

LONG TERM ENVIRONMENTAL MANAGEMENT PLAN

ST HILLIERS (NSW) PTY LTD

126 Kent Road, Marsfield NSW 2122

15 JULY 2020



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Long Term Environmental Management Plan

126 Kent Road, Marsfield NSW 2122

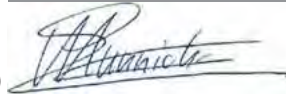
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1 INTRODUCTION

Arcadis Australia Pacific Pty Ltd (Arcadis) was commissioned by St Hilliers (NSW) Pty Ltd (St Hilliers) to complete a Long Term Environmental Management Plan (LTEMP) for the ongoing management of residual Asbestos Containing Material (ACM) contamination in soils in the Block R Containment Cell at 126 Kent Road, Marsfield NSW 2122 (the Site) to address the requirement as per the NSW Environment Protection Authority, *Contaminated Land Management - Guidelines for the NSW Site Auditor Scheme* (2017). In particular, Section 3.4.6 of this document relates to this LTEMP, and is provided as follows:

Within the context of contaminated sites management, an environmental management plan (EMP, sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

An EMP can be an effective means of ensuring the environment is protected, users of the site are not exposed to contamination remaining on site and the site remains suitable for the proposed use when:

- *complete remediation of contamination affecting an area is not practicable (for example low levels of contamination under a concrete slab)*
- *contaminants are being capped or contained on site*
- *remediation is likely to cause a greater adverse impact than would occur if the site were left undisturbed.*

The Site is defined as the Block R Containment Cell which lies within development footprint as per the State Significant Development Approval (SSDA 9344). The location of the development footprint is shown in **Appendix A, Figure 1**, and the location of the Site is shown on **Appendix A, Figure 2**. A site survey plan showing the extent of the Block R Containment Cell, to which the LTEMP applies, underneath Block R, is shown in **Appendix B**.

Another survey taken after the ACM impacted material had been placed within the cell from the top of the visible geofabric marker layer has also been included in **Appendix B**. A concrete 'as built' drawing as taken after the completion of the Block R foundation slab is also provided in **Appendix B**.

1.1 Objective and Purpose

To objectives of the LTEMP are to:

- Compile management procedures required to protect site users, site workers and subcontractors, and the environment from exposure to the contaminants contained on-site within the Block R Containment Cell; and
- Minimise the potential for individuals and the environment to be exposed to the asbestos present within the Containment Cell.

The purpose of the LTEMP is to:

- Fulfil the requirements of the SSDA by managing and mitigating health and environmental risks pertaining to residual ACM (bonded and friable) impacted soil that will remain within the Block R Containment Cell.
- Ensure continued protection of human health of future site users, occupiers, visitors and contractors engaged to work in the area of the Block R Containment Cell.) present in soil the material that is contained within the Block R Containment Cell.

1.2 LTEMP Context

This LTEMP should be considered a live document during the ongoing management and maintenance of the Site. Any changes to the LTEMP should only be completed by a suitably qualified

and experienced person (Environmental Consultant) certified by a NSW EPA recognised association/organisation and approved by DPIE. The updated LTEMP should then be endorsed by a NSW EPA accredited Contaminated Land Site Auditor.

1.3 LTEMP Timeframe

This LTEMP, or revisions thereof, is to remain in place at the Site in perpetuity or until the land use changes. If land use changes the LTEMP is required to be revised to reflect any changes in potential exposure to the residual impacted fill material.

1.4 LTEMP Review

This LTEMP must be reviewed when one or more of the following occur:

- The party responsible for implementing this LTEMP (the Responsible Party) changes. The current Responsible Parties during construction and development works are:
 - St. Hilliers – Construction and Project Manager for the current site development works; andThe Responsible Party after construction and development works will be:
 - Schools Infrastructure NSW/DoE. The Asset Management Unit, Northern Sydney Directorate will become the on-site representative of Schools Infrastructure NSW/DoE, once in place.
- Any relevant safety incidents or non-compliance activities are reported.
- The extent of capping changes.
- There is a change in proposed land use.

Revision of the LTEMP is to ensure that:

- The management procedures outlined in this LTEMP are current and relevant.
- Opportunities for improvement of the LTEMP are identified.
- Changes to legislation, licence and approval conditions are complied with.

If a review of the LTEMP is required, the review is to be carried out by a group comprising at least one of the following:

- The Responsible Party for the Site through a certified and suitably qualified and experienced person;
- The NSW EPA;
- A NSW EPA accredited Contaminated Land Site Auditor; and/or
- Ryde City Council.

2 CONTAMINATION STATUS

2.1 Previous Investigations

The site has been subject to the following environmental investigations:

- Preliminary Site Investigation (Arcadis, 27 April 2018).
- Due Diligence Soil Contamination Assessment (Arcadis, 30 July 2018).
- Further Supplementary Soil Contamination Assessment (Arcadis, 11 November 2019).
- Unexpected Finds Protocol (Arcadis, 29 November 2019).
- Asbestos Management Plan (Arcadis, 4 December 2019).
- Remediation Action Plan (Arcadis, 4 December 2019).
- Waste Classification of ACM Impacted Fill Material (Uncoloured) at 126 Kent Road, Marsfield NSW (Arcadis, 8 December 2019).
- Waste Classification of ACM Impacted Fill Material (Red) at 126 Kent Road, Marsfield NSW (Arcadis, 18 December 2019).
- Re-classification of General Solid Waste to General Solid Waste – Special (Asbestos) (Blue) at 126 Kent Road, Marsfield NSW (Arcadis, 7 January 2020).
- Classification of Virgin Excavated Natural Material (VENM) (Uncoloured) at 126 Kent Road, Marsfield NSW (Arcadis, 8 January 2020).
- Validation Report (Arcadis, 19 May 2020).

2.2 Contamination Status

2.2.1 Preliminary Site Investigation (Arcadis, 27 April 2018)

Based on the scope of work conducted for the PSI at Kent Road Public School within the proposed development area located at 126 Kent Road, Marsfield NSW 2122, the following conclusions and recommendations were provided:

- The development footprint and immediate surrounding area had no history of industrial or commercial use and therefore it was considered that there was no high potential risk for extensive contamination.
- The development footprint had historically been used for residential or educational purposes since 1960s.
- Prior to the 1960s, historical agricultural use of the development footprint (potentially including market gardens and orchards) may have involved use of OCPs, OPPs and herbicides.
- Within the proposed development area of interest, potential indicators of contamination observed at the development footprint included the presence of fill material and building materials containing asbestos and/or lead paint.

Based on the observations made during the walkover and following analysis of site history completed for the PSI, Arcadis believed there was a low risk of gross contamination present on-site within the proposed development area.

Whilst there was a low risk of gross contamination, given that several potential sources of contamination were identified (i.e. former market gardens, fill, asbestos materials and lead paint) and minor disturbance works were proposed during development, Arcadis recommended conducting a targeted assessment of the development footprint soils to confirm that there was no risk to human health or the environment within the proposed development.

2.2.2 Due Diligence Soil Contamination Assessment (Arcadis, 30 July 2018)

Arcadis conducted a Due Diligence Soil Contamination Assessment on the development footprint on the 13 July 2018, where eight (8) soil bores were excavated by hand auger to 0.3 m below ground level (mbgl). These locations are presented in **Appendix A, Figure 3**. This work was commissioned to provide an indicative soil quality report and in-situ indicative waste classification of soils within the proposed development footprint, and the likelihood of potential risk to human health (both workers and occupants/students) and ecological receptors. The locations were selected to provide general coverage of the development footprint, although were targeted to include the indicative area for proposed buildings.

The targeted soil assessment included the collection of surface and natural soils to a maximum depth of 0.3 mbgl. The TRH F2 fraction in soil samples SB03-0.2 and SB07-0.2 reported exceedances above the relevant NEPM 2013 HSL-A and HSL-B criteria. No ACM was reported from the 2018 sampling.

Arcadis recommended that a supplementary soil contamination assessment was required to close out the data gaps identified during the Due Diligence Soil Assessment, and to characterise the nature and depth of the fill in the proposed development area.

2.2.3 Further Supplementary Soil Contamination Assessment (Arcadis, 11 November 2019)

Based on the development site area of 0.55 ha, a total of thirteen (13) soil sample locations was recommended to meet the required minimum number of sampling points to characterise a site in accordance with the relevant industry NSW EPA (1995) Sampling Design Guidelines. Eight (8) sampling locations were completed by hand auger during the Due Diligence Assessment to a depth of 0.3 m, and Arcadis completed a further seven (7) sampling locations as a part of the Supplementary Assessment to the natural soil profile on the 10 August 2019 providing a total of fifteen (15) investigation locations. These locations are presented in **Appendix A, Figure 3**.

Following the observation and positive identification of asbestos containing material (ACM) at three (3) locations (TP-1, TP-3 and TP-4) on site, the sampling density required to effectively characterise the development footprint needed to be reconsidered. In these circumstances, the NEPM guidelines defaulted to the Western Australia (WA) 2009 guidelines which required double the density of sampling locations to characterise a site with potential asbestos containing material (PACM) impacts. Therefore, a minimum of twenty-eight (28) test locations were required to characterise and better assess the ACM impacts at this site. These were completed between the 30 September and the 2 October 2019. These new locations are presented in **Appendix A, Figure 4**.

Based on the findings of the assessments and the objectives of the supplementary assessment, the following conclusions were made by Arcadis:

- Gross contamination in soils at the development footprint was not identified during both investigations, with the exception of bonded ACM observed on the surface and top 100 mm at two test pit locations (TP3 and TP12), scattered surface locations near the garden beds and also other locations observed Arcadis, and within the uncontrolled fill at three (3) test pit locations (TP1, TP4, and GB2).
- The presence of bonded ACM at the surface and in the top 10 cm of soil profile (TP3 and TP12) exceeded the land use criteria of 'no visible asbestos' within the top 10 cm. Arcadis believed that that asbestos fragment reported at TP12 was likely to have been worked into the surface soil as a result of vehicle movements on site as the natural was observed at 0.1 mbgl and the fill material was primarily road base gravels with no suspicious anthropogenic materials.
- ACM was identified and confirmed by laboratory analysis within the fill profile below 10 cm at three (3) of the thirty two (32) locations (TP1, TP4, and GB2), and exceeded the land use criteria of 0.01% (Residential with access to soils) with the results showing TP1 (0.054%) and TP4 (0.019%). ACM concentration in GB2 is 0.008 w/w%.

- Approximately 2,500 m³ of material was understood to be required to be disposed of off-site to reach required building levels. Based on the test pit descriptions, Arcadis estimated the total volume of fill across the development footprint to be approximately 2,275 m³ +/- 10% (7,600 m² x 0.30 m) not allowing for an ex-situ bulking factor.

Based on the findings of the assessments and the objectives of the supplementary assessment, the following recommendations were made by Arcadis:

- An Asbestos Management Plan (AMP) needed to be prepared for the development footprint.
- The ACM impacted fill material could be capped on site or disposed off-site as part of the required bulk excavation works. A Remediation Action Plan (RAP) needed to be prepared as on-site management of the asbestos contaminated fill is a viable option. An Environmental Management Plan (EMP), which had to go on title, would also have to be prepared.
- An Unexpected Find Protocol (UFP) was also recommended be included in the Construction Environmental Management Plan (CEMP) to address any additional contamination not identified during assessment.

Upon completion of the supplementary assessment it was decided by the DoE that some of the asbestos impacted fill material would be retained on-site by a 'cap and contain' strategy.

2.2.4 Unexpected Finds Protocol (Arcadis, 29 November 2019)

An Unexpected Finds Protocol (UFP) was prepared to address any undiscovered hazards that may be present and was intended to be read in conjunction with the Remediation Action Plan and Asbestos Management Plan prepared by Arcadis.

The UFP outlined the procedure to be undertaken in the event that an unexpected find was uncovered during completion of the following at the development footprint:

- Earthworks completed during construction activities for the proposed upgrade works;
- Installation of infrastructure including stormwater, service connections, utilities, roads and access infrastructure; and
- Any other activities that have the potential to uncover or encounter unidentified contaminated materials, waste or asbestos.

2.2.5 Asbestos Management Plan (Arcadis, 4 December 2019)

As asbestos was identified to contaminate the development footprint, Arcadis prepared an Asbestos Management Plan (AMP) to inform all workers that:

- Asbestos exists within the soils on the development footprint;
- There exist requirements for works requiring the penetration of surfaces (E.g. drilling or cutting into existing surfaces); and
- Intrusive earthworks or surface disturbance in areas of the development footprint where asbestos has been identified will be undertaken as a part of remediation works.

A copy of the AMP was required to be maintained on-site during the course of site works/operations.

2.2.6 Remediation Action Plan (Arcadis, 4 December 2019)

With consideration to NSW EPA's endorsed guideline hierarchies for soil remediation options and clean-up objectives (NSW EPA 2017), and the site-specific contaminants, proposed development and environmental setting, the preferred remediation strategy as discussed in the RAP was a combination of 'excavation and removal of all impacted fill soil' and the use of a 'Containment Cell'. This strategy was chosen due to there being various classifications of waste present across the development footprint which have varying costs associated with their disposal.

In the RAP it was decided that soils that have been identified as being impacted by ACM will remain on-site but will be placed within a Containment Cell that will be constructed underneath 'Block R'.

Other fill soils identified on-site with an indicative waste classification of GSW (possibly able to be recycled as GSW-CT1), needed to be disposed of off-site, subject to re-classification to 'GSW – Special (Asbestos)' if any ACM was observed in the material during excavation and removal works.

As a part of the validation of the remediation works, a visual inspection was required to be conducted by a suitably qualified and experienced person. An asbestos clearance certificate was also required to be issued by a Licensed Asbestos Assessor (LAA).

The RAP also specified the requirement for a long-term Environmental Management Plan (LTEMP) which would need to be prepared for the management of ACM impacted soils that will remain on site.

2.2.7 Waste Classification Reports (Arcadis, December 2019 to January 2020)

Arcadis prepared a total of four (4) waste classification reports for the development footprint. These are listed as follows:

- Waste Classification of ACM Impacted Fill Material (Uncoloured) at 126 Kent Road, Marsfield NSW (Arcadis, 8 December 2019).
- Waste Classification of ACM Impacted Fill Material (Red) at 126 Kent Road, Marsfield NSW (Arcadis, 18 December 2019).
- Re-classification of General Solid Waste to General Solid Waste – Special (Asbestos) (Blue) at 126 Kent Road, Marsfield NSW (Arcadis, 7 January 2020).
- Classification of Virgin Excavated Natural Material (VENM) (Uncoloured) at 126 Kent Road, Marsfield NSW (Arcadis, 8 January 2020).

These classifications were linked with the spread of ACM impacted material across the development footprint and therefore were used to guide the remediation options. These are presented in **Appendix A, Figure 5**. The sections on the development footprint and their intended remediation are defined as follows.

- The impacted soil within the area pre-classified as 'Special Waste - General Solid Waste (GSW)' (shaded in red in **Appendix A, Figure 5**) were to be appropriately 'capped and contained' on-site.
- The fill soil containing anthropogenic materials within the area pre-classified as 'GSW (Recyclable)' (shaded in blue in **Appendix A, Figure 5**), if being excavated, were to be immediately be placed in a truck, re-sampled/visually observed from the truckload to confirm the classification, and then taken off-site to an appropriately licensed facility. The TRH hotspot were to also be disposed of with 'GSW (recyclable)' (shaded in yellow **Appendix A, Figure 5**) soils.
- The fill soil containing friable asbestos within the area pre-classified as 'GSW – Special (Asbestos)' (shaded in purple in **Appendix A, Figure 5**) were to be excavated, and taken off-site to an appropriately licensed facility.
- The excavated natural materials on-site (denoted as uncoloured in **Appendix A, Figure 5**) were classified as VENM and were deemed appropriate to be reused on-site. Alternatively, the material could be disposed to landfill as the VENM was pre-classified as GSW as per the 2014 Waste Classification Guidelines.

2.2.8 Validation Report (Arcadis, 19 May 2020)

Arcadis was engaged to undertake fulltime remedial supervision during the Block R Containment Cell construction and backfilling operations of the created cell.

On the 11 December 2019, Arcadis conducted validation sampling to ensure that the remaining fill on the development footprint, which was not removed, nor placed within the Block R Containment Cell was within the adopted NEPC (2013) NEPM Health Investigation Levels (HIL-A) and Health-based Screening Levels (HSL-A) for residential with garden/accessible soil (which includes primary schools). While all validation samples reported concentrations of TPH, BTEX, PAHs, OCPs, OPPs, PCBs and eight priority heavy metals below the HIL-A and HSL-A criteria, friable asbestos was detected in three

of the thirteen samples collected (V8, V9 and V11) (See **Appendix A, Figure 5** for sample locations). This contaminated material was appropriately disposed off-site and successfully validated.

As a part of the final validation of the remediation works, visual inspections were conducted by a suitably qualified and experienced person to ensure that all fill from the ACM impacted areas had been remediated (placed in the cell, or disposed of off-site), and natural materials were exposed. An asbestos clearance certificate was also issued by a Licensed Asbestos Assessor (LAA). Additionally, the three (3) samples collected from within the area of the development footprint impacted with friable asbestos (the purple shaded area in **Appendix A, Figure 5**) all returned negative results after being analysed for the absence/presence of asbestos.

After infilling the Block R Containment Cell with the ACM impacted soils, a visible geofabric marker layer was placed on top of the impacted soil. This was then followed by a 0.4 m thick layer of clean VENM (sourced from the development footprint), a 0.1m thick layer of structural road base, and the 0.18 m thick concrete foundation slab of Block R. A conceptual cap design depicting the capping layer over the Block R Containment Cell has been provided in **Appendix C**.

The validation works determined that the development footprint was suitable for the development and upgrade works proposed within the SSDA as there were no remaining unacceptable risks to human health or the environment. However, the validation report stated that appropriate site management must be implemented through an LTEMP for long-term management of residual contamination at the development footprint within the contamination cell under Block R.

3 SITE CONDITION AND SITE SETTING

3.1 Site Location and Identification

The Site is the Block R Containment Cell, located at 126 Kent Road, Marsfield NSW 2122. The development footprint is shown in **Appendix A, Figure 1** and the location of the Block R Containment Cell is shown in **Appendix A, Figure 2**. The site details are summarised in **Table 3-1**.

Table 3-1 Site Identification

Site Characteristic	Detail
Street Address	126 Kent Road, Marsfield NSW 2122
Lot and DP Number	Part of Lot 1 – DP1250772
Local Government Area	Ryde City Council
Land Zoning	'SP2 – Infrastructure – Educational Establishment', 'SP2 – Infrastructure – Classified Road' and 'R2 – Low Density Residential' under the Ryde Local Environmental Plan 2014
Current Site Use	Kent Road Public School (Primary School)
Site Coordinates (UTM)	Latitude: -33.787917 Longitude: 151.109105
Site Area	Arcadis notes that during the reporting of the Supplementary Assessment it appeared that the site area is approximately 7,600 m ² . Appendix A, Figure 5 and the design plans in Appendix E show the boundary of the Site to which this SSDA and Audit applies. This LTEMP applies only to the Block R Containment Cell as defined in Appendix A, Figure 2 .
Surrounding Land Uses	<ul style="list-style-type: none"> • North: There are residential properties on the northern side of the development footprint, which are bordered by Kent Road and Herring Road; • South: Residential properties; • East: Residential properties and Kent Road; and • West: Residential properties and Herring Road.

3.2 Site History

The following site history was summarised in the PSI (Arcadis, 27 April 2018).

- The development footprint and immediate surrounding area have no history of industrial or commercial use and therefore does not have a high potential risk for extensive contamination.
- The development footprint has historically been used for residential or educational purposes since 1960s. Since that time, configuration has changed from four small buildings on the north west portion to its current configuration of several buildings scattered across the north west, centre and west, along with a basketball and tennis court.
- The surrounding land was observed to be agriculture in nature or undeveloped before residential development began to the south and west in 1961. A large cylindrical tower existed to the north west from 1961 to 1982 and appears to be a water tower.

- Prior to the 1960s, historical agricultural use of the development footprint (potentially including market gardens and orchards) may have involved use of OCPs, OPPs and herbicides.

3.3 Site Condition

During the most recent site inspection undertaken by Arcadis personnel, on the 24 April 2020, construction works according to the SSDA were well underway at the development footprint. The Block R Containment Cell was constructed and backfilled (under Arcadis supervision) with asbestos contaminated fill material sourced from the SSDA site. A concrete slab for Block R had been poured and works on the adjacent structures were also proceeding. No odours were noted. No vegetation was observed on-site.

3.4 Topography

The development footprint slopes slightly south/south east toward Shrimptons Creek and has an elevation of approximately 60 m Australian Height Datum (AHD). Additional information regarding the elevation contours around the development footprint can be found in the PSI (Arcadis, 27 April 2018).

3.5 Geology

The PSI (Arcadis, 27 April 2018) reported the geology as follows:

The 1:100,000 Geological Survey of NSW map of Sydney indicates that the SSDA area is underlain by the following geological unit;

- Triassic aged Ashfield Shale from the Wianamatta Group described as black to dark grey shale and laminate.

The 1:100,000 Geological Survey of NSW map of Sydney indicates that directly to the south east, the following geological unit underlays the development footprint;

- Triassic aged medium to coarse grained quartz sandstone, very minor shale and laminate lenses.

The Soil Conservation Service of NSW Sydney 1:100,000 Soil Landscapes Series Sheet 9310 (2nd Edition) indicates that the landscape of the region comprises of Glenorie Soil Landscapes.

3.6 Hydrogeology

A review of NSW Department of Primary Industries Office of Water records for groundwater bores within a 2000 m radius of the development footprint indicated the presence of twenty-six (26) water monitoring bores. A list of registered groundwater bores within 1500 m from the development footprint are provided in **Table 3-2**. For the full list of registered groundwater bores within the 2000 m dataset buffer, refer to the Lotsearch report provided within the PSI (Arcadis, 27 April 2018).

Based on the information available, the inferred groundwater flow direction beneath the Site is considered likely to be toward the east / southeast following the natural topography down toward Shrimpton's Creek.

Table 3-2 Registered Groundwater Bore Details within a 1500 m Buffer Zone

Bore ID	Use	SWL	Distance from the Development Footprint (m)	Direction
GW108110	Recreation	7.30	849	North West
GW112640	Monitoring	-	867	North
GW112641	Monitoring	-	883	North
GW112642	Monitoring	-	891	North
GW011296	Irrigation	-	934	North
GW016863	Irrigation	-	935	North
GW109694	Monitoring	-	1357	North East

3.7 Hydrology

The nearest surface water receptor is an unnamed water course that branches off Shrimptons creek and is located approximately 73 m south east of the development footprint.

3.8 Acid Sulfate Soil Risk

Review of the 'Standard Local Environmental Plan Acid Sulfate Soils' indicated that there is no known occurrence of acid sulfate soils (ASS) at the development footprint.

Review of the 'Atlas of Australian Acid Sulfate Soils' indicated that the development footprint was in a Class B category with a low probability of occurrence (6 – 70 % chance of occurrence). ASS is not known or expected to occur in these environments, and land management activities are not likely to be affected by acid sulfate materials.

4 POST REMEDIATION CONCEPTUAL SITE MODEL

Schedule B(2) of the NEPM (NEPC, 2013) describes a conceptual site model as

“A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments and provides the framework for identifying how the Site became contaminated and how potential receptors may be exposed to contamination either in the present or the future”.

Based on the site history, site setting, identified contamination, and remediation that has occurred above, the following CSM has been developed.

A conceptual site model (CSM) for the development footprint following completion of the development footprint remediation and validation works is presented in **Table 4-1**. The presence of the Block R Containment Cell is intended to provide a barrier to direct exposure for current and future site users effectively removing the potential for direct contact with the impacted material remaining on-site.

The extent of impacted fill remaining on-site within the Block R Containment Cell is presented in the survey drawings provided in **Appendix B**.

A visual conceptual drawing of the existing cap for the Block R Containment Cell is presented in **Appendix C**.

Table 4-1 Post-Remediation CSM

Source	Pathway	Receptor	Exposure Assessment
Fill materials	Direct contact	Demolition/construction workers, intrusive maintenance workers	Demolition and construction workers may have been exposed to ACM during the earthworks stage occurring as a part of the development. However, controls were placed around the construction area in order to mitigate risks, as per the AMP (Arcadis, 2019). Now that ACM impacted soils have either been disposed of, or contained within the Block R Containment Cell, these workers will not come into contact with ACM impacted soils. The pathway is incomplete.
		School attendants, site workers, surrounding residents	School students and staff at Kent Road Public School will not encounter ACM impacted fill soils as all remaining impacted material have been contained within the Block R Containment Cell, which cannot be readily accessed. The pathway is incomplete.
	Ingestion of dust, inhalation of asbestos fibres.	Intrusive maintenance workers, demolition/construction workers, surrounding residents	All receptors may have been exposed to dust during earth moving and construction works. Appropriate dust controls, barriers and signage were put into place to minimise this exposure pathway to all potential receptors. Now that ACM impacted soils have either been disposed of, or contained within the Block R Containment Cell, this exposure pathway has been eliminated. The pathway is incomplete.

Source	Pathway	Receptor	Exposure Assessment
		School attendants, site workers	<p>School students and staff at Kent Road Public School will not encounter ACM impacted fill soils as all remaining impacted material have been contained within the Block R Containment Cell, which cannot be readily accessed.</p> <p>The pathway is incomplete.</p>
Block R Containment Cell	Direct contact, ingestion of dust, inhalation of asbestos fibres.	Intrusive maintenance workers	<p>The Block R Containment Cell currently contains soil that is known to be impacted by asbestos and ACM material. The cell has been securely capped as presented in Appendix B and Appendix C. As long as the presence and management measures of the cell has been notified on an Environmental Management Plan (EMP) and an asbestos register held by administration, then the pathway is incomplete.</p> <p>Any intrusive works through the capping layers that have the potential to disturb the underlying impacted soils will cause the pathway to remain potentially complete.</p>
	Direct contact, ingestion of dust, inhalation of asbestos fibres.	School attendants, site workers, surrounding residents	<p>School students, staff at Kent Road Public School, Site workers and surrounding residents will not encounter ACM impacted fill soils as all remaining impacted material have been contained within the Block R Containment Cell, which cannot be readily accessed.</p> <p>The pathway is incomplete.</p>

5 IMPLEMENTATION

5.1 Stakeholder Notification

Key stakeholders requiring notification for the LTEMP include:

- Consent Authority (DPIE and The City of Ryde Council)
- Site Owner (Schools Infrastructure or the DoE);
- Site Manager (Schools Infrastructure NSW / DoE);
- Site Occupants (Kent Road Public School Administration and School Principal);
- Site Workers and Contractors; and

The LTEMP will be publicly notified on the Section 10.7 certificate available from City of Ryde Council.

5.2 Environmental Management Structure and Responsibility

The current Responsible Parties during construction and development works are St. Hilliers, who will be responsible for the implementation and enforcement of all aspects of the LTEMP. Upon completion of works legal responsibility pertaining to the long-term implementation of LTEMP, will transfer to the Schools Infrastructure NSW / DoE. The Director of the Asset Management Unit, Northern Sydney Directorate's delegate will become the on-site representative of Schools Infrastructure NSW/DoE, once in place. The LTEMP will be required to be notified on the site-specific asbestos register kept by the relevant Responsible Party.

City of Ryde Council will be responsible for ensuring that this LTEMP is noted on the Section 10.7 Planning Certificate issued for the wider site, and that any development consent which involves any disturbance of the soil below the cap and within the footprint of the Block R Containment Cell, includes a condition requiring the proponent to comply with conditions of the LTEMP.

Table 5-1 provides a summary of the roles and responsibilities of the key stakeholders for the LTEMP after the completion of construction and development works.

Table 5-1 Roles and Responsibilities

Role	Responsible Person(s)	Responsibilities	Frequency
Site Owner	Owner (Schools Infrastructure NSW / DoE)	Ensure that the LTEMP is put in place as an active document and that the management measures detailed herein are executed.	Ongoing
		Ensure that the current and future Site Occupants, Site Maintenance Workers and Contractors are made aware of the presence of residual ACM soil contamination at the Site and provide a copy of the current LTEMP for their records and to ensure appropriate ongoing appropriate management of residual environmental risks.	Ongoing
		Appoint an appropriately qualified and experienced Site Manager to manage compliance with the requirements of the LTEMP on behalf of the Site Owner .	Ongoing

Role	Responsible Person(s)	Responsibilities	Frequency
Site Manager	Site Manager (Schools Infrastructure NSW / DoE, Director of the Asset Management Unit, Northern Sydney Directorate's delegate will become the on-site representative of Schools Infrastructure NSW/DoE, once in place)	<p>Ensure that the LTEMP is added to the asbestos register and reviewed/updated at nominated frequencies.</p>	<p>Review of the LTEMP will need to be undertaken if:</p> <ul style="list-style-type: none"> • The Responsible Party changes. • Relevant safety incidents or non-compliance activities are reported. • The extent of capping changes. • There is a change in proposed land use.
		<p>Provide the Site Owner with updates on the implementation of, and compliance, with the LTEMP.</p>	<p>Annually, or following a significant change in site conditions</p>
		<p>Provide all Site Occupants, Site Maintenance Workers and Contractors likely to come into contact with soil at the Block R site with an induction to the LTEMP. An LTEMP Induction Form (see <i>Form 1, Appendix D</i>) should be put in place, with records maintained as a register, listing all personnel (internal and external) provided with this information, dates of induction, with a signed acknowledgment that they understand the information pertaining to the health and safety requirements of their works. This should be included in and complement any existing site safety and environmental management systems for the Site.</p>	<p>As required</p>
		<p>Conduct regularly inspections (as per Section 7.1) and undertake any required maintenance to maintain integrity of the on-site Block R Containment Cell cap (concrete foundation of Block R). A Cap and Contain System Inspection Form (see <i>Form 3, Appendix D</i>) should be put in place, with records maintained as a register.</p>	<p>Annually as required per Section 7.1 (and following any relevant noted incidents)</p>
		<p>Take appropriate corrective action to resolve any noted non-conformances with the LTEMP. Record non-conformances on a Non-Compliance and Corrective Action Form (see <i>Form 4, Appendix D</i>). Non-conformances should be notified to the Site Owner and NSW EPA if serious or material environmental harm is caused or threatened by the works.</p>	<p>Within 1 month of identification</p>
		<p>Maintaining records of the following throughout the life of the project and the extent of continued land use as a school. As the residual contaminants</p>	<p>Ongoing</p>

Role	Responsible Person(s)	Responsibilities	Frequency
		<p>are stable in the subsurface environment, the LTEMP is anticipated to be required for the life of the building:</p> <ul style="list-style-type: none"> • Details of all inducted personnel approved to undertake intrusive work on the Site; • Records of unexpected finds within the soils below the Site; • Assessment reports for the classification of soil waste, if any; • Approvals to excavate, disturb, remove and/or dispose soil from the Site; • Soil tracking information for material that is either removed from the Site or imported to the Site for use; and • Records of inductions, concrete slab integrity monitoring and non-compliance and corrective actions. 	
		<p>Maintain ongoing communication with all key stakeholders and ensure that updates are provided where there are any significant changes in risk profile.</p>	Ongoing
		<p>Comply with the requirements of the LTEMP.</p>	Ongoing
		<p>Identify, document and communicate the locations of any damage or penetrations to the Block R Containment Cell cap (concrete foundation of Block R) to the Site Manager.</p>	Ongoing
Contractors	Contractor appointed by the Site Owner.	<p>Provision of Safe Work Method Statement (SWMS) that account for risks associated with contamination as set forth in the LTEMP.</p> <p>If intrusive works will not extend below the cap within the footprint of the Block R Containment Cell, i.e. ACM impacted soils will not be disturbed, the works are considered to be low risk. In this case the contractor is required to sign the form included in <i>Form 2, Appendix D</i> to confirm that the works will not disturb impacted soil.</p>	<p>Prior to the start of any site works</p>
		<p>If contractor assumes Principal Contractor role at the Site, they will include the LTEMP within any Construction Environmental Management Plan (CEMP) prepared for the scope of works to be completed and ensure compliance. This includes assuming all responsibilities of the Site Owner and Site Manager roles detailed above,</p>	<p>Prior to and for the duration of works</p>

Role	Responsible Person(s)	Responsibilities	Frequency
	Manager and staff completing intrusive tasks on-site	plus maintaining and providing the Site Manager with a documented record of relevant activities completed in relation to the LTEMP while responsible for the management of the Site (or part thereof).	
		Complete an induction to the LTEMP (or Summary of LTEMP as provided in Appendix F) confirming that they have been made aware of the actual and potential hazards associated with their works.	Prior to the start of any site works and after any revision of the LTEMP
		Follow the relevant management measures pertaining to their works at all times, as detailed in the LTEMP.	At all times
		Report to the Responsible Party any occurrences of PACM or ACM.	At all times
		Identify, document and communicate the locations of any damage or penetrations to the Block R Containment Cell cap (concrete foundation of Block R) to the Site Manager .	During and at completion of works
Environmental Consultant	A Suitably Qualified and Experienced Person	Complete updates and/or amendments to this LTEMP, as required. This person(s) should be a Certified Environmental Practitioner (CEnvP)	Following significant changes in site conditions, at request of Site Manager and/or as per LTEMP review schedule.

Regardless of the roles and responsibilities detailed in **Table 5-1**, all key stakeholders are responsible for environmental compliance in accordance with their 'general environmental duty' under the Protection of the Environment Operations (POEO) Act 1997.

The Site Manager must ensure that records of safety, maintenance, construction, audit and site inductions in relation to the LTEMP are maintained on-site at all times. These documents may be subject to review by a Suitably Qualified and Experienced Environmental Consultant, as per **Section 5.8**.

5.3 Records and Documentation

Records should also be maintained for the following throughout the life of the LTEMP:

- Assessment reports for the classification of the soil within the Block R Containment Cell (as provided by Arcadis, as described in **Section 2.2.7**);
- NSW EPA approvals to remove or dispose soil from the Site;
- Soil tracking information for material that is either removed from the Site or imported to the Site for use; and
- Records of inductions concrete slab integrity monitoring and non-compliance and corrective actions will be kept by the Responsible Party.

5.4 Training and Inductions

All key stakeholders at the Site should receive an induction to the LTEMP and appropriate environmental training to ensure they are:

- Aware of the nature and residual ACM contamination present in soils within the Block R Containment Cell;
- Understand the LTEMP and their responsibilities under it as key stakeholders; and
- Competent to carry out their work in an environmentally acceptable manner.

Applicable management requirements detailed in this LTEMP should be explained to all key stakeholders during the site induction. Ongoing instruction should be provided via modular training packages and toolbox meetings. All inductions and ongoing instruction should be recorded on a project register to ensure all personnel are inducted and receive all appropriate training.

All key stakeholders (and subcontractors), are to receive awareness training in the following areas:

- The LTEMP and related documents;
- Work Health and Safety (WHS) requirements including required Personal Protective Equipment (PPE);
- Emergency procedures and responses; and
- Legal obligations and responsibilities to report unexpected finds, contamination or WHS issues.

All inductions to the LTEMP should be recorded on an LTEMP Induction Form (*Form 1, Appendix D*), with records maintained as a register by the Responsible Party.

5.5 Complaints Management

Any complaints and inquiries should be directed to the Responsible Party who will assess the validity and seriousness of the complaint or inquiry and respond as appropriate. The Responsible Party will then be required to notify the Site Occupant (Kent Road Public School administration) within 24 hours of any complaint or inquiry.

Any complaints will be recorded in an Incident Form and a register maintained by the Responsible Party, including the following details:

- Name, address and contact number of complainant(s);
- Time and date of complaint;
- Reasons for the complaint;
- Investigations undertaken in response and conclusions formed;
- Actions taken to resolve complaint;
- Any abatement measures implemented to mitigate the cause of the complaint; and
- Name and contact details of the person responsible for resolving the complaint.

5.6 Non-Compliance and Incidents

Non-compliance with any aspect of this LTEMP, any project consent conditions and/or monitoring limits will require corrective action and reporting. The type and scale of corrective action and reporting will depend on the type and scale of the non-compliance.

Any relevant incidents to the Block R Containment Cell which that require some form of incident response, rectification or with the potential to cause material or serious environmental harm or nuisance must be recorded in the incidents / complaints register. A near miss of these events must also be recorded.

Any non-compliance or incident will be recorded in an Incident Form and a register maintained by the Responsible Party, including the following details:

- The location of the event;
- The time of the event;
- The time that site personnel became aware of the event;

- The suspected cause of the event;
- A description of the resulting effects of the event;
- Actions taken to mitigate any environmental harm and/or environmental nuisance; and
- Proposed action to prevent a recurrence of the event.

Any key stakeholder that becomes aware of an incident (environmental or otherwise), must notify the Responsible Party immediately. The Responsible Party must notify the NSW EPA if serious or material environmental harm is caused or threatened by the works.

The Responsible Party (Site Manager) should notify the Site Owner of any relevant incident with actual or potential significant off-site impacts to human health or ecology environment as soon as practicable after the occurrence of the incident. Written details of the incident are to be provided to the Site Owner within seven days of the date on which the incident occurred.

Non-compliance and corrective forms are provided in *Form 4, Appendix D*. Records of capping monitoring and non-compliance and corrective actions are to be kept by the Responsible Party (Site Manager).

5.7 Legal Enforcement and Key Contacts

The LTEMP will be legally enforced by Department of Planning, Industry and Environment to address planning conditions relating specifically to Site Contamination in the SSDA. The LTEMP will be publicly notified on the Section 10.7 certificate available from City of Ryde Council.

Section 3.4.6 of the NSW EPA, *Contaminated Land Management: Guidelines for Site Auditor Scheme (3rd Edition)*, 2017 (NSW EPA 2017) requires that a NSW EPA accredited Contaminated Land Site Auditor confirms that the LTEMP can be made legally enforceable as well as ensuring that it is publicly notified. If the enforcement of the LTEMP can only be made via the involvement of DPIE and/or Ryde City Council, the NSW EPA accredited Contaminated Land Site Auditor will require written approval from DPIE and/or Council that the LTEMP is being enforced.

If a Dial-Before-You-Dig (1100.com) search is requested for the Site, the search party will be altered to the presence of this LTEMP.

Key contacts for the Site are provided in **Table 5-2**.

Table 5-2 List of Key Contacts

Organisation / Position	Phone Number	Email
St Hillier's (Construction and Project Manager for the construction period ONLY)	0408 458 492	gmalenstein@sthilliers.com.au
Schools Infrastructure / DoE (Director of the Asset Management Unit, Northern Sydney Directorate)	9472 1208	schoolinfrastructure@det.nsw.edu.au
Site Manager (Director of the Asset Management Unit, Northern Sydney Directorate)	9472 1208	schoolinfrastructure@det.nsw.edu.au
Department of Planning, Industry and Environment (DPIE)	1300 305 695	info@service.nsw.gov.au
NSW EPA	(02) 9995 5555 (02) 131 555 (24 hrs)	info@epa.nsw.gov.au
Ryde City Council	9952 8222	cityofryde@ryde.nsw.gov.au
NSW Emergency Services	000	info@fire.nsw.gov.au Ambulance- GeneralEnquiry@health.nsw.gov.au Police.nsw.gov.au/contact_us
NSW Poisons Hotline	13 11 26	N/A
Crime Stoppers	1800 333 000	

5.8 Approval and Licensing Requirements

All works on the Site must be undertaken with due regard to the environment and to statutory requirements. The legislation relevant to this LTEMP and any licences, approvals or permits required to be obtained under that legislation is identified below. Work on site is to comply with the requirements of the following legislation:

- Contaminated Land Management (CLM) Act 1997, Section 60
- Protection of the Environment Operations (POEO) Act 1997, Clause 42
- Protection of the Environment Operations (POEO) (Waste) Regulation 2014
- NSW WorkCover (2014) 'Managing asbestos in or on soil'
- Work Health and Safety Regulation 2011

Any contractor undertaking intrusive works is responsible for obtaining the licences, approvals and permits required for particular work projects under the legislative framework, unless otherwise agreed by the City of Ryde Council and/or DPIE.

As long as the Block R Containment Cell remains intact, there is no requirement for a NSW EPA accredited Contaminated Land Site Auditor to be involved with the ongoing management of the Cell. If the Containment Cell does become compromised and rectification or validation is required, a NSW EPA accredited Contaminated Land Site Auditor may be required to verify that the Block R Containment Cell has been reinstated in accordance with the original design.

6 RISKS, MANAGEMENT AND CONTROLS

6.1 Environmental Management Activities and Controls

The following section provides details on the applicable environmental management activities and controls to be implemented at the Site in order to minimise potential risks to future site users, site workers, construction workers, and intrusive maintenance workers, associated with the presence of residual soil contamination.

6.1.1 Capping Layers of the Block R Containment Cell

To minimise the potential for contact with any impacted soil that was placed in the Block R Containment Cell, the following mitigation measures were adopted to prevent direct contact, ingestion and incidental inhalation exposure pathways:

- Construction and maintenance of a suitable cap across the entire surface area of the Block R Containment Cell. The cap comprises the following:
 - A visible geofabric marker layer (bright orange);
 - A VENM layer of approximately 0.4 m thickness; and
 - The structural elements of the foundation slab of Block R which include 0.1 m of densely graded road base (DGB20) and 0.18 m of the reinforced concrete slab

If the existing concrete surface layer is disturbed or the any of the capping layers of the Block R Containment Cell require excavation, a suitably qualified contractor should be engaged to rectify and render the slab and any disturbed underlying layers suitable, with verification provided by a suitably qualified and experienced person.

Surveys of the empty Block R Containment Cell, Block R Containment Cell containing impacted soil, and a concrete 'as built' drawing of the Block R slab, have also been provided in **Appendix B**. The conceptual design of the capping layers is presented in **Appendix C**.

6.1.2 General Site Maintenance

Any general site maintenance works (e.g. gardening) that will not extend below the capping layers as defined in **Section 6.1.1** (i.e. where contaminated soils will not be disturbed), are considered to be minimally intrusive and low risk.

Site Maintenance Workers and Contractors undertaking this kind of minimally intrusive works will be required to confirm in writing to the Site Manager that works will not disturb the soil within the Block R Containment Cell.

6.1.3 Management of Intrusive Works

Where intrusive works are proposed at the Block R Containment Cell location which will impact or extend below the capping layers (i.e. where contaminated soils may be disturbed), the following should management activities and controls should be put in place, as a minimum:

- Notification of the proposed works to Schools Infrastructure NSW / DoE, who have the authority to approve any proposed intrusive works which may penetrate the Block R Containment Cell.
- After approval, this LTEMP should be provided to the contractor so that the relevant risks with undertaking works can be managed accordingly.
- The contractor is required to prepare a Construction Environment Management Plan (CEMP) for the proposed works, which is to be provided to Schools Infrastructure NSW / DoE. This CEMP should be endorsed by a Suitably Qualified and Experienced Environmental Consultant or NSW EPA accredited Contaminated Land Site Auditor, who was not involved with the preparation of the CEMP. The CEMP should detail the following:

- Proposed methodology for excavation and maintenance to be undertaken;
 - Proposed occupational health and safety protocols to be implemented during the works. This should cover all potentially affected parties, including contractor staff, site occupants and neighbours;
 - The collection and recording of evidence of appropriate management of soil waste including; waste tracking, excavation volumes and location maps indicating areas of soil excavation; and
 - Proposed details for excavation reinstatement (to comply with the capping layer specifications detailed in **Section 6.1.1**).
- The contractor is also required to prepare a Health and Safety Plan in preparation for working on the Site, which is to be provided to the Asset Management Unit, Northern Sydney Directorate and Schools Infrastructure NSW / DoE. This plan should also incorporate environmental management aspects.

6.1.4 Inspections and Audits

The concrete slab should be inspected annually to ensure it remains in good condition and repairs/replacement may be made as required. Examples of suitable forms for cap monitoring, non-compliance and corrective actions are included in *Form 4, Appendix D*. Photographic records should be maintained.

As the residual contaminants are stable in the subsurface environment, the LTEMP is anticipated to be required for the life of the building. The following records should be detailed after the LTEMP becomes operational (post construction, and when land use as a school resumes):

- Details of all inducted personnel approved to undertake work on the Site;
- Records of unexpected finds on the Site;
- Assessment reports for the classification of soil waste;
- Approvals to remove or dispose soil from the Site;
- Soil tracking information for material that is either removed from the Site or imported to the Site for use; and
- Records of inductions, concrete slab integrity monitoring and non-compliance and corrective actions.

Records of concrete slab inspections should be kept with the LTEMP by the Responsible Party.

6.1.5 Management and Handling of Excavated Materials

6.1.5.1 Handling

Existing material beneath the cap installed above the Block R Containment Cell should be treated as contaminated fill. The contractor responsible for any works that will disturb material from below the cap should consider the following control measures as listed below (but not limited to) during excavation and handling works:

- Excavators should operate with doors and windows closed and air conditioning on to prevent dust and potential asbestos fibres from entering the cab. Suitable air filters should also be used with machinery to minimise exposure risks;
- Machinery and vehicle involved in the handling of residual material should be washed down to prevent tracking of soil across the site boundary;
- Stockpiled soil should be covered with a dust and waterproof barrier to eliminate dust generation and inhalation risks;
- The work area and stockpiled material should be clearly marked out with signs posted noting the presence of contaminated material;

- Site workers involved in excavation or intrusive works are to wear or be provided with appropriate PPE such as coveralls, P2 Dust masks (or equivalent) and sturdy shoes;
- Site workers involved with the direct handling (i.e. hand contact) of contaminated soil are to wear a pair cut proof gloves;
- A high level of personal hygiene should be put in place with appropriate decontamination facilities available between work areas and non-work areas; and
- Bulk soil removed off-site must be classified by an appropriately qualified environmental consultant as specified in **Section 6.1.5.3**.

6.1.5.2 Re-use of Excavated Material

Where possible/practicable, any soil material excavated from the Site is to be replaced back in the Containment Cell from where it originated. If excavated soil is not replaced in the same source location, then it is to be removed from the Site in accordance with the methods detailed in **Section 6.1.5.3**.

6.1.5.3 Off-Site Removal of Excavated Material

Any material removed from the Site is required to be classified in accordance with the NSW Environment Protection Authority (2014) *Waste Classification Guidelines*. This includes the Addendum to the 2014 Waste Classification Guidelines made in October 2016 to include toxicity characteristics leaching procedure (TCLP) and specific contaminant concentration (SCC) values for perfluorooctane sulfonate (PFOS), perfluorohexane sulfonate (PFHxS) and perfluorooctanoic acid (PFOA) chemicals.

A suitably qualified and experienced person should be commissioned to complete the classification works and provide advice on how to manage the material. All material removed off-site may only be re-used or disposed of in a lawful manner.

The *Protection of the Environment Operations (POEO) (Waste) Regulation 2014* requires that transportation and disposal of hazardous waste must be tracked into, with, or out of NSW, Waste tracking involves the following steps:

1. Characterise the waste.
2. Determine if tracking or waste is required (i.e Characterised as hazardous).
3. Obtain Consignment Authorisation (CA) from receiving facility or NSW EPA to give to waste signor to transport specific waste.
4. Complete Transport Certificate (TC). TC contains required information regarding pickup and delivery dates, receiving facilities acceptance of waste, date waste has been disposed/treated or temporarily stored and any discrepancies.

Any discrepancies that have occurred on the TC, that may not accurately reflect the transport and disposal of the waste, must be noted.

6.1.6 Importation of Material

If soil is excavated from the Site and not replaced in the same source location, the excavation will need to be backfilled by appropriate material imported to the Site. The suitability of any imported materials should be assessed (via sampling and analysis) by a suitably qualified and experienced person.

The recommended sampling and analysis rates for imported material are summarised in **Table 6-1**.

Table 6-1 Imported Material Sampling Rates

Volume (m ³)	No. of Samples
<75	3
75 - <100	4
100 - <125	5
125 - <150	6
150 - <175	7
175 - <200	8

For volumes of less than 75m³ imported material should be sampled at a minimum of 3 samples. Analysis of the samples should be in accordance with the NSW EPA (2014) Waste classification guidelines and should include, at a minimum, heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), organochlorine/organophosphorus pesticides (OC/OPP), phenols, asbestos, polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCBs).

Any material imported to site must be accompanied by clean fill certification stating that the material is classified as either:

- VENM in accordance with the Protection of the Environment Operations Act 1997; or
- Excavated Natural Material (ENM) in accordance with the ENM Order 2014.

7 CAP INTEGRITY MONITORING

To monitor the condition and efficacy of the cap, the following monitoring schedule should be followed:

- Completion of an annual visual inspection by the Site Manager (or appropriate contractor) of the condition and integrity of visible parts of the Block R concrete slab, comprising:
 - Assessment of any cracks, degradation or damage to the slab (for example, as a result of concrete spalling or internal building works) – especially around service penetrations.
- Any degradation of the condition and integrity of the cap must be noted and action must be taken to reinstate it appropriately.
- Monitoring of the cap area is to be conducted and commissioned by the Site Owner (Schools Infrastructure NSW / DoE).

The annual cap integrity monitoring should be recorded on the inspection form included in *Form 3, Appendix D*.

8 SUMMARY AND TIMING

Provided that the LTEMP described herein is enforced and adhered to in future at the Site, Arcadis considers that the potential environmental risks associated with the ACM impacted soil that is present within the Block R Containment Cell, will be appropriately managed.

This LTEMP, or revisions thereof, is to remain in place at the Site in perpetuity or until the land use changes. If land use changes the LTEMP is required to be revised to reflect any changes in potential exposure to the residual impacted fill material.

The LTEMP should be included in the appropriate Hazardous Material register kept by Schools Infrastructure NSW / DoE.

9 LIMITATIONS

This LTEMP is an operational document and should read and used in only in the context stated in the objectives. Arcadis has complied this document in a manner consistent with the level of care and expertise exercised by members of the environmental profession.

No warranties, express or implied, are made. Subject to the objectives of the report, Arcadis' assessment is limited strictly to environmental conditions associated with the subject property.

While normal assessments of data reliability have been made, Arcadis assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of Arcadis, or developments resulting from situations outside the scope of this LTEMP.

Arcadis prepared this report for the sole and exclusive benefit and use of St Hillier's Pty Ltd as well as Schools Infrastructure / DoE and for future contractors whose work may impact the containment cell located on-site. Notwithstanding delivery of this LTEMP by Arcadis or the client to any third party, any copy of this LTEMP provided to a third party is provided for informational purposes only, without the right to rely. Arcadis cannot accept any responsibility for any use of or reliance on the contents of prepared reports by any third party except where expressly agreed via an agreed and properly executed reliance letter. Subject to the terms of the reliance letter, Arcadis would disclaim all and any liability to any third person in respect of anything or in consequence of anything done or omitted to be done by that person in reliance, whether whole or partial.

From a technical perspective, this LTEMP has been prepared through the provision of reports and documents provided to the Arcadis by the client. Should additional data become available, Arcadis will be notified in order to update this LTEMP in accordance with the relevant sections outlined in the text above.

Arcadis' professional opinions are based upon its professional judgment, experience, and training. These opinions are also based upon data derived from the limited testing and analysis described in this report. It is possible that additional testing and analysis might produce different results and/or different opinions. Arcadis has limited its investigation(s) to the scope agreed upon with its client.

That standard of care may change, as new methods and practices of exploration, testing and analysis may develop in the future, which might produce different results.

REFERENCES

- Arcadis, *Preliminary Site Investigation*, 27 April 2018
- Arcadis, *Due Diligence Soil Contamination Assessment*, 30 July 2018
- Arcadis, *Further Supplementary Soil Contamination Assessment*, 11 November 2019
- Arcadis, *Unexpected Finds Protocol*, 29 November 2019
- Arcadis, *Asbestos Management Plan*, 4 December 2019
- Arcadis, *Remediation Action Plan*, 4 December 2019
- Arcadis, *Validation Report*, 19 May 2020
- Arcadis, *Waste Classification of ACM Impacted Fill Material (Uncoloured)*, 8 December 2019
- Arcadis, *Waste Classification of ACM Impacted Fill Material (Red)*, 18 December 2019
- Arcadis, *Re-classification of General Solid Waste to General Solid Waste – Special (Asbestos) (Blue)*, 7 January 2020
- Arcadis, *Classification of Virgin Excavated Natural Material (VENM) (Uncoloured)*, 8 January 2020
- NSW Environment Protection Authority, *Contaminated Land Guidelines - Consultants Reporting on Contaminated Land*, 2020
- NSW Environment Protection Authority, *Contaminated Land Management - Guidelines for the NSW Site Auditor Scheme*, 2017
- National Environment Protection Council, *National Environment Protection (Assessment of Site Contamination) Measure*, 1999 (as amended 2013)
- NSW Environment Protection Authority, *Waste Classification Guidelines – Part 1: Classification of Waste*, 2014
- WA Department of Health, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, 2009

APPENDIX A FIGURES

COUNTRY



REGION



SITE LOCATION



LEGEND:

- Audit Site Boundary /
- Development Footprint



- Approximate location of the Block R Containment Cell, to which the LTEMP applies.

KENT ROAD PUBLIC SCHOOL- 126 KENT ROAD
MARSFIELD, NSW, AUSTRALIA

SITE LOCATION PLAN

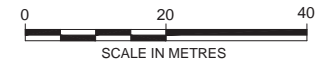


LEGEND:

--- Development Footprint



Location of the Block R Containment Cell, to which the LTEMP applies.



KENT ROAD PUBLIC SCHOOL- 126 KENT ROAD
MARSFIELD, NSW, AUSTRALIA

**LOCATION OF THE BLOCK R
CONTAINMENT CELL**

CITY OF MELBOURNE, VIC. ENVIRONMENTAL & PLANNING DEPARTMENT
 E:\OnSite - Arcadis\BIM 360 Docs\AUSTRALIA\1004229 Kent Rd, Marsfield\2019\1004229-fig 4.LOS8.dwg LAYOUT: 4 SAVED: 8/30/2019 10:39 AM ACADVER: 23.08 (LMS TECH) PAGES: 10 PLOTTED: 8/30/2019 10:40 AM BY: MADIGER, CHIDAMBARAM



LEGEND:

- Development Footprint
- Test Pit Location (2019)
- Borehole Location (2018)
- Study Area Due Diligence Assessment
- Approximate location of the Block R Containment Cell, to which the LTEMP applies.

NOTE:
 HISTORICAL FEATURE LOCATIONS ARE APPROXIMATE.

0 20 40
 SCALE IN METRES

KENT ROAD PUBLIC SCHOOL- 126 KENT ROAD
 MARSFIELD, NSW, AUSTRALIA



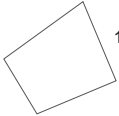

LOCATION OF SOIL BORES AND TEST PITS FROM PREVIOUS INVESTIGATIONS


ARCADIS ARCADIS

FIGURE
3



LEGEND:

-  Development Footprint
-  Test Pit Location
-  14 m Grid
-  Location of the Block R Containment Cell

N


0 20 40
SCALE IN METRES

KENT ROAD PUBLIC SCHOOL- 126 KENT ROAD
MARSFIELD, NSW, AUSTRALIA

TEST PIT SAMPLING LOCATIONS



LEGEND:

- Development Footprint
- Test Pit Location
- Approximately 14 m Grid
- Location of the Block R Containment Cell
- GSW CT1 Recyclable
- GSW due to TRH exceedance
- GSW CT1 Recyclable. Providing no ACM is observed when excavating anthropogenic material observed in fill
- Special Waste with GSW matrix
- Reclassified from GSW CT1 Recyclable to **Special Waste with GSW matrix** due to presence of friable asbestos
- Validation Sample Locations (11.12.2019)
- *Validation Sample Locations (11.12.2019) - Proposed location that were not collected due to observed exposed natural material
- Final Validation Sample Locations (23.01.2020)

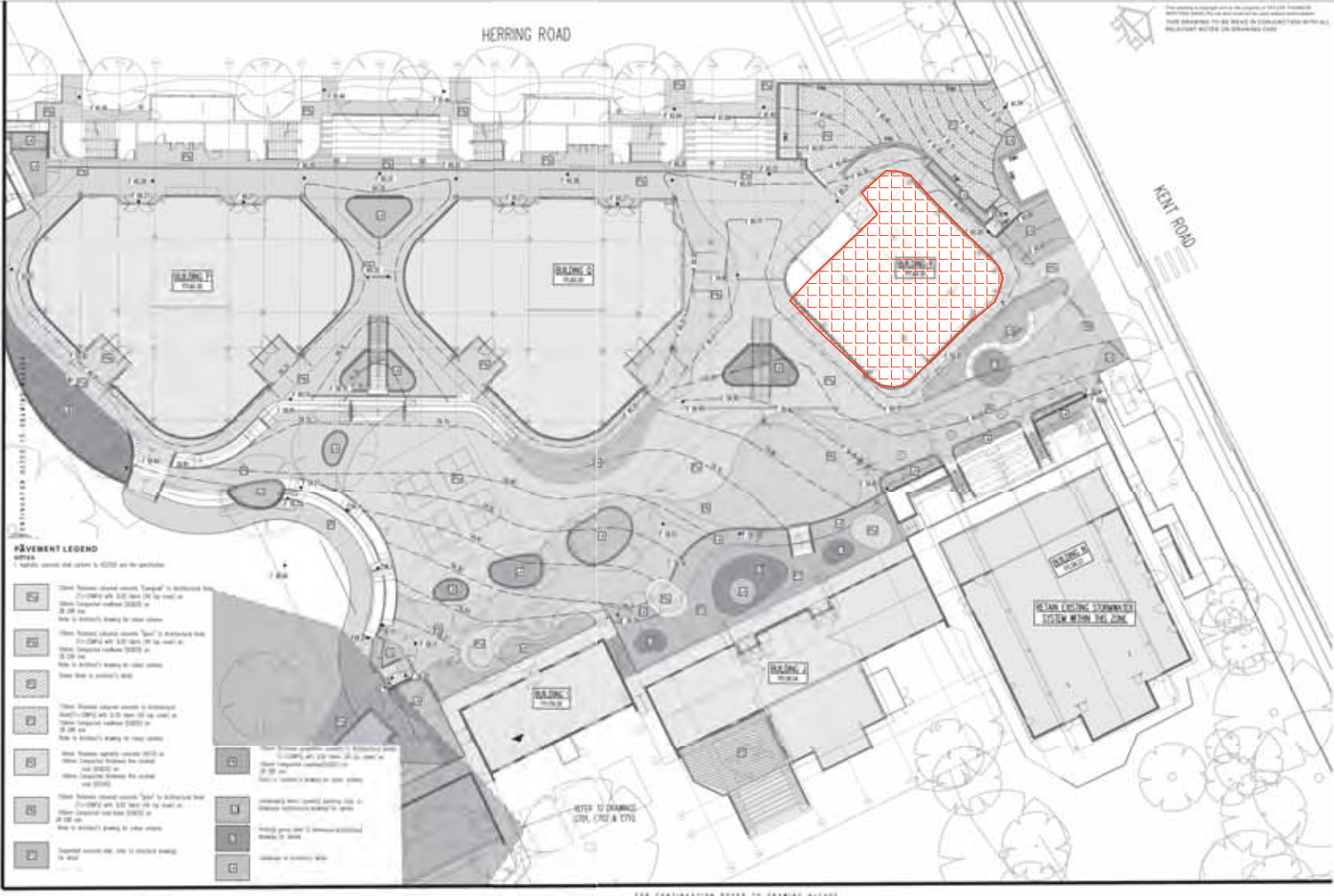
0 40
SCALE IN METRES

KENT ROAD PUBLIC SCHOOL- 126 KENT ROAD
MARSFIELD, NSW, AUSTRALIA

Waste Classification

APPENDIX B BLOCK R CONTAINMENT CELL SURVEY

Block R Containment Cell Location and Empty Containment Cell Survey (as taken from the base of the cell)



Not a warranty or representation of any kind, or a statement of fact. This drawing is intended for use as a guide only and should not be used for any other purpose. It is the user's responsibility to verify the accuracy of the information contained herein.

Client / Site	Rainbow Kent Rd Public School		
Drawing No:	9004		
Area Of Survey	Borrow Pit		
Date	200109	Docket No 66804	
Measure File	200109AM		
Control File	Control Combined 191024		
Surveyor	AM		
Design Correct	Y	Resect 3PI+	Y
Orig BM CHK	Y	CHK SHOT	Y
Orig Control CHK	Y	All SOP Record	NA
SOP Looks Cor	NA	Offsets Clear	NA
All Labels Placed	NA	BM's Clear	NA
Measure CHK	Y	Shown Client	Y
All Works Complete	Y	Final Check Shot	Y
WFM Updated	Y	Next Visit Required	TBC
Drawing Ref	C403-A		
Legend	<p>— TOP OF BORROW PIT</p> <p>* Note: The 'Borrow Pit' is the same as the 'Block R Containment Cell'</p>		

NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION
1	17/11/18	AM	ISSUED FOR PERMIT	1	17/11/18	AM	ISSUED FOR PERMIT
2	17/11/18	AM	REVISED FOR PERMIT	2	17/11/18	AM	REVISED FOR PERMIT
3	17/11/18	AM	REVISED FOR PERMIT	3	17/11/18	AM	REVISED FOR PERMIT
4	17/11/18	AM	REVISED FOR PERMIT	4	17/11/18	AM	REVISED FOR PERMIT
5	17/11/18	AM	REVISED FOR PERMIT	5	17/11/18	AM	REVISED FOR PERMIT
6	17/11/18	AM	REVISED FOR PERMIT	6	17/11/18	AM	REVISED FOR PERMIT
7	17/11/18	AM	REVISED FOR PERMIT	7	17/11/18	AM	REVISED FOR PERMIT
8	17/11/18	AM	REVISED FOR PERMIT	8	17/11/18	AM	REVISED FOR PERMIT
9	17/11/18	AM	REVISED FOR PERMIT	9	17/11/18	AM	REVISED FOR PERMIT
10	17/11/18	AM	REVISED FOR PERMIT	10	17/11/18	AM	REVISED FOR PERMIT

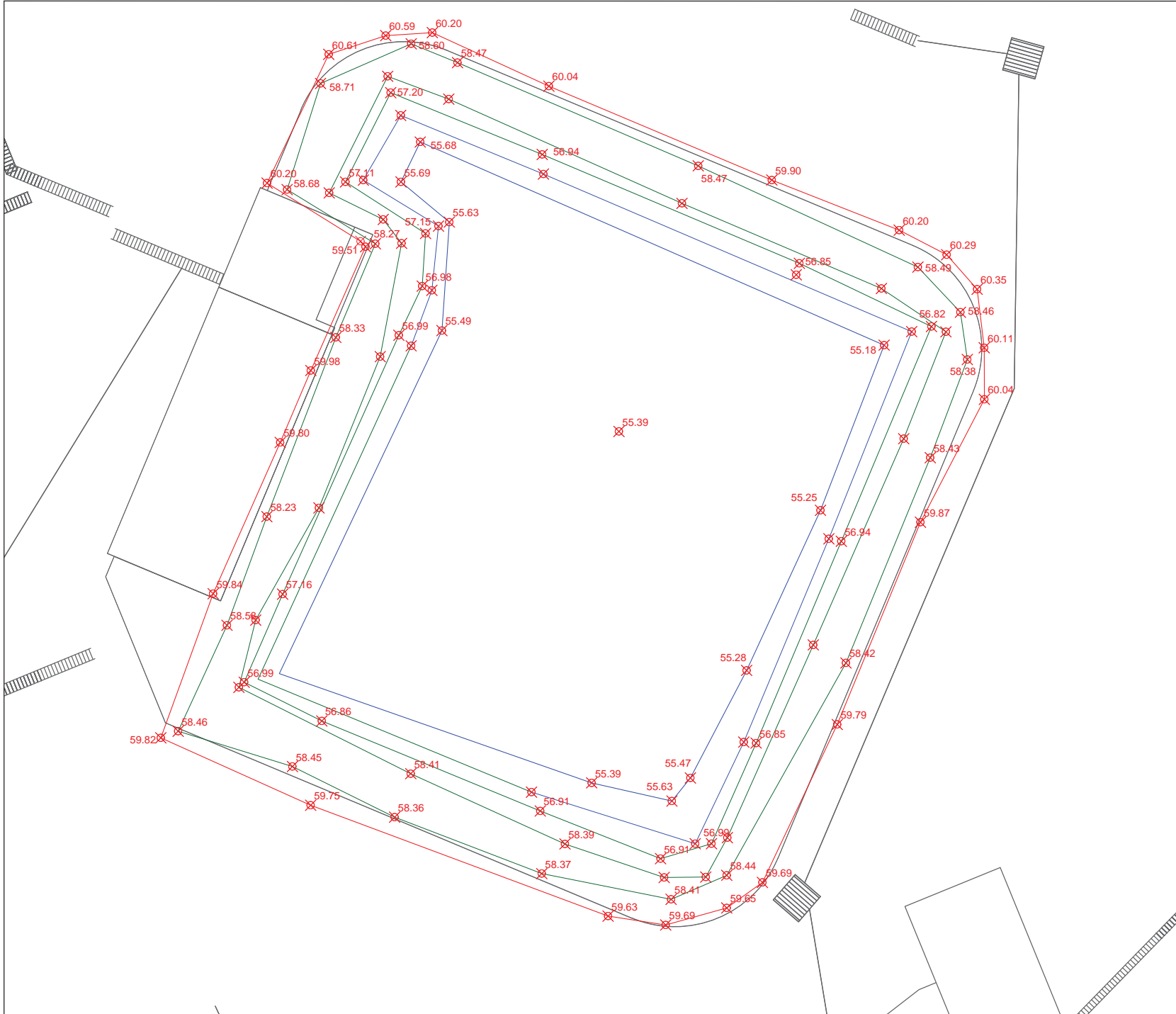


KENT ROAD PUBLIC SCHOOL

PAVEMENT PLAN SHEET 1

Scale: 1:200	Sheet: 1 of 1	Author: AM
Client No: 171518	Drawing No: C403	Version: A
Date: 17/11/18		

BOUNDARY SIGNOFF SHEET	Signoff pdf name
AHD ORIGIN	Origin of AHD
HEIGHT	Height @ Origin
SIGNOFF DATE	Date of Signoff



Client / Site	Rainbow Kent Rd Public School		
Drawing No:	9004b		
Area Of Survey	Borrow Pit		
Date	200109	Docket No 66804	
Measure File	200109AM		
Control File	Control Combined 191024		
Surveyor	AM		
Design Correct	Y	Resect 3PI+	Y
Orig BM CHK	Y	CHK SHOT	Y
Orig Control CHK	Y	All SOP Record	Y
SOP Looks Cor	Y	Offsets Clear	Y
All Labels Placed	Y	BM's Clear	Y
Measure CHK	Y	Shown Client	Y
All Works Complete	Y	Final Check Shot	Y
WFM Updated	Y	Next Visit Required	TBC
Drawing Ref			
Legend			

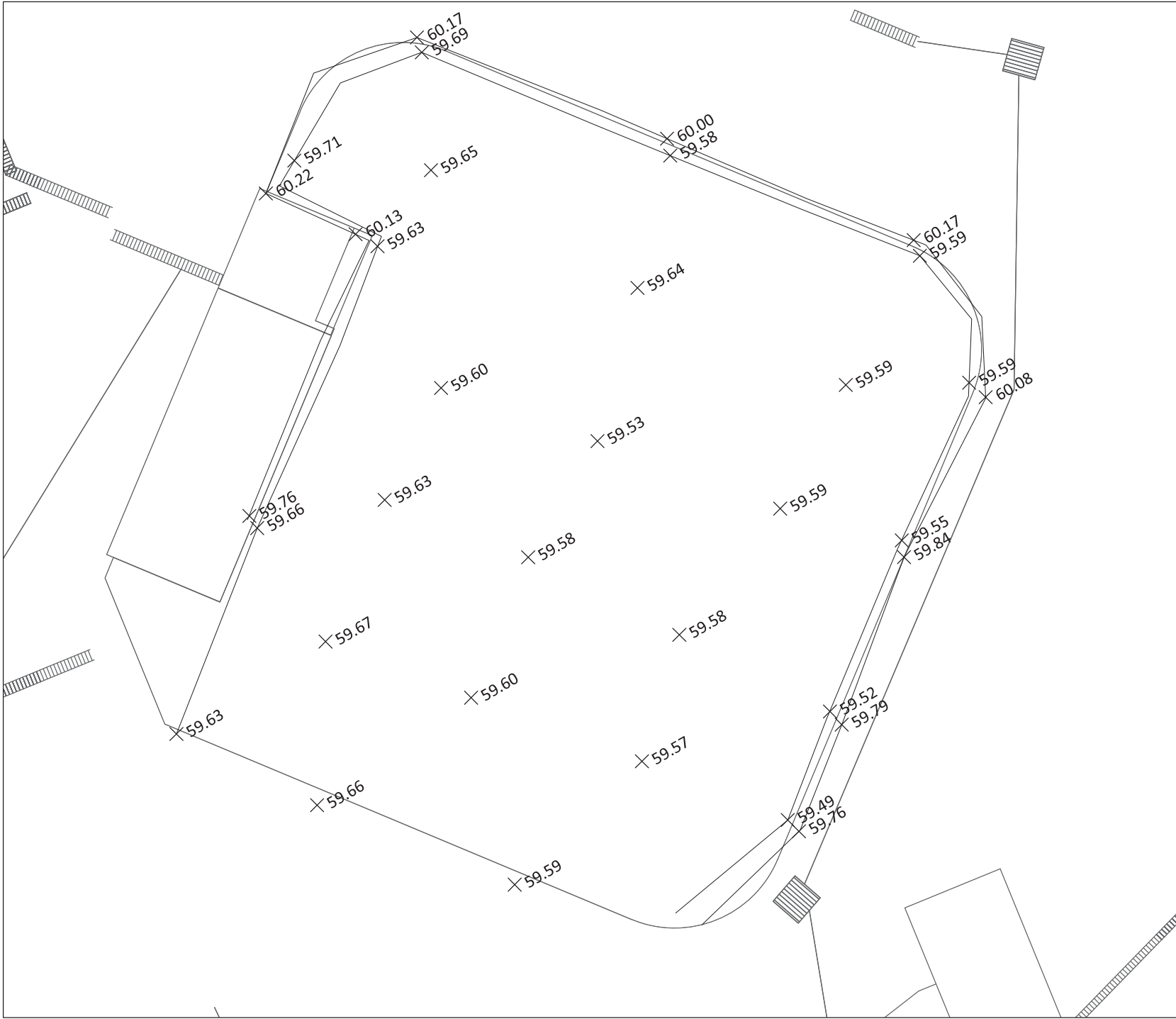
- TOP OF BORROW PIT
- BOTTOM OF BORROW PIT
- BENCHING
- ⊗ SURVEYED POINTS

NOTE:
RL'S ARE SHOWN IN METERS

* Note: The 'Borrow Pit' is the same as the 'Block R Containment Cell'

BOUNDARY SIGNOFF SHEET	Signoff pdf name
AHD ORIGIN	Origin of AHD
HEIGHT	Height @ Origin
SIGNOFF DATE	Date of Signoff

Full Block R Containment Cell Survey (as taken from the top of the visible marker layer)



Client / Site	Rainbow Kent Rd P.S		
Drawing No:	9005		
Area Of Survey	Borrow Pit		
Date	200122	Docket No	56983
Measure File	200122JP		
Control File	Control Combined 191024		
Surveyor	JP		
Design Correct	Y	Resect 3Pt+	Y
Orig BM CHK	Y	CHK SHOT	Y
Orig Control CHK	Y	All SOP Record	Y
SOP Looks Cor	Y	Offsets Clear	Y
All Labels Placed	Y	BM's Clear	Y
Measure CHK	Y	Shown Client	Y
All Works Complete	Y	Final Check Shot	Y
WFM Updated	Y	Next Visit Required	29/01/20
Drawing Ref			
Legend			

VALUES INDICATE FILL LEVELS AT TIME OF SURVEY.

VOLUMES FROM TIN "TIN MEASURE 200111AM EXCAVATION EXTENT" TO TIN "TIN MEASURE 200122JP EXCAVATION FILL"

TOTAL FILL 1010m³

* Note: The 'Borrow Pit' is the same as the 'Block R Containment Cell'

BOUNDARY SIGNOFF SHEET	
AHD ORIGIN	
HEIGHT	SIGNOFF DATE

Concrete 'As Built' for Block R



NORTH (APPROX)

LEGEND

--- GRID LINES

× 46.680 AS-BUILT POINT SHOWING ACTUAL RL & HEIGHT DIFFERENCE TO DESIGN
 0.010 INDICATES 10mm HIGH
 -0.010 INDICATES 10mm LOW

DIMENSION ARROW IS IN THE DIRECTION FROM DESIGN TO AS-BUILT
 (0.003) → DIMENSION RANGE (0.000) TO (0.005)
 (0.011) → DIMENSION RANGE (0.006) TO (0.020)
 (0.024) → DIMENSION RANGE (0.021) +

NOTES:

1. ALL MARKS PLACED ARE ACCURATE AND CORRECT AT DATE OF SURVEY.
2. IF MARKS ARE PLACED PRIOR TO STRESSING, GEOSURV TAKE NO RESPONSIBILITY FOR THE ACCURACY OF THESE MARKS PLACED ONCE STRESSING HAS BEEN CARRIED OUT.
3. CONSTRUCTION WORKS MUST BE RELATED TO THE BENCHMARK ONLY AND NOT LEVELS OF STRUCTURES SHOWN ON THIS PLAN.
4. IT IS THE SOLE RESPONSIBILITY OF THE BUILDER TO MAINTAIN THE INTEGRITY OF MARKS TO BE USED BY CONTRACTORS PRIOR TO USE.
5. THIS SURVEY IS FOR SETOUT PURPOSES ONLY AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.
6. PLAN HAS BEEN PRODUCED AS A PRIORITY AS PER BUILDERS REQUEST FOR CLARITY OF THE OFFSET MARKS SHOWN PLEASE ENLARGE SECTION OF THE PLAN WHEN PRINTING. SEEK CLARIFICATION FROM GEOSURV IF UNSURE OF THE OFFSET OR THE DIRECTION OF THE OFFSET TO THE LOCATION OF THE MARK PLACED.

PLANS USED:
 MTF 2002(2) Block R - Concrete Setout Plan Ground Level

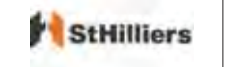
REV	DATE	AMENDMENTS	INT.
A	18/05/20	Issue for Client	NW
PRE	18/05/20	Preliminary Issue	NW

PREPARED BY:



GEOSURV PTY LTD PO Box 11010
 AIN 99 121 987 004 NSW 1500 661016
 www.geosurv.com.au Tel: 1300 893 994
 email: info@geosurv.com.au

PREPARED FOR:

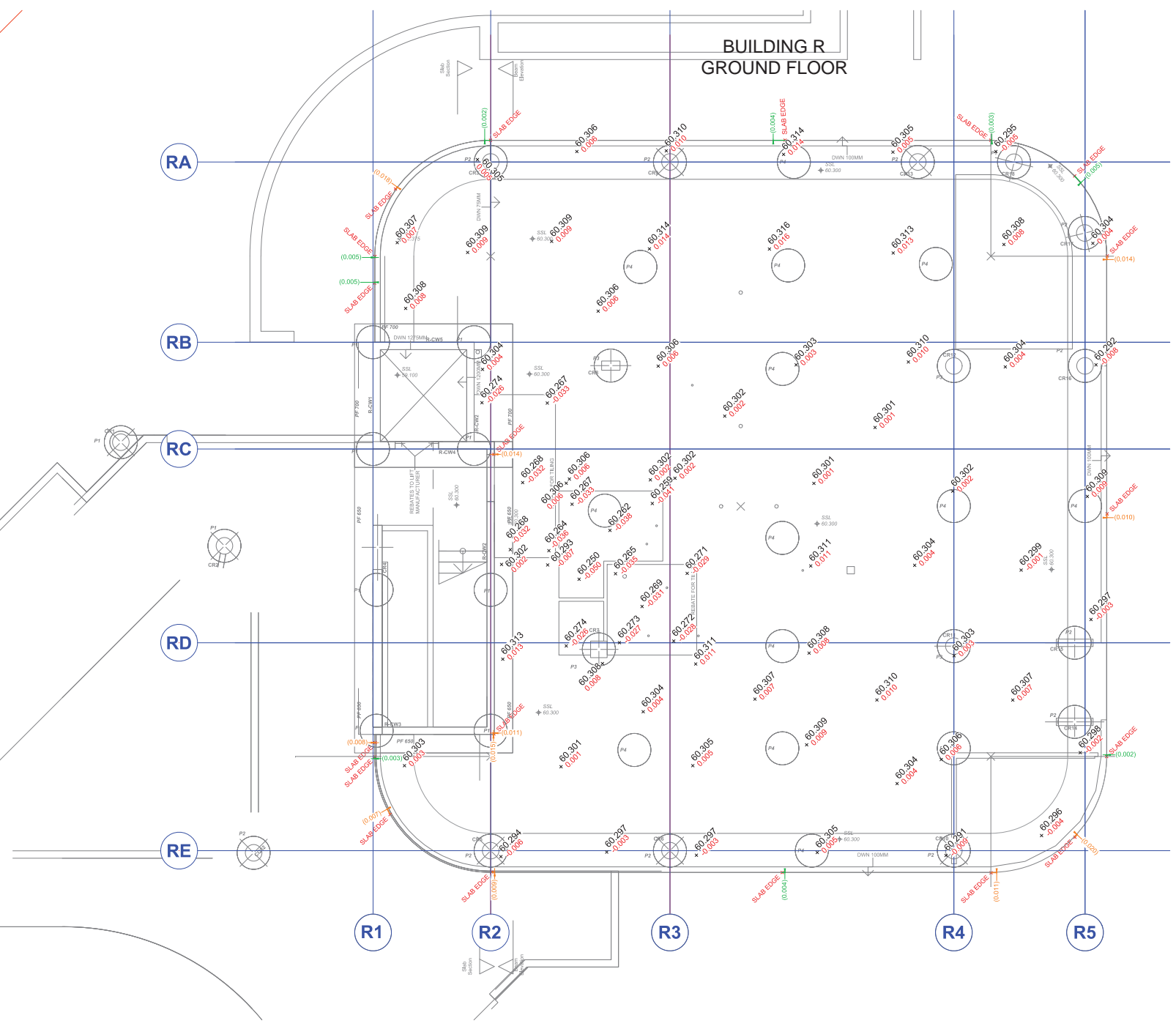


PLAN OF:
**CONCRETE AS BUILT
 BUILDING R GROUND FLOOR
 KENT ROAD PUBLIC SCHOOL
 126 KENT ROAD
 MARSFIELD, NSW**

ORIGINAL SIZE:	A1
SCALE:	1:50 CO-ORD. SITE
DATUM:	SITE ORIG DATUM ADOPTED
SURVEY BY:	RT DATE: 27/04/20
DRAWN BY:	NW DATE: 18/05/20
CHECKED BY:	RT DATE: 18/05/20
APPROVED BY:	AD DATE: 18/05/20

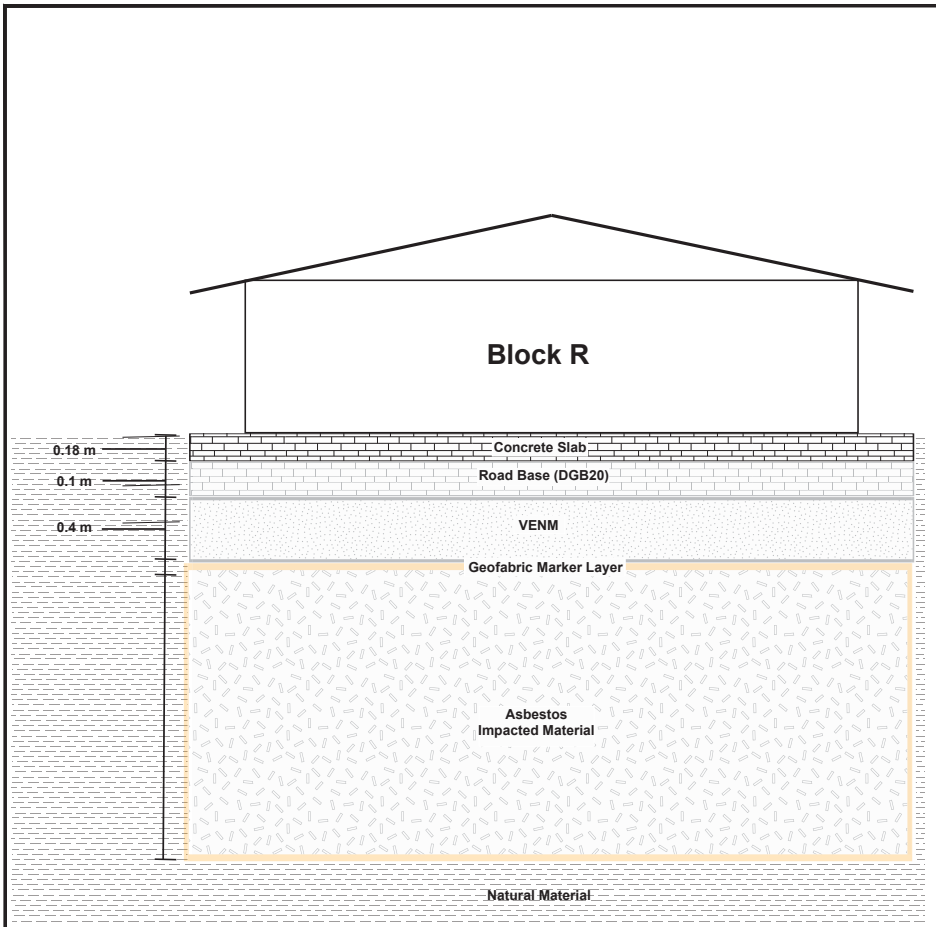
DRAWING #: 190564-AB-C(BR-GF)01 REV: A

BUILDING R GROUND FLOOR

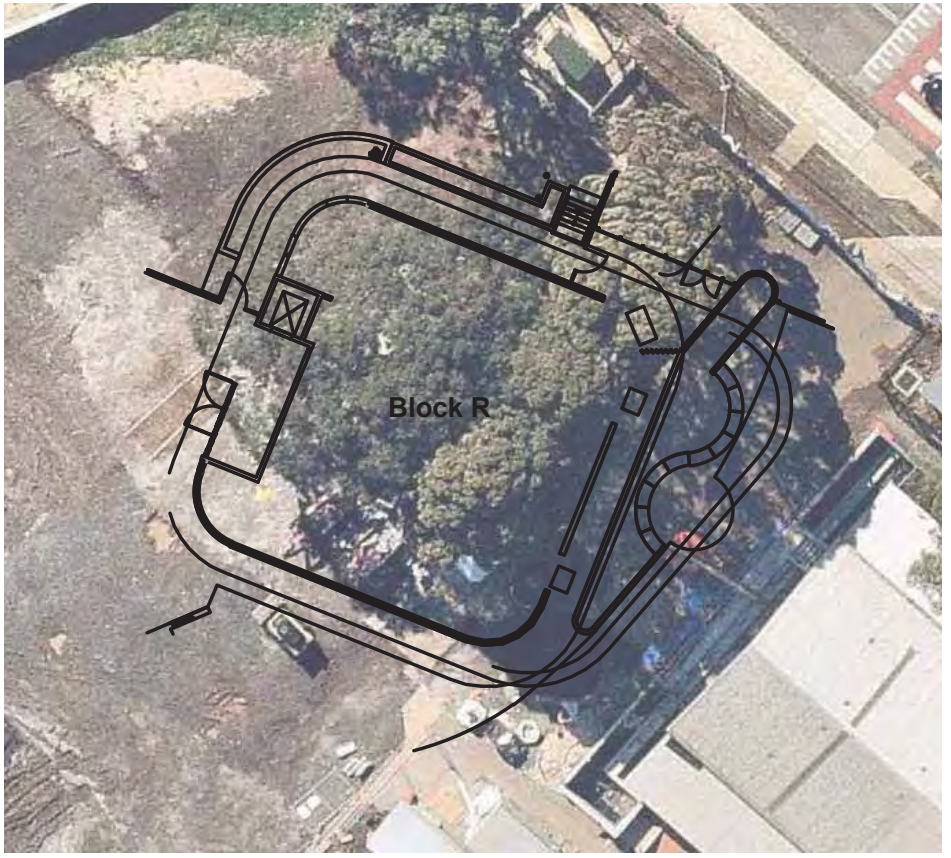


Date: 18/05/2020 12:58:14 PM

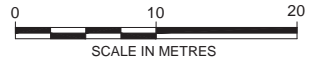
APPENDIX C CONCEPTUAL CAP DESIGN



Block R Containment Cell Design



Block R Containment Area



KENT ROAD PUBLIC SCHOOL- 126 KENT ROAD
MARSFIELD, NSW, AUSTRALIA

Conceptual Drawing of the Containment Cell

ARCADIS ARCADIS | CONSULTANTS AND BUILDERS

FIGURE **6**

APPENDIX D EXAMPLE FORMS

1. Long Term Environmental Management Plan Induction Form

Name: _____

Date: _____

Inducted By: _____

Position: _____

Have you read the LTEMP or, as a minimum, the Summary of the LTEMP (as provided in **Appendix F** of the LTEMP)? Y N

Do you understand the contents of the LTEMP Y N

Are you aware of the type potential contamination at the Site Y N

Are you aware of the location of potential contamination at the Site Y N

Do you agree to follow the procedures and protocols set out in the LTEMP Y N

Are you aware of your responsibilities whilst working in the area of the Site covered by the LTEMP Y N

Signed _____

Date _____

2. Notification of Intention to undertake Shallow Excavation

Name: _____

Date: _____

Company: _____

Position: _____

Signature: _____

Purpose of Excavation: _____

Location of Excavation (attach marked-up site plan) _____

I acknowledge that the proposed excavation:

- Will not be near the Block R Containment Cell and will not have the potential to compromise the Block R Containment Cell; and
- Is not within the footprint of the Block R Containment Cell and does not extend below the base of the capping layer (concrete slab).

Approved by Site Manager _____

Signed _____

Date _____

3. Capping Inspection Form

Name: _____

Date: _____

Completed By: _____

Position _____

Area Inspected (sketch below)

Photographic evidence maintained? Y N

Integrity/condition of
cap:

Observations:

Signed _____

Date _____

4. Non-Conformance and Corrective Action Form

Name: _____

Date: _____

Completed By: _____

Position _____

Non-conformance: _____

Corrective Action _____

Completed By _____

Date _____

Follow-up works _____

Non-conformance: _____

Corrective Action _____

Completed By _____

Date _____

Follow-up works _____

Non-conformance: _____

Corrective Action _____

Completed By _____

Date _____

Follow-up works _____

Signed _____

Date _____

APPENDIX E BUILDING DESIGN PLANS

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LEGEND

- EXISTING BUILDINGS
- NEW BUILDINGS AND EXTENSIONS TO EXISTING BUILDINGS
- EXISTING COLAND SHADE SAIL
- HARDPAVING / RAMP
- EXISTING TREES
- NEW TREES
- 20 NO. OFF NEW & ADDITIONAL TREES AS REQUIRED BY SSIA SHOWN IN INDICATIVE LOCATIONS. LOCATIONS MAY VARY WHEN FINAL DESIGN DEVELOPMENT STAGE IS REACHED
- ROAD RESERVE NO BUILDINGS NOT PART OF SSIA
- EXISTING CYCLEWAY
- NOT PART OF SSIA
- EXTENT OF SSIA

Planning, Industry & Environment
 NSW
 Based under the Environmental Planning and Assessment Act 1979
 Approved under 4.5(1)(c) Approved Application No: 930-0344-Mat-1
 Created on: 1 June 2020 Signed: BC Sheet No: 1 of 12

No.	Issue	Date	Authorisation	Revision Details



1:500 @ ORIGINAL SIZE
 0 10 20 30 40 50m

School Infrastructure NSW
 228 George Street
 SYDNEY 2000

PROJECT
 Kent Road Public School Development
 Herring Road MARSFIELD NSW 2122

DRAWING TITLE
 Proposed Site Plan

PROJECT NO.	DRAWING NO.	REVISION
17058	MT-0400	02
ISSUES/NO.	SHEET/NO.	DATE
As Shown	A1	2/17/2020


GARDNER WETHERILL ASSOCIATES
 T (02) 9929 6777 LEVEL 2 Suite 2.01
 F (02) 9929 3999 460 Pacific Highway
 E design@gardnerwetherill.com.au ST Leonards 2065
 A/CN 10/6/82


1 Proposed Site Plan
 SCALE 1:500

SECTION 4.55 APPLICATION

Material Copyrighted. Material Base for APPLICANT 2017/028 Kent Road Public School 17058 Kent Road Mater

LEGEND

 NOT PART OF SSDA

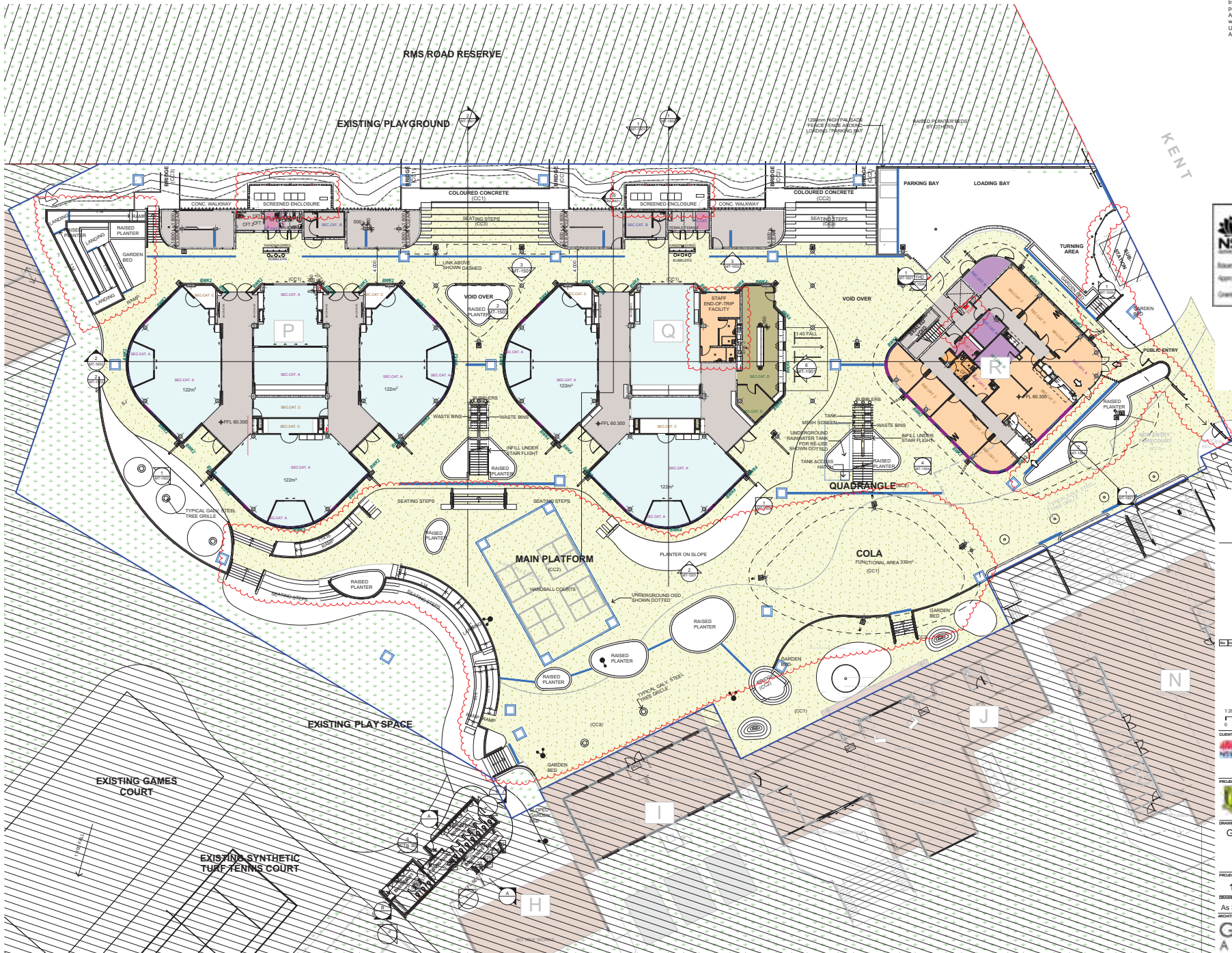
 EXTENT OF SSDA

NSW Planning, Industry & Environment

Issued under the Environmental Planning and Assessment Act 1979

Approved Section 4.55(14) Approved Application No: 505 0344 Mus 1

Created on: 1 June 2020 Signed: BC Sheet No: 2 of 22



Revised Date: _____

Revision Details: _____

North Arrow

1:200 @ ORIGINAL SIZE

0 2 4 6 8 10 12 14 16 18 20m

CLIENT: School Infrastructure NSW
255 George Street
SYDNEY 2000

PROJECT: Kent Road Public School Development
Herring Road MARSFIELD NSW 2122

DRAWING TITLE: Ground Floor Plan

PROJECT NO:	DRAWING NO:	REVISION:
17058	MT-1200	01
ISSUES/REV:	SHEET NO:	DRAWN:
As Shown	A1	DV
DATE:	DATE:	DATE:
	2/10/2020	

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E design@gardnerwetherill.com.au 21 Lindemans Road
NSW 1585 NSW


1 Ground Level
SCALE 1:200


SECTION 4.55 APPLICATION

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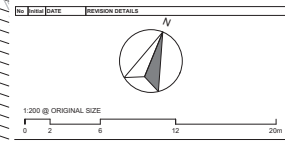
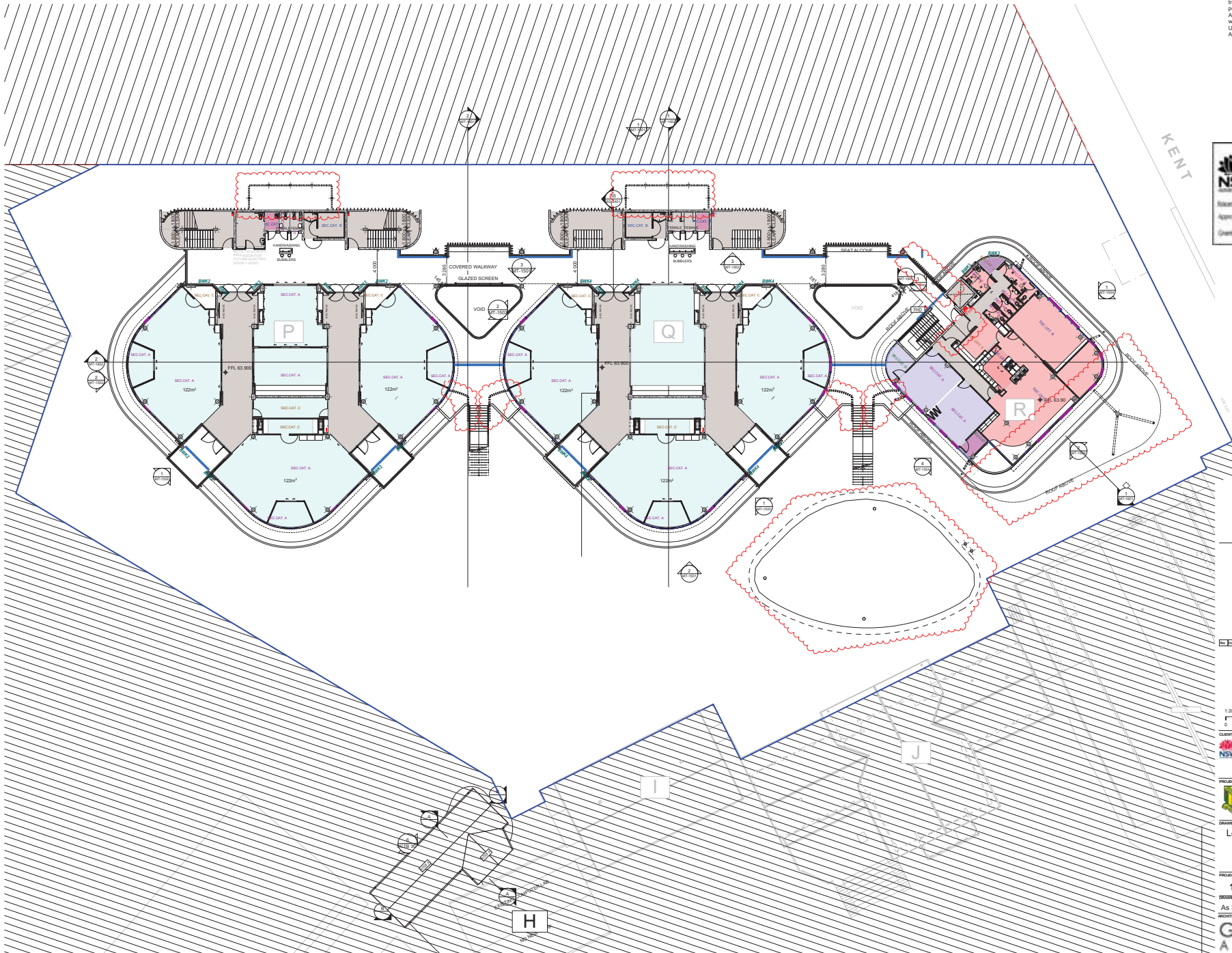
LEGEND

 NOT PART OF SSDA

 EXTENT OF SSDA

NSW Planning, Industry & Environment
Department of

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School Infrastructure NSW
 Education
 255 George Street
 SYDNEY 2000

Project
 Kent Road Public School Development
 Herring Road MARSFIELD NSW 2122

Drawing Title
 Level 1 Plan

PROJECT NO.	DRAWING NO.	REVISION
17058	MT-1201	01
ISSUES/REVISE	SHEET NO.	DATE
As Shown	A1	2/10/2020



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 A/CN 14/18/82

1 First Level
 SCALE 1:200

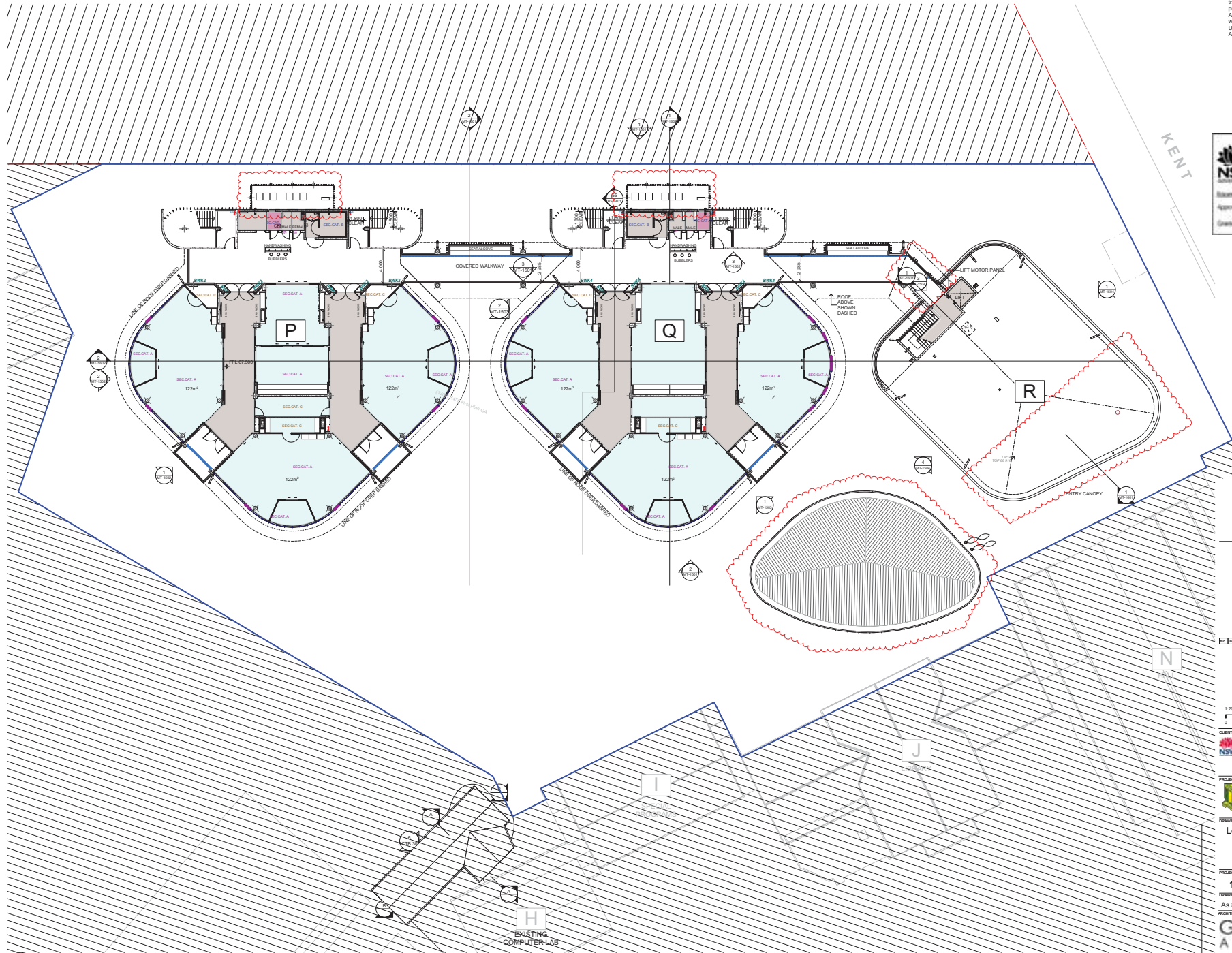
SECTION 4.55 APPLICATION

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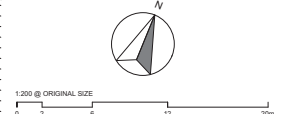
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LEGEND
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 EXTENT OF SSDA

NSW Planning, Industry & Environment
 Board under the Environmental Planning and Assessment Act 1979
 Approved Section 4.55(1)(a) - Approved Application No. 193/0344-Mkt-1
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By Issue Date DIVISION DETAILS



NSW Education School Infrastructure NSW
 Technical Infrastructure Unit 255 George Street SYDNEY 2000

PROJECT
 Kent Road Public School Development
 Herring Road MARSFIELD NSW 2122

DRAWING TITLE
 Level 2 Plan

PROJECT NO. 17058	DRAWING NO. MT-1202	REVISION 01
ISSUES/REVISE As Shown	SHEET NO. A1	DATE 2/10/2020
DESIGNER DV	CHECKER DV	

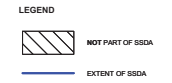
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 E design@gardnerwetherill.com.au 21 Lennox St
 A/CN 14/6/8/82

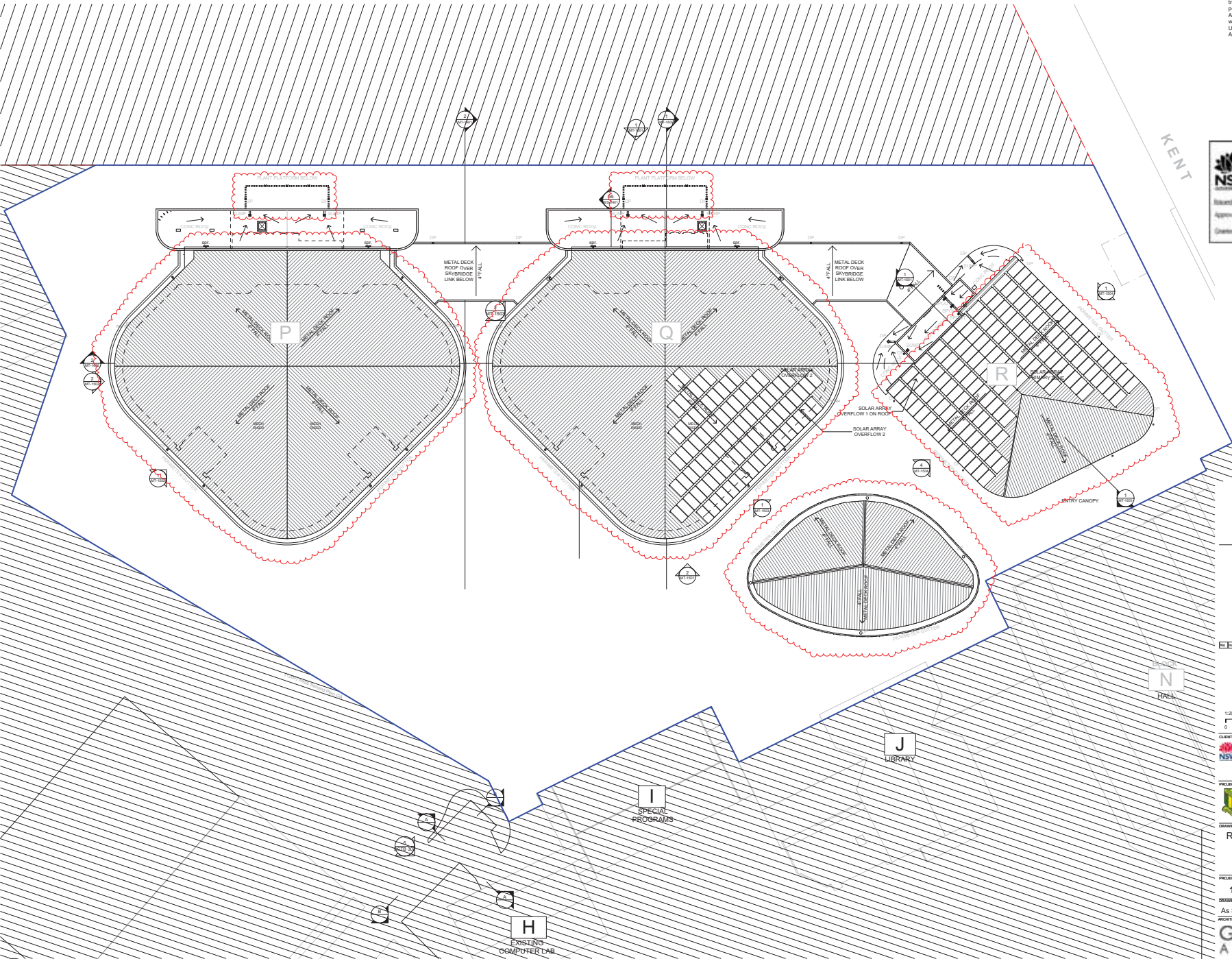
1 Second Level
 SCALE 1:200
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SECTION 4.55 APPLICATION

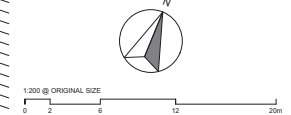
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 Board under the Environmental Planning and Assessment Act 2009
 Approved Section 4.55(1)(c) Approved Application No: 550-0344 Sub 1
 Granted on 1 June 2020 Signed BC Sheet No: 5 of 22



NO SCALE DATE REVISION DETAILS



NSW Education School Infrastructure NSW
 255 George Street SYDNEY 2000

PROJECT Kent Road Public School Development
 Herring Road MARSFIELD NSW 2122

DRAWING TITLE
Roof Plan

PROJECT NO	DRAWING NO	REVISION
17058	MT-1300	01
ISSUES/REV	SHEET NO	DATE
As Shown	A1	2/10/2020

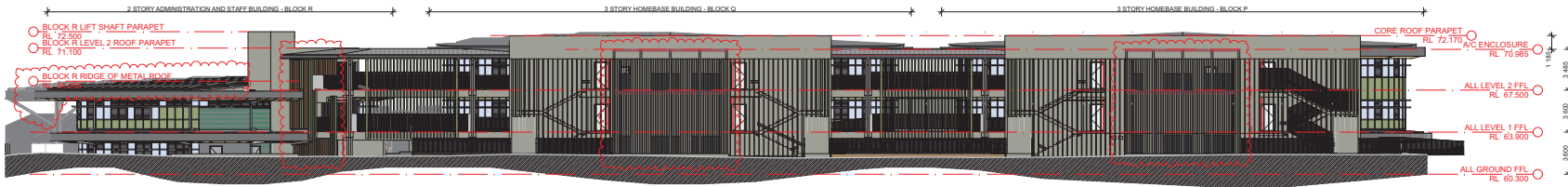
ARCHITECT
GARDNER WETHERILL ASSOCIATES

1 (02) 9929 8777 LEVEL: 2 Suite 2.01
 F (02) 9929 3999 460 Pacific Highway
 E design@gardnerwetherill.com.au 21 Lennox St
 A/CN 10/10/80

1 Roof Level
 SCALE 1:200

SECTION 4.55 APPLICATION

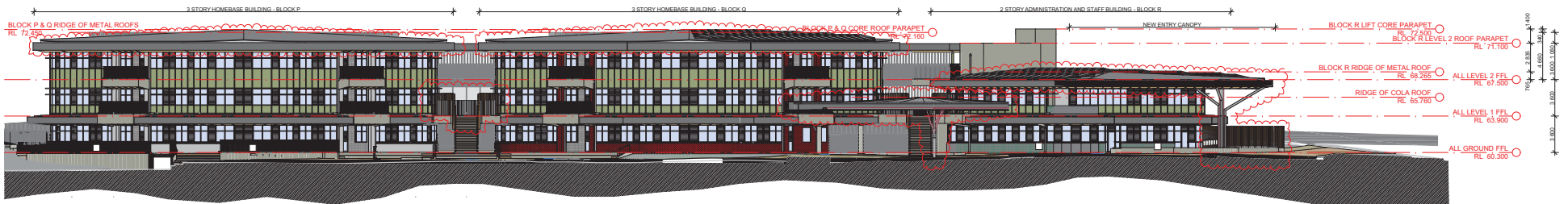
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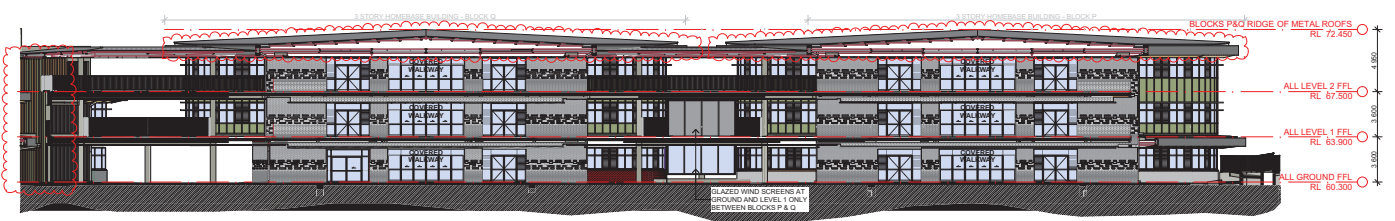
1 North West Elevation (from Road Reserve)
SCALE 1:200

Planning, Industry & Environment
NSW
NSW Government

Issued under the Environmental Planning and Assessment Act 1979
Approved Section 4.55(1)(a) - Approval Application No: 500-0344-Mkt-1
Created on 1 June 2020 Signed BC Sheet No: 6 of 22

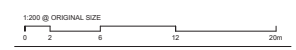


2 South East Elevation
SCALE 1:200



3 Block P & Q - North West Elevation
SCALE 1:200

No.	Date	REVISION DETAILS



School Infrastructure NSW
255 George Street
SYDNEY 2000

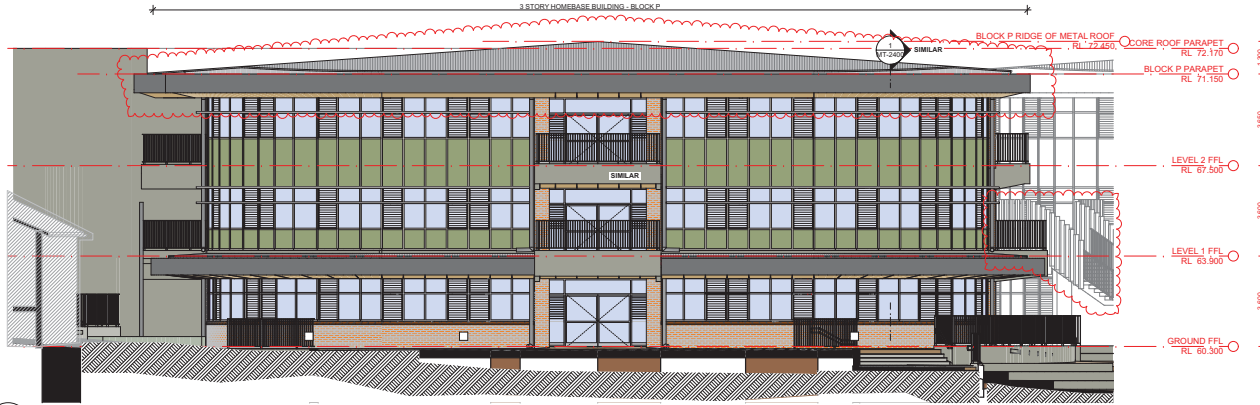
PROJECT
Kent Road Public School Development
Herring Road MARSFIELD NSW 2122

DRAWING TITLE
Blocks P, Q & R Elevations & Sections

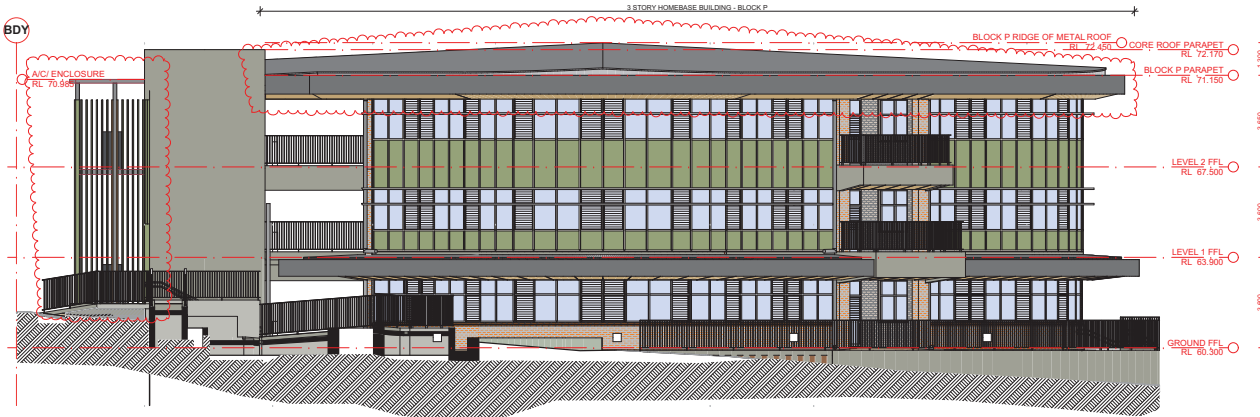
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17058	MT-1501	01
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ACA 164 EN 602

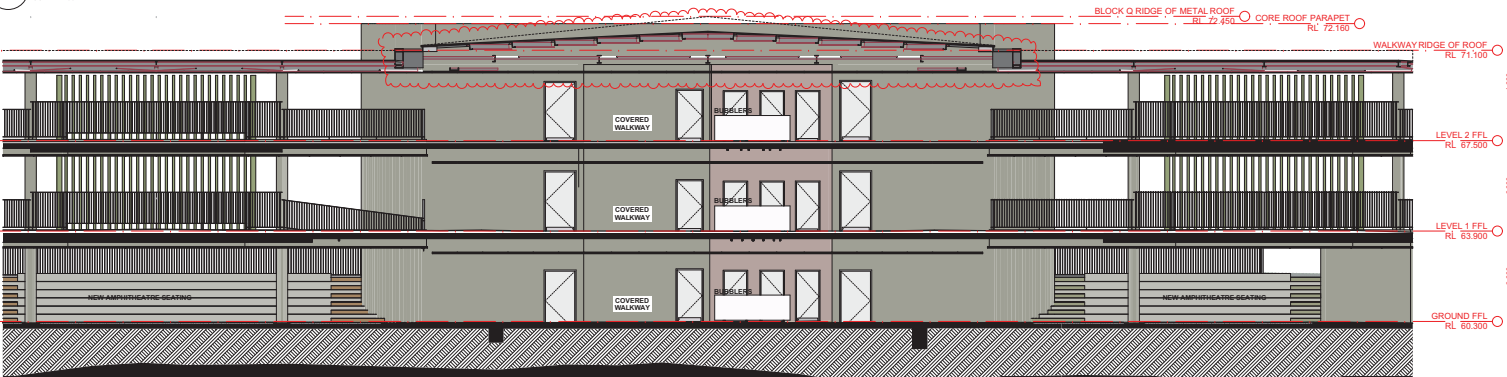
SECTION 4.55 APPLICATION



1 Blocks P & Q - South Typical Elevation
 SCALE 1:100



2 Blocks P & Q - South West Typical Elevation
 SCALE 1:100



3 Block Q - Core South Elevation
 SCALE 1:100

No.	Date	REVISION DETAILS



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NSW Education School Infrastructure NSW
 255 George Street SYDNEY 2000

PROJECT
Kent Road Public School Development
 Herring Road MARSFIELD NSW 2122

DRAWING TITLE
Blocks P & Q - Typical Elevations

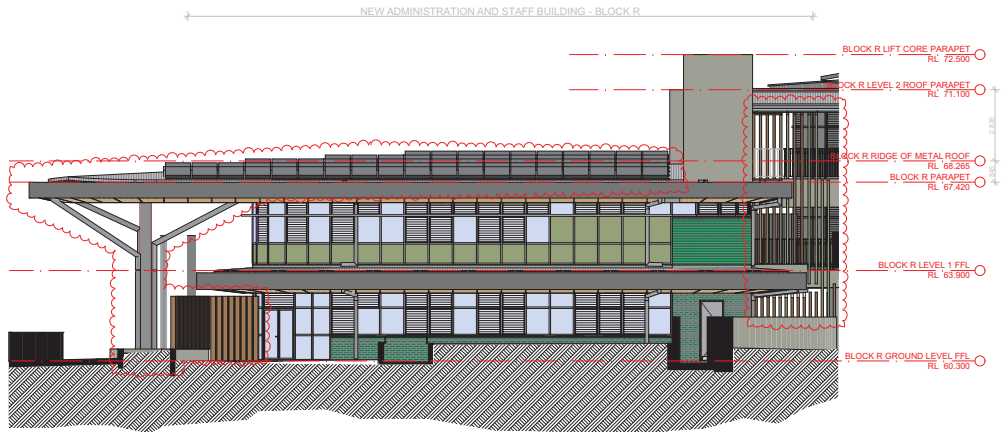
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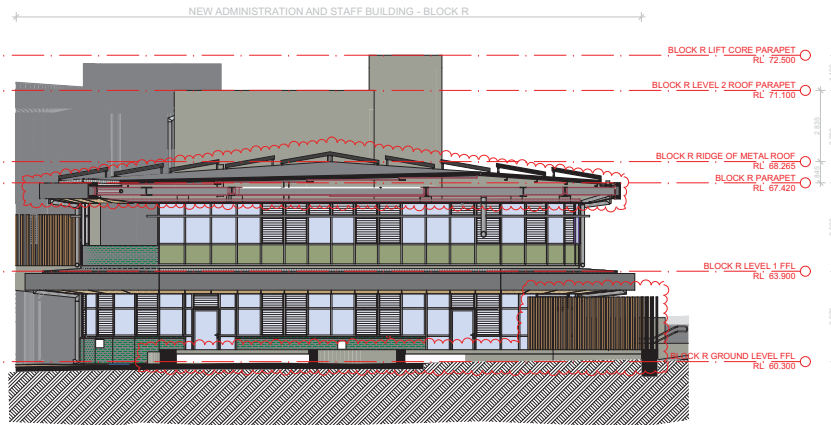
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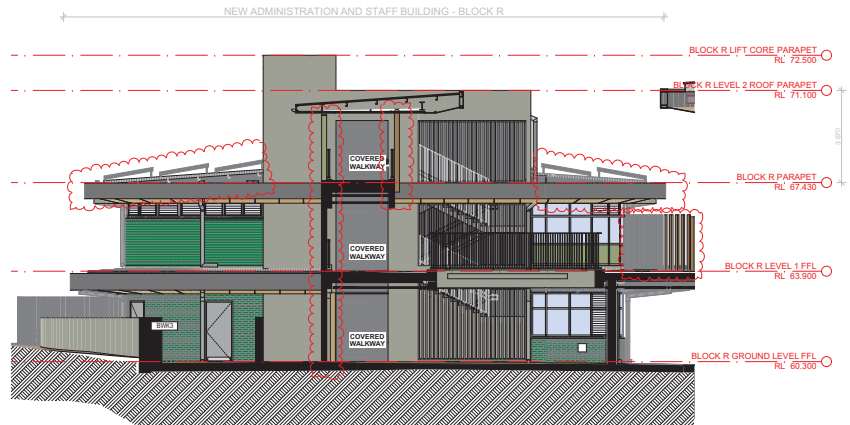
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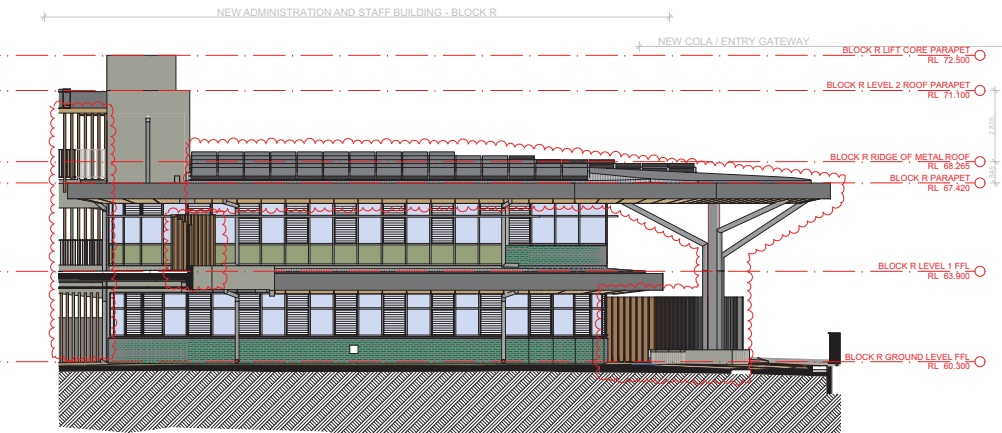
1 Block R - North Elevation
SCALE 1:100



2 Block R - East Elevation
SCALE 1:100



3 Block R - West Elevation
SCALE 1:100



4 Block R - South Elevation
SCALE 1:100

No.	Date	Revision Details



Client: **NSW Education** School Infrastructure NSW
 255 George Street SYDNEY 2000

Project: **Kent Road Public School Development**
 Herring Road MARSFIELD NSW 2122

Drawing Title: **Block R - Elevations**

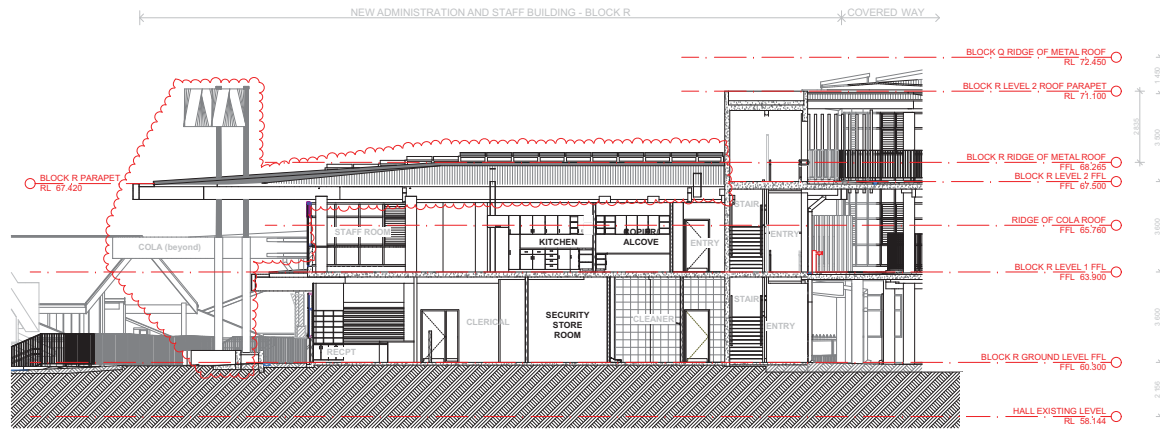
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17058	MT-1503	01
ISSUES/REVISE	SHEET NO.	DRAWN
As Shown	A1	DV
DATE	2/10/2020	

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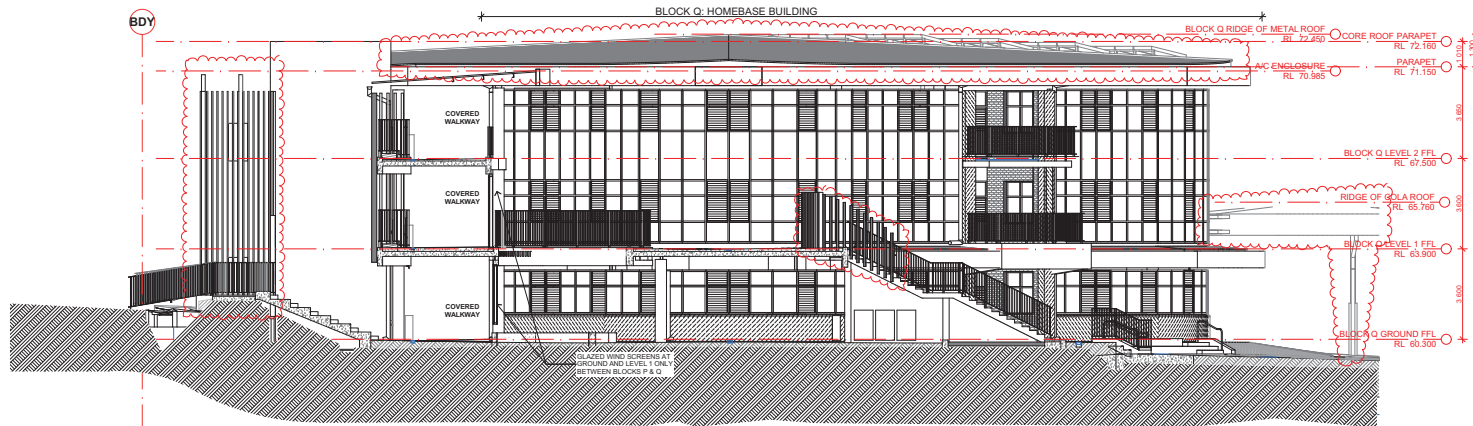
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1 Administration / COLA / Hall Section
 SCALE 1:100



2 Courtyard Section
 SCALE 1:100

No.	Date	Revision Details

CLIENT
NSW Education School Infrastructure NSW
 255 George Street SYDNEY 2000

PROJECT
Kent Road Public School Development
 Herring Road MARSFIELD NSW 2122

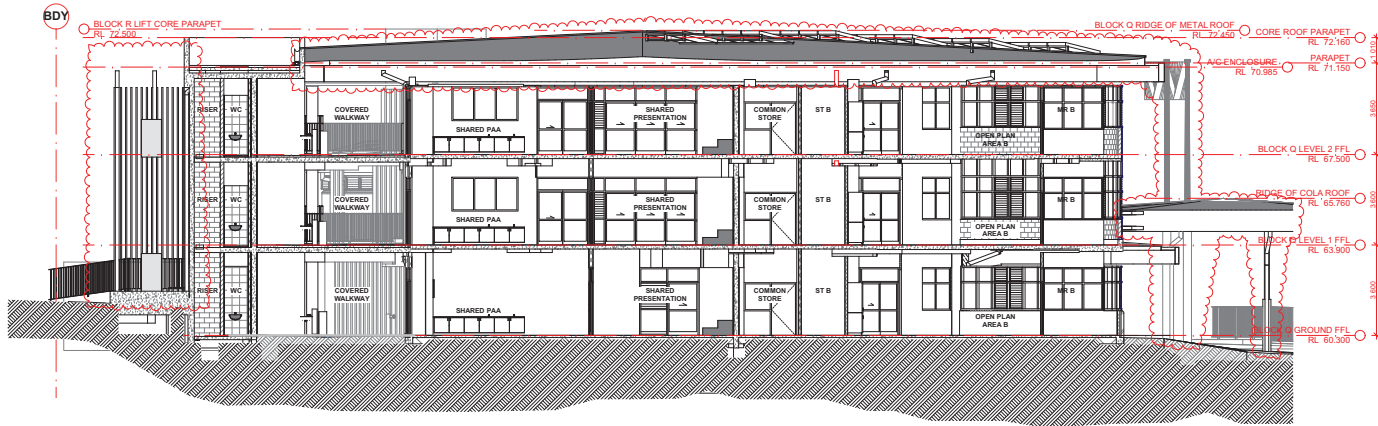
DRAWING TITLE
Sections - Sheet 1

PROJECT NO.	DRAWING NO.	REVISION
17058	MT-1601	01
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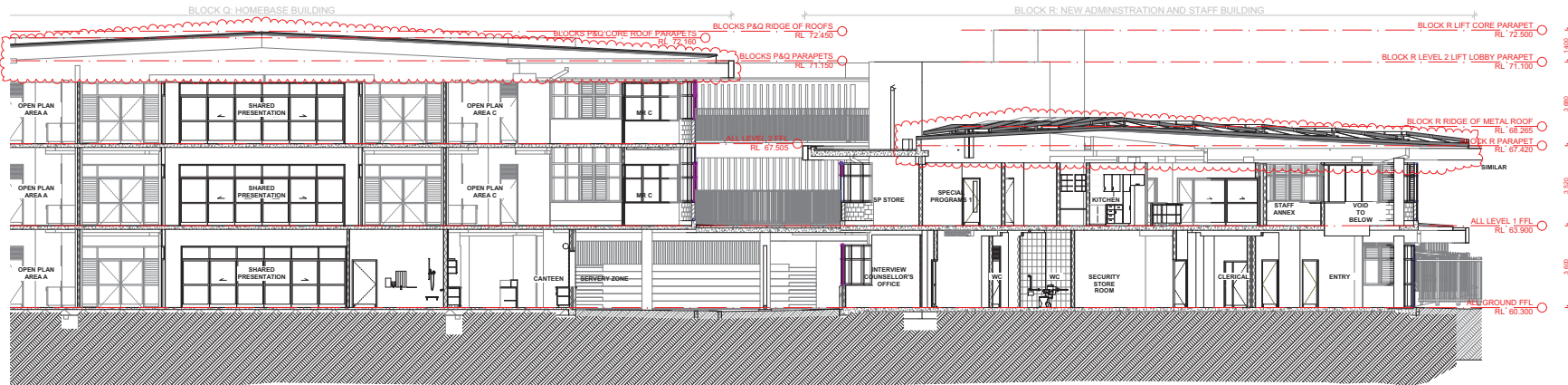
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SECTION 4.55 APPLICATION



1 Blocks P & Q - Typical Section A-A
 SCALE 1:100



2 Block Q & R - Section B-B
 SCALE 1:100

No.	Date	Revision Details

CLIENT: School Infrastructure NSW
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PROJECT: Kent Road Public School Development
 Herring Road MARSFIELD NSW 2122

DRAWING TITLE: Sections - Sheet 2

PROJECT NO.	DRAWING NO.	REVISION
17058	MT-1602	01
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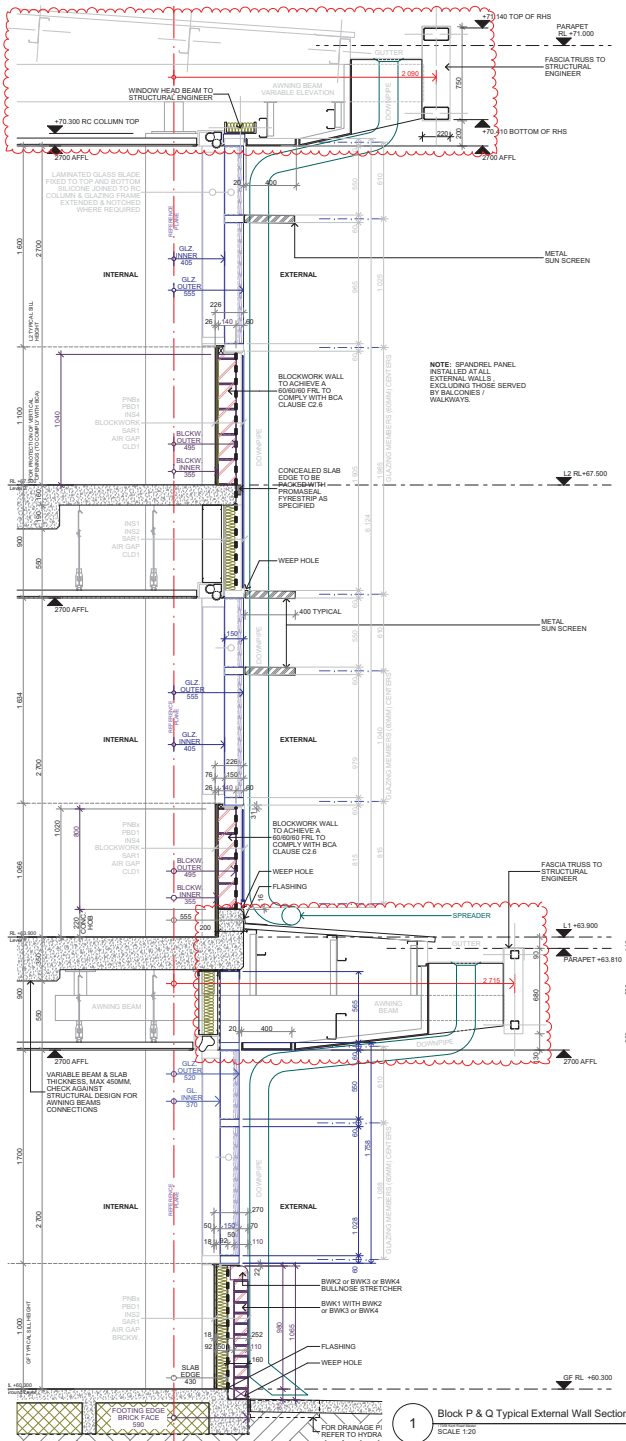
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SECTION 4.55 APPLICATION

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1 Block P & Q Typical External Wall Section Detail
 SCALE 1:20

No.	Date	REVISION DETAILS



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DRAWING TITLE
Section Details Sheet 1

PROJECT NO.	DRAWING NO.	REVISION
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DATE	DATE	DATE
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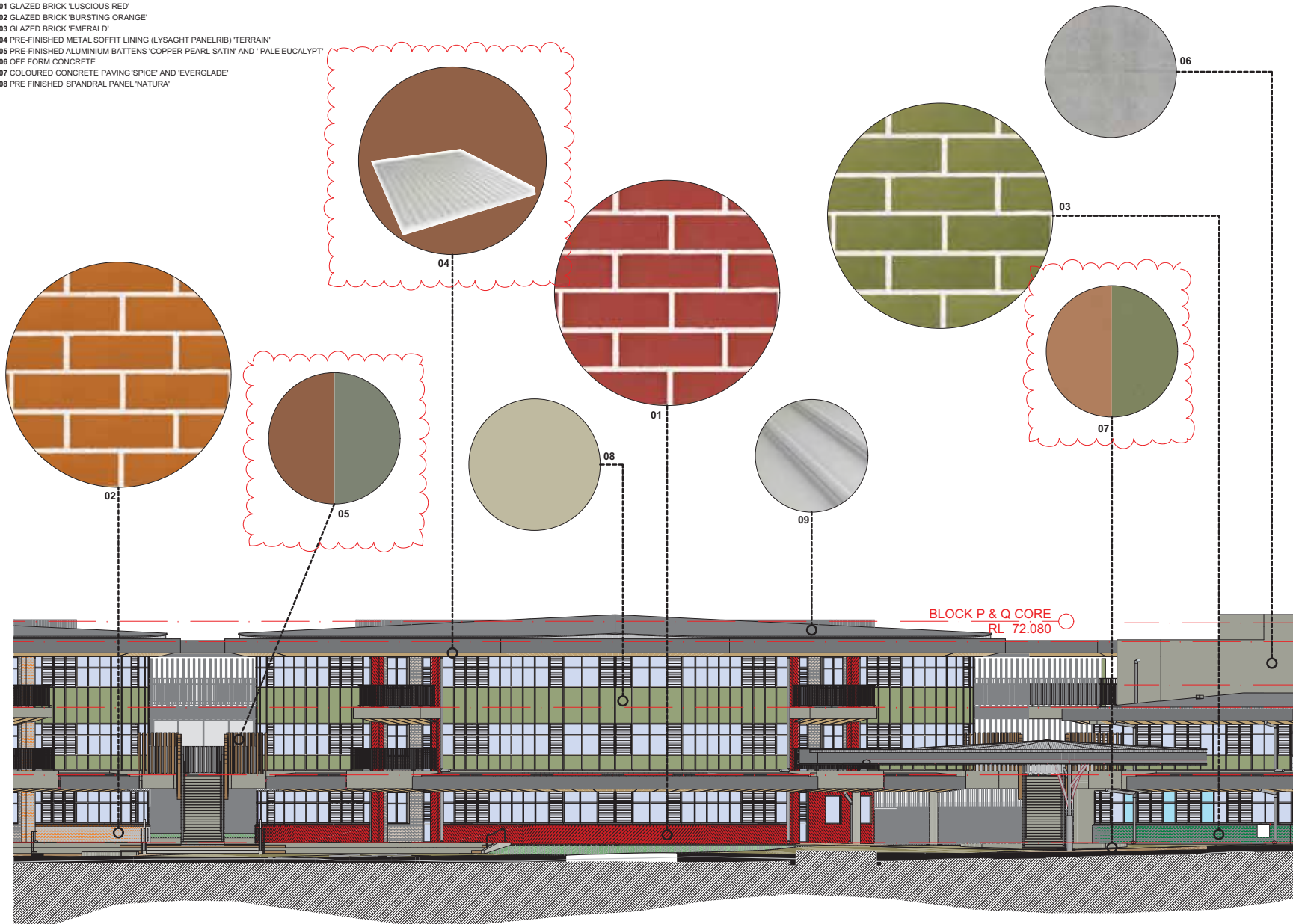
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SECTION 4.55 APPLICATION

- 01 GLAZED BRICK 'LUSCIOUS RED'
- 02 GLAZED BRICK 'BURSTING ORANGE'
- 03 GLAZED BRICK 'EMERALD'
- 04 PRE-FINISHED METAL SOFFIT LINING (LYSAGHT PANELRIB) 'TERRAIN'
- 05 PRE-FINISHED ALUMINIUM BATTENS 'COPPER PEARL SATIN' AND 'PALE EUCALYPT'
- 06 OFF FORM CONCRETE
- 07 COLOURED CONCRETE PAVING 'SPICE' AND 'EVERGLADE'
- 08 PRE FINISHED SPANDRAL PANEL 'NATURA'

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South East Elevation

No.	Date	Revision Details

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 225 George Street
 SYDNEY NSW 2000

PROJECT: Kent Road Public School Development
 Herring Road MARSFIELD NSW 2122

DRAWING TITLE: Materials and Finishes Sheet 1

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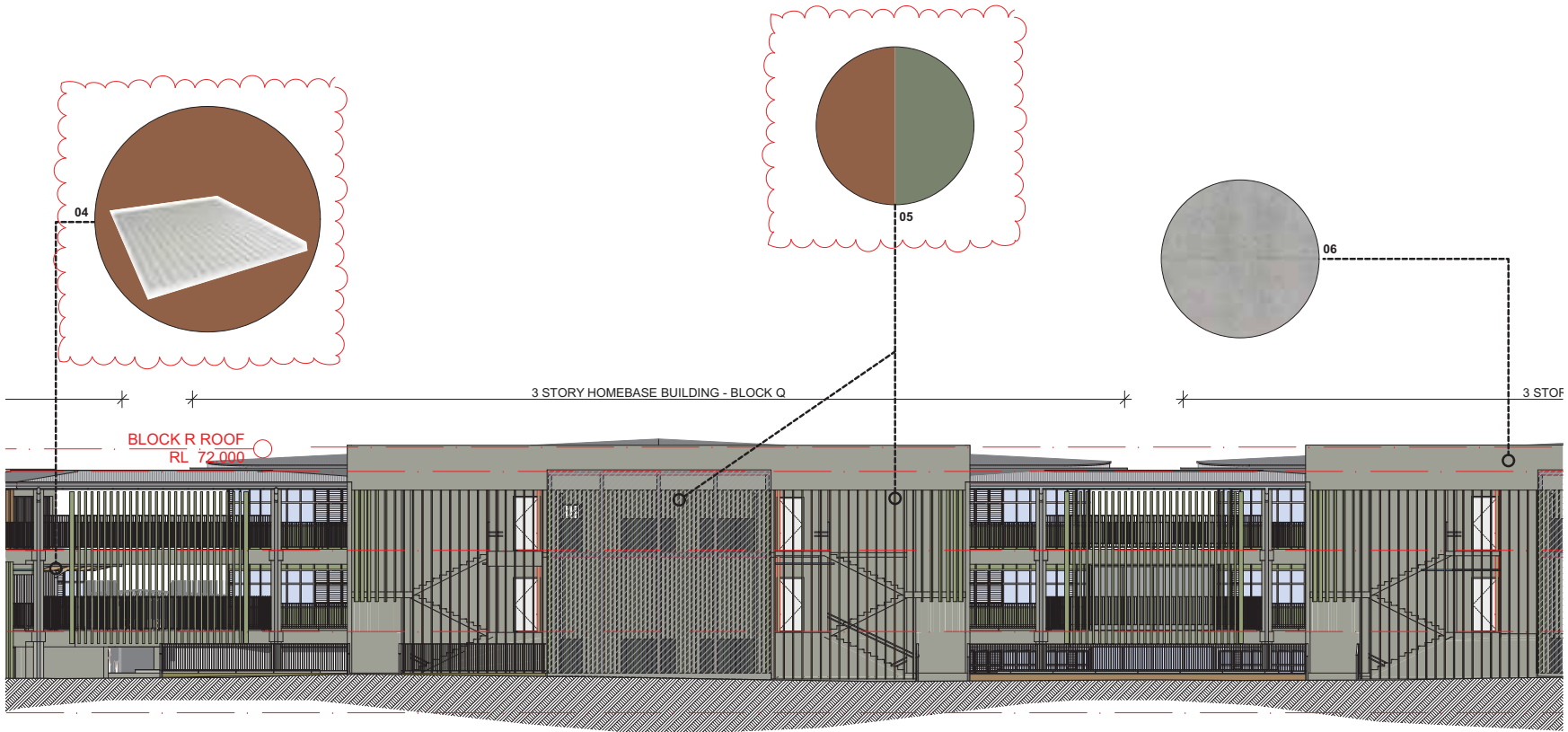
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SECTION 4.55 APPLICATION

- 01 GLAZED BRICK 'LUSCIOUS RED'
- 02 GLAZED BRICK 'BURSTING ORANGE'
- 03 GLAZED BRICK 'EMERALD'
- 04 PRE-FINISHED METAL SOFFIT LINING (LYSAGHT PANELRIB) 'TERRAIN'
- 05 PRE-FINISHED ALUMINIUM BATTENS 'COPPER PEARL SATIN' AND 'PALE EUCALYPT'
- 06 OFF FORM CONCRETE
- 07 COLOURED CONCRETE PAVING 'SPICE' AND 'EVERGLADE'
- 08 PRE FINISHED SPANDRAL PANEL 'NATURA'
- 09 KLIP-LOCK 700, COLORBOND 'MATT SURFMIST'

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 Board under the Environmental Planning and Assessment Act 2005
 Approved Section 4.55(1a) Approved Application No: 502-0344-8846-1
 Created on: 1 June 2020 Signed: BC Sheet No: 13 of 22



North West Elevation (from Road Reserve)

No.	Date	Revision Details

CLIENT
NSW Education School Infrastructure NSW
 255 George Street SYDNEY 2000

PROJECT
Kent Road Public School Development
 Herring Road MARSFIELD NSW 2122

DRAWING TITLE
Materials and Finishes Sheet 2

PROJECT NO.	DRAWING IN	REVISION
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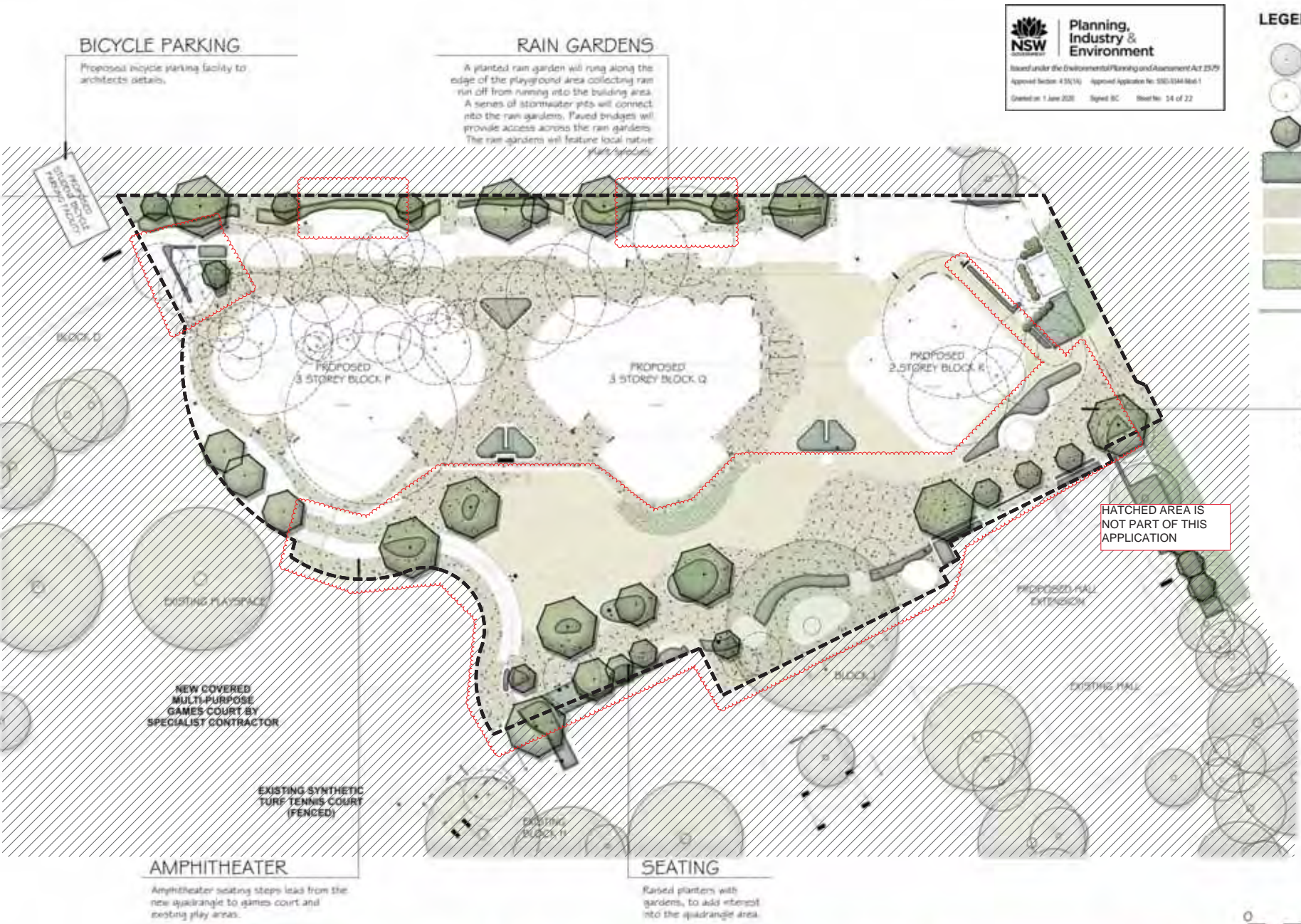
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SECTION 4.55 APPLICATION

- LEGEND**
-  EXISTING TREES TO BE RETAINED
 -  EXISTING TREES TO BE REMOVED
 -  PROPOSED TREES
 -  PROPOSED GARDEN AREAS
 -  NEW COLOURED CONCRETE PAVING TO ARCHITECTS DETAILS
 -  NEW COLOURED CONCRETE PAVING TO ARCHITECTS DETAILS
 -  NEW TURF AREAS: SOFT LEAF BUFFALO
 -  BRICK GARDEN EDGING

ENTRY AREA
 Entry planters and large tree to highlight the entry area.

HATCHED AREA IS NOT PART OF THIS APPLICATION



BICYCLE PARKING

Proposed bicycle parking facility to architects details.

RAIN GARDENS

A planted rain garden will run along the edge of the playground area collecting rain run off from running into the building area. A series of stormwater pits will connect into the rain gardens. Paved bridges will provide access across the rain gardens. The rain gardens will feature local native plants.

NEW COVERED MULTI-PURPOSE GAMES COURT BY SPECIALIST CONTRACTOR

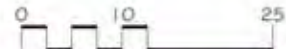
EXISTING SYNTHETIC TURF TENNIS COURT (FENCED)

AMPHITHEATER

Amphitheater seating steps lead from the new quadrangle to games court and existing play areas.

SEATING

Raised planters with gardens, to add interest into the quadrangle area.



Planting

TREES



Acmena smithii
Lilly Pilly



Backhousia myrtifolia
Grey Myrtle



Elaeocarpus reticulatus
Blueberry Ash



Glochidion ferdinandi
Cheese Tree



Syncarpia glomulifera
Turpentine

RAIN GARDEN PLANTS



Dianella caerulea
Paroo Lily



Lomandra longifolia
Spiny Matt Rush

SHRUBS



Banksia spinulosa
Hairpin Banksia

GROUNDCOVERS



Clematis aristata
Old Mans Beard



Doodia aspera
Rasp Fern



Goodenia hederacea
Ivy Goodenia



Hardenbergia violacea
Native Sarsaparilla



Poa sieberiana
Tussock Grass



Themeda australis
Kangaroo Grass

Landscape Elements



Planted sandstone spalls rain garden

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Kent Road Public School

S4.55 MATERIALS PALETTE



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date
March 2020
job,dwg no.
80.20(18)/076
designed by
IJ

scale
-
no. in set
TWO/THREE
drawn by
AM

Arboricultural Addendum

Kent Road Public School, Marsfield



Prepared By:

Temporal Tree Management Pty Ltd.
William Dunlop: Consulting Arborist (M. UrbHort, Grad. Dip(Arb), B.Sc).
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Prepared For:

St Hilliers Property.
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Approved Section: 4.55(1A) Approved Application No: SSD-9344-Mod-1

Granted on: 1 June 2020 Signed: BC Sheet No: 16 of 22

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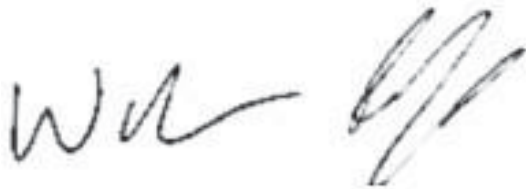
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Granted on: 1 June 2020 Signed: BC Sheet No: 17 of 22

DISCLAIMER

The preparation of this short report is for the use of the subject site owner (*NSW Department of Education*) and the project builder (*St Hilliers Property Pty Ltd.*) for current development works within Kent Road Public School. The purpose of this short report is to update the existing Tree Protection Plan as outlined in section 6.4 of the Arboricultural Impact Assessment that was prepared for this development. The author of this report is *Temporal Tree Management Pty Ltd.* This report is not designed for any other purpose. The author accepts no responsibility for the use of this report for purposes other than as an arboricultural compliance report or if used by any other person / party.

All observations, recommendations and advice expressed within this report are based on *the Australian Standard for the Protection of Trees on Development Sites (AS 4970 2009)*, the professional experience of the author, information gathered during the site assessments and information provided by the clients. Trees are dynamically growing organisms that change over time. No guarantee is implied with respect to future tree condition beyond the advice and recommendations within the report.



William Dunlop

Director of *Temporal Tree Management Pty Ltd.*

B.Sc (Adv.), Grad. Dip (Arb) (AQF Level 8), M.UrbHort.

24 March 2020

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12/03/2020

1. Summary

The purpose of this addendum is to update the existing Arboriculture Impact Assessment dated 1/10/2018, which includes the Tree Protection Plan (TPP), for the current development at Kent Road Public School, Marsfield (subject site). The addendum reflects the extent of work included in SSD 9344 and site inspections on 23/01/2020 to certify the minor reduction of the TPZ for Tree 147 to improve site access and a site inspection on 26/02/2020. From this, updated requirements for tree protection zones on site related to SSD 9344 have been clarified.

The Arboriculture Impact Assessment of 1/10/2018 included a TPP for the fourteen trees identified as being of High retention value. The TPP was split into four Zones (A, B, C and D) and allowed for works not included in SSD9344. The TPP zone applying to the SSD 9344 is confirmed to be Zone D and includes only Tree 147.

Additionally, the tree protection measures specified for exempt work being undertaken in Zone B of the TPP, including Trees 160, 162, 163, 169, are to be retained for the duration this work.

Due to the completion of works within Zones A and C, it is confirmed that the tree protection measures specified for the High retention specimens within Zones A and C (Trees 8, 45, 70, 72, 88, 89, 90 172 and 207) of the TPP are no longer required.

12/03/2020



4

2. Location

2.1. Work Zone Location

The Arboriculture Impact Assessment and TPP in relation to SSD 9344 only applies to Zone D indicated in Figure 1 below.

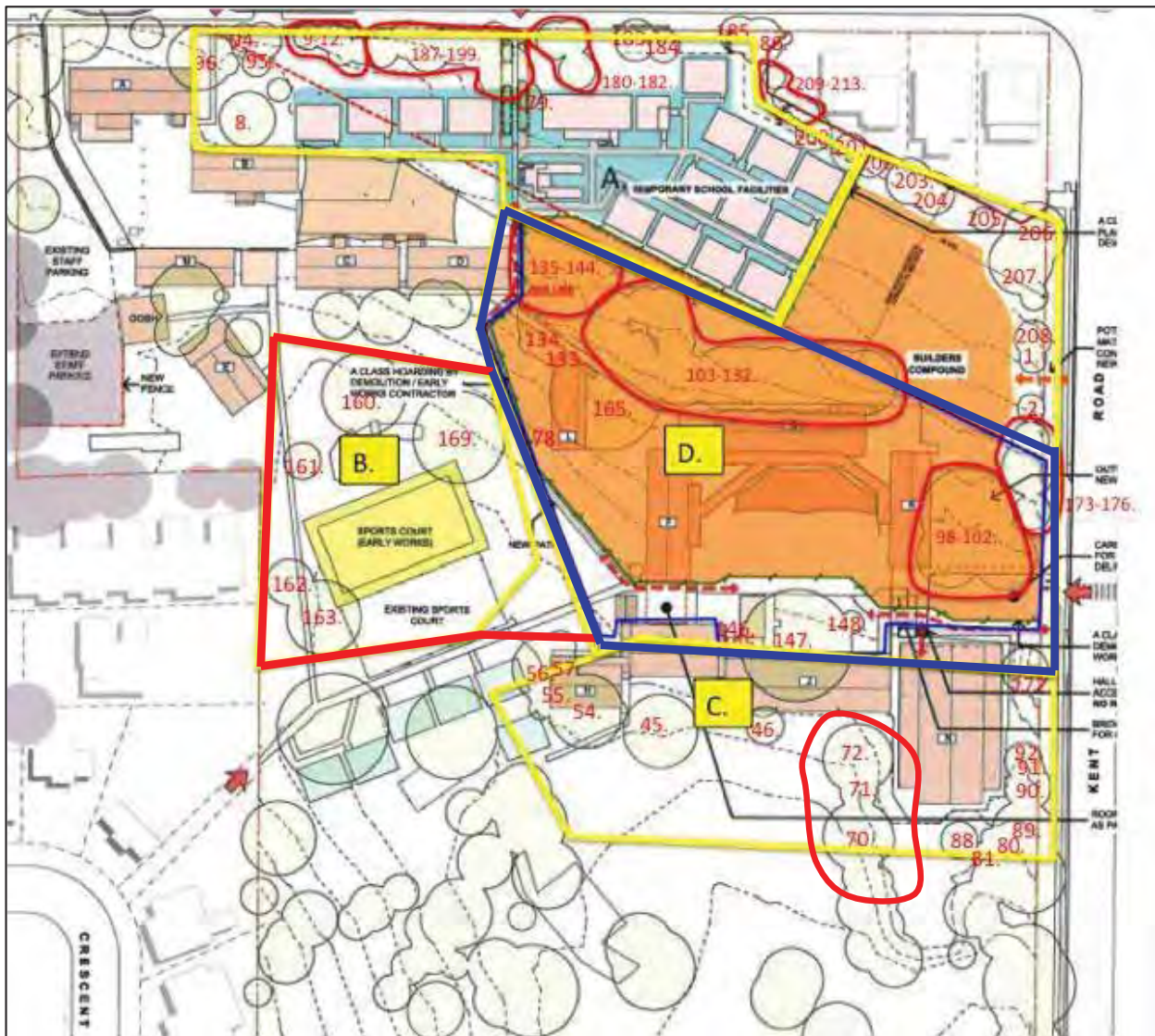


Figure 1. The SSD works are contained within Zone D (Blue boundary)

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2.2. Tree Locations

The original Arboriculture Impact Assessment dated 1/10/2020, specified tree protection measures for fourteen trees identified as being of High retention value.

Tree 147 is the only protected tree within the site area pertaining to SSD 9344. Refer to Table 1 below.

Table 1. Tree protection measures for one tree positioned within the SSD area (Blue).

Tree#	Species	Zone	Health	Structure	ULE	TPZ(m)	SRZ(m)
147	<i>Eucalyptus saligna</i>	D	Fair	Fair	Long	8	3.88



3. Conclusion

The updated Tree Protection Plan areas and requirements as noted in Sections 1 and 2 above are confirmed to be the Tree Protection Requirements for SSD9344 (Zone D)

All tree protection measures for trees positioned within the SSD 9344 area must be retained for the duration of the construction works in this area. The tree protection measures specified in the Arboricultural Impact Assessment Report dated 1/10/2018 and the Arboricultural Addendum dated 24/3/2020 must be retained for Tree 147 (SSD)

As works in Zones A and C are complete, tree protection measures for the High retention trees in these zones are no longer required.

The project arborist must be notified if any design changes or additional works are required outside the SSD area or exempt works area.

References:

Australian Standard for the protection of trees on development sites. AS 4970 (2009) *Standards Australia*.

Australian Standard for pruning amenity trees. AS 4373 (2007) *Standards Australia*.

Barrell Tree Consultancy (2012) Tree AZ model 10.10.NZ. Accessed via: www.TreeAZ.com (19/7/2014).

Johnstone, D., Moore, G., Tausz, M. and Nicolas, M. (2013) The measurement of plant vitality in landscape trees. *Arboricultural Journal: The International Journal of Urban Forestry*, 35(1): 18 -27.

Mattheck, C. and Breloer, H. (1994) A practical guide for tree inspection (Chapter 14). *The Body Language of Trees*, HMSO, London.

Matheny, P. N. and Clark, J. R. (1994) A photographic guide to the evaluation of hazard trees in urban areas (2nd Ed). International Society of Arboriculture, Champaign (pp 5, 8, 22 and 32).



APPENDIX F SUMMARY OF LTEMP

SUMMARY OF LTEMP

The site is defined to be the Block R Containment Cell that lies within development footprint as per the SSDA. The Block R Containment Cell contains soils with residual Asbestos Containing Material (ACM) and Potential Asbestos Containing Material (PACM) contamination. The location of the development footprint and the location of the Site have been attached following this summary.

The purpose of the LTEMP is to manage and mitigate health and environmental risks pertaining to asbestos (bonded and friable) impacted soil that remains within the Block R Containment Cell. The objective of the LTEMP is to ensure continued protection of human health of future site users, occupiers, visitors and contractors engaged to work on the Block R Containment Cell.

Handling of Excavated Materials

Existing material beneath the capping layers should be treated as contaminated fill. The contractor responsible for works that will disturb material from below the cap should consider the following control measures as listed below (but not limited to) during excavation and handling works:

- Excavators should operate with doors and windows closed and air conditioning on to prevent dust and potential asbestos fibres from entering the cab. Suitable air filters should also be used with machinery to minimise exposure risks;
- Machinery and vehicle involved in the handling of residual material should be washed down to prevent tracking of soil across the site boundary;
- Stockpiled soil should be covered with a dust and waterproof barrier to eliminate dust generation and inhalation risks;
- The work area and stockpiled material should be clearly marked out with signs posted noting the presence of contaminated material;
- Site workers involved in excavation or intrusive works are to wear or be provided with appropriate PPE such as coveralls, P2 Dust masks (or equivalent) and sturdy shoes;
- Site workers involved with the direct handling (i.e. hand contact) of contaminated soil are to wear a pair cut proof gloves;
- A high level of personal hygiene should be put in place with appropriate decontamination facilities available between work areas and non-work areas; and
- Bulk soil removed off-site must be classified by an appropriately qualified environmental consultant.

Responsibilities

Person(s) conducting works that may disturb material from below the cap, must undertake the following responsibilities:

- Following the relevant management measures pertaining to their works at all times;
- Report to the Responsible Party (Schools Infrastructure NSW / DoE) all occurrences of PACM or ACM, if any; and
- Identify, document and communicate the locations of any damage or penetrations to the Block R Containment Cell cap (concrete foundation of Block R) to the Site Manager (Schools Infrastructure or Department of Education).

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COUNTRY



REGION



SITE LOCATION



LEGEND:

- Audit Site Boundary / Development Footprint



Approximate location of the Block R Containment Cell, to which the LTEMP applies.



KENT ROAD PUBLIC SCHOOL- 126 KENT ROAD
MARSFIELD, NSW, AUSTRALIA

SITE LOCATION PLAN




FIGURE

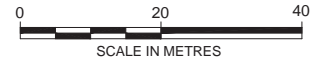
1



LEGEND:

--- Development Footprint

 Location of the Block R Containment Cell, to which the LTEMP applies.



KENT ROAD PUBLIC SCHOOL- 126 KENT ROAD
MARSFIELD, NSW, AUSTRALIA

**LOCATION OF THE BLOCK R
CONTAINMENT CELL**



