LENDLEASE CONSTRUCTION PTY LTD 97 000 098 162

LIVERPOOL HEALTH & ACADEMIC PRECINCT

STORMWATER, EROSION AND SEDIMENTATION MANAGEMENT SUB PLAN

15/09/2021 | Revision No: 3

Document Issue Status				
Date	Document Issue (in numbers)	Purpose and Summary of Amendments	Reviewed by	Approved by
30/01/17	2.0	General update including LLB GMR and legislative amendments.	Tracey Wallbridge	Brian Falls
15/09/2021	3.0	General review and update. Change to dewatering to reflect WDC update.	Tracey Wallbridge/James Cannon	Ross Trethewy

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Project Revision Status				
Date	Project Revision (in numbers)	Purpose and Summary of Amendments	Reviewed by	Approved by
07/07/2021	Rev 1	Draft Approved. Review Only	Lilly Cauchi	Michael Niedzwiecki
05/08/2021	Rev 2	Plan reviewed as per John staff comments	Lilly Cauchi	Daniel Puljic
17/11/2021	Rev 3	Template change and review	Ian Sheils	Daniel Puljic
09/12/2021	Rev 4	Review and update to EMD	Ian Sheils	Daniel Puljic
02/03/2022	Rev 5	Review no changes	Ian Sheils	Daniel Puljic
02/06/2022	Rev 6	Review No Changes	Ian Sheils	Daniel Puljic
02/09/2022	Rev 7	Update to add Temporary Multifaith Shed	Ian Sheils	Daniel Puljic
02/12/2022	Rev 8	Review no changes	Ian Sheils	Daniel Puljic

05/05/23	Rev 9	General review & references to LLB removed & LLC inserted, updated EMD	Nigel Rose	Daniel Puljic
07/11/23	Rev 10	General review & updated EMD	Nigel Rose	Daniel Puljic

SCOPE OF PROJECT AND SUB PLAN

Project Details	
Scope of the Sub Plan	This Stormwater, Erosion and Sedimentation Management Sub Plan addresses the planning and management of activities that result in land disturbance or give rise to the potential for pollution of the environment associated with stormater runoff, site erosion, sedimentation, and the discharge from site of detained stormwater and dewatered groundwater. Controls must be designed, installed and maintained to manage stormwater and the processes of erosion and sedimentation. Refer to Section 1.1 and 3.1 of the Project EHS Management Plan for clarification on how the EHS Sub Plans form part of the Lendlease Construction (LLC) EHS management system.
Objectives of the Sub Plan	• To prevent on-site erosion and sediment runoff. • To prevent environmental pollution associated with stormater runoff. • To prevent environmental harm (pollution) associated with the release of detained water or dewatering to the environment. • To maximise the reuse of stormwater and groundwater for beneficial uses. • To maximise opportunities for stormwater recycling on site. • To effectively manage the bulk excavation and associated dewatering activities to minimise impact on any adjacent water bodies. • To avoid erosion, contamination and sedimentation occurring, resulting from construction or demolition activities with a concentration on controls to minimise dust and vehicular mud-tracking. • Erosion and sediment controls are to be effective and properly always maintained.
Scope of Works	This Sub Plan has been prepared based on the following scope of works: The Liverpool Hospital is a Principal Group A1 tertiary referral hospital, managed by South Western Sydney Local Health District (SWSLHD). Liverpool Hospital currently has 713 inpatient beds and provides a wide range of tertiary and quaternary services. The redevelopment will increase the inpatient bed numbers to 900, as well as expanding tertiary and quaternary services. The Liverpool Hospital Clinical Services Plan 2031 (version 2.0 dated 26 November 2018) predicts substantial growth in service demand to 2025/26 which continues to 2030/31 due to significant population increase, major infrastructure in South Western Sydney and the poor health status of people within the Local Government Area (LGA) and surrounding areas. These increases result in demand well beyond the hospital's present infrastructure capacities.

	● Site establishment including office and compound setup. ● Demolition of Thomas & Rachel Moore education centre, Alex Grimson, Oncology and Pathology buildings. ● Excavation of approximately 10,000m3 of material and backfilling of approximately 4,00m3 of clean fill. ● Installation of 325 Continuous Flight Auguring (CFA) type piles ● Construction of new Integrated Services Buildings over 2 stages, including basements to each, ● Refurbishment of numerous areas within the existing Caroline Chisholm and Clinical Services Building of the hospital ● Addition of a Temporary “Multi-faith” Prayer Room adjacent to the CSB Eastern entry as a demountable-like shed ● Construction of Campbell St shared Zone ● On Grade Car Park Works, ● External works
Key Issues and Risks	The site is located on the Corner of Elizabeth and Goulburn Street opposite Bigge Park. The works required on site will involve significant ground disturbance. The activities with the greatest potential to impact on the local environment and community from a stormwater, erosion and sedimentation perspective are considered to be: ● Site clearing, establishment and operation including storage areas; ● Site access and egress including wheel washing; ● Bulk and detailed excavation ● Stockpiling. ● The loading and haulage of materials off-site; ● Stormwater and groundwater detention and dewatering; and ● Waste disposal (spoil, sediment, and water). ● General runoff of stormwater into construction site and basement areas ● Storage of Materials and Chemicals ● Washout of construction equipment The impacts of these works may include: ● The runoff of ‘dirty’ water into the stormwater system and local waterways causing pollution.

	• Tracking of mud and sediment on public roads affecting safety, visible amenity and runoff quality. • Pollution of downstream waterways or other environments associated with the release of detained stormwater or groundwater from site. • Erosion and land degradation resulting in sedimentation (off-site). The implementation of the control measures identified in the EHS Plan and Stormwater, Erosion and Sedimentation Management Sub Plan are intended to prevent or mitigate these impacts.
Legislation, Approvals and Guidelines	**Federal/National:** The 'Blue Book' (Managing Urban Stormwater Soils and Construction) – Landcom, Fourth Edition (2004) 'White Books' - IECA 2008. Best Practice Erosion and Sediment Control. Books 1-6.International Erosion Control Association (Australasia) ANZECC and ARMCANZ Water Quality Guidelines (2000) **State:** Environmental Protection Act 1997 Environmental Protection Regulation 2005 General Environmental Protection Policy 2016 **Local:** Liverpool LEP 2008 **Lendlease Requirements:** • GMR: 4.13 Degradation or Pollution of the Environment • Lendlease Construction Workplace Delivery Code (WDC) **SSDA – 10389** **Soil and Water** **B16.** Prior to the commencement of construction, the Applicant must install erosion and sediment controls on the site to manage wet weather events. **B17.** Prior to the commencement of construction, erosion and sediment controls must be installed and maintained, as a minimum, in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the 'Blue Book'. **Erosion and Sediment Control** **C27.** All erosion and sediment control measures must be effectively implemented and maintained at or above design capacity for the duration of the construction works and until such time as all ground disturbed by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment. Erosion and sediment control techniques, as a minimum, are to be in

	accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom, 2004) commonly referred to as the 'Blue Book'. **Disposal of Seepage and Stormwater** **C29.** Adequate provisions must be made to collect and discharge stormwater drainage during construction of the building to the satisfaction of the principal Certifier. The prior written approval of Council must be obtained to connect or discharge site stormwater to Council's stormwater drainage system or street gutter. **Stormwater Management System** **C31.** Within three months of the commencement of construction, the Applicant must design an operational stormwater management system for the development and submit it to the satisfaction of the Certifier. The system must: (a) be designed by a suitably qualified and experienced person(s). (b) be generally in accordance with the conceptual design in the EIS. (c) be in accordance with applicable Australian Standards; and (d) ensure that the system capacity has been designed in accordance with Australian Rainfall and Runoff (Engineers Australia, 2016) and Managing Urban Stormwater: Council Handbook (EPA, 1997) guidelines.
Summary of Site Controls	Works must be planned, implemented and monitored in accordance with the Lendlease Global Minimum Requirements, the Project EHS Management Plan, this Sub Plan and the Lendlease Construction Workplace Delivery Code. These documents detail Lendlease's approach and commitment to pro-active and responsible site management. Site specific controls, monitoring, reporting and performance measurements have been identified in this Sub Plan to prevent or minimise the impacts of construction on the environment and community including: • Preventing the potential for erosion by minimising ground disturbance. • Installing stormwater, erosion and sedimentation controls including detention areas/devices. • Covering or stabilising stockpiles; • Stabilising and maintaining internal site access roads and egress points to prevent tracking; • Implementing an effective wheel washing system; and • Documenting testing, treatment, and dewatering processes. • Monitoring of sediment controls to be routinely reviewed on site by the site manager and site foreman to ensure controls are adequately maintained. A Stormwater, Erosion and Sedmentation Management Diagram (EMD) has been prepared (Appendix 1) and will be updated each time the Sub Plan is reviewed.

	The DA approved SECP has been adopted for the works. Construction stage stormwater, erosion and sedimentation requirements and responsibilities must be included in specifications, contract agreements, quality assurance documents, and subcontractor work method statements. Site inspections, monitoring and reporting will be undertaken by Lendlease and subcontractors as detailed in the Project EHS Management Plan and the following implementation table.

IMPLEMENTATION OF THE SUB PLAN

Control Measure	Timing	Methodology	Responsibilty	Monitoring and Reporting	Performance Measurement
Planning and Site Establishment					
Include information in the Site Induction.	Prior to works commencing and ongoing	Address risks and potential impacts of stormwater runoff, erosion and sedimentation on the local environment and community.	CM SM	WMS prepared by subcontractors includes stormwater, erosion and sedimentation controls	Site induction delivered to all workers on site.
Prepare a stormwater, erosion and sediment Environmental Management Diagram (EMD) and Erosion and Sediment Control Plan.	At site establishment and prior to works commencing	Identify the location of stormwater inlets, drains, stockpile locations and erosion and sediment control measures. Identify, review and revise any existing erosion and sediment control plans prepared for the site. Include requirements for design, installation, maintenance and monitoring of control measures in trade packages.	CM SM	EMD and Erosion and Sediment Control Plan prepared prior to works commencing.	Diagram prepared containing all relevant details and communicated. Diagram updated to reflect changes in site conditions. Controls implemented in accordance with the EMD.
Establish site specific water quality discharge criteria.	Prior to site establishment.	Establish discharge water quality criteria in accordance with the the WDC. Document criteria here: pH: TSS (mg/L):	CM SM	Criteria established and captured in Sub Plan, WMS and dewatering plan. Sign off process documented.	Process documented. No pollution incidents.

Control Measure	Timing	Methodology	Responsibilty	Monitoring and Reporting	Performance Measurement
		Turbidity (NTU): Other parameters: Document treatment, testing and release procedures in a dewatering plan. If required, confirm that water quality testing, treatment and dewatering methods satisfy the requirements of the relevant statutory authority.			
Limit ground disturbance to the area required for immediate construction.	Areas of clearing identified prior to works commencing	Identify and fence off trees, ground vegetation and stabilised areas to be retained (leave undisturbed). Subcontractor WMS for design, installation and maintenance of controls to reflect staging plan.	SM Foreman EHS	Review of program. Daily surveillance to assess condition of protective fencing. Weekly/monthly inspection Inspection after a rain event.	No unnecessary land disturbance. No damage to protected vegetation - fencing and signage maintained.
Install stormwater controls i.e., sediment basins/detention areas/tanks.	Prior to commencing works	Establish sediment basins/detention areas (where feasible). Install on-site settlement/ treatment tanks/containers (arrange training by supplier). Operate and maintain in accordance with design/ engineering documentation.	SM	Daily surveillance to assess condition and capacity. Weekly/monthly inspection Inspection during and immediately after rain. incident / observation / inspection reporting platform Enablon	Appropriately designed and maintained detention areas/facilities. Discharge water meets established quality criteria. No overtopping under design conditions.

Control Measure	Timing	Methodology	Responsibilty	Monitoring and Reporting	Performance Measurement
Install erosion and sediment controls as per the EMD and the site Erosion and Sediment Control Plan.	Prior to works commencing	Verify site characteristics and identify location of control measures. Divert clean water (e.g., offsite water, water from gutters or clean hardstand) away from disturbed areas to minimise generation of dirty water. Design and install controls for all disturbed areas of the site including around existing stormwater infrastructure. Install controls in accordance with EMD, design/engineers documentation/ Erosion and Sediment Control Plan.	SM	Daily surveillance to assess effectiveness and condition. Weekly/monthly inspection incident / observation / inspection reporting platform Enablon	EMD and erosion and sediment control plan reviewed quarterly or as deemed necessary Controls modified or new controls installed as required. Revisions documented as evidence of due diligence.
Establish stable site exit points, parking areas, internal roads and turning areas.	Prior to works commencing. Maintain at all times	Retain existing hard surfaces where possible to prevent the tracking of material off-site. Construct stable site entry/exit points and roadways using appropriate materials. Obtain clearance certificates for any imported (stabilising) material before receiving it on site. Provide and maintain shaker grid or wheel wash or drive-thru wash bay at removal of existing hard stand.	SM Foreman	Daily surveillance and maintenance. Weekly/monthly inspection Inspection of imported materials. incident / observation / inspection reporting platform Enablon	No tracking onto public roads or dust. Clearance certificates for all imported materials.

Control Measure	Timing	Methodology	Responsibilty	Monitoring and Reporting	Performance Measurement
During Construction: Erosion and Sediment Control					
Maintain stormwater, erosion and sediment controls in an operable condition.	At all times and after rain events	Assess the condition of controls and maintain. Remove accumulated sediment and debris and dispose. Install new controls as new work areas open or change.	SM Foreman	Daily surveillance. Weekly/monthly inspection Post rain inspections. EMD updated. incident / observation / inspection reporting platform Enablon	Silt collected at base of fence. No breach of fence line.
Review and revise control measures.	Weekly/monthly depending on stage of construction.	Assess site conditions and works. Design and install new controls as work progress and the site changes.		Erosion and Sediment Control Plan updated progressively e.g., weekly during earthworks, monthly during structure. EMD updated quarterly. incident / observation / inspection reporting platform Enablon	Controls appropriate, effective and operable.
Locate stockpiles away from drainage lines, watercourses, sensitive ecosystems and flood prone areas and prevent erosion.	Maximum 1 month after stockpile placement (if the material is remaining on site)	Identify stockpile locations on the EMD diagram. Subcontractor WMS to address stockile management to prevent erosion, sedimentation, and dust (e.g., erosion and sediment controls around the base, stabilisation with a soil binder, sealant, or sterile cover crop (grass).	SM Foreman	Daily surveillance. Weekly inspection incident / observation / inspection reporting platform Enablon	No uncontrolled stockpiles. No stockpiled material runoff into the stormwater system.

Control Measure	Timing	Methodology	Responsibilty	Monitoring and Reporting	Performance Measurement
Maintain erosion and sediment controls until the potential for erosion and sedimentation has been eliminated.	At all times	Maintain controls in accordance with EMD and Erosion and Sediment Control diagram. Permanently stabilise disturbed areas. Do not remove controls prior to any area being deemed stable.	SM Foreman EHS	Weekly/monthly inspection Inspections during rain events. incident / observation / inspection reporting platform Enablon	Controls effective and in good condition. No uncontrolled discharges of sediment off-site or into waterways.
Install a vehicle/wheel wash bay or shaker facility at the site exit.	Prior to construction commencing	Assess requirement in IHRA. Maintain shaker grid/wheel wash or employ high pressure drive-thru wash bay for site heavy duty plant. WMS to be prepared by subcontractor including a maintenance program. Engage sweeper. Limited hosing of hard surfaces only.	SM/Foreman	Daily surveillance. Weekly/monthly inspection incident / observation / inspection reporting platform Enablon	No mud/silt tracked onto roadways.
During Construction: Stormwater / Groundwater Detention and Dewatering					
Inspect stormwater detention basins, tanks, other facilities and maintain in an operable condition (if applicable)	Ongoing. Following a rain event.	Retain capacity in detention facilities for storm events (dewater). Undertake maintenance as required.	SM	Inspection following rain event. Dewatering process followed and documented. incident / observation / inspection reporting platform Enablon	Detention areas and capacity of facilities maintained in operational condition. No uncontrolled discharges from site.

Control Measure	Timing	Methodology	Responsibilty	Monitoring and Reporting	Performance Measurement
					Discharge water quality complies with site specific criteria.
Test, treat and/or reuse collected stormwater or groundwater on-site for dust suppression, truck and plant washing (in designated areas only).	Ongoing	Assess quality of water for reuse suitability.	CM	Water quality test results from a NATA accredited laboratory.	Water suitable for reuse.
Treat, test, and discharge collected stormwater or groundwater off-site if it cannot be reused on site.	Ongoing	Dewatering process and WMS followed for inspection, treatment, testing, sign off and release of stormwater and groundwater from site. Document dewatering and discharge process and approval requirements, to include discharge checklist and approval signoff requirements and discharge register requirements. To discharge water off site approval required is required from. • Local council or authority; or • A licence from the relevant State environmental protection authority; or • A trade waste agreement/ permit from the applicable water/ sewer authority.	SM Sub-contractor	Project approval or licence requirements identified. Water quality test results from a NATA accredited laboratory. Dockets for off-site disposal where the water is not acceptable for discharge. Discharge checklist. Discharge register.	Water treatment and dewatering undertaken in accordance with documented site procedure and Workplace Delivery Code. No discharge of non-compliant water or off-site pollution.

Control Measure	Timing	Methodology	Responsibilty	Monitoring and Reporting	Performance Measurement
Post Construction: Site Stabilisation					
Implement site stabilisation works and landscaping progressively to rehabilitate disturbed ground.	Progressively during construction	Stabilise disturbed areas in accordance with the design/engineering/landscape plans and scope of works.	CM SM EHS	Weekly/monthly inspection Project planning and design meetings. incident / observation / inspection reporting platform Enablon	Stabilisation of all disturbed work areas. No uncontrolled runoff containing sediment or contaminants.

APPENDIX 1: ENVIRONMENTAL MANAGEMENT DIAGRAM (EMD)

ENVIRONMENTAL MANAGEMENT DIAGRAM – LIVERPOOL HEALTH & ACADEMIC PRECINCT PROJECT

EXTENT MAP

KEY ENVIRONMENTAL ISSUES

- Unexpected finds
- Noise to general public / Hospital
- Water run off
- Sediment run off

SENSITIVE RECEPTORS

- Local Residents in Goulburn & Campbell Streets
- Alex Grimson Building
- Caroline Chisholm Building
- Existing Clinical Services Building
- Liverpool TAFE – College Street Campus
- Ingham Institute

KEY CONTROL MEASURES

- Blue metal to cap exposed soil
- Geofabric under pit grates to stormwater inlets to filter water
- Radiation monitoring of cancer bunker
- Shaker grid located inside of gates 2 & 3
- High pressure washer to clean tyres in inclement weather

LEGEND

Icon	Descriptions
	Site Accommodation
	A-Class Hoarding
	Shaker Grid
	Spill Kit
	HS / DG Storage
	Tree Protection Zone
	Stormwater Inlet
	Radiation Monitor
	Noise Monitor
	Ground Vibration Monitor
	Rubbish Skip

KEY CONTACTS

Senior Construction Manager	Senior Site Manager	General Foreman	Senior EHS Coordinator	Emergency Services
Daniel Puljic 0477 393 259	Damien Smith 0437 559 361	James Hall 0429 801 618	Nigel Rose 0428 741 878	000