an AHIP is acquired.			Project Manager Project Supervisor	Construction
		3	1	3	If any human skeletal remains are discovered, cease work immediately and notify the NSW Police. For historic remains (>100 years) notification is required to the DoP Heritage Branch and OEH Aboriginal heritage division. These authorities would direct the appropriate response.	1	3	Project Manager	
Non Aboriginal heritage	Disturbance to a heritage item	3	1	3	All proposal components would be located to avoid known heritage sites.			Project Manager Environmental Representative	Construction
					If any human skeletal remains are discovered, cease work immediately and notify the NSW Police. For historic remains (>100 years) notification is required to the DoP Heritage Branch and OEH Aboriginal heritage division. These authorities would direct the appropriate response.				
					If an item (or suspected item) of non-Aboriginal heritage is discovered during the work, all work in that area would cease and the Contractor's Environmental Representative would inform Department of Education's Project Manager as soon as possible to determine the subsequent course of action.	1	3		
					Section 146 of the Heritage Act requires any person who believes they have discovered or located a relic (in any circumstances) to notify the Heritage Council. The S139 Exception & S146 Notification of a 'Relic' Form (S139- S146Frm2013.pdf, 45kB) should be used for all notifications to the Heritage Council regarding the discovery of relics.				



Aspect category	Poter	ntial Impact	Consequence	Likelihood	Risk Rating	Mitigation Measures	Mitigated Likelihood	Residual Risk Rating	Responsibility	Timing Requirements
Construction air quality	•	Dust generated by vehicles travelling along unsealed roads				Visual monitoring of dust generation would occur and dust suppression measures such as water spraying would be used, especially if windy.			Project Manager / Project Supervisor	Construction
	 Exclused increases in dust generated during excavation works Dust from exposed spoil stockpiles Emissions from machinery, equipment and vehicles used during construction 	generated during excavation works Dust from exposed spoil				Manage spoil stockpiles to minimise the generation of dust. This would include minimising the time spoil is left uncovered and spraying stockpiles to minimise dust.				
		3	4	12	All construction plant and machinery would be properly maintained and fitted with emission control devices complying with the Australian Design Standards.	2	6			
						All emission controls used on vehicles and construction equipment would comply with relevant NSW OEH standards as provided under Section 124 of the PoEO Act.				
					-	Vehicle use on unsealed surfaces would be avoided where possible.				
Construction noise and vibration	 Disturbance from increase vehicle and machinery movements Noise from excavation activities Noise associated with generator and compressor operation Noise from alarms on machinery, such as vehicle reverse alarms 				All construction must comply with both noise and vibration standards and guidelines including the Interim Construction Noise Guideline (DECCW, 2009), including construction force inductions with specific noise mitigation measures required for the site.			Environmental Representative	Construction	
					Construction would occur during standard construction hours: 7am – 6pm Monday to Friday and 8am – 1pm Saturday. No work on Sundays and public holidays.			Project Supervisor		
			3	3	9	Potential vibration impacts would be limited to the construction period.	2	6		
						Quieter and lower vibration emitting construction methods would be used where practicable.				
					Local residents would be informed of construction activities via a letterbox drop two weeks prior to the commencement of construction.			Project Supervisor		
						Vibration levels not to exceed those recommended in the standard, DIN 4150-3 1999: Structural Vibration – Part 3; Effects of vibration on structures. Construction activities would be conducted in accordance with the limits of German Standard DIN 4150-3 1999: Structural Vibration – Part 3; Effects of vibration on structures.			Environmental Representative	

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Aspect category	Potential Impact	Consequence	Likelihood	Risk Rating	Mitigation Measures	Mitigated Likelihood	Residual Risk Rating	Responsibility	Timing Requirements
Waste Management	Incorrect disposal of construction wastes resulting in contaminated land or water				Waste will be managed in accordance with the Waste Management Procedure in Appendix F of the CEMP			Environmental Representative	Construction
					Waste management will occur according to the hierarchy of avoidance, reuse, recycle, and finally disposal.			Project Manager Project Supervisor	
					Waste unable to be reused or recycled will be classified and disposed in accordance with EPA 2014 Waste Classification Guidelines.				
					Worksites would be kept in a clean and tidy condition at all times.				
					Waste refuse bins would be provided on site.				
		4	4	16	Portable toilets would be provided on site with waste removed by an appropriately licensed contractor.	2	8		
					Contaminated waste would be separated from non-contaminated waste and removed to a licensed waste facility.				
					Risk assessments would be undertaken by the Contractor prior to construction to identify and manage environmental and safety risks for all works. These would be reviewed and revised (as required) during the construction phase to ensure they remain relevant.				Pre Construction and Construction
					Bunds for any chemical storage would be provided at not less than 110% of the chemical storage tank sizes as per Australian Standards.				Construction
					Material Safety Data Sheets would be available on site.				



Aspect category	Potential Impact	Consequence	Likelihood	Risk Rating	Mitigation Measures	Mitigated Likelihood	Residual Risk Rating	Responsibility	Timing Requirements
Soils	 Removal of topsoil will increase the potential for sediment 				Use sediment fencing as required to ensure surface erosion is managed.			Project Manager Project Supervisor	Construction
	erosionStockpiling activities on site				Use sediment fencing as required to ensure stockpiles on site are managed.				
					Ensure stockpiled soil material is not left near or within the creek line.				
					Battering of stockpiled material at 1:2 to reduce erosion.				
		4	4	16	Manage potential asbestos containing material under the existing asbestos management plan for the site. An exclusion zone is to be constructed, with warning signs and tape. The material is to wet the area down with a fine mist and secure with geofabric. Ref: <i>WSP Pty Ltd Asbestos</i> <i>Management Plan Warwick Farm Public School</i> <i>March 2019.</i>	2	8		
					Remove temporary works after they are no longer required to ensure area is left as it was found.				
Construction traffic	Increased traffic in residential areas Beduced safety for pedestrians				Construction traffic will be management in accordance with the Traffic Management Plan (TMP) in Appendix G of the CEMP.			Environmental Representative	Construction
	 Reduced safety for pedestrians and cyclists in residential areas Increased noise associated with increased traffic 	5	4	20	Heavy vehicle movements would be kept to a minimum (or eliminated) during school zone hours and morning peak hours to maximise safety and reduce congestion.	2	10	Project Supervisor	
					No unnecessary idling of vehicles.				
Energy usage and Green House Gases (GHG) emissions during construction	Increased GHG emissions from construction				• Energy use will be minimised by minimising excavation volumes, recycling top soil and turf to reduce transport, disposal and resource use, and ensuring plant and equipment is well maintained and turned off when not in operation.			Project Manager / Project Supervisor	Construction
		2	5	10	 No burning of vegetation or other materials will be permitted on site. 	2	4		
					 Energy efficient plant and equipment will be utilised to perform works. 				
					All construction vehicles would be maintained, and emission reduction devices kept in good working order.				



Aspect category	Potential Impact	Consequence	Likelihood	Risk Rating	Mitigation Measures	Mitigated Likelihood	Residual Risk Rating	Responsibility	Timing Requirements
					Vehicles and equipment would be operated in a manner that reduces energy and fuel consumption wherever possible				
Bushfire during construction works	fire during truction (s) - Damage to equipment and machinery - Loss of public and private property - Human injury or death. 5			Check weather forecasts if hot work is expected so that proposed construction activities do not pose bushfire threats. In particular, hot work is not to be done on total fire ban days without having Rural Fire Service (RFS) approval.			Project Manager / Project Supervisor	Construction	
		5	3	15	Suitable fire suppression equipment (extinguisher, pumps, hoses etc) to be available on site for the duration of site work.	2	10		
					Fuels and other flammable materials to be stored and maintained appropriately.				
					Provide adequate site supervision when undertaking activities that have the potential to cause fires.				




Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix E: Soil and Water Management Plan

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1. PURPOSE

To address the requirements of the Development Consent in reference to a Construction Soil and Water Management Plan for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the Project. The following aspects will be covered to determine the environmental risk for each.

- Soils;
- Surface water;
- Groundwater; and
- Contamination associated with the above media.

3. PROCEDURE

This Soil and Water Management Plan details how Hutchinson Builders will undertake works associated with the Project in accordance with the following environmental regulations:

- Contaminated Land Management Act 1997; and
- Water Management Act 2000.

4. SOILS

4.1 Background

The site is located within the South Creek alluvial soil landscape, comprising the present active floodplain of many drainage networks of the Cumberland Plain. This includes the South Creek, Eastern Creek, Ricarbys Creek and Prospect Creek Systems. The landscape is characterised by floodplains, valley flats and drainage depression of the channels. Soils are often very deep layered sediments over bedrock or relict soils.

Site observations from the EIS 2018 Stage 2 Environmental Site Investigation (ESI)ref: *E29918kPrpt2 rev1 EIS 2017* identified fill material generally extending 0.3-0.4m below ground level (mbgl). Deeper fill was identified through the centre of the site, extending >1.9mbgl at one location. The fill material comprised of silty clay or clayey silt with inclusions of ash and construction waste such as fibre cement fragments, glass and ceramic tiles.

Natural soils identified, comprised of alluvial silty clay and clayey silt, extending below the investigation levels, generally >0.8mbgl.

The site was observed to be generally flat, covered in grass with trees scattered across the site. Evidence of erosion and cracking was not noted.

4.2 Potential Impacts and Contamination

A preliminary site investigation conducted by EIS in 2017 ref: *EIS 2017 E29918kPrrp2 rev 1_Stage 2 Environmental Site Investigation* did not identify any significant off-site sources of contamination. Potential unverified fill material imported to site for levelling purposes was identified as an on-site

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source of contamination, potential asbestos containing material (ACM) was noted on the surface of the western portion of site. Hazardous materials from demolition of the former buildings was also identified as an on-site source of contamination.

The Stage 2 ESI (2017) identified asbestos and lead in levels above the adopted health criteria for the site use as a school. An additional surface soil assessment was conducted by EIS in 2018 ref: *E29918kPrpt3 EIS* 2018 to further characterise the lead contamination identified in the Stage 2 ESI (2017). The maximum result of lead analysed in soils was 3,600mg/kg. Asbestos was identified in soils as both bonded and asbestos fines/fibrous asbestos (AF/FA) the maximum concentrations of asbestos identified 0.16%w/w (bonded) and 0.0152%w/w (AF/FA).

A preliminary waste classification was provided by the Stage 2 ESI of "General Solid Waste (Non-Putrescible) Containing Asbestos (Special Waste)" and Restricted Solid Waste (Non-Putrescible) Containing Asbestos (Special Waste)". An additional waste classification was provided in the site Remediating Action Plan Addendum prepared by EIS in 2019 confirming the classification as "General Solid Waste (Non-Putrescible) Containing Asbestos (Special Wastes)". Report ref:E29918KPrpt-RAPADD EIS 2019.

4.2.1 Prevailing Wind Conditions

Local prevailing wind conditions depend on regional winds impacting the site as well as local site setting and built environment (building-wind interaction). Based on the information provided in Environmental Winds – Qualitative Study undertaken by SLR (2017) the local prevailing conditions impacting the site can be summarised as follows:

- Regional wind patterns include the following:
- Summer winds: In summer winds mainly occur from northeast, southeast, and south. According to SLR (2017) Southeast and southerly winds generally provide the strongest gusts during summer.
- Winter and Early Spring winds: In these seasons, winds occur mainly from the west-northwest and the south. West quadrant winds provide the strongest winds during winter.
- Site specific influences include the following:
- > One storey residences generating a typical suburban type exposure, providing moderate sheltering of oncoming winds at ground level.
- To the north and clockwise around to the south, the dense vegetation of Cabramatta Creek will create a slightly more pronounced suburban type exposure with increased shielding for low level winds provided by the continuous line of trees along the creek.

4.2.2 Construction

During the construction phase of the works the following potential impacts have been identified for soil:

- Contaminated soils on-site;
- Spills from machinery on site including oils and fuels; and
- Sediment mobilisation during rain events.



4.3 Mitigation Measures

The following mitigation measures would be implemented to avoid, minimise or manage potential impacts to soils, topography and geology:

- Prior to commencement of construction, construction personnel will be inducted on the requirements of the SWMP and ESMP for the proposal, and the erosion and sediment control measures to be implemented in order to minimise the potential for sedimentation to the creek and downstream receiving environment.
- The Environmental Representative to undertake regular inspections of the works and prepare specific Erosion and Sediment Control Plans to suit each area of works.
- Weekly inspections to ensure Erosion and Sediment Controls are in place as per the Environmental Checklist in Appendix B of the CEMP.
- Soil containing contaminants will be classified in accordance with the EPA Waste Classification Guidelines and removed from site by a qualified contractor and disposed to an appropriately licensed waste management facility.
- Prior to commencement of construction, construction personnel will be briefed on the procedures to be implemented in the event that unexpected contaminated material is encountered or suspected.
- If suspected contaminated areas are found during construction, work in the immediate vicinity will cease and the area cordoned off as if it were a safety risk.
- All excavated material will be stockpiled and surrounded by a silt fence or bund in accordance with the Erosion and Sediment Control plan and may require re-vegetation with approved grass species if stockpiled for greater than 28 days, until its reuse in backfilling or removal from site.
- Excess excavated material that cannot be used in backfilling will be placed within appropriate receptacles for off-site treatment and/or disposal at an appropriately licensed facility, following Waste Classification.
- Excess excavated material that cannot be used in backfilling will be classified in accordance with the Waste Classification Guidelines (EPA, 2014) prior to any offsite disposal at a suitably licensed waste facility.
- Tracking of soils/sediments from work sites to roadways, footpaths and drainage lines as a result of work vehicle/machinery movement should be minimised.
- Disturbance to ground surfaces and the area of exposed surfaces will be minimised. Disturbed areas will be stabilised as soon as possible and in a progressive manner as works are completed.
- Earthworks will not take place during or after heavy rain when doing so is likely to cause soil erosion or soil structural damage.
- In the event of rain developing during works execution, work site/s will be made secure against soil erosion. This will be undertaken in accordance with the Blue Book.
- Permanent or temporary drainage works will be installed early in the construction program to minimise uncontrolled drainage and associated erosion. 'Clean' surface runoff will be diverted around and away from working areas to prevent erosion and remaining will would be diverted away from work areas and into sediment control devices.
- Sediment control devices such as geofabrics, sediment fences, and bunding will be used to prevent release of sediment-laden run off from the construction site.
- Any surface runoff will be diverted away from areas of soil disturbance.

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- Erosion and sedimentation controls will be installed and maintained prior to construction works commencing, in accordance with the Blue Book, and kept in place throughout construction and beyond completion until all surfaces have been fully restored and stabilised.
- All sediment and erosion control devices will be inspected daily (including immediately after rainfall) and will be maintained and repaired as necessary so that they remain effective for the works duration.
- Any sediment that accumulates behind sediment control devices will be cleaned out after every rainfall event and/or when the capacity of the devices is reduced.
- All stockpiles of excavated material will be managed to prevent dust, erosion and sediment runoff.
- Stockpiles will be located on flat ground, outside of the drip line of vegetation, away from drainage lines, and will be contained within sediment control fencing and covered or watered down regularly to prevent wind erosion.
- Stockpiles will be located and monitored to reduce the risk of sediment laden run-off and dust emissions. Stockpiles will be covered if necessary and sedimentation fences installed on the down-slope side.
- Equipment, plant and materials will be situated in designated lay-down areas with bunding where they are least likely to cause erosion. They will not be located within the drip line of trees.
- Spoil will be transported to and from the site via covered trucks. A single designated vehicle path will be utilised to enable the appropriate management of spoil transport.
- Facilities will be installed at entry and exit points to the work site to minimise mud being tracked off site. Any mud that is tracked onto roads will be swept up immediately and as necessary.
- The tyres of work vehicles and machinery will be checked and cleaned as necessary before entering and/or leaving the site to ensure that contaminated soils, weeds or other erodible materials are not transferred into or from the work site.
- Crushed sandstone material will likely be used to construct the permanent access track, to soften the impact of the track on the surrounding environment.
- Access tracks will be monitored and managed for erosion risks during operation of the proposal.

4.4 Erosion and Sediment Management

The Erosion and Sediment Management Plan may be reviewed in full in Appendix I of this CEMP, Table 1 below presents the erosion and sediment management for the site.

Table 1: Erosion and Sediment Control Plan		
Actions	Responsible	Timing
Diversion of uncontaminated runoff around site works as practicable.	Construction Project Manager	Beginning
Work site area perimeter sediment fence is to be constructed prior to the commencement of works.	Construction Project Manager	Beginning
Install temporary sediment trap(s) (e.g. gravel sausages / sand bags) around street stormwater gutters.	Construction	
Existing stormwater entry points in the vicinity of the excavation shall be protected from ingress of materials which may be placed or stockpiled in the vicinity of the excavation.	Project Manager	Throughout



Table 1: Erosion and Sediment Control Plan		
Stockpiles are to be placed in designated areas which can be appropriately bunded using sediment fences, gravel sausages/ sand bags or straw bales on at least the down-slope side.	Construction Project Manager Site workers	Throughout
Stockpiles intended to remain for extended periods, or during inclement weather are to be covered with suitable covering material and anchored with bricks or similar to prevent exposure of the material.	Construction Project Manager	Throughout
Dust control measures such as wetting of stockpiles and/or covering of stockpiles to be used where required. If water spraying is required for site dust suppression, care will be taken to control the quantities of water sprayed so that run-off is not generated.	Construction Project Manager	Throughout
Any soil or mud spilled onto road surfaces or public areas from construction activities should be promptly cleaned.	Construction Project Manager Site workers Haulage	Throughout
Performance Indicators	Responsible	Timing
No evidence of soil mobilising off site into stormwater drains or nearby water bodies.	Construction Project Manager	Throughout
No visible evidence of stockpile erosion, particularly following rainfall events.	Construction Project Manager	Throughout
No visible evidence of soil mobilising off site through onto public roadways / paths.	Construction Project Manager	Throughout
Limited issues identified during the works program	Construction Project Manager	Throughout

4.5 Conclusions and Ongoing Operation

Construction impacts to soils are short-term and considered minor following the implementation of appropriate site-specific controls for the duration of the construction activities. Furthermore, although erosion and sedimentation risks are present across the area, these risks would be reduced through implementation of erosion and sedimentation mitigation measures.

Some maintenance works may involve temporary disturbance of soils and associated erosion risks. Maintenance activities are anticipated to be infrequent and such works would be subject to further environmental assessment and would be carried out in accordance with an approved Environmental Management Plan (EMP), if required.

5. SURFACE AND GROUNDWATER

5.1 Background

The Brickmakers Creek is located on the eastern boundary of the site. The Stage 2 ESI (2017) considered the creek to be likely to intercept overland flows (run-off) and stormwater collected via the on-site drainage network.

A review of Water NSW Bores did not identify any registered bores within 1km of the site, indicating that groundwater is currently not utilised as a resource (EIS Stage 2 ESI 2017). A Preliminary Groundwater Assessment was included in the Stage 2 ESI (2017) indicated that the standing water level of the site was between 2.88->4.2mbgl.

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5.2 Potential Impacts

Potential impacts to surface water and groundwater quality include:

- Sediment produced during construction;
- Sedimentation of downstream systems;
- Hazardous products such as fuels, lubricants, grease and other chemicals required for construction can be released into the water;
- Shallow groundwater may be intercepted and require management due to water being saline, acidic and/ or polluted; and
- Dewatering excavations and environmental implications.

5.3 Mitigation Measures

There is the potential for some mobilisation of sediments into the creek during construction. However, it is anticipated that impacts would be minor, short term and localised as flows from the creek would dilute and disperse sediment.

Potentially hazardous products such as fuels, lubricants, grease and other chemicals required for construction would be contained within appropriately bunded areas within construction compounds and in small volumes. Refuelling activities would be restricted to bunded areas within construction compounds. As such, the risk of surface water (and groundwater) contamination during the construction phase from spills is anticipated to be low.

Groundwater encountered during excavation would be tested to determine whether it is of an acceptable water quality (i.e. within set water quality limits) to be released back into the creek. If the water quality of groundwater is found to exceed the criteria, the Delivery Contractor would dispose of the water via transfer to an appropriately licensed offsite facility. Considering the depth of excavation does not exceed 0.9mgl and the encountered depth to groundwater is > 2.88mbgl, groundwater is not anticipated to be encountered during the project.

5.4 Off-Site Flows

The Hutchinson Builders Environmental Management Plan ref: *Hutchinson Builders (2019) Environmental Management Plan: Mainsbridge Public School* has identified testing requirements for water prior to dewatering in accordance with discharge approval. Dependant on the location of the retained water, discharge may be directed to the adjacent Brickmakers Creek or the stormwater drain on Williamson Crescent. A detention basin has not been considered necessary for the proposed works.

5.4.1 De-Watering Criteria

In the event that off-site discharge is required the Hutchinson Environmental policy has prescribed a Minimum Analysis Suite for the discharge of water from site:

- Total Recoverable Hydrocarbons (C₆-C₄₀) (TRH);
- Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene (BTEXN);
- Poly-aromatic Hydrocarbons (PAH);
- pH;
- Total Suspended Solids (TSS); and
- Turbidity.

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Discharge criteria has been derived from the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000). Criteria is based on a moderately disturbed ecosystem (95% Trigger Values) as the Brickmakers Creek in multiple sections has been re-surface with concrete to form a canal. Applicable criteria are presented in Table 2.

Table 2: Discharge Water Criteria		
Analyte	Criteria (mg/L)	
Benzene	950	
Ethylbenzene	Not Applicable	
Toluene	Not Applicable	
Xylenes	550	
Naphthalene	16	
рН	6.5-8.5	
TSS	50	

5.5 Wet Weather Mitigation and Management

During wet-weather, the mitigation and management measures presented in Table 3 are to be implemented. A full review of wet-weather and flood response and management is provided in Appendix N of this CEMP.

Table 3: Wet-Weather Mitigation and Management			
Mitigation/Measure	Implementation Stage	Responsibility	Site Use Phase
Temporary works such as hardstand areas and access tracks are to be designed and constructed to withstand flooding.	Project manager Site Manager	Project Manager Site Manager	Construction
Minimising the extent of obstructions within the flood prone areas as far as practicable at all times during construction.	Project manager Site Manager	Project Manager Site Manager	Construction Operation
Removing construction infrastructure and equipment from the flood prone areas in the event of a wet-weather event to minimise both the risk of damage to infrastructure /equipment and the risk of flood impacts on properties.	Project manager Site Manager	Project Manager Site Manager	Construction Operation
Secure objects that are likely to float and cause damage.	Construction	Project Manager	Construction Operation



Table 3: Wet-Weather Mitigation and Management			
Mitigation/Measure	Implementation Stage	Responsibility	Site Use Phase
Ensure construction equipment (or excess material) are removed from the low areas especially around creek areas and secured.	Construction	Site Manager	Construction Operation
Relocate waste containers, chemicals and dangerous goods above the potential flood line and secured.	Construction	Site Manager	Construction Operation
Locate plant and equipment on high ground when high rainfall/flooding is expected.	Per event	Site Manager Site personnel	Construction
Amenities wastewater is transported off-site by a licenced operator to a licenced disposable facility (if applicable).	Construction	Project Manager	Construction
Where minor flooding occurs in the works area, set-up temporary diversion or pumping of low flows around the works area.	Per event	Site Manager	Construction

5.6 Stormwater and Flood Management

1 in 1-year ARI and 1 in 5-year ARI flood events and are to be managed under Section 4.4 and 5.5 of this Soil and Water Management Plan. Flood levels for a 1 in 100-ARI event are considered to be between 0.5-1m, in this instance the following additional measures are to be taken. Refer to the *Cabramatta Creek Flood Study and Basin Review Strategy: Bewsher 2011.*

Table 4: 1in 100-ARI Flood Management and Response			
Mitigation/Measure	Implementation Stage	Responsibility	Site Use Phase
Turn off electricity, secure generators and secure gas cylinders when flooding is expected.	Per event	Project Manager Site Manager	Construction Operation
Notification			
Declare the flood potential to the site staff and workers	When SES and BOM website identify flood warning for the area	Project Manager HSE Advisor	Construction Operation
Declaring the site closed.	When SES declare an imminent flood	Project Manager	Construction Operation



Table 4: 1in 100-ARI Flood Management and Response			
Mitigation/Measure	Implementation Stage	Responsibility	Site Use Phase
Declaring the site reopened.	When SES have given the all clear	Project Manager	Construction Operation
Evacuation			
The emergency exit route to be taken before flood waters rise is to exit to the compound on Williamson Crescent. Site sheds will be utilised as a refuge point for high flood waters.	Before flooding of area	All personnel	Construction
No attempt should be made to enter or cross any flood waters that is above a minor flood level, or where the flood inundation level is not known	During flood event	All personnel	Construction Operation

6. CONSULTATION WITH COUNCIL

Council were provided the initial version of this Soil and Water Management Plan on the 13th June 2019. Response was not provided prior to revision of this plan on the 26th June 2019. Refer to Attachment A for evidence of consultation with council.

7. CONCLUSIONS

Provided that the recommended management and mitigation measures are applied during construction and appropriate erosion and sediment control plans are implemented, it would be unlikely that the proposal would be a source of water pollution. Therefore, water quality impacts to the Brickmakers Creek and the downstream Georges River environment are expected to be minor.





Soil and Water Management Plan Hutchinson Builders

Mainsbridge School

Attachment A: Consultation with Council

Phil Ho

From:	Phil Ho
Sent:	Thursday, 13 June 2019 10:55 AM
То:	'lcc@liverpool.nsw.gov.au'
Subject:	25940_95 Lawrence Hargrave Road Warwick Farm_SSD 8792_Condition B20(b)
Attachments:	Condition B23_Construction Soil and Management Plan.pdf

Hi There

In regards to SSD8792 for 95 Lawrence Hargrave Road Warwick Farm, as per Condition B23, please find attached Construction Soil and Water Management Plan for your comment.

Should you have any questions, please do no hesitate to contact me.

Regards,

Phil Ho Project Manager

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Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix F: Construction Waste Management Plan

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1. PURPOSE

To address the requirements of the Development Consent in reference to a Construction Waste Management Plan for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the Project.

3. PROCEDURE

This Waste and Resource Management Procedure details how Hutchinson Builders will undertake works associated with the project in accordance with the waste management hierarchy.

3.1 Waste Types and Quantities

The waste types and quantities expected to be generated as a result of the construction of the project are detailed in **Appendix A** of this procedure. Proposed treatment methods for each waste type have also been indicated.

3.2 Waste and Resource Recovery Measures

The following measures will be implemented where possible to minimise waste generation and maximise resource recovery:

- Waste refuse bins would be provided on site and will be clearly marked with signage to assist waste segregation. This may include: concrete and cement, paving materials, timber, steel, glass, plastic, paper products, etc.
- Ensure suppliers pick up packaging for recycling or reuse, e.g. pallets.
- Encourage suppliers to use sustainable/ recyclable packaging, e.g. metal strapping instead of shrink wrap, paper packaging as opposed to plastic, shredded paper as opposed to foam.
- Testing of excavated material for contamination before disposal.
- Ensure clear segregation of clean material or fill from contaminated fill or materials.
- Ensure no green fill waste, tyres, steel, petroleum products or containers are sent to landfill, but recycled by supplier, recovery centres or councils.
- Use waste contractors that differentiate recycled and landfilled waste in their invoicing and provide volumes and weight for accurate waste reporting.
- Appointing person(s) to monitor waste management, segregation and supervise subcontractors.
- Ensure waste minimisation strategies and reporting requirements are incorporated into subcontractor contracts.
- Waste unable to be reused or recycled would be classified and disposed of in accordance with EPA Waste Classification Guidelines 2014.
- Disposing all waste that cannot be recycled at an appropriate EPA licensed or Council approved waste facility.
- Worksites would be kept in a clean and tidy condition at all times.
- Portable toilets would be provided on site with waste removed by an appropriately licensed contractor.

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- Contaminated waste would be separated from non-contaminated waste and removed to a licensed waste disposal depot.
- Bunds for any chemical storage would be provided at not less than 110% of the chemical storage tank sizes as per Australian Standards.
- Material Safety Data Sheets would be available on site.
- Risk assessments would be undertaken by the Contractor prior to construction to identify and manage environmental and safety risks for all works. These would be reviewed and revised (as required) during the construction phase to ensure they remain relevant.
- Use recycled products or a suitable substitute where they exist (i.e. recycled concrete, crusher dust for pipe bedding, and fly ash as a substitute for sand in concrete).

3.3 Hazardous and Special Waste Management

An existing Asbestos Management Plan (AMP) has been completed for the proposed works at the site ref: *WSP PS113561 Warwick Farm PS AMP RevB March 2019*, refer to Attachment A for a copy for the AMP. The AMP provides the following Asbestos removal/disturbance procedures (pg 8)

- All asbestos disturbance works to be supervised or carried out by licensed Class A (friable and nonfriable) SafeWork NSW Licensed Contractor;
- Notify SafeWork NSW and prepare a site-specific ARCP prior to any asbestos removal works being completed;
- Works area to be isolated with appropriate barricade fencing (e.g. fence panels) and signage;
- Un-authorised personnel are not permitted to enter the isolated work area;
- Air monitoring to be carried out for the duration of the works involving the disturbance of asbestos;
- Licensed Asbestos Assessor to monitor asbestos related works during removal/disturbance to ensure compliance with the AMP (if engaged for fulltime site supervision);
- Decontamination unit (friable 5 stage unit) or decontamination area (non-friable only) to be installed;
- Appropriate personal protective equipment (PPE) to be worn by all personnel entering work area as described in Section 5.3 of the AMP;
- Light water spray to be used as required to repress possible generation of airborne fibres/dust;
- Impacted stockpiles to be covered in accordance with Section 5.5 of the AMP;
- All tools, plant and equipment used in the removal area will be decontaminated follow use in the asbestos areas;
- Removal of soils/rubble by trucks are to be conducted in accordance with Sections 5.2 and 5.6 of the AMP;
- Contaminated soil to be disposed of at licensed asbestos waste facility in accordance with Section 5.2 of the AMP; and
- Truck wheels to be cleaned prior to leaving site.
- All work shall be carried out in accordance with:
 - the SafeWork Australia document How to Safely Remove Asbestos: Code of Practice 2016 made under section 274 of the Work Health and Safety Act 2017. Handling and disposal of asbestos waste;
 - Protection of the Environment Operations (POEO) Act;
 - > POEO Waste Regulation; and
 - NSW EPA Waste Classification Guidelines (NSW EPA, 2014).





The type and quantity of resources and/or waste procured, recycled, reused, avoided and generated on site or offsite as part of the project will be reported as part of quarterly environmental performance reporting.



Appendix A: Waste Types and Expected Quantities			
Waste Types	Classification	Quantities/ Volumes	Proposed Reuse / Recycling / Disposal Method
Demolition/Site Clearing			
Vegetation (logs, mulched timber, weeds)	General Solid (non-putrescible)	Unknown	Native Vegetation – Reuse as Biodiversity measures such as Course Woody Debris (CWD) or as mulch onsite Weeds – Offsite disposal at a licensed facility
Concrete, asphalt and gravel	General Solid (non-putrescible)	Unknown	Offsite recycling
Scrap metal	General Solid (non-putrescible)	Unknown	Offsite recycling
Excavation			
VENM (Virgin Excavated Natural Material)	General Solid (non-putrescible)	Unknown	Beneficial reuse on-site. Balance cut and fill earthworks, where possible, to optimise reuse on the project
Excavated natural material (ENM) that complies with the ENM exemption	General Solid (non-putrescible) during transit and ENM when land applied	Unknown	Beneficial reuse on-site. Balance cut and fill earthworks, where possible, to optimise reuse on the project
Potentially Contaminated Soils	Classification based on soil tests carried out pre-construction and in accordance with the EPA 2014 - Waste Classification Guidelines.	~2,065m ³	Offsite disposal at a licensed facility
Building / Construction Waste			
Steel reinforcing	General Solid (non-putrescible)	Unknown	Offsite recycling
Conduits and pipes	General Solid (non-putrescible)	Unknown	Offsite recycling

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June 2019





Appendix A: Waste Types and Expected Quantities			
Waste Types	Classification	Quantities/ Volumes	Proposed Reuse / Recycling / Disposal Method
Concrete (solids and washouts) and asphalt	General Solid (non-putrescible)	Unknown	Crushed and used as backfill or as road base
Timber formwork	General Solid (non-putrescible)	Unknown	Reuse onsite where possible or off site recycling
Packaging materials, including wood, plastic, cardboard and metals	General Solid (non-putrescible)	Unknown	Off-site recycling
Empty oil and other drums	Hazardous Waste if the containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) from which residues have not been removed by washing or vacuuming	Unknown	Transport to comply with the transport of Dangerous Goods Code applies in preparation for offsite recycling.
Pesticides, herbicides, spill cleans ups, paints and other chemicals	Liquid waste	Unknown	Offsite disposal at a licensed facility
Metals and bulk electrical cabling	General Solid (non-putrescible)	Unknown	Off-site recycling
General Waste from Compound	S		
Tyres	Special waste	Unknown	Offsite recycling
Waste generated by the maintenance of equipment including air and oil filters and rags	General Solid (non-putrescible)	Unknown	Offsite disposal at a licensed facility
Oil, grease, fuel, chemicals and other fluids	Liquid waste	Unknown	Offsite recycling or disposal at a licensed facility





Appendix A: Waste Types and Expected Quantities			
Waste Types	Classification	Quantities/ Volumes	Proposed Reuse / Recycling / Disposal Method
Batteries	Hazardous waste	Unknown	Offsite recycling
Domestic waste generated by workers	General Solid (putrescible)	Unknown	Offsite disposal at a licensed facility / Onsite composting
Sewage sludge (no free liquids)	General Solid (putrescible)	Unknown	Offsite disposal at licensed facility
Liquid sewage	Liquid waste	Unknown	Offsite disposal at a licensed facility
Office Waste			
Paper, cardboard and plastic	General Solid (non-putrescible)	Unknown	Offsite recycling
Glass bottles and aluminium cans	General Solid (non-putrescible)	Unknown	Offsite recycling
Ink cartridges	General Solid (non-putrescible	Unknown	Offsite recycling





Construction Waste Management Plan Hutchinson Builders

Mainsbridge School

Attachment A: WSP Asbestos Management Plan

HAYBALL PTY LTD

ASBESTOS MANAGEMENT PLAN WARWICK FARM PUBLIC SCHOOL LAWRENCE HARGRAVE ROAD, WARWICK FARM, NSW 2170

MARCH 2019





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Asbestos Management Plan Warwick Farm Public School Lawrence Hargrave Road, Warwick Farm, NSW 2170

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REV	DATE	DETAILS
В	22/03/2019	Final

	NAME	DATE	SIGNATURE
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Reviewed by:	Imogen Powell	20/03/2019	Muyon Powers
Approved by:	Kieran White	20/03/2019	Land

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ABBREVIATIONS

ACM	Asbestos-containing materials
AMP	Asbestos management plan
ARCP	Asbestos removal control plan
Doe AMP	Department of Education Asbestos Management Plan
mAHD	Metres Australian Height Datum
mBGL	Metres below ground level
NEPM	National Environment Protection (Assessment of Site Contamination) Measure 2013
NSW EPA	New South Wales Environment Protection Authority
POEO Act	Protection of the Environment Operations Act 1997
RAP	Remediation Action Plan
SWMS	Safe work method statement

1 INTRODUCTION

1.1 BACKGROUND

WSP Australia Pty Ltd (WSP) was commissioned by Hayball Pty Ltd (the client) to prepare this asbestos management plan (AMP) for the proposed relocation of Mainsbridge School to Warwick Farm Public School, Lawrence Hargrave Road, Warwick Farm NSW. This AMP only applies to the developable portion of Warwick Farm Public School with this area nominated as 'the site' and illustrated in Figure 1, Appendix A.

It is understood the proposed development within the school precinct will be to facilitate children with special needs and involve the building of learning spaces, offices, carparks and landscaping. Following a review of historical documents provided to WSP, including the Remediation Action Plan (RAP) developed by Environmental Investigation Services (RAP, EIS¹), contaminants of concern, including friable and non-friable asbestos, have been identified within fill materials on site. The conceptual site model adopted by EIS concludes that all fill materials on site are impacted with non-friable asbestos (ACM) to the depth of natural soils with exception to the south-western portion where friable asbestos in the form of asbestos fines/fibrous asbestos (AF/FA) was identified.

It is also noted that at the time of writing, a data gap assessment was still required to be conducted in the northeastern portion of the site. As a conservative measure, this area has been assumed to be impacted with ACM unless validated otherwise or investigation results identify the presence of ACM or friable asbestos.

This AMP is required under the *Work Health and Safety Regulations 2017* and has been developed specifically to outline the necessary requirements for the ongoing management of asbestos at the site during development works. This includes recommendations for proposed strategies for handling, removal, transportation and disposal procedures. The AMP identifies the potential hazards associated with the site in its current condition and outlines management strategies to mitigate these hazards during proposed site works.

The risk to human health associated with the project is considered to be low if managed in accordance with this AMP. This AMP will need to be reviewed and updated in the event that the site is developed for other uses or if site conditions change.

1.2 OBJECTIVES

The objectives of the AMP are to outline the required procedures for the handling of asbestos containing materials and asbestos impacted soils during the development in accordance with relevant National Codes of Practice and Work Health and Safety (WHS) Legislation. Specifically, the objectives are to provide:

- documentation of the existing extent of asbestos impacted soils (friable/non-friable) at the site;
- safe work procedures required to ensure that works are carried out in such a way as to minimise potential health
 effects to both personnel engaged in the works and any health risks to the public or the operational school;
- procedures required to ensure that all personnel engaged in the works comply with the terms and conditions of the AMP;
- ongoing management requirements of the site to ensure that the risk posed by any potential asbestos impact at the site is properly managed; and

¹ Report to Hayball on Remediation Action Plan for Proposed Relocation of Mainsbridge School to Warwick Farm Public School, Lawrence Hargrave Road, Warwick Farm, NSW. Environmental Investigation Services, 10 October 2018, E29918KPrpt-RAP Rev 1

- assign responsibilities under the AMP, provide contingency plans and timeframes for application of the AMP.

1.3 CONTAMINANT TYPE AND EXPOSURE PATHWAYS

Non-friable asbestos in the form of ACM is defined by Safe Work Australia (2016) as being "…material containing asbestos that is not friable asbestos, including material containing asbestos fibres reinforced with a bonding compound." Mechanical disturbance of fragments of ACM may result in the release of fibres and therefore, such activities should be managed to prevent any fibres becoming airborne. The health effects of asbestos are detailed in enHealth (2005) *Management of Asbestos in the Non-Occupational Environment*. For asbestos, the exposure pathway comprises solely inhalation of fibres that may be generated from the disturbance of asbestos fragments.

Friable asbestos (AF/FA) is defined by Safe Work Australia (2016) as being "*...material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contains asbestos*". Asbestos fibres can range in size from 0.1 to 10 microns (1/10 the size of a grain of sand), and are a potent particulate respiratory hazard. The small fibres gain relatively easy access to the lung airways and air sacs. Damage to the respiratory tract generally tends to be time/dose dependent. An individual exposed to high doses of asbestos for long periods of time will have an increased risk of developing asbestos related diseases. In addition, the effects of asbestos related diseases are usually not detectable for 1 to 30 years after the initial exposure. This is called the latency period, and is a distinguishing feature of asbestos related diseases.

The presence of friable asbestos in fill materials have been identified in the south-western portion of the site with the remaining developable area characterised by ACM in fill materials as concluded in the conceptual site model provided in the RAP. Extent of asbestos impacts are presented in Figure 2, Appendix A.

2 APPLICATION AND RESPONSIBILITES OF THE AMP

2.1 APPLICATION OF AMP

This AMP shall apply from the commencement of ground disturbance works within the site until appropriate capping or removal strategies have been validated.

The responsibilities for site asbestos management apply to all works from the commencement of civil works/demolition until the completion of the development, except where a more specific asbestos management or works plan will be provided by a person conducting business or undertaking (PCBU), i.e., a detailed asbestos removal plan.

2.2 PRINCIPAL CONTRACTOR RESPONSIBILITY

In accordance with the *Work Health and Safety Regulation 2017*, a principal contractor (Person Conducting a Business or Undertaking) shall be appointed for the proposed works. The principal contractor must:

- be responsible for the proposed project work at all times until the work is completed;
- ensure that all persons involved with proposed project work have undertaken occupational health and safety training;
- keep records of induction training for site workers and any site specific training;
- ensure that any subcontractors provide safe work method statements for the activities for which they are engaged;
- monitor any subcontractors to ensure that they are complying with the safe work method statements;
- maintain a hazardous substances register for all hazardous substances used or present on site; and
- comply with occupational health and safety and environmental legislation, regulations, standards, codes and the site-specific rules relating to safety contained in this AMP and the overarching Department of Education Asbestos Management Plan (DoE AMP).

2.3 LICENSED ASBESTOS REMOVALIST

A Class A (friable and non-friable) licensed asbestos removal contractor shall be engaged to complete the asbestos impacted material relocation/removal and other associated asbestos related works. WSP notes that the majority of the site fill materials have been characterised as non-friable. However, due to the identification of friable asbestos materials and the conservative requirements of the DoE AMP, WSP recommends that a Class A licensed asbestos removal contractor is engaged for all asbestos in soils related works on site.

The licensed asbestos removal contractor will be the primary person responsible and in charge for works on site involving ACM or friable asbestos impacted soils. Their responsibilities include:

- Notifying SafeWork NSW and preparing a site-specific Asbestos Removal Control Plan (ARCP) prior to any asbestos removal works being completed;
- ensuring compliance with relevant legislation and the conditions of this AMP and over-arching DoE AMP;

- ensuring handling and management of asbestos contaminated soils at the site is in accordance with relevant legislation;
- ensuring appropriate environmental and safety controls outlined in this AMP are maintained for the duration of the works; and
- assisting all site sub-contractors, where required, in complying with relevant legislation and the procedures
 outlined in this AMP.

2.4 OCCUPATIONAL HYGIENIST

Occupational hygiene panel contractors (contractors nominated to perform occupational hygiene works in accordance with the DoE AMP) in the form of Licensed Asbestos Assessors (LAAs) shall be engaged to assess any suspected asbestos containing materials when required and perform air-borne asbestos monitoring for the duration of asbestos related site activities:

The occupational hygienist (LAA) will:

- complete static asbestos air monitoring during asbestos removal works as well as the excavation and transport of
 impacted materials until such time that the final clearance inspection has been completed. All daily results of air
 monitoring activities are to be displayed or be readily available for the information of site workers. All air
 monitoring events shall be undertaken in accordance with the National Occupational Health and Safety Commission's
 Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003(2005)];
- conduct clearance inspections and prepare clearance certificates (unless the clearance inspections are performed by the environmental consultant for the purpose of site validation with respect to the RAP);
- Provide site specific asbestos awareness training for all contractors who may be impacted or involved with asbestos related tasks and maintain a register until the completion of works (if engaged for fulltime site supervision);
- audit asbestos controls and provide advice in relation to the management of asbestos issues associated with the development (if engaged for fulltime site supervision); and
- ensure that the licensed asbestos removalist complies with the AMP (if engaged for fulltime site supervision).

3 TRAINING, AWARENESS AND LEGISLATIVE REQUIREMENTS

The Principal Contractor must not allow any person to carry out project works unless he/she is satisfied that the person has undergone WHS induction training.

Work undertaken at the site is to be managed in accordance with regulatory requirements and the management systems of the site owner/operator. Prior to the commencement of any task, a safe work method statement (SWMS)/job hazard assessment (JHA) must be prepared to identify any potential for workers to be exposed to contaminants of concern.

In addition, all workers that will conduct work potentially involving asbestos on the site should have undertaken asbestos awareness training (either formal or in-formal, site specific) to ensure that workers on the site are familiar with the risks posed from asbestos and asbestos controls.

3.1 NON-COMPLIANCE WITH THE AMP

Non-compliance with the intent and procedures of the AMP may occur during the implementation of the AMP. Where a non-compliance is identified by a responsible organisation, they shall inform the site operator of the noncompliance in writing. The site operator shall have the responsibility of informing the non-complying party in writing of the non-compliance. The non-compliant party will be required to rectify the non-conformity as soon as possible, as per the requirements of the relevant procedure(s) where the non-compliance has occurred. Detail of the action taken to rectify the non-compliance shall be provided to the site owner. Where a non-compliance cannot be rectified, the AMP is to be reviewed.

3.2 LEGISLATIVE REQUIREMENTS AND GUIDELINES

Key legislation relevant to contaminated soil and asbestos related management is listed in Table 3.1 below.

Table 3.1 Key legislation and guidelines

RELEVANT KEY LEGISLATION AND GUIDELINES	APPLICABLE TO PROJECT
Contaminated Land Management Act 1997.	Establishes a process for investigating and (where appropriate) remediating land areas where contamination presents a significant risk of harm to the environment.
Protection of the Environment Operations Act 1997 (POEO Act) and Protection of the Environment Operations Regulation 1997 (POEO Regulation)	This Act provides for the control of polluting activities in NSW in order to prevent pollution of the environment. Offences exist in relation to activities that cause water, soil and air pollution. The Regulation details requirements in relation to transportation, collection, storage or disposal of asbestos waste.
Landcom 2004, Managing Urban Stormwater: Soils and Construction.	Provides guidance on erosion control measures to be implemented during land development activities.
NSW EPA 2014, Waste Classification Guidelines.	Defines types of wastes, procedures for assessing waste, waste storage and disposal requirements, record keeping and licence requirements.

RELEVANT KEY LEGISLATION AND GUIDELINES	APPLICABLE TO PROJECT
Contaminated land management Guidelines for the NSW Site Auditor Scheme (2017) (3rd edition)	Outlines NSW EPA requirements for assessing and remediating contaminated sites to protect the environment and minimise the risk to public health from the future land use.
National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM, as amended 2013).	Provides adequate protection of human health and the environment, where site contamination has occurred, through the development of an efficient and effective approach to the assessment of site contamination.
WA Department of Health (DoH) 2009, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.	Provides guidance for assessing and remediating asbestos impacted sites in order to minimise the risk to public health from the future use of the site.
SafeWork Australia document How to Safely Remove Asbestos: Code of Practice 2016.	Provides guidance for the safe removal of ACM.
Department of Education Asbestos Management Plan	Provides guidance with respect to the management of asbestos within school precincts

4 REMEDIATION OF IMPACTED SOILS

In accordance with the provided RAP, remediation works for the site are divided into 5 areas with remediation and validation activities expected to occur sequentially. However, there are no concerns from an occupational hygiene perspective if these stages are not performed sequentially. The 5 areas and corresponding remediation strategies are as follows:

- Areas 1 and 2 will involve the excavation and off-site disposal of approximately 2,000 m³ of non-friable asbestos and lead impacted fill materials;
- Area 3 will involve the excavation and off-site disposal of approximately 5 m³ of friable asbestos impacted fill materials;
- Area 4 will involve the onsite sparrow picking of approximately 2,000 m³ of non-friable asbestos impacted fill materials; and
- Area 5 will involve the onsite sparrow picking of approximately 400 m³ of non-friable asbestos impacted fill materials.

It is noted that at the time of writing, a data gap assessment was yet to occur on a portion of the site. The above remediation strategies may change or vary following completion of this investigation.

5 ASBESTOS HANDLING AND DISTURBANCE PROCEDURES

The AMP is to be implemented at the site during works involving the disturbance of asbestos impacted soils or materials at the site. The objective of the plan is to describe procedures to minimise exposure of all site occupants to asbestos materials through the development and implementation of the management systems outlined herein.

5.1 ASBESTOS REMOVAL/DISTURBANCE PROCEDURES

The removal/disturbance of asbestos material from the site shall be conducted in accordance with SafeWork Australia document *How to Safely Remove Asbestos: Code of Practice 2016* with reference to the DoE AMP. A general procedure includes but is not limited to the following steps:

- all asbestos disturbance works to be supervised or carried out by licensed Class A (friable and non-friable)
 SafeWork NSW Licensed Contractor;
- Notify SafeWork NSW and prepare a site-specific ARCP prior to any asbestos removal works being completed;
- works area to be isolated with appropriate barricade fencing (e.g. fence panels) and signage in accordance with Section 5.4;
- un-authorised personnel are not permitted to enter the isolated work area;
- air monitoring to be carried out for the duration of the works involving the disturbance of asbestos materials in accordance with Section 5.9;
- Licensed Asbestos Assessor to monitor asbestos related works during removal/disturbance to ensure compliance with the AMP (if engaged for fulltime site supervision);
- decontamination unit (friable 5 stage unit) or decontamination area (non-friable only) to be installed for personnel as described in Section 5.7;
- appropriate personal protective equipment (PPE) to be worn by all personnel entering work area as described in Section 5.3;
- light water spray to be used as required to repress possible generation of airborne fibres/dust;
- impacted stockpiles to be covered in accordance with Section 5.5;
- all tools, plant and equipment used in the removal area will be decontaminated as described in Section 5.7;
- removal of soils/rubble by trucks are to be conducted in accordance with Sections 5.2 and 5.6;
- contaminated soil to be disposed of at licensed asbestos waste facility in accordance with Section 5.2; and
- truck wheels to be cleaned prior to leaving site.

5.2 ASBESTOS DISPOSAL PROCEDURES

5.2.1 WASTE CLASSIFICATION FOR OFF-SITE DISPOSAL

Waste classifications are required for any excavated soil or fill materials which are to be disposed off-site. Fill material to be taken off-site for disposal shall be assessed in accordance with the waste classification guidelines (NSW EPA,

2014). Materials excavated from the site should be tracked from 'cradle to grave', in order to provide detailed and accurate information about the location and quantity of all materials both on and off-site from the time of their excavation until their disposal.

For any truck or bin leaving the site, the following information would be recorded:

- origin of material;
- material type;
- approximate volume; and
- truck and/or bin registration number.

Fill material containing asbestos are to be classified as asbestos waste with the following to be applied:

- The POEO Act defines 'asbestos waste' as any waste that contains asbestos, including fragments or fibres. It is understood that as a result, the NSW EPA considers asbestos contaminated soil to be an asbestos waste. In addition, the POEO Waste Regulation provides certain requirements for the transportation of asbestos. It is understood that the NSW EPA requires any management of soil containing asbestos waste on or off the site to be at least equal to controls set out by the Regulation; and
- All asbestos contaminated soil or fill leaving the site will be transported in a leak proof covered vehicle and disposed of at a licensed facility in accordance with waste classification guidelines (NSW EPA, 2014).

All work shall be carried out in accordance with the SafeWork Australia document *How to Safely Remove Asbestos: Code of Practice 2016* made under section 274 of the Work Health and Safety Act 2017. Handling and disposal of asbestos waste material should also be carried out in accordance with the POEO Act, POEO Waste Regulation and waste classification guidelines (NSW EPA, 2014).

5.3 PERSONAL PROTECTION EQUIPMENT

PPE will be used to protect individuals from actual or potential exposure to asbestos fibres. Personnel entering the exclusion zone/asbestos removal area must be supplied with, and use, PPE that is suitable for the work being undertaken. All personnel working within the exclusion zone are to wear a level of protection as follows:

- disposable overalls (TYVEK) rated type 5, category 3 or equivalent;
- disposable gloves and booties;
- half face disposable or cartridge type particulate respirator Class P3 or respirator for friable asbestos removal; and/or
- as a minimum, half face disposable or cartridge type particulate respirator Class P2 or respirator for non-friable asbestos removal.

Respirators to be used will be approved for protection against asbestos. Respirator filters will be changed upon detection breakthrough, or when breathing difficulty is encountered due to particulate loading, or as per manufacturer's instructions.

Personnel will discard protective clothing which becomes torn, punctured, or appears to deteriorate under chemical action. All discarded clothing will be placed into specially marked plastic bags and disposed of as asbestos waste. If protective equipment appears to deteriorate under chemical action, the site operator is to be notified immediately.

5.3.1 CLOTHING INSPECTION

PPE should be inspected before and during use. The following checks should be made before use:

- Determine that the clothing material is correct for the specific task at hand.
- Visually inspect for:
 - imperfect seams
 - tears
 - malfunctioning closures.
- During the work task, periodically inspect for the following:
 - closure fails
 - punctures
 - tears
 - seam discontinuity.

5.3.2 PLANT

All plant operators must close cabin doors and windows and set air conditioning to re-circulate when operating within the asbestos work area.

In any plant with open cabins, operators must wear PPE and respiratory protective equipment (RPE) as described above.

5.4 BARRICADING AND SIGNAGE

Necessary measures are to be in place for the effective exclusion of unauthorised persons to impacted areas. All areas of a workplace that contain asbestos, including plant, equipment or components, must be signposted with warning signs, or labels, as appropriate to ensure personnel are not unknowingly exposed to asbestos when undertaking operational activities.



The location, type and positioning of signs and labels must be decided, or authorised, by a competent person. For the removal of friable asbestos impacted soils, a minimum exclusion zone of 10 metres is recommended. Asbestos warning signs must comply with the requirement of AS 1319-1994 for size, illumination, location and maintenance. Warning signs may include some of the above examples. With respect to barricade fencing, chain-wire fencing/ATF with shade cloth would be considered suitable.

5.5 STOCKPILE MANAGEMENT

All stockpiles must be kept damp (not flooded) and covered by geofabric/plastic, sealed with a soil binding product (dust-bloc) or sealed with hydro mulch as soon as practical. Regular inspections of long term stockpiles should be undertaken to ensure the controls implemented are in good condition, no dust is being generated from the stockpile and no runoff is occurring.

5.6 DUST MANAGEMENT

The following information is provided as a guide to control dust during earthworks in areas of known or suspected asbestos impacted soil:

- prior to the first removal of the sub surface, dampening with water of the proposed excavation area;
- prior to movement of stockpiled materials, dampening with water across the stockpile surface;
- during soil/rubble movement, the materials should be kept sufficiently damp to minimise the emission of dust; and
- if trucks are required to enter the restricted area, the wheels of the trucks and the sides of the body should be washed down before the truck leaves the restricted area. This can be performed within a wash-bay or on sacrificial geofabric to be disposed of as asbestos waste.

The excavation surface should be continually monitored and the surface wet down as drying occurs. This process should continue until the ACM or asbestos impacted soils excavation works in the Asbestos Work Area are completed.

The above method relies on the following factors:

- use of water fogging nozzle (not high pressure hoses); and
- constant vigilance of trained operators/contractor.

5.7 DECONTAMINATION

The Licensed Asbestos Removal Contractor shall ensure that an area is established on the site for people to personally decontaminate themselves and any tools and equipment when they are entering and leaving each asbestos works zone (5 stage decontamination unit for friable asbestos removal and asbestos decontamination area for non-friable removal).

The details for decontamination shall be specified in the Licensed Asbestos Removal Contractor's Asbestos Removal Control Plan and SWMS for asbestos related work and is to comply with the requirements outlined in SafeWork 2016: *How to Safely Remove Asbestos.*

In summary, when leaving the work area all site personnel must enter the decontamination unit/area, wash footwear, remove obvious signs of asbestos dust/impacted soils and remove coveralls and mask and place in 200 μ m thick polythene bag.

Non-reusable clothing and masks will be collected in asbestos bags for disposal by licensed asbestos removal contractors as asbestos waste. No waste will be removed from the site without the approval of the site operator. Any waste to be removed from the site would be undertaken in accordance with relevant NSW EPA guidelines.

At the conclusion of the works, any plant or equipment shall be parked within a designated washing area or wash bay. Decontamination should include removing all soil from the tracks, body and bucket of the plant as far as reasonably practicable.
All water generated from decontamination of asbestos impacted materials, persons or plant will be considered to be impacted by asbestos. All asbestos impacted water must be captured and prevented from movement outside the exclusion zone

5.8 VALIDATION OF ASBESTOS REMOVAL

In the event that non-friable asbestos impacted soils are removed, to validate the successful removal, a visual clearance inspection will be performed by the LAA (or environmental consultant for the purpose of satisfying the RAP) resulting in a clearance certificate post the successful remediation.

For the removal of friable asbestos impacted soils, validation sampling of the footprint/excavation is required to be undertaken at a rate of 1 per $25m^2$ base or 1 per 5 metre linear wall in accordance with the requirements of NEPM (2013) and the WA DoH (2009) asbestos guidelines.

Representative stockpile sampling for characterisation purposes should be undertaken in accordance with NEPM, which also references WA DoH (2009). Sample density will be determined based on the volume of material stockpiled. Asbestos sampling will be undertaken at a rate of one sample per 70 m³ of material (in accordance with WA DoH, 2009).

5.9 AIR MONITORING

During all asbestos excavation, transport and placement works on site involving asbestos impacted materials, airborne asbestos fibre monitoring will be undertaken by the LAA using calibrated portable air sampling pumps. Monitoring locations shall be determined by the LAA but shall include at least 6 locations surrounding the work area or site boundary. At the end of each monitoring period the pump and attached filter will be collected and analysed at a NATA-accredited laboratory.

Monitoring works shall be conducted in accordance with NOHSC Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition (NOHSC:3003 [2005]).

The results of air monitoring will be available prior to the commencement of work on the following business day (with exception to weekend monitoring). Daily air monitoring reports shall be displayed in a common area outside of the asbestos work area (e.g. site office or lunch shed) or be able to be produced upon request.

The following action levels will be applied upon receipt of daily results:

- reading of less than 0.01 fibres/mL control measures in place are working effectively, site works to continue;
- reading between 0.01 and 0.02 fibres/mL a review of control measures shall be completed in the work area; and
- reading greater than 0.02 fibres/mL works shall cease until the cause of contamination is identified and rectified (the removal contractor is required to notify SafeWork regarding the level of exceedance).

5.10 UNEXPECTED FINDS PROTOCOL

It is acknowledged that previous investigations of the site have been undertaken to assess the identified contaminants of potential concern in selected parts of the site. However, ground conditions between previous sampling points may vary, and further hazards may arise from unexpected sources and/or in unexpected locations during site works. The nature of any residual hazards which may be present at the site are generally detectable through visual means such as friable asbestos lagging.

As a precautionary measure to ensure the protection of the workforce and surrounding community, should additional asbestos be identified (or any other unexpected potentially hazardous substance), the procedure summarised in the below flow chart is to be followed.



6 **REFERENCES**

- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013.
- National Occupational Health and Safety Commission 2005, Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos.
- NSW DEC 2006, Guidelines for the NSW Site Auditor Scheme (2nd Edition).
- NSW EPA 2014, Waste Classification Guidelines.
- NSW EPA (2015), Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997.
- SafeWork Australia document How to Safely Remove Asbestos: Code of Practice 2016.
- SafeWork NSW 2011, Occupational Health and Safety Act (NSW).
- SafeWork NSW2017, Occupational Health and Safety Regulation (NSW).

7 LIMITATIONS

This Report is provided by WSP Australia Pty Limited (WSP) for Hayball (Client) in response to specific instructions from the Client and in accordance with WSP's proposal dated 05 March 2019 and agreement with the Client dated 11 March 2019 (Agreement).

PERMITTED PURPOSE

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (Permitted Purpose).

QUALIFICATIONS AND ASSUMPTIONS

The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and / or recommendations in the Report (Conclusions) are based in whole or in part on information provided by the Client and other parties identified in the report (Information), those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

The Conclusions are reflective of the current Site conditions and cannot be regarded as absolute without further extensive intrusive investigations, outside the scope of the services set out in the Agreement and are indicative of the environmental condition of the Site at the time of preparing the Report. As a general principle, vertical and horizontal soil or groundwater conditions are not uniform. No monitoring, common or intrusive testing or sampling technique can eliminate the possibility that monitoring or testing results or samples taken, are not totally representative of soil and / or groundwater conditions encountered at the Site. It should also be recognised that Site conditions, including subsurface conditions can change with time due to the presence and concentration of contaminants, changing natural forces and man-made influences.

Within the limitations imposed by the scope of the services undertaken by WSP, the monitoring, testing (intrusive or otherwise), sampling for the preparation of this Report has been undertaken and performed in a professional manner in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

WSP has prepared the Report without regard to any special interest of any person other than the Client when undertaking the services described in the Agreement or in preparing the Report.

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commitment or otherwise. It is the responsibility of the Client to accept (if the Client so chooses) the Conclusions and implement any recommendations in an appropriate, suitable and timely manner.

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APPENDIX A FIGURES





Warwick Farm Public School

HAYBALL PTY LTD

wsp

Warwick Farms Public School Extent of Asbestos Impacted Soils





Figure 2

Warwick Farms Public School

Hayball Pty Ltd

APPENDIX B ASBESTOS IN SOILS REGISTER – SITE AREA



wsp

Warwick Farm PS Developable Area - Site Asbestos in Soils Register

Hazard	Sample No/Test Pit	Description of Hazardous Material	Location of Hazardous Material	Friable	Consultant Comments
Asbestos	Visual identification during assessments including TP31, TP33 and TP45	Materials comprised non-friable asbestos containing materials including fibre cement sheeting fragments	The extent of the site excluding the friable asbestos impacted fill materials located at TP40	Non-friable	Remediation works are to be performed in accordance with the RAP.
Asbestos	Laboratory analysis following the submission of representative samples of TP40	Asbestos in fill materials comprised AF/FA	The extent of the site encompassing TP40	Friable	Remediation works are to be performed in accordance with the RAP.

	Remediation Date (where applicable)	Remediation Comments
	TBD	NA
	TBD	NA
_		
_		







Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix G: Traffic and Pedestrian Management Plan

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1. PURPOSE

To address the requirements of the Development Consent in reference to a Construction Traffic and Pedestrian Management Plan for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. PROCEDURE

This Construction Traffic and Pedestrian Management Plan details how Hutchinson Builders will undertake works associated with the project in accordance with Local Council and Road and Maritime Authority requirements.

3.1 Transport Routes To and From Site

A Traffic Management Plan prepared by E.V.S Group in July 2019 ref: *Traffic Management Plan 249F14 E.V.S Group July 2019*, has identified the following traffic routes.

Access

Construction Vehicles are to approach as follows:

Vehicles are to approach along The Hume Highway turning left or right into Homepride Avenue heading North and then turning right into Lawrence Hargrave Road, then turning left onto Williamson Crescent, and then turning right to enter the construction site.

Egress

Vehicles are to leave the Construction Site turning left onto Williamson Crescent, turning right onto Lawrence Hargrave Road, turning left onto Homepride Avenue and then turning left or right onto The Hume Highway to disperse to their intended destination.

Refer to Attachment A for the E.V.S Group Traffic Management Plan.

3.2 Project Vehicle Speeds

Vehicles speeds will be dictated by the speed restrictions placed on the road network within the vicinity of the project. A 10km/h speed restriction will be applied to vehicles whist travelling on the project site.

3.3 Safety Risks Associated with Project Vehicles

A risk assessment has been undertaken to identify the safety risks associated with project vehicles and control measures to be used in mitigating these risks. Refer to the Environmental Work Method Statement in Appendix C of the CEMP.

3.4 Community Notification

Notification to local residents regarding construction activities that may impact local roads will occur in accordance with section 5.5 of the CEMP regarding Community Consultation.



3.5 On-Site Vehicle Parking

On-site parking will be along the western site boundary, adjacent the site entrance/exit. Refer to Attachment B for parking location.

3.6 Road and Lane Closures

The E.V.S Traffic Management Plan has not identified the necessity for lane or road closures for the project. Where road or lane closures are required, as part of the project works, consultation will be conducted with the road authority (Local Council / RMS) and a Road Occupancy Licence (ROL) will be sought. Currently, there is no requirement for ROL for this proposed construction. Community consultation regarding road and lane closures will occur in accordance with the CEMP.

Any road or lane closure including any traffic control devices required will be detailed on site specific Traffic Control Plans (TCP's) prepared by an accredited Engineer in accordance with RMS Manual 'Traffic Control at Worksites'.

3.7 Driver Code of Conduct

General requirements for the Driver code of conduct include the following:

- Hold a valid driver's licence for the class of vehicle that the driver is operating;
- Operate the vehicle in a safe manner within and external to the site;
- Comply with the direction of authorised site personnel when within the site;
- Adhere to the speed limit identified in Section 3.2;
- Heavy vehicle drivers are to minimise compression breaking when driving with residential areas adjacent the site;
- Heavy vehicle drivers are to be aware of their adopted fatigue management scheme and operate within its requirements;
- Vehicles waiting to enter the site, are to wait with engines off;
- All vehicles are expected to be covered with material/canopy, whether or not the vehicle is loaded;
- When vehicles are loading hazardous loads, such as asbestos or lead waste, drivers are to follow directions on site and remain in the cabin with the windows closed and air-conditioning is on recirculated.

3.8 Traffic Management Measures

The following measures will be implemented where possible to minimise impacts from construction traffic on the surrounding road network:

- Heavy vehicle movements would be kept to a minimum during school zone hours and morning peak hours to maximise safety and reduce congestion;
- No unnecessary idling of vehicles;
- Pedestrians would be kept clear of worksites at all times;
- The project has been sited to avoid direct impacts on residential and business access;
- Consultation would occur with any affected property owners and occupiers to coordinate disruptions to driveway access;
- The construction program will consider Endeavour Energy and TransGrid maintenance and access requirements;

Page | 2



- Traffic controller(s) will be employed to control traffic flows, reduce public nuisance and prevent accident or injury where required;
- Minimise vehicle movements during 'pick up' and 'drop off' times at local school, where applicable to construction traffic route;
- Speed restrictions for construction vehicles will be applied on site and on local roadways to prevent accidents; and
- Implement car-pooling for site personnel to reduce parking spaces required and traffic loads.

It is expected that there will be no requirement to divert pedestrian access. Isolated instances may occur when pedestrians may be stopped for short periods while construction vehicles enter and exit the driver ways under a Traffic Controller guidance.

3.9 Community Consultation

The following phases of the community engagement has been undertaken at the time of writing this plan (25/06/2019):

- 1) Site Office with the Assistant Principal, teacher representative, SINSW and Head Contractor 06/06/19
- 2) Meeting with Parent and Teachers before school with SINSW Community engagement member 19/06/19
- 3) Presentation to Parents (Warwick Farm PS and Liverpool Council Childcare Centre) and teachers at their coffee club 19/06/19
- 4) Letterbox drop, and door knock with Warwick Farm residents 19/06/19

Further proposed community engagement strategies proposed include the following:

- 1) Buildability workshop with the Warwick Farm Principal and Project team 26/06/19
- 2) Meeting with the Manager of Liverpool Council Childcare Centre 26/06/19

All community engagement works have been completed as provided in Section 5.5 of this CEMP. Complaints will be managed under Section 5.6 of this CEMP.

3.10 Consultation with Local Council

Following consultation with the City of Liverpool Council the following conclusions were made:

- 1) Williamson Crescent's crossover into the site is a distance from Warwick Farm's Kiss and Drop Zone. Approximately 70m from the southern general entrance and 100m from the heavy vehicle access.
- 2) Deliveries are outside of school hours. School operating hours are 8:30am to 3pm.
- 3) Additional trade vehicles are to park approximately 2 streets away (west) from the site.

Refer to Attachment C for consultation with council.

3.11 Consultation with RMS

RMS was notified of the first version of this plan via email. A response from the appropriate RMS agent has not been received.

3.12 Plan Review

Hutchinson Builders will conduct a formal review of this Traffic and Pedestrian Management Plan at a minimum of six monthly intervals or a lesser frequency if required by other factors such as the results of audit reports, complaints, incidents or changes in site conditions or scope of works. Reviews will be carried out by consulting documents such as:

- Subcontractor documentation;
- Work Method Statements;

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- Incident Reports; and
- Complaint registers.

Changes to this plan will be recorded and issued as per the document control at the start of the CEMP. The review will adequately address all sections of the CEMP and action them appropriately.





Traffic and Pedestrian Management Plan Hutchinson Builders

Mainsbridge School

Attachment A: Traffic Management Plan

HUTCHINSON BUILDERS

Warwick Farm Public School Williamson Crescent Warwick Farm

TRAFFIC MANAGEMENT PLAN U.B.D Ref 249 F14

July 2019

TRAFFIC MANAGEMENT PLAN

CONTROL SHEET – SUMMARY UPDATES

- 1. Insert new or revised sheets into the section of the TMP and remove/destroy any superseded sheets
- Record revision, date and brief description immediately after the TMP is updated
 3.

Revision	Date	Brief description of update
0/1	July 2019	Initial Submission

TRAFFIC MANAGEMENT PLAN

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TRAFFIC MANAGEMENT PLAN

1.0

INTRODUCTION

The Project located at Warwick Farm Public School Williamson Crescent Warwick Farm comprises of the construction of new school amenities. The construction site is located on the Eastern side of Williamson Crescent at Warwick Farm.

The Traffic Management plan addresses the conditions, approval requirements for this project, as well as the construction works proposed by Hutchinson Builders.

The objective of the plan is to ensure that the traffic issues and the construction movement of both plant and equipment are managed with minimal impact to motorists, pedestrians and local residents and complies with the requirements of all relevant authorities including RMS, Liverpool City Council and the Emergency Services.

Through a consultative approach between Hutchinson Builders and E.V.S Group, this plan details the best way to manage traffic issues associated with this project.

1.1

PURPOSE

The purpose of the Traffic Management Plan is to ensure that the planned works adhere to and comply with the Authority requirements for the Control of movement of construction vehicles (Plant & Equipment) around the Project and adjacent transport corridors. Specifically, this plan must recognize, be consistent with and comply with the traffic configuration of the local road network as it exists at varying stages, during the project.

In addition to the Authority requirements, this plan must also comply with:

- The requirements of relevant authorities, including RMS, Liverpool City Council, NSW Police and State Emergency Services:
- Road Act 1993 (NSW) and all other legislative requirements;
- Certificates, licenses, consents, permits and approvals, including in respect of working hours;

This plan will provide:

- Detailed traffic management procedures for the site;
- Traffic control plan detailing modification to existing traffic patterns vehicular and pedestrians. (Attached)
- Ensure the appropriate notification of relevant emergency services prior to implementing road and pedestrian traffic modifications;
- Safety of Pedestrians, Commuters, Cyclists and personnel of both Hutchinson Builders Properties and its sub contractors;
- Impacts on residents and/or commercial enterprises on traffic routes (including traffic movement);
- Objectives for Material delivery management & transportation to and from site;
- Roles and responsibilities of personnel and sub contractors;
- Updating of the Traffic Management plan on an as needs basis;

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TRAFFIC MANAGEMENT PLAN

1.2

SCOPE OF WORK

The main element of the work in respect to traffic management is;

- Traffic Management while Construction Vehicles are entering and exiting the work zones;
- Control of movement of vehicles carrying construction plant/equipment around the Project and adjacent traffic corridors;
- Plan must recognize, be consistent with and comply with the traffic configuration of the local road network as it exists at varying stages, during the project;

1.3 APPLICATION

All delivery drivers and sub contractors of Hutchinson Builders Properties shall comply with the requirements of this plan.

1.4 ABBREVIATIONS & TERMINOLOGY

The following terms, abbreviations and definitions are used in this Plan;

Terms	Explanation
TMP/Plan	Traffic Management Plan
VMP	Vehicle Movement Plan
PMP	Pedestrian Movement Plan
JPM	Junior Project Manager
RMS	Roads and Maritime Services
ТМС	Road and Maritime Services Traffic Management Centre
LCC	Liverpool City Council

TRAFFIC MANAGEMENT PLAN

2.0 DISTRIBUTION CONTROL & APPROVAL OF THIS PLAN

2.1 Approval & Changes

Approval of Plan

Record of Issue, Review and Approval of plan will be via LCC and Hutchinson Builders.

Issue of Plan

Hutchinson Builders Site Manager will ensure the Approved Plan is available to all personnel.

The most current version of the plan was issued at Tender and forms part of the sub contractors contract documentation.

Copies of the TMP and TCP's are available from the site office.

Laminated copies of the TCP's will be placed on the walls of the induction room.

Changes to the TMP

No changes to this TMP are permitted with any changes to be provided in a new TMP to be approved by LCC.

Distribution Policy

Controlled copy of the TMP is held by Hutchinson Builders. All company employees have access to this plan through the Site Manager. The list of holders of controlled copies of the plan includes;

COPY NO	ISSUED TO	ISSUE DATE	ISSUED BY
01	Project Manager	01/07/2019	E.V.S Group
02	Site Manger	01/07/2019	E.V.S. Group
03	Cadet	01/07/2019	E.V.S. Group
04			
05			
06			

The personnel to whom these copies have been issued will be sent amendments as they occur, and it is their responsibility to discard superseded pages and insert new pages.

Uncontrolled Copies

Uncontrolled copies will now be issued amendments.

Acknowledgement of receipt

If a controlled copy of the Traffic Management Plan has been issued, acknowledgement of its receipt is to be sent to the Site Manager within seven days to ensure further amendments are received.

TRAFFIC MANAGEMENT PLAN

3.0 CONDITIONS OF APPROVED RESPONSE

The checklist detailing the verification process to ensure contract requirements have been met in this Traffic Management Plan for the Conditions of Approval listed below:

	WHERE ADDRESSED
Traffic Management Plan (TMP) has been prepared in consultation	
with relevant Hutchingon Builders personnal. The TMD must	
with relevant Hutchinson Builders personnel. The TWP must	
include information on the following matters relating to the	
project:	
a) Including the staging of construction works to minimize	All Sections
traffic and pedestrian delays	
b) The impact on pedestrians including measures to ensure	
safety to pedestrians at all times;	Section 4.3
 Maximum and average truck volumes 	Section 4.3
d) Truck ingress and egress routes	Section 4.3
e) Access, for construction vehicles entering and leaving work	
area;	Section 4.3
f) No heavy vehicle queuing on public roads unless otherwise	
agreed by the LCC and/or the RMS	Section 4.2
g) Construction traffic generation	Section 4.3
h) A response plan which sets out the proposed response to	
any traffic, construction or other incident.	Section 4.1
i) Proposed traffic control within Traffic Control Plan	ATTACHED
j) Measures to manage traffic flows around the area affected	
by the Project, including as required traffic control devices	
necessary for the implementation of the TCP's.	Section 4.1
The performance of all project traffic arrangements must be	
Monitored during construction.	
Any additional traffic and transport management measures as	
Required by the RMS shall form part of the TMP.	

TRAFFIC MANAGEMENT PLAN

4.0 STAGING PLANS, PROPOSED SEQUENCE OF WORKS

The Work Area listed below, itemize on site activity (in relation to proposed works) and relate to Traffic Control sequences.

4.1 WORK AREA – Warwick Farm Public School Williamson Crescent Warwick Farm

Date	Area	Activity
01/07/2019	WA1	Demolition & Excavation & Construction

5.0 PROPROSED PROGRAMME

The approximate program for implementation of the work area is as follows:

WORK AREA	START DATE	FINISH DATE	
Work Area 1	July 2019	October 2020	

5.1 Managing Cumulative Impacts

Spoil from Demolition and Excavation shall be loaded entirely within the site boundaries. There is no queuing on Williamson Crescent or any other surrounding roads. All deliveries will be unloaded from within the confines of the Construction Zone. Any large deliveries will need to be organized in advance to reduce any cumulative congestion impacts attributed to traffic.

The site manager is responsible for monitoring traffic conditions. In the event that construction traffic impacts do have a negative impact on the road network, Hutchinson Builders Properties shall liaise with LCC to solve the problem.

5.2 Work Area Assessment and Impacts

This section details the requirements for the Construction Site.

Williamson Crescent is a 2 lane 2 way road consisting of 2 through lanes. The speed limit on Williamson Crescent is 50Km/h and it runs in an East - West direction.

There is no offsite parking for construction vehicles. Sub contractors are to be advised that they should utilize public transport wherever possible. Hutchinson Builders will be required to allow for sub contractor parking within the site boundaries.

There will not be a works zones on Williamson Crescent with all construction deliveries being loaded and unloaded entirely from within the work site. All spoil from Demolition and excavation is to be loaded entirely within the site boundaries. All concrete pours will be completed from within the construction site.

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TRAFFIC MANAGEMENT PLAN

Construction vehicles are not to reverse into site during the works. There will need to be traffic control present as per the attached TCP's. The proposed works will generate additional truck movements along the main access routes.

Heavy vehicles movement shall be kept to minimum during school zone hours and during times of high pedestrian activity.

5.3 WORK AREA – ACCESS & EGRESS FOR CONTRUCTION VEHICLES

Access

Construction Vehicles are to approach as follows:

Vehicles are to approach along The Hume Highway turning left or right into Homepride Avenue heading North and then turning right into Lawrence Hargrave Road, then turning left onto Williamson Crescent, and then turning right to enter the construction site (as per VMP).

Egress

Vehicles are to leave the Construction Site turning left onto Williamson Crescent, turning right onto Lawrence Hargrave Road, turning left onto Homepride Avenue and then turning left or right onto The Hume Highway to disperse to their intended destination (as per VMP).

Truck Volumes

General Construction Vehicle Volume is expected to be approximately 10 movements per day for the Demolition and Excavation stages with up to 10 movements per day for the Construction Stage. The largest concrete pour will require approximately 25 concrete deliveries.

Traffic Diversions

There will be no need for traffic diversions for this project. The road must be fully opened to the public when works are completed at the end of each day.

No heavy vehicle queuing on public roads is allowed unless approved by the RMS and LCC. The Site Manager will provide strict instruction to all drivers during toolbox meetings and inductions.

Impact on Public Transport

No impact is expected on public transport. There is a School Bus Route in Williamson Crescent, however the planned works will have no effect on the bus stop and bus routes will not be affected.

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TRAFFIC MANAGEMENT PLAN

Pedestrians/Road Closures

Pedestrians will not be required to divert on Williamson Crescent as per attached TCPs, there may be isolated instances where they will be required to stop for short periods while construction vehicles enter and exit the driveways under Traffic Controller guidance.

Traffic Control Requirements

All site access, egress and unloading zones will require traffic control in accordance with the Roads and Traffic Authority Guideline Traffic Control at Work Sites, and Australian Standards 1742.3 Manual of Uniform Traffic Control Devices, Part 3: Traffic Control Devices for works on Roads.

The main access, egress and unloading points for these works are via council or RMS roads. Safe and simple traffic control for all road users shall be provided at all site access points in accordance with standard requirements. (Refer to 5.2)

6.0 OTHER TMP REQUIREMENTS

6.1 **Provisions for other users**

TCP's must cater for all users affected by the Construction at Warwick Farm Public School Williamson Crescent Warwick Farm. These users include but are not limited to cyclists and emergency vehicles.

6.2 Hours of Operation

The hours of Operation for General Construction will be:

Monday to Friday	07.00am – 18.00pm
Saturday	08.00am – 13.00pm
Sunday & Public Holidays	No Work Permitted

This TMP is based on the information that was obtained from numerous sources.

This plan is presented by Peter Wietecki RMS Cert # 0051768541 – Prepare a Work Zone Traffic Management Plan, qualified since 2012, on behalf of E.V.S Group.

Peter Wietecki

Peter Wietecki Works Supervisor E.V.S. Group

TRAFFIC MANAGEMENT PLAN



E.V.S Group

Australia

TRAFFIC MANAGEMENT PLAN







Traffic and Pedestrian Management Plan Hutchinson Builders

Mainsbridge School

Attachment B: On-Site Parking



LEGEND



EXISTING WARWICK FARM PS

NEW CONSTRUCTION

EXTERNAL WORKS

1	COORDINATION ISSUE	24/07/19
Н	ISSUED FOR CC	14/06/19
G	ISSUED FOR CC	23/05/19
F	TENDER ADDENDA	14/02/19
E	TENDER ISSUE	02/11/18
D	TENDER ISSUE	11/10/18
Rev	Description	Date



Melbourr 4/135

Ground Floor T +61 2 9660 9329

Brisban Level 12,
 Sturt Street Southbank,
 11-17 Buckingham Street
 324 Queen Street,

 VIC 3006
 Surry Hills NSW 2010
 Brisbane Qld 4000

 T +61 3 9699 3644
 T +61 2 9660 9329
 T +61 7 3211 9821

ABN: 84006394261 NSW Nominated Architects:Tom Jordan 7521, Richard Leonard 7522, David Tordoff 8028





Project Title

Mainsbridge SSP

Project Address

95 Lawrence Hargrave Rd, Warwick Farm NSW 2170

Drawing Title

SITE PLAN - PROPOSED

Status

CONSTRUCTION CERTIFICATE

Drawn By	Checked By	Date Printed	Scale
EP	RC	24/07/2019 7:27:33 PM	1 : 500@A1
Project No	Drawing No	Revision	
2141.01	01.A01.02	Ι	

Builders/Contractors shall verify job dimensions before any job commences. Figured dimensions shall take precedence over scaled work. Work shall also conform to the specification, other drawings and job dimensions. All shop drawings shall be submitted to the Architect/Consultant and manufacture shall not commence prior to the return of inspected shop drawings signed by the Architect/Consultant. © Copyright 2008 All rights reserved





Traffic and Pedestrian Management Plan Hutchinson Builders

Mainsbridge School

Attachment C: Consultation with Regulatory Bodies

Alex Chaplin

From:	Melissa Stojanovic <melissa.stojanovic@ghd.com></melissa.stojanovic@ghd.com>
Sent:	Thursday, 20 June 2019 12:47 PM
То:	Phil Ho
Cc:	John Tu
Subject:	RE: 25940_95 Lawrence Hargrave Road Warwick Farm_SSD 8792_Condition B20(b)

Hi Phil,

We confirm that consultation has occurred with the school and community. This aligns with our community engagement strategy as approved by the DPE 10/05/19.

We outline these events below:

- 1) Site Office with the Assistant Principal, teacher representative, SINSW and Head Contractor 06/06/19
- 2) Meeting with Parent and teachers before school with SINSW Community engagement member 19/06/19
- 3) Presentation to Parents (Warwick Farm PS and Liverpool Council childcare centre) and teachers at their coffee club 19/06/19
- 4) Letterbox drop and door knock with Warwick Farm residents 19/06/19

Next week:

- 1) Buildability workshop with the Warwick Farm Principal and Project team 26/06/19
- 2) Meeting with the Manager of Liverpool Council Childcare Centre 26/06/19

Spoke with Rachel from Liverpool council today (20/06/19) who inquired with Warwick Farm school (18/06/19) regarding the change of traffic. She mentioned Mahavir is her colleague and they are working together on this project.

We advised that:

- 1) Williamson crescent's crossover into the site is a distance from Warwick Farm's Kiss and Drop Zone. Discussed whilst using google-maps.
- 2) Deliveries are outside of school hours. School operating hours will be included in the CEMP and considered.
- 3) Additional trade vehicles are to park approximately 2 streets away (west) from the site and that this would be provided on a site-map in the updated CEMP. A letterbox drop has occurred advising residents of the potential construction traffic.

Please let me know if this is accepted and can be included in the Traffic Management plan.

Thank you, Melissa

From: Phil Ho <Phil.Ho@hutchinsonbuilders.com.au>
Sent: Wednesday, 19 June 2019 5:00 PM
To: Melissa Stojanovic <Melissa.Stojanovic@ghd.com>
Cc: John Tu <John.Tu@ghd.com>
Subject: FW: 25940_95 Lawrence Hargrave Road Warwick Farm_SSD 8792_Condition B20(b)

Melissa

A response from Liverpool council below.

Can you refer to Item 6, has GHD done any previous consultation with the school on this?

Should you have any questions, please do not hesitate to contact me.

Regards,

Phil Ho Project Manager

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T 02 8344 2432 | F 02 9313 7386 | M 0427 858 900 E phil.ho@hutchies.com.au A 23 DUNNING AVE, ROSEBERY NSW 2018 NSW

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From: Mahavir Arya [mailto:AryaM@liverpool.nsw.gov.au]
Sent: Wednesday, 19 June 2019 1:44 PM
To: Phil Ho
Cc: Charles Wiafe
Subject: FW: 25940_95 Lawrence Hargrave Road Warwick Farm_SSD 8792_Condition B20(b)

Hi Phil

Thanks for providing a copy of Traffic and Pedestrian Management Plan (TPMP) for Council comments.

Please update the plan to include the following for Council review and comments.

- 1. Location of the proposed worksite and proposed work access.
- 2. Access route of heavy vehicles.
- 3. Location of work vehicle parking within the worksite.
- 4. Future requirements of road occupancies and works zone for using the existing road reservation for the proposed works.
- 5. Copies of proposed traffic control plans, if any.
- 6. Consultation with the school.

The submitted document is incomplete as it has reference to other sections of the report which was not provided.

Please contact me should you be having any further questions.

Regards

Mahavir Arya Traffic & Transport Engineer



02 8711 7592 | | <u>AryaM@liverpool.nsw.gov.au</u> | <u>www.liverpool.nsw.gov.au</u> Customer Service: 1300 36 2170 | 33 Moore Street Liverpool, NSW 2170, Australia



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Order of Liverpool Award nominations close 23 July

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On 4 June 2019 7:45 am, Phil Ho wrote: Attention: Planning & Transport team

In regards to SSD8792 for 95 Lawrence Hargrave Road Warwick Farm, as per Condition B20(b), please find attached Traffic and Pedestrian Management Plan for your comment.

Should you have any questions, please do no hesitate to contact me.

Regards,

Phil Ho Project Manager

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Regards

Charles Wiafe

	×	
Service Manager – Traffic and Transport		

33 Moore Street, Liverpool NSW 2170 P: 8711 7452 E:<u>wiafec@liverpool.nsw.gov.au</u> | W: <u>www.liverpool.nsw.gov.au</u>

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Alex Chaplin

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Regards

Mahavir Arya Traffic & Transport Engineer



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Regards

Charles Wiafe

Service Manager – Traffic and Transport

33 Moore Street, Liverpool NSW 2170 P: 8711 7452 E:wiafec@liverpool.nsw.gov.au | W: www.liverpool.nsw.gov.au

Alex Chaplin

From:Phil Ho <Phil.Ho@hutchinsonbuilders.com.au>Sent:Monday, 1 July 2019 11:59 AMTo:Anushiya MohandasSubject:RE: MAINSBRIDGE SCHOOL FOR SPECIFIC PURPOSES – Traffic & Pedestrian Plan

Hi Anushiya

Thanks for your reply.

No I didn't receive any further communication.

Are you now able to assist?

Should you have any questions, please do not hesitate to contact me.

Regards,

Phil Ho Project Manager

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From: Anushiya Mohandas [mailto:Anushiya.MOHANDAS@rms.nsw.gov.au]
Sent: Monday, 1 July 2019 11:49 AM
To: Phil Ho
Subject: RE: MAINSBRIDGE SCHOOL FOR SPECIFIC PURPOSES – Traffic & Pedestrian Plan

Hi Phil, Did someone from RMS contact you regarding this matter?

Sorry I referred this to my colleagues prior to going on my leave and now he is gone on his paternity leave.

Regards, Anu

Anushiya Mohandas Network & Safety Officer (Mon, Tues and Wed) North West Precinct Greater Sydney Division

T 02 8849 2713 M 04 3770 6745 www.rms.nsw.gov.au Every journey matters From: Phil Ho [mailto:Phil.Ho@hutchinsonbuilders.com.au]
Sent: Thursday, 27 June 2019 4:03 PM
To: Sharon Verhoeven
Cc: Anushiya Mohandas
Subject: RE: MAINSBRIDGE SCHOOL FOR SPECIFIC PURPOSES – Traffic & Pedestrian Plan

Hi Sharon

Referring email below, is there a direct contact from the Network Safety Team I can discuss my plan with?

Should you have any questions, please do not hesitate to contact me.

Regards,

Phil Ho Project Manager

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From: Phil Ho
Sent: Monday, 17 June 2019 7:20 AM
To: 'Sharon Verhoeven'
Cc: Anushiya Mohandas
Subject: RE: MAINSBRIDGE SCHOOL FOR SPECIFIC PURPOSES – Traffic & Pedestrian Plan

Thanks Sharon

Is there a direct contact from the Network Safety Team I can discuss it with?

Should you have any questions, please do not hesitate to contact me.

Regards,

Phil Ho Project Manager

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From: Sharon Verhoeven [mailto:Sharon.VERHOEVEN@rms.nsw.gov.au] Sent: Friday, 14 June 2019 11:57 AM To: Phil Ho

Cc: Anushiya Mohandas **Subject:** RE: MAINSBRIDGE SCHOOL FOR SPECIFIC PURPOSES – Traffic & Pedestrian Plan **Importance:** High

Hi Phil

I have forwarded your email to the Network Safety Team.

Kind regards Sharon

From: Phil Ho [mailto:Phil.Ho@hutchinsonbuilders.com.au]
Sent: Thursday, 13 June 2019 10:53 AM
To: Development Sydney
Subject: RE: MAINSBRIDGE SCHOOL FOR SPECIFIC PURPOSES – Traffic & Pedestrian Plan

Hi There

Has anyone been able to review this report for comment?

Should you have any questions, please do not hesitate to contact me.

Regards,

Phil Ho Project Manager

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From: Phil Ho
Sent: Tuesday, 4 June 2019 7:41 AM
To: 'development.sydney@rms.nsw.gov.au'
Subject: MAINSBRIDGE SCHOOL FOR SPECIFIC PURPOSES – Traffic & Pedestrian Plan

Attention: Malgy Coman

Hi There,

In regards to the project at Mainsbridge School for Specific Purposes at 95 Lawrence Hargrave Rd Warwick farm (ref: SYD17/01351/02 (A21784985)) please find attached Traffic and Pedestrian Management Plan for your comment.

Should you have any questions, please do no hesitate to contact me.

Regards,

Phil Ho Project Manager

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Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix H: Weed Management Plan

greencap.com.au





To address the requirements of the Development Consent in reference to a Construction Environmental Management Plan for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. PROCEDURE

This Noxious Weed Management Protocol details how Hutchinson Builders will undertake works associated with the Project in accordance with the requirements of the Development Consent.

3.1 Noxious Weeds Identification

There are 24 plant species that are listed as weeds within 1km of the site identified under the *Environment Protection and Biodiversity Conservation Act 1999*. Noxious weeds have been detailed for ease of identification in Appendix A of this protocol.

3.2 Noxious Weeds Classification

In accordance with the Noxious Weeds Act 1993, noxious weeds identified with the project area will be treated in accordance with the following requirements.

Class	Characteristics	Example Control Requirements
Class 1 : State Prohibited Weeds	Plants that pose a potentially serious threat to primary production or the environment and are not present in the State or are present only to a limited extent.	The plant must be eradicated from the land and the land must be kept free of the plant. The weeds are also "notifiable" and a range of restrictions on their sale and movement exist.
Class 2: Regionally Prohibited Weeds	Plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies and are not present in the region or are present only to a limited extent.	The plant must be eradicated from the land and the land must be kept free of the plant. The weeds are also "notifiable" and a range of restrictions on their sale and movement exist.
Class 3 : Regionally Controlled Weeds	Plants that pose a serious threat to primary production or the environment of an area to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area.	The plant must be fully and continuously suppressed and destroyed.
Class 4 : Locally Controlled Weeds	Plants that pose a threat to primary production, the environment or human health, are widely distributed in an area to	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must

Page | 1



Class	Characteristics	Example Control Requirements	
	which the order applies and are likely to spread in the area or to another area.	not be sold propagated or knowingly distributed	
Class 5 : Restricted Plants	Plants that are likely, by their sale or the sale of their seeds or movement within the State or an area of the State, to spread in the State or outside the State.	There are no requirements to control existing plants of Class 5 weeds. However, the weeds are "notifiable" and a range of restrictions on their sale and movement exists.	

3.3 Noxious Weeds Control Measures

The following measures will be implemented where applicable to ensure efficient control and minimise weed spread:

- Weed control will be carried out prior to and during the construction phase to ensure the spread of weeds and their associated seeds are contained / controlled so they do not contaminate or impact the works, including stockpile areas and the surrounding environment.
- Prior to entering the project alignment, the work area will be inspected to confirm the presence
 of noxious weeds. Where noxious weeds are identified with in the construction corridor, weeds
 will be removed to the extent necessary, placed in a separate waste receptacle and covered to
 prevent seed spread.
- All noxious weeds that are cleared as part of the project will be segregated from non-weed species and disposed of to a licenced waste facility.
- Inspection/maintenance procedures will be undertaken to reduce the carriage of weed material on machinery.
- The introduction or spread of weed species on site will be minimised by avoiding introducing fill to the Project site and washing equipment and machinery before leaving a site and entering a new site.

3.4 Inspection and Monitoring

Potential weeds to be encountered during the project are included in Appendix A – Expected Weeds and Identification, of this document. These weeds will be removed, using the methods stated in these plans, both prior to and during the construction phase. The entire works area, including the stockpile areas, will be monitored regularly to ensure weeds that have been removed do not return throughput the construction phase and during the 24 months monitoring period.

All plant, equipment and vehicles accessing and exiting the project site will be inspected to ensure soil, vegetative material or other material has been removed. Construction plant and vehicles working in areas identified as containing noxious weeds will be thoroughly washed down prior to leaving the immediate site. Monitoring will be recorded on the waste management log sheet and weekly environmental inspection report.



Appendix A: Expected Weeds and Identification				
Species	Status	Required treatment	Potential location	Identification
Alligator Weed Alternanthera Philoxeroides	Weed of National Status (WONS) Class 2	Low – high volume spot spray, dependant on occurrence of large weed mass and proximity to native vegetation.	Seasonal flood ways, creeks, drainage canals and has been identified in the Georges River.	
Madeira Vine Anredera Cordifolia	WONS	Physical removal – remove all vine parts, underground tubers and climbing vines. Cut back top growth and spray 2 metre stems with herbicides.	Bushlands, waste areas, gardens, parks, roadsides and waterways.	
Asparagus Fern Asparagus Aethiopicus	WONS Class 3	Physical removal – remove all parts, rhizomes and tubers. Spot spray or brush with herbicides for large infestations.	Scattered	



Appendix A: Expected Weeds and Identification				
Species	Status	Required treatment	Potential location	Identification
Bridal Creeper Asparagus Asparagoides	WONS Class 2	Application of herbicides away from native species or spot sparing of herbicides to fresh cut lower limbs.	Along roadsides, waste places, scrubland, riparian vegetation areas and lowland grassy areas.	
Cabomba Cabomba Caroliniana	WONS Class 2	Physical cutting and removing from land accessible areas.	Within aquatic environments.	
Boneseed Chrysanthemoides Monilifera Subsp. Monilifera	WONS Class 3	Shrub areas.	Scattered.	





Appendix A: Expected Weeds and Identification				
Species	Status	Required treatment	Potential location	Identification
English Broom Cytisus Scoparius	WONS Class 4	Hand weeding and hoeing for small isolated plants. Bulldozing for large infestations. Cut and paint with herbicides.	Roadsides and edges of bushland.	
Water Hyacinth Eichhornia Crassipes	WONS Class 2	Remove by hand and harvest machine removal for larger infestations. Use of herbicides with local council approval.	Within aquatic environments.	
Cape Broom Genista Monspessulana	WONS Class 2	Hand removal of smaller plants. Cut and paint of larger plants with herbicides	Small gardens, disturbed areas such as roadsides, fence lines, creek margins and poorly managed pastures, and disturbed bushland.	









Appendix A: Expected Weeds and Identification				
Species	Status	Required treatment	Potential location	Identification
Lantana Lantana Camera	WONS Class 2	Combination of herbicides, mechanical removal, biological control and revegetation.	Disturbed sites such as roadsides, cultivated	
African Boxthorn Lycium ferocissimum	WONS Class 2	Herbicides can be applied as foliar sprays when the plants are actively growing, spraying around the base of stems to a height of 30-40 cm above ground level or cutting each stem off at ground level and immediately applying herbicide to the cut surface. Where there are no native plants to be affected, a residual herbicide can be applied to the soil between the base of the plant and the drip-line, usually when the soil is wet or rain is expected	Creek-beds, fence-lines and roadsides.	
Chilean Needle Grass Nassella neesiana	WONS Class 3	Removal by hand or chipping.	Scattered.	









Appendix A: Expected Weeds and Identification				
Species	Status	Required treatment	Potential location	Identification
Serrated Tussock Nassella trichotoma	WONS Class 3	Spot spraying with a registered herbicide or chipping with a mattock.	Scattered.	
Prickly pear Opuntia spp.	WONS Class 4	Hand weeding – Hand-removal of plants, fruit and root systems	Scattered	
Blackberry Rubus Fruticosis Aggregate	WONS Class 3	Burning, slashing, grazing, grubbing, chemical spraying and biological control. The chosen program it will need to be planned and sustained over a number of years to prevent re-infestation.	Scattered	





Appendix A: Expected	Weeds and Identifica	ation		
Species	Status	Required treatment	Potential location	Identification
Sagittaria Sagittaria Platyphylla	WONS Class 4	Low – high volume spot spray, dependant on occurrence of large weed mass and proximity to native vegetation. Application of herbicide to isolate and discrete occurrences of weed species	Creek lines.	
Willows Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii	WONS Class 2 and 3	Apply high rates of grass selective herbicides any time from autumn to spring.	Creek lines.	
Salvinia Salvinia Molesta	WONS Class 2	Mechanical weeding – Removal of weeds from water with mechanical harvesters and scoops. Low – high volume spot spray, dependant on occurrence of large weed mass and proximity to native vegetation. Application of herbicide to isolate and discrete occurrences of weed species	On surface water.	





Appendix A: Expected Weeds and Identification					
Species	Status	Required treatment	Potential location	Identification	
Fire Weed Senecio madagascariensis	WONS Class 4	Chipping removal of plants. Low – high volume spot spray, dependant on occurrence of large weed mass.	Roadsides, pastures and areas adjacent open forest. Prefers bare soil to establish.		









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Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix I: Erosion and Sediment Management Plan



1. PURPOSE

May 2019

To address the requirements of the Development Consent in reference to a Construction Erosion and Sediment Control Plan for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. PROCEDURE

This Erosion and Sediment Management Plan details how Hutchinson Builders will undertake works associated with the Project in accordance with provisions made in the following legislative guidelines;

- Water Administration Act 1986;
- Managing urban Stormwater Soils and Construction Volume 1, Landcom 2004; "The Blue Book";
- Guidelines for Erosion and Sediment Control on Building Sites; and
- Managing Urban Stormwater Design DEC, 1998.

Table 1: Erosion and Sediment Control Plan		
Actions	Responsible	Timing
Diversion of uncontaminated runoff around site works as practicable.	Construction Project Manager	Beginning
Work site area perimeter sediment fence is to be constructed prior to the commencement of works.	Construction Project Manager	Beginning
Install temporary sediment trap(s) (e.g. gravel sausages / sand bags) around street stormwater gutters. Existing stormwater entry points in the vicinity of the excavation shall be protected from ingress of materials which may be placed or stockpiled in the vicinity of the excavation.	Construction Project Manager	Throughout
Stockpiles are to be placed in designated areas which can be appropriately bunded using sediment fences, gravel sausages/ sand bags or straw bales on at least the down-slope side.	Construction Project Manager Site workers	Throughout
Stockpiles intended to remain for extended periods, or during inclement weather are to be covered with suitable covering material and anchored with bricks or similar to prevent exposure of the material.	Construction Project Manager	Throughout
Dust control measures such as wetting of stockpiles and/or covering of stockpiles to be used where required. If water spraying is required for site dust suppression, care will be taken to control the quantities of water sprayed so that run-off is not generated.	Construction Project Manager	Throughout
Any soil or mud spilled onto road surfaces or public areas from construction activities should be promptly cleaned.	Construction Project Manager Site workers Haulage	Throughout
Performance Indicators	Responsible	Timing
No evidence of soil mobilising off site into stormwater drains or nearby water bodies.	Construction Project Manager	Throughout



May 2019

Table 1: Erosion and Sediment Control Plan		
No visible evidence of stockpile erosion, particularly following rainfall events.	Construction Project Manager	Throughout
No visible evidence of soil mobilising off site through onto public roadways / paths.	Construction Project Manager	Throughout
Limited issues identified during the works program	Construction Project Manager	Throughout
Monitoring	Responsible	Timing
Construction Project Manager (or delegate) should assess stockpile conditions daily, ensuring they are covered (if necessary).	Construction Project Manager Site workers	Throughout
The Construction Project Manager (or delegate) shall record details of any erosion onsite and immediately take corrective measures to prevent further such occurrence.	Construction Project Manager Site workers	Throughout
Reporting	Responsible	Timing
Reporting Erosion/ sedimentation issues should be reported to the CPM immediately.	Responsible Construction Project Manager Site workers	Timing Throughout
Reporting Erosion/ sedimentation issues should be reported to the CPM immediately. The CPM should record any incidents in a logbook or form and report on corrective actions taken before the recommencement of site work.	ResponsibleConstructionProject ManagerSite workersConstructionProject Manager	Timing Throughout Throughout
Reporting Erosion/ sedimentation issues should be reported to the CPM immediately. The CPM should record any incidents in a logbook or form and report on corrective actions taken before the recommencement of site work. Corrective Actions	ResponsibleConstructionProject ManagerSite workersConstructionProject ManagerResponsible	Timing Throughout Throughout Timing
Reporting Erosion/ sedimentation issues should be reported to the CPM immediately. The CPM should record any incidents in a logbook or form and report on corrective actions taken before the recommencement of site work. Corrective Actions Sediment trapped by the down slope controls should be removed as required to maintain effectiveness. This sediment can be re-stockpiled.	ResponsibleConstructionProject ManagerSite workersConstructionProject ManagerResponsibleConstructionProject ManagerSite workers	Timing Throughout Throughout Timing Throughout
Reporting Erosion/ sedimentation issues should be reported to the CPM immediately. The CPM should record any incidents in a logbook or form and report on corrective actions taken before the recommencement of site work. Corrective Actions Sediment trapped by the down slope controls should be removed as required to maintain effectiveness. This sediment can be re-stockpiled. Investigate the cause of the incident.	ResponsibleConstructionProject ManagerSite workersConstructionProject ManagerConstructionProject ManagerSite workersSite workersConstructionProject ManagerSite workersConstructionProject ManagerSite workersConstructionProject Manager	TimingThroughoutThroughoutTimingThroughoutThroughoutThroughout





Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix J: Environmental Incident Response Plan

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1. PURPOSE

The intent of this Environmental Incident Response Plan (EIRP) is to assist site personnel to adequately respond to a potential emergency situation. It details specific responsibilities and processes to be implemented in the event of an environmental incident that could result in environmental impact.

This document shall be read in conjunction with the CEMP and associated Hutchinson Builders internal procedures.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. RESPONSIBILITIES

Responsibilities of key personnel with regards to implementing this plan are as set out in the following section.

The Hutchinson Builders Project Manager shall be accountable for the implementation of this Environmental Incident Response Plan and shall be assisted in daily activities by the Hutchinson Builders nominated "Incident Response Coordinator (IRC)".

3.1 Construction Manager

Table 1: Construction Manager Responsibilities				
Responsibilities	Frequency			
Ensure that activities are assessed for risk prior to commencement	Continually			
Managing the emergency from a corporate level	As required			
Informing the Managing Director, Systems Manager and Operations Manager of an incident	On occurrence			
Participation in the investigation of serious incidents	On occurrence			
Provide appropriate resources to implement the processes defined in this Plan	As required			

3.2 Project Manager

Table 2: Project Manager Responsibilities		
Responsibilities	Frequency	
Manage environmental Incident response on the project site level	On occurrence	
Report Incidents to the appropriate regulatory authority in accordance with Section 5.7 of the POEO Act 1997 (Pollution events causing or threatening 'material harm' to the environment.)	On occurrence	
Review and implement this plan	As required	
Ensure that foreseeable risks (potential emergency situations) are identified, documented on Workplace Risk Assessments and controlled appropriately	Continually	
Provide appropriate resources to implement the processes defined in this Plan (Nominate the Incident Response Coordinator)	As required	



Table 2: Project Manager Responsibilities	
Responsibilities	Frequency
Ensure site personnel are trained in environmental incident procedures	As required
Inform the Construction Manager of environmental incidents	On occurrence
Inform the Client representative of environmental incident status	On occurrence
Notification of and participation in the investigation of serious incidents	On occurrence
Monitor the effectiveness of implemented incident control measures	Continually
Keep Hutchinson Builders management informed of the ongoing situation regarding an environmental incident	As required

3.3 Project Supervisor

Table 3: Project Supervisor Responsibilities	
Responsibilities	Frequency
Review and implement this Plan	As required
Ensure that foreseeable risks (potential emergency situations) are identified, documented on Workplace Risk Assessments and controlled appropriately	Continually
Notification of and participation in the investigation of serious incidents	On occurrence
Implement incident control procedures	As required
Monitor the effectiveness of implemented emergency response control measures	Continually
Accounting for all personnel working for Hutchinson Builders and various subcontractors if an environmental incident occurs.	On occurrence
Co-ordinating with the incident response coordinator	As required

3.4 Hutchinson Builders Workforce

Table 4: Hutchinson Builders Workforce Responsibilities		
Responsibilities	Frequency	
Notify the occurrence of all hazards and incidents to the Hutchinson Builders Project Supervisor / Project Manager	All Incidents	
Adhere to all incident response related instructions provided by supervision or Emergency Response Coordinator	Continually	

3.5 Hutchinson Builders Subcontractors

Table 5: Hutchinson Builders Subcontractors	
Responsibilities	Frequency
Notify the Hutchinson Builders Project Supervisor / Project Manager of activities being performed that are high risk or could be cause for an emergency situation	Continually
Notify the occurrence of all hazards and incidents to the Hutchinson Builders Project Supervisor / Project Manager	All Incidents

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Frequency

December 2019

Table 5: Hutchinson Builders Subcontractors

Responsibilities

Adhere to all incident response related instructions provided by supervision or Continually Emergency Response Coordinator

3.6 Incident Response Coordinator (IRC)

The IRC is to be either the Project Manager or Supervisor.

Table 6: IRC Responsibilities	
Responsibilities	Frequency
Ensure site personnel are trained in incident response procedures	Continually
Implement incident control procedures	As required
Determine the level of response required to adequately manage an Environmental Incident	On occurrence
Coordinate with emergency services, client and other stakeholders throughout incident.	Continually
Notify the occurrence of an environmental incident to the Hutchinson Builders Project Supervisor / Project Manager	Continually
Maintain communication with Hutchinson Builders Management throughout emergency situation	As appropriate

4. **GENERAL**

In preparation for an environmental incident occurring, the risks associated with the site's activities and the interaction of our activities with other stakeholders will be identified through the daily hazard assessment. Potential Hazards and risks will be identified, assessed and suitable controls implemented.

5. EMERGENCY WARNING

In the event of an emergency on this site, personnel will be alerted via the following methods:

- Selected UHF Radio Channel communication through "Emergency, Emergency" call,
- Verbal communication if in ear shot,
- Building alarm systems,
- An aerosol siren, or
- Non-verbal hand signals / gestures to indicate if something is wrong.

6. POTENTIAL SITE SPECIFIC EMERGENCY SITUATIONS

On review of the scope of works, the following potential environmental incidents have been identified;

- Fire (building / equipment / plant / explosion / vegetation);
- Hazardous substance spillage or disturbance;
- Uncontrolled pollutant release;
- Flooding;

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- Traffic Accidents; and
- Injury to workers or public.

7. EMERGENCY RESPONSE EQUIPMENT

The Hutchinson Builders Project Manager shall ensure environmental incident response equipment is appropriate to the tasks being performed and is suitably maintained, serviced and strategically located around the site. Allocation of sufficient resources to implement emergency response procedures will include spill kits, fire extinguishers, erosion and sediment controls, plant, equipment and personal protective equipment.

7.1 Fire Fighting Equipment

- Fire extinguishers shall be suitable for the type of works to be performed;
- Fire extinguishers shall be located in easily accessible locations; and
- Employees shall be trained in the correct identification and application of the fire-fighting equipment.

7.2 Hazardous Substances

Spill kits appropriate to the quantities and type of hazardous materials in use on site shall be located in close proximity to where work is being done or where the material is stored.

Before commencing any clean-up of hazardous substances spill, a specific risk assessment shall be conducted to ensure site personnel are not exposed to any significant yet not considered risks.

7.3 Control of Discharge of Pollutants

Equipment will be maintained to control the potential discharge of pollutants to the environment. This will include erosion and sediment controls (sediment fence, sand bags, geotextile material covering), dust suppression control (e.g. Water carts, sprays) plant and machinery (e.g. pumps) to undertake remediation if required.

7.4 Communication Devices

Devices for communication on this site will be via:

- UHF radio, channel to be confirmed; and
- Mobile phone device.

8. EMERGENCY RESPONSE

An environmental incident response drill shall be completed within the first 6 weeks of establishment on site and thereafter at 6 monthly intervals or as otherwise determined by the Project Manager. Such drills will include all personnel on site at any specific time (extends to employees, subcontractors and visitors)

Note: Drills should simulate various potential emergencies (fire, chemical spills or personnel injury) so that the response can be practiced.



9. EMERGENCY RESPONSE PROCEDURES

The following incident procedures are a guide of what to do in the event of an environmental Incident and shall be communicated to all site personnel at their induction.

Table 7: Emergency Response Procedures	
Event Type	Response
Any incident and emergency	 Assess for danger to workers and general public; Notify local emergency services if required based on severity of situation; Cease activities and implement appropriate response procedures to minimise environmental impact; Notify the Hutchinson Builders Project Supervisor and Project Manager; and Notify regulatory authority and project client where required.
Water pollution	 Switch off pump, close valves, seal hoses, plug leaks (stops water source); Form a barrier around the discharge i.e. booms, sand bag bunds; Divert discharge away from drainage lines and water courses; If the discharge is contained on land, then reclaim the substance. This may be achieved by soaking up with spill response equipment or pumping substance back into where it has been pumped from e.g. water cart, bund, sediment basin, holding tank etc. Do not pump from water bodies.
Noise and or vibration above allowable limits	 Cease noise and vibration generating activities; Liaise with any affected community stakeholders, manage complaints; Reassess construction methodologies and plant items used; and Monitor noise and vibration impacts in accordance with compliance levels.
Air pollution e.g. dust, odour	 Cease dust / odour generating causing works; Engage water cart to wet down exposed soil surfaces; Cover odour generating stockpiles with material covers e.g. geo-textile; and Discontinue works in windy conditions.



Table 7: Emergency Response Procedures		
Event Type	Response	
Damage to property including cultural heritage	 Cease construction activities and make the area safe; Notify Project Manager; Liaise with any affected community stakeholders, manage complaints; Cultural heritage – notify appropriate regulatory authority; and Limit access to area with safety barriers. 	
Non approved impact to vegetation	Cease construction activities and make the area safe;	
Death or injury to native fauna	 Notify Project Manager and Project Supervisor; and Notify appropriate regulatory authority. 	
Unlawful waste disposal		
Fire, including bushfire emergencies	 Extinguish the fire immediately if safe to do so using fire extinguishers, fire hose, water carts etc.; Remove any hazardous or flammable construction materials from the area where possible e.g. fuel containers, plant and equipment if safe to do so; If unsafe, notify the local Fire Control Services and safely evacuate the area; If required, notify local residents to evacuate affected areas; No hot works to be carried out during "Total Fire Ban" days; In the event of a bushfire being imminent, the Hutchinson Builders Project Supervisor and Project Manager are to call a cease to all works until it is deemed safe to do so by the local authorities; Should a bushfire emergency occur while workers are on site, all personnel are to be evacuated immediately to the emergency evacuation point beside the site lunch room and wait there for further communication from Hutchinson Builders management. Communication methods as noted in section 5 and 7.4 above should be used to advise of the emergency. 	
Flood	• Do not store construction materials e.g. (Plant equipment, stockpiles, containers etc.) within the creek line, low lying or flood prone areas;	

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Table 7: Emergency Response Procedures		
Event Type	Response	
	Monitor weather conditions continually in preparation of flood events;	
	• Remove plant and equipment from, low lying or flood prone areas in times of heavy or prolonged rainfall;	
	 Restrict access to site by blocking access routes, installing warning signs and informing the wider construction team; and 	
	Continue to monitor weather conditions and inform construction teams accordingly.	
Sediment discharge	• Do not store stockpiles within the creek line, low lying or flood prone areas;	
	Contain the discharge- Form a barrier around the discharge i.e. sediment fences, sand bag bunds; and	
	 Recover the sediment – use excavators, shovels and other earth moving equipment to return sediment to appropriate area or disposal to a licensed facility. 	
	Stop the spill - Switch off pump, close values, seal hoses, plug leaks;	
Spill	Contain the spill - Form a barrier around the discharge i.e. booms, sand bag bunds;	
	 Recover the spill – use absorbent material from the spill kits to soak up the spilt liquid. Can also use soil, sand or absorbent pads; 	
	 Collect the contaminated sorbent - Brooms can be used to sweep up the sorbent material and put it into buckets or garbage bags and directly into waste bins; 	
	 Dispose of the waste – in accordance with its waste classification; and 	
	Restock the spill kit and report to the Project Manager.	



10. INCIDENT RESPONSE CONTACT DETAILS

Table 8: Incident Response Contact Details		
Issue	Contact	Number
Life threatening emergencies Spills involving Mercury (call HAZMAT)	Fire Brigade (including HAZMAT), Ambulance or Police	000
Safety, Environmental issues, incidents, complaints,	Hutchinson Builder Site Manager – Dennis Denobrega	0429 657 037
contamination sites, heritage discoveries etc.	Greencap Environmental Consultant – Matthew Barberson	0438 862 88
Pollution incidents	EPA	131 555 or 02 9995 5000 (24 hours)
	Ministry of Health	9391 9000
	SafeWork NSW	13 10 50
	City of Liverpool	1300 362 170
Electricity Supplier (NSW)	TransGrid	1800 027 253
Loss of supply, fallen wires, or other electrical emergency	Endeavour Energy	131 003
Discovery of Aboriginal heritage items	OEH Aboriginal heritage division.	02 9873 5800
Discovery of Non-Indigenous heritage items	Heritage Council	131 555 or 02 9995 5000 (24 hours)
Discovery of human skeletal	NSW Police	000 or 112 (from a mobile)
remains	Hutchinson Builder Site Manager - Dennis Denobrega	0429 657 037
Water and sewer mains	Sydney Water	13 20 90 (24 hours)
Injured animals	WIRES – Sydney	(02) 8977 3333

Table 9: Hutchinson Builders Contacts		
Hutchinson Builders Site Contacts		
Position	Contact Name	Contact Number
Dennis Denobrega	Site Manager	Mob: 0429 675 037
Hutchinson Builders Off-Site Contacts		
Position	Contact Name	Contact Number
Hutchinson Builders Sydney Office	John Koumoukelis	(02) 8344 2424



11. NOTIFY REGULATORY AUTHORITY

In the event of an environmental incident causing or threatening 'material harm' to the environment, the following authorities must be notified immediately (in this order):

- The appropriate regulatory authority; either the EPA of SafeWork NSW;
- Ministry of Health;
- Local Council; and
- Fire and Rescue NSW.

Contact numbers can be found in section 10 of this Plan.

12. INCIDENT REPORTING

In the event of an incident, the following will be undertaken:

- A record of the incident will be completed;
- An incident investigation prior to the end of the next business day will be commenced, unless there are statutory or other requirements to commence sooner;
- An incident investigation report will be completed, which, among other things, nominates appropriate timeframes for completing improvement actions arising from the incident investigation, taking into consideration the exposed risk;
- The incident investigation will be completed within 5 Business Days of commencing the incident investigation, unless otherwise agreed by Sydney Water; and

To appropriately maintain a record of all incidences which have occurred on site, the following documentation is utilised:

- An Environmental Incident Register is included in Appendix A of this document.
- An Environmental Incident Form is included in Appendix B of this document.

Any improvement actions contained in the relevant incident investigation report will be implanted within the nominated timeframe.

12.1 Analyse Incident

The Hutchinson Builders Project Manager, in conjunction with the Hutchinson Builders Construction and Systems Managers, shall review the incident and implement effective corrective and preventive actions. Any such actions shall be communicated throughout the company to ensure potential recurrence is minimised on any other sites.



13. MONITORING AND CONTROL

Routine monitoring will be undertaken by the Project Manager and Project Supervisor on control equipment using the Environmental Checklist provided in Appendix B of the CEMP. Workplace inspections will be undertaken periodically to assess compliance with the requirements of this procedure. The table below details monitoring that will be undertaken to minimise the likelihood and to maintain preparedness for environmental incidents and emergencies.

Table 10: Environmental Incident Monitoring		
Control Parameter	Target Level	
Fire Extinguishers	All Fire Extinguisher inspection tags current.	
Spill Response Kits	Adequate size spill kits retained on site. Spill kits located in all excavators and other hydraulic plant.	
Sedimentation Controls	Appropriate sediment controls in place and availability of adequate supplies of sedimentation controls.	
MSDS available on site	MSDS for all materials used on site available and up to date.	

14. REVIEW

The Project Manager shall ensure that the Environmental Incident Management Plan is reviewed after each and every drill or emergency situation.

Results of emergency drills and evacuations shall be communicated back to the site at a toolbox meeting, so all personnel are aware of any improvements.

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Appendix A: Environmental Incident and Action (EIA) Register					
EIA Number	Date Issued	Responsible Person	Date Due	Date Closed	

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Appendix B: Environmental Incident and Action (EIA) Form					
Date Issued:	Issued to:				
Issued by:	EIA Number:				
Close Out Date:	EIA Type:				
1. Details of Enviror	nmental Incident				
Issued By:	Date:				
2. Roo <u>t Cause Analy</u>	/sis				
2 Corrective Prove	atative Action to be Undertaken				
5. Confective Prever					
4 Corrective Prever	ntive Action taken to Prevent Recurrence				
D					
Responsible Person	Date EIA to b Completed	e			
Signed	Date Signed:				
5. Verification that	Corrective/ Preventive Action is Complete				
	Date				
Closed	Dute				
Closed Further Action					





Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix K: Noise and Vibration Management Plan

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1. PURPOSE

February 2020

To address the requirements of the Development Consent in reference to a Construction Noise and Vibration Management Plan for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. PROCEDURE

This Noise and Vibration Management Plan details how Hutchinson Builders will undertake works associated with the Project in accordance with the Interim Construction Noise Guidelines (OEH 2009) and the EPA Noise Control Manual Chapter 171 "Noise Control Guidelines for Construction Site Noise".

3.1 Sensitive Receptors

The closest sensitive receptors are the residential dwellings on the western boundary, the day care centre on the northern boundary and the Warwick Farm Public School on the southern boundary of the construction site.

3.2 Potential Impacts

Construction noise and vibration impacts on residential dwellings within the proximity of the study area would be associated with the following:

- Vehicle and staff movements;
- Generator operation;
- Use of plant and machinery for clearing/transporting of vegetation;
- Excavation and compaction works;
- Use of plant machinery for spoil removal and sandstone block splitting and sorting;
- Use of equipment for cleaning; and
- Delivery and removal of materials.

Vibration impacts would be generated by truck movements and use of plant equipment. Such potential vibration impacts are likely to dissipate with distance from the works. Due to the proximity of the sensitive receptors the potential for impact is moderate, but temporary and limited to the duration of the construction works.

Vibration generated by construction activities is not anticipated to exceed the Department of Environment and Climate Change criteria for human comfort (DECC, 2006) due to the distance of the works from residential receivers.

3.3 Noise

When planning construction operations; ensure all practical efforts to comply the EPA Noise Control Manual Chapter 171"*Noise Control Guidelines for Construction Site Noise*". Where the EPA guidelines are likely to be exceeded, apply a practical and economical combination of noise control measures to manage the impacts of construction noise. This include operational controls such as:

- Substitution by alternative process;
- Restricting times when noisy work is carried out;

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February 2020

- Placement of work compounds, parking areas, equipment and material stockpile location away from noise-sensitive locations;
- Where noise barriers/walls are to be constructed, program this as early as possible to reduce noise impacts from other construction work on sensitive receptors;
- Screening or enclosures; and
- Consultation with affected residents. Provisions for this is located in the CEMP.

All construction plant and equipment used on the project must, in addition to other requirements, be:

- Fitted with properly maintained noise suppression devices in accordance with the manufacturer's recommendations;
- Maintained in an efficient condition; and
- Operated in a proper and efficient manner.

Potential risk events which can give rise to hazards associated with noise and vibration include but are not limited to:

- Plant and equipment operation;
- Failure of plant noise controls; and
- Adverse weather conditions (wind).

3.4 Background Noise Levels

The background noise levels and the intrusiveness noise objectives derived from long term noise logging are presented in the Environmental Impact Statement (Ubris 2017) are provided in **Table 1**.

Table 1: Long Term Noise Logging					
Time of Day	Background Noise Level dB(A)L ₉₀	Intrusiveness Noise Objectives dB(A)Leq (15 minutes) (Background+5db)			
Day Time (7am-6pm)	39	44			
Evening (6pm-10pm)	33	38			

3.5 Noise Controls

3.5.1 Muffler Requirements

As most construction noise is derived from plant powered by internal combustion engines, much of the noise will be controlled by use of adequate muffler systems. Check when plant starts at whether mufflers are defective. If so, arrange prompt repairs, or get subcontractors to fix their plant.

3.5.2 Maintenance and Operation of Equipment

Poor maintenance of construction plant may increase operating noise levels. Faulty or loose mechanical parts etc, all contribute to increasing noise level of machines and equipment.

Careless or improper handling and operation of plant can also increase construction noise levels. Poor handling, unloading, excavation and hauling techniques are some examples of how lack of adequate guidance may lead to increased noise levels.

All construction plant must be regularly inspected to ensure adequate maintenance. Operators will be required to be properly trained in the use of construction plant.



February 2020

3.5.3 Plant Emission Level Requirements

One of the most effective methods of reducing noise impact of induvial items of construction plant is to use quieter machines. This will be accomplished by specifying the quietest available plant.

3.5.4 Time and Activity Constraints

During leisure hours, noise disturbance from construction plant must be kept to a minimum. The basis for this noise management strategy will be to limit the times that certain noise producing activities may be carried out. Generally, this will be accomplished by performing noisy work during daylight hours.

3.6 Vibration Controls

3.6.1 Time and Activity Constraints

During leisure hours, vibration disturbances from construction must be kept to a minimum. The basis for this vibration management strategy will be to limit times that certain vibration producing activities may be carried out. Generally, this will be accomplished by performing such work, during day light hours (when the majority of adjacent residents are either not present or engaged in less vibration sensitive activities).

3.7 Dilapidation Surveys

Unless otherwise approved, dilapidation surveys should be carried out for each public utility, structure and building within the distance from the appropriate construction activity as follows:

Table 2: Dilapidation Survey Requirements				
Activity	Distance			
Excavation by hammering or ripping	100m			
Demolition of Structures	50m			

4. SITE CONTROL MEASURES

In addition to the measures in this section, please refer to Attachment 2 of this plan for the CNVMP of Acoustic Logic.

4.1 Standard Working Hours

Monday to Friday: 7am to 5pm

Saturday: 8am to 1pm

No work Sunday and Public Holidays

No hammering or saw cutting before 7:30 am Monday to Friday or before 8:30 am on Saturday.

SINSW's Community Communication Strategy for the site specifies additional construction hours. Rock breaking, hammering, sheet piling and similar activities are only to be conducted in the following hours:

Monday to Friday: 9am to 12pm

Monday to Friday: 2pm to 5pm

Saturday: 9am to 12pm



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4.2 High Noise Generating Activities

Rock breaking or hammering, jack hammering, pile driving, vibrating rolling, cutting of pavement, concrete or steel and any other activities which result in Impulsive or Tonal Noise generation shall only be scheduled between normal working hours as stated above in section 4.1.

Work outside of standard hours: All out of hours works are subject to approval by Department of Education and local council.

Any "Emergency Work" to avoid the loss of lives, property and/or to prevent environmental harm is exempt.

Strategies for managing high noise generating works were developed through community consultation process described in Section 4.8.

4.3 Standard Controls

- All vehicles, plant and equipment must be fitted with appropriate and approved sound attenuators (exhaust silencers) and maintained in good operating condition as per manufacture specifications/requirements;
- Minimise vehicle movement including loading and unloading operations;
- Minimise disturbance arising from delivery of goods to construction site;
- Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers;
- Switch off/turn off vehicles and equipment that are unnecessarily idling or not required;
- To minimise noise and vibration, whenever possible, house machine on rubber;
- Avoid shouting;
- Adhere to site specific delivery hours and truck movements; and
- Reversing beepers to be monitored and possible fit out of the Quaker type.

All noise (including the use of audio equipment e.g. 2-way radio) and vibrations should be kept to a minimum and managed in accordance with the applicable Australian Standard (e.g. Noise-Australian Standard 2436, Guide to noise control on construction, maintenance and demolition sites) and EPA requirements.

4.4 Complaints Handling

Complaints regarding noise or vibration are to be addressed under Section 5.6 of this CEMP.

4.5 Performance Indicators

- No unreasonable noise releases;
- No undue vibration detected;
- No complaints from nearby residences/business/local authority; and
- No structural impact as consequence activities.

4.6 Monitoring

• The Development Consent C20. requires vibration monitoring for vibratory compactors used within 30m of residential buildings to ensure compliance with the following criteria as prescribed in C19.:

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February 2020

(a) for structural damage, the latest version of DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures (German Institute for Standardisation, 1999); and

(b) for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: a technical guideline (DEC, 2006) (as may be updated or replaced from time to time).

- All vibration and noise complaints that are neither frivolous nor vexatious, as assessed by the Site Manager shall be investigation and assessed to determine if the noise or vibration is unreasonable or unacceptable; and
- Such investigations may require vibration or noise monitoring at the complainant's residence to identify the offensive source.

4.7 Corrective Action

- In the event that unreasonable noise is caused by machinery, appropriate repairs shall be undertaken, and the maintenance schedule reviewed;
- Should vibration or noise levels exceed standards criteria, vibration measurement assessment shall be performed by a suitably qualified person and a review of mitigation measures is to be undertaken and appropriate corrective action to be implemented;
- In the event that monitoring confirms non-compliance of the performance criteria, the Site Manager or delegated personnel shall undertake any necessary measures to achieve compliance. Corrective actions may include:
 - Repairs to exhaust silencers;
 - Relocation of the relevant activity; Alteration to the hours of operation of the specific machinery; and use of alternative machinery.

The Project Manager is to be notified in the event of non-compliance.

4.8 Community Liaison

The following phases of the community engagement has been undertaken at the time of writing this plan (25/06/2019):

- 1) Site Office with the Assistant Principal, teacher representative, SINSW and Head Contractor 06/06/19
- 2) Meeting with Parent and Teachers before school with SINSW Community engagement member 19/06/19
- 3) Presentation to Parents (Warwick Farm PS and Liverpool Council Childcare Centre) and teachers at their coffee club 19/06/19
- 4) Letterbox drop, and door knock with Warwick Farm residents 19/06/19
- 5) Community consultation regarding High Noise Generating Activities was undertaken on 30/01/2020 – evidence associated with this consultation is attached to this plan (See. Attachment 1 of this plan)

Further proposed community engagement strategies include the following:

- 1) Buildability workshop with the Warwick Farm Principal and Project team 26/06/19
- 2) Meeting with the Manager of Liverpool Council Childcare Centre 26/06/19

All community engagement works have been completed as provided in Section 5.5 of this CEMP.

Use **Table 3** to record occasions or refer to Section 5 of the CEMP for Community Consultation when notifications to the community take place. Use **Table 4** to record any vibration complaints.

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Table 3: Schedule of Community Liaison				
Date of Advice	Medium	Area Covered	Activity	Position & Signature
12 February 2020	High Noise Generating Activities	Warwick Farm PS and Childcare Centre	Civil Works Truck Deliveries Drilling Hammering Angle Grinding Electric Saw Impact Drill Concrete Pumping Cement Truck Mixing	Refer to Attachment 1 of this Plan



February 2020

Table 3: Schedule of Community Liaison				
Date of Advice	Medium	Area Covered	Activity	Position & Signature

Table 4: Schedule of Noise/Vibration Complaints and any Noise Incidences			
Date	Complaint/Incident	Response	Position & Signature



February 2020

	-	-





ATTACHMENT 1 OF NVMP - Evidence of community consultation

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Level 2 / 11-17 Khartoum Road North Ryde NSW 2113 Australia P: (02) 9889 1800 www.greencap.com.au

21 January 2020

Amir Maglajilic Contracts Administrator Hutchinson Builders 23 Dunning Avenue, **ROSEBERY, NSW 2018**

RE: Community Consultation Meeting Agenda for High Noise Generating Activities

Dear Amir,

Greencap understands the details about the discussions made in previously held community consultation meetings regarding high noise generating activities were not available in records. Therefore, to be on the safe side, the parties decided to organise a specific community consultation meeting for High Noise Generating activities.

The proposed agenda of this meeting is provided as follows in accordance with the requirements of the Construction Noise and Vibration Management Plan (CNVMP)—*subject to stakeholder acceptance, including the Independent Environmental Auditor*:

- High Noise Generating Activities planned to be undertaken
- Anticipated time frames, dates and duration of these activities
- Site control measures to minimise noise impact from high noise generating activities
- Discussion of group concerns about high noise generating activities and recording their inputs
- Complaints handling procedure
- Provision of the details of the Site Manager for potential noise complaints

Minutes of meetings need to be hold during this meeting and the inputs received from the nearest potentially affected community members (includes the Child Care Centre to the North, Warwick Farm Public School, and the residential premises to the West) need to be incorporated to the CNVMP.

Yours sincerely,

Matthew Barberson Team Manager | Contaminated Land Management East | CENVP:

C123836:4. J161921 - Mainsbridge School - Agenda for Noise Consultation.docx

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12 February 2020

Project W P P		Western Sydney and Wollongong Schools _{From} Program – Mainsbridge School for Specific Purpose		Melissa Stojanovic	
Subject		Community Noise Consultation	Tel	0405 210 434	
Venue/Date/Time		Warwick Farm PS / 30.01.2020 / 11.00 am – 11.30 am	Job No	2125817	
Copies to		All attendees and Name (Company)			
Attendee	Apology				
Х		Teresa Mamone (WF Early Edu centre	Supervisor) TM		
Х		Virginia Baker (SINSW Community Enagement Officer) (VB)			
x		Melissa Stojanovic (GHD Project Mana	ager) (MS)		
Minutes				Action	

Project Background

A relocation is underway for Mainsbridge School for Specific Purposes (SSP) to part of the existing Warwick Farm Public School site.

MS discussed previous concerns raised by the childcare centre following email correspondence received 24 January from the centre over noise. Proceeding event as followed.

- 1) Spoke to Hutchinson to receive details and anticipated lengths of the loud works.
- 2) Corresponded with Terese.
- 3) Attempt to contact SINSW.
- 4) Terese contacted Dennis.
- 5) Terese advised GHD that an agreement had been reached.

VB advised that white noise machines can be used to assist in possible.

Noise generated Activities planned to be undertaken

To allow for the five building of the school to be built, ground areas are required to be prepared for several slab pours whilst surrounding areas levelled for landscaping. Levelling will require soil to move around site, and some additional soil imported through delivery trucks, followed by heavy machinery rolling and compacting the moved soil. To create the slabs, cement trucks will enter site, pour cement into the excavated areas and vibrators applied to the wet cement.

Mainsbridge SSP high noise generated activities include:

1. Civil Works

- 2. Truck deliveries
- 3. Drilling
- 4. Hammering
- 5. Angle grinding
- 6. Electric Saw
- 7. Impact Drill
- 8. Concrete Pumping
- 9. Cement Truck Mixing

Anticipated time frames, dates and duration

The anticipated time of these activities is from mid-February to early April 2020 as they are generally related to civil and excavation works. The remaining components will be completed in short sections throughout the duration of the project. All other high noise generating activities as listed above, will be undertaken progressively until the construction works are complete in early 2021.

Consideration will be taken to children sleep hours where possible. These are 11.30 – 1.30 each day.

Hutchins on/GHD

Hammering will typically produce the loudest noise levels emanating from the site and have the highest potential for noise impacts on the local residents. Hand tools would only be typically used sporadically and where possible, away from the site boundaries.

All construction traffic, including loading and unloading operations are proposed to occur via an access gate along Williamson Crescent. The loading and unloading area exists within the site compound and away from the Crescent.

Trucks and concrete trucks must turn off their engines when on site to reduce impacts on adjacent land use

Where concrete pumps are located unscreened and within 35m of a residence, pumping should not commence prior to 8am and respite hours discussed with the Childcare Centre and implemented where reasonable.

All high noise generating activities will be under the supervision of site personnel.

Consultations have occurred with the immediate residents and businesses.

Complaints handling procedure

If you have any queries or concerns about this project you can contact School Infrastructure NSW during business hours on 1300 482 651.

Further project details can be found at

https://www.schoolinfrastructure.nsw.gov.au/projects/m/mainsbridge-school.html

Provision of the details of the Site Manager for potential noise complaints

Dennis Denobrega of Hutchinson Builders (m) 0429 675 037. TM frequently cooresponds with the site manager and note they have been proactive in assisting queries.

MS / TM Discussions on amendment to the childcare centre fence and dates provided for the fence amendments during March.

Melissa Stojanovic

Project Manager



12 February 2020

Project		Western Sydney and Wollongong Schools _{From} Program – Mainsbridge School for Specific Purpose		Melissa Stojanovic	
Subject		Community Noise Consultation	Tel	0405 210 434	
Venue/Date/Time		Warwick Farm PS / 30.01.2020 / 10.00 am – 10.45 am	Job No	2125817	
Copies to		All attendees and Name (Company)			
Attendee	Apology				
Х		Melanie Macmillian (WFPS School Pri	ncipal)		
Х		Neil Hogan (SINSW Project Director) (NH)		
Х		Virginia Baker (SINSW Community En	agement Officer) ((VB)	
х		Melissa Stojanovic (GHD Project Mana	ager) (MS)		
Minutes				Action	

Project Background

A relocation is underway for Mainsbridge School for Specific Purposes (SSP) to part of the existing Warwick Farm Public School site.

Noise generated Activities planned to be undertaken

To allow for the five building of the school to be built, ground areas are required to be prepared for several slab pours whilst surrounding areas levelled for landscaping. Levelling will require soil to move around site, and some additional soil imported through delivery trucks, followed by heavy machinery rolling and compacting the moved soil. To create the slabs, cement trucks will enter site, pour cement into the excavated areas and vibrators applied to the wet cement.

No rock breaking operations are proposed on site.

Mainsbridge SSP high noise generated activities include:

- 1. Civil Works
- 2. Truck deliveries
- 3. Drilling
- 4. Hammering
- 5. Angle grinding
- 6. Electric Saw
- 7. Impact Drill
- 8. Concrete Pumping

9. Cement Truck Mixing

Anticipated time frames, dates and duration

The anticipated time of these activities is from mid-February to early April 2020 as they are generally related to civil and excavation works. The remaining components will be completed in short sections throughout the duration of the project. All other high noise generating activities as listed above, will be undertaken progressively until the construction works are complete in early 2021.

Hours of works are: Monday to Friday: 7:00am to 6:00pm Saturday: 8:00am to 1:00pm. No work will be undertaken on Sunday or on public holidays.

[Action Item] MM advises that noisy works should not be undertaken during NAPLAN testing. Melaine will provide details of these dates to the Project Manager.

GHD/ Hutchinson

Hammering will typically produce the loudest noise levels emanating from the site and have the highest potential for noise impacts on the local residents. Hand tools would only be typically used sporadically and where possible, away from the site boundaries.

All construction traffic, including loading and unloading operations are proposed to occur via an access gate along Williamson Crescent. The loading and unloading area exists within the site compound and away from the Crescent.

Trucks and concrete trucks must turn off their engines when on site to reduce impacts on adjacent land use

Where concrete pumps are located unscreened and within 35m of a residence, pumping should not commence prior to 8am and respite hours discussed with the Childcare Centre and implemented where reasonable.

All high noise generating activities will be under the supervision of site personnel.

Consultations have occurred with the immediate residents and businesses.

Complaints handling procedure

If you have any queries or concerns about this project you can contact School Infrastructure NSW during business hours on 1300 482 651. Further project details can be found at https://www.schoolinfrastructure.nsw.gov.au/projects/m/mainsbridge-school.html

Provision of the details of the Site Manager for potential noise complaints

Dennis Denobrega of Hutchinson Builders (e) Dennis.Denobrega@hutchinsonbuilders.com.au (m) 0429 675 037

MM advises she frequently corresponds with Dennis and have had no concerns so far.

Melissa Stojanovic

Project Manager





ATTACHMENT 2 OF NVMP - CNVMP of Acoustic Logic

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MANAGING DIRECTORS MATTHEW PALAVIDIS VICTOR FATTORETTO

DIRECTORS MATTHEW SHIELDS BEN WHITE



Mainsbridge SSP

Construction Noise and Vibration Management Plan

SYDNEY A: 9 Sarah St MASCOT 2020 T: (02) 8339 8000

SYDNEY MELBOURNE BRISBANE CANBERRA LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au ABN: 11 068 954 343

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DOCUMENT CONTROL REGISTER

Project Number	20170661.13		
Project Name	Mainsbridge SSP		
Document Title	Construction Noise and Vibration Management		
	Plan		
Document Reference	20170661.13/1411A/R1/YK		
Issue Type	Email		
Attention To	Hayball Pty Ltd		
	James Cristallo		

Revision	Date	Document Reference	Prepared	Checked	Approved
			Ву	Ву	Ву
0	14/11/2017	20170661.13/1411A/R0/YK	YK		BW
1	29/08/2018	20170661.13/1411A/R1/YK	VF		VF
2	29/08/2018	20170661.13/1411A/R2/YK	VF		VF

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1 INTRODUCTION

This report presents the recommended approach for managing potential noise and vibration impacts arising from the excavation and construction activities associated with the relocation of the existing Mainsbridge School for Specific Purposes from its existing location to a new site along Williamson Crescent, Warwick Farm, on surplus land located to the rear of the existing Warwick Farm Public School (WFPS).

The principal objective of this study is to undertake an evaluation of works/activities to be performed during the excavation and construction of the project, and forecast the potential impacts of noise and vibration. This assessment will be used to formulate and streamline effective regulation and mitigation measures.

The principal issues, which will be addressed in this report, are:

- Identification of the noise and vibration guidelines which will be applicable to this project.
- Prediction of likely noise levels impacting surrounding receiver locations.
- Formulation of a strategy for construction to comply with the standards identified in the above point.
- Establishment of direct communication networks between affected groups, principal contractor (when engagement is finalised) and Acoustic Logic Consultancy Pty Ltd.

A critical component of this report is the formulation of noise and vibration control strategies for the different excavation and construction processes. These strategies include the formulation of site management procedures, whether they can be operational or time based. A detailed noise and vibration management plan forms part of this report.

The objective of this study in all cases is to minimise noise and vibration emissions from the excavation and construction processes or to schedule works which may have a significant acoustic impact on adjoining receivers.

Provided all measures outlined in this report are fully implemented, noise and vibration impacts associated with the construction of the development site will be strictly controlled, and the impact on the surrounding environs minimised.

2 SITE DESCRIPTION / AFFECTED PROPERTIES

The subject site is located at 102 Lawrence Hargrave Drive, Warwick Farm. It is located immediately to the north of the Warwick Farm Public School (WFPB) and is bounded by Williamson Crescent to the west, WFPB to the south, Brickmakers Creek to the east and existing residential property to the north (at 68 Williamson Crescent).

The project involves the relocation of the Mainsbridge SSP to the site detailed above. This will include the construction of three school buildings (A01a, B01a & B01b) and a new sports field. carparking spaces are proposed along the western boundary of the site, adjoining Williamson Crescent. All access to site is only proposed via Williamson Crescent.

We have been advised that all works on site are proposed to extend over an approximate 21month period, divided into two stages;

- Early works Package includes Bulk Excavation and Remediation works and expected to
 extend over an approx. 3-month period. <u>Note Early works package does not form part of
 the State Significant Development Application. Notwithstanding, of the "particularly
 annoying" activities noted in Section 4.5 of the Interim Construction Noise Guideline only
 power saws and vibratory rolling are likely to occur as part of this package and can be
 managed with appropriate respite periods.
 </u>
- Construction Stage approx. 18 months.

Figure 1 below illustrates location of the subject site and surrounding properties. The potentially nearest affected receivers are as follows;

- Receiver 1 Liverpool City Council Early Education & Care Centre, adjoining the subject development to the north.
- Receiver 2 Warwick Farm Public School, adjoining the subject development to the south.
- Receiver 3 Existing residential properties to the west of the subject development, across Williamson Crescent.

All construction vehicles will access the site via Williamson Crescent. Figure 1 below illustrates the location of the subject site and unattended noise monitor location. Figure 2 illustrates the subject development.







Figure 2 – Proposed Development

3 HOURS OF WORK

Section 2.2 of the NSW Environmental Protection Authority's (EPA) Interim Construction Noise Guideline (ICNG) recommends the following standard hours of construction. Certain activities can be performed outside of these hours, and these are detailed in section 2.3 of the ICNG.

Work Type	Recommended Standard Hours of Work	
	Monday to Friday 7am to 6pm	
Normal construction	Saturday 8am to 1pm	
	No work on Sundays and Public Holidays	

Table 1 – NSW EPA ICNG Recommended Standard Hours of Construction Work

4 AMBIENT NOISE MONITORING

Long term noise monitoring $(26^{th} - 31^{st} \text{ July 2017 and } 25^{th} \text{ May to } 1^{st} \text{ June 2018})$ was previously conducted by this office, using Acoustic Research Laboratories noise monitors installed along the western boundary of the site and at the receivers to the east. The monitor was set to an A-weighted fast response mode, recording continuously at 15-minute intervals. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted.

The measured daytime rating background noise level is detailed below. The lower of the measured background noise levels was used.

Table 2 – Measured Daytime Rating Background Noise Level

Location	Rating Background noise level dB(A)L _{90(period)}	
	Daytime (7am-6pm)	
Northern Boundary of Site	39	
Eastern Residences	42	

5 NOISE AND VIBRATION MANAGEMENT CRITERIA

5.1 NOISE

Noise impacts from the proposed construction works on site will be assessed against the following guidelines;

- NSW EPA Interim Construction Noise Guideline; and
- Australian Standard 2436-2010 "Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites".

5.1.1 NSW EPA Interim Construction Noise Guideline

This guideline nominates acceptable levels of noise emissions above the background noise level. For projects within the recommended standard hours, the guideline recommends a noise level of 10 dB(A) above the background for surrounding affected residential properties. This level is referred to as the "Management Level".

The noise emission goals applicable for this assessment is detailed below;

Time of Day	Measured Background Noise Level dB(A)L ₉₀	Management Level = Background Level + 10dB(A)L _{eq(15min)}
Day (7am-6pm)	39	49

Table 3 – Noise Emission Goal – Residential Properties

Where noise from the construction works is above the "management level", the proponent should apply any feasible and reasonable work practices to minimise noise.

If noise emissions are likely to exceed 75 dB(A) $L_{eq(15min)}$ at the boundary of surrounding affected residential receivers, the receiver is deemed to be "highly noise affected". Introduction of management controls such as scheduling of noisy periods, or respite periods is then recommended.

Section 4.1.2 and 4.1.3 of this guideline also nominates management levels for other sensitive land uses (other than residences). Criteria relevant to this assessment is detailed below.

Table 4 – Noise Emission Management Levels – Non-Residential Properties

Land Use	Management Level			
Classrooms at schools and other educational institutions	Internal noise level 45 dB(A)L _{eq(15mins)} External noise level 55 dB(A)L _{eq(15mins)} *			
Active recreational areas (will be used for the outdoor play areas of adjoining childcare centre)	External noise level 65 dB(A)L _{eq(15mins)}			

*Section 4.1.2 of the NSW EPA ICNG outlines that a conservative estimate of the difference between internal and external noise levels is 10dB for buildings other than residences. Hence an external noise level of 55 dB(A) will be used for this assessment at the façade of any affected school building.

5.1.2 Australian Standard 2436-1981 "Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites"

The Australian Standard AS2436 states that where all reasonable and available measures have been taken to reduce construction noise, mitigation strategies may be put in place to reduce levels noise levels to within a reasonable and acceptable level.

For the control and regulation of noise from construction sites, AS 2436:1981 nominates the following:

- a. That reasonable suitable noise criterion is established,
- b. That all practicable measures be taken on the building site to regulate noise emissions, including the siting of noisy static processes to locations of the site where they can be shielded, selecting less noisy processes, and if required regulating construction hours, and
- c. The undertaking of noise monitoring where non-compliance occurs to assist in the management and control of noise emission from the construction site.

The guideline reflects on feasible and reasonable mitigation strategies, management controls and public liaising in the effort to reach realistic comprises between construction sites and potential noise affected receivers.

Based on these criteria the following procedure will be used to assess noise emissions:

- Predict noise levels produced by typical construction activities at the sensitive receivers.
- Adopt management conditions as per AS 2436 in the event of a non-compliance.

5.2 VIBRATION

Vibration caused by the proposed excavation or construction activities on site should be assessed using the following guidelines:

- For structural damage vibration, German Standard DIN 4150-3 Structural Vibration: Effects of Vibration on Structures; and
- For human exposure to vibration (amenity), the evaluation criteria presented in the NSW EPA's *Assessing Vibration: a technical guideline* document will be used to set management levels.

The criteria and the application of these standards are discussed in separate sections below.

5.2.1 Structure Borne Vibrations

German Standard DIN 4150-3 (1999-02) provides a guideline for acceptable levels of vibration velocity in building foundations, to assess the effects of vibration on structures. The table give guidance on the maximum accepted values of velocity at the foundation and in the plane of the highest floor of various types of buildings, to prevent any structural damage.

The table below lists the peak particle velocity, which is the maximum absolute value of the velocity signals for the three orthogonal components. This is measured as a maximum value of any of the three orthogonal component particle velocities when measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Type of Structure		Peak Particle Velocity (mms ⁻¹)						
		At Foun	Plane of Floor of Uppermost Storey					
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies			
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40			
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15			
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8			

Table 5 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration

5.2.2 Assessing Amenity – Human Comfort

The NSW EPA's Assessing Vibration – a technical guideline is based on the guidelines contained in British Standard BS 6472-1992 'Guide to Evaluate Human Exposure to Vibration Buildings (1Hz to 80Hz'. This guideline provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings.

The recommendations of this guideline should be adopted to assess and manage vibration from the site. Where vibration exceeds, or is likely to exceed, the recommended levels then an

assessment of reasonable and feasible methods for the management of vibration should be undertaken.

		RMS acceleration (m/s²)		RMS veloc	tity (mm/s)	Peak velocity (mm/s)	
Place	Time	Preferred	Maximum	Preferred	Maximum	Preferred	Maximum
	Continuou	s Vibration					
Residences	Daytime	0.01	0.02	0.2	0.4	0.28	0.56
Offices	Day or	0.02	0.04	0.4	0.8	0.56	1.1
Workshops	night-time	0.04	0.08	0.8	1.6	1.1	2.2
	Impulsive	Vibration					
Residences	Daytime	0.3	0.6	6.0	12.0	8.6	17.0
Offices	Day or	0.64	1.28	13	26	18	36
Workshops	night-time	0.64	1.23	13	26	18	36

Table 6 – BS 6472 Vibration Criteria

Note 1: Continuous vibration relates to vibration that continues uninterrupted for a defined period (usually throughout the daytime or night-time), e.g. continuous construction or maintenance activity. (DECC, 2006).

Note 2: Impulsive vibration relate to vibration that builds up rapidly to a peak followed by a damped decay and that may or may not involve several cycles of vibration (depending on frequency and damping), with up to three occurrences in an assessment period, e.g. occasional loading and unloading, or dropping of heavy equipment. (DECC, 2006)

6 PROPOSED CONSTRUCTION ACTIVITIES

We have been advised of the typical equipment/processes anticipated to be used for the construction of the subject development.

The A-weighted sound power levels for the anticipated equipment/processes are outlined in the tables below.

Construction Activity	Equipment / Process	Sound Power Level dB(A)	
	Cherry Picker	105	
	Trucks	108	
	Drilling	94*	
	Hammering	115*	
Construction	Angle grinders	114*	
	Electric Saw	111*	
	Impact Drill	105*	
	Concrete Pump	107	
	Cement Mixing Truck	105	

Table 7 – Construction Activities

* - includes 5 dB(A) addition for characteristics of noise source.

The noise levels presented in the above table are derived from the following sources:

- 1. On-site measurements;
- 2. Table D2 of Australian Standard 2436-1981 & Table A1 of Australian Standard 2436-2010; and
- 3. Data held by this office from other similar studies.

7 NOISE EMISSION PREDICTIONS

7.1 METHODOLOGY

Noise from the loudest typical construction activities for each stage of works have been predicted to the nearest most affected sensitive receivers. The predicted noise levels are presented in this section and are based on the areas on the site in which the plant is likely to be used.

The predictions present a range of noise levels taking into account:

- The varying distance between the noise source and the receiver depending on the location of the noise source on the site.
- The screening effect provided by any existing building structures.

It is noted that many of the noise sources are present over a small period of the day or may be present for a few days with a significant intervening period before the activity occurs again.

Construction Phase	Construction Plant	Plant Noise Level dB(A)	Receiver Location	Predicted Noise Range dB(A)L _{eq(15mins)}		Noise Management Level dB(A)L _{eq(15mins)}	Management Conditions
	Cherry Picker	105	Receiver 1	65	73	65	Refer Section Error! Reference source not found.
			Receiver 2	59	62	55	
			Receiver 3	62	65	49	
		108	Receiver 1	56	60	65	
	Trucks		Receiver 2	53	57	55	
Construction			Receiver 3	44	52	49	
	Drilling	94	Receiver 1	39	59	65	
			Receiver 2	29	49	55	
			Receiver 3	32	52	49	
	Hammering	115	Receiver 1	60	80	65	
			Receiver 2	50	70	55	
			Receiver 3	53	73	49	
	Angle Grinders	114	Receiver 1	59	79	65	
			Receiver 2	49	69	55	
			Receiver 3	52	72	49	

Table 8 – Predicted Noise from Demolition, Excavation and Construction Works

Construction Phase	Construction Plant	Plant Noise Level dB(A)	Receiver Location	Predicted Noise Range dB(A)L _{eq(15mins)}		Noise Management Level dB(A)L _{eq(15mins)}	Management Conditions
	Electric Saw	111	Receiver 1	56	76	65	Refer Section Error! Reference source not found.
			Receiver 2	46	66	55	
			Receiver 3	49	69	49	
	Impact Drill	105	Receiver 1	50	70	65	
			Receiver 2	40	60	55	
Construction			Receiver 3	43	63	49	
Construction	Concrete Pump	te 107	Receiver 1	63	67	65	
			Receiver 2	65	69	55	
			Receiver 3	51	59	49	
	Cement Mixing Truck	105	Receiver 1	53	57	65	
			Receiver 2	50	54	55	
			Receiver 3	41	49	49	

Table 8 – Predicted Noise from Demolition, Excavation and Construction Works

8 AMELIORATIVE MEASURES

8.1 SITE SPECIFIC RECOMMENDATIONS

Site specific recommendations are provided below.

8.1.1 Potential Vibration and Structure Borne Noise Impacts

No vibration intrusive activities (piling or rock breaking operations) are proposed on site and hence no vibration and structure borne noise impacts are expected from the construction of the subject development.

8.1.2 Excavator and Piling Noise

Sheet Piling (silent piles – press piles) and excavators are expected to be used for the majority of the time during the excavation periods. Where prolonged use is necessary, this equipment/machinery could be moved to another part of the site to offer the receiver closest to the plant some respite. Where practical and feasible, by moving the excavator from working on one part of the site to the opposite side of the site, this can provide up to a 5dB(A) reduction in noise levels impacting residential receiver locations. Management processes include;

- We recommend commencing all noisy excavation works on site only after 8am, providing a 1-hour respite period during the morning period from the 7am standard hours of construction.
- Additionally, an afternoon respite period will also be enforced on site between the hours of 12pm to 1:30pm.
- All surrounding receivers will be notified of the duration and extent of the works proposed during the excavation stage via letterbox drops, with a detailed engagement plan and contact information for all relevant personnel on site.
- When operating close to the Child Care Centre the respite periods should be coordinated with children's rest period.

8.1.3 Hand Tools (Jackhammers, Angle Grinders, Impact Drills, Electric Saws)

Hammering will typically produce the loudest noise levels emanating from the site and have the highest potential for noise impacts on surrounding receivers. Hand tools would only be typically used sporadically. However, where extended use of these items would occur noise emissions should be managed. Management processes will include:

 Notification of potentially affected receivers of the duration and extent of the works proposed via letterbox drops, with a detailed engagement plan and contact information for all relevant personnel on site.

- The School must be consulted to ensure any intrusive construction operations does not impact sensitive operations like examinations and appropriate measures taken to minimise impacts.
- The child care centre must be consulted to ensure intrusive construction operations do not unreasonably impact the centre at sensitive times such as rest periods.

8.1.4 Vehicle Noise and Concrete Pumps

All construction traffic, including loading and unloading operations are proposed to occur via an access gate along Williamson Crescent. We recommend the following controls:

• Establishing a designated loading/unloading area as illustrated in the figure below. Any concrete pumping operations must also be limited to this area. This location will provide maximum proximity to the surrounding identified sensitive receivers.



Figure 3 – Recommended Designated Zone for Concrete Pumping and loading/unloading operations

- Trucks and concrete trucks must turn off their engines when on site to reduce impacts on adjacent land use (unless truck engine needs to remain on, for example during concrete pumping).
- Where concrete pumps are located unscreened and within 35m of a residence, pumping should not commence prior to 8am.
- Where concrete pumps are located unscreened and within 35m of the child care centre, pumping times should be coordinated with child rest periods to the extent that it is reasonable.

8.1.5 Other Activities

- In the event of complaint, noise management techniques identified in this report should be employed to minimise the level of noise impact. This may include community consultation and scheduling of loud construction processes.
- Notwithstanding above, general management techniques and acoustic treatments are included below which may be implemented on a case-by-case basis to reduce noise emissions to surrounding receivers.

9 CONTROL OF CONSTRUCTION NOISE AND VIBRATION

The execution of this work will facilitate the formulation of noise control strategies for this project.

The flow chart presented in Figure 4 illustrates the process that will be followed in assessing construction activities.



10 NOISE AND VIBRATION CONTROL METHODS

The determination of appropriate noise control measures will be dependent on the particular activities and construction appliances. This section provides an outline of available methods.

10.1 SELECTION OF ALTERNATE APPLIANCE OR PROCESS

Where a particular activity or construction appliance is found to generate excessive noise levels, it may be possible to select an alternative approach or appliance. For example; the use of a hydraulic hammer on certain areas of the site may potentially generate high levels of noise. By carrying this activity by use of pneumatic hammers, bulldozers ripping and/or milling machines lower levels of noise will result.

Selection of alternative appliances have been explored for the demolition of the existing structure. Due to safety concerns, particularly in relation to slab and structural loading, large excavator mounted milling will not be feasible.

Pre-drilling, saw cutting and ripping may be incorporated in the excavation of the existing base slab. Whilst hammering may still be required, the substitution of drilling, sawing and ripping will reduce degree of hammering required.

10.2 ACOUSTIC BARRIER

Barriers or screens can be an effective means of reducing noise. Barriers can be located either at the source or receiver.

- The placement of barriers at the source is generally only effective for static plant (tower cranes). Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source.
- Barriers can also be placed between the source and the receiver however this will not beneficial in this instance due to receivers overlooking the site.

The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source, reductions of up to 15dB(A) can be expected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance that is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 10mm or 15mm thick plywood (radiata plywood) would be acceptable for the barriers.

10.3 SILENCING DEVICES

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

10.4 MATERIAL HANDLING

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

10.5 TREATMENT OF SPECIFIC EQUIPMENT

In certain cases, it may be possible to specially treat a piece of equipment to dramatically reduce the sound levels emitted.

10.6 ESTABLISHMENT OF SITE PRACTICES

This involves the formulation of work practices to reduce noise generation. It is recommended that all available and reasonable treatments and mitigation strategies presented in this report be adopted to minimise noise emissions from the excavation and construction activities on site.

10.7 COMBINATION OF METHODS

In some cases, it may be necessary that two or more control measures be implemented to minimise noise.

10.8 MAINTENANCE OF PLANT, EQUIPMENT AND MACHINERY

Construction Profile will ensure all plant, equipment and machinery are regularly serviced and maintained at optimum operating conditions, to ensure excessive noise emissions are not generated from faulty, overused or unmaintained machinery.

10.9 STAFF TRAINING AND REPORTING MECHANISM

All construction staff on site, as part of the site induction process, will be informed of the surrounding sensitive receivers on site and the site specific recommendations to reduce noise impacts to these receivers (late starts, respite period, vehicle noise control etc. – refer section 8).

Any complaints received by construction staff must be immediately reported to the site foreman, followed by completion of incident report form and steps detailed in section 11.3 below.

A copy of the recommendations detailed in this report (section 8) and dealing with complaints procedure (section 11.2) will be posted at key areas around the site for easy reference by all staff.

11 COMMUNITY INTERACTION AND COMPLAINTS HANDLING

11.1 ESTABLISHMENT OF DIRECT COMMUNICATION WITH AFFECTED PARTIES

In order for any construction noise management programme to work effectively, continuous communication is required between all parties, which may be potentially impacted upon, the builder and the regulatory authority. This establishes a dynamic response process which allows for the adjustment of control methods and criteria for the benefit of all parties.

The objective in undertaking a consultation processes is to:

- Inform and educate the groups about the project and the noise controls being implemented;
- Increase understanding of all acoustic issues related to the project and options available;
- Identify group concerns generated by the project, so that they can be addressed; and
- Ensure that concerned individuals or groups are aware of and have access to a Constructions Complaints Register which will be used to address any construction noise related problems should they arise.

Community consultation is recommended immediately (as works have already commenced on site), with letterbox notifications to all identified surrounding sensitive receivers (refer section 2). This will include a construction management plan detailing the proposed works on site and duration of each stage.

11.2 DEALING WITH COMPLAINTS

Should ongoing complaints of excessive noise or vibration criteria occur immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration limits all work potentially producing vibration shall cease until the exceedance is investigated.

The effectiveness of any changes shall be verified before continuing. Documentation and training of site staff shall occur to ensure the practices that produced the exceedances are not repeated.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form. The complaint form should list:

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;

- Required remedial action, if required;
- Validation of the remedial action; and
- Summary of feedback to the complainant.

A permanent register of complaints should be held. All complaints received should be fully investigated and reported to management. The complainant should also be notified of the results and actions arising from the investigation.

The investigation of a complaint shall involve where applicable;

- Noise measurements at the affected receiver;
- An investigation of the activities occurring at the time of the incident;
- Inspection of the activity to determine whether any undue noise is being emitted by equipment; and
- Whether work practices were being carried out either within established guidelines or outside these guidelines.

Where an item of plant is found to be emitting excessive noise, the cause is to be rectified as soon as possible. Where work practices within established guidelines are found to result in excessive noise being generated then the guidelines should be modified so as to reduce noise emissions to acceptable levels. Where guidelines are not being followed, the additional training and counselling of employees should be carried out.

Measurement or other methods shall validate the results of any corrective actions arising from a complaint where applicable.

11.3 REPORTING REQUIREMENTS

The following shall be kept on site:

- 1. A register of complaints received/communication with the local community shall be maintained and kept on site.
- 2. Where noise/vibration complaints require noise/vibration monitoring, results from monitoring shall be retained on site at all times.
- 3. Any noise exceedances occurring including, the actions taken and results of follow up monitoring.
- 4. A report detailing complaints received and actions taken shall be presented to the construction liaison committee.

11.4 CONTINGENCY PLANS

Where non-compliances or noise complaints are raised, the following methodology will be implemented:

1. Determine the offending plant/equipment/process.

- 2. Locate the plant/equipment/process further away from the affected receiver(s) if possible.
- 3. Implement additional acoustic treatment in the form of localised barriers, silencers etc. where practical.
- 4. Selecting alternative equipment/processes where practical.

12 CONCLUSION

This report presents an assessment of potential noise and vibration impacts associated with the excavation and construction activities proposed as part of the relocation of the Mainsbridge School for Specific Purposes from its existing location to a new site along Williamson Crescent, Warwick Farm, on surplus land located to the rear of the existing Warwick Farm Public School (WFPS).

Noise emission predictions to the surrounding sensitive receivers have been detailed in Section 7 and ameliorative treatments to reduce noise impacts are detailed in Section 8.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

1 Watht

Acoustic Logic Consultancy Pty Ltd Victor Fattoretto

(refer attached CV for experience and qualifications)


Qualifications

Bachelor of Mechanical Engineering (Hons, Class1) (1982)

Member of the Acoustic Society of Australia (M.A.A.S)

1994 - Current	Director, Acoustic Logic Consultancy
1992 to 1994	Associate Director, Renzo Tonin and Associates
1989 to 1992	Project Engineer, Renzo Tonin and Associates
1981 to 1989	Engineer, NSW Public Works Department

Outline of Experience

Between 1981 and 1989 Victor was employed with the NSW Public Works Department as a professional engineer. His work involved the investigation, design and construction supervision of mechanical services (air conditioning, ventilation heating, solar design) for new and existing public buildings throughout the state as well as acoustics.

Victor joined Renzo Tonin and Associates, a Sydney-based acoustics and vibration consultancy, in 1989 as a project engineer, and was made an associate director of the firm in 1992. In 1994 he became a director of Acoustic Logic Consultancy.

Victor's areas of expertise include:

Building acoustics and building services noise control Environmental noise modelling and assessment Vibration isolation and structural dynamics Traffic noise prediction Helicopter & aircraft noise Industrial Noise Control

Project Experience

Victor has undertaken a number of environmental noise and vibration impact assessments for a variety of projects. Some of these are listed below.

M5 East - Kyeemagh to King Georges Road EIS (Study Director) Trinity Grammar Masterplan Liverpool to Hornsby Transport Link (Study Director) Sydney Olympics Eastern Distributor Very Fast Train Project Austrak North Tahmoor Mine Project (Study Director) Honeysuckle, Newcastle (Study Director) North Arncliffe Local Environment Plan. (Study Director) Epping Road, Lane Cove Upgrade (Study Director) M5 - King Georges Road to Moorebank Section Pacific Highway Oak Flats to Dunmore Noise Assessment (Study Director)





Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix L: Tree and Fauna Management Plan

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1. PURPOSE

To address the requirements of the Development Consent in reference to a Construction Environmental Plan for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. PROCEDURE

This Tree and Fauna Management Plan details how Hutchinson Builders will undertake works associated with the project to ensure no impacts occur to the tree species located on the creek bank on the eastern boundary, and to trees remaining on site. The plan also details how to minimise disturbance to fauna, including threatened species and their habitat and access corridors.

The Tree and Fauna Management Plan should be read in conjunction with the Biodiversity Management Plan.

4. EXISTING ENVIRONMENT

A Biodiversity Assessment Reporting Conducted in July 2018 identified exotic grassland, exotic planted vegetation and Forest Red Gum on floodplain of NSW (River-flat Eucalypt Forest. The Forest Red Gum accounted for approximately 37ha of the 1.7 ha of vegetation. The Red Gum vegetation community is comprised of midstory and canopy species that are 'native vegetation; but do not occur within the Sydney Basin Bioregion. The understory consisted of native grasses, exotic species constituted ~50-95% of underground species. No Hollow bearing trees were identified during the assessment.

The site was identified as suitable land for the Southern Myotis (bat) and the Grey-headed Flying Fox. Minimal fauna habitat was identified. No hollow bearing trees, or substantial fauna habitat in the form of coarse woody debris were identified.

5. TREES

5.1 Initial Works

The following measures are to be undertaken prior to construction:

- The Biodiversity Management Plan is to be reviewed and clearly mark and document all vegetation to be retained, removed or replanted;
- Any hollow bearing trees, if identified, are to be marked out to be avoided;
- Protection to trees will be provided in the form of screening of trees with fabric and wooden stakes around the trunks;
- All machinery is to arrive on-site in a clean washed condition, free of fluid leaks; and
- All vegetation within the site that is not required to be cleared for construction purposes shall be retained and incorporated into the landscaping and revegetation.

5.2 During Construction Works

During construction works the following tree management aspects are to be considered;

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- Hollow bearing trees will be avoided where practicable;
- Logs from hardwood trees are to be retained and reinstated into the creek;
- Stockpiling of soils are to occur a minimum of 2 metres away from trees and/or not under the tree dripline;
- Ensure all herbicides and pesticides used on site are registered for use within a waterway as per NSW DPI guidelines;
- All plant and equipment shall be inspected daily for leakage of oil, fuel or hydraulic fluids. Machinery found to be leaking are to be immediately repaired or removed from site;
- Any additional green waste is recommended to be used as mulch; and
- Any excess green waste to be taken off site to an appropriate licensed facility.

5.2.1 Activities Near Trees

- Avoid manoeuvring heavy vehicles and equipment under the tree canopy to prevent damage to trunks and minimise the potential for soil compaction and vibration to the roots;
- If boring under trees is required, bore at depths greater than 1m to avoid harming the root system;
- No chemical or dangerous goods are to be stored under the tree canopy;
- Do not service of refuel vehicles, equipment or machinery under the tree canopy;
- Avoid excavating under the tree canopy. Hand dig/trench wen around tree root systems when practicable; and
- Consult a qualified arboriculturist when cutting trees and/or tree roots.

6. FAUNA

Hutchinson Builders is responsible for the detection and protection of all fauna located within the site boundaries and adjacent areas affected by the works:

- All vegetation is to be checked for wildlife prior to commencing works;
- Potential burrows are to be marked and assessed by an ecologist;
- Suitable tree sections will be used to provide habitats for ground dwelling fauna identified;
- An ecologist is to be present on site when tree-felling and large vegetation clearing is undertaken;
- Fauna is only to be handled by trained fauna handlers, animals are to be left to leave on their own volition;
- Wires is to be contacted if wildlife is injured or at risk on site;
- Potential for collisions with fauna to occur on site would be mitigated by ensuring the site vehicles adhere to the site speed limit of 10km/h as per the T&PMP in Appendix G;
- Food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent attracting vermin such as foxed, rats, dogs and cats which can pose a threat to fauna on site.





Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix M: Biodiversity Management Plan

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XIV



1. PURPOSE

To address the requirements of the Development Consent in reference to a Biodiversity Management Plan for construction purposes at the construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. PROCEDURE

This Biodiversity Management Plan details how Hutchinson Builders will undertake works associated with the project to ensure that potential impacts to biodiversity are appropriately management.

3.1 Existing Environment

The project area is primarily clear of dense vegetation, with open grassed areas and sparse trees. On the eastern boundary the Brickmakers Creek is lined by dense vegetation consisting of undergrowth and trees.

A Biodiversity Assessment Report conducted in July 2018 ref: *Alphitonia (2018) Biodiversity Development Assessment Report* (BDAR), identified exotic grassland, exotic planted vegetation and Forest Red Gum on floodplain of NSW (River-flat Eucalypt Forest). The Forest Red Gum accounted for approximately 0.37 ha of the 1.7 ha of vegetation in the investigation area. Refer to Attachment A, figure 1 for the extent of the Forest Red Gum plant community (shaded green).

The Red Gum vegetation community is comprised of midstory and canopy species that are 'native vegetation; but do not occur within the Sydney Basin Bioregion'. The understory consisted of native grasses, exotic species constituted ~50-95% of underground species. No hollow bearing trees were identified during the assessment. Refer to Attachment A, figure 1 for the *Alphitonia* (2018) biodiversity values map.

The site was identified as suitable land for the Southern Myotis (bat) and the Grey-headed Flying Fox. Minimal fauna habitat was identified. As *Alphitonia* (2018) indicated that the works are not likely to significantly impact these threatened species, an indicative map of the threatened species is not considered necessary.

No hollow bearing trees, or substantial fauna habitat in the form of coarse woody debris were identified.

3.2 Tree Management

A tree impact assessment report conducted in August 2018 ref: *Paul Shearer Consulting (2018) Arboricultural Impact Assessment Report* identified which trees and plant communities will be affected during the proposed remediation and construction of the site. The assessment identified 46 trees within 15m of the proposed development, six of which were considered significant in the community due to the scale, amenity value and for other considerations. A stand of approximately 20 eucalypt trees, were identified on the south-eastern portion of the site.

The assessment identified the stand of 20 trees are to be retained, eight trees that are to be retained, one tree that may be retained or removed and 37 trees that are to be removed.

The trees to remain on site are located on the south-east portion of the site, this area is considered suitable for active management and restoration. Additional restoration is to be considered on the whole eastern boundary of the site post-construction as there are no proposed structures in the area. The remainder of the site will consist of hardstand, a sportsfield and gardens and are not considered

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suitable for biodiversity management and restoration. Refer to Section 3.8 for potential tree replenishment options.

Refer to Attachment A, figure 2 for the Paul Shearer Consulting (2018) tree management plan map, showing trees to be retained.

3.3 Biodiversity Credits and Offset

The BDAR identified the value of credits required to be purchased/offset based on the removal of all 0.37ha of the Red Gum Vegetation Community. A small portion of the community is to be retained, refer to figure 2 for the trees to remain on site.

3.4 Hollow Bearing Trees

During the Alphitonia 20018 assessment, no hollow bearing trees were identified. However, if a hollow bearing trees is identified during construction, it will be managed under the unexpected finds protocol in Section 5 of this plan.

3.5 Fauna Management

The following measures are to be undertaken to manage fauna on site:

- All vegetation is to be checked for wildlife prior to commencing works as a preclearance survey, conducted by a suitably qualified ecologist;
- Potential burrows are to be marked and assessed by an ecologist;
- Suitable tree sections will be used to provide habitats for ground dwelling fauna identified;
- A suitably qualified ecologist is to be present on site at all times when tree-felling and vegetation clearance is undertaken to act as a spotter/catcher;
- A Post Clearance Report is to be prepared by the suitably qualified ecologist and submitted to the local council; and
- Fauna is only to be handled by trained fauna handlers.

3.6 Feral Pest and Weed Management

- Food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent attracting vermin such as foxed, rats, dogs and cats which can pose a threat to fauna on site;
- Bins used on site are to be bird and animal proof;
- All litter will be collected and disposed as above at the start and end of each day of demolition and construction;
- Considering the size of the site, trapping of feral cats, foxes and rabbits are to be utilised for feral pests. Traps are to be trialled if pest are identified on site, or evidence such as tracks, droppings or disturbance of the bins are noted;
- A Weed Management Plan is presented in Appendix H of this CEMP, including potential weeds to be encountered on site, inspection and monitoring and weed removal requirements. Below are the weed control measures to be implemented on site:
 - Weed control will be carried out prior to and during the construction phase to ensure the spread of weeds and their associated seeds are contained / controlled so they do not contaminate or impact the works, including stockpile areas and the surrounding environment;
 - Prior to entering the project area, the work area will be inspected to confirm the presence of noxious weeds. Where noxious weeds are identified within the construction corridor, weeds will be removed to the extent necessary, placed in a separate waste receptacle and covered

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to prevent seed spread;

- All noxious weeds that are cleared as part of the project will be segregated from non-weed species and disposed of to a licenced waste facility;
- Inspection/maintenance procedures will be undertaken to reduce the carriage of weed material on machinery; and

The introduction or spread of weed species on site will be minimised by avoiding introducing fill to the Project site and washing equipment and machinery before leaving a site and entering a new site.

3.7 Tree Protection

Prior to construction, trees identified as protected/to remain on site are to be managed under the following:

- Protective fencing and ground cover is to be erected around the protected trees, installed at the tree protection zone (TPZ);
- The TPZ are to be in installed and retained in accordance with AS4970 2009 to protect retained vegetation during construction works;
- An arborist is to be engaged to oversee implementation of the installation of tree protection;
- Tree fencing is to consist of 1.8m high chainwire fencing on above-ground concrete supports;
- Ground protection within the TPZ is to consist of a 75mm layer of mulch over a sheet of geotextile fabric, this depth of mulch is to be maintained during the life of the project;
- Signage is to be presented on all TPZ areas; and
- If traffic is anticipated with the TPZ then rumble boards are to be installed.

Examples of tree protection and signage to be erected is available in figures 3 and 4 of Attachment A of this Plan.

3.8 Site Training

During demolition and construction, the following measures will be undertaken to further manage tree protection:

- Pre-start meetings are to include information regarding TPZs, no-go areas, limits on clearing, limits on plant access, and the tree and fauna mitigation measures implemented on site;
- Maps of the TPZs and the no/go zones will be presented in the site office and the induction office;
- Site inductions will include information on the TPZ/SRZ and biodiversity management measures on site;
- Machine operators and other workers to be instructed on limits of clearing.

3.9 Tree Replenishment

Trees that are removed for construction are to be replaced with native species in accordance with Liverpool Council's guidelines for biodiversity and tree replenishment. Trees selected to be planted and the planning regime must take into consideration the design of the constructed site, such that roots do not pose a risk to building integrity. Revegetation is to only be undertaken by a suitably qualified/experienced bush regeneration contractor.

The following tree types have been identified to be present in the Liverpool government area and are to be considered to be planted on-site:

• Forest Red Gum;

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- Hard-leaved Scribbly Gum;
- Parramatta Red Gum; and
- Broad-leaved Ironbark Grey Box.

A plant schedule is to be produced by a suitably qualified arborist to replenish the site. Plants must be grown to the Australian Standard AS 2303-2015 Tree Stock for Landscape Use or NATSPEC. Associated landscaping is to consider the DEC internal document; Landscape Management in NSW School.

4. MONITORING AND REVIEW OF THIS PLAN

Routine monitoring will be undertaken by the Project Manager and Project Supervisor to ensure that controls are implemented and installed according to this plan. Monitoring of the fencing and depth of mulch is to be undertaken using the Environmental Checklist provided in Appendix B of the CEMP. Additional monitoring is to be conducted:

- Prior to planned vegetation clearance to ensure that all protection measures are in place to prevent removal of protected trees;
- Following bulk earthworks to determine if the SPZ has been impacted; and
- Following storm events to ensure the mulch is maintained to the appropriate depth.

The Project Manager shall ensure that the Biodiversity Management Plan is reviewed after each inspection, to determine the effectiveness of the controls.

5. UNEXPECTED BIODIVERSITY FINDS

This unexpected finds procedure should be applied by all workers when unexpected flora or fauna is identified. Unexpected finds can include but are not limited to:

- Hollow bearing trees;
- Trees not identified in the Biodiversity Assessment report;
- Burrows and bird nests not identified by the ecologist prior to clearing; and
- Evidence of fauna, such a tracks and droppings.





Unexpected Biodiversity Finds Protocol:







Biodiversity Management Plan Hutchinson Builders

Mainsbridge School

Attachment A: Figures







Figure 1: Biodiversity Values of the Site (Alphitonia 2018)

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Figure 2: Tree Management Plan (Paul Shearer Consulting 2018)





Figure 3: Example of Tree Protection Fencing (Paul Shearer Consulting 2018)



Figure 4: Example of Tree Protection Fencing (Paul Shearer Consulting 2018)

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Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix N: Bush Fire and Flood Emergency Response Plan

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1. PURPOSE

To address the requirements of the Development Consent in reference to a Construction Environmental Plan for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. PROCEDURE

This Bush Fire and Flood Emergency Response Plan details how Hutchinson Builders will undertake works associated with the project to manage response to potential bush fire and flood risks.

3.1 Existing Environment

The site is currently covered in grass with sparse trees across the site. The site is adjacent to the Brickmakers Creek (on the eastern boundary), the creek is a tributary to the Georges River to the north-east. Land to the west and south is generally covered in residential buildings and school buildings. Land east of the creek is used as a sports field with sparse tree coverage. Land to the north is covered in grass land, with dense vegetation following the Cabramatta Creek and flood plain.

The closest NSW Fire and Rescue is located on St Johns Road in Cabramatta, approximately 2.5km to the north-east, approximately seven minutes away during light traffic.

The Liverpool LEP 2008 identified the land to be within a flood prone area and flood planning area.

3.2 Bush Fire

3.2.1 Ignition Sources

Fuels, lubricants and some chemicals will be used during construction phase of the proposed modification. There is the potential of increased ignition sources as a result of routine construction activities such as the use of machinery.

3.2.2 Potential Impacts

The potential impacts of the project on fire management may include:

- Increased possibility of accidental fire in the region;
- Loss of life;
- Damage to infrastructure such as fences, machinery and site buildings;
- Increased susceptibility of erosion or invasion by weeds following a fire.
- Loss of vegetation and flora species; and
- Loss of localised fauna habitat and species in the event of a fire.

3.2.3 Bush Fire Management Measures

Mitigation measures developed to manage bush fire risk during construction of the project are separated into four elements as follows and are detail in Table 1-4:

- Prevention;
- Preparedness;
- Response; and
- Recover.

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Table 1: Prevention Methods			
Aspect	Management Action	Responsibility	
Fire Detection	Site personnel will report fires within the project area.	All site personnel	
	Identify potential sources of ignition e.g. fuel storage areas.	All site personnel	
	Hutchinson Builders will advise NSW RFS and the City of Liverpool Council of the contact details for the site (including after-hours contact details).	Project Manager	
	Vehicles will regularly be inspected and cleared of vegetation build-up.	Operator	
Fire Equipment	All machinery capable of causing a fire during operation will be fitted with appropriate guards to prevent accidental ignition of vegetation from sparks or heat sources.	Mechanic	
	An on-site water truck/vehicle fitted with a water tank and pump system capable of initial attack of spot fires will be located will be located at the site office area.	Supervisor	
	Fire fighting equipment (fire extinguishers, protective hear) will be supplied to all vehicles, machinery, and amenity areas. An effective placement plan for employees to locate necessary equipment in the event of an emergency will be available in site amenities.	HSE Advisor	
	Fire equipment will be checked and tested regularly to ensure it is in good working order and will be replaced or repaired when necessary.	HSW Advisor	
Access	Access roads to and around the site will be regularly inspected and graded to ensure rapid deployment of fire fighting vehicles and earthmoving equipment to roll vegetation at the fires edge (if required).	Supervisor	
	At least two evacuation routes will be maintained from the work area and these will be identified to all personnel working on the project.	HSW Advisor	
	Evacuation doors, points and routes will be clearly marked and maintained around temporary construction facilities, amenities, office and warehouse areas.	HSW Advisor	



Table 1: Prevention Methods			
Aspect	Management Action	Responsibility	
Storage	Oxygen and fuel gas cylinders will not be stored together, with a minimum of 3 metres between cylinders.	Supervisor	
	Flammable materials (solid, liquid or gases) shall not be stored within 5 metres of any occupied building. These materials will be suitably secured and correctly signposted "Danger, Highly Flammable."	HSW Advisor	
Other	Open fires will not be allowed in the project area.	All personnel	
	For all work involving heat, sparks or flame, such as welding and grinding all flammable materials will be cleared away from the area of works, whilst minimising disturbance to vegetation where possible. Fire extinguishers will be fitted to vehicles to extinguish spot fires. Where necessary a water cart and pump will be provided.	All personnel	
	A Hot Work Permit will be required for any activity involving heat, sparks or flames.	HSW Advisor	

Table 2: Preparedness Methods			
Aspect	Management Action	Responsibility	
Training	The Contractor's induction will include information from this Bush Fire Response Plan. Employees will be shown the location and use of fire-fighting equipment. Contractors will be briefed on relevant fire management practices and emergency response and evacuation procedures. Fire drills will be carried out on a monthly basis to ensure all personnel are familiar with the procedures. These will be addressed in the site induction.	HSE Advisor	
Equipment	Fire-fighting equipment will be checked and maintained on a regular basis.	HSE Advisor	
	Testing of alarm systems, escape routes and fire extinguishers will be conducted during weekly inspections.	HSE Advisor	
Housekeeping	Hutchinson Builders will maintain excellent housekeeping standards of storage areas and construction areas to keep down potential sources of flammable material.	Supervisor	



Table 2: Preparedness Methods			
Aspect	Management Action	Responsibility	
Water Supplies	A water truck/vehicle will be available for dust suppression and could be used to control small fires.	Supervisor	

Table 3: Response Methods			
Aspect	Management Action	Responsibility	
Fire Suppression	Upon becoming aware of a fire, the observer will alert all bystanders and then attempt to extinguish the fire, if this can be done safely. If the fire can be suppressed without additional resources, then personnel will suppress the fire, make the area safe and organise a patrol to monitor the suppressed fire.	All site personnel present at the fire	
	The senior person at the fire will co-ordinate fire-fighting activities and will be responsible for ensuring that all personnel are kept safe at all times.	All site personnel	
	In the event that a fire is reported within the project area, Hutchinson Builders will assess the situation and decide whether to enact fire emergency procedures depending on the severity of the fire, current conditions and its potential to impact on infrastructure, or human and environmental values. Alternatively, if the fire is assessed as nonthreatening and is not likely to impact on infrastructure, or human and environmental values it will be closely monitored and allowed to burn out	Supervisor	
	In the event that a fire occurs adjacent to the project area or surrounding bush lands, Hutchinson Builders will contact the NSW RFS and other relevant authorities to report the fire. Hutchinson Builders will assess the fire and whether it has the potential to migrate into the project area and impact on infrastructure, or human and environmental values, or significantly impact on the environmental values of the construction site. If this is the case, the Contractor will implement emergency response procedures and liaise with NSW RFS and other relevant authorities where necessary.	Supervisor	



Table 3: Response Methods			
Aspect	Management Action	Responsibility	
Communication	In the event that control of the situation is taken by fire-fighting authorities, the Hutchinson Builders personnel will follow the directions of the relevant authorities and assist where possible.	All site personnel	
	In the event that a significant bushfire occurs in the Project area, the Contractor will follow the communication protocol outlined below. NSW Fire and Rescue Cabramatta Fire Station (02) 9726 5940	HSE Advisor	
	If a bushfire occurs on or near the project area, the response time to communicate with the relevant agencies will be dependent on the severity of the fire. The NSW Fire and Rescue and other relevant stakeholders will be notified immediately of a significant fire by Hutchinson Builders.	HSE Advisor	
	In the event of a significant bushfire requiring agency assistance, it is anticipated that the response time to communicate with these agencies will be less than 30 minutes.	HSE Advisor	
	It will be the responsibility of Hutchinson Builders to communicate with the appropriate personnel to coordinate the necessary fire-fighting equipment required for the first response of the fire. In the event that the fire is not immediately suppressed, and further intervention is required the HSE Manager would be responsible for contacting the appropriate fire-fighting authorities.	HSE Advisor	
Responsibility	It will be the responsibility of Hutchinson Builders to ensure the evacuation of buildings and affected areas within the project area to a pre-arranged emergency meeting point.	HSE Advisor	
	Hutchinson Builders will be responsible for liaisons with local authorities such as the NSW Fire Service and City of Liverpool Council on an as needs basis.	HSE Advisor	



Table 4: Assessment Methods			
Aspect	Management Action	Responsibility	
Recovery	Once the site has been deemed safe to re-enter Hutchinson Builders will assess the extent of damage to the site and equipment and determine if works can resume. Part of the assessment will be to determine if the resumption of works will cause increased environmental damage, such as increasing the susceptibility of erosion.	Project Manager	
Review	The Bush Fire Response Plan will be reviewed if a significant fire event has occurred.	HSE Advisor	
Reporting	All fire incidents will be reported. The person who observes the incident is responsible for reporting the incident.	All personnel	
	Fire and safety training undertaken by site personnel will be recorded and maintained.	HSE Advisor	



3.2.4 Monitoring and Reporting

Weekly visual inspections will be conducted to ensure adequate fore control measures are being implemented and maintained at the site. Fire-fighting equipment are to be regularly checked to ensure it is in good working condition and will be replaced where necessary (after use, damage, loss or expiration date).

Evacuation points and routes will be clearly marked and maintained around the site. All staff are responsible for alerting of fires that occur within the project area.

All bush fires will be recorded as an incident. Records will document time, date, location and cause of fire.

Table 5: Performance Indicators	
Key Management Action	Performance Indicator
Maintain fire-fighting equipment	Fire-fighting equipment is in good, operable condition.
Maintain fire breaks	Fire breaks are clean and accessible.
Maintain evacuation routes	Evacuation routes are accessible, clearly signposted and maintained around the plant, office and accommodation areas.
Safe storage of dangerous goods	Oxygen cylinders and fuel are nor stored together (within 3m). Flammable materials are not stored within 5m of occupied buildings and secured and signposted.
Hot work permits	Completion of Hot Work Permits by contractors when conducting open flame activities.
Personnel fire training	All personnel likely to attend a fire are adequately trained.
Review of Bush Fire Response Plan	Plan reviewed annually or within 1 month of a bush fire incident.
Review training records	Record of training reviews available.
Complete fire incidence reports and notify relevant authorities	Incident reports are in place for all fires, date, location and area burnt.



3.3 Flooding

3.3.1 Assembly Points and Refuge Protocols

Assembly points will be clearly identified on the site by aluminium placards and on safety notice boards within the site amenities. Refuge points will be indicated on the safety notice boards within site amenities.

3.3.2 Predicted Flood Levels

Table 6: Summary of Existing Flood Behaviour		
Catchment	Summary of Existing Flood Behaviour	
Cabramatta Creek	The site is located on the eastern boundary of the Cabramatta Creek Flood plain. The majority of the 100 year ARI floodplain extent is located within open spaces. However, it intrudes into urban zones including the residential land near the northern extent of the Lawrence Hargrave Road, east of Brickmakers Creek.	
Brickmakers Creek	The majority of the 100 year ARI floodplain is located within open space zones. Marginal ingresses occur in residential zones land. The floodplain extends significantly into residential zones south-east and south-west of the intersection of Hume Highway and Copeland Street. And within Coolaroo Crescent and Wonga Street. Predicted flood levels from the creek indicate that flooding within the site would be between 0.5-1.0m for a 100 Year ARI event.	

The 1% Annual Exceedance Probability (AEP) flood scenario is presented on Figure 1 below (Wood&Grieve Engineers 2018). Based on Flood ERP Classification of Communities presented in the Floodplain Risk Management Guideline (Office of Environment and Heritage 2007), the site does not contain any flood islands or trapped perimeter areas (see Figure 1).







3.3.3 Flood Emergency Response

In case of flooding on the eastern section of the site (as modelled with AEP%, refer to Figure 1 above), vehicle and worker evacuation will be possible overland to higher ground towards west. Rescue operations are not expected to be necessary for the construction site as the site will not contain any persons with disabilities and all workers will be able to evacuate on foot towards Williamson Crescent. The following measures (presented on **Table 7**) have been prepared in reference to the Floodplain Risk Management Guideline (Office of Environment and Heritage 2007).

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Table 7: Flood Mitigation and Response Measures				
Mitigation/Measure	Implementation Stage	Responsibility	Site Use Phase	
General				
All construction personnel will be provided with information/training regarding the importance of flood warning and evacuation requirements.	Pre Construction Construction	HSE Advisor	Construction	
Temporary works such as hardstand areas and access tracks are to be designed and constructed to withstand flooding.	Project manager Site Manager	Project Manager Site Manager	Construction	
Minimising the extent of obstructions within the flood prone areas as far as practicable at all times during construction.	Project manager Site Manager	Project Manager Site Manager	Construction Operation	
Removing construction infrastructure and equipment from the flood prone areas in the event of a forecast flood to minimise both the risk of damage to infrastructure /equipment and the risk of flood impacts on properties.	Project manager Site Manager	Project Manager Site Manager	Construction Operation	
Monitoring for Potential Flood				
Monitor Bureau of Meteorology (BoM) forecast heavy rainfall events in order to allow sufficient time to vacate and prepare the site prior to the commencement of heavy rainfall and flood events.	During major rainfall events in the Liverpool LGA catchments	Project Manager	Construction Operation	
Monitor Bureau of Meteorology (BoM) for flood warnings for the Cabramatta Creek and the Georges River.	During major rainfall events in the Liverpool LGA catchments	Project Manager	Construction Operation	
Secure objects that are likely to float and cause damage.	Construction	Project Manager	Construction	



Table 7: Flood Mitigation and Response Measures				
Mitigation/Measure	Implementation Stage	Responsibility	Site Use Phase	
			Operation	
Ensure construction equipment (or excess material) are removed from	Construction	Site Manager	Construction	
the low areas especially around creek areas.			Operation	
Relocate waste containers, chemicals and dangerous goods above the	Construction	Site Manager	Construction	
potential flood line.			Operation	
Locate plant and equipment on high ground when flooding is expected.	Per event	Site Manager	Construction	
		Site personnel		
Amenities wastewater is transported off-site by a licenced operator to a licenced disposable facility (if applicable).	Construction	Project Manager	Construction	
Where minor flooding occurs in the works area, set-up temporary diversion or pumping of low flows around the works area.	Per event	Site Manager	Construction	
Turn off electricity, secure generators and secure gas cylinders when	Per event	Project Manager	Construction	
flooding is expected.		Site Manager	Operation	
Notification				
Declare the flood potential to the site staff and workers	When SES and BOM	Project Manager	Construction	
	website identify flood warning for the area	HSE Advisor	Operation	
Declaring the site closed.	When SES declare an	Project Manager	Construction	
	imminent flood		Operation	
Declaring the site reopened.	When SES have given	Project Manager	Construction	
	the all clear		Operation	



Evacuation			
The emergency exit route to be taken before flood waters rise is to exit to the compound on Williamson Crescent. Option 1 evacuation route (presented in Figure 2) will be adopted.	Before flooding of area	All personnel	Construction
The emergency exit route to be taken before flood waters rise is to exit to the compound on Williamson Crescent. Option 1 evacuation route (presented in Figure 2) will be adopted.	Before flooding of area	All school staff	Operation
During flooding the SES will advise through radio and the internet what roads are passable in the area. All site personnel will have secured and left the site by this time.	During flood event	All personnel	Construction Operation
No attempt should be made to enter or cross any flood waters that is above a minor flood level, or where the flood inundation level is not known	During flood event	All personnel	Construction Operation
Assessment of Damage and Remediation After Flood			
Ensure that damage is assessed and reported when all clear is given to return to site.	Following flood event	Project Manager HSE Advisor	Construction Operation
Remediate areas of damage, this includes clearing away of debris, sedimentation and blockage of uncompleted and temporary flood mitigation structures	Following flood event	Project Manager	Construction Operation
Debrief all key personnel and update / modify the flood emergency response plan, as required.	Following flood event	Project Manager	Construction Operation
Incorporating procedures to manage the effects of flooding on residential properties and the Warwick Farm Public School during construction.	Following flood event	Project Manager	Construction





Figure 2: Flood evacuation routes (Option 1 is the main route for construction phase) (Wood&Grieve Engineers 2018)



3.3.4 Training

All employees, contractors and utility staff working on site will undergo site induction training that will include details of this plan and the flood warning and evacuation requirements prior to construction commencing.

Staff of the Warwick Farm Public School will be made aware of this BF&FMP and will be communicated to students during evacuation and emergency education and drills.

In addition, the Emergency response plan will be tested every 6 months and will include a flood scenario to test the below requirements associated with this BF&FMP:

- Monitoring for flood and extreme weather events;
- Notifications;
- Site preparation prior to flood; and
- Evacuation requirements.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in flood management or those undertaking an activity with a high risk of environmental impact.

Site personnel will undergo refresher training at not less than six monthly intervals. Daily pre-start meetings conducted by the Site Manager will inform the site workforce of any environmental issues relevant to flooding that could potentially be impacted by, or impact on, the day's activities.

3.3.5 Monitoring and Reporting

Weekly monitoring is to be conducted during the project which will include a review of the following:

- Monitoring of BOM website for flooding of the Carbamate Creek and the Georges River;
- Flood warning services; and
- Creek heights prior to a flood event.

All floods will be recorded as an incident. Records will document time, date, extent and damages from the flood.

3.4 Review

The Project Manager shall ensure that the Bushfire and Flood Management Plan is reviewed after each and every drill or after a fire or flood event.

Results of emergency drills and evacuations shall be communicated back to the site at a toolbox meeting, so all personnel are aware of any improvements.

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Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix O: Unexpected Finds Protocol – Contamination

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1. PURPOSE

To address the requirements of the Development Consent in reference to an Unexpected Finds Protocol for the construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. **PROCEDURE**

This Unexpected Finds Procedure should be applied by workers when suspected contamination such as potential hydrocarbons and asbestos containing material (ACM) are unexpectedly found on site. Such an occurrence may occur:

- during excavation works;
- during demolition and building work;
- following soil disturbance after a storm or other unexpected event; or
- as a result of illegal dumping.

3.1 Prior to Work

Review

Undertake a review of any relevant information of the site (e.g. EIS Phase 2 Environmental Assessment and Remedial Action Plan)

If contamination is present within the work area, seek advice from the Site Manager who will consult the Environmental Representative prior to works commencing.

Inspect

Prior to commencing works, inspect the work area.

Is there evidence of historic or industrial activities, is there evidence of construction and demolition waste?

If any of the above are identified within or immediately adjacent to the work area, contractors should implement increased diligence during excavation works





Unexpected Find Occurs

The Workers should:

- Immediately cease work;
- Leave the area;
- Isolate the area; and
- Contact the Protocol Controller (site manager) as soon as possible.

Protocol Controller Attends Site

The Protocol Controller should:

- Install controls to further manage the isolation of the area. This may be achieved by use of warning signage and barricading;
- Cover stockpiled materials with tarpaulin or builders plastic and install appropriate stormwater and sediment controls to prevent the uncontrolled escape of potential contamination leaving the area; and
- Engage the services of a suitably qualified Asbestos/Environmental Consultant to assess the work area for contamination.

Asbestos/Environmental Consultant Attends Site.

The Consultant should decide on the presence of contamination in the work area.

No Contamination Present

The Protocol Controller should:

- Inform Workers that the suspected material is not contaminated;
- Direct Workers that they may recommence work; and
- Attach relevant documentation used in the determination into the site safety plan.

Contamination Present

The Protocol Controller should:

- Consider the recommendations of the Asbestos/Environmental Consultant;
- Consider arranging for the contaminated material to be removed to a suitably licensed facility; and/or
- Consider redesigning the work process so that the contaminated material is not disturbed if possible.

Area Safe to Re-Enter

Once the area has been deemed by a competent person to be safe to re-enter, the Protocol Controller should:

- Inform Workers that the work area is safe to re-enter; and
- Include any relevant documents (e.g. asbestos removal clearance certificates, bulk sample analysis results and air monitoring results) into the site safety plan.





Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix P: Unexpected Finds Protocol – Heritage

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XVII



1. PURPOSE

May 2019

To address the requirements of the Development Consent in reference to a Heritage Unexpected Finds Protocol for construction of the Mainsbridge School at the Warwick Farm Public School.

2. SCOPE

Applies to all Hutchinson Builders work-related activities, workplaces, employees, contractors, subcontractors and visitors associated with the project.

3. PROCEDURE

This Unexpected Finds Procedure should be applied by workers when suspected objects of heritage value are identified. Unexpected finds may include but are not limited to:

- Aboriginal stone artefacts, shell middens, burial sites, engraved rock areas, scarred trees;
- Remains of rail infrastructure including buildings, rail lines, signal boxes, bridges and stations;
- Remains of other infrastructure including sandstone or brick buildings, wells, drainage systems, bridges and retaining wells.
- Artefact scatters including clustering of broken bottles, glass ceramics, animal bones and clay pipes; and
- Archaeological human skeletal remains.



strategy (addressing all

Recommence work as planned or altered to minimise impact

regulatory requirements)





Construction Environmental Management Plan Hutchinson Builders

Mainsbridge School

Appendix Q: Development Application Resolution Table

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XVIII


Table 1: Development Consent Resolution Table					
Condition	Sub-condition	Resolution			
B17 - Management plans required under this consent must be prepared in accordance with relevant guidelines, and include	 details of: (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; 	 (i) 3. of this CEMP (ii) 2.6 and 8 of this CEMP, 4.5 of Appendix K of this CEMP; and (iii) 8 of this CEMP and Appendix B of this CEMP. 			
	a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Appendix E, F, G, H, I, K, M, N of this CEMP			
	 a program to monitor and report on the: (i) impacts and environmental performance of the development; (ii) effectiveness of the management measures set out pursuant to paragraph (c) above; 	 (i) 8 and Appendix B of this CEMP (ii) 8 of this CEMP 			
	a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Appendix J			
	a program to investigate and implement ways to improve the environmental performance of the development over time;	8 of this CEMP and Appendix B of this CEMP			
	 a protocol for managing and reporting any: (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); (ii) complaint; and (iii) failure to comply with statutory requirements. 	(i) Appendix J			
	a protocol for periodic review of the plan.	8 of this CEMP			
	(a) Details of: (i) hours of work;	(i) Section 2.4 of this CEMP (ii) Section 4.1 of this CEMP			

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Table 1: Develor	oment Consent Resolution Table

Condition	Sub-condition	Resolution
B18. Prior to commencement of construction, the Applicant must prepare a Construction Environmental Management Plan (CEMP) and it must include, but not be limited to, the following:	 (ii) 24-hour contact details of site manager; (iii) management of dust and odour to protect the amenity of the neighbourhood; (iv) stormwater control and discharge; (v) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site; (vi) groundwater management plan including measures to prevent groundwater contamination; (vii) external lighting in compliance with AS 4282-1997 Control of the obtrusive effects of outdoor lighting; (viii) community consultation and complaints handling; 	 (iii) Appendix C – EWMS (iv) Appendix E – Soil and Water Management Plan (v) Appendix E – Soil and Water Management Plan (vi) Appendix E – Soil and Water Management Plan (vii) Section 2.6 of this CEMP (viii) Section 5 of this CEMP
	Construction Traffic and Pedestrian Management Sub-Plan (see condition B20);	Appendix G of this CEMP
	Construction Noise and Vibration Management Sub-Plan (see condition B21);	Appendix K of this CEMP
	Construction Waste Management Sub-Plan (see condition B22)	Appendix F of this CEMP
	Construction Soil and Water Management Sub-Plan (see condition B23);	Appendix F of this CEMP
	Biodiversity Management Sub-Plan (see condition B24);	Appendix M of this CEMP
	Bush Fire and Flood Emergency Response (see condition B25);	Appendix N of this CEMP
	an unexpected finds protocol for contamination and associated communications procedure;	Appendix O of this CEMO
	an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure;	Appendix P of this CEMP



Table 1: Development Consent Resolution Table					
Condition	Sub-condition	Resolution			
	waste classification (for materials to be removed) and validation (for materials to remain) be undertaken to confirm the contamination status in these areas of the site; and	N/A			
B20. The Construction Traffic and Pedestrian Management Sub-	be prepared by a suitably qualified and experienced person(s);	Appendix R of this CEMP			
Plan (CTPMSP) must address, but not be limited to, the following:	be prepared in consultation with Council and RMS;	3.9 of Appendix G of this CEMP			
	detail the measures that are to be implemented to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services;	3.6 of Appendix G of this CEMP			
	detail heavy vehicle routes, access and parking arrangements;	3.1 and Attachment A of Appendix G of this CEMP			
	 (e) include a Driver Code of Conduct to: (i) minimise the impacts of earthworks and construction on the local and regional road network; (ii) minimise conflicts with other road users; 	3.6, 3.7 and 3.9 of Appendix G of this CEMP			
	(iii) minimise road traffic noise; and (iv) ensure truck drivers use specified routes;				
	(f) include a program to monitor the effectiveness of these measures; and	3.11 of Appendix G of this CEMP			
	(g) if necessary, detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes.	3.8 of Appendix G of this CEMP			
B21. The Construction Noise and Vibration Management Sub-Plan	(a) be prepared by a suitably qualified and experienced noise expert;	Appendix R of this CEMP			
must address, but not be limited to, the following:	(b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009);	3.3 and 3.4 of Appendix K of this CEMP			
	 (c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers; 	3.4 of Appendix K of this CEMP			

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Table 1: Development Consent Resolution Table					
Condition	Sub-condition	Resolution			
	(d) include strategies that have been developed with the community for managing high noise generating works;	4.1, 4.7 of Appendix K of this CEMP and 5.5 of this CEMP			
	(e) describe the community consultation undertaken to develop the strategies in condition B21(d); and	4.7 of Appendix K of this CEMP			
	(f) include a complaints management system that would be implemented for the duration of the construction.	4.7 of Appendix K of this CEMP and 5.6 of this CEMP			
B22. The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the following:	(a) detail the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations;	Each type of waste and the potential facilities identified has been identified in Appendix A of Appendix F of the CEMP. However, volumes and disposal locations have not be confirmed.			
	(b) removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility in accordance with the requirements of the relevant legislation, codes, standards and guidelines, prior to the commencement of any building works.	3.3 of Appendix F of this CEMP			
B23. The Applicant must prepare a Construction Soil and Water	(a) be prepared by a suitably qualified expert, in consultation with Council;	Appendix R, Section 6 and Attachment A of Appendix F of this CEMP			
Management Plan (CSWMSP) and the plan must address, but not be	(b) describe all erosion and sediment controls to be implemented during construction;	4.4 of Appendix E of this CEMP			
	(c) provide a plan of how all construction works will be managed in a wet- weather events (i.e. storage of equipment, stabilisation of the Site);	5.5 of Appendix E of this CEMP			
	(d) detail all off-Site flows from the Site; and	5.4 of Appendix E of this CEMP			
	(e) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 1-year ARI, 1 in 5-year ARI and 1 in 100-year ARI).	5.6 of Appendix E of this CEMP			
B24. The Biodiversity Management Sub-Plan (BMSP)	(a) provide information and maps that define the biodiversity values across the site;	3.1 and Attachment A of Appendix M of this CEMP			
must address, but not be limited to, the following:	(b) outline priority investment area on-site where biodiversity will benefit from active management and restoration;	3.2 and Attachment A of Appendix M of this CEMP			

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Condition	Sub-condition	Resolution
	(c) map potential areas for management of threatened and significant species;	3.2 and Attachment A of Appendix M of this CEM
	(d) measures to minimise the loss of key fauna habitat, including tree hollows;	3.4, 3.7 and 5 of Appendix M of this CEMP
	(e) measures to minimise the impacts on fauna on site, including conducting fauna preclearance surveys prior to vegetation clearing, building/structure demolition;	3.5 of Appendix M of this CEMP
	(f) engagement of an appropriately qualitied ecologist with experience in capturing native wildlife to be on site for all vegetation removal activities;	3.5 of Appendix M of this CEMP
	(g) controlling weeds and feral pests;	3.6 of Appendix M, and Appendix H of this CEMP
	(h) an Unexpected Finds Procedure detailing procedures and management measures to be implemented in the event that flora and fauna is uncovered in any area not identified in the updated Biodiversity Assessment (BAR);	5 of Appendix M of this CEMP
	(i) measures to ensure biodiversity values not intended to be impacted are protected, including barriers and mapping of protected/ 'no-go' areas; and	3.7 of Appendix M of this CEMP
	(j) a program to monitor the effectiveness of the measures in the BMSP.	4 of Appendix M of this CEMP
B25. The Flood Emergency Response Sub-Plan (FERSP) must	(a) be prepared by a suitably qualified and experienced person(s);	Appendix R of this CEMP
address, but not be limited to, the following:	(b) address the provisions of the <i>Floodplain Risk Management Guideline</i> (OEH, 2007);	3.3 of Appendix N of this CEMP
	 (c) include details of: (i) flood emergency responses for both construction and operation phases of the development; (ii) predicted flood levels; (iii) flood warning time and flood notification; (iv) assembly points and evacuation routes; (v) evacuation and refuge protocols; and 	 (i) Table 7 of Appendix N of this CEMP (ii) 3.3.2 of Appendix N of this CEMP (iii) Table 7 of Appendix N of this CEMP (iv) Table 7 of Appendix N of this CEMP (v) Table 7 of Appendix N of this CEMP; and (vi) 3.3.4 of Appendix N of this CEMP
	(vi) awareness training for employees and contractors, and students.	





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Mainsbridge School

Appendix R: Consultant Experience

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Table 1: Project Team Experience						
Consultant	Qualifications	Relevant Consulting Experience	Position/ Role			
Matthew Barberson	BSc Environmental Engineering - METU MEng Engineering Management – Cornell University	7	Team Manager – Environment NSW/ACT			
Alex Chaplin	BSc Hons Geology - University of New South Wales MSci Environmental Science and Law – University of Sydney OHS General Induction for Construction Work in NSW	3	Consultant - Environment Project Manager			
Eustace Vance	Bsc Environmental, Applied Biology – Griffith University Master of Environmental Management – The University of Newcastle	6	Senior Consultant Environment			
Damian Licari	PhD in Science - University of Technology Sydney Master of Business Administration – University of New South Wales BSc – University of New South Wales Biobanking Assessor Accreditation Accredited Person (OEH)	10	Principal Consultant - Environment			
George Zantey	Bsc Applied Science, (Food Technology) - University of Western Sydney Diploma of Quality Auditing Diploma of WHS NSW Licensed Asbestos Assessor (LAA000196) Exemplar Global Certified Management Systems Auditor	9	Senior Consultant - Property Risk			





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Appendix S: Flood Risk Management Report

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Mainsbridge School for Specific Purposes

Civil

Report

Flood Risk Management Report

Prepared for:

Hayball Pty Ltd

Prepared by:

Hock Chua Project No. 39935 P:\39935\project documentation\civil\documents & reports\39935-syd-c-frm - mainsbridge.docx

Date: 03 February 2020 Level 6, Building B, 207 Pacific Highway, St Leonards NSW 2065 T: (02) 8484 7000 E: sydney@wge.com.au W: www.wge.com.au

Revision

REVISION	DATE	COMMENT	APPROVED BY
A	21.08.18	SSDA Issue	ннс
В	24.08.18	SSDA Issue	ННС
С	10.09.18	SSDA Issue	ННС
D	11.09.18	SSDA Issue	ннс
E	03.02.20	Reissue with Author's Experience and qualification	ННС

Site Address: Real Property Description: Proposed Development: 95 Lawrence Hargrave Road, Warwick Farm 2170 Lot 505 DP235414 Education Development

Client: Local Authority Authority Reference #: Wood & Grieve Reference: Hayball Pty Ltd Liverpool City Council N/A 39935-SYD-C-R-FRM

hul

Hock Chua Civil Project Engineer Hock Chua 30 years Experience, Bachelor of Engineering (Civil), CPEng (651170), NPER, RPEQ (14290), VBA(EC470257) For and on behalf of Wood & Grieve Engineers

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1. Introduction

Wood & Grieve Engineers have been commissioned by Hayball Pty Ltd to prepare this Flood Risk Management report for the proposed development at 95 Lawrence Hargrave Road, Warwick Farm. The sites real address is Lot 505 DP235414.

This report has been prepared to accompany a development application (SSDA) for the site with Liverpool City Council. The report is in support of Liverpool City council's Stakeholder Engagement Meeting held on the 01/09/17, that a Flood Risk Management Report is to be prepared given the "buildings will be built to 500mm above the 1% AEP flood height (not designing for peak maximum flood)" (Appendix C – Meeting Minutes).

This revision (D) has been updated to include the new findings from Liverpool City Council's TUFLOW model results of the Amalfi Park Detention Basin Design (2013), received on the 30/08/2018 and Liverpool City Council's correspondence (Appendix D) confirming the Brickmakers Creek Flooding Report (2007) by GHD is "not valid" that "the Amalfi Park Detention Basin Design (2013) is the current applicable model to Brickmakers Creek". Council's correspondence 03/09/2018 (Appendix D) has also identified that there is "no overland flow path through the site".

1.1 Purpose of Study

This flood risk management report will assess the impact of the existing flooding on the proposed development and suggest flood prevention and mitigation measures to reduce the impacts of flooding.

2. Existing Site Characteristics

2.1 Property Detail

Address: Real Property Description: 95 Lawrence Hargrave Road, Warwick Farm Lot 505 DP235414

The Mainsbridge SSP is a special needs school located adjacent to the existing Warwick Farm Public School. It proposed that the existing buildings WC2 & WC3 are to be demolished.

The proposed development will consist of one (1) one storey education building (Block C), three (3) two storey education buildings (Block A,B,D), one (1) one storey pool block (Block E1), a sports field and an open car parking hardstand areas.



Figure 1: Site Plan Layout

The site is bounded by:

- Child care centre and Warwick Farm recreation reserve to the North,
- Brickmakers Creek to the East,
- Lawrence Hargrave Road and Brickmakers creek to the South,
- And Williamson Crescent to the West.

Refer to locality plan in figure 2.



Figure 2: Site Location Plan (Source: Nearmaps 2018)

2.2 Topography

The existing site consists of existing public school buildings, hardstand areas and greenfield areas.

The site generally falls west to east towards Brickmakers Creek. The high point of the proposed development is located in the north western corner of the site at a level of approximately RL9.50m AHD. The low point located along the eastern boundary at approximately RL5.68m AHD.

2.3 Stormwater Catchments

The surrounding area has been investigated to determine the likely impact of existing external stormwater catchments on the proposed site.



Figure 3: Upstream Catchment Plan (Source: SIX VIEWER 2017 – Department of Land and Property Inform......,

The proposed development is generally situated at the bottom of the localised catchment. The overland flow from upstream catchment areas will be conveyed via the adjacent roads and discharge into Brickmakers Creek.

2.4 Existing Stormwater Discharge

The site consists of an existing developed public school education building facilities, landscaped areas and open car parking areas with existing stormwater pit and pipe networks. The existing drainage currently discharges into a kerb inlet pit at the intersection of Williamson Crescent and Lawrence Hargrave Road and directly into Brickmakers Creek.

3. Flood Impact Assessment

3.1 Existing Flooding

3.1.1 Flood Related Development Controls

In preparing the report, Wood and Grieve Engineers has referred to Liverpool City Council's DCP & LEP, NSW Floodplain Risk Management Manual (2005), Cabramatta Flood Study & Basin Strategy Review (2011) by Bewsher, Brickmakers Creek Flooding Report (2007) by GHD, Liverpool City Council's TUFLOW model of the Amalfi Park Detention Basin Design (2013) and Council's Flood Certificate issued 1st of Feb 2017 (refer to Appendix A). This information in the vicinity of the property will be used to understand the extent of flooding on the site and to assist in the assessment and preparation of the Flood Risk Management Report as per the Secretary's Environmental Assessment Requirements (SEARs).

Wood and Grieve have reviewed Liverpool City Council's comments, ePlanning maps, Cabramatta flood study & basin strategy review (2011), Brickmakers Creek Flooding Report (2007) and Council's TUFLOW model of design of Amalfi Park Detention Basin (2013) and have determined that the development is flood affected during the 20% AEP, 5% AEP, 1% AEP and PMF.

Liverpool City Council has provided the latest TUFLOW model - Amalfi Park Detention Basin Design (2013) on the 30th August 2018 and have confirmed the "Brickmakers Creek Flood Report (2007) is no longer valid" and "the Tuflow model of Amalfi Park Detention basin design (2013) is the current applicable model" (see council correspondence, Appendix D). Since the Brickmakers Creek Flooding Report in 2007, a significant amount of flood mitigation measures has been completed around Brickmakers Creek including the construction of the Amalfi Park Detention Basin. These mitigation measures have been reflected in the TUFLOW model Amalfi Park Detention Basin (2013). Based on this model, the 1% AEP flood extent results show no overland flow travelling through the site as a result of improving conditions of the creek from recent flooding mitigation works (figure 7). This has been confirmed by Council via email correspondence on the 03/09/2018 stating "there Is no overland flow through the site" (Appendix D) which addresses any overland flow Flooding Issue raised by NSW Office of Environment and Heritage from the Brickmakers Creek Flood Modelling report and subsequently will not require further flood study or investigation.

From reviewing the council eplanning maps the eastern boundary of the site has been categorized under high and medium hazard with the rest of the site under low flood risk (figure 4). It is stated in the flood certificate (Appendix A) the that the mainstream flood level from Brickmakers creek for the PMF is RL12.00m AHD, 1% AEP (1 in 100-year ARI) is RL7.60m AHD, 2% AEP (1 in 50-year ARI) is RL7.00 and 5% AEP (1 in 20-year ARI) is RL6.80m AHD. The flood levels from the flood certificate was obtained from Cabramatta Flood Study & Basin Strategy Review (2011) (figure 5).

Extract of the flood risk and design flood extent maps are attached below.



Figure 4: Flood Hazard & FPL Extent (Source: Liverpool City Council ePlanning Maps)



Figure 5: Design 100 Year Flood for existing (2008) conditions (Source: Cabramatta Flood Study & Basin Strategy Review, 2011)



Figure 6: 5% AEP Flood Extents (Source: LCC TUFLOW model of Amalfi Park Detention Basin Design, 2013)



Figure 7: 1% AEP Flood Extents (Source: LCC TUFLOW model of Amalfi Park Detention Basin Design, 2013)



Figure 8: PMF Flood Extents (Source: LCC TUFLOW model of Amalfi Park Detention Basin Design, 2013)

3.1.2 Local Flooding and Flood Planning

As seen in the figures above, the site is affected by the 20% AEP(5yr ARI), 5% AEP (20yr ARI), 1% AEP (100yr ARI) and the PMF. As a result, the development must comply with Council's DCP Floodplain Mainstream and Local Overland Flooding Controls. Council's flood policy identifies the proposed educational development as "sensitive uses and facilities" within in the Cabramatta Creek floodplain and under the low risk hazard zone from council's DCP and to not increase the risks or costs associated with flooding.

With reference to council's flood certificate issued 1st of Feb 2017 (Appendix A), the Cabramatta Flood Study & Basin Strategy Review (2011) and Liverpool City Council's TUFLOW model of design of Amalfi Park Detention Basin (2013) (Figure 6-8), the following Brickmakers Creek mainstream flood levels are as follows:-

- PMF RL 12.00m;
- Flood Planning Level (1% AEP + 500mm) RL 8.10m
- 1% AEP (100 year ARI) RL 7.60m;
- 2% AEP (50 year ARI) RL 7.00m;
- 5% AEP (20 year ARI) RL 6.80m.

Liverpool city council's DCP Floodplain Control indicates that areas classified under sensitive uses and facilities in the Cabramatta Creek Floodplain require floor levels to be no lower than the PMF level (RL12.00m) unless justified by site specific assessment. A meeting with Liverpool council conducted on the 1st of September 2017 has concluded that the "buildings will be built to 500mm above the 1% AEP flood height (not designing for peak maximum flood) provided that a Flood Risk Management Report is prepared to demonstrate the flood risk management" (Appendix C – Meeting Minutes). This Flood Risk management report has been prepared to satisfy the council's requirement and has included the impacts of flooding to address key issue 5 - Flooding 30/04/18 raised by the NSW department of planning and environment and the Flooding item 24/04/18 by Liverpool City Council.

3.2 Proposed Development

3.2.1 Floor levels

As discussed in section 3.1.2 the minutes of the meeting with council states that building floor levels are to be built to 500mm above the 1% AEP flood height. The proposed floor levels are summarised in the table below:

Floor	RL (mAHD)	Habitable (Y/N)	Above 5% AEP (RL6.80m) *	Above 1% AEP (RL7.60m) *	Above 1% AEP+500mm (RL8.10m) *	Above PMF (RL12.00m) *
Block A – Ground	RL 8.50	Y	Y	Y	Y	N
Block B – Ground	RL 8.50	Y	Y	Y	Y	N
Block C – Ground	RL 8.50	Y	Y	Y	Y	N
Block D – Ground	RL 8.50	Y	Y	Y	Y	N
Block E – Ground	RL 8.50	N	Y	Y	Y	N
Block A – Level 1	RL 12.00	Y	Y	Y	Y	Y
Block B – Level 1	RL 12.00	Y	Y	Y	Y	Y
Block D – Level 1	RL 12.00	Y	Y	Y	Y	Y

* Based on 1% AEP levels from LCC flood certificate, Cabramatta Flood Study & Basin Strategy Review (2011) and consistent with LCC's TUFLOW Amalfi Park Detention Basin model (2013).

Table 9: Flood Level Summary

3.2.2 Car parking

As required by the Cabramatta Creek Floodplain policy, the minimum surface level of a car parking area, which is not enclosed (e.g. open car parking space or carport) shall be as high as practical, but no lower than the 5% AEP flood level (RL6.80m) or the level of the crest of the road at the highest point. It has been proposed that the open carpark level be set at RL 8.50m at the lowest point which is 1.7m above the 5% AEP flood level (RL 6.8m) and 0.9m above the 1% AEP flood level (RL 7.6m).

3.2.3 Impact of flooding on the proposed development

As noted above, the site will be impacted by the 1% AEP flood extent. The proposed building Block C will encroach within the 1% AEP flood extent at RL7.6m (Figure 10). Liverpool City Council's DCP has stated that no structures other than concessional development, open type structures or small non habitable structures (not more than 30sqm) are permitted within the flood extent. The flood impact from the proposed development Block C will be minor with an estimated flood storage loss of 4m³. To ensure that there is no net loss of floodplain storage volume below the 1% AEP flood, compensatory excavation will be provided in the North Eastern boundary in accordance with Liverpool City Council's Floodplain Policy as part of the removal of contaminated soil. This flood mitigation measure will ensure that the development will not increase flood effects elsewhere in regard to flood levels, flood conveyance, velocity and flood storage.



Figure 10: Proposed Development & 1% AEP Extent

As discussed above, all building floor levels are set at RL8.50m, which is above the 1% AEP overland flood levels. In the event of a PMF, the ground floor levels (RL8.50m) and carpark areas will be flood affected. To reduce any additional risks of flooding within all buildings, it is proposed that water tight doors be install at all entrances. Block A, B and D level 1 floor level will be at the PMF level (RL12.00m) and will not impacted by the PMF.

Refer to the various profiles and sections of the development in relation to the Brickmakers Creek Report flood levels for clarity.



Figure 11: Major Storm event extent on Proposed Development – Block A & Block B (West Elevation view)





Figure 13: Major Storm event Extent on Proposed Development –Block D (South Elevation view)



Figure 14: Major Storm event Extent on Proposed Development –Block E (East Elevation view)

3.3 Flood Evacuation

In the event of a major flood event, various options will be available to ensure patrons are safe from rising flood levels. A flood evacuation plan illustrates a reliable safe flood access for people to a refuge in the event of a major storm event. It is required that reliable access for pedestrians or vehicles be provided from the building to an area of refuge above the PMF level. A Mainsbridge SSP flood evacuation plan has been developed indicating safe egress passage away from the site, see Appendix B.

1% AEP (100-year ARI)

During a 1% AEP flood event patrons can safely evacuate the area by foot or vehicles. Vehicles can safely exit the site via the driveway along Williamson Crescent and patrons can safely exit the building from the ground floor. Evacuating patrons can either travel north along Williamson Crescent and continue (west) along Williamson Crescent until reaching Lawrence Hargrave Road or turn directly onto Lawrence Hargrave Road and travel west. Both routes will head west towards Homepride Ave and continue heading west onto local access roads towards Cumberland Highway. Patrons can then turn left (south) on Cumberland Highway and turn right (west) onto Grimson Crescent which will be unaffected by flood waters. Both evacuation routes will not be inundated during a 1% AEP (100-year ARI) and will provide safe passage away from the rising flood waters (Figure 16).

PMF (Probable Maximum Flood)

Time constraints for evacuation do apply to around the site and along the evacuation route during a PMF. In the event of a storm event greater than the 100 year, an emergency response plan will be executed for when the ground floor is inundated during events greater than the 1% AEP.

Prior to building inundation during the PMF event, patrons will need to quickly evacuate vehicles in the carpark via the driveway while it is still safe to do so and follow the Flood evacuation plan route (Appendix B) away from rising flood waters. Patrons residing in the building will exit from the ground floor and head to Williamson Crescent and Lawrence Hargrave Road while it is still safe and follow the Flood evacuation plan route (Appendix B) to higher land above the PMF.

Once building inundation becomes too severe and patrons are required to evacuate the carpark and ground floor and head to Level 1 Block A, B or D via the egress stairs located in the south-west, north and west in each respective building (figure 17). Patrons will then make their way up stairs to L1 where the floor level is at the PMF (RL12.00m). It is recommended that patrons remain in the building until the storm or floodwaters have subsided.

Trucks may be used to evacuate people and their possessions if necessary.



Figure 15: Flood Evacuation Plan 1% AEP (100 Year ARI Event)



Figure 16: Ground Floor Flood Evacuation Plan during the PMF Event

3.4 Mitigation Measures

A number of initiatives are to be implemented to reduce risks associated with flooding, including the following:

- All Finished Floor Levels are above the specified 1% AEP (100-year ARI) level and 1% AEP + 500mm Freeboard.
- Adoption of flood compatible materials below the PMF level is proposed.
- No shelving and store goods will be proposed beneath the 1% AEP flood level plus 500mm freeboard.
- No storage of materials below the design floor level which may cause pollution or be potentially hazardous during any flood.
- The development and buildings are to be designed to ensure structural soundness and integrity in the event of floodwater, debris and buoyancy up to and including a 1% AEP flood level plus 500mm freeboard.
- All elements of structure will be designed to withstand forces arising from PMF.
- All key services, including electrical equipment, fuel lines or other services will be located in positions where they are not at risk from flooding effects. All electrical appliances/outlets to be located above the 1% AEP & Flood Planning Level.
- A watertight door is proposed at the entrances to residential/habitable areas.
- Compensatory storage will be provided to ensure that there is no net loss of floodplain storage volume below the 1% AEP flood.
- Fences are to be constructed in a manner that does not obstruct the flow of floodwaters. Fences shall be constructed to withstand the forces of floodwaters.
- An assessment of the population and floor levels at risk. This seeks to understand who is at risk from flooding effects, how significant is the hazard and what mitigating measures or strategies are to be put in place. Key considerations of this risk assessment include:
 - All residents residing in L1 can remain safely during a significant flood event.
 - Appropriate evacuation warning signs in the ground floor will be displayed.
 - A Flood Evacuation Strategy will be fully developed, to direct affected residents to a safe place of refuge. Concept proposals are indicated in section 3.3 Flood Evacuation and Appendix B.

4. **Conclusion and Recommendation**

Based on the review of the documents and information available, we conclude the following:

- The proposed development will be outside the 1% AEP flood extent.
- The proposed development will be constructed with all floor levels 0.9m above the 1% AEP (100-year ARI).
- The proposed development building levels are 0.4m above the Liverpool City Council Flood Certificate 1% AEP + 500mm flood level.
- The proposed development, Block A, B & D Level 1 floor levels are above the Liverpool City Council Flood Certificate PMF level.
- The development will include compensatory excavation storage to ensure no net loss of 1% AEP floodplain storage as a result of minor encroachment of Block C into the 1% AEP flood extent.

Based on the above conclusion, we therefore recommend that Council accept this development proposal without further flood study or building modification.

APPENDIX A Council Flooding Certificate

ANNEXURE TO SECTION 149(5) CERTIFICATE

LIVERPOOL CITY COUNCIL

Issue Date: 1/02/2017

Issue No: 2027198

File No: 2017/0074

Premises at Lot 22DP 715287

Lawrence Hargrave Road Warwick Farm

Further to the advice contained in the Section 149(2) Certificate and on the basis of the latest information available to the Council:

- 1. the maximum calculated level of the probable maximum flood (PMF) in the vicinity of your property in metres AHD is **12.0**.
- 2. the maximum calculated level of the 1% annual exceedance probability flood (previously referred to as the 1 in 100 year) in the vicinity of your property in metres AHD is **7.6**.
- 3. the maximum calculated level of the 2% annual exceedance probability flood (previously referred to as the 1 in 50 year) in the vicinity of your property in metres AHD is 7.0.
- 4. the maximum calculated level of the 5% annual exceedance probability flood (previously referred to as the 1 in 20 year) in the vicinity of your property in metres AHD is **6.8**.

The Council does not possess accurate information on the natural surface levels of individual allotments or on constructed building levels, and these should be established by private survey to ascertain their relationship to the above flood levels.

Flood levels are obtained from Cabramatta Creek Flood Study and Basin Strategy Review - September 2011

Name of Assessor: W. Siripala Signature:

APPENDIX B Flood Evacuation Plan

MAINSBRIDGE – SCHOOL FOR SPECIFIC PURPOSES **FLOOD EVACUATION PLAN**



TO EVACUATE FROM THE SITE EITHER :

- **OPTION 1** TURN RIGHT (NORTH) ON WILLIAMSON CRES AND HEAD WEST, THEN TURN RIGHT (WEST) ONTO LAWRENCE HARGRAVE RD UNTIL REACHING HOMEPRIDE AVE; OR
- **OPTION 2** TURN ONTO LAWRENCE HARGRAVE ROAD AND HEAD WEST UNTIL **REACHING HOMEPRIDE AVE**

UPON REACHING HOMEPRIDE AVE CONTINUE WEST ONTO LOCAL ACCESS ROADS AND HEAD TOWARDS CUMBERLAND HWY AND TURN LEFT (SOUTH) ONTO CUMBERLAND HWY AND TURN RIGHT (WEST) ONTO GRIMSON CRESCENT.

Background

The site is subject to flooding during major storm events. Anticipated flood levels are as follows: 1% AEP (100 year Average Recurrence Interval) flood Level = 7.60 m AHD

- Probable Maximum Flood level = 12.00 m AHD. •

The building finished floor levels are:

- Building Ground Floor level RL 8.50m, Below the Probable Maximum Flood level. •
- Building A, B, D Level 1 RL 12.00m, at the Probable Maximum Flood level.

There is no flood warning system available.

Plan

The 100 year Average Recurrence Interval flood and the Probable Maximum Flood are expected to occur rarely. If they do occur, the evacuation routes shown on the plan are preferred. Evacuation should be triggered by flood water lapping against the eastern and southern side of the buildings.

Once the building is inundated, the risk is too high to evacuate as vehicles become unstable. In this case the operator of the building/event may deem it appropriate to evacuate the ground floor and carpark and take shelter in building A, B or D L1 floor as the floor level is at the PMF.

IN AN EMERGENCY DIAL 000

Note: Numbers shown are flood levels for the Probable Maximum Flood, shown to Australian Height Datum (AHD)



APPENDIX C Meeting Minutes



1 September 2017

Project	Western Sydney Wollongong Schools	From	Liam Titmarsh
Subject	Liverpool Council Stakeholder Engagement Meeting	Tel	02 9239 7288
Venue/Date/Time	Banksia Room, 33 Moore St, Liverpool / 09.08.17 / 10:00am – 11:00am	Job No	2125817
Copies to	All attendees and apologies		
Attendees	David Smith (Council DA Coordinator) Charles Wiofe (Council Service Manager)	Apologies	
	Rachel Palermo (Council Road Safety Officer)		
	Anupam Saha (Council Graduate Civil Engineer)		
	Stephen Joannidis (Council Manager Development Engineering)		
	James Frost (GHD Senior Project Manager)		
	Luke Houghton (GHD Project Manager)		
	Liam Titmarsh (GHD Project Engineer)		
	Kit Ku (Hayball Architect)		
	Carlos Sogari (Hayball Architect)		

Minutes

Action Introduction GHD provided an overview of the Western Sydney and Wollongong Note . Schools group of projects GHD noted that the objective of the meeting was to brief Liverpool • Note Council on the proposed projects for the Liverpool area and obtain feedback (concerns and opportunities) for each of the projects Mainsbridge School for Specific Purposes (SSP) Note Hayball provided an overview of the Mainsbridge SSP scope and • current concept design plans. The scope includes: Development of new facilities at the Warwick Farm PS site 0

- Administration, Staff and Library buildings 0
- 2 Learning Space blocks 0
- Multipurpose Space / Hall with trade skills kitchen attached 0 (to be shared with Warwick Farm Public School; potential for community use after hours)

linute	es		Action
	0	Site and landscape works to internal courtyard and Warwick Farm PS sports field	
	0	Frontage on Williamson Crescent with off street drop off lane with covered drop off point	
•	Noted and ph (minibu does n	Mainsbridge SSP caters to moderate and severe intellectual ysical disabilities. A majority of students utilise paid transport uses and/or cabs) to go to school. This means the school ot have the same effect on traffic as a Public School	Note
•	Noted School constra	the development was not undertaken at Lawrence Hargrave as they cater to behavioural disabilities and the site is very ained (limited frontage, located in flood planning zone)	Note
•	Noted year flo school	the buildings will be built to be 500 mm above the 1 in 100 bor height (not designing for peak maximum flood). Noted the will require a flood risk management plan	Note
•	Noted still not	the intended use of the existing Mainsbridge SSP site has t been decided	Note
•	Propos Develo	ed planning pathway under the current legislation is opment Application (DA)	Note
•	Counc	il comments:	
	0	Noted Williamson Crescent is a narrow street (6 m width)	Note
	0	Noted there are parking restrictions currently in place during school hours	Note
	0	Noted traffic and parking were key concerns. A traffic consultant will need to be engaged to prepare a traffic report	Note
	0	Noted the school could also develop an operational traffic management plan (i.e. staggered arrival)	Note
	0	Noted filling in "high risk" flood areas is prohibited	Noto
	0	Noted when filling in "medium risk" and "low risk" flood areas the flood capacity would need to be replaced	NOLE
	0	Noted the flood areas can be reviewed online (<u>https://eplanning.liverpool.nsw.gov.au/</u> - refer online maps)	Note
	0	Noted schools do not typically lease fields to the public after hours. When they do lease the field for sporting events this creates traffic issues	

Minutes		Action		
Cecil Hills Public School				
 Hayba and cu 	Il provided an overview of the Cecil Hills PS project scope rrent concept design plans. The scope includes:	Note		
0	New 2 storey building with 15 home bases, library hub and staff unit			
0	Hall extension and refurbishment			
0	Remove 12 demountable classrooms			
0	Net increase of 3 classrooms			
 Proposition (CDC) 	sed planning pathway is Complying Development Certificate	Note		
Counc	il comments:			
0	Noted primary access is from Leopold Place (one way in / one way out)	Note		
0	Noted there is an opportunity to provide improved access from the road that currently services the community centre to the north of the school However this is a private council road and has not been developed	Note		
0	Noted the school has existing traffic issues which are an issue of contention for parents. Council has been working with P&C to make improvements	Note		
0	Noted the community issue may develop with project providing new facilities but not addressing traffic issues	Note		
0	Noted parents have been parking in the shopping mall and in the community centre	Note		
0	Project should engage a traffic consultant to conduct a review, including covering construction traffic	Note		
0	Noted the requested construction traffic access point will need to be discussed with the Council Property team as it is part of a reserve associated with the heritage site and subject to a management plan	GHD 8/9/17		

Prestons Public School

• Hayball provided an overview of the Prestons PS project scope and Note current concept design plans. The scope includes:

Minutes		Action	
	0	New single storey building with 10 home bases, library and special programs area	
	0	Hall extension	
	0	Administration extension and refurbishment	
	0	Remove 3 demountable classrooms	
	0	Net increase of 7 classrooms	
•	Propos	ed planning pathway is CDC	
•	Noted presen	there is a large set back from the fence line due to the ce of Cumberland Plain Forest	Note
•	Counc	il comments	
	0	Noted traffic is an existing issue (however not to the extent of Cecil Hills PS)	Note
	0	Noted Kurrajong Road has parking both sides	Note
	0	Noted Box Road is a dead end and does not have a crossing	Note
	0	Noted the intersection between Box Road and Kurrajong Road is an issue – could be improved by putting in a roundabout	Note
Marsd	en Road	l Public School	
•	Hayba scope	Il provided an overview of the Marsden Road PS project and current concept design plans. The scope includes:	Note
	0	New single storey building with 8 home bases and staff / special programs	
	0	Refurbish staff / special programs space in the hall	
	0	Remove 4 demountable classrooms (subject to enrolments)	
	0	Net increase of 4 classrooms (subject to enrolments)	
•	 Noted the new building will have ~10m setback from fence line and retain trees where possible 		Note
•	 Proposed planning pathway is CDC 		
•	Counc	il comments:	Note
	0	Noted that the school has direct access to Elizabeth Drive.	

School has agreed not to use this entrance so the 40 km/hr

restriction can be removed

Note

Minutes	Action			
 Main access / egress in onto Marsden Road adjacent the pedestrian crossing. Marsden road is narrow and parking is an existing issue 	Note			
 Noted the school could also develop an operational traffic management plan (i.e. staggered arrival) 	Note			
Liverpool West Public School				
• Noted Liverpool West PS has been announced as a project however the scope has not been finalised. There is potential for the development to be significant depending on enrolment projections and may include using the existing Mainsbridge SSP site.	Note			
Council comments:				
 Noted the area has existing traffic issues on both Hoxton Park Road and Flowerdale Road. Expected to become worse when the Western Sydney Airport opens 	Note			
 Noted the traffic controller on Flowerdale Road has caused traffic issues in the past (prioritising pedestrians) 	Note			
 Noted the lack of a left turn slip lane from Hoxton Park Road onto Flowerdale Road causes traffic to bank at the lights (especially at pick up / drop off) 	Note			
 RMS has previously considered installing a footbridge over Hoxton Park Road to allow access to the mall area. This has been constrained by the space available on the school side 	Note			
Next Steps				

•	Council to provide feedback from Community Planning	Council 8/9/17
•	Council to provide contact for the Council Properties team	Council 8/9/17
•	GHD to issue draft copies of plans to council for information only	GHD 8/9/17
•	GHD to raise concerns and opportunities with DoE	GHD 8/9/17

Liam Titmarsh

Project Manager
APPENDIX D Council Correspondence

From: Waliminipelli Siripala <SiripalaW@liverpool.nsw.gov.au>
Sent: Monday, 3 September 2018 4:26 PM
To: Nadia Brogan <nbrogan@hayball.com.au>; Maruf Hossain <HossainM@liverpool.nsw.gov.au>
Cc: Hock Chua <Hock.Chua@wge.com.au>; Anthony Chua <Anthony.Chua@wge.com.au>; Rob Chan <rchan@hayball.com.au>
Subject: RE: 2141.01 - Mainsbridge SSP - SSDA

Hi Nadia/Chan

We noted that there is no overland flow path through the site according to flood mapping from the tuflow model provided by Council compared to 2007 Brickmakers Creek flood model. This could be a result of improving flooding condition of the creek from recent flooding mitigation works along the creek (see my previous email). The tuflow model provided to you, ie tuflow model of Amalfi Park basin design (2013), is the current applicable model to Brickmakers Creek.

Regards W Siripala 8711 7672

From: Nadia Brogan [mailto:nbrogan@hayball.com.au]
Sent: Monday, 3 September 2018 9:14 AM
To: Waliminipelli Siripala <<u>SiripalaW@liverpool.nsw.gov.au</u>>; Maruf Hossain <<u>HossainM@liverpool.nsw.gov.au</u>>
Cc: Hock Chua <<u>Hock.Chua@wge.com.au</u>>; Anthony Chua <<u>Anthony.Chua@wge.com.au</u>>; Rob Chan
<<u>rchan@hayball.com.au</u>>
Subject: RE: 2141.01 - Mainsbridge SSP - SSDA

Hi Waliminipelli,

I'm just chasing up a response to the email below. We are on a tight timeframe to get our SSDA RtS submission in for the new Mainsbridge SSP, and really need to get the flooding issue closed out. Would you be able to respond today, if possible?

Thanks in advance,

Nadia Brogan (on behalf or Rob Chan)

Nadia Brogan Senior Architect

Architecture Interior Design Urban Design SYDNEY BRISBANE MELBOURNE

T +61 2 9660 9329 D +61 2 8203 0726 E <u>nbrogan@hayball.com.au</u> W <u>hayball.com.au</u> Ground Floor, 11-17 Buckingham Street Surry Hills NSW 2010 ABN 84 006 394 261 NSW nominated architects: Tom Jordan 7521. Richard Leonard 7522, David Tordoff 8028

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From: Rob Chan

Sent: Thursday, 30 August 2018 3:59 PM

To: Waliminipelli Siripala <<u>SiripalaW@liverpool.nsw.gov.au</u>>; Maruf Hossain <<u>HossainM@liverpool.nsw.gov.au</u>> Cc: Lawson Yu <<u>lawson.yu@det.nsw.edu.au</u>>; Melissa Stojanovic <<u>Melissa.Stojanovic@ghd.com</u>>; Kate Liddell <<u>kate.liddell@ghd.com</u>>; James Frost <<u>james.frost@ghd.com</u>>; Hock Chua <<u>Hock.Chua@wge.com.au</u>>; Anthony Chua <<u>Anthony.Chua@wge.com.au</u>>; James Cristallo <<u>jcristallo@hayball.com.au</u>>; Nadia Brogan <<u>nbrogan@hayball.com.au</u>>; David Tordoff <<u>dtordoff@hayball.com.au</u>> Subject: 2141.01 Mainsbridge SSD_SSDA

Subject: 2141.01 - Mainsbridge SSP - SSDA

Dear Waliminipelli,

Thank you for your email on 30/8/2018, in response to Department of Education's request for the Tuflow model at Warwick Farm Public School (Attached for your reference).

You have stated in your email that :

"2007 Brickmakers Creek flood model is not valid now.

Since 2007, a significant amount of flood mitigation works has been completed along the creek including construction of Amalfi Park detention basin. Flood modelling has been updated accordingly to include these works.

Please find below link for downloading tuflow model of Design of Amalfi Park detention basin, which is the current applicable for the creek. It is to be noted that as the subject site is located at the confluence of Cabramatta Creek and Brickmakeres Creek, worst case flooding scenario from two creeks would apply for the site."

The request is in relation to our imminent Response to Submissions to Department of Planning regarding the Mainsbridge School Development SSDA (project reference http://majorprojects.planning.nsw.gov.au/?action=view_job&job_id=8792)

Following your advice to our project team to date we have undertaken a Flood Risk Management Plan/Report, with consideration for both 2007 Brickmakers Creek Report (as requested by OEH, refer attached forward submission) and 2011 Cabramatta Flood Report.

Our Flood Consultants (WGE) have rerun your TuFlow model and extracted the 100y ARI Flood (Figure 1) and compared it against the 100y ARI flood extent from the 2007 Brickmaker Creek Flood Study Report (Figure 2).

We note there is <u>no</u> over land flow path through the site on your latest TuFlow Model through the site.

Rob Chan Architect

From: Waliminipelli Siripala <SiripalaW@liverpool.nsw.gov.au>
Sent: Thursday, 30 August 2018 11:37 AM
To: Lawson Yu <lawson.yu@det.nsw.edu.au>
Cc: Maruf Hossain <HossainM@liverpool.nsw.gov.au>
Subject: RE: Warwick Farm Public School flood model request- tuflow model of Cabramatta Creek

Hi Lawson

2007 Brickmakes Creek flood model is not valid now.

Since 2007, a significant amount of flood mitigation works has been completed along the creek including construction of Amalfi Park detention basin. Flood modelling has been updated accordingly to include these works.

Please find below link for downloading tuflow model of Design of Amalfi Park detention basin, which is the current applicable for the creek. It is to be noted that as the subject site is located at the confluence of Cabramatta Creek and Brickmakeres Creek, worst case flooding scenario from two creeks would apply for the site.

<u>https://liverpoolcouncil-</u> <u>my.sharepoint.com:443/:u:/g/personal/siripalaw_liverpool_nsw_gov_au/EcEQpmXdNdJKnsdFLnWRgvIBsCLIxH1N3Sjhp</u> AbTDk7qwA?email=lawson.yu%40det.nsw.edu.au&e=UGK7zs

Let me know if you have problems with downloading the files. Regards W Siripala





Hutchinson Builders

Mainsbridge School

Appendix T: Stormwater Management Report

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WESTERN SYDNEY AND WOLLONGONG SCHOOLS

STORMWATER MANAGEMENT REPORT

MAINSBRIDGE SCHOOL - 95 LAWRENCE HARGRAVE ROAD, WARWICK FARM

HAYBALL

CONFIDENTIAL

PROJECT NO 2304785T DATE: NOVEMBER 2017

LEVEL 27, 680 GEORGE STREET SYDNEY NSW 2000 GPO BOX 5394 SYDNEY NSW 2001

TEL: +61 2 9272 5100 FAX: +61 2 9272 5101

REV	DATE	DETAILS
А	21/11/2017	Development Application
В	12/12/2017	Development Application
С	20/12/2017	Development Application – Water Quality Treatment Measures Revised
D	18/12/2018	Updated Music Model
E	04/02/2020	Updated Qualifications and Experience of Author

	NAME	DATE	SIGNATURE
Prepared by:	Steven Hanna	20/12/2017	S.H.
Reviewed by:	Lithesh Prasad	20/12/2017	L.P.
Approved by:	Graeme Deaker	20/12/2017	G.D.

PROJECT NO 2304785T WESTERN SYDNEY AND WOLLONGONG SCHOOLS STORMWATER MANAGEMENT REPORT

MAINSBRIDGE SCHOOL - 95 LAWRENCE HARGRAVE ROAD, WARWICK FARM

Mainsbridge School is a new special needs school located in Lawrence Hargrave Rd, Warwick Farm, NSW. The new special needs school shall be constructed adjacent to the existing Warwick Farm Public School. The existing Warwick farm toilet blocks are proposed to be demolished and reconstructed adjacent to the existing Block C2 building. The proposed new development shall consist of the following new constructions: sports field, Admin building (A01a), single Storey learning building (B01a), 2 storey learning building (B01b) and new vehicle parking and driveway.

This report outlines the stormwater requirements for the site and how the proposed stormwater works will achieve compliance with relevant policies.

STORMWATER DESIGN STRATEGY

→ Stormwater Management

Stormwater controls were implemented to ensure that the proposed development does not adversely impact on stormwater flows and water quality of the stormwater system downstream of the site.

The principles and operation of the proposed stormwater system for the development and the components of the drainage system are detailed on the stormwater management Drawings. The requirements for the provision of OSD and water quality treatment elements, in accordance with relevant Authority specifications and policies, have been discussed below.

Stormwater Quantity

On-site Stormwater Detention (OSD)

On-site Stormwater Detention (OSD) was provided for the development to ensure that runoff is appropriately managed in accordance with Liverpool City Council's 'On-site Stormwater Detention Technical Specification', 2003. The site stormwater system was designed to safely convey the flows through the site and within the capacity of the downstream system.

The drainage system for the development was designed to collect all concentrated flows from the proposed buildings and surrounding surfaces. The piped drainage system was designed to convey the 1 in 20 year ARI with adequate provision for overflows in the event of a 1 in 100 year ARI event.

The proposed development provides 115m³ of On-site Stormwater Detention (OSD) storage in accordance with Council's Specification. The OSD volumes were ascertained in the DRAINS modelling program.

Rainwater Reuse

A 10,000L rainwater tank was provided for the school in accordance with Liverpool City Council's Development Control Plan 2008, Part 1 – General Controls for all Development, Section 22 Water Conservation. A 150mm diameter overflow pipe will be provided from the tank and connected to the inground drainage system.

Flooding

The site is subject to flooding from Brickmakers Creek that runs adjacent the site. An application for flood levels was made to Council which ascertained the 1 in 100 year Average Recurrence Interval (ARI) flood level adjacent the creek is 7.6mAHD and the PMF is 12.0mAHD. The 1 in 100 year ARI flood level was plotted on the civil drawings and it was ascertained that no major works on the school site are proposed within this flood extent. Accordingly, a flood study was not anticipated to be required for the development.

Habitable floor levels were set at a minimum 1 in 100 year ARI plus 500mm freeboard. Floor levels at the PMF were not adopted due to issues with accessibility for the site.

wsp

Furthermore, the flood levels obtained from Council were used as tail water levels within the sites' drainage modelling in the DRAINS software.

<u>Construction Materials for New Buildings</u>

The following recommendations are provided on the types of materials to be used in construction to ensure that structural integrity of the building is maintained during a flood event.

Various types of loads must be considered in the design of the proposed buildings in relation to flood protection. These include:

- Impact loading caused by debris carried by flood waters
- Uplift or buoyancy forces
- Hydrostatic forces
- Hydrodynamic forces

The structure will be designed in accordance AS1170 for the types of loadings listed above for all flood events up to the PMF level.

In addition to potential loadings due to flooding, construction materials must be durable for short term duration immersion in flood waters. This would include all structural components being constructed from reinforced concrete, bricks or reinforced masonry blocks.

Flood Evacuation Strategy / On-site Response Plan

A Flood Evacuation Strategy and On-site Response Plan will most likely not be required for the proposed works. The water within a low hazard flood category are considered safe to wade through should emergency access be required in a flood event.

→ Stormwater Quality

Post Construction

Liverpool City Council's 'Water Management Policy' 2016 does not stipulate any water quality treatment measures for the Council area. Treatment devices have therefore not been provided for the school site in Liverpool City Council's jurisdiction.

The Secretary's Environmental Assessment Requirements (SEARs) policy requires the preparation of an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design. In lieu of specific pollutant removal targets in this policy, the Green Star targets (Table 26.2 of the Green Star policy) have been used. The water quality modelling software program, MUSIC, was used to establish the effectiveness of the water quality treatment proposal. The program is able to model pollutant loads present in stormwater runoff from a catchment and assess the effectiveness of different treatment devices in terms of pollutant load reduction. The MUSIC modelling for the site was undertaken in accordance with Liverpool Council's MUSIC-Link available through the MUSIC software.

The main methods of treatment within the treatment train of the proposed development include; 15 x Stormfilter Cartridges (PSorb) by Stormwater360, a Rainwater Tank, a Landscaped Swale, and Enviropod200 pit baskets.

These measures were implemented to achieve the Pollution Reduction Targets Council's set out in Column A of Table 26.2 of the Greenstar Guidelines, which include:

- 85% reduction in Gross Pollutants
- 80% reduction in Total Suspended Solids
- 30% reduction in Total Phosphorous

PROJECT NO 2304785T WESTERN SYDNEY AND WOLLONGONG SCHOOLS STORMWATER MANAGEMENT REPORT

vsb

30% reduction in Total Nitrogen

The MUSIC model output is presented below.



MUSIC Model Results

During Construction – Erosion and Sediment Control

An erosion and sediment control plan has been prepared for the development to reduce the amount of sediment laden runoff leaving the site.

→ Relevant Stormwater Design Standards

The Civil design has been undertaken in accordance with the following design standards / policies:

- AS3500 'National Plumbing and Drainage Code' Part 3: Stormwater Drainage
- Australian Rainfall and Runoff, 2016 Parts 1 & 2
- Landcom Managing Urban Stormwater Soils and Construction, Volume 1, 4th Edition March 2004
- Liverpool City Council 'On-site Stormwater Detention Technical Specification', 2003
- Liverpool City Council 'Water Management Policy' 2016
- Liverpool City Council Liverpool Development Control Plan 2008, Part 1 General Controls for all Development
- Green Building Council of Australia Green Star Design & As Built v1.2 26 Stormwater



→ Stormwater Management Drawing List:

Drawing No.	Drawing Name	Revision
C010	GENERAL ARRANGEMENT PLAN	P3
C020	STORMWATER DETAILS, OSD TANK DETAILS, PIT LID SCHEDULE	P3
C060	SEDIMENT & EROSION CONTROL PLAN	P2
C061	SEDIMENT & EROSION CONTROL TYPICAL DETAILS	P2

Alan flam

Steven Hanna

Associate civil engineer with 13 years' experience in infrastructure works and civil site works (including commercial, educational, industrial and residential). Involved in a variety of projects which have involved some or all of the following: site investigations, feasibility studies, conceptual design, detail design, management plans, specifications and tender documentation, analysis and negotiations, project management, site inspections and construction phase services, and report preparation.

PROFESSIONAL ASSOCIATIONS

Member, The Institution of Engineers, Australia MIEAust Chartered Professional Engineer CPEng National Engineers Register NER Board of Professional Engineers Queensland RPEQ Justice of the Peace in the State of New South Wales NSW JP 219023

Professional Experience - Education St Justin's and St Benedict's Catholic Schools, Oran Park NSW St Luke's Catholic College, Marsden Park NSW John Therry Catholic School, Rosemeadow NSW University of Technology Sydney (UTS), Chippendale NSW Childcare Centre, Buckland Street, Chippendale NSW

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