Kingscliff Public School

Traffic and Transport Impact Assessment

NSW School Infrastructure

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RESPONSE TO IR SUBMISSIONS

An Information Request has been received from Council dated 13 July 2021 for the upgrade of Kingscliff Public School. Table E.1.1 below summarises Bitzios' response to the IR submissions from Council and Transport for NSW.

Table E.1.1: Response to IR Submissions

Council's IR	
IR Item	**Response**
Parking	
The parking proposed does not adequately cater for demand. The plans should be revised to provide an additional 13 spaces on-site to cater for staff.	The subject site is constrained in terms of its ability to accommodate additional parking. A staff parking area was created in 2010 to accommodate the growing demands and currently exhibits spare capacity. Based on consultation between SINSW and Council, a proposal to create nine (9) on-street spaces on the school's Sutherland Street frontage to the south of the bus bay. These spaces accommodate the net increase in staff associated with the expansion. Please refer to Section 4, Section 7 and Appendix A. In addition, on-street parking has been observed to have existing spare capacity to accommodate for staff parking demand without adversely impacting on parking availability, residential amenity, and road operations.
The Traffic Report raised concerns with the informal parking on Sutherland Street and cars blocking the footpath. The informal parking is proposed to remain but the plans do not appear to include measures to mitigate this risk. This should be reviewed and addressed in the plans.	As outlined above, works are proposed to include kerb and channel along the eastern side of Sutherland Street to address informal verge parking and will formalise an additional nine (9) parallel parking spaces along this segment to formalise and improve parking behaviours. Please refer to Section 4, and Appendix A.
Road Network Operations	
That the adjacent road network be reassessed on-site, given the proposed measures to improve traffic flow and safety (moving all buses to Sutherland Street and extending the 'kiss and drop' in Orient Street) have already been implemented. While the changes appear to have improved safety and reduced congestion, there is still extensive delays and safety issues on Sutherland Street.	Further site observations have been conducted in July 2021 and discussed with Council officers. Recent updates to the school's transport arrangements including the separation of the kiss'n'drop and the bus zone have substantially improved the efficiency and operations of the road network. Additional updates including new kerbside allocation signage and line marking on Orient Street are planned as part of the proposal and will further improve operations and safety for all road users. Refer to Section 3.5 for updated observations and Section 4 for proposed improvements.
Issues with the right turns into and out of Orient Street at the Sutherland Street intersection. The need for a right turn ban from Orient Street was recommended for review once the bus zones and 'kiss and drop' zones is relocated.	Based on this intersections layout it is considered banning of right turn had merit based on limitations to sight lines during the afternoon peak period. Based on further consultation with Council including feedback from the Local Traffic Committee (LTC), it is agreed that a right turn ban out of and into Orient Street would not be installed at this stage given the low turning volumes during the peak period (i.e. 5 vehicles per peak hour).

Council's IR	
IR Item	**Response**
Through traffic being completely blocked on Sutherland Street, particularly northbound, by motorists queuing to turn left into Orient Street.	The potential for kiss'n'drop vehicle queues extending back to Sutherland Street was previously observed to occur for approximately 8 minutes in the PM peak. Impacts to through traffic were exacerbated and only present due to parallel on-street parking which required vehicles turning left to store in the northbound travel lane for a short period of time. Following this original observation, recent changes to remove buses from Orient Street and extend the kiss'n'drop were observed to reduce the queue length and significantly reduced the number of instances and time vehicles extend back to Sutherland Street. To assist in the short-term queue management associated with the kiss'n'drop, it is recommended that No Stopping signage (2:30PM to 3:30PM Mon-Fri) be installed on Sutherland Street east of Orient Street. Refer to Section 4 and external works concept plans contained in Appendix A.
Buses being delayed by queues on Sutherland Street.	Further site observations have been undertaken following the relocation of school bus services to the eastern side of the school on Sutherland Street and subsequent lengthening improvements to the Orient Street kiss'n'drop facility. These site observations determine that bus operations had improved in comparison to previous arrangements. During the first bus egress, a delay of approximately 1 minute was observed at 3:08pm. Following this, no further queues were present. Overall the relocation of buses to Sutherland Street from Orient Street has resulted in a noticeable improvement in bus delays and bus accessibility to the dedicated bus zone.
Through traffic being blocked on Orient Street	Apart from the kiss'n'drop facility and school crossing, no formalise parking and controls are present on Orient Street. The proposal seeks to improve the operations of Orient Street through a new school crossing as well as signage and line marking updates to formalise parking and travel lanes. The width of Orient Street in line with the kiss'n'drop currently accommodates for northbound kerbside on-street parking, southbound kerbside kiss'n'drop facility and two through travel lanes. The proposed line marking upgrades seek to formalise these arrangements. For narrower sections of Orient Street to the south, on-street parking can be managed through the installation of signage and line marking in order distribute on-street parking, maintain driveways and maintain two-way traffic flow during peak pick-up periods.

Council's IR	
IR Item	**Response**
Any adverse effects of the changed traffic conditions on surrounding intersections.	The Rapid Transport Assessment (RTA) undertaken for KPS identified a range of opportunities to improve the road and active transport system for both the school and the surrounding community. It is important to note that these items are not the sole responsibility of the KPS or its operations, but rather a legacy of the area. As a result of the RTA, the extension of the kiss'n'drop on Orient Street and relocation of all buses to Sutherland Street significantly improved the afternoon period's transport operations. In addition to this, it is understood that the RTA helped inform Council's grant applications to construct pathways on the eastern side of Sutherland Street. The proposal will further build on these initiatives with improvements to vehicle parking and traffic operations on Orient Street and Sutherland Street. The proposal also includes the construction of key missing links of pedestrian pathways surrounding the school to promote walking to school and reduce private vehicle utilisation.
Kiss and Drop Area	
The 'kiss and drop' on Orient Street has already been extended and its operation should be reviewed and any modifications needed should be included in the Traffic Report and plans	Based on recent site observations the kiss'n'drop was observed to operate more efficiently with the reduction in vehicle and bus conflicts. Further guidance for management to ensure full capacity of kiss'n'drop is used as part of STP. Line marking and delineation of Orient Street will formalise and separate the travel lane, kiss'n'drop and on-street parking. See proposed works in External Works Concept Plans contained in Appendix A.
The existing 'kiss and drop' on Sutherland Street has been removed and the bus zone extended. The efficiency and operations of the new arrangement should be reviewed and increased in width and length if required. Any modifications needed should be included in the Traffic Report and plans.	Based on recent site observations the bus bay was observed to operate more efficiently with the reduction in vehicle and bus conflicts. Once further proposed signage and line marking works occur (see Appendix A) this is expected to further improve operations.
Active Transport	
The Traffic Report is revised to propose measures to improve pedestrian/cyclist safety at the five-way roundabout given it was identified as a barrier to active transport uptake. This could be used by Council for funding nominations.	Following consultation with Council, the shared path on the northern side of Sutherland Street will improve active transport accessibility and allow cyclist to avoid this potential 'barrier'. Refer to plans provided in Appendix A.
The Traffic Report recommends that pedestrian deficiency D9 (lack of crossing on Sutherland Street) is not upgraded. This should be reviewed with consideration to the new shared path being installed on the eastern side of Sutherland Street (between Moss Street and Seaview Street) and the new traffic arrangements.	Deficiency D9 is not specifically recommended due to the proximity to the relocated bus zone and increase in buses accessing the eastern school access. Alternate to this potential crossing point, there are two more existing pedestrian refuge crossings provided on either end of the school on Sutherland Street (i.e. west of Palmers Lane fronting the school and to the south of Hungerford Lane intersection). Both of these crossings are located away from the intersection conflict points and connect the new shared path to the KPS.

TfNSW	
IR Item	**Response**
General Comments	
The TTIA provides a copy of the Traffic Network Diagrams (Appendix E). The data in these diagrams appears to be incomplete: • The "background volumes" sheets do not show any background data for the local streets, Omar, Seaview and Olga Streets. Additionally the diagrams do not accurately represent the street connections or how they may be used by traffic generated by the existing and proposed development. • There is no explanation in the appendix to inform where the data has been sourced from. • It is unclear if the "with development" volumes for the local streets are demonstrating the additional traffic generated by the increase in new students only, or is intended to also include the existing traffic. TfNSW recommends the Consent Authority seek clarification from the proponent in regards to the background traffic volumes, growth rates, generated traffic volumes, for both the existing and the proposed development.	As per Section 6.2 of the report Existing traffic volumes were obtained from traffic surveys undertaken by Traffic Data and Control (TDC) on Thursday 19 November 2019 at the following intersections: • Sutherland Street / Viking Street • Sutherland Street / Pearl Street • Sutherland Street / Orient Street • Orient Street / Viking Street. The local streets of Omar, Seaview, and Olga Streets where not subject to traffic survey data collection and therefore are survey volumes are not listed. Based on site observations, Omar Street for example was observed to have little to no traffic. A few vehicles were observed to park on Omar Street for pick-up / drop-off however this was a minor amount. Omar Street was therefore not been included in the key intersections. A compounding growth rate of 1.54% per annum was used to forecast background traffic to future years. This is consistent with the medium growth scenario adopted for the Tweed Road Development Strategy (TDRS).
Existing Background Traffic and Kiss 'n' Drop activity	
Section 6.2 of the TTIA refers to background traffic and a survey undertaken on 19 November 2019, which captured this information for four key intersections (shown in Figure 3.2) surrounding the approach to the public school, and assessments of the existing trips generated by the existing school have been demonstrated in Tables 6.1 and 6.2. The background traffic survey focuses on intersections only and as a result do not appear to identify the midblock queuing occurring in Orient Street and Sutherland Street, which appear to be due to the misuse of the existing Kiss 'n' Drop facilities in both streets. It is noted that the PM peak hour traffic shows a difference in volume to the AM peak hour, in both the survey traffic volumes and the Existing Trip Generation totals shown in Tables 6.1 and 6.2. The change appears to occur for the KHS Non-staff traffic volumes only. This may be due to the Kiss 'n' Drop facility being misused in the afternoons, as observed in Section 3.5 of the TTIA where it states, "Parents / carers began to arrive for pick-up approximately 45 minutes before school concluded". TfNSW recommends that further investigations be undertaken to determine if the misuse of the Kiss 'n' Drop facilities are the potential cause for the difference in traffic generated by the KPS Non-Staff during the AM and PM peak hours in the background traffic data, as a result of parents arriving earlier than the designated PM peak hour period. TfNSW further recommends that Kiss 'n' Drop facilities be addressed further in the School Travel Plan (STP), to include communications to parents informing on the appropriate use of the facility. TfNSW notes that this is a behavioural issue that is not uncommon, however, in order to implement the STP appropriately, this should to be addressed and mitigation measures proposed with ongoing monitoring to prevent future misuse of the facility.	Further site observations have been undertaken following the relocation of school bus services to the eastern side of the school on Sutherland Street and subsequent lengthening improvements to the Orient Street kiss'n'drop facility. Recent updates and extension of the facility have improved the efficiency and operations of the kiss'n'drop on Orient Street and the additional signage and line marking proposed will further improve operations. Previous issues with misuse have been resolved through updated signage provisions. Refer to Section 3.5 for updated observations and Section 4 for proposed improvements. Based on recent site observations the kiss'n'drop was observed to operate more efficiently with the reduction in vehicle and bus conflicts. Further guidance for management to ensure full capacity of kiss'n'drop is used as part of STP.

TfNSW	
IR Item	**Response**
Reconfiguration – Bus Drop off / Pick up and Kiss 'n' Drop facilities.	
Section 1.3 and Section 3.5 of the TTIA identifies a number of safety concerns in both Orient and Sutherland Streets. These concerns include but are not limited to mid-block U-Turn maneuvers, intersection congestion, informal parking arrangements, vehicles queueing and causing conflicts with designated Bus zones and school crossing locations, constrained two-way traffic movements and informal street crossings occurring away from the designated school crossing. Section 6.7 further addresses the conflicts between the Kiss 'n' Drop facilities and the Bus zones on both Sutherland Street and Orient Street, in addition to Sutherland Street potentially reaching and exceeding its capacity in the forecasted years. TfNSW understands the development recommends a reconfiguration of both the Kiss 'n' Drop facilities and the Bus zone locations. This reconfiguration appears to be consolidating all Kiss 'n' Drop facilities to be located on Orient Street, and all Bus zones to be solely located on Sutherland Street. It is noted however that no plans have been included in the development application demonstrating the proposed reconfiguration. TfNSW supports this reconfiguration in principle, through the separation of heavy vehicles (buses) from light vehicle activities, reducing the potential for conflict between buses, vehicles and children. Clearer detail is required however, to understand the extent of the proposed works to be built in the road reserves of both Sutherland and Orient Streets. TfNSW recommends that the Consent Authority request further detailed drawings of the proposed works occurring in the road reserves of the surrounding streets relevant to the school. These drawings should be informed by information gathered through further consultation with the bus operator Surfside Bus Lines, TfNSW and KPS to determine what infrastructure is needed for both the proposed reconfiguration design and to accommodate the proposed increase in students (further addressed below).	Further site observations have been undertaken following the relocation of school bus services to the eastern side of the school on Sutherland Street and subsequent lengthening improvements to the Orient Street kiss'n'drop facility. Based on recent site observations the kiss'n'drop was observed to operate more efficiently with the reduction in vehicle and bus conflicts. Further guidance for management to ensure full capacity of kiss'n'drop is used as part of STP. Line marking and delineation of Orient Street will formalise and separate the travel lane, kiss'n'drop and on-street parking. See proposed works in External Works Concept Plans contained in Appendix A. Existing bus services were reviewed in consultation with the bus operators and as part of a review for several schools across the Tweed Shire. Information provided during this process outlined that buses were generally highly utilised and near capacity for some routes. The primary service provider Surfside Buslines undertakes annual review changes in consultation with TfNSW and based on NSW bus pass applications. It is noted that school bus services are closely integrated across multiple schools in the Tweed Shire including primary schools, high schools and private schools. Discussions between SINSW and TfNSW bus planning and contracts representatives are ongoing around potential improvements as part of a future network review as well as shorter term updates as part of their annual bus service review processes. This has also included a review of passenger information such as Trip Planner and real-time bus tracking.
Parking	
TfNSW recommends the Consent Authority be satisfied that the local streets can support all future parking needs, both onsite and on-street, for the proposed increase in students and staff and works with the proposed reconfiguration.	Noted, discussion have occurred with Council. Proposal upgrades include providing additional formalised on-street parking on Sutherland Street (see Section 4 and Appendix A). Further spare capacity in the existing road network is considered to meet the satisfaction of Council given constrained site circumstances.

Construction Traffic Management Plan (CTMP)	
TfNSW key concerns during the construction process is around the safety and efficiency of the key intersections, and any potential impacts on pedestrians and cyclists coming and going from the school. It is noted that the CTMP is of a preliminary nature, as such, a construction contractor and finer detail around the construction methods are not (yet) available. Notwithstanding this, TfNSW notes that it is unclear what impacts the traffic generated by construction staff will have on the surrounding road network. Figure 4.1 and Section 4.4.4 address the Construction Access Route. It is understood by TfNSW this route is addressing the construction design vehicles listed in Section 4.2.1. It is unclear if this is also intended to be the transport route for construction staff as the identified parking locations are located beyond the school site. Although the number of Construction staff is unknown, including their generated traffic volumes and movements, TfNSW supports the recommendations in Section 4.3.3 of the Preliminary CTMP, that construction staff be encouraged to carpool to work, to reduce the number of worker vehicles and that "The availability of on-street parking should be considered when determining the peak work force." TfNSW further supports the recommendation to utilise existing public car parks located within walking distance of the development site, accessible by a network of public footpaths and stairs. Section 3.3.2 in the Preliminary CTMP identifies the existing crossover from Orient Street to School Lane as being the primary construction access to the development site. It should be noted this crossover is located in the immediate vicinity of the designated school crossing and interacts with an existing footpath along Orient Street. Section 4.3.4 states that "Any impacts to pedestrian pathways or cycle routes will be managed under the CTMP", however no mitigation measures have been proposed at this stage to manage the potential for conflict between pedestrians or cyclists and construction vehicles arriving or departing the site. TfNSW recommend the Consent Authority conditions the applicant, to prepare the final CTMP in consultation with TfNSW and Tweed Shire Council, prior to the secretary's acceptance of the document. The updated CTMP should further detail the expected construction traffic volumes / trip generation. The start and finish times for the construction staff should be included in this updated information and further include any mitigation measures to prevent conflicts between construction vehicles, other vehicles, pedestrians and / or cyclists around the School Lane crossover and during drop-off and pick-up times. Notwithstanding the above requested additional information, TfNSW recommends that a final updated CTMP should be consistent with the Consent Authorities typical format for SSD and be a requirement of any project approval. The final document should include a Driver Code of Conduct (DCoC), be prepared in consultation with the relevant Road Authorities and approved by the Consent Authority prior to the commencement of vehicle movements associated with the major project."	As recommended by TfNSW, the imposition of a condition of consent requiring the preparation of a final CTMP is supported, line with the DPIE's standard conditions of consent. The CTMP will be prepared in consultation with Council and TfNSW, for the approval of the Planning Secretary.

Road Network Operations	
TfNSW recommends the Consent Authority request further sensitivity analysis be undertaken by the applicant to understand the cumulative impacts on the surrounding road network, during both construction and operational stages, by this proposed development, in addition to the proposed redevelopment of the nearby Kingscliff High School (KHS), Tweed Valley Hospital (TVH) and any other major infrastructure project or development within the immediate Kingscliff region. Where applicable, Austroads turn warrant assessments should be undertaken for all intersections, to consider the merit for any turn treatments and / or central medians to prevent turning movements at key locations. The Consent Authority should be satisfied that warrant assessments reflect expected demand (individual and cumulative).	Further site observations were conducted in July 2021 to address concerns raised in Council's information request items and were subsequently discussed with Council officers. The noted developments (or their associated construction traffic impacts) are not within the immediate catchment of the KPS, or key intersections assessed. Therefore, the requested additional sensitivity tests are not considered necessary in terms of identifying traffic impacts that would require mitigation measures to imposed. No major traffic matters are considered to be outstanding and/or not addressed.
Kiss and Drop Area	
TfNSW recommends that further investigations be undertaken to determine if the misuse of the Kiss 'n' Drop facilities are the potential cause for the difference in traffic generated by the KPS Non-Staff during the AM and PM peak hours in the background traffic data, as a result of parents arriving earlier than the designated PM peak hour period. TfNSW further recommends that Kiss 'n' Drop facilities be addressed further in the School Travel Plan (STP), to include communications to parents informing on the appropriate use of the facility. TfNSW notes that this is a behavioural issue that is not uncommon, however, in order to implement the STP appropriately, this should be addressed and mitigation measures proposed with ongoing monitoring to prevent future misuse of the facility.	Further site observations have been conducted in July 2021 and discussed with Council officers. Recent updates and extension of the facility have improved the efficiency and operations of the kiss'n'drop on Orient Street and the additional signage and line marking proposed will further improve operations. Previous issues with misuse have been resolved through updated signage provisions. Refer to Section 3.5 for updated observations and Section 4 for proposed improvements. Further operational improvements will be able to be managed through further STP recommendations
Active Transport	
TfNSW recommends that further investigations be undertake in consultation with both Council and TfNSW to identify where the informal crossings are occurring, which directions the active transport users are arriving and departing from, which mode they are travelling by and whether there is a need for both an upgrade to the existing crossing and / or a new crossing to be located away from the existing. TfNSW further recommends, prior to developing concept designs any further for all works in the road reserve, in addition to the abovementioned consultations, all of the proposed treatment/s and works in the road reserve (including the Bus reconfigurations) should be referred to the Local Traffic Committee for review and comment on all relevant regulatory facilities.	Noted, previous prepared concepts were provided to Council with number of matters discussed at their Local Traffic Committee in February 2021. Further observations have been conducted in July 2021 and discussed with Council officers. Improvements to be delivered by the project and/or Council will provide suitable crossing facilities that reflect the main desire lines observed.
TfNSW recommends prior to the issue of the Construction Certificate, the Consent Authority condition bicycle parking and end of trip facilities be provided for staff and students in accordance with Australia Standard AS1742.9:2018 Austroads Guides including, locate bicycle parking and storage facilities in secure, convenient, accessible areas close to the main entries incorporating adequate lighting and passive surveillance and in accordance with Austroads guidelines.	This statement is generally agreed. The conditions of consent should require bicycle parking and end of trip facilities to be provided in accordance with Australia Standard AS1742.9:2018 Austroads Guides.

Buses	
TfNSW recommend the Consent Authority request the proponent to further consult with TfNSW and the bus operator to understand both the increase in students numbers will have on the current bus services, in addition to the increase in overall students taking up the bus services on implementation of the STP.	It is understood that TfNSW routinely consult with bus operators on refining school bus routes and student patronage needs. In addition, school student numbers and details are directly provided to TfNSW through the School Student Transport Scheme (SSTS). Discussions between SINSW and TfNSW bus planning and contracts representatives are ongoing around potential improvements as part of a future network review as well as shorter term updates as part of their annual bus service review processes. This has also included a review of passenger information such as Trip Planner and real-time bus tracking.
Department of Planning, Industry and Environment	
IR Item	**Response**
Parking	
The comments made in the Transport for NSW regarding the assessment of transport impacts must be satisfactorily addressed.	Responses to matters raised are addressed in earlier sections of this table.
The Traffic Impact Assessment (TIA) does not conclude whether works zones are required during construction. The TIA should be amended to include these details and any mitigation measures to minimise impacts on the surrounding traffic network.	The CTMP has been amended to identify the south eastern corner of the site is the primary works zone and access point for during construction. This is located away from the KnD and bus zone to minimise impacts during construction. Refer to Appendix C. During the later stages of construction, the CTMP will be refined in consultation with the project's Contractor and TSC, and further detailed assessment would be expected as part of a detailed CTMP which would form part of conditions of approval.
The TIA states in relation to the existing Orient Street drop-off / pick-up location, that it observed vehicle queuing extending north up to Sutherland Street. Detailed vehicle queuing mitigation and management measures for the proposed consolidated drop-off / pick-up arrangements should be provided.	Further site observations have been conducted in July 2021 and discussed with Council officers. Recent changes to the kiss'n'drop as a result of the relocation of the bus facility to Sutherland Street have improved the efficiency and operations of the kiss'n'drop on Orient Street. Additional signage and line marking proposed will further improve operations. Previous issues with misuse have been resolved through recent improvements. Refer to Section 3.5 for updated observations. Refer to Section 4 and Appendix A for further information on proposed improvements.
Detailed plans are required which clearly show the following: o the location and total number of the proposed drop-off / pick-up spaces and bus spaces. o the drop-off / pick-up vehicle queuing area. o the location of all existing and proposed street signages to control vehicle movements, including 'no stopping' and 'no-parking signage', associated with the drop-off / pick-up zone and bus zone. o all proposed line marking associated with the development.	Please refer to external works concept plans contained in Appendix A for details.

RESPONSE TO SEARS

The Planning Secretary's Environmental Assessment Requirements (SEARs) are provided below for the upgrade of Kingscliff Public School. Table E.1 below summarises Bitzios' response to SEARs Item 6 dated 31st July 2020.

Table E.9.2: SEARs Item Responses

SEARs Item 6	Response
Analysis of the existing transport network, including	
Road hierarchy	The road hierarchy of key roads near the school is discussed in Section 3.2
Pedestrian, cycle and public transport infrastructure	The active and public transport provisions is discussed in Section 3.3
Current daily and peak hour vehicle movements and % of heavy vehicles	Background traffic volumes are discussed in Section 6.2 and 6.7
Existing performance levels of nearby intersections	The SIDRA intersection results are discussed in Section 6.4
Available sight distances at key intersections	A sight distance assessment of Sutherland Street / Orient Street is provided in Section 3.3
Details of the proposed development, including	
A map of proposed access which identifies public roads, bus routes, footpaths and cycleways	The subject site's accesses are shown in Section 3.3
Vehicular access arrangements for service and emergency vehicles, including ingress and egress swept paths	Service and emergency vehicular access is discussed in Section 8.1. As the service and emergency vehicle access to the site is undertake on-street no ingress and egress swept paths are required
Car parking, bicycle parking and end-of-trip facilities	Section 7 discusses car and bicycle parking facilities on and off street. It is noted there is a shortfall in off-street car parking for staff and visitors compared to Council's typical requirements however an alternate assessment method determines the actual car parking demand generated by KPS
Drop off / pick up zones and bus bays	The vehicular access to KPS including pick up / drop off, staff parking and buses is discussed in Section 5.3
Pedestrian or road infrastructure improvements or safety measures	Active transport improvements at and surrounding the school are discussed in Section 3.3.1 Road infrastructure improvements are discussed in Section 5.3
Analysis of the impacts due to the operation of the proposed development, including	
Proposed modal split for all users of the development	The existing modal split for staff and students is discussed in Section 3.5 and the proposed modal split is discussed in the STP provided in **Appendix B**
Estimated total daily and peak hour vehicular trip generation	Forecast traffic volumes are discussed in Section 6.5 and 6.7
Justification of the assumed growth rate, volume and distribution of proposed trips, type and frequency of design vehicles accessing the site	The growth rate and distribution of additional trips generated by the upgrade is discussed in Section 6
Performance of nearby intersections with the additional traffic generated by the development both at the commencement of operation and 10-years following operation	SIDRA intersection results are discussed in Section 6.4 and shows all intersections operate within typical performance thresholds

SEARs Item 6	Response
Cumulative traffic impacts from any surrounding approved developments	There are currently no significant approved developments surrounding KPS that would influence the outcomes of the TTIA.
Adequacy of active and public transport infrastructure to accommodate the development	Active transport recommendations are discussed in Section 3.3.1 and public transport recommendations are discussed in Section 3.3.2
Adequacy of car and bicycle parking provision when assessed against the relevant codes and standards	Car and bicycle parking requirements are discussed in Section 7 and identifies an alternate assessment method. This assessment is based on parking surveys which identify the existing parking demands of KPS. The future parking demands are expected to increase at a rate proportion to the increase in enrolments
Adequacy of the drop off / pick up zones and bus bays including assessment of any related queueing during peak hour access	The adequacy and queue issues related to the kiss'n'drop and bus zones are discussed in Section 5
Adequacy of the existing / proposed pedestrian infrastructure to enable convenient and safe access to and from the site for all users	The active transport recommendations are discussed in Section 3.3.1
Measures to ameliorate any adverse traffic and transport impacts due to the development based on the above analysis, including	
Travel demand management measures to encourage sustainable transport	Several improvements to the active transport network have been included in the project. These will be communicated to the school community through the School Travel Plan and Travel Access Guide provided in **Appendix B**
Infrastructure improvements, including details of timing and method of delivery	The infrastructure improvements and method of delivery is discussed in Section 3.3.1 and the STP provided in **Appendix B**
A preliminary operational traffic and access management plan for the site, the drop-off / pick-up zone(s) and bus bay(s)	
Prepare a preliminary operational traffic and access management plan for the site, the drop-off / pick-up zone(s) and bus bay(s)	A School Travel Plan has been prepared and is provided in **Appendix B**, including a preliminary Travel Access Guide
Analysis of the impacts of the traffic generated during construction of the proposed development, including	
Construction vehicle routes, types and volumes	Discussion of the construction impacts are discussed in the construction traffic management plan provided in **Appendix C**
On-site car parking and access arrangements for construction, emergency and construction worker vehicles.	
Cumulative impacts associated with other construction activities in the locality (if any)	
Road safety at identified intersections near the site due to conflicts between construction vehicles and existing traffic in the locality	
Measures to mitigate impacts, including to ensure the safety of pedestrian and cyclists during construction	
A preliminary Construction Traffic and Pedestrian Management Plan	
Prepare a preliminary Construction Traffic and Pedestrian Management Plan	Traffic management during the construction phase is discussed in the construction traffic management plan provided in **Appendix C**

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1. INTRODUCTION

1.1 Background

Bitzios Consulting (Bitzios) has been engaged by NSW Department of Education: School Infrastructure (SINSW) to undertake a Traffic and Transport Impact Assessment (TTIA) for the proposed redevelopment and upgrade of Kingscliff Public School (KPS). The proposal is to upgrade the school campus to improve facilities for existing enrolments and accommodate the growing requirement for educational providers in the north coast region. Development plans prepared by SJB Architects are provided in **Appendix A**.

The subject site is located at 12 Orient Street, Kingscliff (formally described as Lot 1 on DP 384195). The subject site location is shown in Figure 1.1.

Source: Nearmap

Figure 1.1: Subject Site Location

1.2 Assessment History

Bitzios has previously prepared a Traffic Impact Assessment (TIA) report for the proposed development. The TIA was undertaken through a conventional methodology generally in line with Transport for New South Wales's (TfNSW's) (formally RMS) *Guide to Traffic Generating Developments* and Tweed Shire Council's (Council's) typical requirements. This methodology focusses on vehicle traffic impacts and parking provision.

Following a review of the draft TIA reports, SINSW requested that Bitzios Consulting then undertake a Rapid Transport Assessment (RTA) to further the assessment into the active and public transport components of the school to:

"recommend the required multi-modal transport infrastructure, programs and policies to serve the primary and high school catchments without relying on one-car one-student kiss-and-drop".

The RTA provided a supplementary analysis to the original draft TIAs, with a focus on improving active and public transport facilities and increasing utilisation of these modes. Some of the RTA recommendations have been adopted by SINSW and will be implemented to support the upgrade of the school. The remaining recommendations will be implemented in collaboration with key stakeholders. As such, this report will further support the recommendations outlined in the RTA. Subsequent to the receipt of Information Request IR submissions this TIA has been updated with the revisions and inclusions noted in Table E.1.1. Further site investigations were conducted on 27 July 2021 to support the response.

1.3 Stakeholder Engagement

While preparing this document and the RTA key stakeholders were engaged including representatives from KPS, Tweed Shire Council (Council), TfNSW and Surfside Bus Lines. Key outcomes of the stakeholder engagement are as follows:

- KPS
  - Dangerous driving behaviours occur on Orient Street due to congestion and lack of education / enforcement
  - There is no enforcement during the morning and afternoon peak periods though there may be some benefit with occasional education and/or enforcement
  - Students tend to cross on Orient Street and Sutherland Street at unsafe locations due to the school crossing locations, lack of crossings and parents parking across the road
  - Orient Street reduced to one-way traffic when cars parked on both sides of the road
  - Vehicles queued on Orient Street from the kiss'n'drop back through the school crossing to the Sutherland Street intersection
  - Right turn queues on Sutherland Street into Orient Street extended back to the Sutherland Street / Pearl Street 5-leg roundabout
  - The kiss'n'drop on Sutherland Street extended back into the bus zone
  - The high turnover of vehicles using the kiss'n'drop area on Sutherland Street created conflicts and congestion on Sutherland Street due to the high number of through trips
- Council (Transport Officers)
  - Potential to include the RTA recommendations into their Pedestrian Access and Mobility Plan (PAMP)
  - Generally supportive of the RTA recommendations
  - Generally open to co-fund several other required upgrades in collaboration with SINSW and TfNSW
  - Accepting of the proposal to relocate the kiss'n'drop and bus zones
- TfNSW
  - The RTA public transport recommendations will need to be included in TfNSW's Network Review occurring in June 2020
  - Public transport e-ticketing pilot projects are currently in place in other regional towns and could be investigated for Tweed
- Surfside Bus Lines
  - Bus routes are flexible to changing demand and a holistic review of the entire network has not been undertaken for some time

- Surfside Bus Lines identified several limitations within their current operating system including lack of travel data, complex bus route timetable and inability to amend service times
- New buses would be required to support new routes due to the different fleet requirements for QLD and NSW

- SINSW
  - School enrolment numbers are expected to increase from existing enrolment numbers in a linear fashion over the next 10 years
  - The draft TIA report required additional detail around active and public transport modes
  - The ultimate goal being to decrease single passenger kiss'n'drop
  - Key infrastructure improvements to be co-funded and implemented as a priority to offset the impacts associated with KPS's upgrade
  - Identified Surfside Bus Lines are undertaking a regional review of bus services and would be a great opportunity to amend school bus services for KPS.

Subsequent to the original TTIA report, and receipt of IR Submissions the following stakeholder discussions occurred:

- A meeting was held with TfNSW and Council officers on 29 July 2021 to discuss IR items and proposed responses and improvements. Key outcomes of the discussions were:
  - The Local Traffic Committee and Council officers do not support provision of dedicated right turn on Sutherland Street into Orient Street citing road network impacts of peak pick up period only a 10-minute period balanced against impact on availability of on-street parking for residents and their visitors.
  - Agreed the separation of KnD and Bus Stop areas has seen noticeable improvement and latest observed issues can be addressed through further management improvements of the KnD and signage/line marking treatments to restrict parking around the Sutherland Street / Orient Street intersection (discussed further herein see Section 4.0 and Appendix A)
  - Preferrable to create formalised parking on the southern extent of the site's frontage to Sutherland Street to address existing parking behaviours that may impact footpath use and to partially offset parking demand generated by the development.

Further it is important to note that no other community submissions and/or concerns have received as part of the SSD.

1.4 Report Inclusion

This TTIA includes the following components:

- A review of the existing transport conditions including drop-off / pick-up arrangements, pedestrian and cycling facilities, public transport facilities and connectivity surrounding the subject site
- A review of the existing transport planning documents
- A transport assessment of the development's student enrolment catchment and travel modes
- A review of historical crash data
- Assessment of the existing and proposed access arrangements for vehicles, servicing and refuse collection
- Estimation of the development's trip generation and distribution on the local road network
- Assessment of the development's impacts on the surrounding road network
- Assessment of the development's car and bicycle parking provision
- Assessment of the on-site parking layout, access, servicing and refuse collection requirements.

2. TRANSPORT PLANNING CONTEXT

2.1 Overview

A review of State and Local planning documents was undertaken to gain an understanding of the current policies and programs within the Tweed region. This also allows this assessment to align with other related plans. A range of documents were reviewed, and the subsequent sections detail the documents that have outcomes relevant to this assessment.

2.2 State Documents

State documents were reviewed including the NSW Government's Long-Term Strategic Master Plan, NSW Bike Plan, Regional NSW Services, North Coast Regional Plan and Infrastructure Plan, Road Safety Plan. The following details the outcomes from the relevant state government plans:

- NSW Long Term Transport Master Plan – this plan identifies that bus service contracts in the region are to be renewed which is an opportunity to improve routes and outcomes for customers. This includes cross-border routes and infrastructure
- NSW Bike Plan – this plan recognises the importance of the Coastline Cycleway which follows Cudgen Creek, east of KPS. However, there are currently no adequate or safe connections to the cycleway from KPS
- Regional NSW Services and Infrastructure Plan – this plan identifies additional cross-border public transport options including short-term bus priority and long-term heavy/light rail.

2.3 Local Documents

Council documents were reviewed including the Local Environment Plan, Development Control Plan, Section 7.11 Developer Contributions, Road Development Strategy, Pedestrian Access and Mobility Plan (PAMP) and Tweed Public Transport Strategy. The following details the outcomes from the relevant state government plans:

- Tweed PAMP – this plan identifies relevant actions that directly benefit KPS including:
  - Construct pathway on northern side of Sutherland Street
  - Construct pathway on eastern side of Sutherland Street south of Moss Street
  - Convert Hungerford Lane to 10km/h shared zone
  - Widen pathway on Pearl Street to 2.5m.

Council has stated that it has plans to prepare a new PAMP and Bike Plan for the Tweed Shire subject to funding and collaborations with TfNSW. Most of the actions from the existing PAMP have not been implemented yet. The outcomes from the previous RTA was therefore recommended to be fed into the updated PAMP and Bike Plan.

Tweed Council also operate a Public and Active Transport Group which provides recommendations to Council regarding infrastructure needs, information and education, strategic planning, funding applications and cross-border issues.

2.4 RTA relationship to TIA

The RTA provided a supplementary analysis to inform the TIA, with a focus on identifying potential active and public transport improvements and increasing utilisation of these modes.

Some of the RTA recommendations have been adopted by SINSW and will be implemented to support the upgrade of the school where appropriate and practical.

The remaining recommendations will be implemented in collaboration with key stakeholders but should not be considered as being required prior to commence of operations for the project development's opening. A number of updates are recommended to be rectified as part of Council's revised PAMP and Bike Plan inclusions for the greater transport network but are not proposed as part of the KHS works.

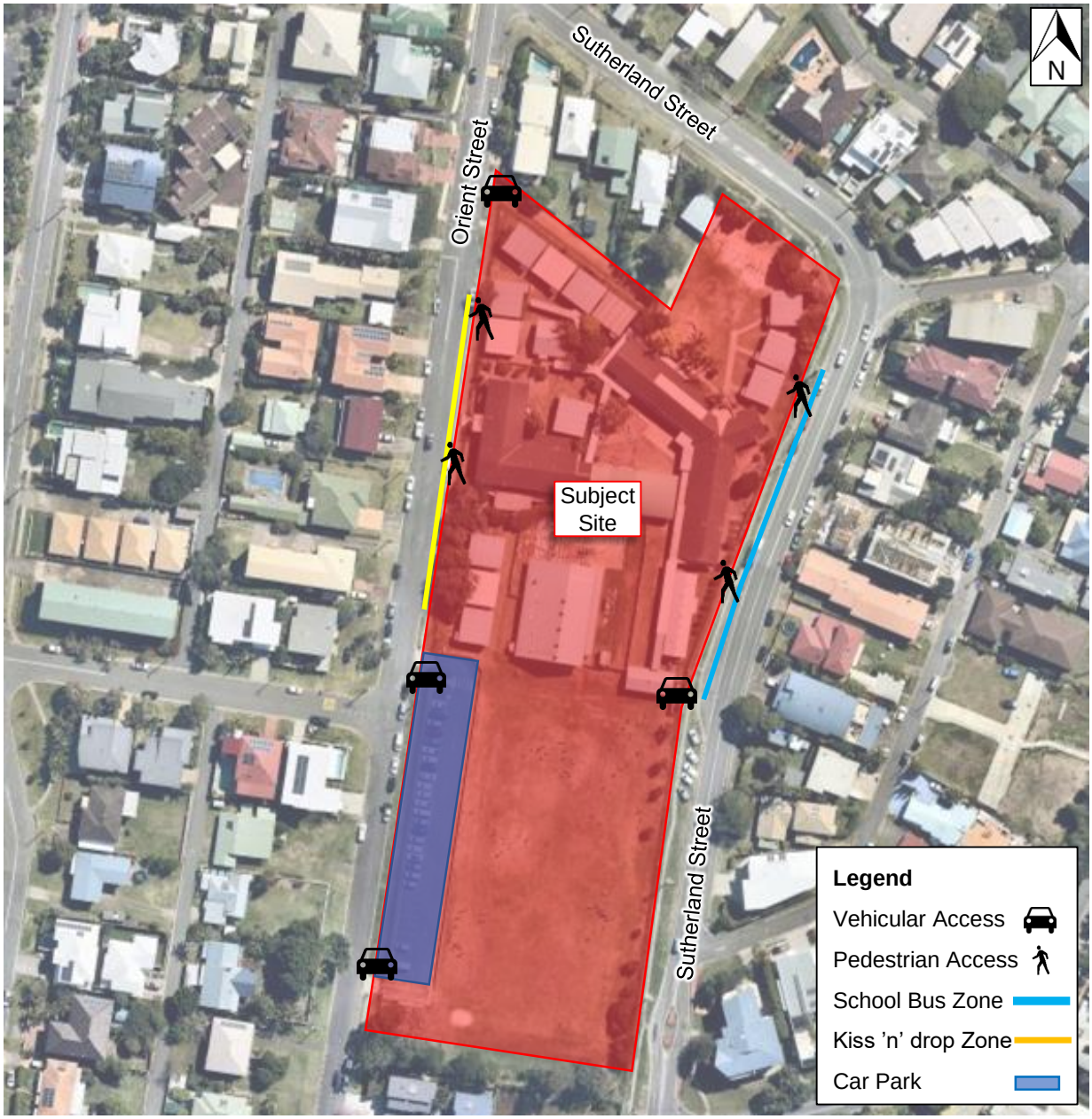
Through this project and other school projects across the Tweed Shire, SINSW has demonstrated a partnering and collaborative approach improving outcomes over time and will work with Council and TfNSW stakeholders to seek further improvements for alternate transport modes through grants, stimulus and co-funding opportunities.

3. EXISTING CONDITIONS

3.1 Subject Site

KPS currently caters for around 614 students and 37 staff. The typical school bell times are 9:00AM and 3:00PM. Vehicular access is provided for staff only via Orient Street to the south of the site with 32 off-street parking spaces. The on-site car parking spaces are restricted to staff only and is gated to prevent parents from parking on-site. There are secondary accesses on Orient Street to the north at School Lane and Sutherland Street. The School Lane access runs between the school buildings and houses and is used for maintenance purposes. The Sutherland Street access is located on the south side of the bus zone and is used for servicing and refuse collection vehicles. There are multiple pedestrian access points on both Orient Street and Sutherland Street.

The key transport facilities surrounding the school is shown in Figure 3.1.



Source: Nearmap

Figure 3.1: Key KPS Transport Facilities

3.2 Road Network

Details of the surrounding road network are provided in Table 3.1.

Table 3.1: Surrounding Road Network

Road Name	Jurisdiction	Hierarchy	Lanes	Divided	Posted Speed
Orient Street	Council	Local	2	No	50km/h 40km/h (school peaks)
Sutherland Street	Council	Collector	2	Yes	50km/h 40km/h (school peaks)
Viking Street	Council	Local	2	No	50km/h
Omar Street	Council	Local	2	No	50km/h 40km/h (school peaks)

The surrounding roads generally have unrestricted parking except for the bus zone and kiss'n'drop zones on Orient Street and Sutherland Street. The bus zone is sign posted as "8:00-9:00am and 2:30-4:00pm School Days". The kiss'n'drop zone is sign posted as "5-minute parking" which restricts long stay car parking and is intended for a high turnover of vehicles.

The surrounding key intersections in proximity to the subject site are summarised in Table 3.2.

Table 3.2: Surrounding Key Intersection Details

No.	Major Road	Minor Road	Jurisdiction	Control
1	Sutherland Street	Orient Street	Council	Priority
2	Sutherland Street	Pearl Street	Council	Roundabout
3	Viking Street	Orient Street	Council	Priority
4	Sutherland Street	Viking Street	Council	Priority

The location of the key intersections with respect to the KPS is shown in Figure 3.2. During site visits, Omar Street was observed to have little to no traffic. A few vehicles were observed to park on Omar Street for pick-up / drop-off however this was a minor amount. Omar Street has therefore not been included in the key intersections.

Source: Nearmap

Figure 3.2: Key Intersections

3.3 Available Sight Distance

A review of the Sutherland Street / Orient Street intersection has identified limited sight lines due to the intersection layout and the hilly terrain. Austroads *Guide to Road Design Part: 4a Unsignalised and Signalised Intersections* Safe Intersection Stopping Distance (SISD) requires a minimum SISD of 95m for an intersection with a design speed of 50km/h and upward slope of 8%. Source: Nearmap

Figure 3.3 shows the available sight distance at the Sutherland Street / Orient Street intersection.

Source: Nearmap

Figure 3.3: Sutherland Street / Orient Street Sight Distance Assessment

A review of the TfNSW *Interactive Crash Statistics* shows no recorded crashes occurring at the Sutherland Street / Orient Street intersection since 2015 (earliest available year). Based on the crash history, despite the available sight distance being less than the SISD, there is no existing safety issue at the Sutherland Street / Orient Street intersection. This is likely a result of the low traffic volumes associated with the right turn movement from Orient Street to Sutherland Street. However, it is noted consolidating the kiss 'n' drop to Orient Street may increase the right turn traffic volumes and the crash risk at the Sutherland Street / Orient Street intersection.

Based on further discussions with Council (in July 2021) and the outcomes of their discussion at the Local Traffic Committee (in February 2021) a right turn ban was however not supported at this point in time.

3.4 Alternate Transport

3.4.1 Active Transport

The current active transport facilities surrounding the school are shown in Figure 3.4. There is steep terrain surrounding KPS as its located at the top of a hill. Some parts are so steep that pathways have been constructed as stairs.

There is a lack of pedestrian connections on the western side of Orient Street and the eastern side of Sutherland Street, which impacts direct pedestrian access to the school. The paths fronting the school are not wide enough for shared use.

Source: Nearmap

Figure 3.4: Key Active Transport Facilities

The KPS student enrolment boundary is generally within a 3.6km cycle catchment (i.e. 15-minute ride). Majority of students live in the south towards Casuarina where the key active transport barriers include the undulating terrain and high traffic volumes on Sutherland Street.

Figure 3.5 details the existing active transport network within key walk and bicycle catchments.

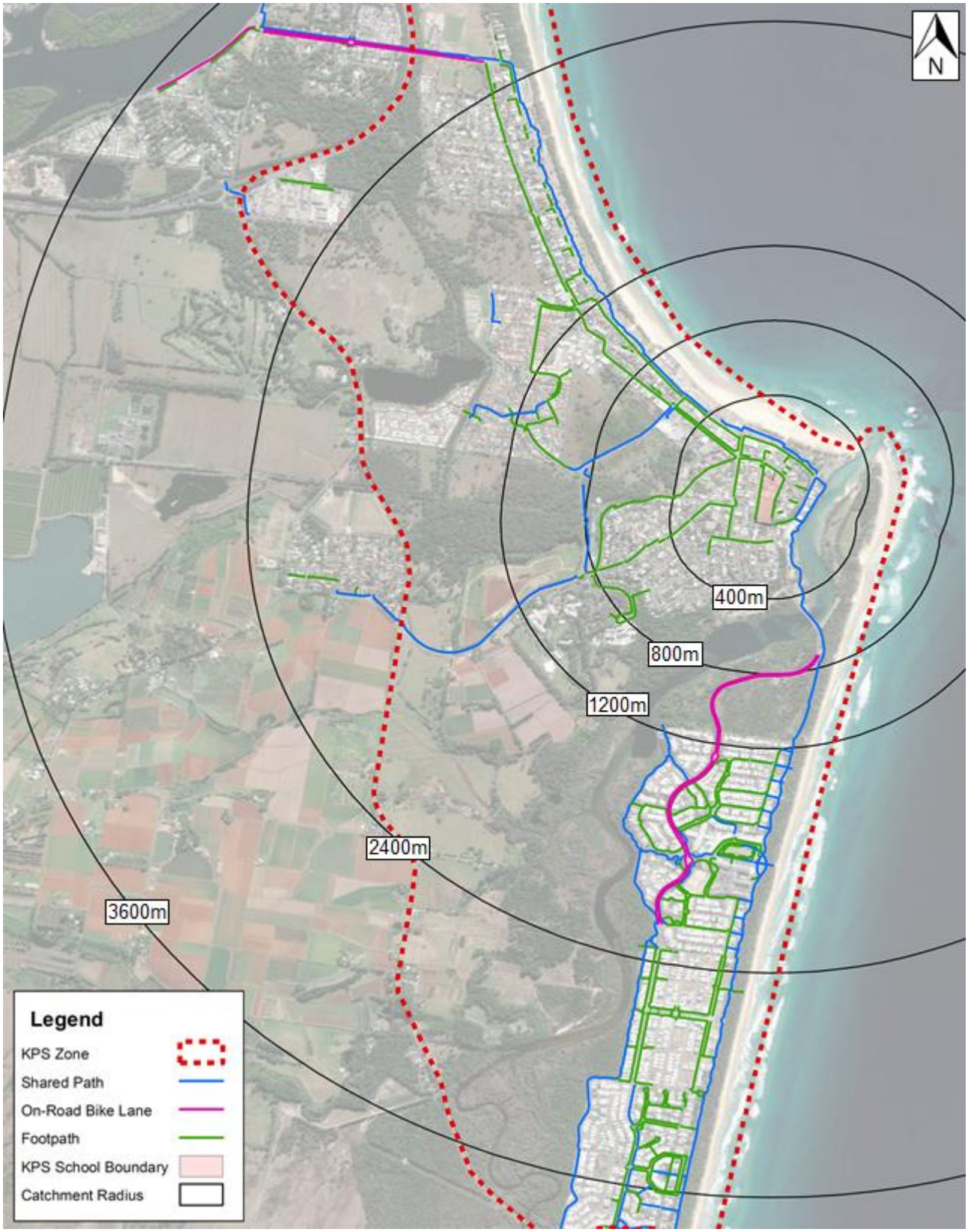


Figure 3.5: Key Active Transport Provisions

As shown above, there are active transport connections within the surrounding residential catchments to the north and south, though there is a lack of continuity with several key missing links and safe crossing locations.

Based on information provided, the students living within walk and cycle catchments are detailed in Table 3.3.

Table 3.3: Student Population within Walk and Bicycle Catchments

Catchment	Distance	Student Population	Proportion
400m	5min walk	80	13%
800m	10min walk	135	22%
1200m	15min walk / 5min bicycle	190	31%
2400m	10min bicycle	350	57%
3600m	15min bicycle	497	81%

As stated previously, the pedestrian entrances are located on Orient Street and Sutherland Street. There are missing connections and crossing facilities to these accesses which are needed to encourage active transport participation and improve safety. Further, there are opportunities to provide high quality infrastructure, generally within 1.2km of the school, to provide a continuous network and cater for the potential walk and bicycle demand.

A detailed analysis of the active transport deficiencies surrounding the school was undertaken and shown in Figure 3.5.

Source: Nearmap

Figure 3.6: Active Transport Deficiencies

The identified deficiencies are detailed as follows:

- **D1** - Pathway on northern side of Sutherland Street (210m missing link) with two kerb ramps required to cross Palmers Lane
- **D2** - Pathway on eastern side of Sutherland Street (190m missing link) with two kerb ramps required to cross Hungerford Lane
- **D3** - Pathway on western wide of Orient Street (360m missing link)
- **D4** - Pathway on eastern side of Orient Street (130m missing link)
- **D5** - Pathway on northern side of Viking Street (140m missing link)
- **D6** - Existing refuge crossing is too far from pedestrian desire lines (Orient Street to Marine Parade)
- **D7** - The roundabout does not provide safe crossing facilities
- **D8** - Existing crossing is unsafe during school peaks and pathway is too narrow
- **D9** - Crossing deficiency associated with kiss'n'drop on opposite side of Sutherland St - Not recommended for upgrade
- **D10** - School crossing to be installed on Orient Street north of Omar Street to accommodate pedestrians from the south
- **D12** - Pathway links on Omar Street to connect to the new school crossing on Orient Street.

The deficiencies identified on the school's frontage (D3, D4 and D10) are planned to be rectified as part of the KPS redevelopment in consultation with Council. The deficiencies located further away would be expected to be rectified as part of the revised PAMP and Bike Plan inclusions for the greater active transport network. The status of these deficiencies is to be tracked in the School Transport Plan (STP) provided in **Appendix B**.

During the initial site observations and assessment D9 was identified as a crossing deficiency as the eastern side of Sutherland Street was utilised for pick up / drop off and informal crossings were occurring in this location. However, considering the available and more desired crossing to the north and south of the eastern school access D9 is not recommended. These existing pedestrian refuge facilities are considered more desired crossing locations due to the bus and traffic conflicts directly fronting the school access.

To note, SINSW has recently assisted Council in the gaining funding for an updgrade for a shared path on the opposite site of Sutherland Street. As of August 2021, a shared pathway on the eastern side of Sutherland Street was constructed but not completed opened when further site observations had occurred.

3.4.2 Public Transport

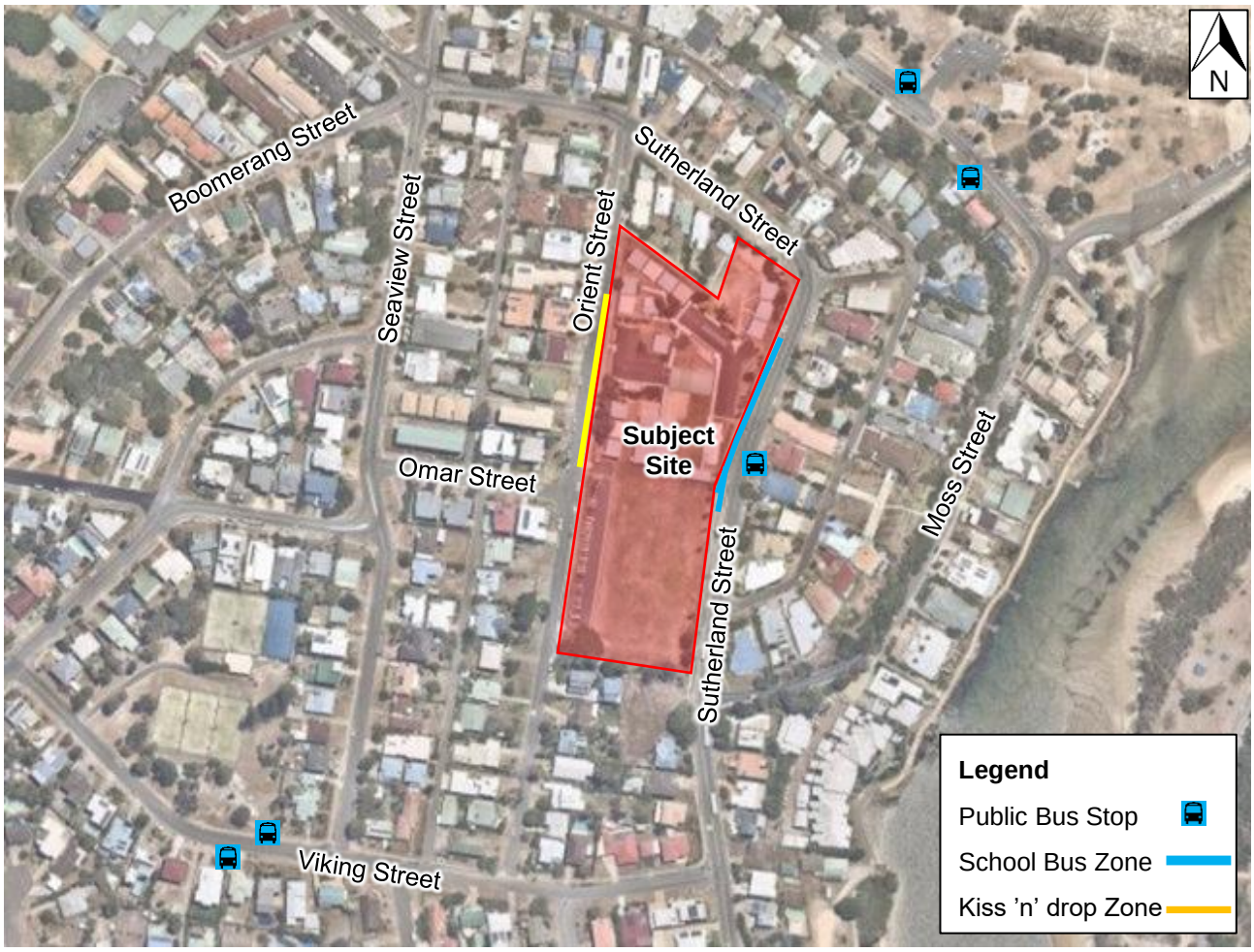
Based on previous site observations, it was recommended that the kiss'n'drop be relocated from Sutherland Street to Orient Street and relocate the bus drop-off / pick-up from Orient Street to Sutherland Street. This treatment removed the high turnover kiss'n'drop activities from the high volume, high order road (Sutherland Street to the low volume, lower order road (Orient Street) and allows the capacity of the Orient Street kiss'n'drop to be increased.

The existing bus zone on Sutherland Street can also be increased to the north to accommodate four buses which is the maximum expected at any one time, and pavement width from boundary to kerb. The bus zone on the Sutherland Street frontage has a wider shoulder than standard (approximately 3-4m wide) and the existing shoulder north of this is narrower (2.5m wide). As the traffic lane width is standard (3.5m wide), the overall width (6.0m wide) is expected to be adequate for a bus zone.

The bus zone on the Sutherland Street is located within the 40km/hr School Zone with kerb, hard stand and signage works proposed to formalise and improve the facility.

Overall as a result of the proposal, there vehicle conflicts are reduced with an improvement in operations, traffic efficiency and road safety. This recommendation was adopted by Council in Term 2, 2021 and recent site observations confirmed an improvement in the kiss'n'drop operations and increase in safety on Sutherland Street.

The public transport facilities surrounding the school are shown in Figure 3.7.



Source: Nearmap

Figure 3.7: Key Public Transport and Drop-off Facilities

KPS is serviced by both public and school bus services. These services are operated by Surfside Bus Lines and service other primary and high schools within the Kingscliff and Tweed Heads region. The bus stop infrastructure varies and includes 17 sheltered stops.

The school services operate as hail 'n' ride so students are able to get on the bus at any location in lieu of bus stop infrastructure. Based on the information provided, the following is noted regarding the bus services:

- 460 students (75%) live within 400m of a bus stop
- 592 students (96%) live within a 400m of a bus route
- 313 students (51%) have been issued a school bus pass.

School students can receive free bus passes to travel to and from school, with eligibility based on the distance the student lives from the school and the age of the student for primary students.

Many of the school bus routes overlap and circulate through the local road network servicing several other schools. KPS bus timetable is summarised in Table 3.4.

Table 3.4: Bus Route Information

Route Number	Route	Start	Finish
AM			
1222	From North Kingscliff & Noble Park	8:15	8:30
1224	From Fingal Heads, Chinderah, Tweed Coast Road, Cudgen Road and Kingscliff High School	8:08	8:29
1217	From Oyster Point & Kingscliff (1st trip)	8:00	8:27
1217	From Kingscliff & Chinderah (2nd Trip)	8:41	8:54
1219	From Salt / Casuarina North	8:18	8:30
1221	From Round Mountain Road / Cudgera Creek	7:43	8:31
1228	From Bogangar & Casuarina South	8:07	8:30
1237	From Pottsville, Koala Beach, Hastings Point & Cabarita	7:37	8:30
1227	From West Tweed, Bilambil, Terranora, Oxley Cove & Barneys Point	8:04	8:33
1232	From Banora Point East	8:15	8:32
PM			
1207	To Cudgen, Chinderah & Kingscliff	3:05	3:26
1237	To Casurina Central	3:05	3:15
1215	To Casuarina South & Bogangar	3:05	3:24
1234	To Kingscliff & Chinderah	3:13	3:30
1213	to Banora Point	3:25	3:49
1223	To Casuarina North	3:05	3:12
1210	To Bogangar, Hastings Point, Koala Beach & Pottsville	3:05	4:15

The public and school bus route network shown in Figure 3.8 has been summarised into AM and PM bus routes.

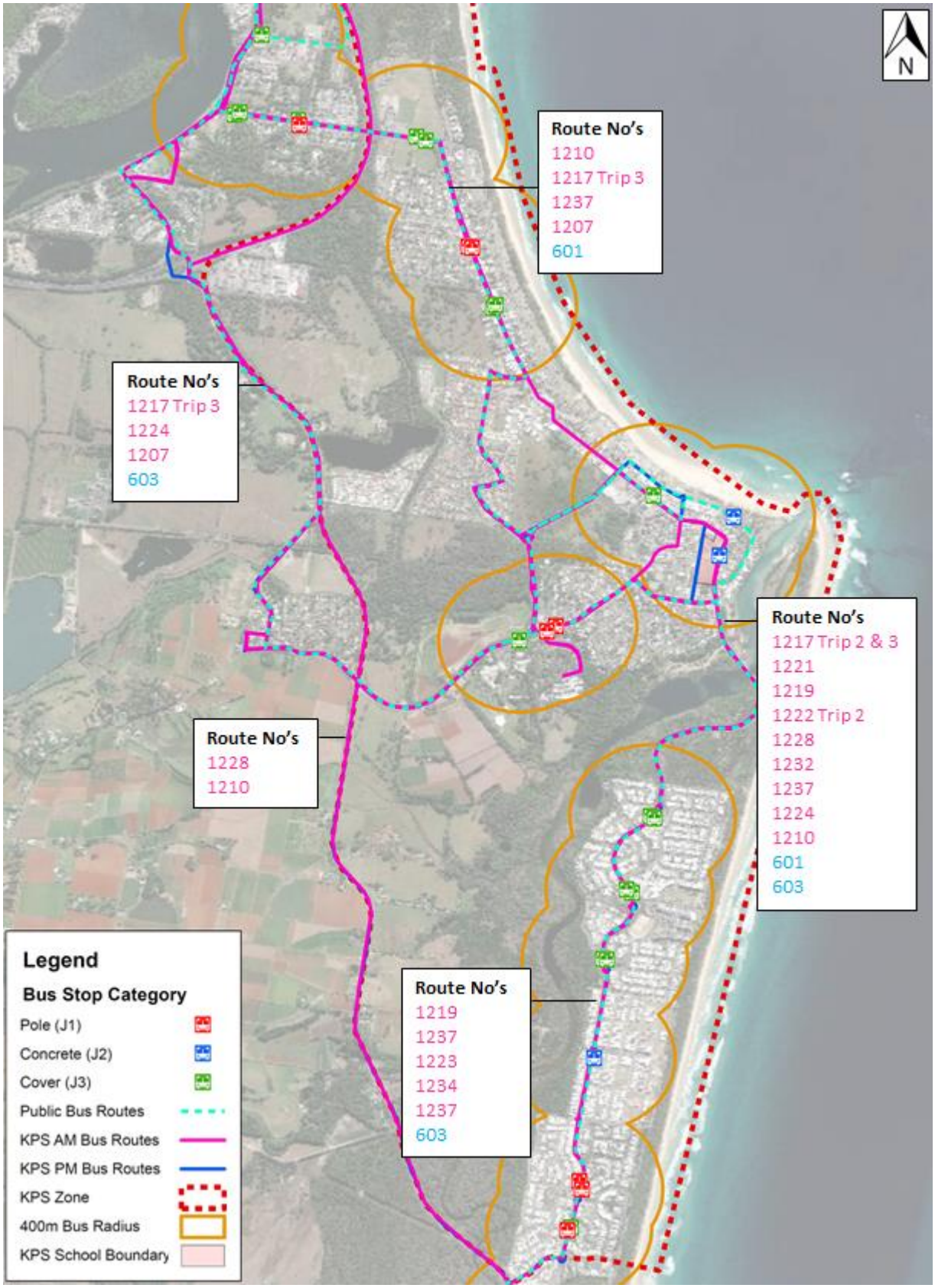


Figure 3.8: Existing Public Transport Provisions

Surfside Bus Lines do not record occupancy data and there is no electronic data collection in place (i.e. smart card – Opal Card). Surfside Bus Lines have stated that the bus routes generally experience high occupancy.

Discussions with Surfside Bus Lines indicate that the bus routes have been modified slightly over the years to suit the changing student demands, however there are significant limitations in implementing efficiencies or additional services.

Any changes to the public transport arrangements are to be documented in the STP provided in **Appendix B**.

3.5 School Arrival and Departure Operations

3.5.1 Morning Peak Operations (Arrival)

A site visit was undertaken on 19 November 2019 to observe drop-off / pick-up operations and general traffic and parking conditions during the morning and afternoon peak periods, respectively. The following traffic and transport-related observations were made during the morning peak:

- Orient Street is the primary access and drop-off / pick-up location
- On-street parking restricts two-way traffic on Orient Street except between the school crossing and staff car park entry driveway
- Numerous vehicles were observed to be performing U-turns near the school crossing to queue for the drop-off / pick-up zone
- The queues to enter the Orient Street drop-off / pick-up zone extended back to Sutherland Street
- The off-street car park is restricted to staff only
- Many vehicles parked across the grassed area to the south of the bus bay and blocked the footpath on Sutherland Street
- Vehicle queues extended back from the drop-off / pick-up into the bus bay on Sutherland Street
- There is a lack of pedestrian connections on the western side of Orient Street and the eastern side of Sutherland Street.

3.5.2 Afternoon Peak Operations (Departure)

The drop-off / pick-up operations and issues observed during the morning peak are consistent with the afternoon peak, however some of these issues are exacerbated due to the larger concentration vehicles. Observation have been conducted in November 2019 and in July 2021.

The following updated (July 2021) traffic and transport-related observations were made during the afternoon peak:

- Parents / carers began to arrive for pick-up approximately 15 minutes before school concluded since updated arrangements and signage improvements have been made to the Kiss n Drop area
- Two staff members managed the drop-off / pick-up on Orient Street and was observed to be efficient as students stayed within school grounds until their surname was called out
- Vehicle queues extended back on Sutherland Street to turn right into Orient Street however cleared within 8 minutes after the school bell
- Vehicles parking on the southern side of Sutherland Street and eastern side of Orient Street creating pinch point to exacerbate issue for queuing and blocking through traffic on Sutherland Street.
- Kiss’n’drop operated efficiently accommodating a high turnover of vehicles however start of kiss’n’drop could be better utilised

- Many students were observed to be crossing midblock near the Orient Street / Omar Street intersection with the mid-block school crossing under utilised

Figure 3.9, Figure 3.10 and Figure 3.11 show the observations and issues identified on-site. These matters will be addressed through treatments associated with the proposed development.

Source: Site visit 19/11/2019

Figure 3.9: Pedestrian Pathway blocked by vehicles on Sutherland Street

Source: Site visit 27/07/2021

Figure 3.10: On Street Parking on Orient Street near corner of Sutherland

Source: Site visit 27/07/2021

Figure 3.11: Vehicle Parking on southern side of Sutherland restricting traffic

To address these two issues identified above, parking on Sutherland Street be formalised and time of day no stopping provisions be installed on the eastern side of Orient Street and southern side of Sutherland Street near the intersection of these two roads.

These upgrades are noted further herein in Section 4.0, with concepts contained in **Appendix A.**

3.6 Transport Mode Share

A student and staff travel mode share survey was undertaken to determine the existing travel behaviours. The estimated mode share split of students is provided in Figure 3.12.

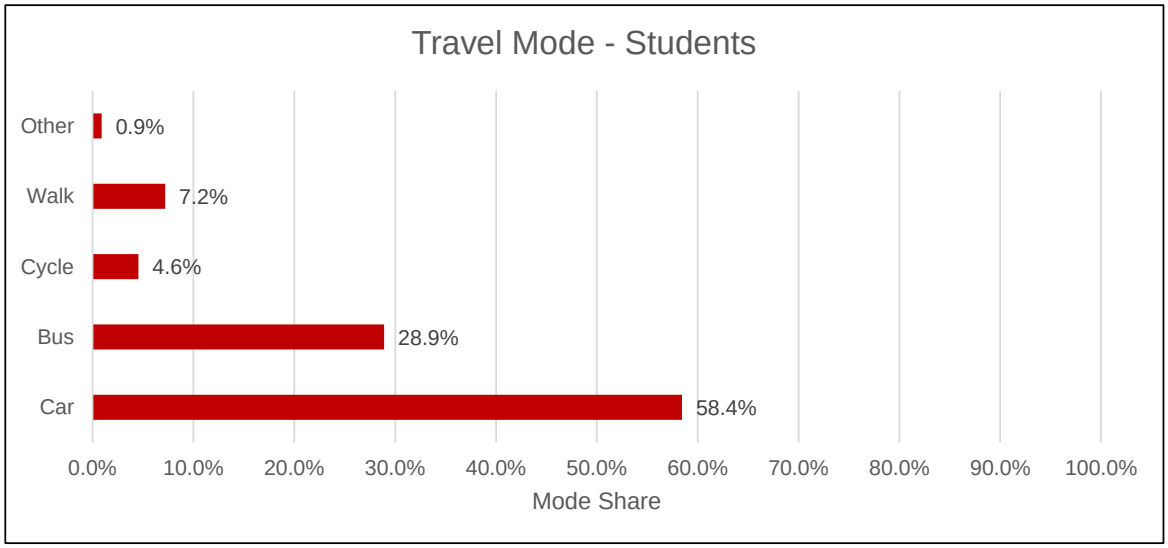


Figure 3.12: Student Travel Mode Share

As shown, buses are generally well used by students and during the site visit several school buses were observed to be at capacity. However, there is little opportunity to further increase public transport mode share without new services. Active transport participation, particular cycling could be increased given there is approximately 31% of students living within 1.2km walking catchment (i.e. 15-minute walk) and 81% of students within a 3.6km cycling catchment (i.e. 15-minute ride) to the school.

The estimated mode share spilt of staff is provided in Figure 3.13

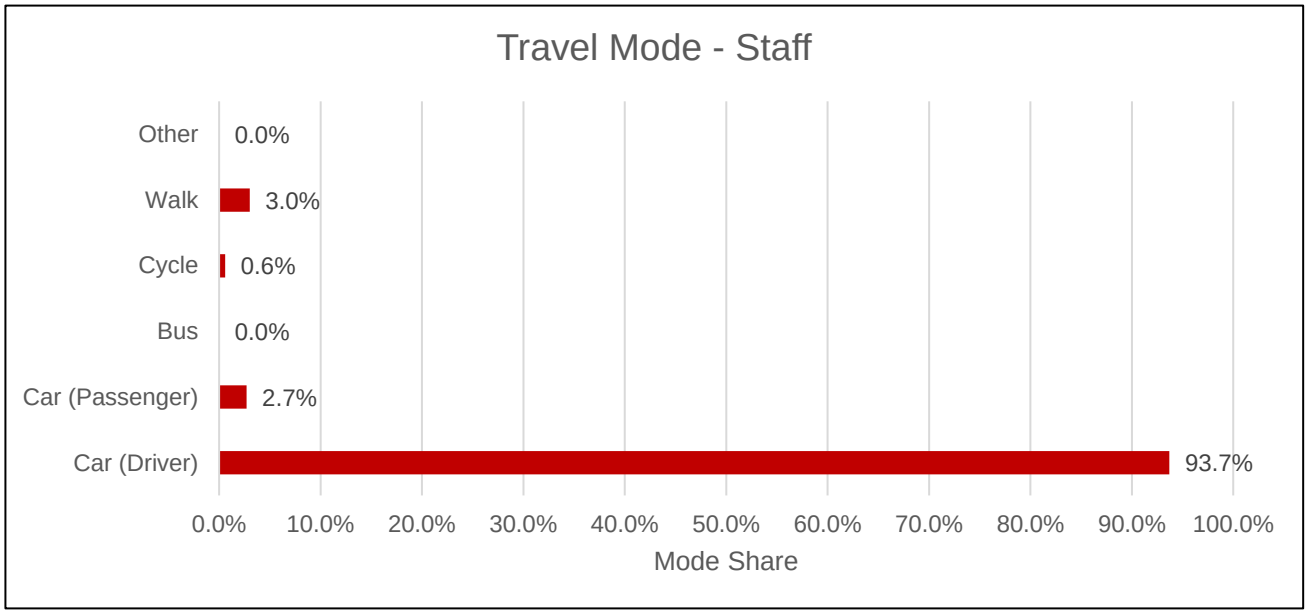


Figure 3.13: Staff Travel Mode Share

As shown, most staff drive to school and there is little alternate transport participation. It was identified in the survey that staff who drive to school typically participate in before and/or after work events of which there is no easy transport option aside from private vehicle. Further, unlike students, staff are not employed based on their place of residence and do not have to live within the school's enrolment catchment. This means that there may be no other transport options available for the entire trip from home to work and alternate modes of transport are not convenient. Travel options for staff are discussed in the STP provided in **Appendix B**.

3.7 Historical Crash Analysis

The TfNSW Centre for Road Safety's interactive crash statistics were used to source crash data for the area surrounding KPS. A review of reported crashes that occurred between 2015 and 2019 were analysed and identified a total of 14 crashes occurred in proximity to the school.

Figure 3.14 shows the location and Road User Movement (RUM) code of each crash.

Source: TfNSW Centre for Road Safety

Figure 3.14: Crash Analysis

As shown above, there has been two crashes involving pedestrians, one of which occurred on the school frontage. There are no other crash clusters or clear crash type trends present surrounding the school. The pedestrian crashes have been reviewed in detail and summarised in Table 3.5.

Table 3.5: Crash Analysis

Location	RUM Code	Comments
Orient Street / Omar Street intersection	0	Intersection crash occurred in 2019, vehicle hit pedestrian on the nearside. There is no pedestrian crossing and during the site visit many unsafe crossings were observed at this intersection as the school crossing is located too far north past the school entrance. Section 3.3.1 recommends the school crossing be relocated south to front the main school entrance. This is expected to reduce unsafe crossing behaviours as a formalised crossing facility will be in proximity to the entrance.
Pearl Street	0	Midblock crash occurred in 2019 from the nearside because of unsafe crossing behaviours. Pearl Street is typically parked out and sightlines are limited. There is an existing pedestrian refuge and zebra crossing located on Pearl Street in proximity to the crash location. It is recommended that education on safe crossing behaviours is prioritised to students and parents. This is identified within the STP in **Appendix B**.

4. PROPOSED DEVELOPMENT

4.1 Development Details

The proposal is to upgrade the campus to cater for existing enrolments and to accommodate the growing requirement for educational providers in the north coast region. This includes demolition of existing school buildings and construction of new facilities to provide improved facilities. The aim is to provide new classrooms and bike storage facilities on-site. As stipulated in Section 3.1, KPS currently caters for around 614 students and 37 staff. Based on the information provided, this assessment considers:

- **A maximum of 730 students.** This represents an increase of 116 students (19%) relative to the existing operations and enrolments (614 students). SINSW have identified that student growth is expected to occur in a linear fashion over the next 10 years
- **An additional 8 teaching staff.** This represents an increase of 21% relative to the existing (37 staff total). The total number of new staff is estimated to be 8 based on the student population growth to 730 students.

The student enrolment increase over the 10 year period from the anticipated year of opening (year 2022) to the 10 year design horizon (year 2032) is detailed in Table 4.1.

Table 4.1: Yearly Student Enrolment Increase

Year	Current	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Student Enrolments	614	625	635	646	656	667	677	688	698	709	719	730

Additional transport facility upgrades are included in the proposal as discussed in Section 3.3.1. These were originally identified in the RTA as deficiencies on the school's frontage.

The upgrades are shown on the development plans prepared by SJB Architects, along with external works concept plans and provided in **Appendix A**.

The recommended upgrades are discussed in Table 4.2.

Table 4.2: Proposed Transport Facility Upgrades

Reference / Location	Issue / Infrastructure Description	Benefit
D3	Pathway on western wide of Orient Street (360m missing link)	Provides a formal path on the external network adjacent to the school frontage which provides safe pedestrian connections to KPS
D4	Pathway on eastern side of Orient Street (130m missing link)	Provides a formal pathway south of the school and encourages path users to walk / cycle in safe locations
D10	School crossing to be installed north of Omar Street to accommodate pedestrians from the south	Provides a crossing location for pedestrian travelling from the south as the existing school crossing is too far north past the school entrance. This is a key desire line for pedestrians across Orient Street which should reduce the number of informal crossings
Additional on-street	Vehicles currently parking informally at this location	Provides an additional 9 formalised on-street spaces that can be utilised by the

Reference / Location	Issue / Infrastructure Description	Benefit
parking on Sutherland Street	Lack of parking on-site	school during peak times to reduce the impact on residential amenity. The number of spaces is subject to further detailed design including confirmation of emergency access arrangements. Refer to Figure 4.1 below and Appendix A.
Line marking and delineation on Orient Street	Vehicles parking close to the intersection of Orient Street and Sutherland Street creating a pinch point. Unclear delineation between the travel lane, on-street parking areas and kiss'n'drop area on Orient Street	Formalise and better delineate between the different zones to direct and slow vehicles, along with remove pinch points. Refer to Figure 4.2 and Appendix A for proposed signage and line marking provisions.

Some of the existing deficiencies which are located on or near the school frontage (D2, D67 and D9) have not been recommended for upgrade this stage.

D2 is located on the opposite side of Sutherland Street and NSWSI has recently assisted Council in the gaining funding for this upgrade. As of August 2021, D2 shared pathway on the eastern side of Sutherland Street was constructed as shown in Figure 4.3.

D6 relates to a new refuge crossing near Orient Street. The installation of this crossing would only be practical with the installation of a short right turn pocket from Sutherland Street to Orient Street. These works are not proceeding in line with consultation with Council. The crossing would also narrow Sutherland Street further and compromise the ability for through traffic movements during peak afternoon pick-up periods.

D9 is located on the school frontage on Sutherland Street however it is not recommended for upgrade as it relates to the previous school operations (prior to Term 2 2021) and would further encourage drop-off / pick-up on the opposite side of Sutherland Street. This location experiences high traffic volumes on and has an increase in buses fronting the school as a result of the recent changes. Alternate to this crossing point, the existing refuge islands located to the north and south of this location are promoted.

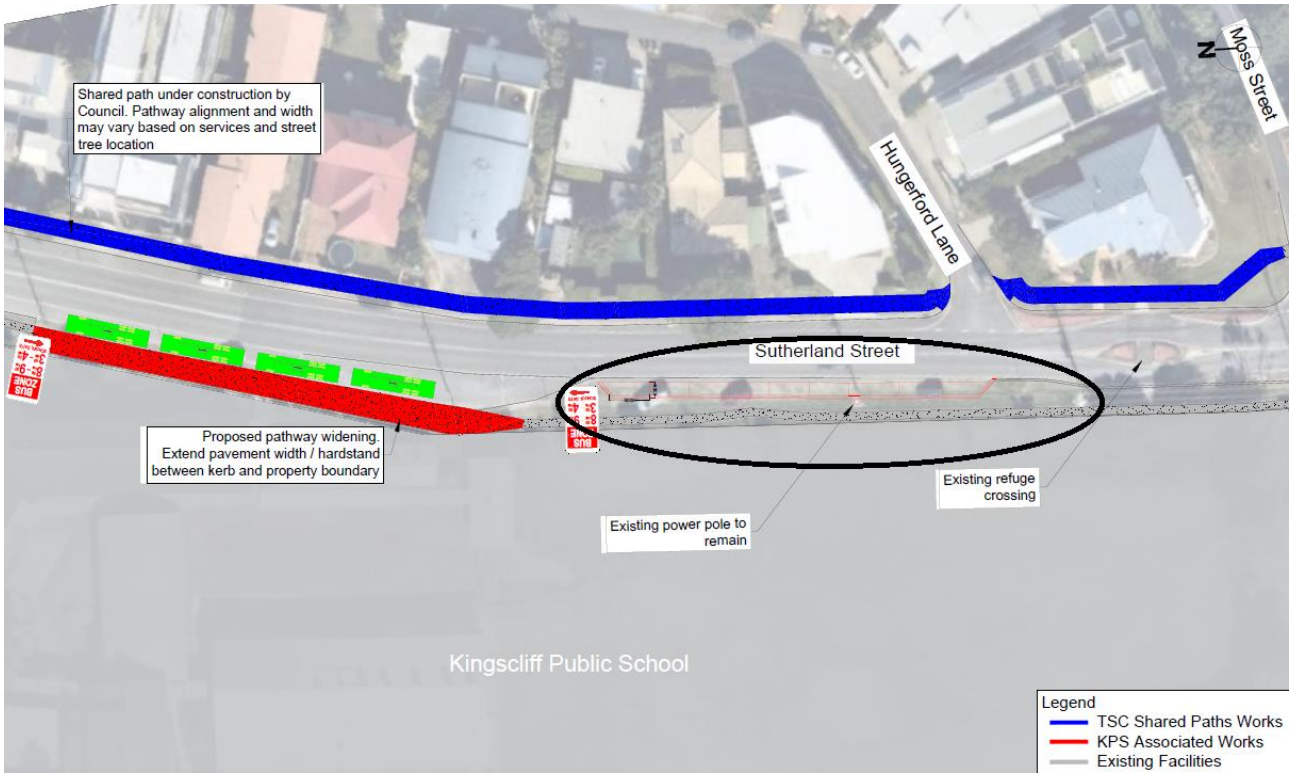


Figure 4.1: Formalised parking bays on Sutherland Street

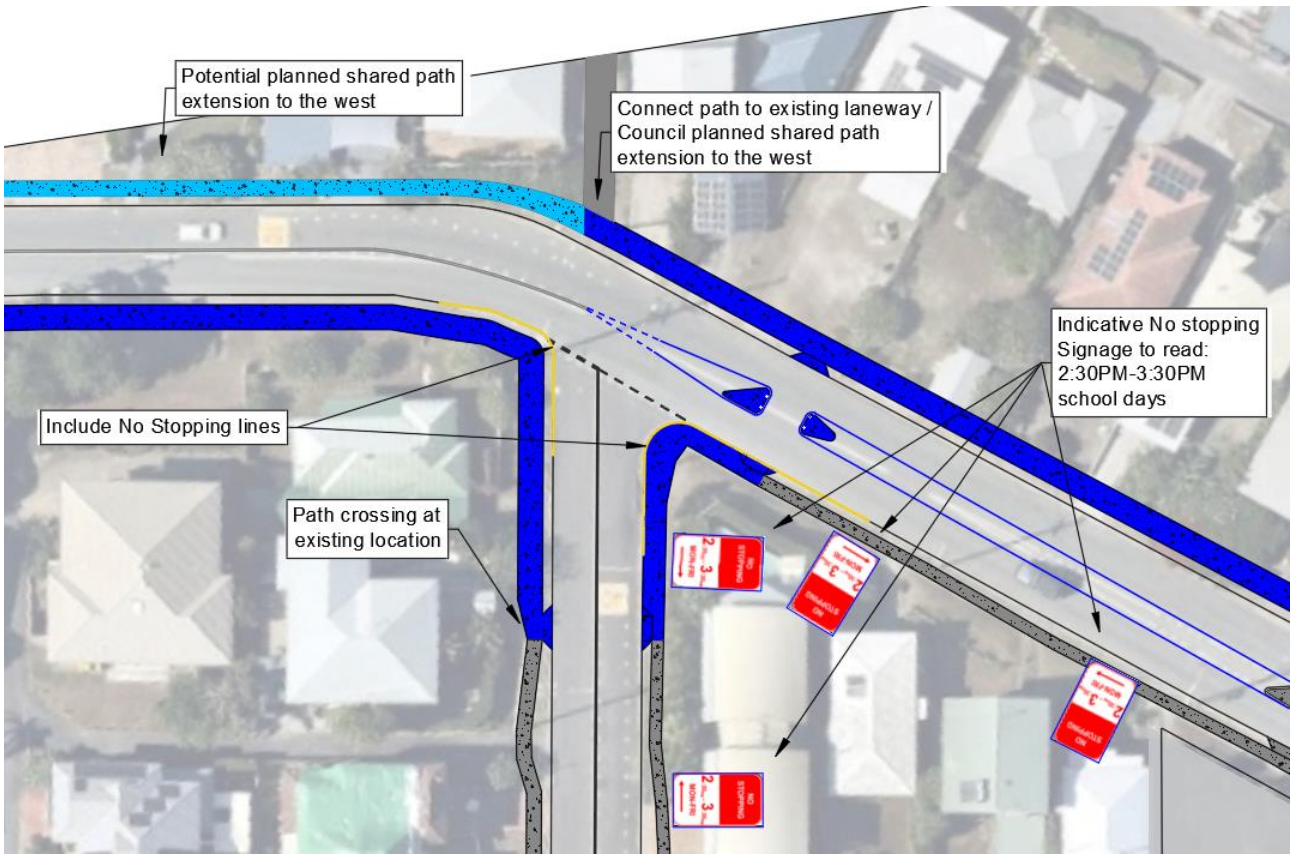


Figure 4.2: Proposed treatments around Orient Street / Sutherland Street intersection

Source: Nearmap

Figure 4.3: Recently Constructed Shared Path on Sutherland Street

5. ACCESS ASSESSMENT

5.1 Overview

The development proposes modifications to the existing vehicular and pedestrian crossing on Orient Street and Sutherland Street. These are discussed in detail in the subsequent sections.

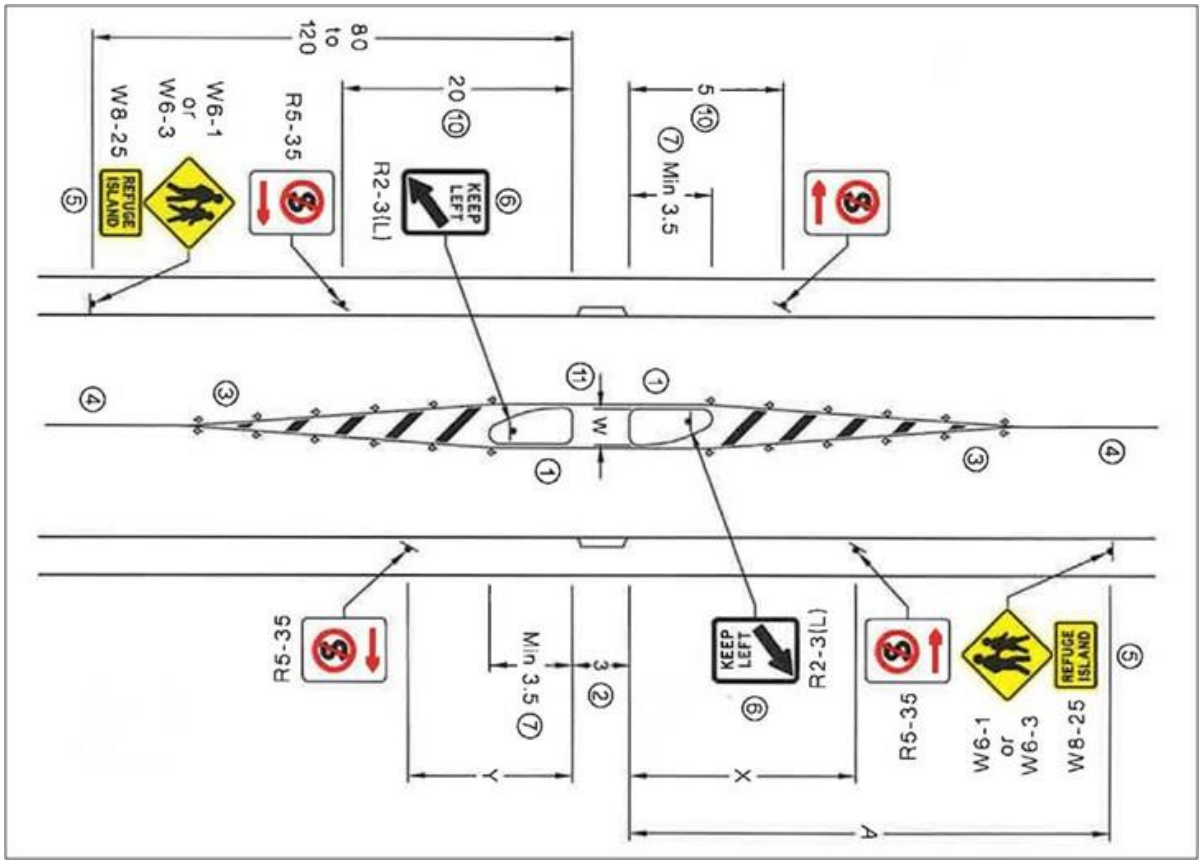
5.2 Pedestrian Access

Pedestrian access to the subject site is provided at four locations with two on Orient Street, as shown in Figure 3.1. The proposal includes an additional crossing on Orient Street (D10) to align with key pedestrian desire lines, as shown in Figure 3.6.

The location of the proposed pedestrian refuge crossing on Sutherland Street is to comply with the following requirements:

- Figure 7 of Australian Standards AS1742.10 Manual of Uniform Traffic Control Devices: Pedestrian Facilities
- Safe Stopping Distance (SSD) as stipulated in Section 5.3 of Austroads *Guide to Road Design Part 3: Geometric Design* (AGRD3)
- Crossing sight distance (CSD) as stipulated in Section 3.3 of Austroads *Guide to Road Design Part 4A: Signalised and Unsignalised Crossings* (AGRD4A).

The layout of the pedestrian refuge crossing as shown in *AS1742.10* is shown in Figure 5.1.



Source: AS1742.10 Manual of Uniform Traffic Control Devices: Pedestrian Facilities

Figure 5.1: Pedestrian Refuge Layout

Previously it was recommended to relocate the existing school crossing located at the northern end of Orient Street further south however it is noted a crossing directly fronting the main school entrance would significantly impact the on-street kiss'n'drop zone. It is therefore preferred that an additional school crossing on Orient Street, north of Omar Street be installed to accommodate crossings at the southern end of Orient Street. Sight lines on Orient Street in proximity to the proposed crossing location are sufficient given the flat and straight road environment.

A concept of the proposed school crossing on Orient Street is shown in Figure 5.2, with the exact location will need to be determined at the detailed design stage. Line marking to formalise the kiss'n'drop and on-street parking is also recommended north of the proposed crossing to assist in directing traffic. It is noted that the new crossing location is near the driveway crossover for the staff car park. This is not expected to create any issues due to the low number of car parking spaces and therefore low number of conflicts.

Source: Nearmap

Figure 5.2: Proposed School Crossing Concept – Orient Street

Based on a recent site observations, the school crossing was under-utilised, and majority of crossings occurred at the proposed crossing location or further north on Sutherland Street. Once the new proposed crossing is installed consideration may be given to having the existing school crossing could be removed as part of a separate project. This may allow for increased storing capacity on Orient Street and assist in reducing the queue onto Sutherland Street.

It is noted however given these queues do not extend over a significant period of time (i.e. typically clear within 8 minutes), removing the school crossing would not likely result in any noticeable improvement to vehicle queuing.

5.3 Vehicular Access

Vehicular access to the staff car parking area is provided via Orient Street with two one-way crossovers. These crossovers comply with Council's and AS2890.1 requirement in terms of location and form. Vehicular access to the school frontages is gained via a kiss'n'drop on Orient Street and a bus zone on Sutherland Street. It is recommended to line mark the kiss'n'drop and on-street parking facilities on Orient Street to formalise and better delineate between the travel lane and the kiss'n'drop area.

6. TRAFFIC ASSESSMENT

6.1 Overview and Methodology

The purpose of this traffic assessment is to determine the impacts of the proposed school upgrade on the external network, including the increase in student numbers and removal of the Sutherland Street kiss'n'drop facility. Traffic impacts have been assessed at the following key surrounding intersections:

- Sutherland Street / Viking Street
- Sutherland Street / Pearl Street
- Sutherland Street / Orient Street
- Viking Street / Orient Street.

As discussed previously, during site visits, Omar Street was observed to have little to no traffic. A few vehicles were observed to park on Omar Street for pick-up / drop-off however this was a minor amount. Omar Street has therefore not been included in the key intersections. The additional traffic associated with the upgrade of KPS has been determined based on the additional enrolments and staff as follows:

- 116 additional students
- 8 additional staff.

The existing school traffic was captured in traffic surveys. The methodology is summarised as follows:

- Source traffic survey data for the surrounding road network
- Separate out school traffic by defining the background volume and separating the peak spikes
- Forecast traffic volumes to the anticipated year of opening (2022) and the 10-year design horizon (2032).

The following sections detail the traffic assessment.

6.2 Traffic Surveys and Background Traffic

Existing traffic volumes were obtained from traffic surveys undertaken by Traffic Data and Control (TDC) on Thursday 19 November 2019 at the following intersections:

- Sutherland Street / Viking Street
- Sutherland Street / Pearl Street
- Sutherland Street / Orient Street
- Orient Street / Viking Street.

The survey results include the existing development traffic volumes for KPS. At the time that traffic surveys were undertaken KPS had 614 students and 37 staff.

The traffic survey data is provided in **Appendix D**. Traffic Network Diagrams are provided in **Appendix E**.

6.3 Existing School Traffic

The traffic surveys include traffic generated by the schools and other traffic. The school traffic was separated from other traffic by removing the spikes during the school bell times (8:00-9:00AM and 2:45-3:45PM). As schools have specific start and finish times, peak periods are well defined.

The assessment is considered conservative as a flat profile for background traffic was used, which does not consider peak period increases for non-school related traffic on the network (particularly in the morning where school and commuter peaks coincide). Figure 6.1 and Figure 6.2 show the background traffic for the Sutherland Street / Orient Street intersection daily peaks.

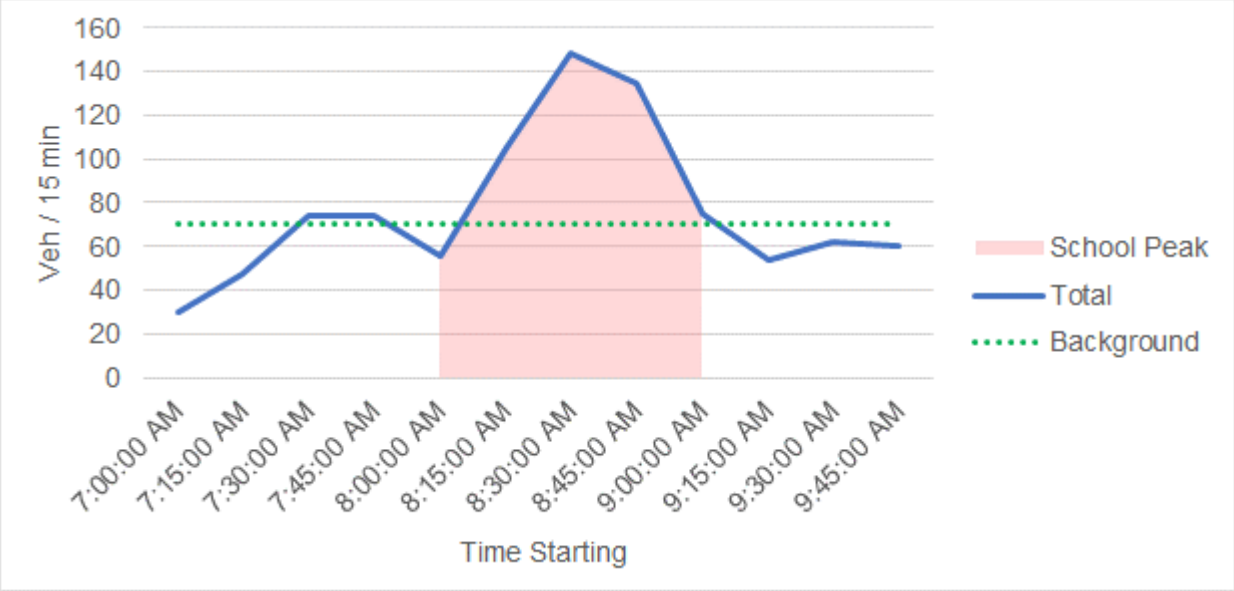


Figure 6.1: Morning Turning Movements at Sutherland Street / Orient Street

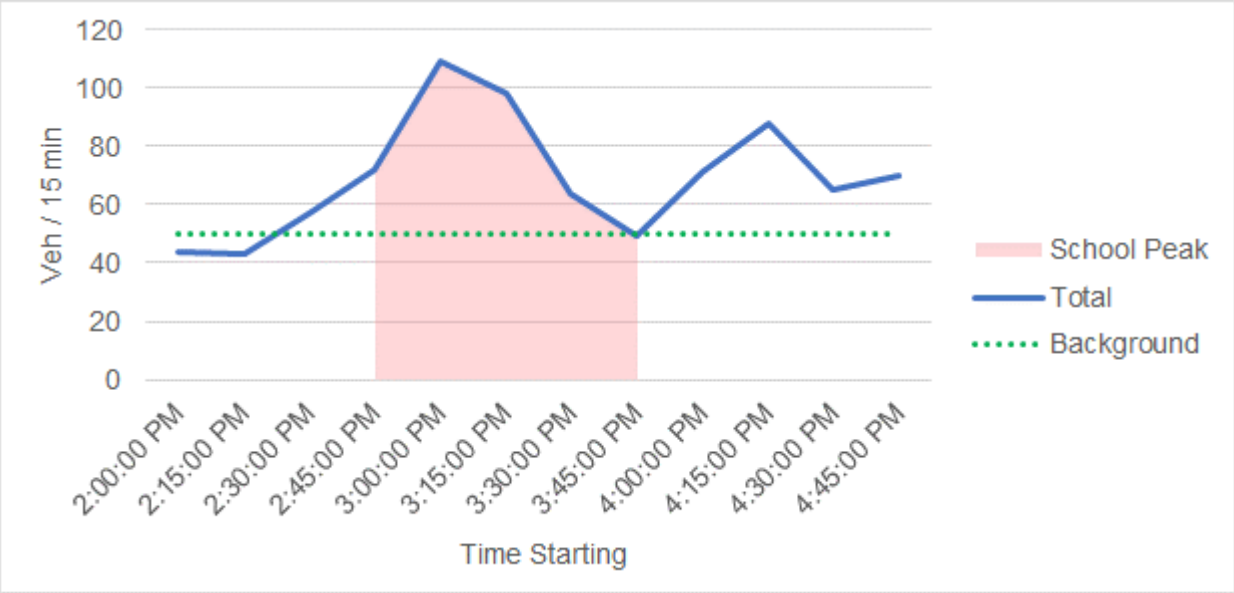


Figure 6.2: Afternoon Turning Movements at Sutherland Street / Orient Street

Existing school traffic was determined to be 164 trips in the morning peak hour and 143 trips in the afternoon peak hour. Trips were split into two categories:

- KPS staff – each member will generate one IN trip in the morning and one OUT trip in the afternoon
- KPS non-staff staff – the remaining of trips were assigned as non-staff trips.

A breakdown of existing traffic generation is presented in Table 6.1 and Table 6.2.

Table 6.1: Summary of Existing Trip Generation (AM Peak)

Component	Quantity		Peak hour trip rate		Peak Hour Trips
KPS Staff Trips	37	staff	1	per staff	37
KPS Non-Staff Trips	127	total non-staff trips	1	per non-staff	127
Total Existing					164

Table 6.2: Summary of Existing Trip Generation (PM Peak)

Component	Quantity		Peak hour trip rate		Peak Hour Trips
KPS Staff Trips	37	staff	1	per staff	37
KPS Non-Staff Trips	106	total non-staff trips	1	per non-staff	106
Total Existing					143

The following splits for existing school traffic were adopted:

- Staff – 100% IN for the morning and 100% OUT for the afternoon
- Non-staff splits (pick-up/drop-off) – 50% IN / 50% OUT for both the morning and afternoon peaks.

Existing Traffic splits are presented in Table 6.3 and Table 6.4.

Table 6.3: Existing School Traffic Splits (AM Peak)

Component	IN %	OUT %	IN Trips	OUT Trips
KPS Staff Trips	100%	0%	37	0
KPS Non-Staff Trips	50%	50%	64	64

Table 6.4: Existing School Traffic Splits (PM Peak)

Component	IN %	OUT %	IN Trips	OUT Trips
KPS Staff Trips	0%	100%	0	37
KPS Non-Staff Trips	50%	50%	53	53

6.4 Forecast Background Traffic

A compounding growth rate of 1.54% per annum was used to forecast background traffic to future years. This is consistent with the medium growth scenario adopted for the Tweed Road Development Strategy (TDRS). Existing school traffic was first removed from the survey volumes before applying the growth rate and then re-introduced afterwards to provide an accurate indication of growth in the area.

The growth rate was applied to through movements on Sutherland Street and through movements on Viking Street at the Viking Street / Orient Street intersection. The area surrounding the school is well developed with limited potential for background growth due to development in the short-medium term. The main growth expected is associated with the school upgrades, which has been catered for in the design traffic.

Traffic diagrams showing the forecast background traffic volumes through the network at the anticipated year of opening (Year 2022) and the 10-year design horizon (Year 2032) are provided in **Appendix E**.

6.5 Design Traffic

6.5.1 Traffic Generation

Traffic generation associated with the school upgrade has been estimated based on the proportional increase in staff and students as discussed in Section 4.1. As the student enrolments are expected to increase in a linear fashion, at the year of opening (2022) there will be 10% of the additional student enrolments and at 10-year design horizon (2032) there will be 100% of the additional enrolments. It is understood that the school upgrades will cater for an additional 8 staff and a 19% increase in overall student numbers. Non-staff trips were generated as a percentage increase of the existing non-staff trips.

The net increase in traffic for KPS associated with the proposed upgrade is summarised in Table 6.5 and Table 6.6.

Table 6.5: Development Traffic – Net Increase (AM Peak)

Component	Quantity		Peak hour trip rate		Peak Hour Trips
KPS Staff Trips	8	additional staff	1	per staff	8
KPS Non-Staff Trips	127	existing non-staff trips	19%	increase of non-staff	24
Total Additional					32

Table 6.6: Development Traffic – Net Increase (PM Peak)

Component	Quantity		Peak hour trip rate		Peak Hour Trips
KPS Staff Trips	8	additional staff	1	per staff	8
KPS Non-Staff Trips	106	existing non-staff trips	19%	increase of non-staff	21
Total Additional					29

As demonstrated, KPS is estimated to generate an additional 32 trips during the AM peak, and 29 trips in the PM peak.

6.5.2 Development Traffic Splits

Traffic splits consistent with those used for the existing traffic have been used. Development traffic splits are presented in Table 6.7 and Table 6.8.

Table 6.7: Development Traffic Splits (AM Peak)

Component	IN %	OUT %	IN Trips	OUT Trips
KPS Staff Trips	100%	0%	8	0
KPS Non-Staff Trips	50%	50%	12	12

Table 6.8: Development Traffic Splits (PM Peak)

Component	IN %	OUT %	IN Trips	OUT Trips
KPS Staff Trips	0%	100%	0	8
KPS Non-Staff Trips	50%	50%	12	12

6.5.3 Development Traffic Distribution and Assignment

Development traffic distributions are based on existing turning movements at each intersection and with consideration to the surrounding road network and land uses. Traffic distributions are provided in **Appendix E**.

Stick diagrams showing the design traffic volumes (i.e. background traffic plus traffic generation) on the network at the anticipated year of opening and 10-year design horizon are provided in **Appendix E**.

6.6 Intersection Assessment

6.6.1 Overview

The key intersections were assessed using SIDRA Intersection (Version 8) to determine development traffic impacts by comparing 'without development' (background traffic) and 'with development' (design traffic) for the anticipated year of opening (2022) and 10-year design horizon (2032). The impacts were assessed during the morning and afternoon peak hours.

Each intersection is assessed in the following sections with a full copy of the SIDRA Intersection 8 outputs are provided in **Appendix F**.

6.6.2 Sutherland Street / Viking Street Intersection

The layout adopted for the Sutherland Street / Viking Street intersection is shown in Figure 6.3.

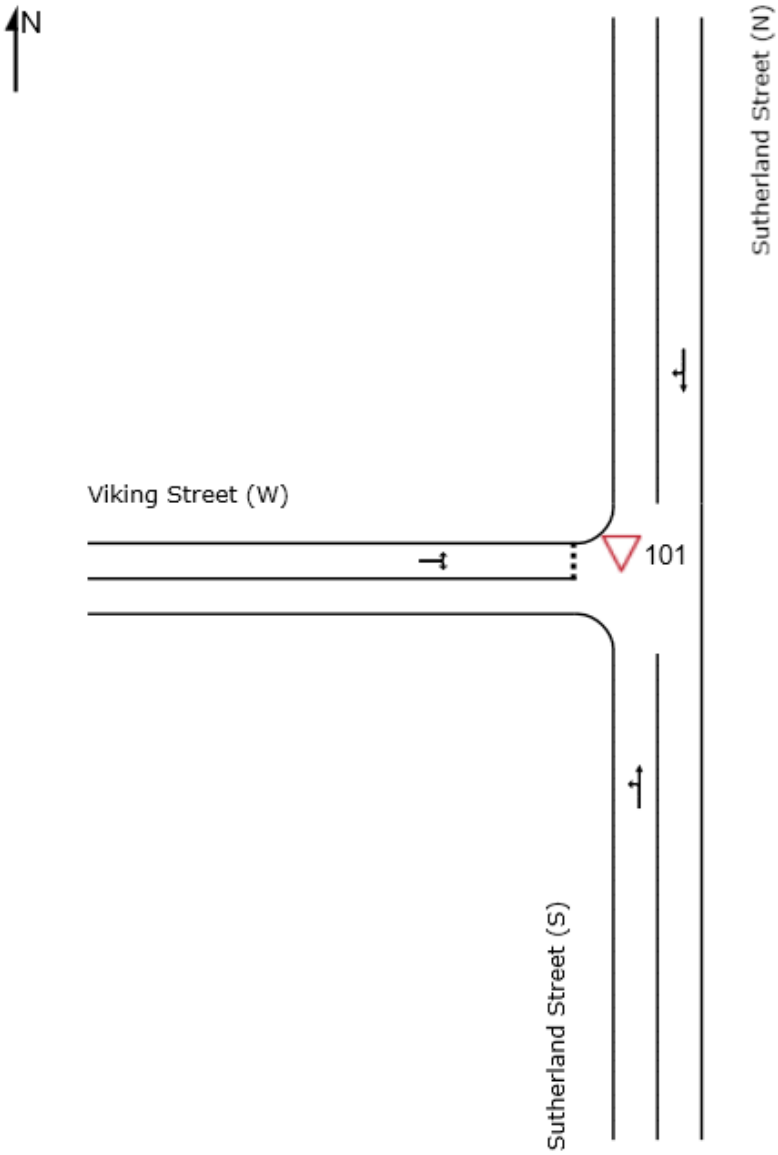


Figure 6.3: SIDRA Layout Sutherland Street / Viking Street Intersection

Table 6.9 summarises the SIDRA output for the Sutherland Street / Oxley Street intersection.

Table 6.9: Sutherland Street / Viking Street Intersection SIDRA Results

Year	Time Period	Scenario	DOS (v/c)	Average Delay (s)	Queue (m)
2022	AM (07:45 – 08:45)	Background	0.3	4	8
		Design	0.3	4	8
	PM (14:30 – 15:30)	Background	0.2	4	7
		Design	0.3	4	8
2032	AM (07:45 – 08:45)	Background	0.3	4	9
		Design	0.3	4	10
	PM (14:30 – 15:30)	Background	0.3	4	8
		Design	0.3	4	9

The SIDRA results indicate the Sutherland Street / Viking Street intersection operates within typical performance limits (in terms of DOS, delays, and queues) for a priority-controlled intersection. The results are generally consistent with site observations. The addition of the development traffic is shown to have a minor impact on the intersection performance. Therefore, the results do not warrant the need for any mitigation measures to be imposed on the proposed development.

6.6.3 Sutherland Street / Orient Street Intersection

The layout adopted for Sutherland Street / Orient Street intersection is shown in Figure 6.4.

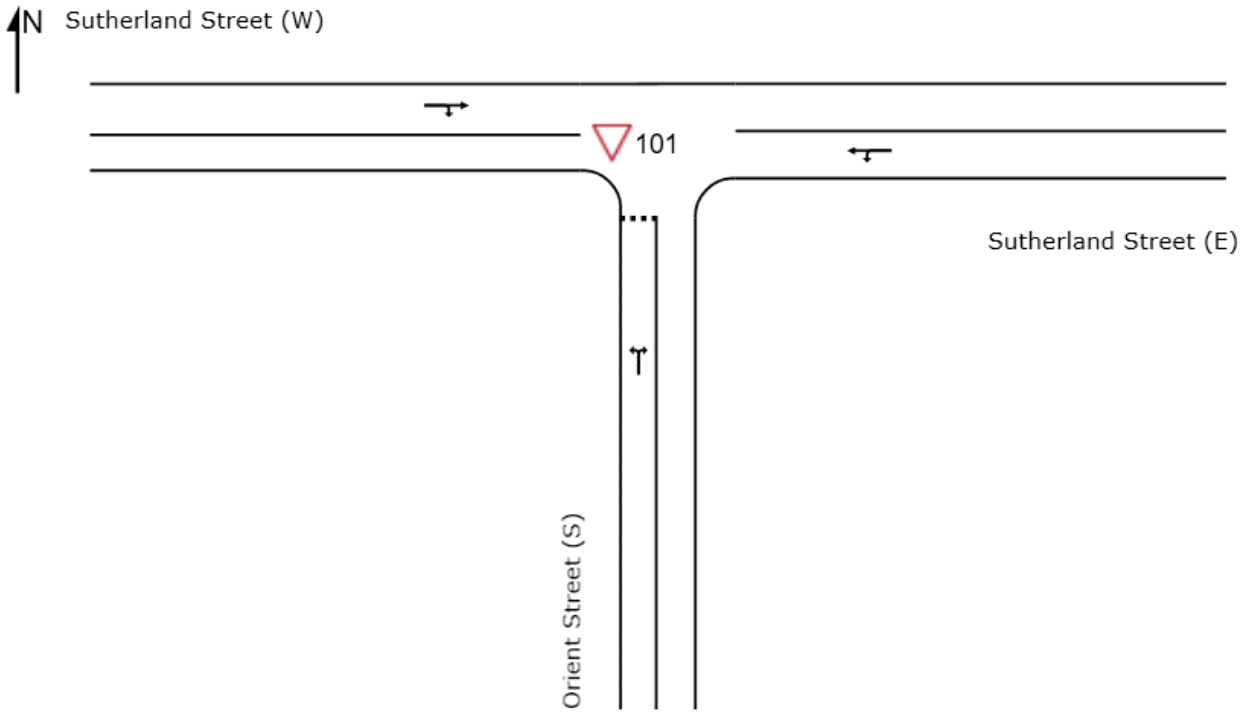


Figure 6.4: SIDRA Layout Sutherland Street / Orient Street Intersection

Table 6.10 details the SIDRA outputs for the Sutherland Street / Orient Street intersection.

Table 6.10: Sutherland Street / Orient Street Intersection SIDRA Results

Year	Time Period	Scenario	DOS (v/c)	Average Delay (s)	Queue (m)
2022	AM (07:45 – 08:45)	Background	0.2	2	5
		Design	0.2	2	5
	PM (14:30 – 15:30)	Background	0.1	2	3
		Design	0.1	2	3
2032	AM (07:45 – 08:45)	Background	0.2	2	6
		Design	0.2	2	6
	PM (14:30 – 15:30)	Background	0.1	1	3
		Design	0.1	2	4

The SIDRA results indicate the Sutherland Street / Orient Street intersection operates within typical performance limits (in terms of DOS, delays and queues) for a priority-controlled intersection. The results are generally consistent with site observations. The addition of the development traffic is shown to have a minor impact on the intersection performance. Therefore, the results do not warrant the need for any mitigation measures to be imposed on the proposed development.

6.6.4 Sutherland Street / Pearl Street Intersection

The layout adopted for the Sutherland Street / Pearl Street is shown in Figure 6.5.

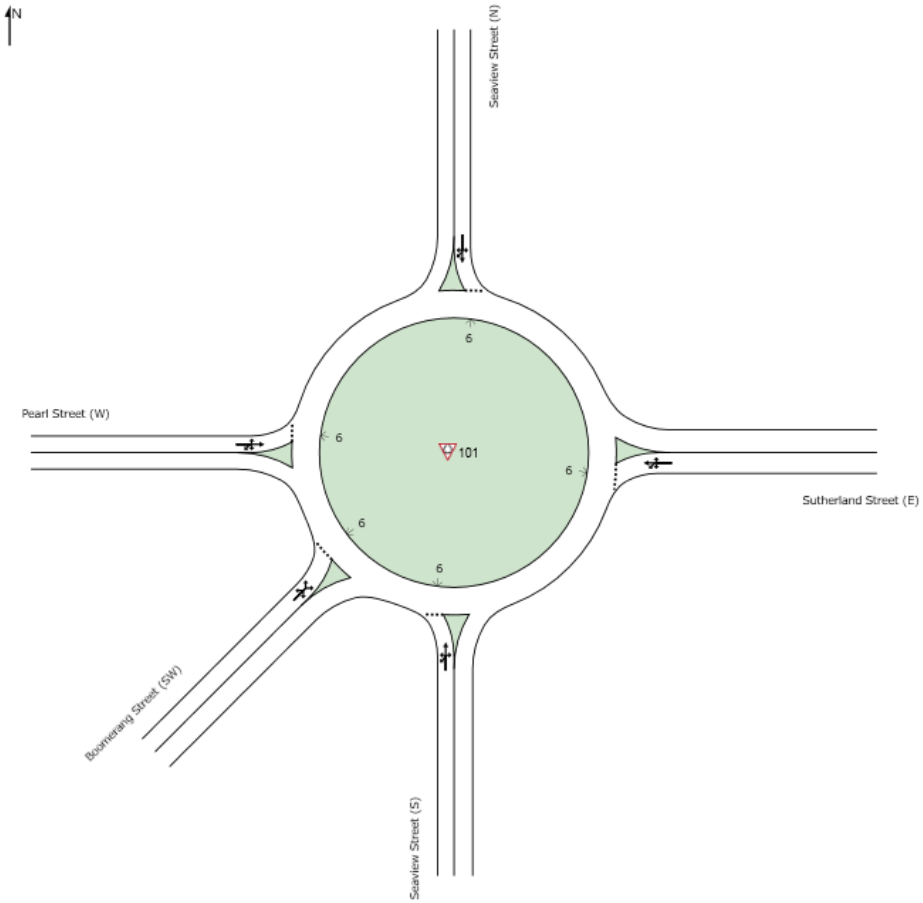


Figure 6.5: SIDRA Layout Sutherland Street / Pearl Street Intersection

Table 6.11 details the SIDRA outputs for the Sutherland Street / Pearl Street intersection.

Table 6.11: Sutherland Street / Pearl Street Intersection SIDRA Results

Year	Time Period	Scenario	DOS (v/c)	Average Delay (s)	Queue (m)
2022	AM (07:45 – 08:45)	Background	0.4	7	15
		Design	0.4	7	15
	PM (14:30 – 15:30)	Background	0.4	7	19
		Design	0.4	7	19
2032	AM (07:45 – 08:45)	Background	0.4	7	19
		Design	0.4	7	19
	PM (14:30 – 15:30)	Background	0.4	7	15
		Design	0.4	7	15

The SIDRA results indicate the Sutherland Street / Pearl Street intersection operates within typical performance limits (in terms of DOS, delays and queues) for a priority-controlled intersection. The results are generally consistent with site observations. The addition of the development traffic is shown to have a minor impact on the intersection performance. Therefore, the results do not warrant the need for any mitigation measures to be imposed on the proposed development.

6.6.5 Viking Street / Orient Street Intersection

The layout adopted for the Sutherland Street / Pearl Street is shown in Figure 6.6.

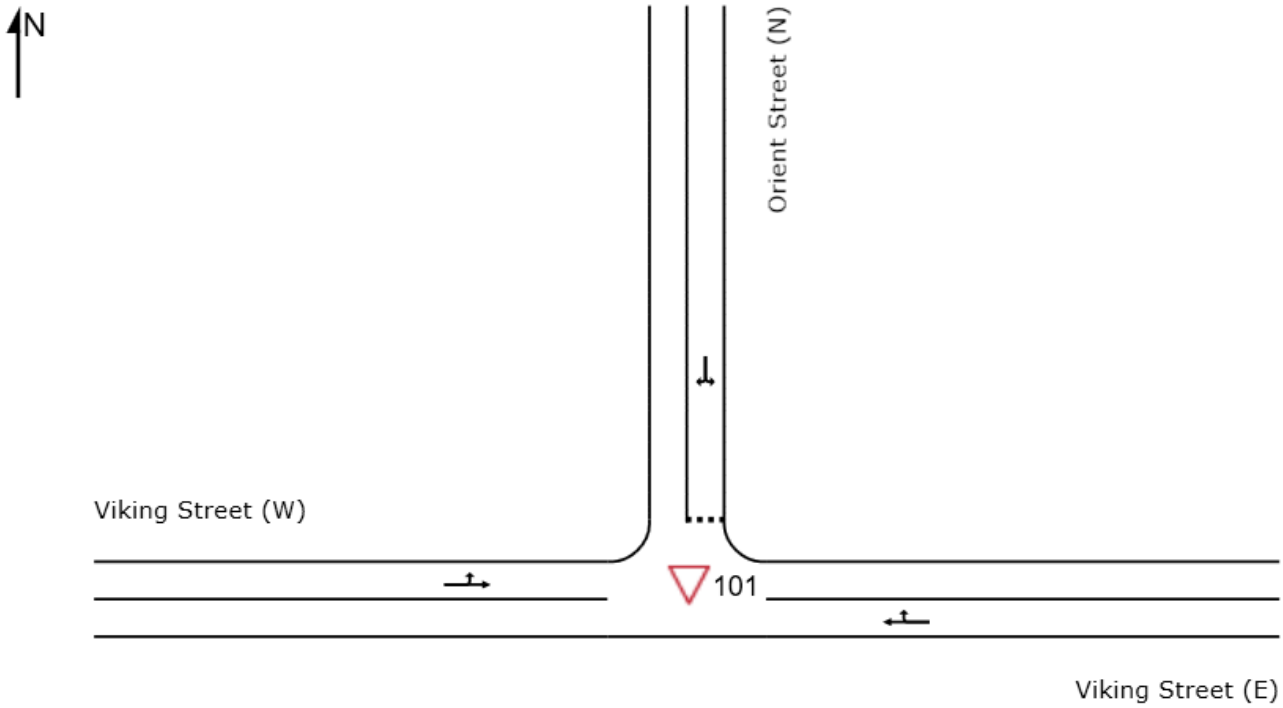


Figure 6.6: SIDRA Layout Viking Street / Orient Street Intersection

Table 6.12 details the SIDRA outputs for the Sutherland Street / Pearl Street intersection.

Table 6.12: Viking Street / Orient Street Intersection SIDRA Results

Year	Time Period	Scenario	DOS (v/c)	Average Delay (s)	Queue (m)
2022	AM (07:45 – 08:45)	Background	0.1	1	2
		Design	0.1	2	3
	PM (14:30 – 15:30)	Background	0.1	2	2
		Design	0.1	2	2
2032	AM (07:45 – 08:45)	Background	0.1	1	2
		Design	0.2	2	4
	PM (14:30 – 15:30)	Background	0.1	2	2
		Design	0.1	2	2

The SIDRA results indicate the Viking Street / Orient Street intersection operates within typical performance limits (in terms of DOS, delays and queues) for a priority-controlled intersection. The results are generally consistent with site observations. The addition of the development traffic is shown to have a minor impact on the intersection performance. Therefore, the results do not warrant the need for any mitigation measures to be imposed on the proposed development.

6.7 Daily Traffic

An assessment of daily traffic volumes was undertaken to identify any issues with environmental capacity for the key roads. The purpose of this is to determine the impacts of the re-configured Sutherland Street kiss‘n’drop and additional enrolments on the external road network.

Recorded daily traffic volumes were not available for the subject roads, being Sutherland Street, and Orient Street. Daily traffic volumes were estimated using the following method:

- Averaging the peak hour volumes and multiplying by a factor of 10. This method is commonly accepted for converting between peak hour and daily traffic volumes.

The environmental capacity of each road was estimated using Council's *Urban Roads Cross Sections Standards Drawing 001-003.* However, the subject roads may have been constructed to be a different standard and the road capacity is also dependant on the actual construction of the road (i.e. sub-grade). As such, the environmental capacity is an estimation only.

The Sutherland Street cross section closely resembles between a "*Low / Normal Volume Neighbourhood Connector Road"* which can cater for up to 7000 vehicles per day (vpd). Table 6.13 details the daily traffic of Sutherland Street for the anticipated year of opening (2022) and the 10-year design horizon (2032).

Table 6.13: Sutherland Street Daily Traffic Assessment

Year	Capacity (vpd)	Scenario	Average Peak (vpd)	Daily Volume (vpd)
2022	7000	Background	632	6315
		With Development	600	6000
2032		Background	706	7055
		With Development	685	6850

Sutherland Street exceeds the capacity threshold for a "*Normal Volume Neighbourhood Connector Road*" during the 2032 background scenario and may require further investigation.

Orient Street most closely resembles a "*Low Volume Neighbourhood Connector Road*" which can cater for up to 5000 vpd. Table 6.14 details the daily traffic of Orient Street for the anticipated year of opening (2022) and 10-year design horizon (2032).

Table 6.14: Orient Street Daily Traffic Assessment

Year	Capacity (vpd)	Scenario	Average Peak vpd	Daily Volume (vpd)
2022	5000	Background	82	815
		With Development	108	1080
2032		Background	82	815
		With Development	115	1145

Orient Street operates below the capacity threshold for a "*Low Volume Neighbourhood Connector Road*". No further investigation is required.

6.8 Traffic Impacts Summary

The key details of the traffic impact are as follows:

- The purpose of this traffic assessment is to determine the impacts of the additional school enrolments and the re-configuration of the Sutherland Street kiss‘n’drop on the external road network
- Traffic impacts have been assessed at the following intersections:
  - Sutherland Street / Viking Street priority-controlled intersection
  - Sutherland Street / Orient Street priority-controlled intersection
  - Sutherland Street / Pearl Street roundabout
  - Viking Street / Orient Street priority-controlled intersection
- For the scenario including the enrolment increase, the traffic generated by the KPS is expected to increase proportionally with the enrolments, which equates to an additional 32 trips during the AM peak and 29 trips during the PM peak
- For the year of opening (2022), it is anticipated that only 10% of the additional enrolments will be introduced to the road network with 100% of additional enrolments being achieved by the 10-year design horizon (2032)
- Based on SIDRA analysis all intersections assessed operate within typical performance thresholds and do not warrant the need for any mitigation measures to be imposed on the proposed development
- The re-configuration of the KPS kiss’n’drop is not anticipated to negatively impact the surrounding road network
- Sutherland Street potentially surpasses its estimated environmental capacity threshold and may require further investigation.

The proposed development is therefore not expected to introduce any adverse traffic conditions.

7. PARKING ASSESSMENT

7.1 Overview and Methodology

The purpose of this parking assessment is to determine the impacts of the proposed upgrade on the off-street and on-street parking facilities. Parking impacts have been assessed based on the increase in staff and student numbers detailed in Section 4.1.

KPS did not have any on-site car parking facilities until recently with the current on-site car park being constructed in 2010. The reliance on on-street car parking is typical of older, small scale public schools. The growing scale of KPS was one of the drivers for constructing the on-site car parking facility in 2010. It is noted between 2019 and 2021 site observations utilisation of this car park has improved, it would appear the facility may still have some space capacity.

The additional parking demand associated with the upgrade has been determined based on the proportionate increase in staff and students. The existing parking associated with the school was captured in on-street parking surveys. The methodology is summarised as follows:

- Source parking survey data and separate out school parking
- Forecast parking demands based on the expected enrolment increase
- Assess if the existing parking infrastructure will meet the schools future parking demands.

The following sections detail the parking assessment.

7.2 Council Car Parking Requirements

Standard car parking rates for KPS were sourced from *Council's Development Control Plan (DCP) Section A2 – Site Access and Parking Code* (2014). The relevant car parking rates and requirements are outlined in Table 7.1.

Table 7.1: Car Parking Requirements

Land Use	Quantity	Parking Rate	Spaces Required
Educational Establishments Schools - Primary	46 staff	0.5 spaces per staff	23
	730 students	1 space per 14 students	53
Total			75

As shown, Council's on-site car parking requirements are high compared to the existing on-site car parking provision. Therefore, the standard car parking rates are considered onerous and not appropriate to determine the car parking demand associated with the school. Particularly given the spaces associated with the students would only be used during the morning and afternoon peak periods and the historical reliance on on-street car parking.

As stated previously, the off-street car park was recently constructed in 2010 for staff only parking and KPS operated for a significant amount of time without any on-site car park. As such the school currently operates with the below parking rates (based on 32 on-site parking spaces, 37 staff and 614 students):

- No on-site parking for parents, visitors, or students
- 1 space per 1.2 staff.

The above rates therefore do not currently comply with Council's parking requirements.

Further, KPS is located on a small and constrained site, and it is not viable to provide all parking on-site.

An alternative methodology to determine the car parking demand of KPS is provided in the following.

7.3 Existing Car Parking

A car parking survey was undertaken by TDC on Tuesday 19 November 2019 at KPS to identify the current car parking demand. The survey included both off-street and on-street parking. The survey area is shown in Figure 5.1. The survey data is provided in **Appendix G**.

Source: Nearmap

Figure 7.1: Surveyed Car Parking Areas

7.3.1 On-Street Parking

It is recommended to install line marking and signage on Orient Street to formalise and delineate between the travel lane and parking areas.

The parking surveys include parking generated by KPS and other parking demands (i.e. residential parking). The school parking was separated from other parking by removing the spikes during the school bell times (7:45-8:45AM and 2:30-3:30PM). As schools have specific start and finish times, peak periods are well defined. The assessment is considered conservative as a flat profile for background parking was used, which doesn't consider peak period increases for non-school related parking in the area. This profile is graphically shown in Figure 7.2.

Figure 7.2: On-Street Car Parking Profile

Prior to 7:00am it is unlikely there will be any school related parking demands, therefore any occupancy above the residential demand is considered to be the school parking demands. The residential parking demand (25 spaces) has been excluded from this assessment.

The survey demonstrated a relatively low occupancy rate of 31% at the peak time of 8:00AM. The survey results are summarised in Table 7.2.

Table 7.2: Existing On-Street Parking Demand

On-Street Parking Location	Supply	Max Occupied (Excluding residential)	Peak Time	Unoccupied Spaces
Omar Street	27 spaces	4 spaces	1:00PM	16 spaces
Southern end of Orient Street	39 spaces	7 spaces	10:00AM	29 spaces
Norther end of Orient Street	35 spaces	10 spaces	8:00AM	20 spaces
Sutherland Street east of KPS	44 spaces	10 spaces	8:00AM	29 spaces
Sutherland Street north of KPS	8 spaces	0 spaces	-	8 spaces
Total	153 spaces	31 spaces		102 spaces

7.3.2 Off-Street Parking

The off-street car park is currently restricted to staff only and has a peak occupancy of 78% for the majority of the day. The parking profile is shown in Figure 7.3.

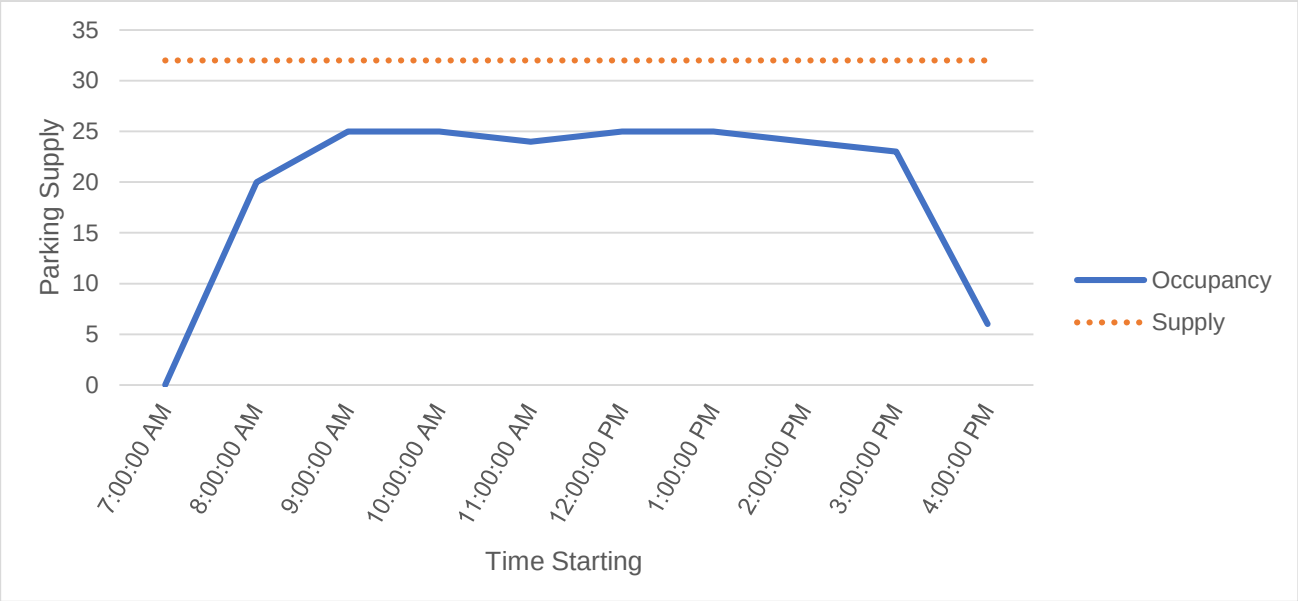


Figure 7.3: Off-Street Car Parking Profile

The off-street parking occupancy increases from 7:00AM and reaches peak occupancy at 9:00AM which is consistent with the morning peak period. There is a consistent occupancy throughout the day, associated with staff parking and decreases from 3:00PM onwards as staff leave.

The survey results are summarised in Table 7.3.

Table 7.3: Existing Off-Street Parking Demand

Type	Supply	Max Occupied	Peak Time	Unoccupied Spaces
Off-Street (staff only)	32 spaces	25 spaces	9:00AM-1:00PM	7 spaces

It was noted during the morning and afternoon peak observations that some staff were parking on-street, but the staff car park did not reach capacity. This is due to the management and allocation of off-street spaces however based on more recent site observations the staff car park was fully occupied.

7.4 Future Car Parking Demand

7.4.1 On-Street Parking

Historically, the school utilised on-street parking for parents and visitors to drop-off / pick-up. As the surrounding area is mostly residential, on-street parking is typically available during drop-off / pick-up times. It is also noted staff parking demands do not coincide with the typical residential parking demands. The surrounding streets have an overall provision of around 153 spaces, with an additional 8 parallel spaces proposed to the south of the bus bay on Sutherland Street.

The survey results indicate an increase in on-street parking from 8:00AM to 9:00AM and again from 2:00PM to 4:00PM. On-street parking around these peak periods reaches a maximum of 31% occupancy and decreases to a maximum of 27% during the off-peak periods (midday).

It is estimated that the on-street parking demand will increase at a rate proportionate to the proposed increase of students (19%). Table 7.4 summarises the future on-street parking demands.

Table 7.4: Future On-Street Parking Demand

Type	Existing Surplus	Current Demand (Excluding residential)	Additional Demand	Future Parking Surplus (Including proposed spaces)
On-street	102 spaces	31 spaces	6 spaces	104 spaces

Based on the current utilisation and the future demand, the existing on-street parking facilities can accommodate the KPS upgrade. This is shown in Figure 7.4.

Figure 7.4: Future On-Street Parking Demand

With the construction of active transport infrastructure, private vehicle demand is expected to decrease. Also, the parking impacts associated with the school are short-term and will typically last between 10 – 15 minutes during the AM and PM peak hours. The overall impact on surrounding residents and amenity is considered to be negligible.

7.4.2 Off-Street Parking

KPS is located on a small and constrained site, and it is not viable to provide all parking on-site. It is expected that the off-street parking demands will increase with the staff numbers and the existing staff parking area was shown to have available capacity. As discussed previously, KPS has also historically relied on on-street parking and given the site grades and access locations, no spaces is available on-site to further expand the staff car parking facility off Orient Street. On-street facilities will therefore continue to be used for both drop-off / pick-up and potentially excess staff demands. This has been considered in assessing the appropriate provision of car parking for the site. That is, all permanent long-term demand is to cater for within the on-site car parking area.

The future car parking demands are summarised in Table 7.5

Table 7.5: Future Off-Street Parking Demand

Type	Existing Supply	Staff Numbers (FTE only)			Additional Parking Demand
		Existing	Increase	Total	
Off-street (staff only)	32 spaces	37 spaces	8 spaces	45 spaces	13 spaces

As a result of the upgrade there is potential an additional demand of 13 staff parking spaces. However, it is noted that parking remained available within the off-street parking area under existing operations. The net increase in staff parking demand is estimated at 8 spaces based on the proposed expansion in numbers.

It is recommended the grassed area south of the bus zone on Sutherland Street be upgraded to a formalised parking area given it is already utilised informally for additional parking (as shown in Figure 4.1). This is subject to further detailed design including confirmation of emergency access arrangements, however, should be able to provide an additional 9 parking spaces. Refer to **Appendix A** for concept plans of the proposal.

It is acknowledged that some on-street parking demands and conditions are expected to change during the construction of the upgrades. Impacts associated with the construction are detailed in the preliminary CTMP provided in **Appendix C**.

7.5 Bicycle Parking Requirements and Provision

Council's *DCP Section A2 – Site Access and Parking Code* (2014) stipulates a bicycle parking rate of "*1 bicycle space per 5 students over Year 4",* assuming the future enrolments of 730 is evenly distributed across each year level (i.e. 104 students per year) this would equate to 62 bicycle parking spaces for Year 4 – Year 6.

Students travelling by bicycle is linked to:

- The age of the student and therefore competence and confidence
- The quality infrastructure to provide a high level of service
- The quantity and quality of end of trips facilities provided at the destination.

While bicycle participation is expected to increase as a result of the project due to the infrastructure improvements being delivered, any increase is expected to increase gradually over time. Importantly and as stated previously, the student enrolments are expected to increase in a linear fashion over 10 years.

The school currently has provision for approximately 15 student bicycle parking spaces. During the site visit it was observed that around 40 bicycles were parked at this location. As Councils rate does not accurately reflect the current bicycle parking demand, it is recommended that an additional 33 student bicycle parking spaces be provided on site to cater for the existing demand plus the new demand as a result of additional enrolments. Bicycle participation should then be monitored further to ensure the bicycle parking provision is meeting the demand. This is detailed further in the STP provided in **Appendix B**.

To further encourage a modal shift, it is recommended to provide four staff bicycle parking spaces initially. Similar to the student bicycle parking spaces, this should also be monitored and increased based on the demand in the future. Additionally, staff bicycle parking spaces should be secure, weather protected and located near the main staff areas separate to student bicycle parking. The staff bicycle parking is to be supplemented with end of trip facilities (e.g. showers, lockers, change areas, etc).

7.6 Other Wheeled Devices

To further encourage modal shift to active modes, it is recommended that storage for other wheeled devices such as skateboards and scooters be provided for students. These devices are currently used by students, but no secure storage areas are provided on-site. An example of a secure storage area for these devices is shown in Figure 7.5.

Figure 7.5: Other Wheeled Device Secure Storage – Example Kingscliff High School

Consistent with the bicycle parking, participation should be monitored further to ensure the storage provision is meeting the demand. This is detailed further in the STP provided in **Appendix B**.

7.7 Car Parking Layout Review

Any additional on-site car parking facilities provided have been assessed against the relevant requirements of Council's DCP and Australian Standards AS2890.1, AS2890.2 and AS2890.6. The assessment is documented in Table 7.6.

Table 7.6: Car Parking Geometrical Assessment

Design Element	Requirement	Proposed	Compliant
90° Staff Parking Bays (User Class 1A)	2.4m x 5.4m (min.)	2.5m x 5.5m	Shall Comply
PWD Bay (User Class 4)	2.4m x 5.4m with shared area of the same dimension	2.4m x 5.5m with shared area of 2.9m x 5.5m	Shall Comply
90° Parking Aisle Width	5.8m (min.) + 0.3m clearance where bounded by solid wall	6.3m (min.)	Shall Comply
Circulating Aisle	5.5m (min.) + 0.3m clearance where bounded by solid wall	6.1m (min.)	Shall Comply
Grades (car parking areas)	Max. 1:20 parallel to the bay Max. 1:16 in any other direction	Max. 1:20 parallel to the bay Max. 1:16 in any other direction	Shall Comply
Clearance adjacent to vertical obstructions	0.3m (min.)	0.3m (min.)	Shall Comply
Bicycle Parking (horizontal)	1.8m x 0.5m with 1.5m aisle	1.8m x 0.5m with 1.5m aisle	Shall Comply

As there are no changes proposed to the existing car parking areas no swept paths have been undertaken.

8. HEAVY VEHICLE ASSESSMENT

8.1 Servicing and Refuse Collection

The proposed upgrade is not expected to result in a significant change to the servicing or refuse collection demand and as such, arrangements are unlikely to change. Servicing and refuse collection will still be undertaken on Sutherland Street within the bus zone and occur outside of drop-off / pick-up peak times. As such, servicing and refuse collection are not deemed to have an adverse impact on the safety and efficiency for other road users or pedestrians.

As there are no changes proposed to the existing servicing areas no swept paths have been undertaken.

8.2 Bus Operations

As an outcome of the RTA, recent changes to the bus operations and consolidation to Sutherland Street have been shown to be effective in formalising bus operations and separating buses from pedestrian and kiss'n'drop areas during peak times. Additional hard stand works are recommended along Sutherland Street in proximity to the bus area to accommodate student volumes boarding and alighting. Refer to **Appendix A** for concept plans or potential extent of works.

In regards to increased student patronage on buses as part of the increased enrolments over time, it is understood that TfNSW routinely consult with bus operators on refining school bus routes and student patronage needs. In addition, school student numbers and details are directly provided to TfNSW through the School Student Transport Scheme (SSTS).

9. SUMMARY AND RECOMMENDATIONS

9.1 Assessment Summary

The key findings of the Kingscliff Public School traffic and transport impact assessment are as follows:

- The proposal is to upgrade the school campus to improve facilities for existing enrolments and accommodate the growing requirement for educational providers in the north coast region, with key details as follows:
  - The proposal also includes an enrolment capacity to 730 students, an increase of 19%
  - The growth is expected to occur in a linear fashion over the next 10 years
  - A suite of upgrades are proposed including new bike storage facility and improvements to active transport infrastructure directly fronting the school
- A review of the existing conditions around the KPS identified the following:
  - Several deficiencies with the active transport infrastructure in the nearby catchment of which those fronting KPS are being rectified as part of the proposed development and those located further away would be rectified as part of revised PAMP and Bike Plan inclusions for the greater active transport network
  - The school bus network is well used, and Surfside Bus Lines have stated that the bus routes generally experience high occupancy
  - The existing drop off / pick up operations highlighted the need for changes to the kiss'n'drop / bus zone areas. Some of these changes have recently already occurs in consultation with the school and Council
  - The current mode share for both staff and students is heavily weighted towards private vehicle though most students live within walkable/cyclable distance or are within walking distance of a school bus service
  - A crash review showed some pedestrian and vehicle crashes which are expected to be improved with the additional crossing near the Orient Street / Omar Street intersection
- The assessment of the proposed accesses showed:
  - An additional crossing on Orient Street will provide a key crossing location for pedestrian desire lines and reduce informal crossings midblock. The exact location of the crossing would need to be investigated at the detailed design stage
  - The newly relocated bus zone on Sutherland Street and kiss'n'drop on Orient Street was observed to operate efficiently with the reduction in bus and vehicle conflicts
  - The two one-way crossovers to the on-site staff car park comply with Council's and AS2890.1 requirement in terms of location and form
- The assessment traffic impacts showed:
  - All intersections assessed operate within typical performance thresholds
  - The re-configuration of the KPS kiss'n'drop is not anticipated to negatively impact the surrounding road network
  - Sutherland Street potentially surpasses its estimated environmental capacity threshold and may require further investigation
- The assessment parking impacts showed:
  - Council's DCP stipulates a total of 75 on-site car parking spaces for staff and visitors
  - Given the history of parking operations at KPS, the constrained nature of the site and the short-term nature of parking demands for visitors / parents, providing all parking on-site is not considered viable or appropriate or practical.

- An alternate parking demand assessment method was adopted which utilised the car parking survey results to determine the existing parking demands generated by KPS, and the expected increase proportionate to the increase in enrolments
- This identified the existing peak parking occupancy of 31 car parking spaces, leaving 102 unoccupied parking spaces on street during the peak period
- The car parking demand is expected to increase by 19%, increasing the peak parking demand to 37 car parking spaces. Therefore, the existing on-street capacity will be able to accommodate the additional parking generated by the KPS upgrade
- The off-street car park had a peak parking occupancy of 25 spaces from 9:00AM – 1:00PM, leaving 7 spaces unoccupied, though some staff were observed to park on-street
- An additional 8 staff are anticipated at KPS to cater for the increase in enrolments
- 9 additional on-street parking spaces are recommended south of the bus bay on Sutherland Street to accommodate the increased demand associated with the proposal. This is subject to further detailed design including confirmation of emergency access arrangements.
- Council's DCP stipulates a total of 62 on-site bicycle parking spaces for Year 4 – Year 6 students, however based on the current utilisation approximately 40 students ride to school
- The school currently has provision for 15 bicycle parking spaces
- There are currently no staff bicycle parking spaces or end-of-trip facilities

- The assessment of heavy vehicle operations showed:
  - Servicing and refuse collection arrangements are unlikely to increase in intensity with the proposal
  - Servicing and refuse collection will still be undertaken on Sutherland Street within the bus zone and occur outside of drop-off / pick-up peak times.

9.2 Recommendations

Several recommendations were identified in the TTIA as follows:

- Incorporate relevant and practical recommendations from Rapid Transport Assessment into revised PAMP and Bike Plan documents for the greater active transport network
- Implement the School Travel Plan on an annual basis to monitor travel mode share and evaluate the success of the improvements to active and public transport improvements
- Further develop the preliminary Construction Traffic Management Plan with the ultimate construction contractor
- Formalise line marking on Orient Street to separate the kiss'n'drop, on-street parking and additional crossing
- Formalise the on-street parking south of the bus bay on Sutherland Street to cater for the additional parking demands. This is subject to further detailed design including confirmation of emergency access arrangements, however, should be able to provide an additional 9 parking spaces to be attributed to the schools parking provision
- An additional 33 student bicycle parking spaces should be provided on-site
- Four staff bicycle parking and end-of-trip facilities should be provided on-site to further encourage a modal shift
- Storage for other wheeled devices such as skateboards and scooters be provided for students.

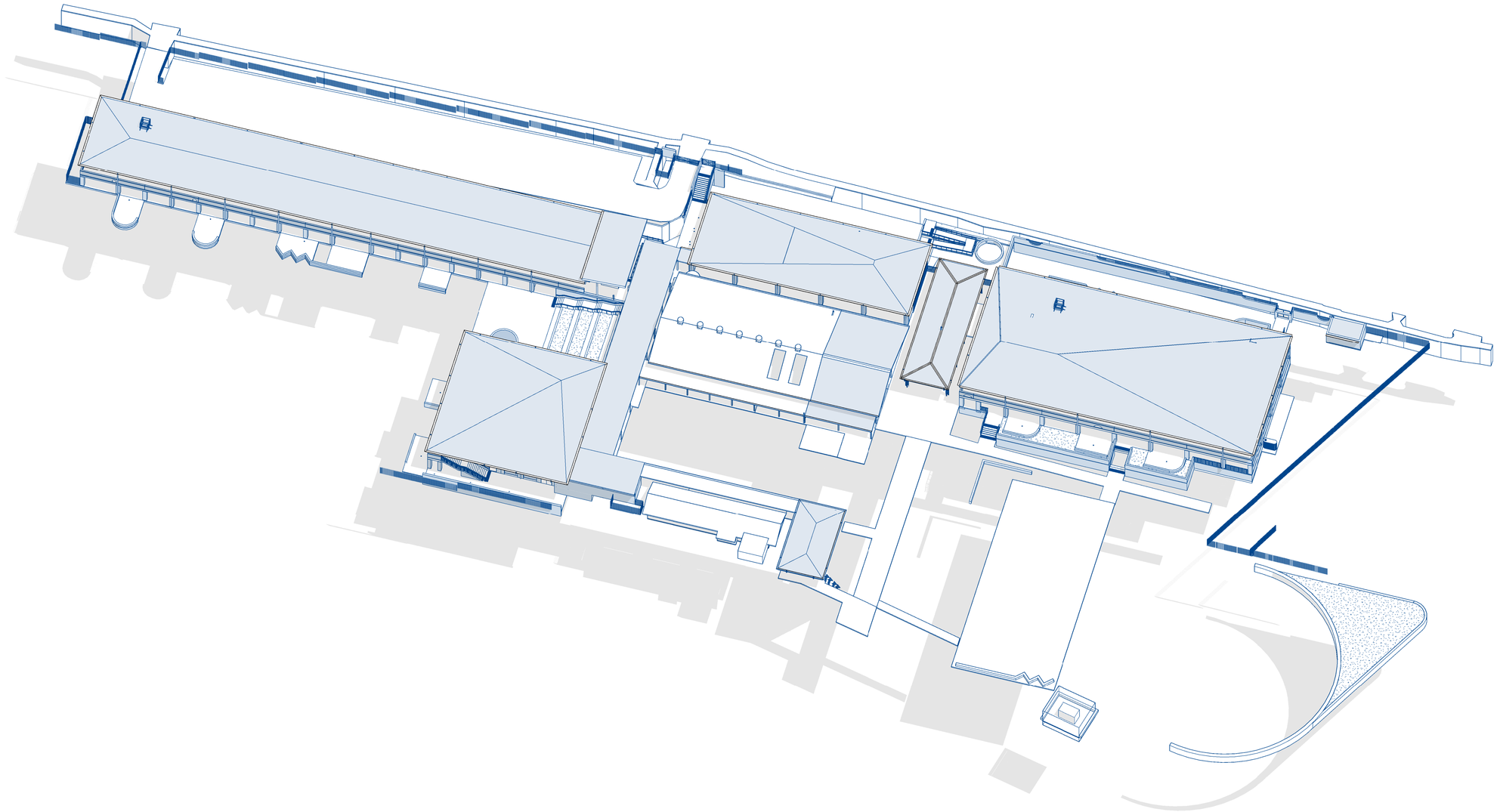
Appendix A: Development Plans and External Works Concepts

DESIGN DEVELOPMENT: KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

FOR: RICHARD CROOKES CONSTRUCTIONS

4 NEW BUILDINGS
12 ORIENT ST, KINGSCLIFF, NSW

SITE INFORMATION:
TWEED SHIRE COUNCIL
COUNTY OF ROUS
PARISH OF CUDGEN
LOT 1 IN DP384195



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NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
FOR INFORMATION ONLY

REV	DATE	DETAILS	ISSUER
A	05.02.2021	CONSULTANT ISSUE	YC
B	18.02.2021	INTERIM 50% DD ISSUE	HM
C	02.03.2021	50% DD ISSUE	YC
D	08.04.2021	INTERIM 100% DD ISSUE	YC

CLIENT:
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT ST, KINGSCLIFF, NSW

DRAWING TITLE:
COVER

SCALE @ A1:

DRAWN:	CHECKED:	PROJECT No:
YC	AG	1554

DRAWING No:	REVISION:	DATE:
A-X-0001	D	08.04.2021

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LEGEND - EXISTING & DEMOLITION PLAN

SYMBOL / GRAPHIC	DESCRIPTION
ROOM NAME / 000	Room Name (or abbreviation) Room Number
	Existing item to be Demolished (as seen when cut)
	Existing item to be Demolished (as seen in projection)
	Existing item to Remain (as seen when cut)
	Existing item to Remain (as seen in projection)
12	Demolition Note - refer separate legend
000 / 00000 SIMILAR	Detail Number of Section / Elevation Sheet Number of Section / Elevation

LEGEND - FLOOR PLAN

SYMBOL / GRAPHIC	DESCRIPTION
GA.##	(Glazing Assembly).(Glazing Assembly Number) - Refer to Glazing Assembly Elevations for details.
W.R.##	(Window).(Room Number).(Window Number) - Refer Elevations & Schedules.
D.R.##	(Door).(Room Number).(Door Number) - Refer Elevations & Schedules.
8.CB-H1	Keynote Tag - refer legend and selections schedules. • number prefix indicates architectural spec. section) • prefix 'e' indicates existing item)
ROOM NAME / 000 / 150 m²	Room Name (or abbreviation) Room Number Room Area
000 / 00000 SIMILAR	Detail Number of Section / Elevation Sheet Number of Section / Elevation

LEGEND - ROOF PLAN

SYMBOL	DESCRIPTION
15°	Roof Pitch & Direction of Fall
000 / 00000 SIMILAR	Detail Number of Section / Elevation Sheet Number of Section / Elevation

GENERAL NOTES

- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH SINSW – EDUCATIONAL FACILITIES STANDARDS AND GUIDELINES (EFSG). IF A CONFLICT EXISTS BETWEEN THE EFSG AND THE DRAWINGS & SPECIFICATIONS, THE MORE ONEROUS REQUIREMENT OR CHARACTERISTIC SHALL BE ADOPTED, AND SEEK CLARIFICATION PRIOR TO PROCEEDING
- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH RELEVANT STRUCTURAL, CIVIL, AND BUILDING SERVICES DRAWINGS & SPECIFICATIONS.
- WHERE ANY DISCREPANCY OCCURS, CONTRACTOR TO SEEK CLARIFICATION PRIOR TO PROCEEDING
- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT PROJECT CONSULTANT REPORTS
- CONTRACTOR TO CONFIRM COMPLIANCE WITH THE BCA AND DDA ACCESS REPORTS INCLUDING ALL RECOMMENDATIONS & SUGGESTED PERFORMANCE SOLUTIONS. WHERE A DISCREPANCY OCCURS BETWEEN THE REPORT & DOCUMENTATION, CONTRACTOR IS TO SEEK CLARIFICATION PRIOR TO PROCEEDING
- THE SETOUT DIMENSIONS REFLECT ARCHITECTURAL INTENT. IF THE DIMENSIONS ARE INCONSISTENT WITH OTHER CONSULTANT'S INPUT, THE CONTRACTOR IS TO SEEK CLARIFICATION PRIOR TO PROCEEDING .

LEGEND - REFLECTED CEILING PLAN

SYMBOL / GRAPHIC	DESCRIPTION
GA.##	(Glazing Assembly).(Glazing Assembly Number) - Refer to Glazing Assembly Elevations for details.
3000 / PB01	Height above floor level Ceiling Type Mark
RAKING / PB01	Indicates sloped ceiling - refer slope arrow Ceiling Type Mark
5.00°	Slope Arrow with degree of pitch
	Ceiling Height: 2100mm AFFL
	Ceiling Height: 2400mm AFFL
	Ceiling Height: 2700mm AFFL
	Wet Area Ceiling
ROOM NAME / 000 / 150 m²	Room Name (or abbreviation) Room Number Room Area
000 / 00000 SIMILAR	Detail Number of Section / Elevation Sheet Number of Section / Elevation

SERVICES TAG	DESCRIPTION
L1	LUMINAIRE FLUORESCENT BATTEN FITTING
L3	LUMINAIRE SURFACE MOUNTED
D	RECESS DOWNLIGHT
EM	EMERGENCY SURFACE MOUNTED DOWNLIGHT
	SMOKE DETECTOR
	AUDIO SPEAKER
	AIR SUPPLY GRILLE
	RETURN / EXHAUST GRILLE
	WALL MOUNTED FAN COIL UNIT
	SUPPLY AIR CONTINUOUS LINEAR SLOT DIFFUSER
	CONTINUOUS LINEAR BAR GRILLE - WALL MOUNTED
	SUPPLY AIR REGISTER
R / A	RETURN AIR GRILLE EXHAUST GRILLE ACCESS PANEL
	THERMAL INSULATIO TO UNDERSIDE OF SOFFIT.

CEILING TYPES

CLG-101	PLASTERBOARD SUSPENDED CEILING.
CLG-102	PLASTERBOARD SUSPENDED CEILING - MOISTURE RESISTANT.
CLG-103	PLASTERBOARD SUSPENDED CEILING - ACOUSTIC
CLG-104	PLASTERBOARD - FIRE RATED.
CLG-105	ACOUSTIC PANEL
CLG-501	PRE-FINISHED COMPRESSED FIBRE-CEMENT

RCP NOTES

- CONTRACTOR TO CONFIRM INSULATION REQUIREMENTS IN ACCORDANCE WITH THE SECTION J REPORT AND REQUIRED R VALUES.
- LOCATION OF BUILDING SERVICES REFLECT ARCHITECTURAL INTENT. REFER TO SERVICES CONSULTANT'S DRAWINGS AND REPORTS FOR QUANTITIES. WHERE OMISSIONS OR DISCREPANCIES OCCUR, THE CONTRACTOR IS TO SEEK CLARIFICATION PRIOR TO PROCEEDING.
- LIGHTING TO COMPLY WITH NCC AND EFSG REQUIREMENTS.
- PROVIDE ACOUSTIC PANELLING TO ACOUSTIC CONSULTANT'S ADVICE.
- SETOUT AS PER ARCHITECTURAL INTENT. QUANTITIES TO ELECTRICAL ENGINEER'S SPECIFICATION.
- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH SINSW – EDUCATIONAL FACILITIES STANDARDS AND GUIDELINES (EFSG). IF A CONFLICT EXISTS BETWEEN THE EFSG AND THE DRAWINGS & SPECIFICATIONS, THE MORE ONEROUS REQUIREMENT OR CHARACTERISTIC SHALL BE ADOPTED, AND SEEK CLARIFICATION PRIOR TO PROCEEDING
- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH RELEVANT STRUCTURAL, CIVIL, AND BUILDING SERVICES DRAWINGS & SPECIFICATIONS AND ALL RELEVANT PROJECT CONSULTANT REPORTS. WHERE ANY DISCREPANCY OCCURS, CONTRACTOR TO SEEK CLARIFICATION PRIOR TO PROCEEDING.

SCOPE OF WORKS LEGEND

SYMBOL	DESCRIPTIONS
	EXISTING TO REMAIN
	EXISTING TO BE DEMOLISHED
	NEW WORKS
	REFURBISHMENT WORKS
	OUT OF SCOPE

GENERAL ABBREVIATIONS

ANNOTATIONS

APPROX.	APPROXIMATE DIMENSION
AB	DENOTES HEIGHT ABOVE BENCHTOP
AFFL	ABOVE FINISHED FLOOR LEVEL
CH	CEILING HEIGHT
COS	CHECK ON SITE
CJ	CONTROL JOINT
EFFL	EXISTING FFL (REFER TO SURVEY)
ERL	EXISTING REDUCED LEVEL (REFER TO SURVEY)
FGL	FINISHED GROUND LEVEL
FPL	FINISHED PAVING LEVEL
FFL	FINISHED FLOOR LEVEL
FSL	FINISHED STRUCTURAL LEVEL
FW	FLOOR WASTE
MJ	MOVEMENT JOINT
TOK	TOP OF KERB
TOW	TOP OF WALL
TOB	TOP OF BEAM
BOP	BOTTOM OF PLANTER
RL	REDUCED LEVEL
U/S	UNDERSIDE

ELEMENTS

ADJ	ADJUSTABLE SHELF
BOL	BOLLARD
DR	DRAWER
BTS	BATH TAP SET
COL	STRUCTURAL COLUMN
CR	CEMENT RENDER
CSC	CURTAIN SCREEN
CHS	CIRCULAR HOLLOW SECTION
DP	DOWNPIPE
DV	DIVERTER
DW	DISHWASHER
EDP	EXISTING DOWNPIPE
TR	TOWEL RAIL
FG	FIXED GLAZING
FS	FIXED SHELF
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FX	FIRE EXTINGUISHER
FPG	FLOOR PLENUM GRILLE
GALV	HOT DIPPED GALVANISED
GPO	POWER OUTLET
GS	GLASS SHELF
HP	HOT PLATE
HR	HANGING RAIL
H/R	HANDRAIL
MI	MIRROR
MIO	MICACEOUS IRON OXIDE PAINT FINISH
MW	MICROWAVE OVEN
MX	MIXER DOUBLE
OHC	OVERHEAD CUPBOARD
OS	OPEN SHELF UNIT
PB	PLASTERBOARD LINING
PD	PLANTER DRAIN
PTRY	PANTRY
REF	REFRIGERATOR AND GPO
RH	RANGEHOOD
RHS	RECTANGULAR HOLLOW SECTION
RWO	RAIN WATER OUTLET
RWP	RAIN WATER PIPE
S	SINK
SC	STEEL COLUMN
SCR	SHOWER SCREEN
SD	SOAP DISH
SHR	SHOWER BASE
SHS	SQUARE HOLLOW SECTION
SP	SEWER PIPE
SR	SHOWER ROSE
SS	STAINLESS STEEL
STS	SHOWER TAP SET
L	LAUNDRY TROUGH
TGI	TACTILE GROUND INDICATORS
TR	TOWEL RAIL
TRH	TOILET ROLL HOLDER
UB	UNDERBENCH OVEN
VB	VANITY BASIN
WM	WASHING MACHINE
WMS	WASHING MACHINE SUPPLYP
WC	WATER CLOSET / TOILET SUITE
WS	WHEEL STOP

GENERAL KEYNOTE LEGEND

KEYNOTE	
CLG-101	SUSPENDED ACOUSTIC PLASTERBOARD CEILING
CLG-102	SUSPENDED MOISTURE RESISTANT PLASTERBOARD CEILING
CLG-103	SUSPENDED ACOUSTIC PLASTERBOARD CEILING
CLG-104	SUSPENDED FIRE RATED PLASTERBOARD CEILING
CLG-501	PREFINISHED COMPRESSED FIBRE CEMENT SOFFIT LINING
CON-101	OFF-FORM CONCRETE FINISH CLASS 2
DOR-401	OPERABLE WALL
FIX-101	RANGE
FIX-102	GRIDDLE AND STAND
FIX-104	FRYER - FREE STANDING FLOOR
FIX-105	COMBI STEAMER (LARGE)
FIX-106	BAIN MARIE (LARGE)
FIX-107	PASS THROUGH DISHWASHER
FIX-108	UNDER COUNTER DISHWASHER
FIX-110	ESPRESSO COFFEE MACHINE - AUTOMATIC
FIX-112	COMMERCIAL FRIDGE - UPRIGHT 2 DOOR, SELF-CONTAINED (NO GLASS DOORS)"
FIX-113	COMMERCIAL FREEZER - UPRIGHT 2 DOOR, SELF-CONTAINED
FIX-117	UNDERBENCH DISHWASHER
FIX-118	451L REFRIGERATOR
FIX-120	32L INVERTER MICROWAVE
FIX-201	COMMERCIAL ROLLER BLIND
FIX-204	PINBOARD
FLR-108	BROADLOOM CARPET
FLR-109	BROADLOOM CARPET
FLR-110	BROADLOOM CARPET
FLR-201	ENTRY MAT
FLR-301	SHEET VINYL
FLR-303	LINOLEUM SHEETING
FLR-304	LINOLEUM SHEETING
FLR-307	LINOLEUM SHEETING
FLR-308	LINOLEUM SHEETING
FLR-501	TACTILE INDICATORS
FLR-601	ENGINEERED TIMBER FLOORING
ILS-304	ACOUSTIC PANEL
ILS-408	WALL TILING
IWS-301	INTERNAL GLAZED PARTITION
JFF-211	FABRIC
JFL-302	LAMINATE
JFL-304	MAGNETIC LAMINATE WHITEBOARDS
JFL-305	TIMBER LAMINATE
JFL-307	LAMINATE
JFL-308	LAMINATE
JFL-312	LAMINATE
JFL-314	LAMINATE
JFL-316	LAMINATE
PNT-101	INTERIOR PAINT (WALLS - NO WET AREAS)
PNT-102	INTERIOR ACRYLIC PAINT (WALLS - NO WET AREAS)
PNT-103	INTERIOR ACRYLIC PAINT (CEILINGS)
PNT-106	INTERIOR ACRYLIC ENAMEL PAINT (TIMBER DOOR)
PNT-118	INTERIOR ACRYLIC PAINT (WALLS AND CEILINGS)
PNT-119	INTERIOR ACRYLIC PAINT - (CEILINGS)
PNT-121	INTERIOR ACRYLIC PAINT (WALLS)
PNT-123	INTERIOR ACRYLIC PAINT (WALLS AND CEILINGS)
PNT-165	INTERIOR PAINT (WALLS - NO WET AREAS)
PNT-166	INTERIOR ACRYLIC PAINT (CEILINGS)"
SAN-101	KITCHEN SINK
SAN-102	KITCHEN SINK
SAN-103	KITCHEN SINK - HANDS FREE OPERATED
SAN-104	DOUBLE BOWL SINK
SAN-105	SINGLE END BOWL
SAN-203	PAPER TOWEL DISPENSER
SAN-301	HYDROTAP
SAN-303	COMMERCIAL TAPWARE
SAN-304	SINK MIXER
SAN-305	SELF-CLOSING MIXER
SAN-309	SELF-CLOSING PILLAR TAP
TRM-100	SKIRTINGS
TRM-101	MDF SKIRTING
TRM-102	COVED VINYL SKIRTING

GENERAL SYMBOLS LEGEND

SYMBOL	DESCRIPTIONS
A	BUILDING/BLOCK TAG
0	GRIDLINE
℄	CENTRELINE
	SETOUT POINT
FALL	INDICATES DIRECTION OF FALL
	BREAK LINE
UP	INDICATES RISE OF RAMP + STAIRS
1:10	INDICATES SLOPE (UP)
XXX-01	MATERIAL/FINISH TAG
A01	WALL TAG
D01	DOOR TAG
W00	WINDOW TAG
FXT-00	FIXTURE TAG
RL 0.00	REDUCED LEVEL - SECTION
FFL 0.00	FLOOR FINISH LEVEL - SECTION
CH 2700	CEILING HEIGHT - SECTION
RL 14.000	REDUCED LEVEL (AHD)
SSL 15.000	STRUCTURAL SLAB LEVEL (AHD)
FFL 14.000	FINISHED FLOOR LEVEL (AHD)
FH	FIRE HYDRANT
RWO	RAIN WATER OUTLET
FW	FLOOR WASTE
DP	DOWNPIPE
30	STEP/SETDOWN (LEVEL CHANGE IN mm)
	LOCALISED FALL IN SLAB TO RWO/FW
	BOUNDARY OUTLINE
	SECONDARY BOUNDARY / NEIGHBOUR
	ABOVE / OVERHEAD

LEGEND - FITOUT PLANS AND ELEVATIONS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
GA.##	(Glazing Assembly).(Glazing Assembly Number) - Refer to Glazing Assembly Elevations for details.	T01 / 600 / -	Type Mark Width of Unit Mark
W.R.##	(Window).(Room Number).(Window Number) - Refer Elevations & Schedules.	ROOM NAME / 000	Room Name (or abbreviation) Room Number
D.R.##	(Door).(Room Number).(Door Number) - Refer Elevations & Schedules.		
000 / 000000 SIMILAR	Number of Detail Sheet Number of Detail	00 / 00 / 00	Orientation of and Detail Number of Internal Elevation
000 / 00000 SIMILAR	Detail Number of Section / Elevation Sheet Number of Section / Elevation		

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NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
FOR INFORMATION ONLY

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E	23.04.2021	100% DD ISSUE	HM

CLIENT:
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT ST, KINGSCLIFF, NSW

DRAWING TITLE:
GENERAL LEGENDS

SCALE @ A1: As indicated

DRAWN:	CHECKED:	PROJECT No:
YC	AG	1554

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A-X-0003	E	23.04.2021

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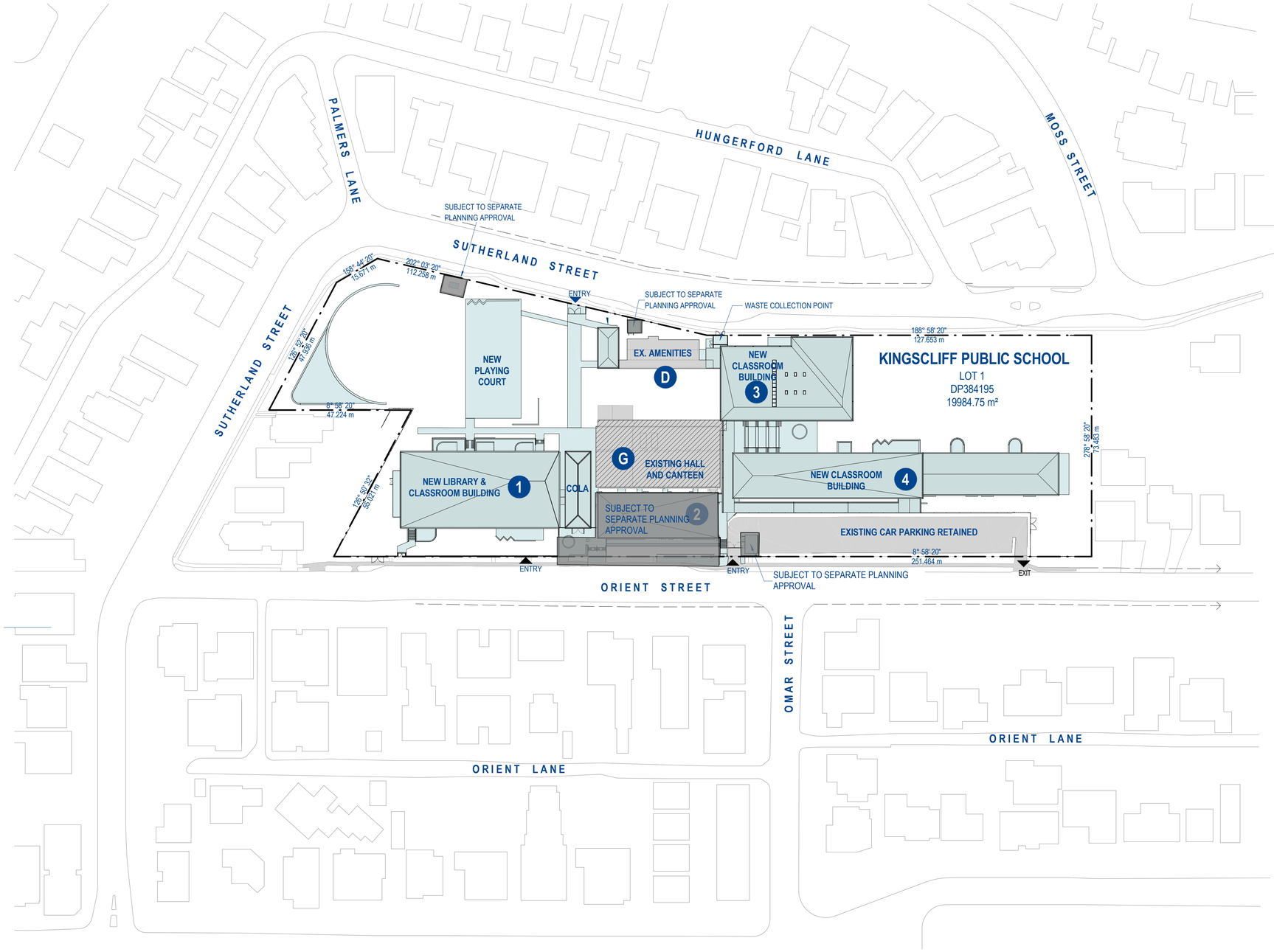

1 PROPOSED LOCATION PLAN
1 : 750

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NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
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G	27.05.2021	SCHEMATIC DESIGN ISSUE	YC
1	29.06.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	16.07.2021	CONTRACT DOCUMENTATION ISSUE	HM

CLIENT:
RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT ST, KINGSCLIFF, NSW

DRAWING TITLE:
PROPOSED LOCATION PLAN

0m 5m 10m 15m 20m 25m

SCALE @ A1: 1 : 750

DRAWN:	CHECKED:	PROJECT No:
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DRAWING No:	REVISION:	DATE:
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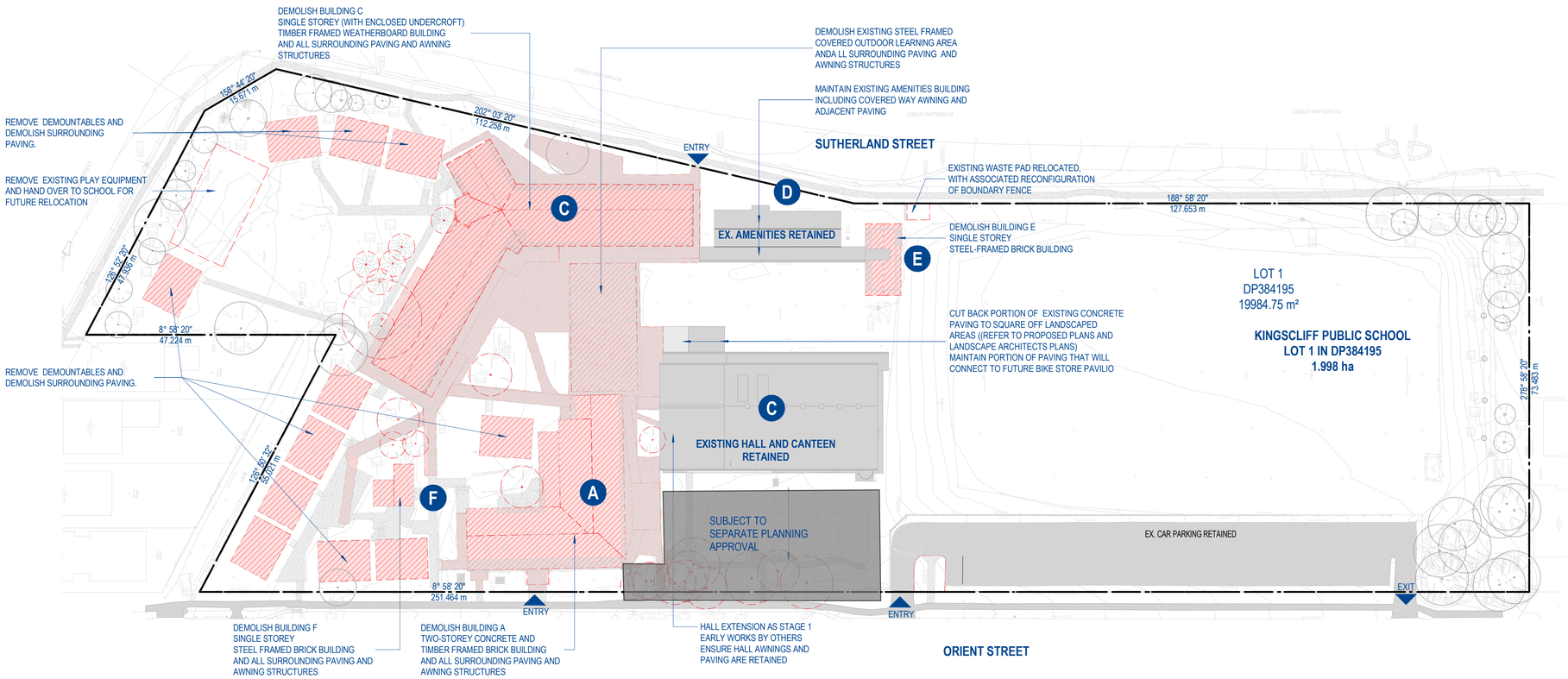
BM



1 **SITE PLAN - EXISTING & DEMOLITION**
1 : 500

LEGEND - SITE PLAN - DEMOLITION

SYMBOL / GRAPHIC	DESCRIPTION
	PROPERTY BOUNDARY
	EXTENT OF WORKS
	EXISTING TREE TO REMAIN
	EXISTING TREE TO BE REMOVED
	EXISTING TO REMAIN (OUT OF SCOPE)
	EXISTING TO BE DEMOLISHED (AS SEEN WHEN CUT)
	EXISTING TO BE DEMOLISHED (AS SEEN IN PROJECTION)

SITE PLAN - DEMOLITION NOTES

- CUT EXISTING FLOOR SLABS FOR NEW EXCAVATIONS, FOR FOOTINGS AND SERVICES. REFER ALSO TO STRUCTURAL AND SERVICES DRAWINGS AND DOCUMENTATION FOR EXTENT OF DEMOLITION WORKS.
- DISCONNECT ALL SERVICES PRIOR TO DEMOLITION. REFER TO CONSULTANT DRAWINGS AND DOCUMENTATION.
- REFER TO ENG.'S DRAWINGS FOR EXTENT OF UNDERPINNING OF EXISTING FOOTINGS AND WALLS, REMOVAL OF EXISTING BEAMS, COLUMNS, CONCRETE SLABS AND SEQUENCE OF REMOVAL, TEMPORARY PROPPING OF WALLS, BEAMS, COLUMNS, CONCRETE, SLABS AND BRICKWORK.
- DEMOLITION WORK TO BE COORDINATED WITH THE NEW BUILDING WORK SHOWN ON ARCHITECTURAL DOCUMENTATION AND DOCUMENTATION OF OTHER CONSULTANTS.
- DEMOLISH ALL EXISTING ROOFS.
- REMOVE ALL FIXTURES, FITTINGS, AND FINISHES INCLUDING TILED WALLS AND FLOORS AND CLEAN ALL SURFACES IN PREPARATION OF RECEIVING NEW FINISHES AS PER SCHEDULES OR SPECIFICATION.
- REMOVE ALL PIPEWORK, EQUIPMENT AND SERVICES NOT SPECIFICALLY DOCUMENTED TO BE RETAINED, INCLUDING; METAL DUCTWORK, SPRINKLER PIPEWORK, GUTTERS, DOWNPIPES, ELECTRICAL FIXTURES & FITTINGS, REDUNDANT PLANT EQUIPMENT, AND REDUNDANT SIGNAGE.
- REMOVE ALL SUSPENDED CEILINGS AND PLASTERBOARD CEILINGS INCLUDING DISCONNECTING AND REMOVING ALL ELECTRICAL SERVICES, EQUIPMENT AND LIGHT FITTINGS ETC.
- REMOVE ALL PARTITIONING, AND OTHER LIGHTWEIGHT WALLS, TO ALL FLOORS INCLUDING ANY BUILT IN FIXTURES AND FITTINGS.
- DISCONNECT EXISTING SANITARY FIXTURES, AND DEMOLISH ON ALL LEVELS. REMOVE ALL FITTINGS AND FIXTURES AND ALL WALL & FLOOR TILES.
- NOTE: THE BUILDER SHALL SET OUT ALL WORK ON SITE, INCLUDING THE ESTABLISHMENT OF ALL LEVELS, THE MARKING OF ALL WALLS AND THE LOCATIONS OF ALL RISER DUCTS. PRIOR TO THE COMMENCEMENT OF SHOP DRAWINGS OR CONSTRUCTION. THIS SHALL INCLUDE A STUDY OF, AND ALLOWANCE FOR, ALL EXISTING CONDITIONS INCLUDING EXISTING SERVICES WITHIN AND AROUND THE SITE.
- ALL SHOP DRAWINGS SHALL BE PREPARED ON THE BASIS OF SITE CONFIRMATION OF EXISTING CONDITIONS. SHOULD ANY VARIATIONS OCCUR IN THE DOCUMENTATION WHICH WILL EFFECT THE WORK, THE BUILDER SHALL NOTIFY THE ARCHITECT IMMEDIATELY.
- THIS DRAWING BROADLY SETS OUT DEMOLITION WORK. THE BUILDER SHALL CARRY OUT ALL DEMOLITION NECESSARY TO COMPLETE THE WORKS.
- THE BUILDER SHALL ALLOW TO MAKE GOOD EDGES/SIDES OF ALL DEMOLISHED MASONRY WALLS AND WINDOWS TO CLEAR AND STRAIGHT EDGE SO AS TO ALLOW FOR FUTURE FINISHED.
- REMOVE ALL FLOOR COVERINGS AND ADHESIVES ASSOCIATED WITH FLOOR COVERINGS. ALLOW FOR NEW FINISHES TO BE APPLIED.
- REMOVE ALL WINDOWS, SECURITY MESH AND SCREENS.
- REMOVE ALL INTERNAL AND EXTERNAL DOORS.
- REMOVE ALL MECHANICAL DUCTWORK & EQUIPMENT WHICH EXTENDS TO PERIMETER OF BUILDING.
- REFER TO LANDSCAPE ARCHITECTS DRAWING FOR EXTENT OF REMOVAL OF EXISTING RETAINING WALLS AND EXISTING VEGETATION.
- REMOVE ALL EXISTING PLANTER BOXES AND MAKE GOOD TO FINISHED FLOOR SURFACE SO AS TO ALLOW FOR FUTURE FINISHES.
- WHERE STAIRS ARE TO BE DEMOLISHED ENSURE ENTIRE STAIR IS DEMOLISHED INCLUDING BALUSTRADES AND UNDERSIDE OF SOFFIT WHERE IT MEETS THE SLAB ABOVE.
- ALL LEVELS NOTED ON DRAWINGS ARE INDICATIVE ONLY. MINOR VARIATIONS IN LEVELS ARE TO BE ALLOWED FOR.

SITE PLAN - GENERAL NOTES

- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH SINSW – EDUCATIONAL FACILITIES STANDARDS AND GUIDELINES (EFSG). IF A CONFLICT EXISTS BETWEEN THE EFSG AND THE DRAWINGS & SPECIFICATIONS, THE MORE ONEROUS REQUIREMENT OR CHARACTERISTIC SHALL BE ADOPTED, AND SEEK CLARIFICATION PRIOR TO PROCEEDING
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- CONTRACTOR TO CONFIRM COMPLIANCE WITH THE BCA AND DDA ACCESS REPORTS INCLUDING ALL RECOMMENDATIONS & SUGGESTED PERFORMANCE SOLUTIONS. WHERE A DISCREPANCY OCCURS BETWEEN THE REPORT & DOCUMENTATION, CONTRACTOR IS TO SEEK CLARIFICATION PRIOR TO PROCEEDING
- THE SETOUT DIMENSIONS REFLECT ARCHITECTURAL INTENT. IF THE DIMENSIONS ARE INCONSISTENT WITH OTHER CONSULTANT'S INPUT, THE CONTRACTOR IS TO SEEK CLARIFICATION PRIOR TO PROCEEDING .

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NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

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CLIENT:
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT ST, KINGSCLIFF, NSW

DRAWING TITLE:
SITE PLAN - EXISTING AND DEMOLITION

0m 10m 20m 30m 40m 50m

SCALE @ A1: 1 : 500

DRAWN:	CHECKED:	PROJECT No:
YC	AG	1554

DRAWING No:	REVISION:	DATE:
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LEGEND - OVERALL SITE PLAN

SYMBOL / GRAPHIC	DESCRIPTION
	PROPERTY BOUNDARY
	EXTENT OF WORKS
	FENCE LINE
	EXISTING TO REMAIN
	NEW CONSTRUCTION
	EXISTING TREE TO REMAIN
	NEW TREE - INDICATIVE ONLY

SITE PLAN - GENERAL NOTES

- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH SINSW – EDUCATIONAL FACILITIES STANDARDS AND GUIDELINES (EFSG). IF A CONFLICT EXISTS BETWEEN THE EFSG AND THE DRAWINGS & SPECIFICATIONS, THE MORE ONEROUS REQUIREMENT OR CHARACTERISTIC SHALL BE ADOPTED, AND SEEK CLARIFICATION PRIOR TO PROCEEDING
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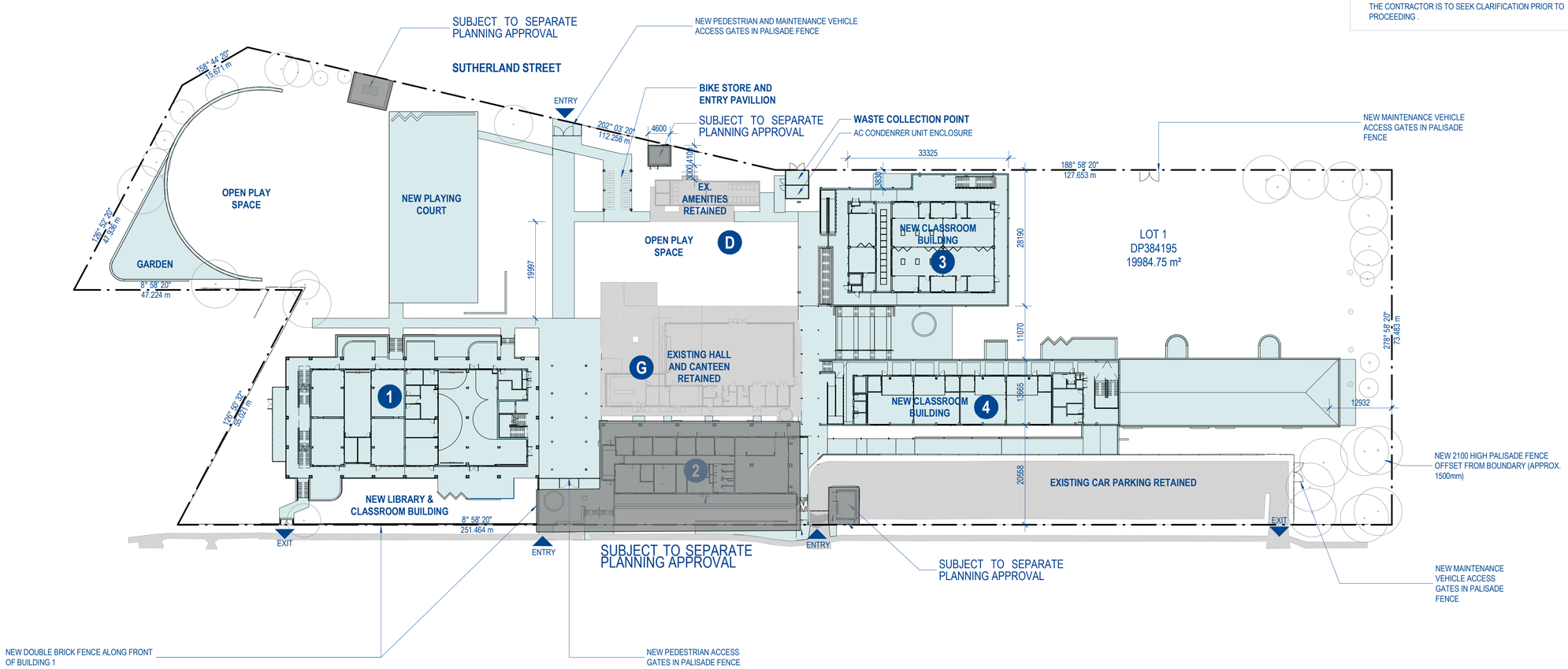
H	27.05.2021	SCHEMATIC DESIGN ISSUE	YC
1	29.06.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	16.07.2021	CONTRACT DOCUMENTATION ISSUE	HM



1 SITE PLAN - PROPOSED - GROUND
1 : 500

CLIENT:
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT ST, KINGSCLIFF, NSW

DRAWING TITLE:
SITE PLAN - PROPOSED - GROUND

0m 10m 20m 30m 40m 50m

SCALE @ A1: 1 : 500

DRAWN:	CHECKED:	PROJECT No:
YC	AG	1554

DRAWING No:	REVISION:	DATE:
A-X-0112	2	27.05.2021

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LEGEND - OVERALL SITE PLAN

SYMBOL / GRAPHIC	DESCRIPTION
	PROPERTY BOUNDARY
	EXTENT OF WORKS
	FENCE LINE
	EXISTING TO REMAIN
	NEW CONSTRUCTION
	EXISTING TREE TO REMAIN
	NEW TREE - INDICATIVE ONLY

SITE PLAN - GENERAL NOTES

- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH SINSW – EDUCATIONAL FACILITIES STANDARDS AND GUIDELINES (EFSG). IF A CONFLICT EXISTS BETWEEN THE EFSG AND THE DRAWINGS & SPECIFICATIONS, THE MORE ONEROUS REQUIREMENT OR CHARACTERISTIC SHALL BE ADOPTED, AND SEEK CLARIFICATION PRIOR TO PROCEEDING
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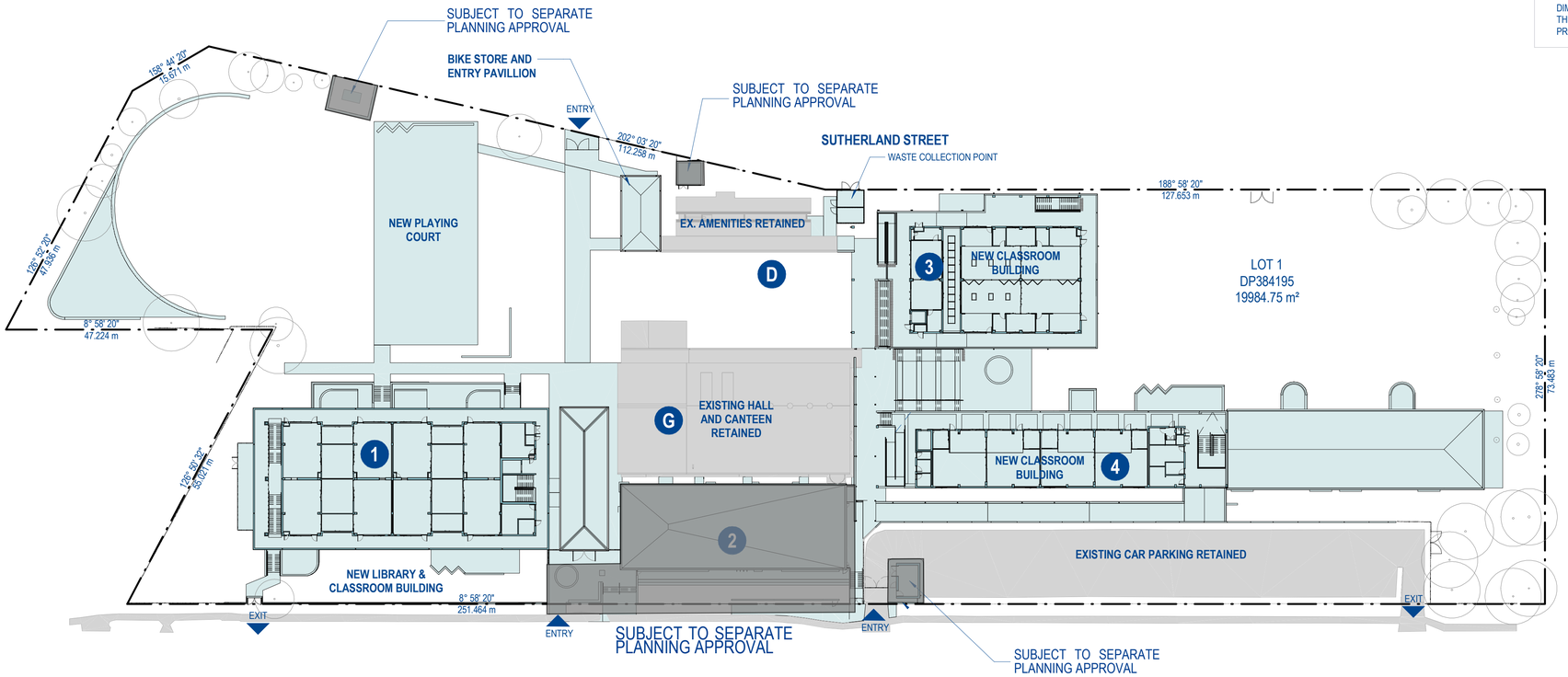

1 SITE PLAN - PROPOSED - LEVEL 1
1 : 500

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NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
FOR INFORMATION ONLY

REV	DATE	DETAILS	ISSUER
D	26.03.2021	COORDINATION ISSUE	HM
E	08.04.2021	INTERIM 100% DD ISSUE	YC
F	23.04.2021	100% DD ISSUE	HM
G	18.05.2021	CONSULTANTS COORDINATION	YC
H	27.05.2021	SCHEMATIC DESIGN ISSUE	YC
1	29.06.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	16.07.2021	CONTRACT DOCUMENTATION ISSUE	HM

CLIENT:
RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT ST, KINGSCLIFF, NSW

DRAWING TITLE:
SITE PLAN - PROPOSED - LEVEL 1

0m 10m 20m 30m 40m 50m

SCALE @ A1: 1 : 500

DRAWN:	CHECKED:	PROJECT No:
YC	AG	1554

DRAWING No:	REVISION:	DATE:
A-X-0113	2	27.05.2021

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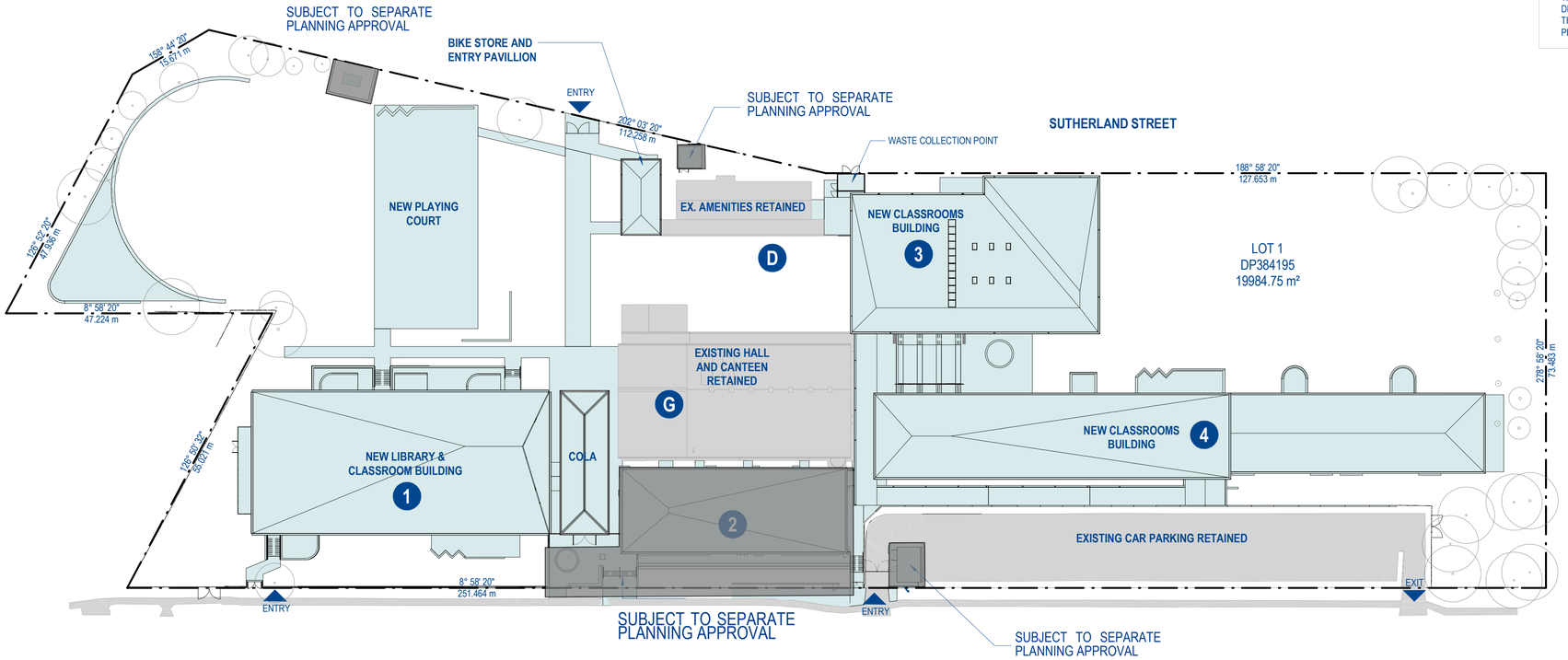

1 **SITE PLAN - PROPOSED - ROOF**
1 : 500

LEGEND - OVERALL SITE PLAN

SYMBOL / GRAPHIC	DESCRIPTION
	PROPERTY BOUNDARY
	EXTENT OF WORKS
	FENCE LINE
	EXISTING TO REMAIN
	NEW CONSTRUCTION
	EXISTING TREE TO REMAIN
	NEW TREE - INDICATIVE ONLY

SITE PLAN - GENERAL NOTES

- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH SINSW – EDUCATIONAL FACILITIES STANDARDS AND GUIDELINES (EFSG). IF A CONFLICT EXISTS BETWEEN THE EFSG AND THE DRAWINGS & SPECIFICATIONS, THE MORE ONEROUS REQUIREMENT OR CHARACTERISTIC SHALL BE ADOPTED, AND SEEK CLARIFICATION PRIOR TO PROCEEDING
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NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
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C	02.03.2021	50% DD ISSUE	YC
D	26.03.2021	COORDINATION ISSUE	HM
E	08.04.2021	INTERIM 100% DD ISSUE	YC
F	23.04.2021	100% DD ISSUE	HM
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CLIENT:
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NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT ST, KINGSCLIFF, NSW

DRAWING TITLE:
SITE PLAN - PROPOSED - ROOF

0m 10m 20m 30m 40m 50m

SCALE @ A1: 1 : 500

DRAWN:	CHECKED:	PROJECT No:
YC	AG	1554

DRAWING No:	REVISION:	DATE:
A-X-0114	2	27.05.2021

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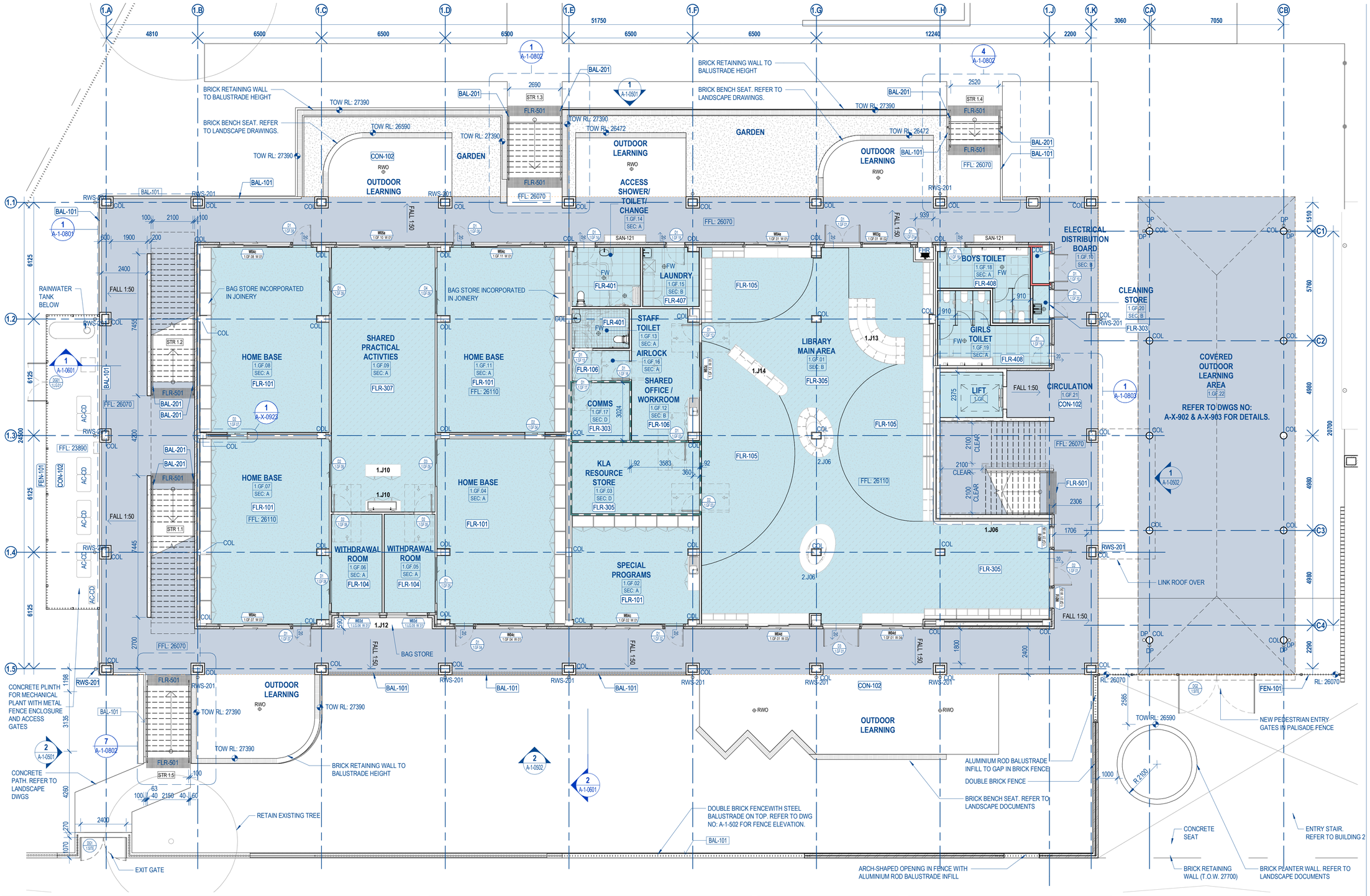

LEGEND - FLOOR PLAN

SYMBOL / GRAPHIC	DESCRIPTION
GA.##	(Glazing Assembly).(Glazing Assembly Number) - Refer to Glazing Assembly Elevations for details.
W.R.##	(Window).(Room Number).(Window Number) - Refer Elevations & Schedules.
D1 AAA	(Door).(Room Number).(Door Number) - Refer Elevations & Schedules.
8.CB-H1	Keynote Tag - refer legend and selections schedules. • number prefix indicates architectural spec. section) • prefix 'e' indicates existing item)
IW-92	Wall Type Mark - Refer to Schedule
ROOM NAME	Room Name (or abbreviation)
000	Room Number
150 m²	Room Area
000 SIMILAR / 00000	Detail Number of Section / Elevation Sheet Number of Section / Elevation

SYMBOL / GRAPHIC	DESCRIPTION
	Wall lining security - rating D - to comply with EFSG requirements
	Wall fire rating - 60/60/60 - Refer to Schedule

ROOM COLOUR FILL LEGEND

SYMBOL / GRAPHIC	DESCRIPTION
	EXISTING TO REMAIN (OUT OF SCOPE)
	NEW CONSTRUCTION

ROOM SECURITY LEGEND

A	Lockable Doors to External Areas
B	Lockable Windows/doors
C	Security Mesh to Windows
D	Steel Lined Door, No Windows, Mansory or Steel Mesh under Lining.

GENERAL NOTES

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LEGENDS

SYMBOL / GRAPHIC	DESCRIPTION
FH	FIRE HYDRANT
RWO	RAIN WATER OUTLET
FW	FLOOR WASTE
DP	DOWNPIPE
	LOCALISED FALL IN SLAB TO RWO/FW

KEYNOTE LEGEND

CODE	ELEMENT
2.J06	
AC-CD	AIR CONDITIONING - CONDENSER UNIT. REFER MECH. DWGS
BAL-101	METAL HANDRAIL/ BALUSTRADE
BAL-201	STAINLESS STEEL HANDRAIL
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-102	WORKED CONCRETE FINISH - BROOM
DP	DOWNPIPE - REFER TO HYDRAULIC DWGS.
FEN-101	STEEL PALISADE FENCE
FHR	FIRE HOSE REEL - REFER TO HYDRAULIC DWGS
FLR-101	CARPET TILES
FLR-104	CARPET TILES
FLR-105	CARPET TILES
FLR-106	BROADLOOM CARPET
FLR-303	LINOLEUM SHEETING
FLR-305	LINOLEUM SHEETING
FLR-307	LINOLEUM SHEETING

KEYNOTE LEGEND

CODE	ELEMENT
FLR-401	FLOOR TILING
FLR-407	FLOOR TILING
FLR-408	FLOOR TILING (NON WET AREAS)
FLR-501	TACTILE INDICATORS
FW	FLOOR WASTE - REFER TO HYDRAULIC DWGS.
RWS-201	DOWNPIPE

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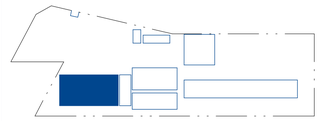
1	04.06.2021	CONTRACT DOCUMENTATION ISSUE	YC



KEY PLAN

CLIENT:
RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT | Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:
BUILDING 1 - LIBRARY & HOME BASE - PROPOSED - GROUND

NORTH

DATE:	SCALE @ A1:	
04.06.2021	1 : 100	
DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

DRAWING No: A-1-0201
REVISION: 1

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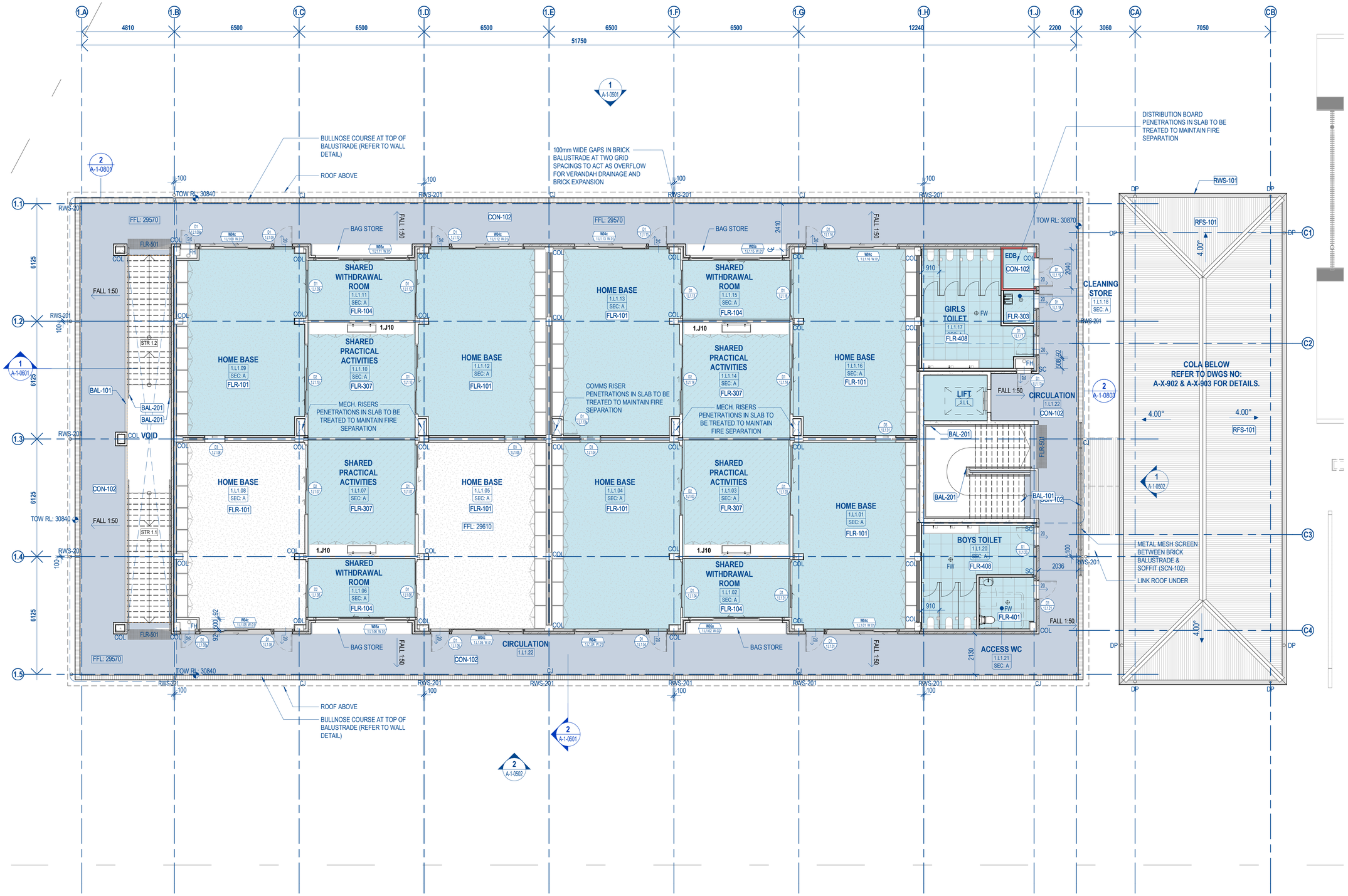

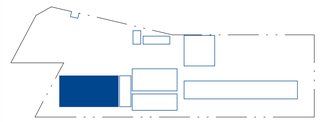

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SYMBOL / GRAPHIC	DESCRIPTION
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D1 AAA	(Door).(Room Number).(Door Number) - Refer Elevations & Schedules.
8.CB-H1	Keynote Tag - refer legend and selections schedules. • number prefix indicates architectural spec. section) • prefix 'e' indicates existing item)
IW-02	Wall Type Mark - Refer to Schedule
ROOM NAME	Room Name (or abbreviation)
000	Room Number
150 m²	Room Area
000 SIMILAR / 00000	Detail Number of Section / Elevation Sheet Number of Section / Elevation

SYMBOL / GRAPHIC	DESCRIPTION
	Wall lining security - rating D - to comply with EFSG requirements
	Wall fire rating - 60/60/60 - Refer to Schedule

ROOM COLOUR FILL LEGEND

SYMBOL / GRAPHIC	DESCRIPTION
	EXISTING TO REMAIN (OUT OF SCOPE)
	NEW CONSTRUCTION

ROOM SECURITY LEGEND

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LEGENDS

SYMBOL / GRAPHIC	DESCRIPTION
FH	FIRE HYDRANT
RWO	RAIN WATER OUTLET
FW	FLOOR WASTE
DP	DOWNPIPE
	LOCALISED FALL IN SLAB TO RWO/FW

KEYNOTE LEGEND

CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BAL-201	STAINLESS STEEL HANDRAIL
CJ	CONSTRUCTION JOINT - REFER TO STRUCT. DWGS
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-102	WORKED CONCRETE FINISH - BROOM
DP	DOWNPIPE - REFER TO HYDRAULIC DWGS.
FH	FIRE HYDRANT - REFER TO HYDRAULIC DWGS.
FLR-101	CARPET TILES
FLR-104	CARPET TILES
FLR-303	LINOLEUM SHEETING

KEYNOTE LEGEND

CODE	ELEMENT
FLR-307	LINOLEUM SHEETING
FLR-401	FLOOR TILING
FLR-408	FLOOR TILING (NON WET AREAS)
FLR-501	TACTILE INDICATORS
FW	FLOOR WASTE - REFER TO HYDRAULIC DWGS.
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE
SC	STEEL COLUMN - REFER TO STRUCT. DWGS
SCN-102	METAL MESH

CLIENT:

RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:

KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 1 - LIBRARY & HOME BASE - PROPOSED - LEVEL 1

NORTH

DATE:	SCALE @ A1:	
04.06.2021	1 : 100	
DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554
DRAWING No:		REVISION:
A-1-0202		1

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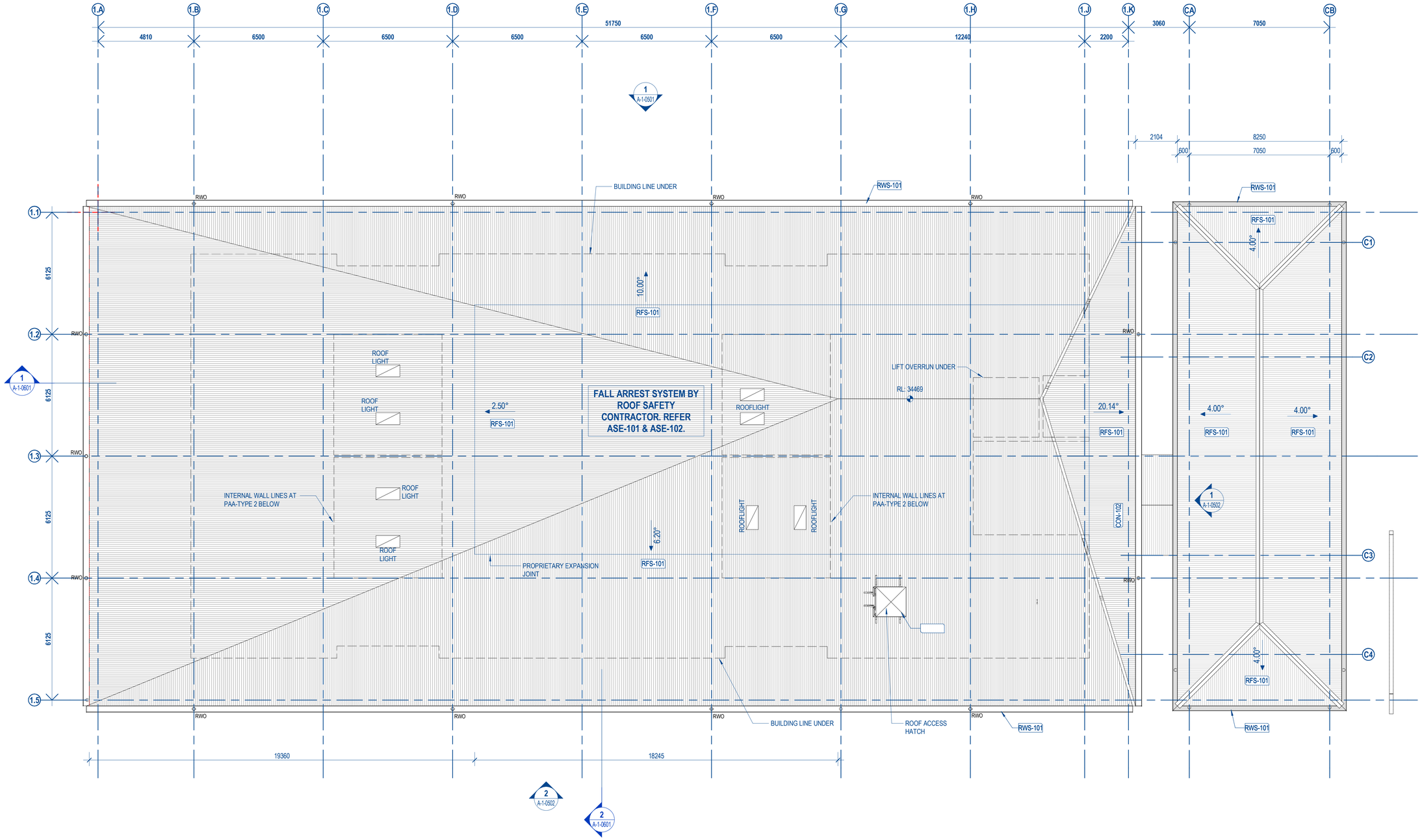

LEGEND - ROOF PLAN

SYMBOL / GRAPHIC	DESCRIPTION
15°	Roof Pitch & Direction of Fall
000 SIMILAR / 00000	Detail Number of Section / Elevation Sheet Number of Section / Elevation

GENERAL NOTES

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LEGENDS

SYMBOL / GRAPHIC	DESCRIPTION
FH	FIRE HYDRANT
RWO	RAIN WATER OUTLET
FW	FLOOR WASTE
DP	DOWNPIPE
↘ ↙ ↗ ↖	LOCALISED FALL IN SLAB TO RWO/FW

KEYNOTE LEGEND

CODE	ELEMENT
CON-102	WORKED CONCRETE FINISH - BROOM
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER

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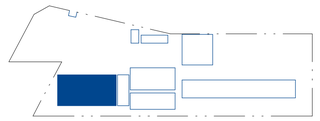

KEY PLAN

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PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

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YC	AB	1554
DRAWING No:		REVISION:
A-1-0203		1

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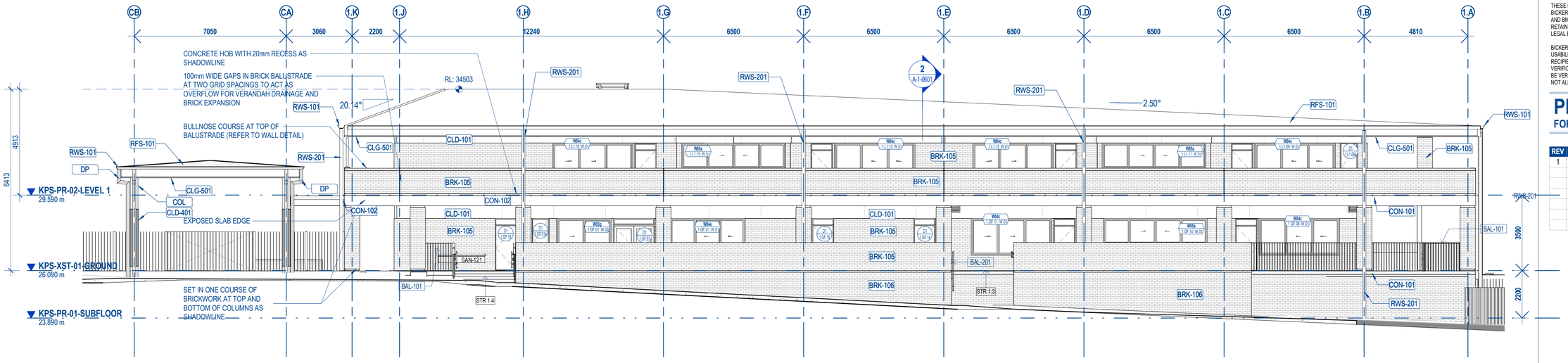
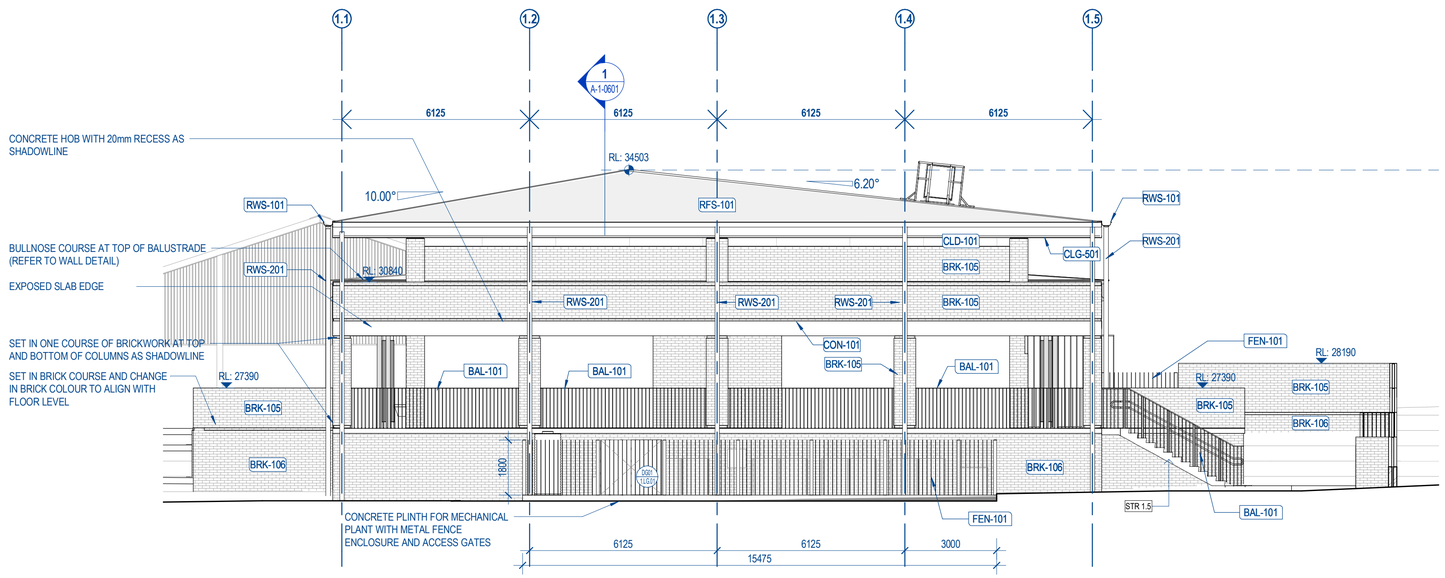


1 BUILDING 1 - EAST ELEVATION

A-1-0200 1 : 100



2 BUILDING 1 - NORTH ELEVATION

A-1-0200 1 : 100

GENERAL NOTES

- ALL DRAWINGS & SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH SINSW – EDUCATIONAL FACILITIES STANDARDS AND GUIDELINES (EFSG). IF A CONFLICT EXISTS BETWEEN THE EFSG AND THE DRAWINGS & SPECIFICATIONS, THE MORE ONEROUS REQUIREMENT OR CHARACTERISTIC SHALL BE ADOPTED, AND SEEK CLARIFICATION PRIOR TO PROCEEDING
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LEGEND - BUILDING ELEVATION

SYMBOL / GRAPHIC	DESCRIPTION
GA.##	(Glazing Assembly).(Glazing Assembly Number) - Refer to Glazing Assembly Elevations for details.
W.R.##	(Window).(Room Number).(Window Number) - Refer Elevations & Schedules.
D.R.##	(Door).(Room Number).(Door Number) - Refer Elevations & Schedules.
000 SIMILAR 00000	Detail Number of Section / Elevation Sheet Number of Section / Elevation

KEYNOTE LEGEND

CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BRK-105	FACE BRICKWORK - CLAY
BRK-106	FACE BRICKWORK - CLAY
CLD-101	PREFINISHED COMPRESSED FIBRE CEMENT CLADDING
CLD-401	EXTERNAL TILING - COLUMNS
CLG-501	PREFINISHED COMPRESSED FIBRE CEMENT SOFFIT LINING
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-101	OFF-FORM CONCRETE FINISH - CLASS 2
CON-102	WORKED CONCRETE FINISH - BROOM
DP	DOWNPIPE - REFER TO HYDRAULIC DWGS.
FEN-101	STEEL PALISADE FENCE
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE

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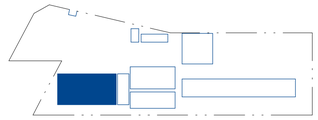
PRELIMINARY ISSUE

FOR INFORMATION ONLY

REV	DATE	DETAILS	ISSUER
1	04.06.2021	CONTRACT DOCUMENTATION ISSUE	YC



KEY PLAN

CLIENT:

RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:

KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 1 - LIBRARY & HOME BASE - ELEVATION 01

NORTH

DATE:	SCALE @ A1:	
04.06.2021	1 : 100	
DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

DRAWING No: A-1-0501

REVISION: 1

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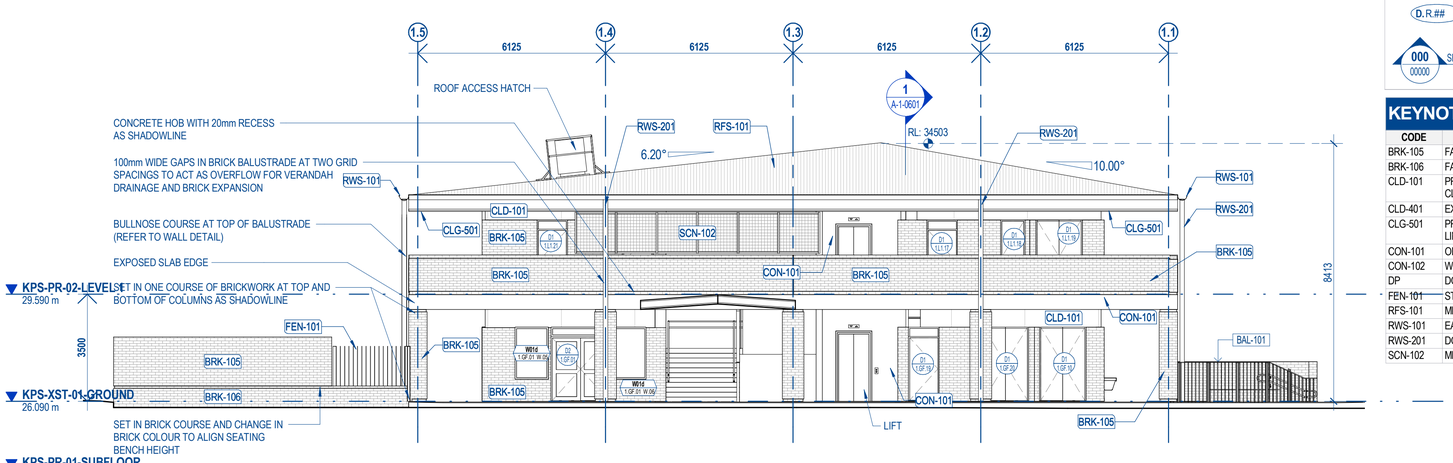
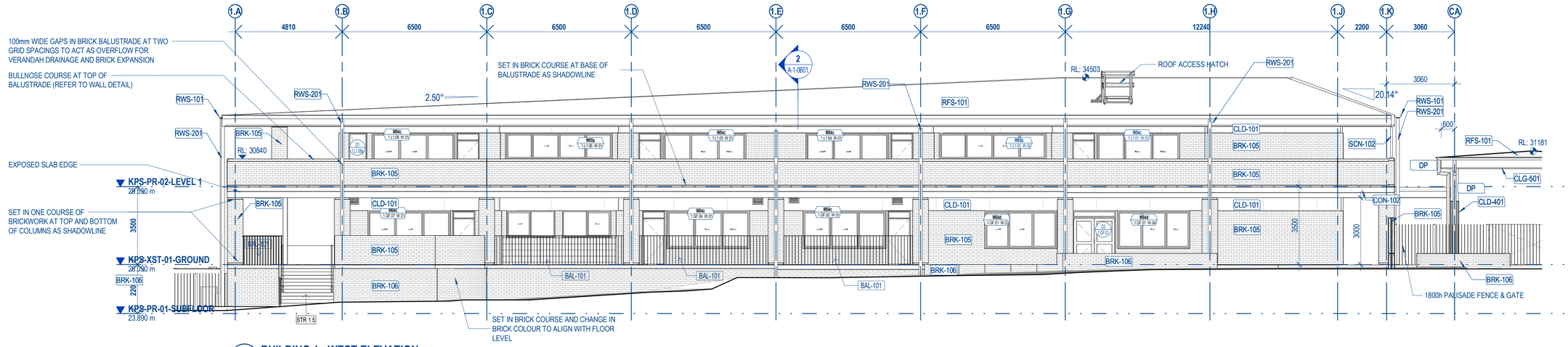
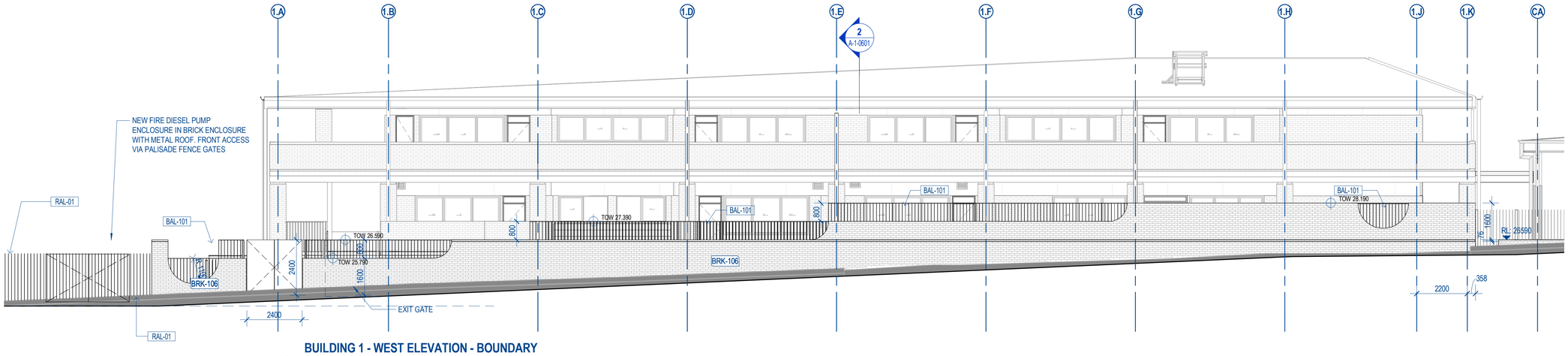


1 A-1-0201 **BUILDING 1 - SOUTH ELEVATION**
1 : 100



2 A-1-0202 **BUILDING 1 - WEST ELEVATION**
1 : 100



3 **BUILDING 1 - WEST ELEVATION - BOUNDARY WALL**
1 : 100

LEGEND - BUILDING ELEVATION

SYMBOL / GRAPHIC	DESCRIPTION
GA.##	(Glazing Assembly).(Glazing Assembly Number) - Refer to Glazing Assembly Elevations for details.
W.R.##	(Window).(Room Number).(Window Number) - Refer Elevations & Schedules.
D.R.##	(Door).(Room Number).(Door Number) - Refer Elevations & Schedules.
000 SIMILAR / 00000	Detail Number of Section / Elevation Sheet Number of Section / Elevation

KEYNOTE LEGEND

CODE	ELEMENT
BRK-105	FACE BRICKWORK - CLAY
BRK-106	FACE BRICKWORK - CLAY
CLD-101	PREFINISHED COMPRESSED FIBRE CEMENT CLADDING
CLD-401	EXTERNAL TILING - COLUMNS
CLG-501	PREFINISHED COMPRESSED FIBRE CEMENT SOFFIT LINING
CON-101	OFF-FORM CONCRETE FINISH - CLASS 2
CON-102	WORKED CONCRETE FINISH - BROOM
DP	DOWNPIPE - REFER TO HYDRAULIC DWGS.
FEN-101	STEEL PALISADE FENCE
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE
SCN-102	METAL MESH

GENERAL NOTES

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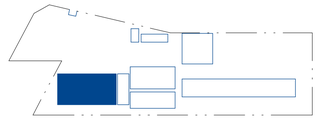
PRELIMINARY ISSUE
FOR INFORMATION ONLY

REV	DATE	DETAILS	ISSUER
1	04.06.2021	CONTRACT DOCUMENTATION ISSUE	YC



KEY PLAN

CLIENT:
RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:
BUILDING 1 - LIBRARY & HOME BASE - ELEVATION 02

NORTH

DATE:	SCALE @ A1:	
04.06.2021	1 : 100	
DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554
DRAWING No:		REVISION:
A-1-0502		1

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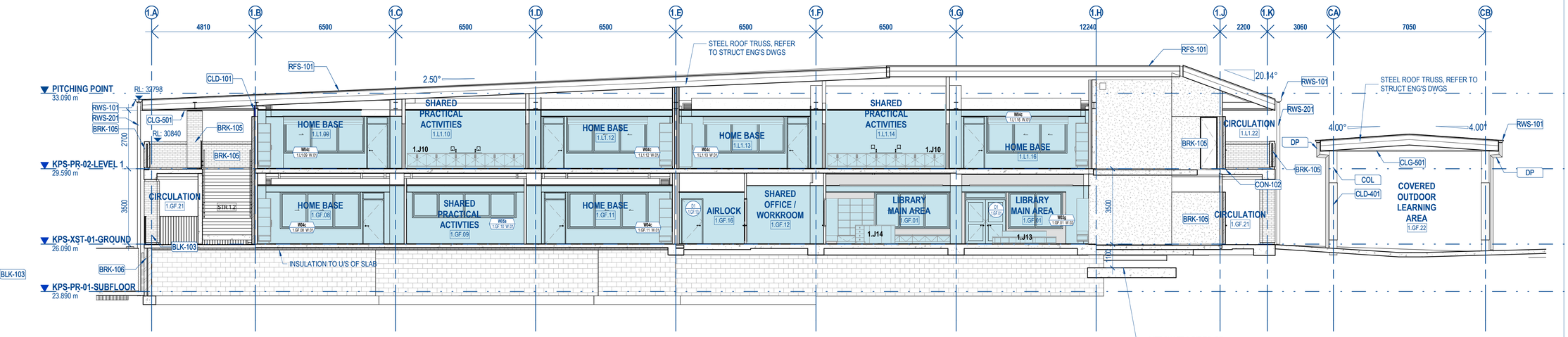
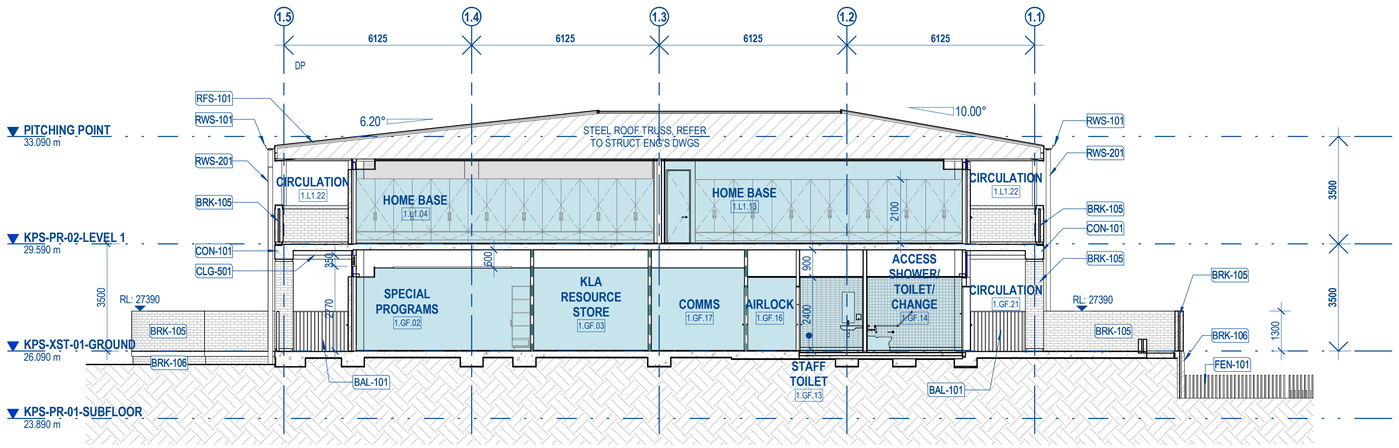


1 BUILDING 1 - SECTION A
A-1-0200 1 : 100



2 BUILDING 1 - SECTION B
A-1-0200 1 : 100

LEGEND - BUILDING SECTION

SYMBOL / GRAPHIC	DESCRIPTION
GA.##	(Glazing Assembly).(Glazing Assembly Number) - Refer to Glazing Assembly Elevations for details.
W.R.##	(Window).(Room Number).(Window Number) - Refer Elevations & Schedules.
D.R.##	(Door).(Room Number).(Door Number) - Refer Elevations & Schedules.
ROOM NAME / 000	Room Name (or abbreviation) / Room Number
000 SIMILAR / 00000	Detail Number of Section / Elevation / Sheet Number of Section / Elevation
	WALL LINING SECURITY - RATING D - TO COMPLY WITH EFSG REQUIREMENTS
IW-02	WALL TYPE MARK - REFER SCHEDULE
	WALL FIRE RATING - 60/60/60 - REFER SCHEDULE

ROOM COLOUR FILL LEGEND

SYMBOL / GRAPHIC	DESCRIPTION
	EXISTING TO REMAIN (OUT OF SCOPE)
	NEW CONSTRUCTION

GENERAL NOTES

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KEYNOTE LEGEND

CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BLK-103	CONCRETE BLOCKWORK - 190MM
BRK-105	FACE BRICKWORK - CLAY
BRK-106	FACE BRICKWORK - CLAY
CLD-101	PREFINISHED COMPRESSED FIBRE CEMENT CLADDING
CLD-401	EXTERNAL TILING - COLUMNS
CLG-501	PREFINISHED COMPRESSED FIBRE CEMENT SOFFIT LINING
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-101	OFF-FORM CONCRETE FINISH - CLASS 2
CON-102	WORKED CONCRETE FINISH - BROOM
DP	DOWNPIPE - REFER TO HYDRAULIC DWGS.
FEN-101	STEEL PALISADE FENCE
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE

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REV	DATE	DETAILS	ISSUER
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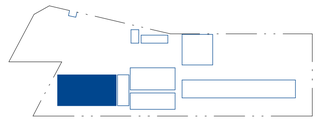

KEY PLAN

CLIENT:
RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:
BUILDING 1 - LIBRARY & HOME BASE - SECTION 01

NORTH

DATE:	SCALE @ A1:	
04.06.2021	1 : 100	
DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

DRAWING No: A-1-0601
REVISION: 1

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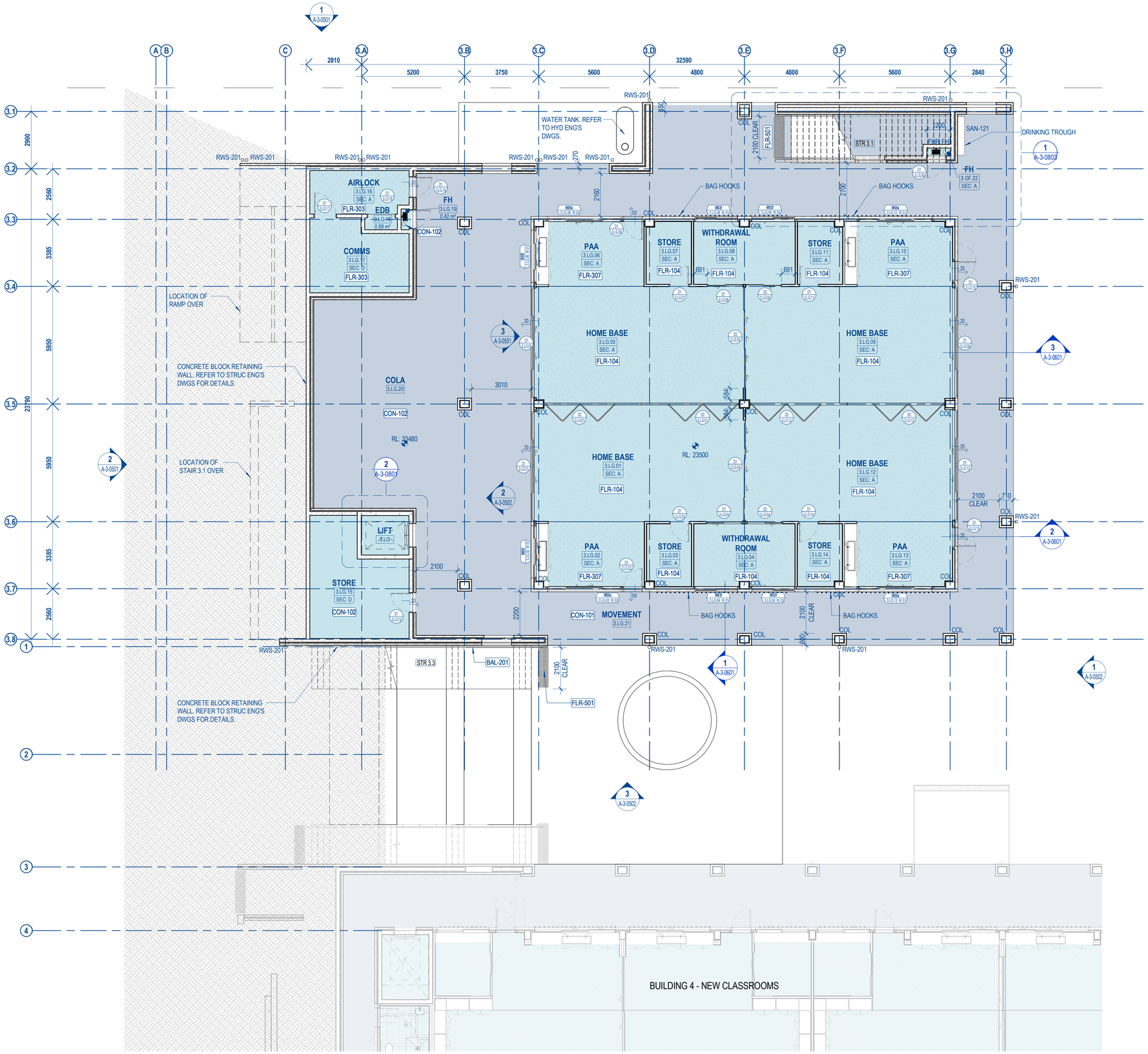

1 BUILDING 3 - LOWER GROUND FLOOR PLAN
1 : 100

LEGEND - FLOOR PLAN

SYMBOL / GRAPHIC	DESCRIPTION
JH1 / aaa W 01	WINDOW TYPE WINDOW ROOM NUMBER + WINDOW NO.
D1 / AAA	DOOR NUMBER ROOM NUMBER
BRK-102 BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.
ROOM NAME	ROOM NAME (OR ABBREVIATION)
000 / SEC: A	ROOM NUMBER ROOM EFSG SECURITY RATING
000 / 00000 SIMILAR	DETAIL NUMBER OF SECTION / ELEVATION SHEET NUMBER OF SECTION / ELEVATION
	WALL LINING SECURITY - RATING D - TO COMPLY WITH EFSG REQUIREMENTS
IW-02	WALL TYPE MARK - REFER SCHEDULE
	WALL FIRE RATING - 60/60/60 - REFER SCHEDULE

ROOM COLOUR FILL LEGEND

SYMBOL / GRAPHIC	DESCRIPTION
	EXISTING TO REMAIN (OUT OF SCOPE)
	NEW CONSTRUCTION
	NEW CONSTRUCTION (EXTERNAL SPACES)

ROOM SECURITY LEGEND

A	Lockable Doors to External Areas
B	Lockable Windows/doors
C	Security Mesh to Windows
D	Steel Lined Door, No Windows, Mansory or Steel Mesh under Lining.

GENERAL NOTES

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NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
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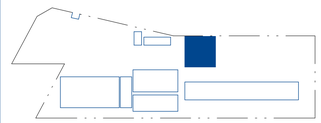
REV	DATE	DETAILS	ISSUER
C	02.03.2021	50% DD ISSUE	YC
D	23.03.2021	CONSULTANT COORDINATION ISSUE	HM
E	08.04.2021	INTERIM 100% DD ISSUE	HM
F	27.05.2021	SCHEMATIC DESIGN ISSUE	YC
G	04.06.2021	100% DD ISSUE	HM
1	02.07.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	16.07.2021	CONTRACT DOCUMENTATION ISSUE	HM

KEYNOTE LEGEND

CODE	ELEMENT
BAL-201	STAINLESS STEEL HANDRAIL
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-101	OFF-FORM CONCRETE FINISH - CLASS 2
CON-102	WORKED CONCRETE FINISH - BROOM
FH	FIRE HYDRANT - REFER TO HYDRAULIC DWGS.
FHR	FIRE HOSE REEL - REFER TO HYDRAULIC DWGS
FLR-104	CARPET TILES
FLR-303	LINOLEUM SHEETING
FLR-307	LINOLEUM SHEETING
FLR-501	TACTILE INDICATORS
RWS-201	DOWNPIPE
SAN-121	DRINKING BAY



KEY PLAN - NTS

CLIENT:
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:
BUILDING 3 - HOME BASE - PROPOSED - LOWER GROUND

0m 2m 4m 6m 8m 10m
SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

DRAWING No:	REVISION:	DATE:
A-3-0201	2	16.07.2021

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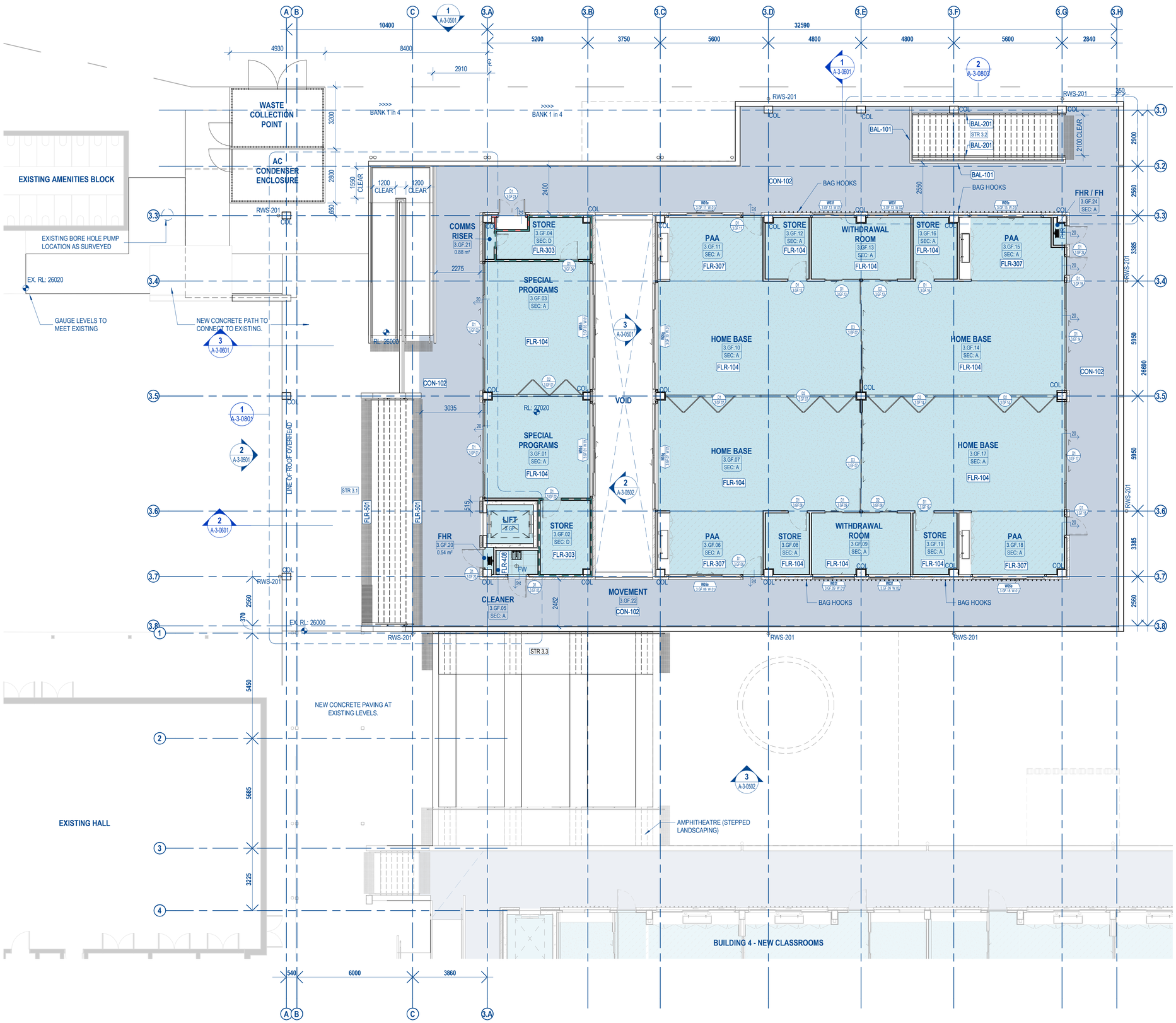

LEGEND - FLOOR PLAN

SYMBOL / GRAPHIC	DESCRIPTION
JR1 / WW 01	WINDOW TYPE / WINDOW ROOM NUMBER + WINDOW NO.
D1 / AAA	DOOR NUMBER / ROOM NUMBER
BRK-102 BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.
ROOM NAME / 000 / SEC: A	ROOM NAME (OR ABBREVIATION) / ROOM NUMBER / ROOM EFSG SECURITY RATING
000 / 00000 SIMILAR	DETAIL NUMBER OF SECTION / ELEVATION / SHEET NUMBER OF SECTION / ELEVATION
	WALL LINING SECURITY - RATING D - TO COMPLY WITH EFSG REQUIREMENTS
IW-02	WALL TYPE MARK - REFER SCHEDULE
	WALL FIRE RATING - 60/60/60 - REFER SCHEDULE

ROOM COLOUR FILL LEGEND

SYMBOL / GRAPHIC	DESCRIPTION
	EXISTING TO REMAIN (OUT OF SCOPE)
	NEW CONSTRUCTION
	NEW CONSTRUCTION (EXTERNAL SPACES)

ROOM SECURITY LEGEND

A	Lockable Doors to External Areas
B	Lockable Windows/doors
C	Security Mesh to Windows
D	Steel Lined Door, No Windows, Mansory or Steel Mesh under Lining.

GENERAL NOTES

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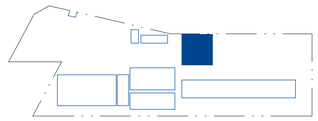
NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
FOR INFORMATION ONLY

REV	DATE	DETAILS	ISSUER
C	02.03.2021	50% DD ISSUE	YC
D	23.03.2021	CONSULTANT COORDINATION ISSUE	HM
E	08.04.2021	INTERIM 100% DD ISSUE	HM
F	27.05.2021	SCHEMATIC DESIGN ISSUE	YC
G	04.06.2021	100% DD ISSUE	HM
1	02.07.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	16.07.2021	CONTRACT DOCUMENTATION ISSUE	HM

KEYNOTE LEGEND

CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BAL-201	STAINLESS STEEL HANDRAIL
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-102	WORKED CONCRETE FINISH - BROOM
FHR	FIRE HOSE REEL - REFER TO HYDRAULIC DWGS
FLR-104	CARPET TILES
FLR-303	LINOLEUM SHEETING
FLR-307	LINOLEUM SHEETING
FLR-408	FLOOR TILING (NON WET AREAS)
FLR-501	TACTILE INDICATORS
FW	FLOOR WASTE - REFER TO HYDRAULIC DWGS.
RWS-201	DOWNPIPE



KEY PLAN - NTS

CLIENT:

RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:

KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 3 - HOME BASE - PROPOSED - GROUND

0m 2m 4m 6m 8m 10m

SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

DRAWING No:	REVISION:	DATE:
A-3-0202	2	16.07.2021

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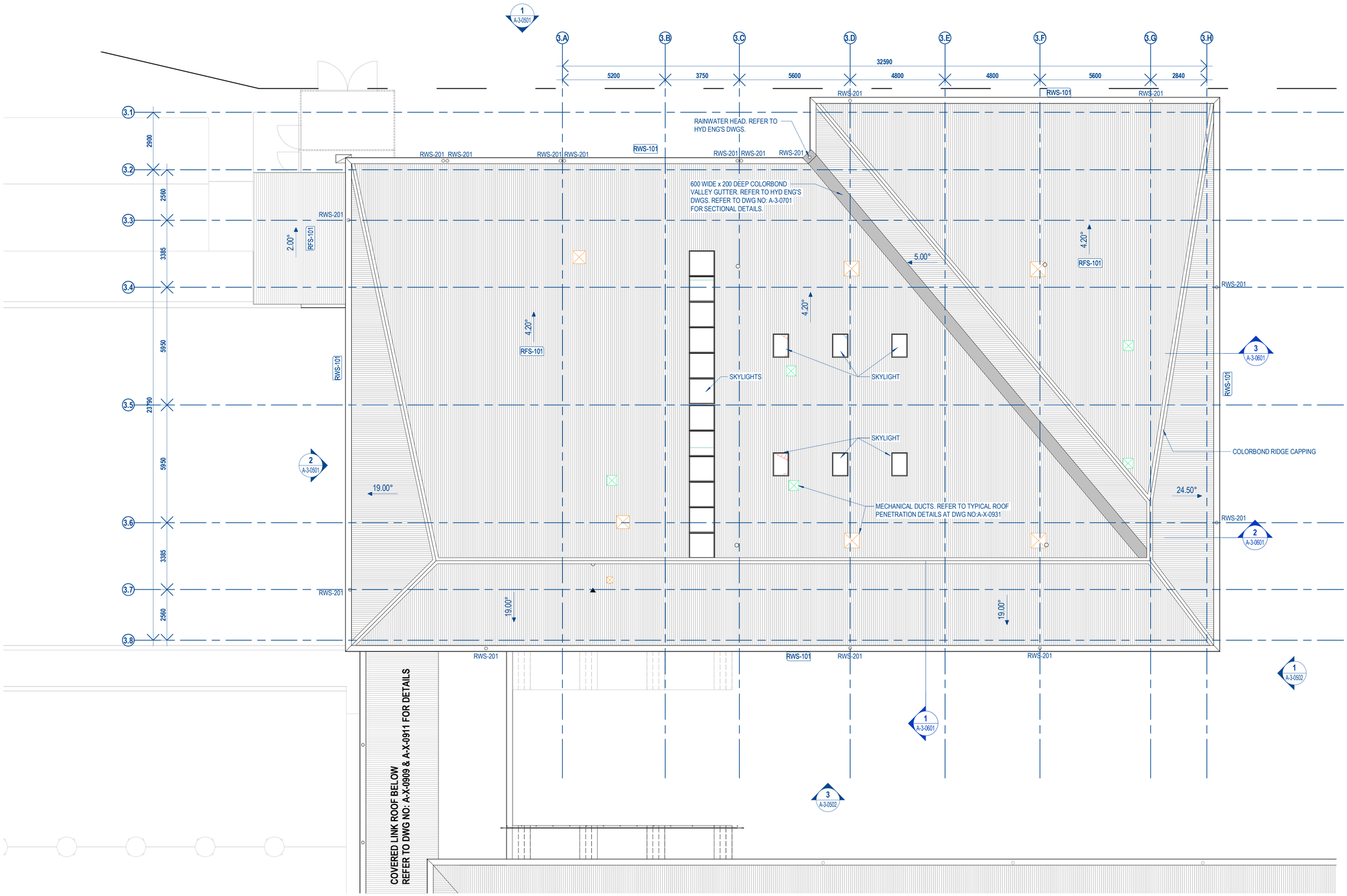

LEGEND - ROOF PLAN

SYMBOL / GRAPHIC	DESCRIPTION
15°	ROOF PITCH & DIRECTION OF FALL
BRK-102 BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.
000 SIMILAR / 00000	DETAIL NUMBER OF SECTION / ELEVATION SHEET NUMBER OF SECTION / ELEVATION

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KEYNOTE LEGEND

CODE	ELEMENT
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE

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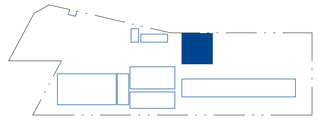

KEY PLAN - NTS

CLIENT:

RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:

KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 3 - HOME BASE - PROPOSED - ROOF

0m 2m 4m 6m 8m 10m

SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

DRAWING No:	REVISION:	DATE:
A-3-0203	2	16.07.2021

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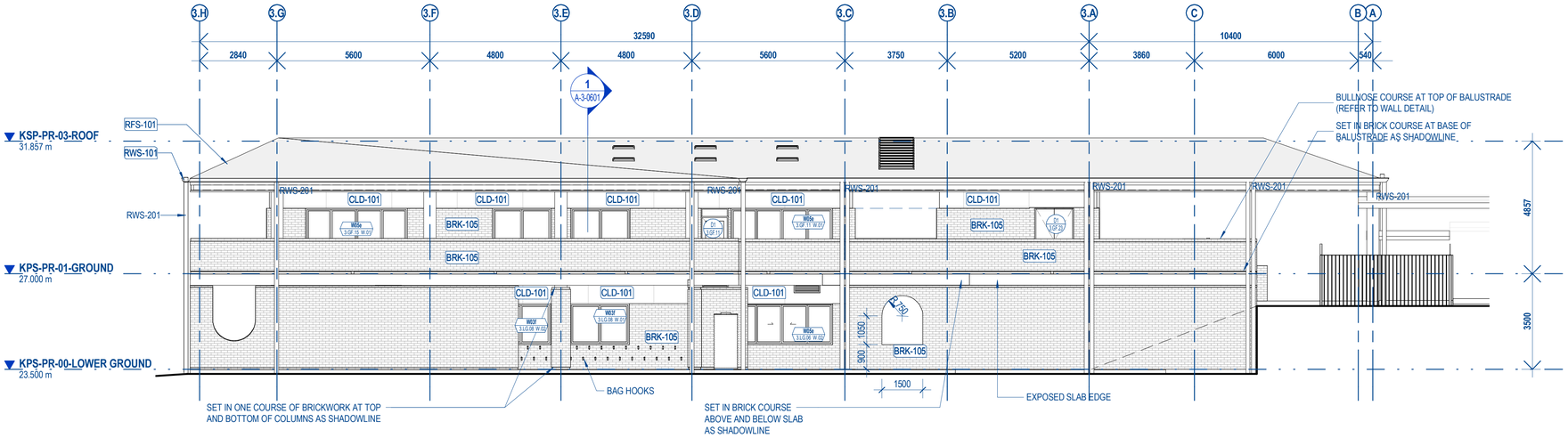
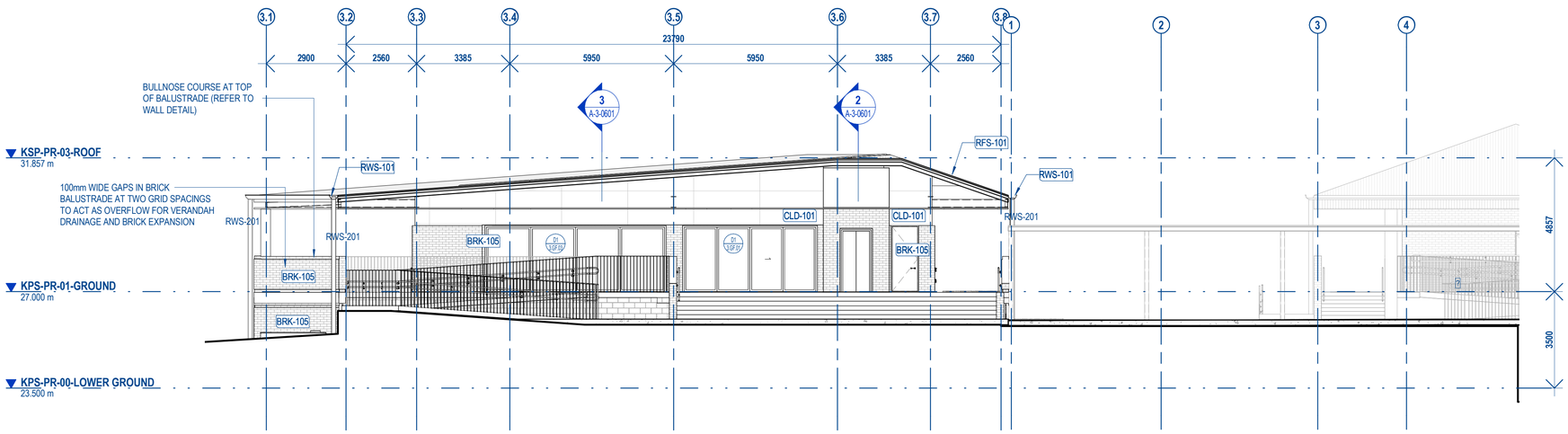


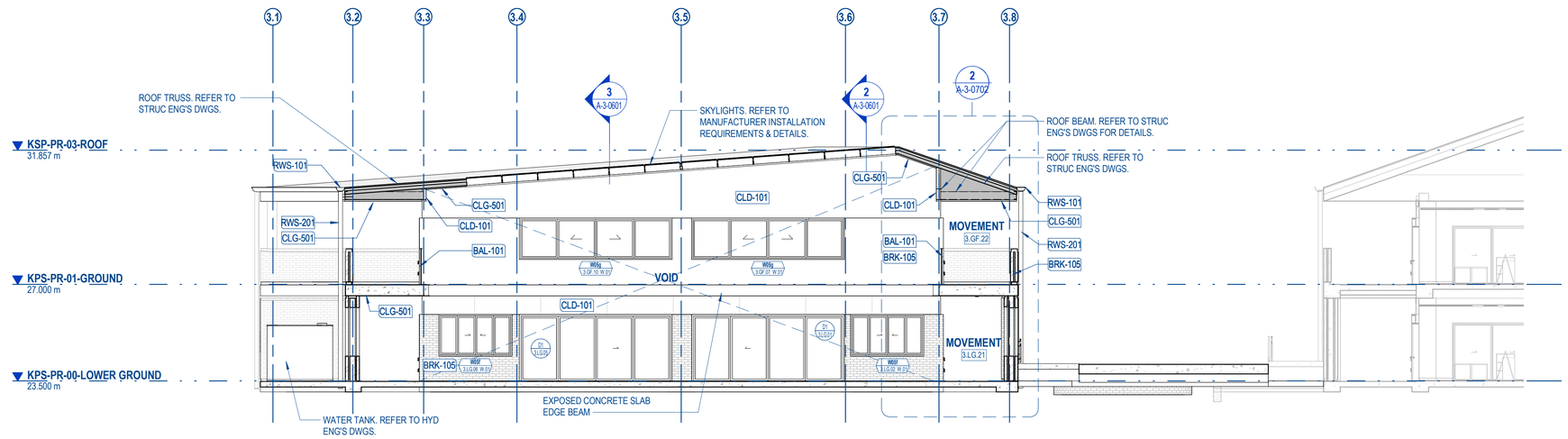
1 A-3-0201 BUILDING 3 - EAST ELEVATION

1 : 100



2 A-3-0201 BUILDING 3 - NORTH ELEVATION

1 : 100



3 A-3-0201 BUILDING 3 - NORTH ELEVATION (THROUGH VOID)

1 : 100

LEGEND - BUILDING ELEVATION

SYMBOL / GRAPHIC	DESCRIPTION
JR1 AAA W.01	WINDOW TYPE WINDOW ROOM NUMBER + WINDOW NUMBER
D1 AAA	DOOR NUMBER ROOM NUMBER
BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.
000 SIMILAR 00000	DETAIL NUMBER OF SECTION / ELEVATION SHEET NUMBER OF SECTION / ELEVATION

KEYNOTE LEGEND

CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BRK-105	FACE BRICKWORK - CLAY
CLD-101	PREFINISHED COMPRESSED FIBRE CEMENT CLADDING
CLG-501	PREFINISHED COMPRESSED FIBRE CEMENT SOFFIT LINING
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE

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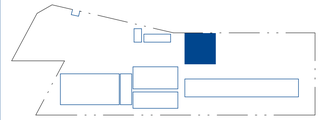

KEY PLAN - NTS

CLIENT:

RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:

KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 3 - HOME BASE - ELEVATION 01

0m 2m 4m 6m 8m 10m

SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

DRAWING No:	REVISION:	DATE:
A-3-0501	2	16.07.2021

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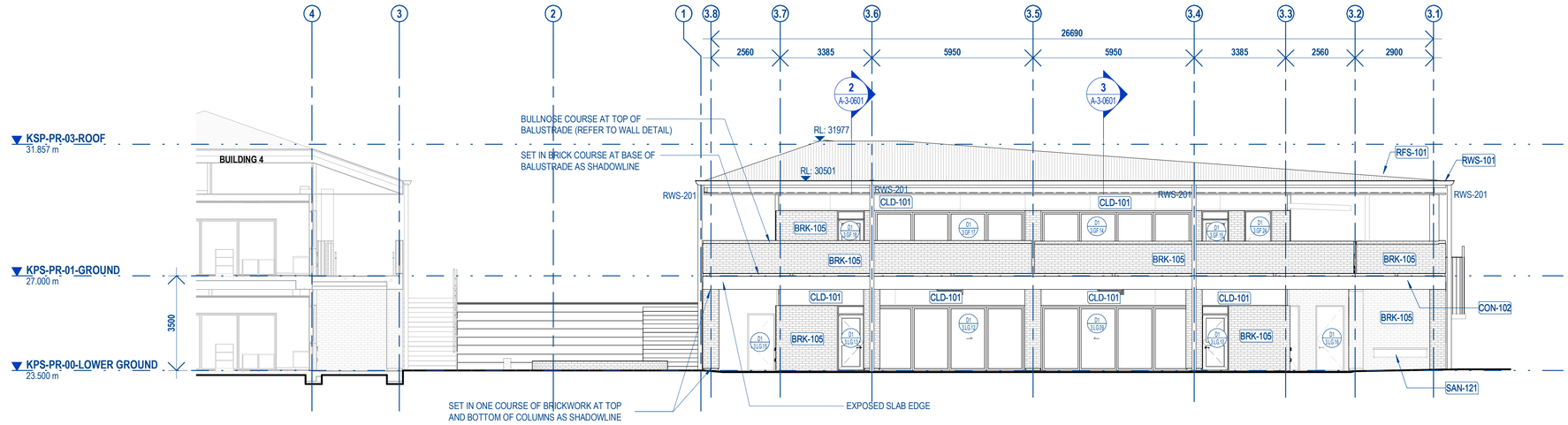
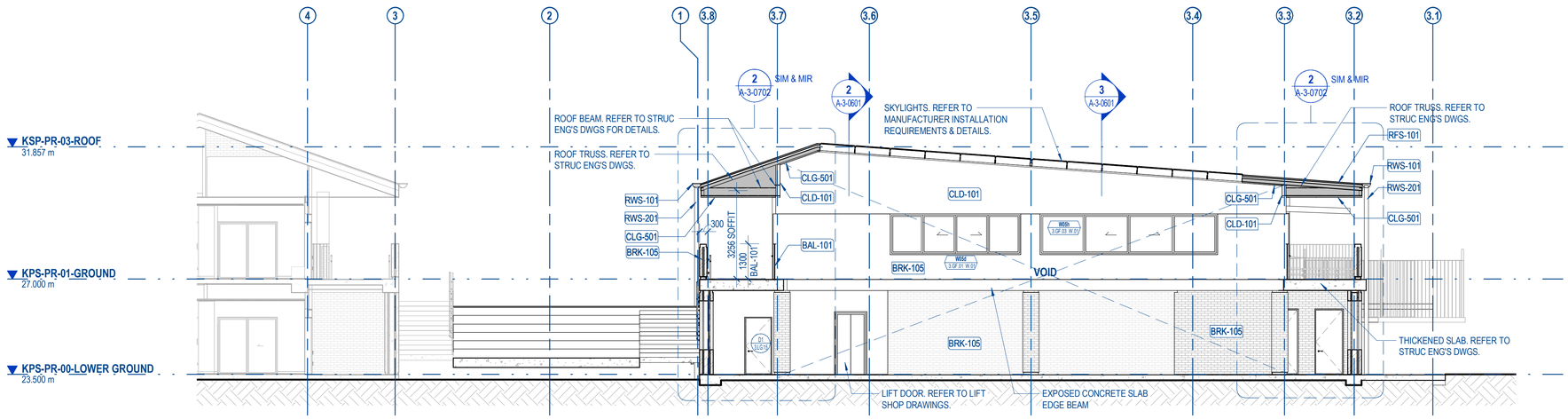
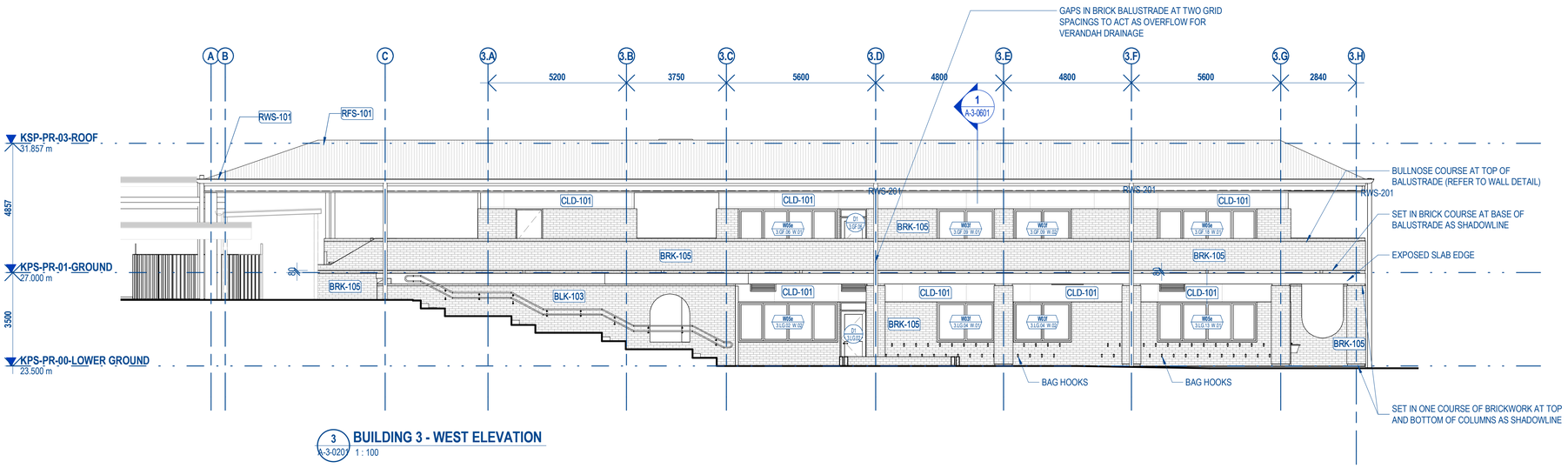


1 A-3-0201 **BUILDING 3 - SOUTH ELEVATION**
1 : 100



2 A-3-0201 **BUILDING 3 - SOUTH ELEVATION (THROUGH VOID)**
1 : 100



3 A-3-0201 **BUILDING 3 - WEST ELEVATION**
1 : 100

LEGEND - BUILDING ELEVATION

SYMBOL / GRAPHIC	DESCRIPTION
JR1 / W06 W.03	WINDOW TYPE WINDOW ROOM NUMBER + WINDOW NUMBER
D1 / AAA	DOOR NUMBER ROOM NUMBER
BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.
000 SIMILAR / 00000	DETAIL NUMBER OF SECTION / ELEVATION SHEET NUMBER OF SECTION / ELEVATION

KEYNOTE LEGEND

CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BLK-103	CONCRETE BLOCKWORK - 190MM
BRK-105	FACE BRICKWORK - CLAY
CLD-101	PREFINISHED COMPRESSED FIBRE CEMENT CLADDING
CLG-501	PREFINISHED COMPRESSED FIBRE CEMENT SOFFIT LINING
CON-102	WORKED CONCRETE FINISH - BROOM
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE
SAN-121	DRINKING BAY

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NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

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F	04.06.2021	100% DD ISSUE	HM
1	02.07.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	16.07.2021	CONTRACT DOCUMENTATION ISSUE	HM

CLIENT:

RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:

KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 3 - HOME BASE - ELEVATION 02

0m 2m 4m 6m 8m 10m

SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

DRAWING No:	REVISION:	DATE:
A-3-0502	2	16.07.2021

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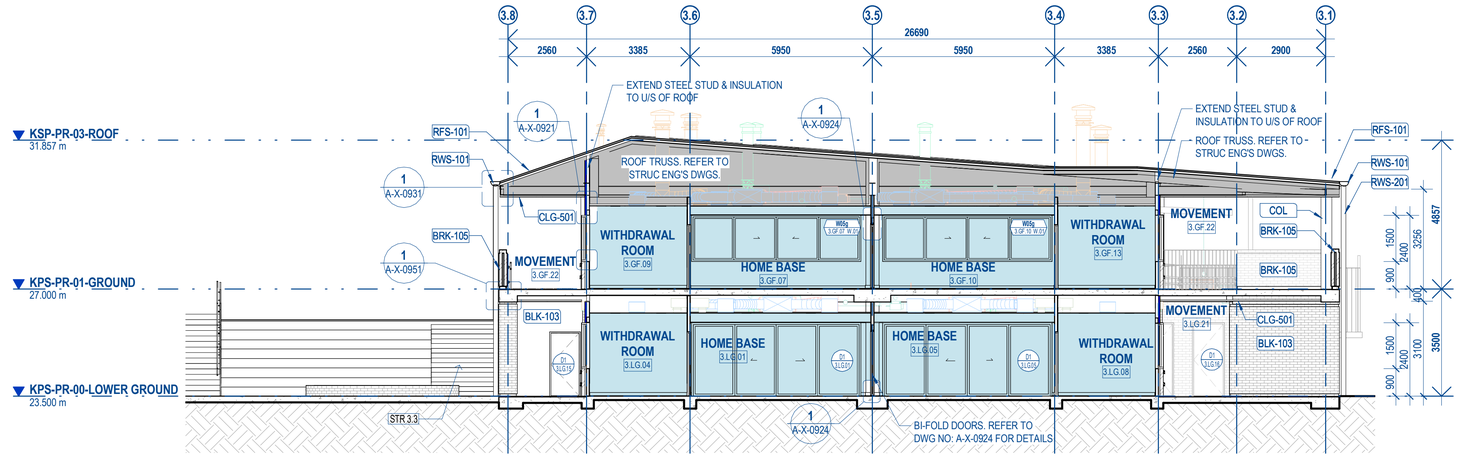
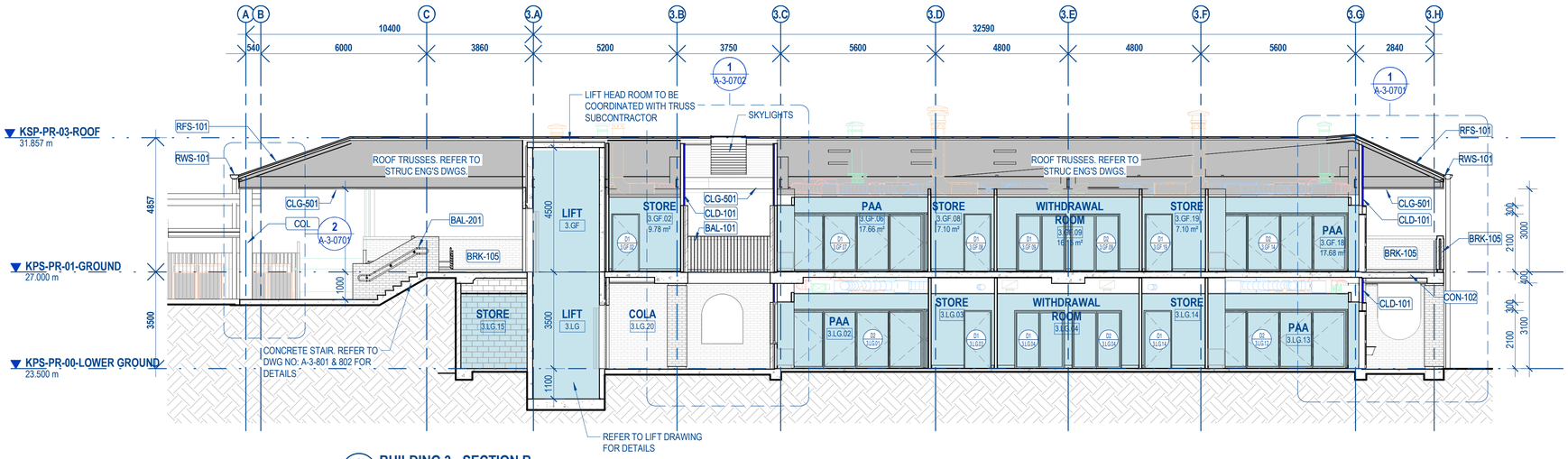
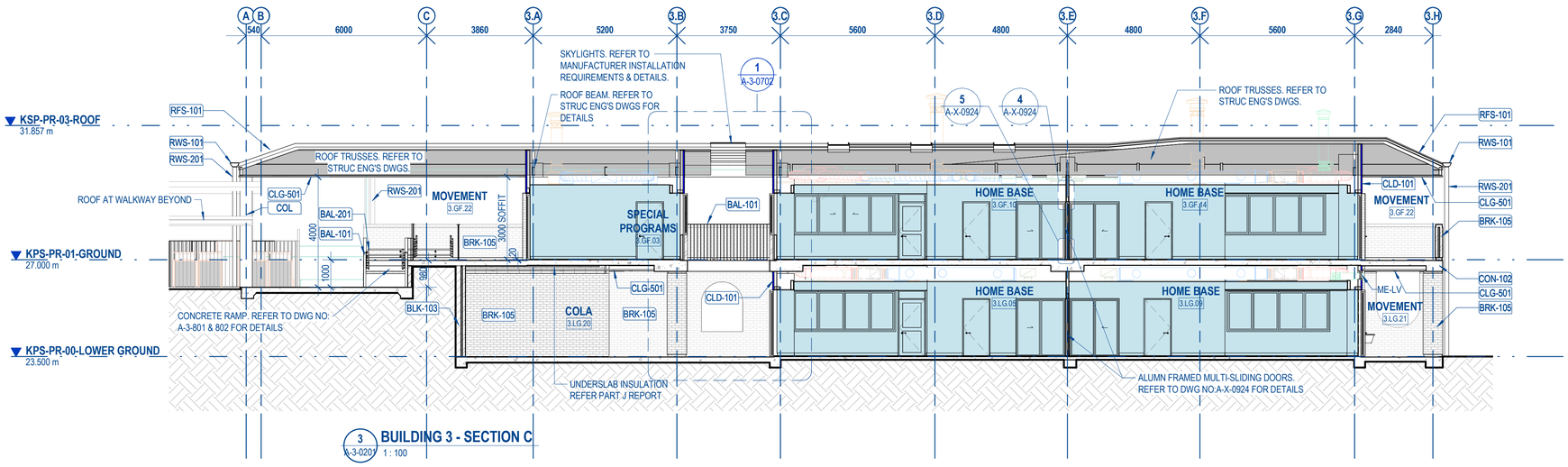


1 A-3-0201 **BUILDING 3 - SECTION A** 1 : 100



2 A-3-0201 **BUILDING 3 - SECTION B** 1 : 100



3 A-3-0201 **BUILDING 3 - SECTION C** 1 : 100

LEGEND - BUILDING SECTION

SYMBOL / GRAPHIC	DESCRIPTION
W01 / 900 W 910	WINDOW TYPE WINDOW ROOM NUMBER + WINDOW NUMBER
D1 / AAA	DOOR NUMBER ROOM NUMBER
BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.
ROOM NAME / 000	ROOM NAME (OR ABBREVIATION) ROOM NUMBER
000 / 00000 SIMILAR	NUMBER OF DETAIL SHEET NUMBER OF DETAIL
000 / 00000 SIMILAR	DETAIL NUMBER OF SECTION / ELEVATION SHEET NUMBER OF SECTION / ELEVATION

ROOM COLOUR FILL LEGEND

SYMBOL / GRAPHIC	DESCRIPTION
	EXISTING TO REMAIN (OUT OF SCOPE)
	NEW CONSTRUCTION

GENERAL NOTES

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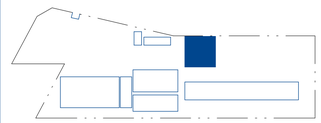
BRK-105	FACE BRICKWORK - CLAY
CLD-101	PREFINISHED COMPRESSED FIBRE CEMENT CLADDING
CLG-501	PREFINISHED COMPRESSED FIBRE CEMENT SOFFIT LINING
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-102	WORKED CONCRETE FINISH - BROOM
ME-LV	MECHANICAL VENTILATION LOUVRE. REFER TO MECH. DWGS
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE



KEY PLAN - NTS

CLIENT:

RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:

KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 3 - HOME BASE - SECTION 01

0m 2m 4m 6m 8m 10m

SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

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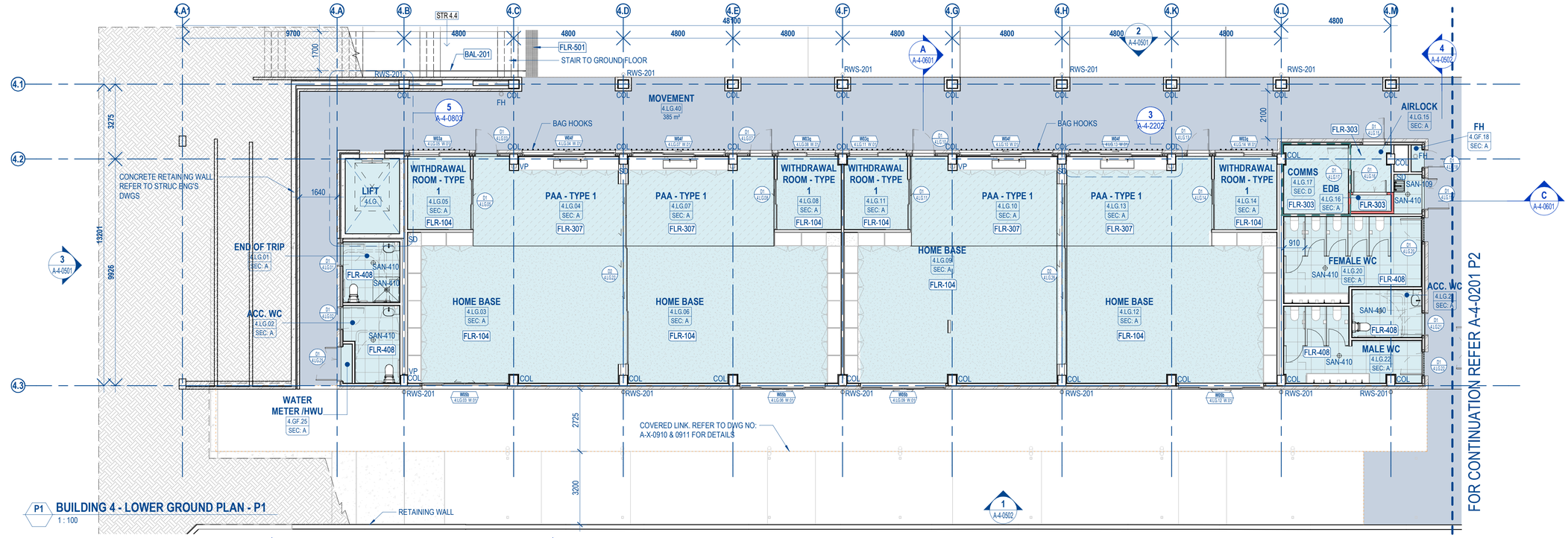
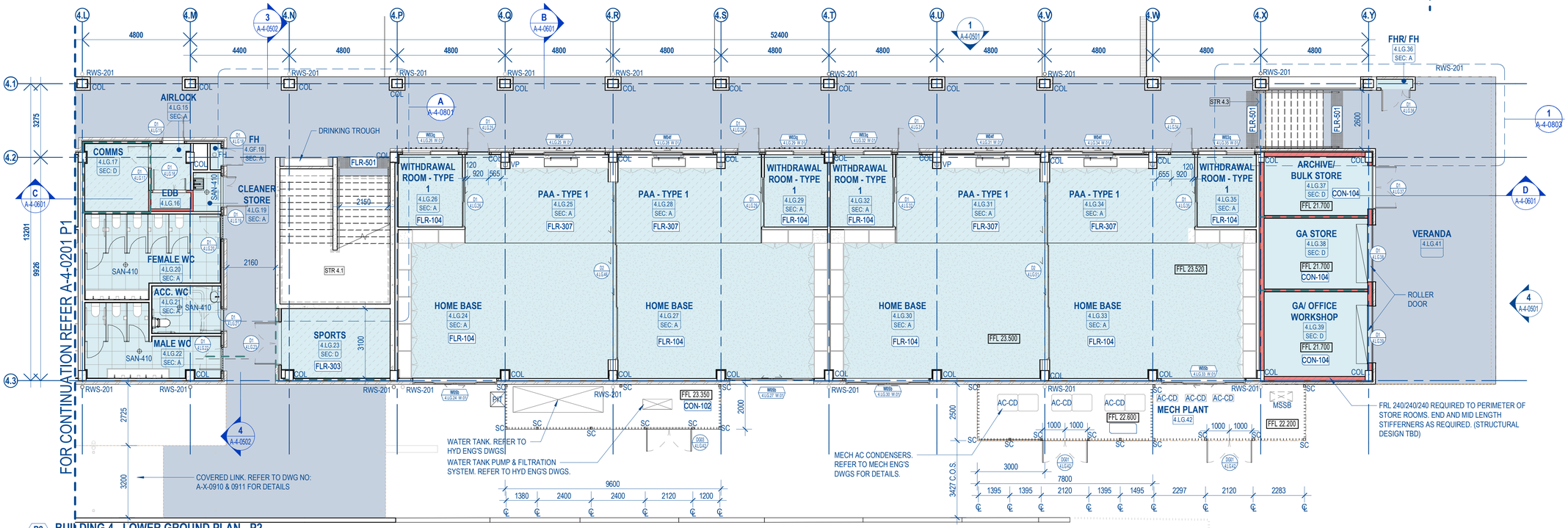


P1 BUILDING 4 - LOWER GROUND PLAN - P1
1 : 100



P2 BUILDING 4 - LOWER GROUND PLAN - P2
1 : 100

LEGEND - FLOOR PLAN

SYMBOL / GRAPHIC	DESCRIPTION
GA.##	(Glazing Assembly).(Glazing Assembly Number) - Refer to Glazing Assembly Elevations for details.
W.R.##	(Window).(Room Number).(Window Number) - Refer Elevations & Schedules.
D1 AAA	(Door).(Room Number).(Door Number) - Refer Elevations & Schedules.
8.CB-H1	Keynote Tag - refer legend and selections schedules. • number prefix indicates architectural spec. section) • prefix 'e' indicates existing item)
ROOM NAME / 000 / 150 m²	Room Name (or abbreviation) / Room Number / Room Area
000 SIMILAR / 00000	Detail Number of Section / Elevation / Sheet Number of Section / Elevation

SYMBOL / GRAPHIC	DESCRIPTION
	WALL LINING SECURITY - RATING D - TO COMPLY WITH EFSG REQUIREMENTS
IW-02	WALL TYPE MARK - REFER SCHEDULE
	WALL FIRE RATING - 60/60/60 - REFER SCHEDULE

ROOM COLOUR FILL LEGEND

SYMBOL / GRAPHIC	DESCRIPTION
	EXISTING TO REMAIN (OUT OF SCOPE)
	NEW CONSTRUCTION

GENERAL NOTES

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GA'S NOTES

- IT IS THE RESPONSIBILITIES OF THE CONTRACTOR TO VERIFY ALL PENETRATIONS SHOWN ON THE CONCRETE SETOUT AND TO SEEK CLARIFICATION OF ANY OMMISSION OR ADDITIONAL PENETRATION REQUIRED.

LEGENDS

SYMBOL / GRAPHIC	DESCRIPTION
FH	FIRE HYDRANT
RWO	RAIN WATER OUTLET
FW	FLOOR WASTE
DP	DOWNPIPE
	LOCALISED FALL IN SLAB TO RWO/FW

KEYNOTE LEGEND

CODE	ELEMENT
AC-CD	AIR CONDITIONING - CONDENSER UNIT. REFER MECH. DWGS
BAL-201	STAINLESS STEEL HANDRAIL
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-102	WORKED CONCRETE FINISH - BROOM
CON-104	APPLIED CONCRETE FINISH
FH	FIRE HYDRANT - REFER TO HYDRAULIC DWGS.
FLR-104	CARPET TILES
FLR-303	LINOLEUM SHEETING
FLR-307	LINOLEUM SHEETING
FLR-501	TACTILE INDICATORS
PIT	STORMWATER PIT - REFER HYDRAULIC DRAWINGS
RWS-201	DOWNPIPE
SAN-109	CLEANER'S SINK
SAN-410	FLOOR WASTE
SC	STEEL COLUMN - REFER TO STRUCT. DWGS
SD	SEWER DOWNPIPE - REFER HYDRAULIC DRAWINGS
VP	VENT PIPE - REFER HYDRAULIC DRAWINGS

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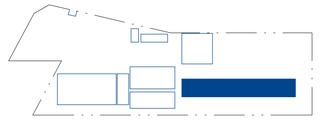
NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
FOR INFORMATION ONLY

REV	DATE	DETAILS	ISSUER
C	02.03.2021	50% DD ISSUE	YC
D	26.03.2021	CONSULTANT ISSUE	HM
E	08.04.2021	INTERIM 100% DD ISSUE	HM
F	27.05.2021	SCHEMATIC DESIGN ISSUE	YC
G	04.06.2021	100% DD ISSUE	HM
1	02.07.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	02.08.2021	CONTRACT DOCUMENTATION ISSUE	HM



KEY PLAN - NTS

CLIENT:
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:
BUILDING 4 - HOME BASE - PROPOSED - LOWER GROUND

0m 2m 4m 6m 8m 10m
SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC	AB	1554

DRAWING No:	REVISION:	DATE:
A-4-0201	2	02.08.2021

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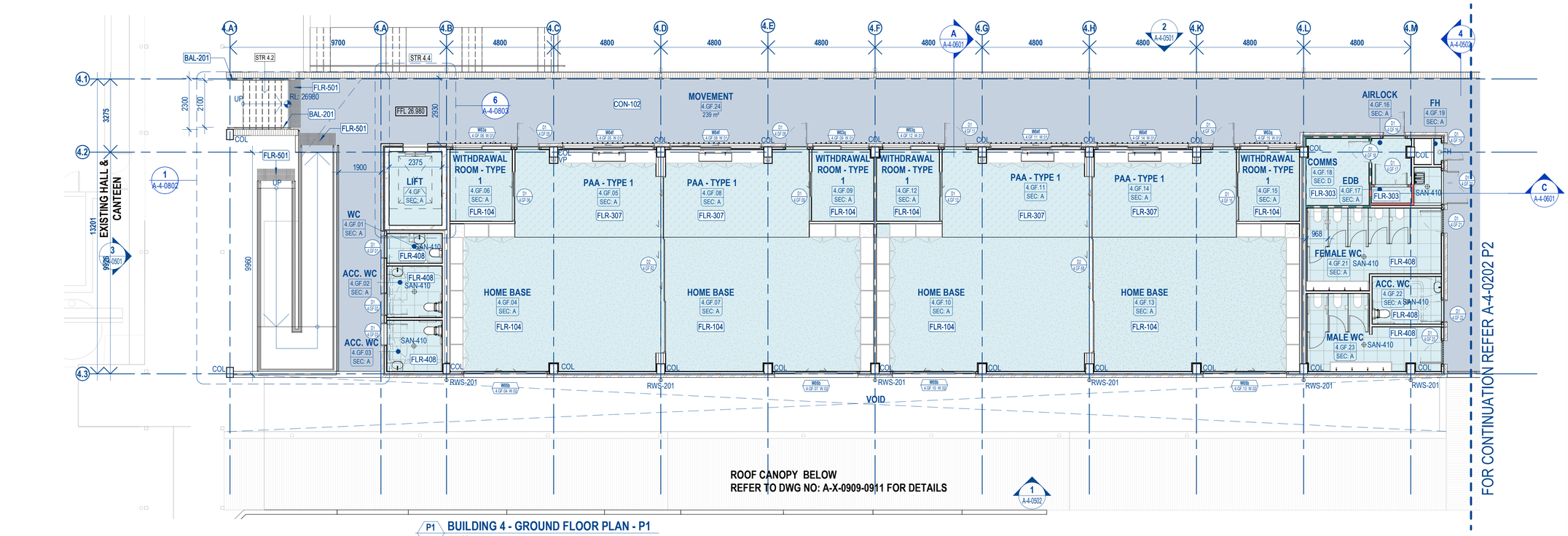
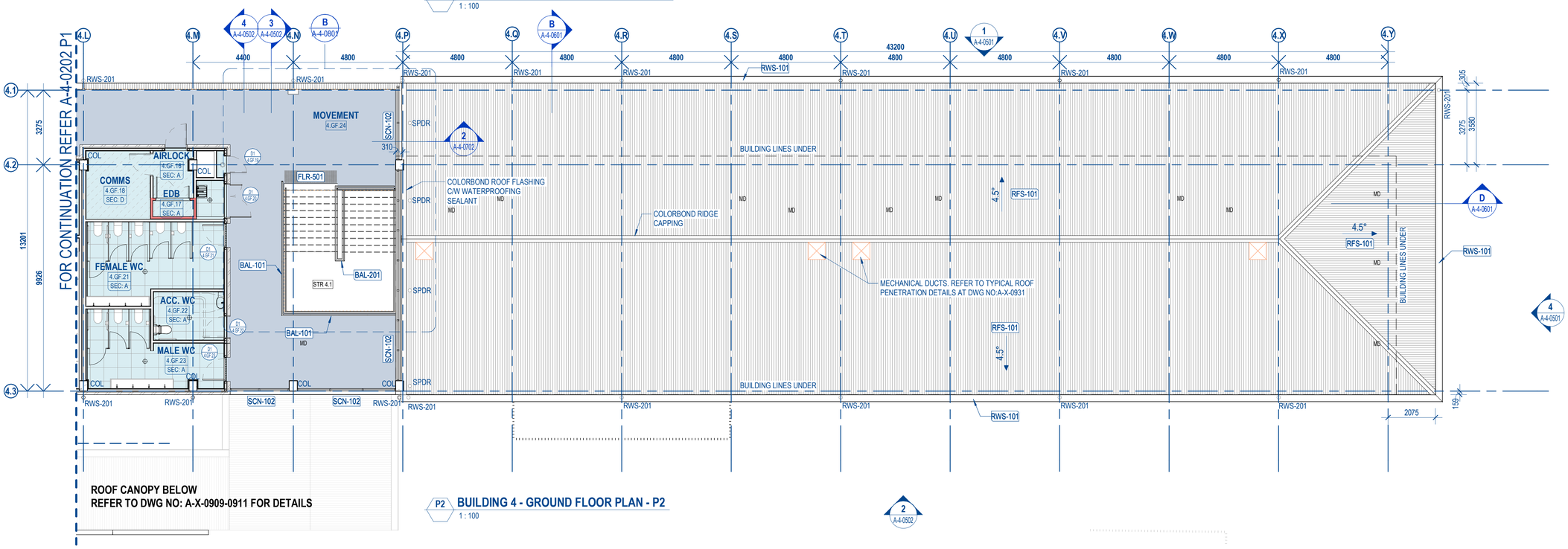


P1 BUILDING 4 - GROUND FLOOR PLAN - P1
1 : 100



P2 BUILDING 4 - GROUND FLOOR PLAN - P2
1 : 100

LEGEND - FLOOR PLAN

SYMBOL / GRAPHIC	DESCRIPTION
GA.##	(Glazing Assembly).(Glazing Assembly Number) - Refer to Glazing Assembly Elevations for details.
W.R.##	(Window).(Room Number).(Window Number) - Refer Elevations & Schedules.
D1 / AAA	(Door).(Room Number).(Door Number) - Refer Elevations & Schedules.
8.CB-H1	Keynote Tag - refer legend and selections schedules. • number prefix indicates architectural spec. section) • prefix 'e' indicates existing item)
ROOM NAME	Room Name (or abbreviation)
000	Room Number
150 m²	Room Area
000 SIMILAR / 00000	Detail Number of Section / Elevation Sheet Number of Section / Elevation

SYMBOL / GRAPHIC	DESCRIPTION
	WALL LINING SECURITY - RATING D - TO COMPLY WITH EFSG REQUIREMENTS
IW-02	WALL TYPE MARK - REFER SCHEDULE
	WALL FIRE RATING - 60/60/60 - REFER SCHEDULE

ROOM COLOUR FILL LEGEND

SYMBOL / GRAPHIC	DESCRIPTION
	EXISTING TO REMAIN (OUT OF SCOPE)
	NEW CONSTRUCTION

GENERAL NOTES

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LEGENDS

SYMBOL / GRAPHIC	DESCRIPTION
FH	FIRE HYDRANT
RWO	RAIN WATER OUTLET
FW	FLOOR WASTE
DP	DOWNPIPE
↘ ↙ / ↗ ↖	LOCALISED FALL IN SLAB TO RWO/FW

KEYNOTE LEGEND

CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BAL-201	STAINLESS STEEL HANDRAIL
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-102	WORKED CONCRETE FINISH - BROOM
FH	FIRE HYDRANT - REFER TO HYDRAULIC DWGS.
FLR-104	CARPET TILES
FLR-303	LINOLEUM SHEETING
FLR-307	LINOLEUM SHEETING
FLR-501	TACTILE INDICATORS
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE
SAN-410	FLOOR WASTE
SCN-102	METAL MESH
SPDR	DOWNPIPE WITH SPREADER - REFER HYDRAULIC DRAWINGS
VP	VENT PIPE - REFER HYDRAULIC DRAWINGS

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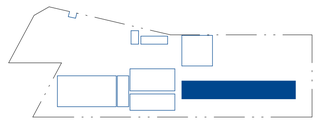
NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
FOR INFORMATION ONLY

REV	DATE	DETAILS	ISSUER
D	26.03.2021	CONSUILTANT ISSUE	HM
E	08.04.2021	INTERIM 100% DD ISSUE	HM
F	27.05.2021	SCHEMATIC DESIGN ISSUE	YC
G	04.06.2021	100% DD ISSUE	HM
H	16.06.2021	100% DD ISSUE	HM
1	02.07.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	02.08.2021	CONTRACT DOCUMENTATION ISSUE	HM



KEY PLAN - NTS

CLIENT:
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:
BUILDING 4 - HOME BASE - PROPOSED - GROUND

0m 2m 4m 6m 8m 10m

SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC		1554
DRAWING No:	**REVISION:**	**DATE:**
A-4-0202	2	02.08.2021

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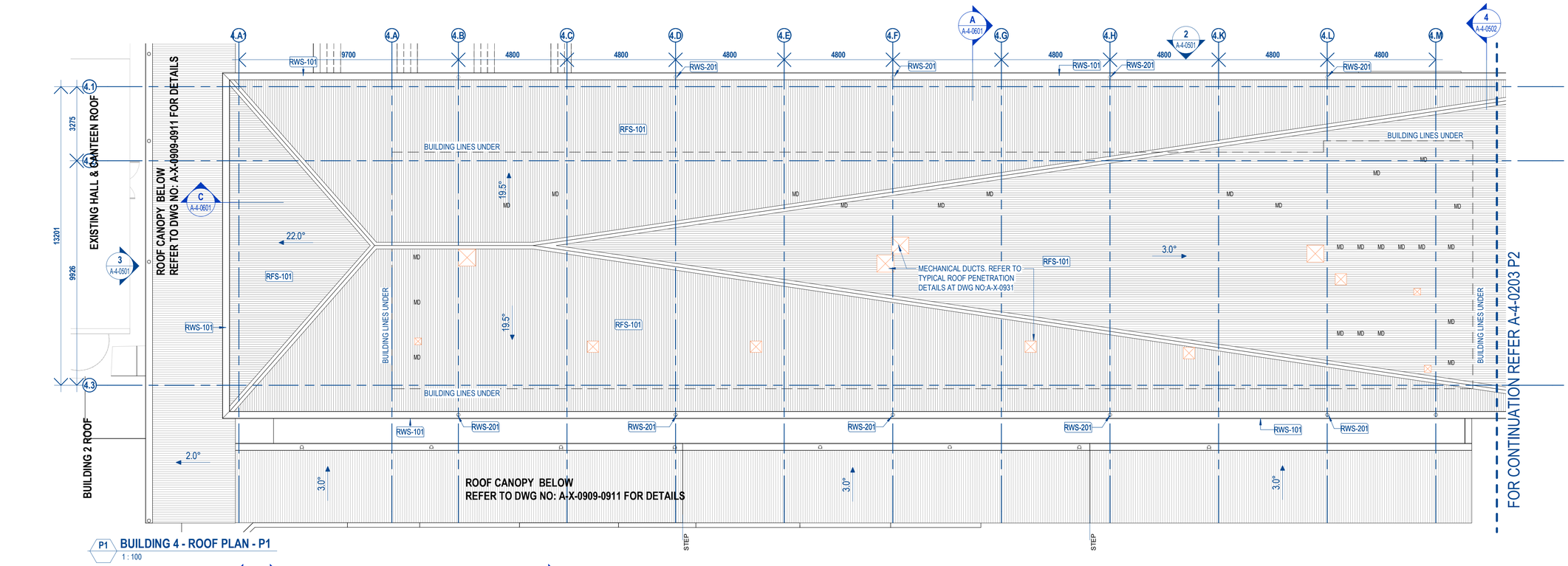
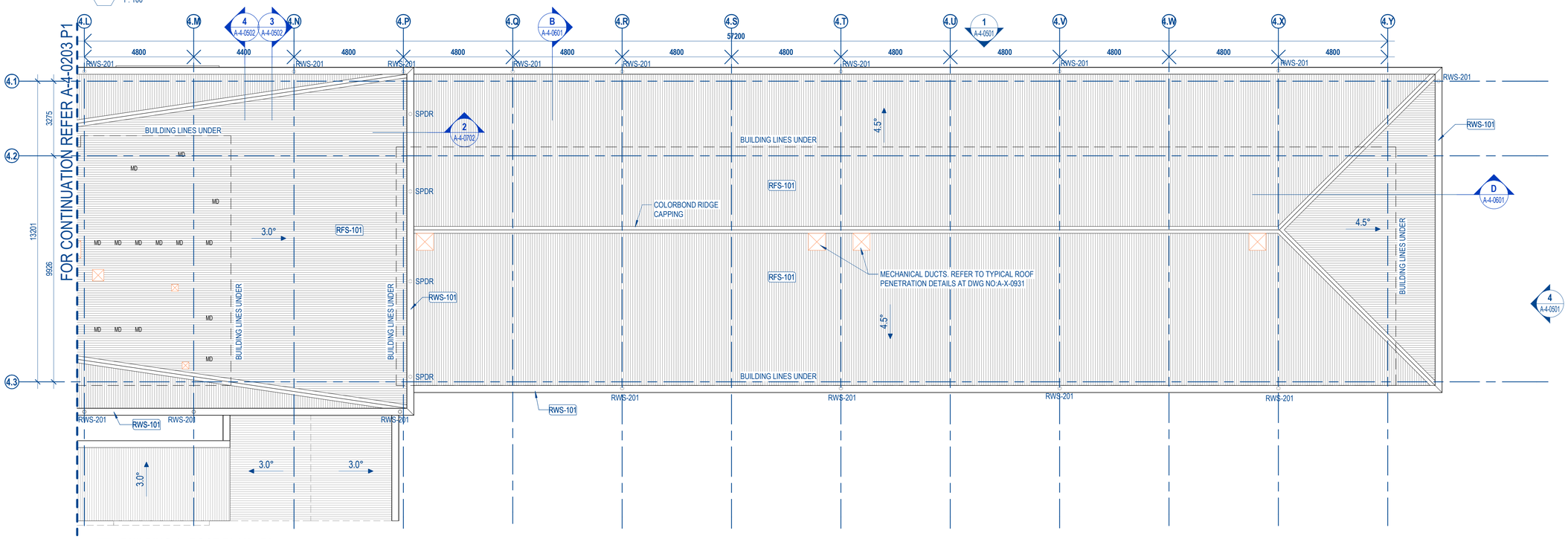


P1 BUILDING 4 - ROOF PLAN - P1
1 : 100



P2 BUILDING 4 - ROOF PLAN - P2
1 : 100

LEGEND - ROOF PLAN

SYMBOL / GRAPHIC	DESCRIPTION
15°	ROOF PITCH & DIRECTION OF FALL
000 SIMILAR / 00000	DETAIL NUMBER OF SECTION / ELEVATION SHEET NUMBER OF SECTION / ELEVATION
BRK-102 BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.

GENERAL NOTES

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KEYNOTE LEGEND

CODE	ELEMENT
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE
SPDR	DOWNPIPE WITH SPREADER - REFER HYDRAULIC DRAWINGS

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NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
FOR INFORMATION ONLY

REV	DATE	DETAILS	ISSUER
B	18.02.2021	INTERIM 50% DD ISSUE	HM
C	02.03.2021	50% DD ISSUE	YC
D	26.03.2021	CONSULTANT ISSUE	HM
E	27.05.2021	SCHEMATIC DESIGN ISSUE	YC
F	04.06.2021	100% DD ISSUE	HM
1	02.07.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	02.08.2021	CONTRACT DOCUMENTATION ISSUE	HM

KEY PLAN - NTS

CLIENT:
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

PROJECT:
KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:
BUILDING 4 - HOME BASE - PROPOSED - ROOF

0m 2m 4m 6m 8m 10m
SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC		1554

DRAWING No:	REVISION:	DATE:
A-4-0203	2	02.08.2021

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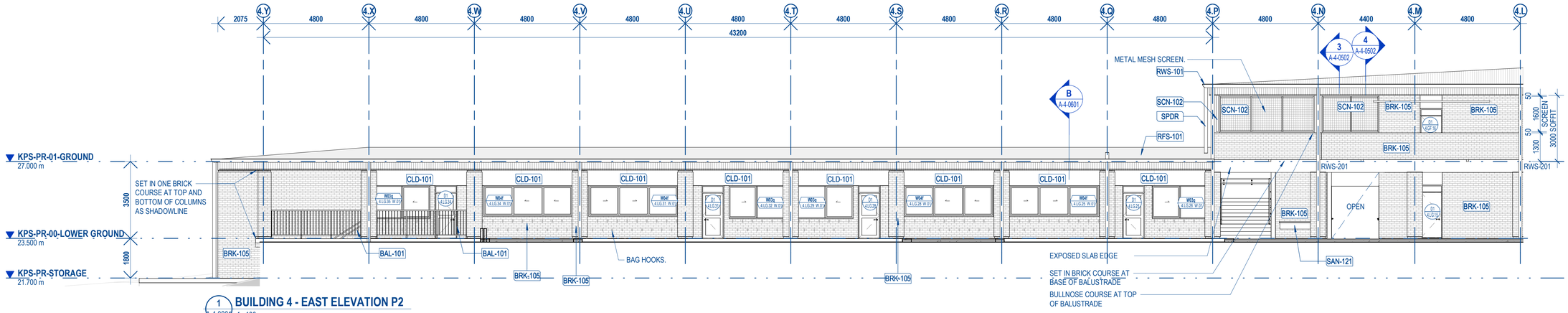
FORTITUDE VALLEY
4006, QLD
www.bickertonmasters.com.au

KEYNOTE LEGEND

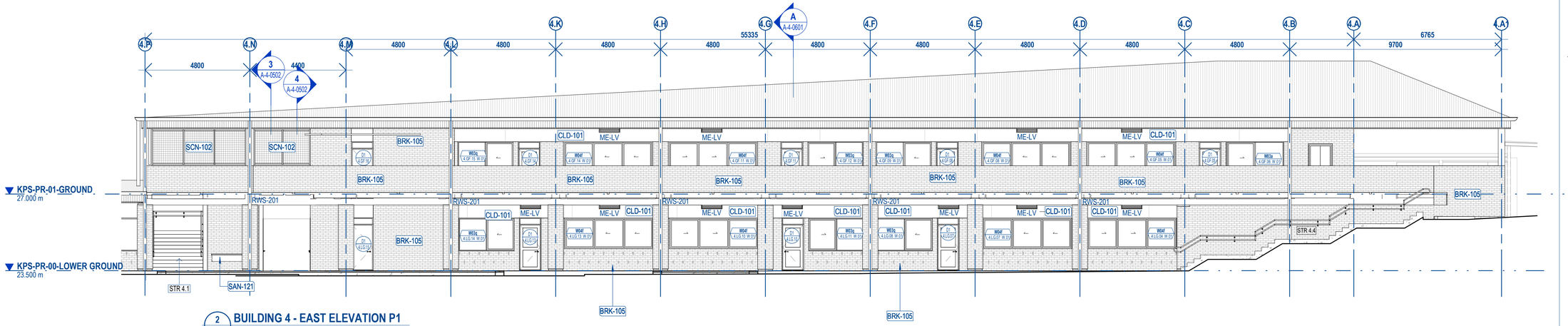
CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BRK-105	FACE BRICKWORK - CLAY
CLD-101	PREFINISHED COMPRESSED FIBRE CEMENT CLADDING
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-102	WORKED CONCRETE FINISH - BROOM
ME-LV	MECHANICAL VENTILATION LOUVRE. REFER TO MECH. DWGS
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE
SAN-121	DRINKING BAY
SCN-102	METAL MESH
SPDR	DOWNPIPE WITH SPREADER - REFER HYDRAULIC DRAWINGS

LEGEND - BUILDING ELEVATION

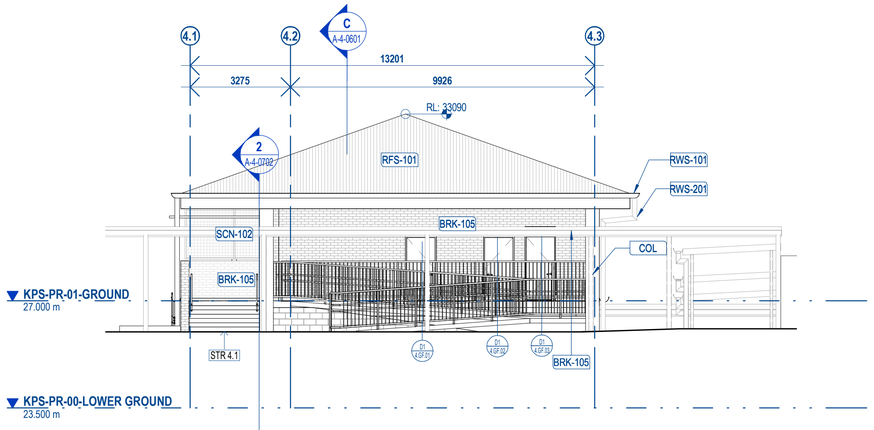
SYMBOL / GRAPHIC	DESCRIPTION
JR1 aaa W 01	WINDOW TYPE WINDOW ROOM NUMBER + WINDOW NUMBER
D1 AAA	DOOR NUMBER ROOM NUMBER
BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.
000 00000 SIMILAR	DETAIL NUMBER OF SECTION / ELEVATION SHEET NUMBER OF SECTION / ELEVATION



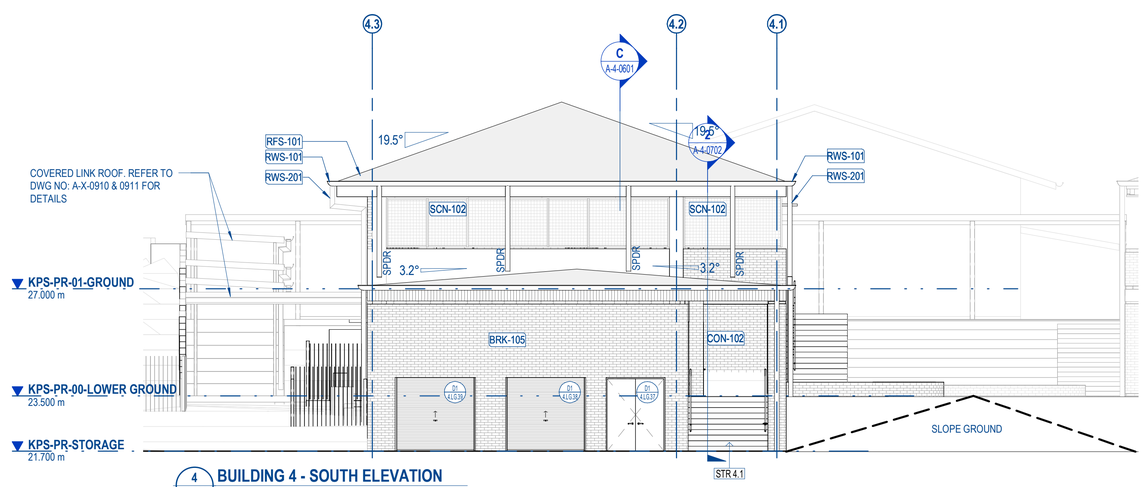
1 A-4-0201 **BUILDING 4 - EAST ELEVATION P2**
1 : 100



2 A-4-0201 **BUILDING 4 - EAST ELEVATION P1**
1 : 100



3 A-4-0201 **BUILDING 4 - NORTH ELEVATION**
1 : 100



4 A-4-0201 **BUILDING 4 - SOUTH ELEVATION**
1 : 100

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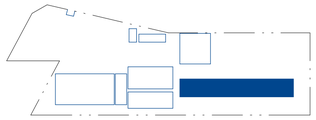
NSW NOMINATED ARCHITECT: ANDREW MASTERS (9037)

PRELIMINARY ISSUE
FOR INFORMATION ONLY

REV	DATE	DETAILS	ISSUER
A	05.02.2021	CONSULTANT ISSUE	YC
B	18.02.2021	INTERIM 50% DD ISSUE	HM
C	02.03.2021	50% DD ISSUE	YC
D	27.05.2021	SCHEMATIC DESIGN ISSUE	YC
E	04.06.2021	100% DD ISSUE	HM
1	02.07.2021	CONTRACT DOCUMENTATION ISSUE	HM
2	02.08.2021	CONTRACT DOCUMENTATION ISSUE	HM



KEY PLAN - NTS

CLIENT:

RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:

KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 4 - HOME BASE - ELEVATION 01

0m 2m 4m 6m 8m 10m

SCALE @ A1: 1 : 100

DRAWN:	CHECKED:	PROJECT No:
YC		1554

DRAWING No:	REVISION:	DATE:
A-4-0501	2	02.08.2021

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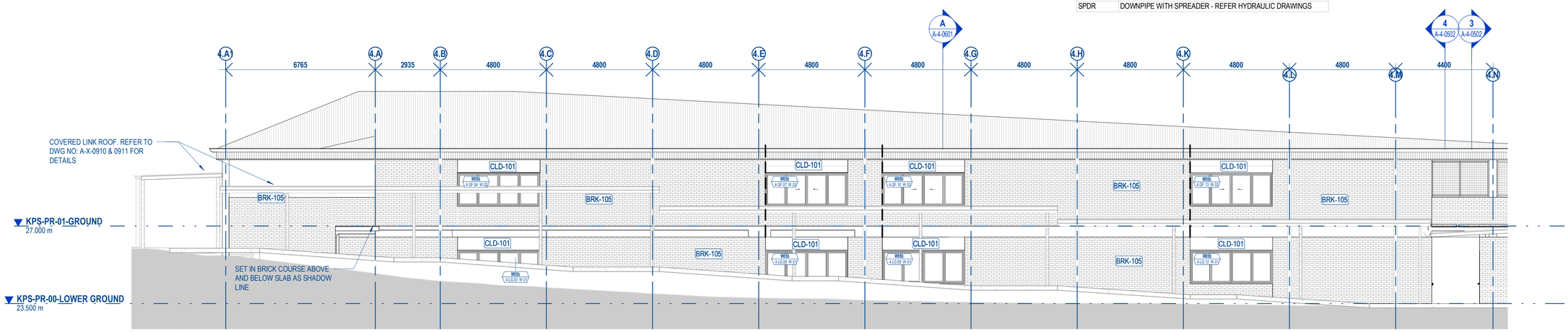
www.bickertonmasters.com.au

KEYNOTE LEGEND

CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BRK-105	FACE BRICKWORK - CLAY
CLD-101	PREFINISHED COMPRESSED FIBRE CEMENT CLADDING
CLG-501	PREFINISHED COMPRESSED FIBRE CEMENT SOFFIT LINING
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-101	OFF-FORM CONCRETE FINISH - CLASS 2
CON-102	WORKED CONCRETE FINISH - BROOM
FEN-101	STEEL PALISADE FENCE
RFS-101	METAL DECK ROOF
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE
SCN-102	METAL MESH
SPDR	DOWNPIPE WITH SPREADER - REFER HYDRAULIC DRAWINGS

LEGEND - BUILDING ELEVATION

SYMBOL / GRAPHIC	DESCRIPTION
JR1 / AAA W.01	WINDOW TYPE WINDOW ROOM NUMBER + WINDOW NUMBER
D1 / AAA	DOOR NUMBER ROOM NUMBER
BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.
000 / 00000 SIMILAR	DETAIL NUMBER OF SECTION / ELEVATION SHEET NUMBER OF SECTION / ELEVATION



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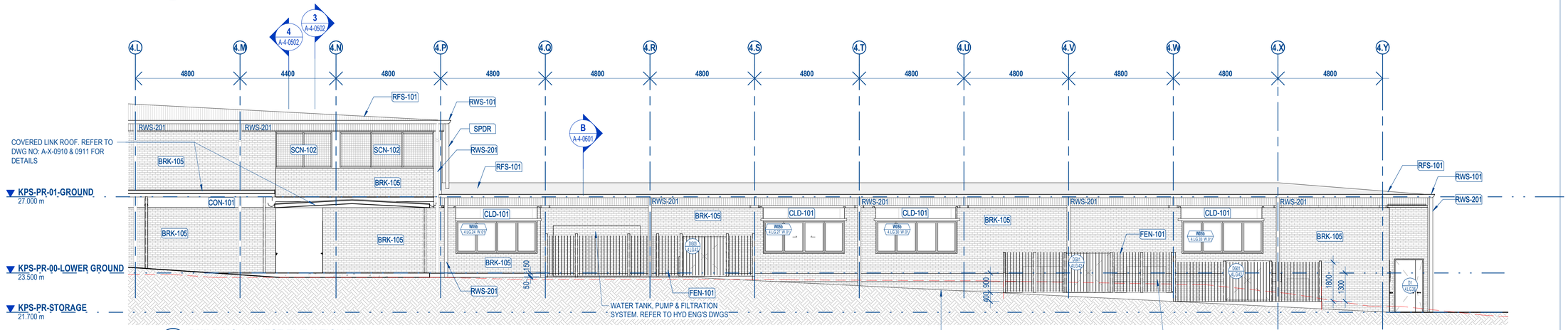

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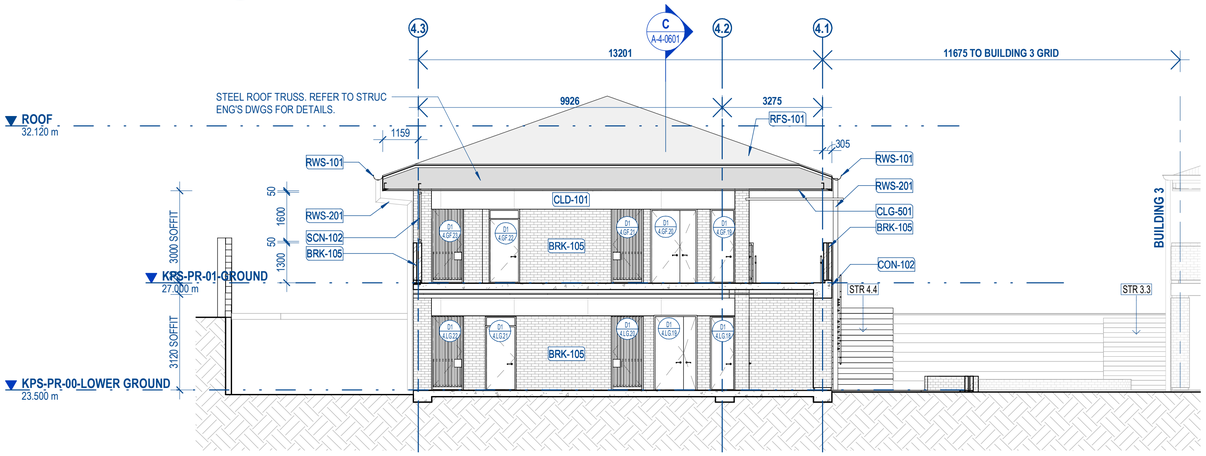

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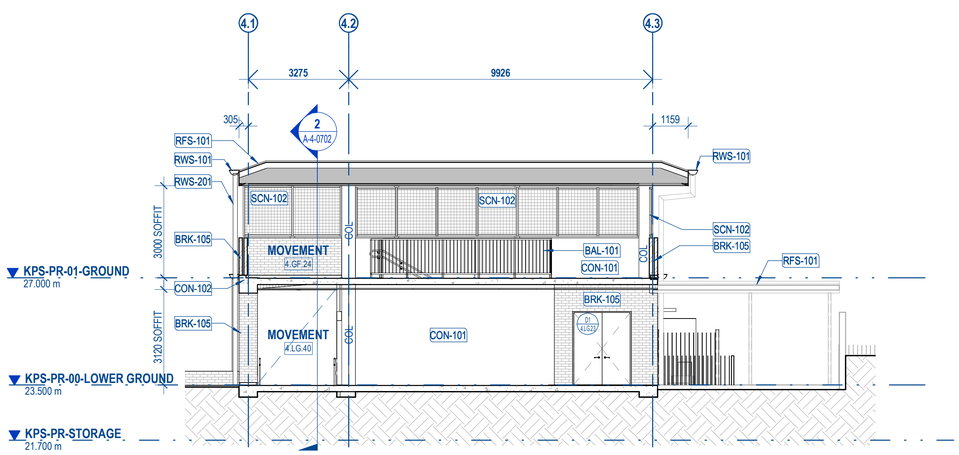

3 A-4-0202 **BUILDING 4 - SOUTH ELEVATION/SECTION** 1 : 100

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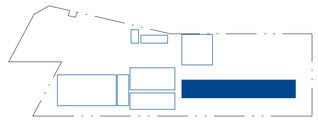

KEY PLAN - NTS

CLIENT:

RICHARD CROOKES CONSTRUCTIONS

NSW GOVERNMENT Education School Infrastructure

PROJECT:

KINGSCLIFF PUBLIC SCHOOL - STAGE 2 MAIN WORKS

12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 4 - HOME BASE - ELEVATION 02

0m 2m 4m 6m 8m 10m

SCALE @ A1: 1 : 100

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YC		1554

DRAWING No:	REVISION:	DATE:
A-4-0502	2	02.08.2021

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www.bickertonmasters.com.au

KEYNOTE LEGEND

CODE	ELEMENT
BAL-101	METAL HANDRAIL/ BALUSTRADE
BAL-201	STAINLESS STEEL HANDRAIL
BRK-105	FACE BRICKWORK - CLAY
CLD-101	PREFINISHED COMPRESSED FIBRE CEMENT CLADDING
CLG-501	PREFINISHED COMPRESSED FIBRE CEMENT SOFFIT LINING
COL	STRUCTURAL COLUMN - REFER STRUCT. DWGS.
CON-101	OFF-FORM CONCRETE FINISH - CLASS 2
PFC	PFC BEAM. REFER TO STRUCTURE DRAWINGS
RFS-101	METAL DECK ROOF
RHS	RHS HORIZONTAL WINDOW HEADER. REFER TO STRUCTURE DRAWINGS
RWS-101	EAVES GUTTER
RWS-201	DOWNPIPE
SCN-102	METAL MESH
SPDR	DOWNPIPE WITH SPREADER - REFER HYDRAULIC DRAWINGS
UB	UB BEAM. REFER TO STRUCTURE DRAWINGS

LEGEND - BUILDING SECTION

SYMBOL / GRAPHIC	DESCRIPTION
W# / aaa W.01	WINDOW TYPE WINDOW ROOM NUMBER + WINDOW NUMBER
D1 / AA	DOOR NUMBER ROOM NUMBER
BRK-102	KEYNOTE TAG - REFER LEGEND AND SELECTIONS SCHEDULES.
ROOM NAME / 000	ROOM NAME (OR ABBREVIATION) ROOM NUMBER
000 SIMILAR / 00000	NUMBER OF DETAIL SHEET NUMBER OF DETAIL
000 SIMILAR / 00000	DETAIL NUMBER OF SECTION / ELEVATION SHEET NUMBER OF SECTION / ELEVATION

ROOM COLOUR FILL LEGEND

SYMBOL / GRAPHIC	DESCRIPTION
	EXISTING TO REMAIN (OUT OF SCOPE)
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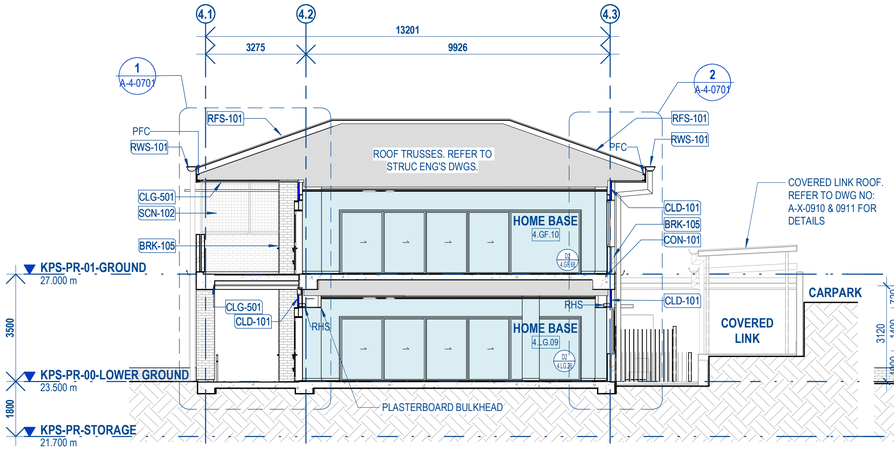

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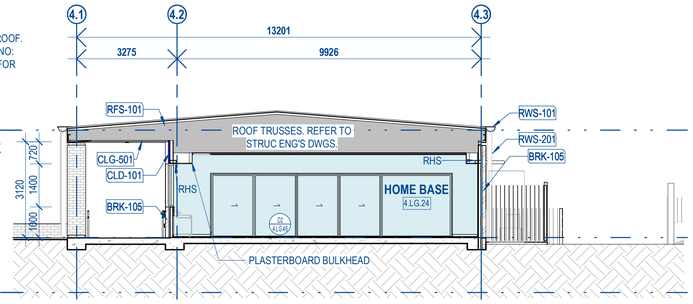

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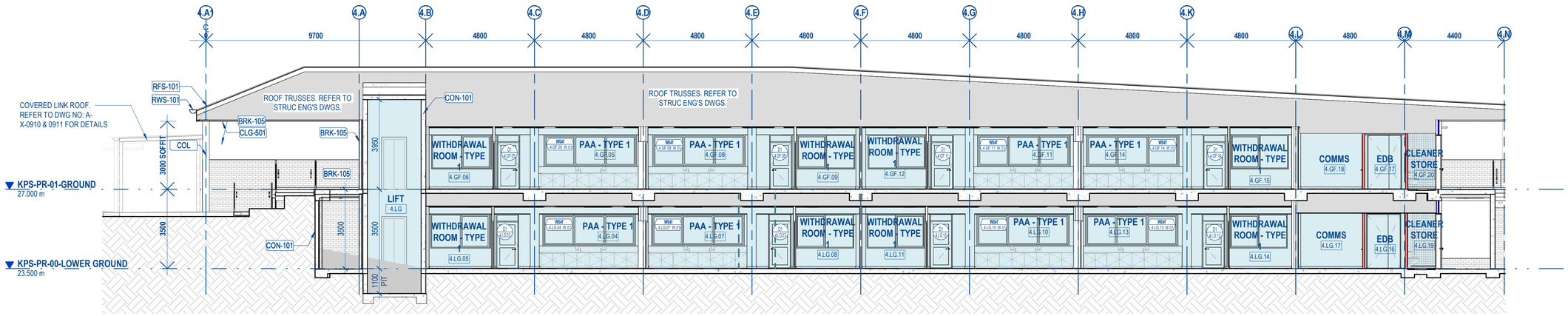

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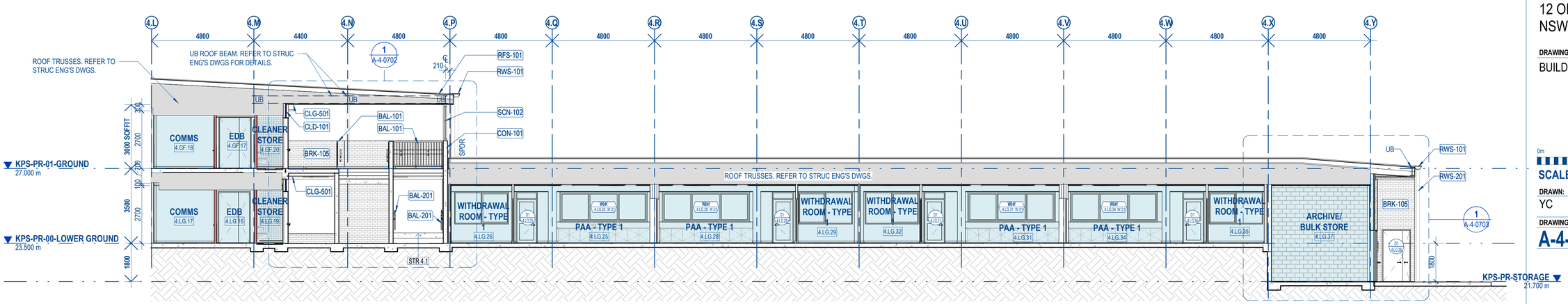

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PROJECT:

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12 ORIENT STREET, KINGSCLIFF, NSW 2487

DRAWING TITLE:

BUILDING 4 - HOME BASE - SECTION 01

0m 2m 4m 6m 8m 10m

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- KPS Associated Works
- Existing Facilities

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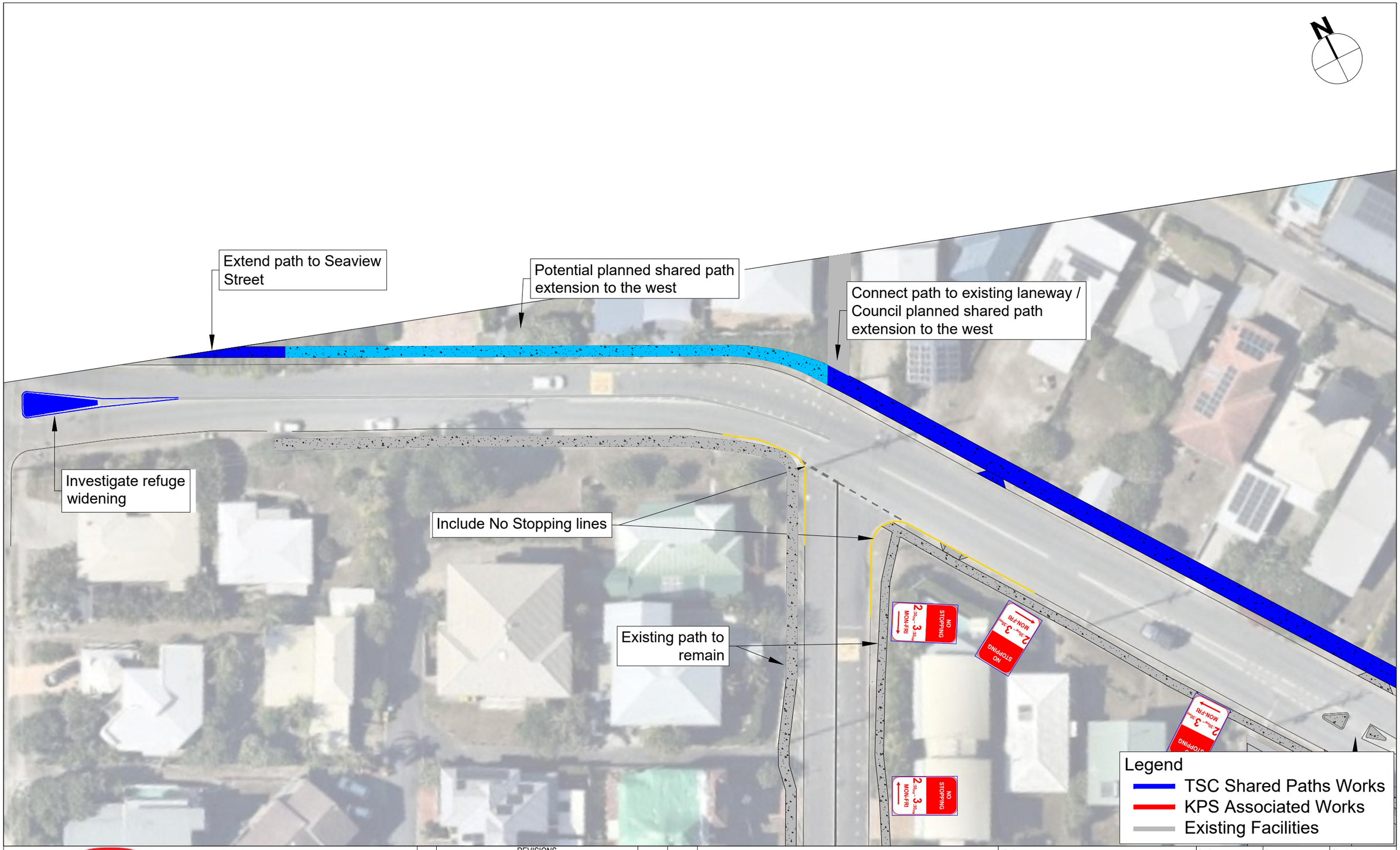
REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Concept for Discussion	J.I	21/01/2021
002	Project Team Updates	J.I	22/02/2021
003	Council Updates	J.I	24/02/2021

Scale @ A3 0 10 20 30 40 50 60 1:1250

Project: Kingscliff Public School Expansion	Design: J.I	Drawn: J.I	Checked: A.E
Title: Overview	CONCEPT ONLY	Date: 24/02/2021
	Project Number: P4398	Sheet Number: 0	Issue: 003



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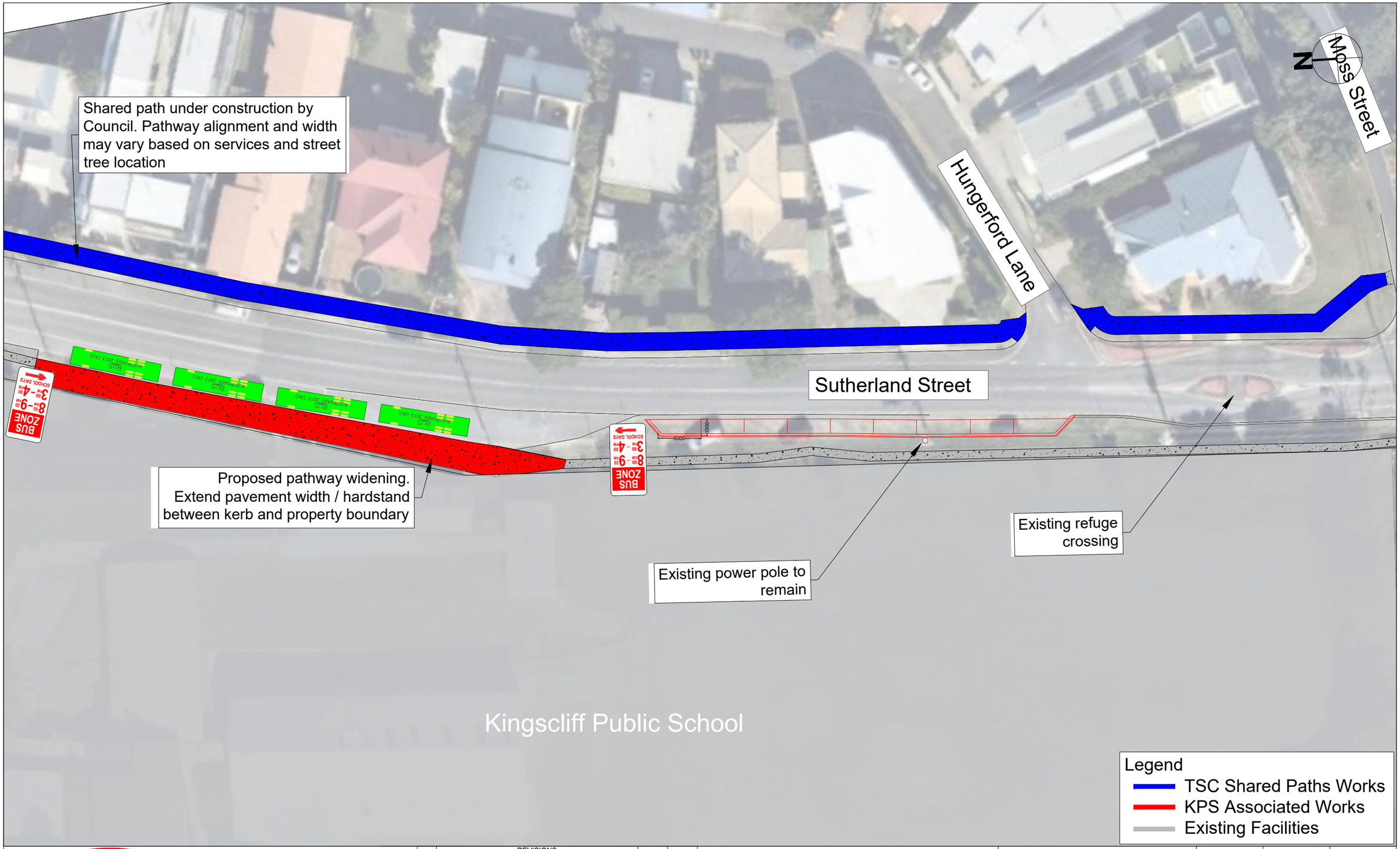
Title: Right-Turn Pocket	CONCEPT ONLY	Date: 06/08/2021
	Project Number: P4398	Sheet Number: 1	Issue: 004



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002	Project Team Updates	J.I	22/02/2021
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004	External works Concept	M.F	09/08/2021

Scale @ A3 0 5 10 15 20 25 1:500

Project: Kingscliff Public School Expansion

Title: External Works Concept Sutherland Street

Design	Drawn	Checked
M.K	M.K	A.E

CONCEPT ONLY

Date: 09/08/2021

Project Number	Sheet Number	Issue
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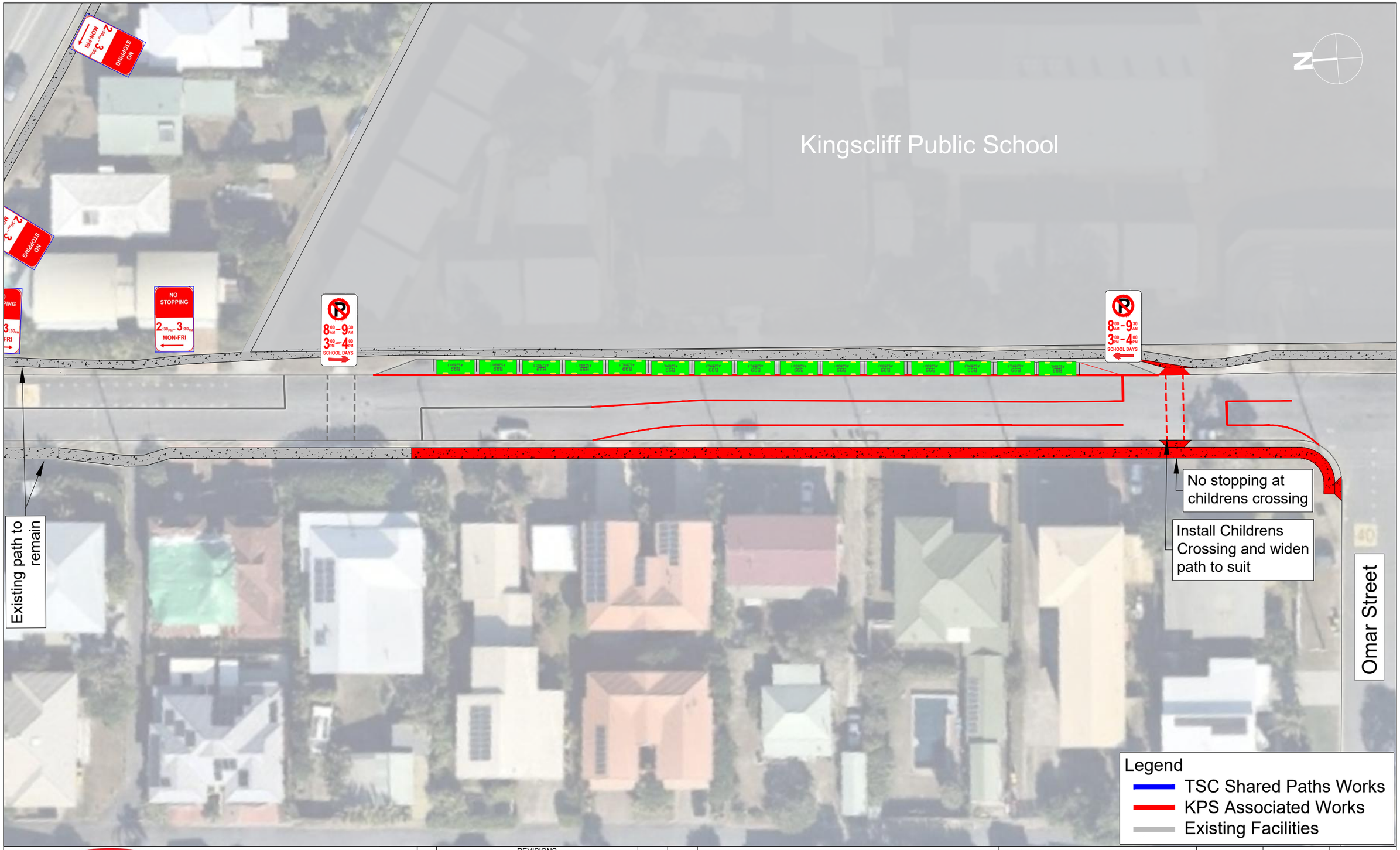

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003	Council Updates	J.I	24/02/2021
004	External Works Concept	M.F	09/08/2021

Scale @ A3 0 5 10 15 20 25 1:500

Project: Kingscliff Public School Expansion

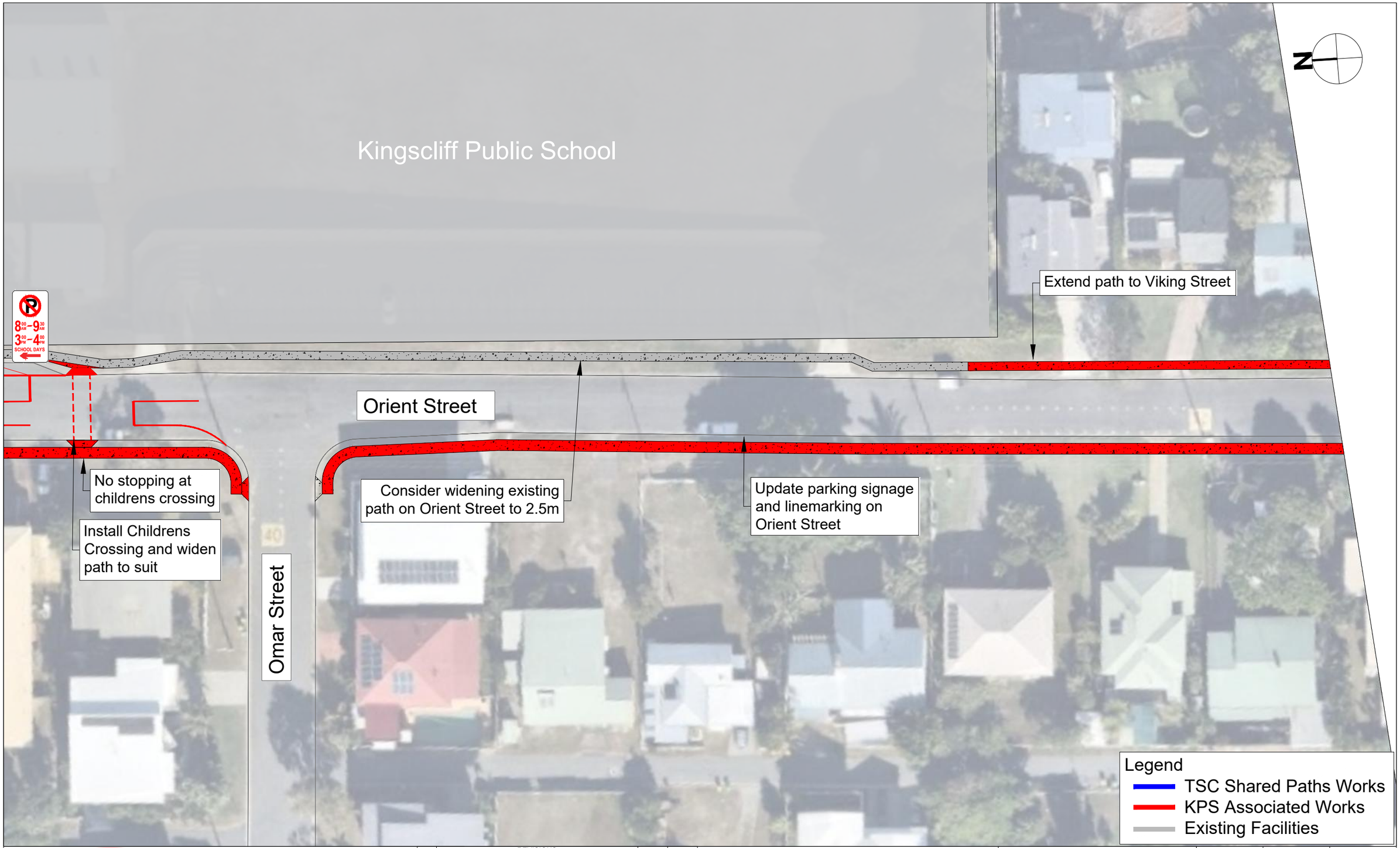
Title: External Works Concept
Orient Street

Design	Drawn	Checked
M.K	M.K	A.E

CONCEPT ONLY

Date: 09/08/2021

Project Number	Sheet Number	Issue
P4398	1	004



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Project: Kingscliff Public School Expansion	Design: J.I	Drawn: J.I	Checked: A.E
Title: Orient Street 2	CONCEPT ONLY	Date: 24/02/2021
	Project Number: P4398	Sheet Number: 4	Issue: 003

Appendix B: School Travel Plan

Kingscliff Public School

School Transport Plan

School Infrastructure NSW

10 August 2021

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P4398.003R KPS - School Transport Plan	S. Seeney	J. Brook	S. Seeney	10/08/2021	Gabe Reyes MBB Group Gaberiel.reyes@mbbgroup.com.au

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Appendix A: Transport Access Guide

1. INTRODUCTION

1.1 Background

Schools Infrastructure New South Wales (SINSW) are delivering upgrades to schools in the Tweed. Kingscliff Public School (KPS) falls within the Tweed Primary Cluster which are situated within the Tweed Shire. The proposal is to upgrade the campus to cater for existing enrolments and to accommodate the growing requirement for educational providers in the north coast region. This includes demolition of existing school buildings and construction of new facilities to provide improved facilities.

1.2 Purpose of a School Transport Plan

The School Transport Plan (STP) is a document that that is managed by a school travel coordinator which identifies strategies to increase safe travel to school. The aim being to deliver efficient, safe and sustainable access to school during the planning, delivery, and operation of school assets. It is understood that the school travel coordinator will be appointed based on an 18-month period.

1.3 About the School Transport Plan

This STP is a document that focusses on details for sustainable travel options to and from the school and proposes strategies to encourage the wider use of alternative transport.

This plan covers:

- Existing transport facilities and conditions
- Current student and staff travel patterns
- Proposed green travel targets
- Actions to achieve travel mode share targets.

This STP should be reviewed and updated annually to monitor progress towards targets and strategy successes. The proposed methodology is outlined in Figure 1.1.

Step 1 – Understanding Existing Conditions
Background information is collected about the existing site, such as:
- Description of the area and the development
- Public transport routes and facilities
- Active transport routes and facilities
- Existing travel patterns

Step 2 – Specifying Achievable Targets
Transport for New South Wales (TfNSW) Regional NSW Services and Infrastructure Plan & existing mode share data will be sourced to set mode share targets:
- Switching mode share from private vehicles to alternate transport modes
- Reducing vehicle-kilometres travelled.

Step 3 – Developing Actions
A range of actions are developed to meet the targets. These actions involve:
- Identifying measurable outcomes which demonstrate the aims of the plan have been met
- Developing methods to achieve these outcomes.

Step 4 – Monitoring and Revision
The plan is reviewed and updated annually.

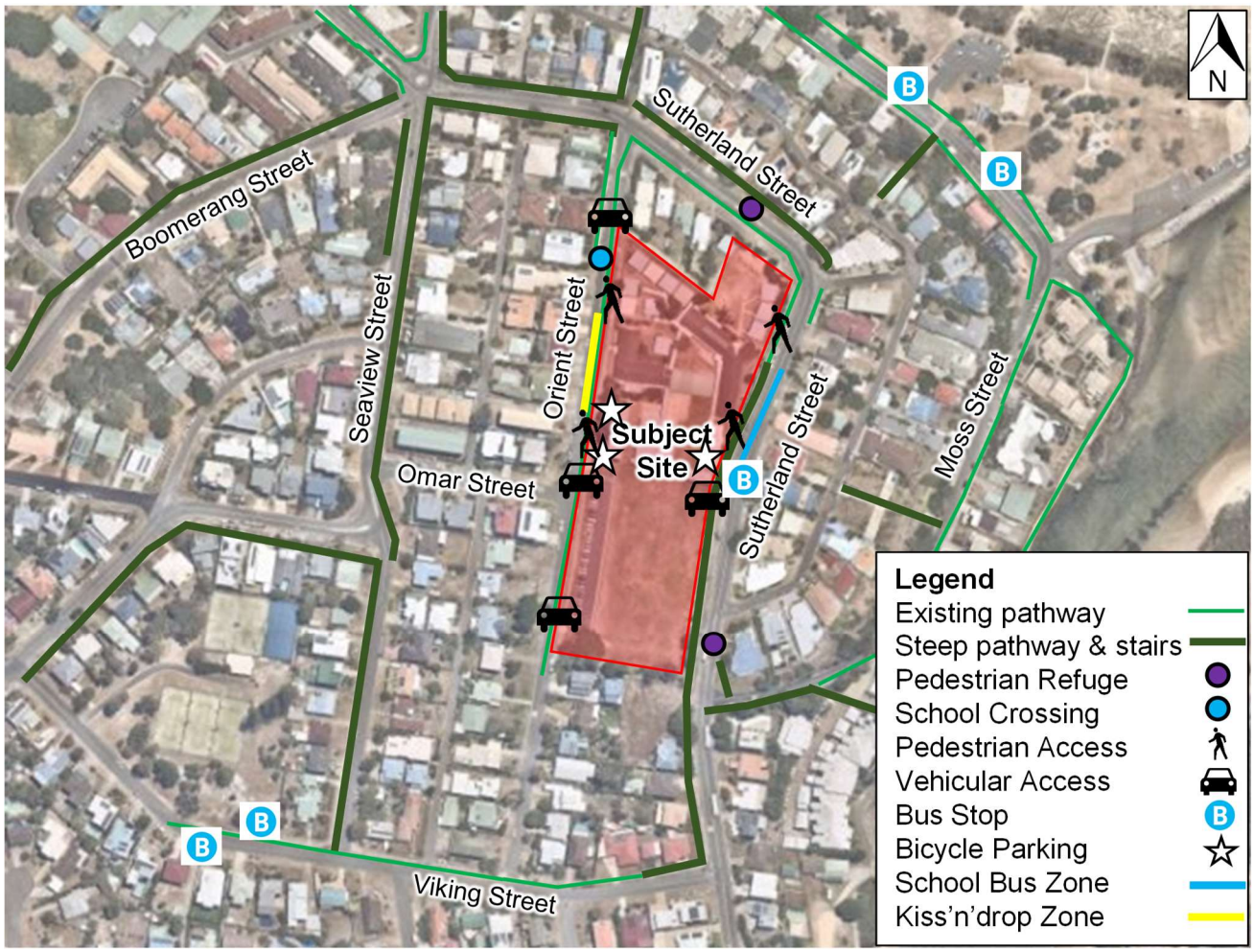
Figure 1.1: STP Methodology

2. EXISTING CONDITIONS

2.1 Existing Operations and Facilities

KPS is located at 12 Orient Street, Kingscliff. KPS operates with around 614 student enrolments and 37 staff. The typical school bell times are around 9:00AM and 3:00PM. Vehicle access to the off-street car park is provided via Orient Street towards the southern side of the site with 32 (formal) staff car parking spaces. There is one bus zone and one kiss'n'drop located on Orient Street and Sutherland Street fronting the school. There are multiple pedestrian access points on Orient Street and Sutherland Street.

The existing transport facilities surrounding the school is shown in Figure 2.1.



Source: Nearmaps

Figure 2.1: Existing Transport Facilities

As shown, the existing network of pathways and crossings provide connections to surrounding areas though there are several missing pathway links and crossing locations.

There are 15 bicycle parking spaces provided on site however was observed to not cater for the existing demand. an additional 33 bicycle, scooter / skateboard parking spaces are recommended to accommodate the existing demand. The bicycle parking locations are shown in Figure 2.2.

Figure 2.2: Bicycle Parking Locations

Students can receive free or subsidised public transport travel to and from school through the School Student Transport Scheme (SSTS). This is issued in the form of a paper bus pass though use of the passes is not well known. Based on information from Surfside Bus Lines, approximately 51% of students have been issued a school bus pass at KPS. Eligibility for the bus pass is dependent on the age of the student and distance the student lives from school.

KPS is serviced by both public and school bus services. These services are operated by Surfside Bus Lines and service other primary and high schools within the Kingscliff and Tweed Heads region. This system is limited as many of the school bus routes overlap and is difficult to change as many schools rely on the one service. It is currently not an efficient bus network as its convoluted and confusing to use.

The school services operate as hail 'n' ride so students are able to get on the bus at any location in lieu of bus stop infrastructure. Based on the information provided, the following is noted regarding the bus services:

- 359 students (75%) live within 400m of a bus stop
- 592 students (96%) live within a 400m of a bus route
- 313 students (51%) have been issued a school bus pass.

The existing bus stops and active transport surrounding KHS are shown in Figure 2.3 including the 400m walking radius around each bus stop. The below shows the percentage of students within each catchment area to the north and south of the school.

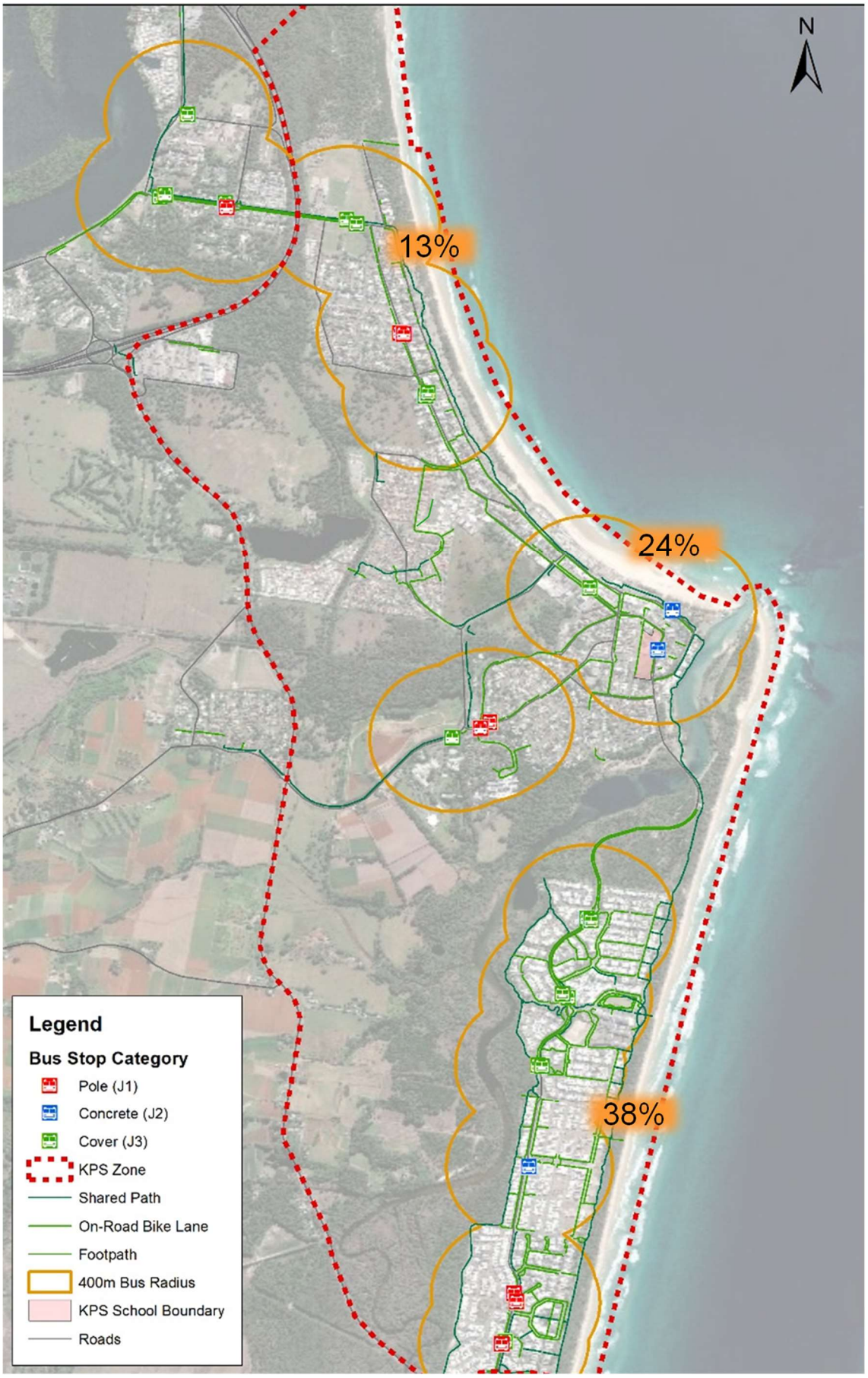


Figure 2.3: **Existing Bus Stop Catchments**

2.2 Catchment Analysis

Depersonalised student data provided by SINSW was used to determine the number of students within key walk and ride catchments. This also shows the potential walk and cycle uptake, as shown in Figure 2.4.

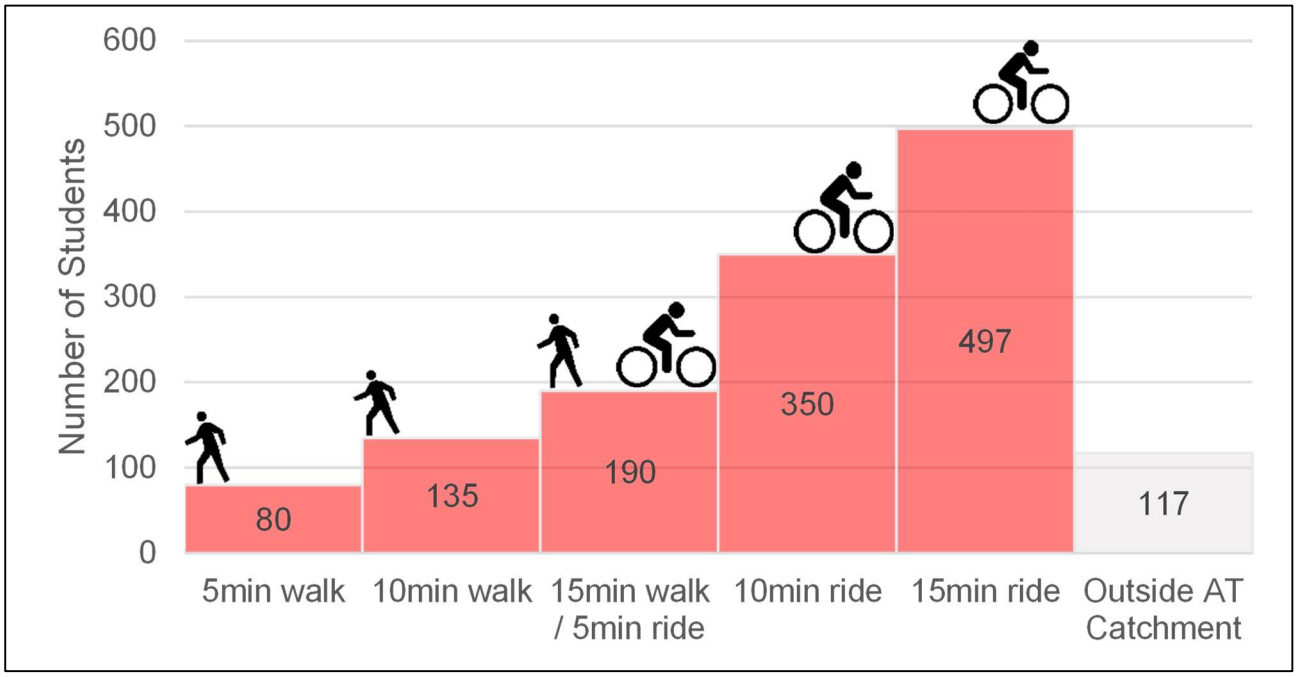


Figure 2.4: Student Catchment Analysis

As shown above, approximately 31% of students currently live within a 15-minute walking catchment and 81% live with a 15-minute ride of KPS. The existing active transport facilities within 400m, 800m, 1.2km, 2.4km and 3.6km radii of the school is shown in Figure 2.7 The below shows the percentage of students within each catchment that could participate in the walking or cycling mode share.

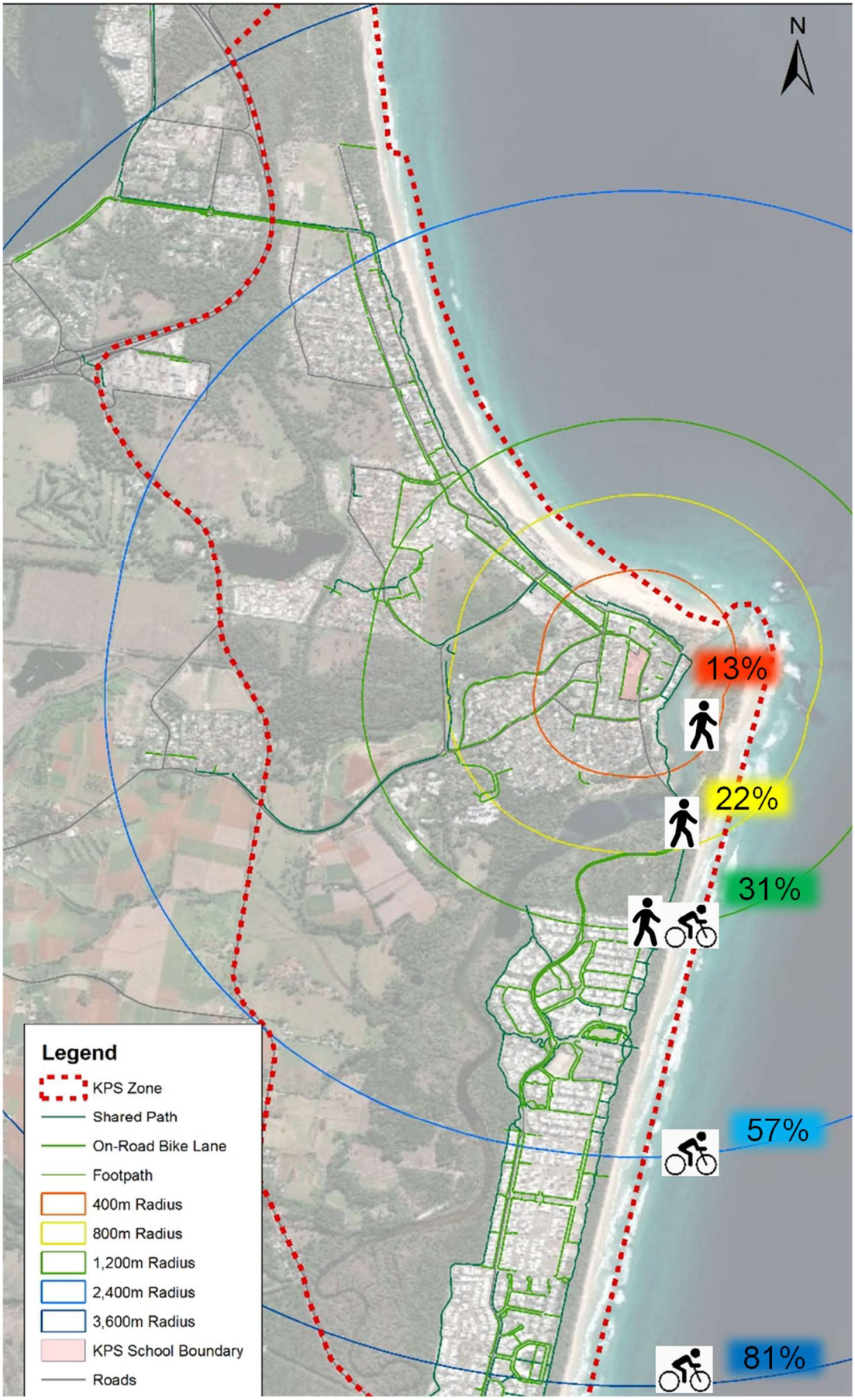


Figure 2.5: Existing Active Transport Facilities within Key Catchments

2.3 Transport Mode Share

A student and staff travel mode share survey was undertaken to determine the existing travel behaviours. The estimated mode share split of students is provided in Figure 2.6.

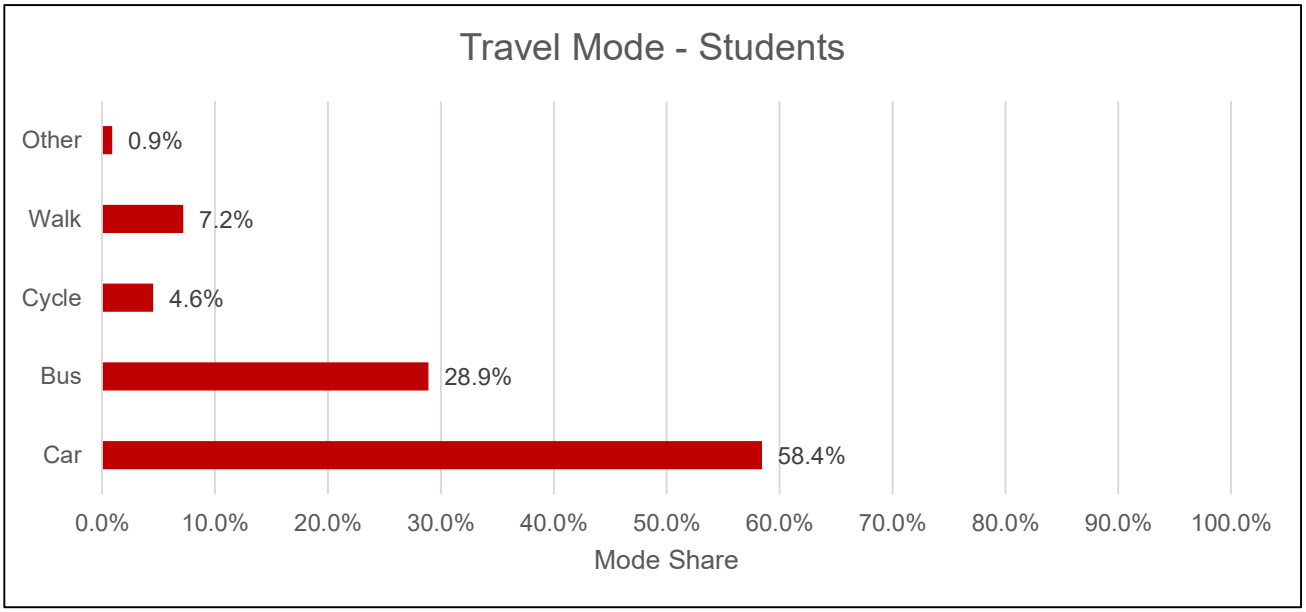


Figure 2.6: Student Travel Mode Share

As shown, buses are generally well used by students and during the site visit, several school buses were observed to be at capacity. However, there is little opportunity to further increase public transport mode share without new services. Active transport participation, particular cycling could be increased given there is approximately 31% of students living within 1.2km walking catchment (i.e. 15 minute walk) and 81% of students within a 3.6km cycling catchment (i.e. 15 minute ride) to the school.

The estimated mode share spilt of staff is provided in Figure 2.7.

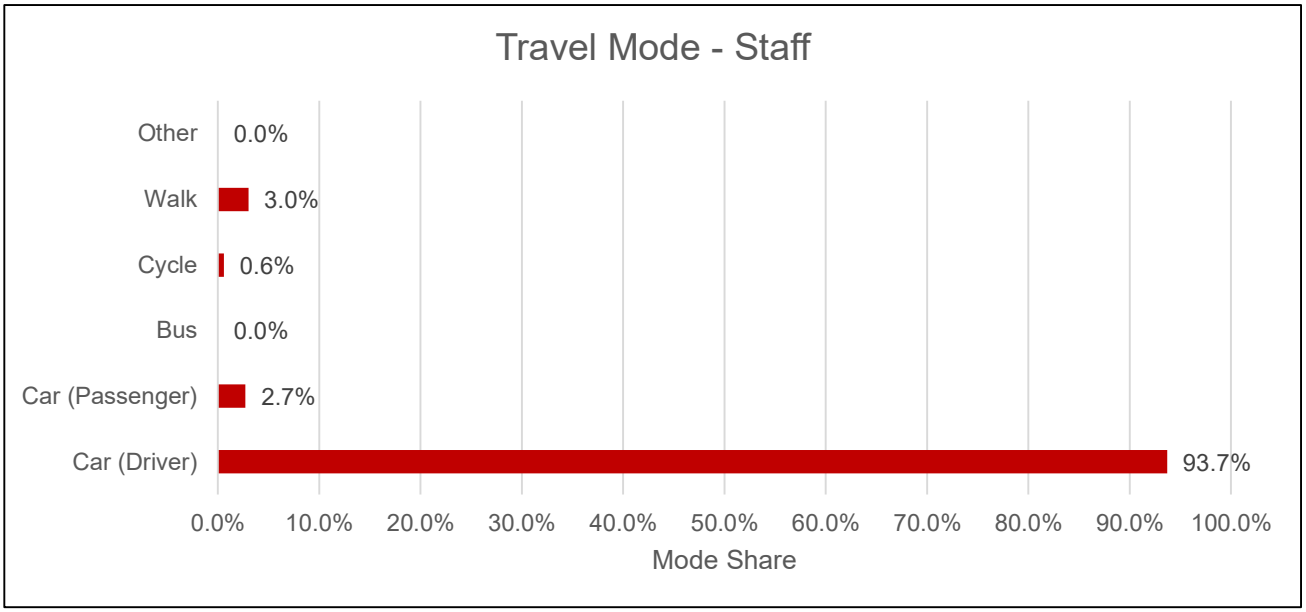


Figure 2.7: Staff Travel Mode Share

As shown, most staff drive to school, and there is little alternate transport participation. It was identified in the survey that staff who drive to school typically participate in before and/or after work events of which there is no easy transport option aside from private vehicle. Further, unlike students, staff are not employed based on their place of residence and do not have to live within the school's enrolment

catchment. This means that there may be no other transport options available for the entire trip from home to work and alternate modes of transport are not convenient Importantly; the current mode share of students and staff is consistent with other regional areas.

3. Transport Policies, Objectives and Actions

3.1 Policy and Objectives

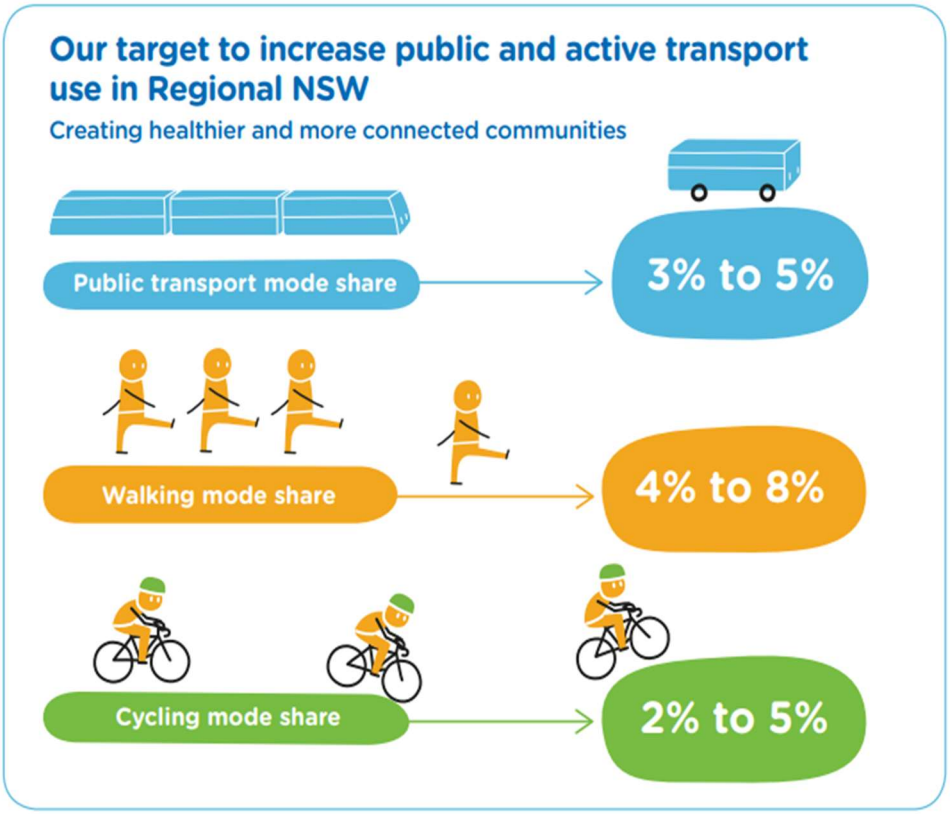
The overarching transport policy for KPS is to "*improve pedestrian and student safety*". This will increase participation in alternate transport modes, namely public and active transport, and increase daily physical activity which has a strong correlation to improved education results.

The SINSW STP *Practice Note* was used to adopt objectives specifically relevant for KPS and will drive the direction of the STP.

The 4 key pillars and objectives for school travel is summarised in Table 3.1.

Table 3.1: Transport Objectives

Safe	Efficient	Sustainable	Collaborative
To minimise pedestrian and vehicle conflict	To reduce local traffic congestion and parking impacts	To increase sustainable transport mode share to school	To identify opportunities to work with state and local government transport agencies
To identify and implement new transport and safety measures as required	To ensure required infrastructure and operations are delivered prior to occupancy	To minimise car parking and kiss 'n' drop provision on site	To share identified travel demand and transport opportunities early in the process
		To integrate the school transport facilities within the nearby community	



3.2 Targets

The mode share targets for KPS have been developed considering the transport targets from the *Regional NSW Services and Infrastructure Plan* (2018), the existing staff and student travel mode surveys and the catchment analysis. The staff mode share targets relate to the regional targets and the student mode share targets have been derived from the catchment analysis. Importantly, students live within multiple transport catchments and have multiple transport options available. That is, students live within a walking catchment and within the cycling and bus catchments.

Both staff and student mode share targets also consider the changes as a result of the KPS upgrades. The key changes being new active transport facilities near KPS.

Table 3.2 details the future mode share targets for KPS considering the recommended upgrades in the TTIA.

Table 3.2: KPS Mode Share Targets

Travel Mode	Existing Mode Share	Regional Mode Share Targets / Catchment Analysis *	STP Mode Share Targets	Change
Staff				
Private Vehicle	96%	82%	92%	**-4%**
Walking	3%	8%	3%	**0%**
Cycling	1%	5%	5%	**+4%**
Bus	0%	5%	0%	**0%**
Student				
Private Vehicle	58%	4% **	54%	**-4%**
Walking	7%	31%	10%	**+3%**
Cycling	7%	50%	7% ***	**0%**
Bus	29%	51% ****	29%	**0%**

* *Catchment analysis proportions do not add to 100% for students due to overlapping catchments*
** *The proportion of students do not live within 400m of a bus route*
*** *The proportion of recommended bicycle parking facilities at the school*
**** *The proportion of students that have been issued a bus pass*

Aspirational mode share targets for the school are provided in Table 3.3 and are based on further upgrades to the bus network and active transport in the future considering the school enrolment boundary. These targets provide best case scenario for the school long term as there is an increase in public and active transport investments.

Table 3.3: KPS Aspirational Mode Share Targets

Travel Mode	Existing Mode Share	Regional Mode Share Targets / Catchment Analysis *	Mode Share Targets	Change
Staff				
Private Vehicle	96%	82%	75%	-21%
Walking	3%	8%	8%	+5%
Cycling	1%	5%	8%	+7%
Bus	0%	5%	9%	+9%
Student				
Private Vehicle	58%	12% **	10%	-48%
Walking	7%	8%	10%	+3%
Cycling	7%	31%	10%	+3%
Bus	29%	77% ***	80%	+51%

3.3 Actions

3.3.1 Overview

Several actions have been provided to encourage the transport objectives and mode share targets. The actions discussed in the follow sections are not intended to be exhaustive and other actions are encouraged to be incorporated. As this document is intended to be 'live' and updated regularly, it is recommended that these actions be introduced at any time.

3.3.2 Staff Carpooling

Staff carpooling can reduce the number of private vehicle trips by reducing the number of drivers and increasing the number of passengers. This could be undertaken informally (i.e. co-workers) or formally by online registers. The School Travel Coordinator would be responsible for the development of a school-based carpooling register. To further encourage carpooling, dedicated car parking spaces for carpooling vehicles can be provided in a convenient location (i.e. closer to the entry) to further encourage staff to carpool. Pavement stamps are typically used to show the dedicated spaces, as shown in Figure 3.1.

Monitor & Review

Review the uptake of carpooling annually by monitoring staff car park occupancy and staff travel surveys.

Figure 3.1: Staff Car Pooling Example

3.3.3 Monetary Incentives for Staff

Monetary incentives for staff to participate in active or public transport include the following:

- Subsidised backpacks for staff committed to active travel
- Salary sacrifice options for purchases of bikes or other micro-mobility devices
- Subsidised public transport travel for staff.

The above options could provide staff an incentive to utilise alternate modes of transport. Any of the above options could be implemented in consultation with TfNSW, Council and SINSW.

Monitor & Review

A survey of staff could be used to monitor uptake, feedback and identify any changes that are required to further encourage a modal shift. Continuous consultation with relevant government departments would also be required to monitor budgets and accessible resources. A review is proposed to be undertaken at the end of each school term.

3.3.4 Walking or Bike Buses

A walking or bike bus allows a group of students to walk or cycle safely to school in a group while being supervised by adults. Students are also typically accompanied by a parent. Multiple routes could be arranged for different directions (i.e. north, south, etc.). The walking or bike bus encourages students to participate in active transport. Once walking and bike bus groups are created, it is recommended to be advertised to students and parents and a register be developed to assist in managing number of students and available parent leaders. The School Travel Coordinator will promote the opportunity to introduce a walking bus which will be implemented if feasible and there is sufficient interest.

Monitor & Review

A survey could be extended to the parents to monitor uptake, feedback and identify any organisational issues with implementing a walking or bike bus. A review is proposed to be undertaken at the end of each school term.

3.3.5 School Activities Relating to Walking or Cycling

Gamification of active or public transport could be incorporated into the classroom specifically for primary school students. This could include any of the following:

- Activities relating to active and public transport
- Students involved in sharing their trip to school (i.e. maps, art or videos)
- Cycling and bike maintenance courses
- Competition / scoreboard of how many steps / walking trips students can undertake.

Monitor & Review

Consultation with teachers is required to monitor uptake, feedback and identify any organisational issues with implementing different activities. A review is proposed to be undertaken at the end of each school term.

3.3.6 Student and Staff Bicycle Parking

Safe routes to school and a secure place to store a bicycle encourages staff and students to ride to school. It is recommended that four staff and 33 student bicycle parking spaces be installed to cater for the potential cycle demand and encourage travel change. Cycling routes and information should also be provided to staff, students and parents to promote the use of additional bicycle parking facilities. The staff and student bicycle parking facilities should be provided in separate locations.

Monitor & Review

Monitor the usage of the additional bicycle parking facilities to understand the increase in cycling as a mode share. Gain student and staff feedback on cycling and its facilities in an annual travel mode survey.

3.3.7 Active Transport Infrastructure Upgrades

A number of active transport infrastructure upgrades have been identified as part of the Rapid Transport Assessment (RTA) for KPS. This additional infrastructure will provide a continuous and safe network for students and staff. The following upgrades proposed as part of the masterplan include:

- **D3** - Pathway on western wide of Orient Street (360m missing link)
- **D4** - Pathway on eastern side of Orient Street (130m missing link)
- **D10** - Additional school crossing to be installed on Orient Street north of Omar Street to accommodate pedestrians from the south.

The following upgrades are also recommended to be rectified as part of Council's revised PAMP and Bike Plan inclusions for the greater transport network. These will improve safety and provide safe active transport facilities that will further support and encourage a modal shift:

- **D1** - Pathway on northern side of Sutherland Street (210m missing link) with two kerb ramps required to cross Palmers Lane
- **D2** - Pathway on eastern side of Sutherland Street (190m missing link) with two kerb ramps required to cross Hungerford Lane
- **D5** - Pathway on northern side of Viking Street (140m missing link)
- **D6** - Existing refuge crossing on Sutherland Street is too far from pedestrian desire lines (Orient Street to Marine Parade)
- **D7** - The Sutherland Street / Seaview Street roundabout does not provide safe crossing facilities
- **D8** - Existing crossing on Moss Street is unsafe during school peaks and pathway is too narrow
- **D12** - Pathway links on Omar Street to connect to the new school crossing on Orient Street.

These upgrades are shown in Figure 3.2.

Source: Nearmap

Figure 3.2: Active Transport Infrastructure Upgrades

The deficiencies located further away from the school that are not being upgraded as part of the KPS upgrade would be expected to be rectified as part of revised PAMP and Bike Plan inclusions for the greater active transport network.

Also include in the proposal is to relocate the kiss'n'drop from Sutherland Street to Orient Street. To improve the bus operations on Sutherland Street the hardstand area where the drop-off / pick-up occurs is also proposed to be increased. This includes length for four buses, which is the maximum expected at any one time, and pavement width from boundary to kerb.

It is recommended that the need for these upgrades be monitored in the annual staff and student travel mode survey as discussed in Section 5.

4. TRAVEL ACCESS GUIDE

4.1 Overview

A Travel Access Guide (TAG) should be provided to students upon enrolment and before the start of the school year to inform the available transport modes. The TAG summarises the school's location, access locations, transport facilities and the most direct transport options. This document also provides links to other external information as required (i.e. bus route and timetable information). A preliminary TAG has been prepared for KPS and is provided in **Appendix A**.

5. Monitor and Manage Travel Demand

5.1 Monitor School Travel Plan

An annual student and staff travel mode share survey undertaken by the School Travel Coordinator should be implemented to collect current data and assist in decision making. This data can be compared against the mode share targets identified in Section 3.2. The STP can be updated to align with the results of the mode share survey and potentially include additional actions. The annual student and staff travel mode share survey aims to gain feedback and provide realistic actions targeted specifically for KPS staff and students.

Communication between state and local government agencies will be required to collaborate policies where possible. Tweed Shire Council's (Council's) policies including the Pedestrian Access and Mobility Plan (PAMP) and Bike Plan could include the STP's actions to better integrate KPS's transport facilities within the nearby community.

It is noted Council does not currently have a Bike Plan and could be beneficial in implementing strategies for the region and the school. The School Travel Coordinator will be required to submit progress reports to the Department of Planning, Infrastructure and Environment.

The following template can be used to accurately monitor and review actions annually.

Action Name (i.e. Staff Carpooling)	
Target Date	
Current Status	
Updates Required	
Revised Target	
Date for Review	

6. FUNDING ARRANGEMENTS

6.1 Potential Funding Options

The available funding for active and public transport projects is reliant on Council's budget allocations and successful grant applications through State and Federal Government programs. Potential funding options include:

- Collaborations with State Government (e.g. TfNSW)
- Section 94 Contributions
- Council Rates
- Planning Agreements
- Reallocation of existing funds within Council's budget
- Cycleway grants
- Commonwealth Government grants.

Appendix A: Transport Access Guide

NSW Department of Education – School Infrastructure

Kingscliff Public School

Travel Access Guide

10th August 2021

Project Overview

We encourage Kingscliff Public School staff, students and parents to use active and public transport options to travel to and from school. Many options are convenient, safe and stress free – it also helps you get your daily physical activity!

Use this guide to plan your travel each day to Kingscliff Public School.

Active ways to get to school

Walking is an active and healthy way to get to school

- Always cross at a designated crossing
- Look left and right when crossing

Ride your bike

- Be careful of other people using the path

Ride your scooter

- Be careful of other people using the path

Kiss'n'drop expectations

- Drive all the way to the front of the kiss'n'drop to pick up / drop off
- Do not queue through the school crossing whilst waiting to enter the kiss'n'drop
- Do not store in kiss'n'drop for more than 5 minutes

Message from your Principal (To be completed)

- ……
- ……
- ……

Message from your P&C President (To be completed)

- …..
- …..
- …...

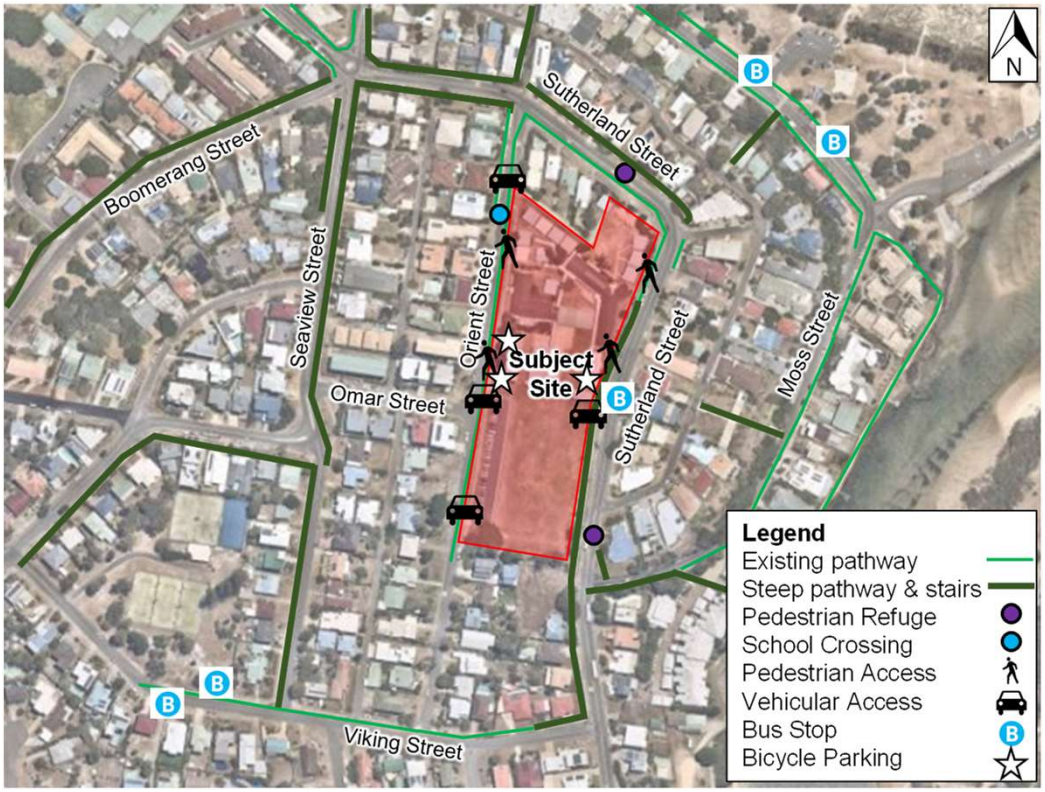
For more information contact:

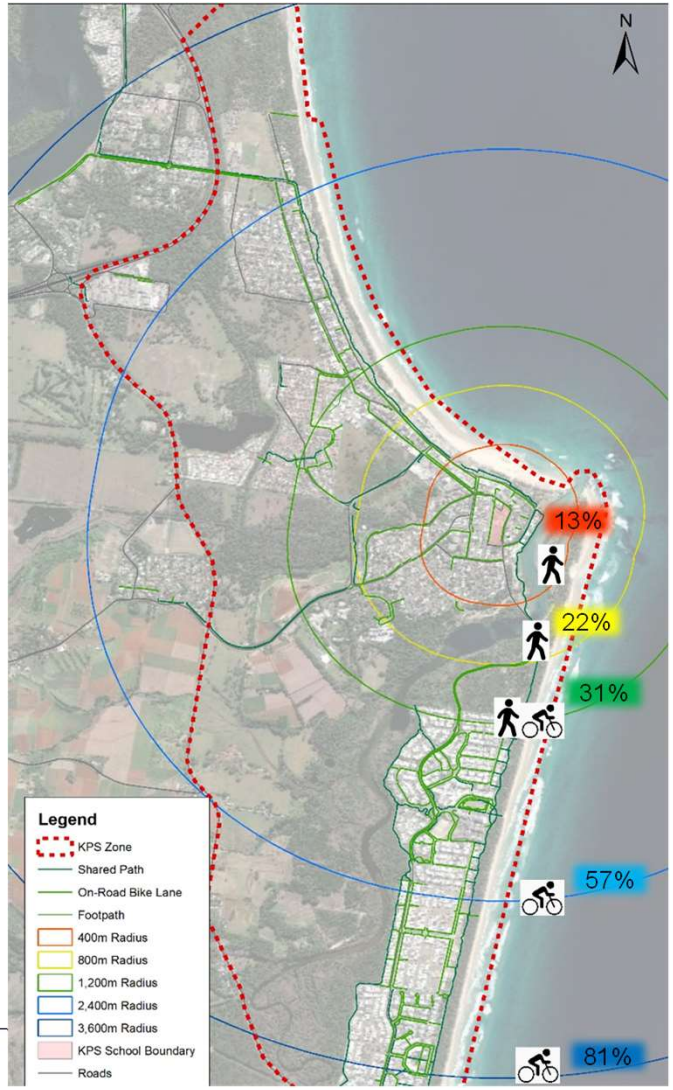
School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 651

NSW

NSW Department of Education – School Infrastructure

Local Map: Active Travel





For more information contact:

School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 651

NSW

NSW Department of Education – School Infrastructure

Kingscliff Public School

Travel Access Guide

10th August 2021

NSW Department of Education – School Infrastructure

Project Overview

We encourage Kingscliff Public School staff, students and parents to use active and public transport options to travel to and from school. Many options are convenient, safe and stress free – it also helps you get your daily physical activity!

Use this guide to plan your travel each day to Kingscliff Public School.

Using public transport to get to school

School bus services to get to school include:

- 10 bus routes in the AM
- 7 bus routes in the PM
- There are 2 public routes (601 & 603) that service the school
- There are 17 sheltered bus stops surrounding the school

Kiss'n'drop Code of Conduct

- Drive all the way to the front of the kiss'n'drop to pick up / drop off
- Do not queue through the school crossing whilst waiting to enter the kiss'n'drop
- Do not store in kiss'n'drop for more than 5 minutes

Apply for a School Term Bus Pass

School Student Transport Scheme

Students can receive a free school travel pass to be used on school or public bus services operated by Surfside Bus Lines.

Visit: https://www.service.nsw.gov.au/transaction/apply-school-travel-pass for more information.

Visit www.transportnsw.info or call 131500 to plan your trip and access up to date timetables and maps.

Message from your Principal (To be completed)

- ……
- ……
- ……

Message from your P&C President (To be completed)

- …..
- …..

For more information contact:

School Infrastructure NSW

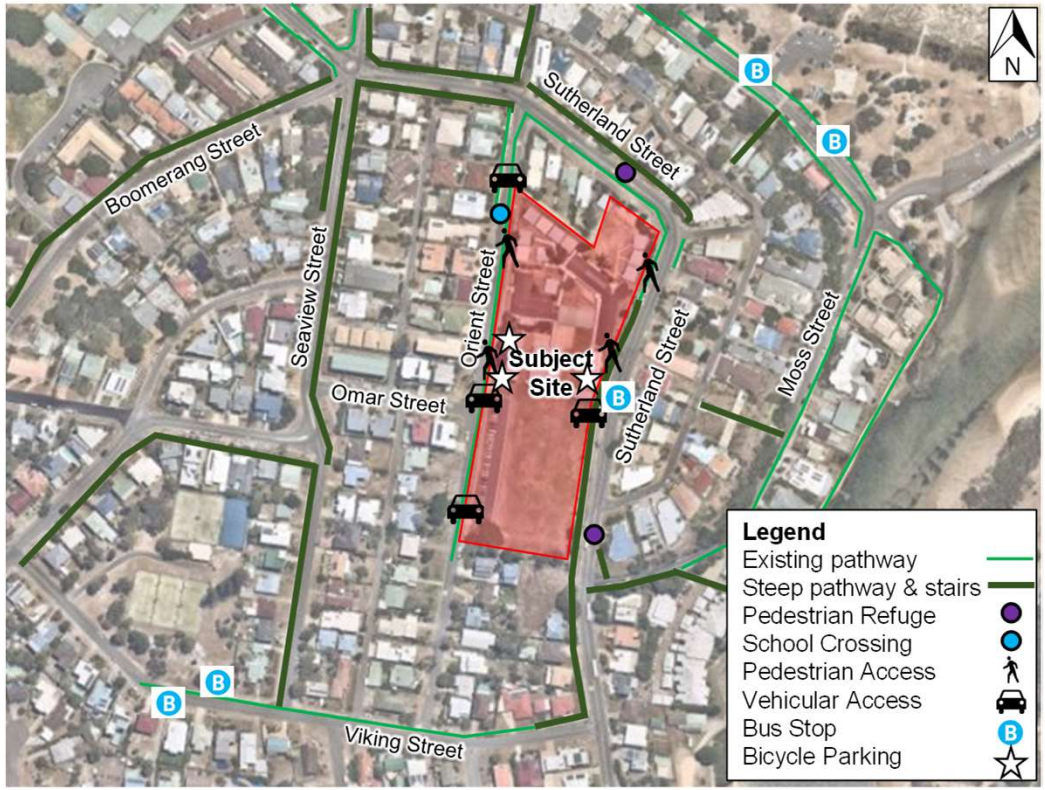
Email: schoolinfrastructure@det.nsw.edu.au

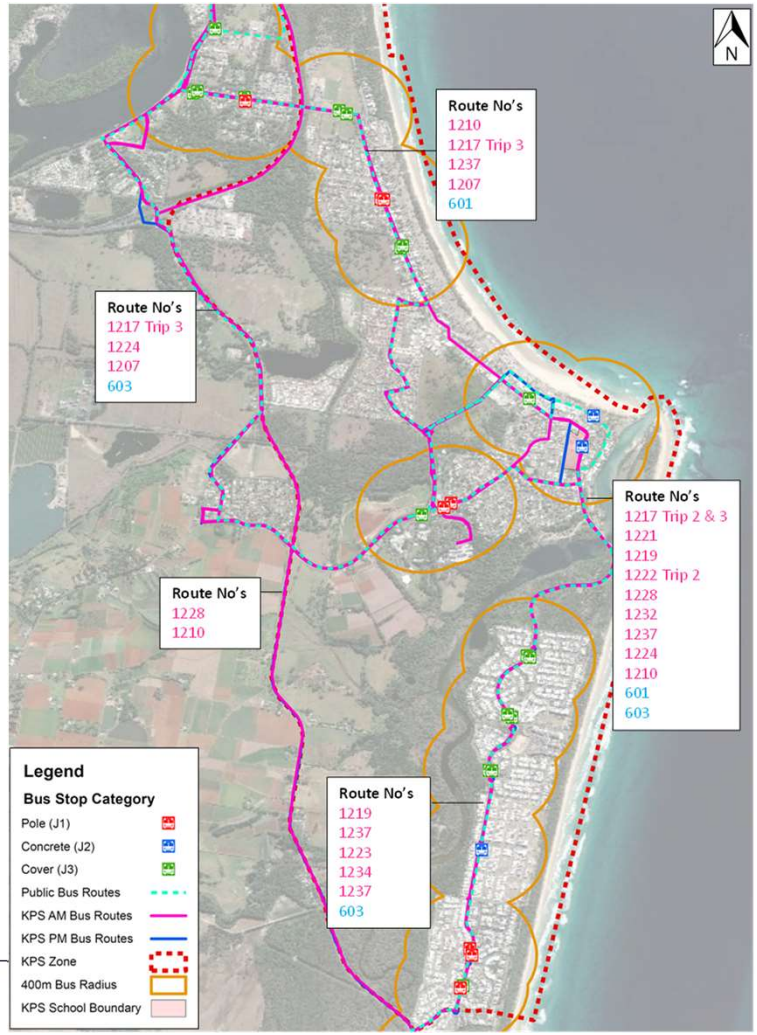
Phone: 1300 482 651

NSW

NSW Department of Education – School Infrastructure

Local Map: Public Transport





For more information contact:

School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
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NSW

Appendix C: Preliminary Construction Traffic Management Plan

Kingscliff Public School

Construction Traffic Management Plan

Schools Infrastructure NSW

6 September 2021

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P4398.002R KPS Construction Traffic Management Plan	J. Imai	B. Newman	B. Newman	10/03/2021	Gabriel Reyes MBB Group Gabriel.Reyes@mbbgroup.com.au
P4398.003R KPS Construction Traffic Management Plan	S. Seeney	A. Eke	A. Eke	7/09/2021	Gabriel Reyes MBB Group Gabriel.Reyes@mbbgroup.com.au

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1. INTRODUCTION

1.1 Background

Bitzios Consulting has been engaged to prepare a preliminary Construction Traffic Management Plan (CTMP) for the Kingscliff Public School (KPS) Development Application (DA). Importantly, the DA is categorised as a State Significant Development (SSD). As this CTMP is being prepared during the DA stage, a construction contractor and finer detail around the construction methods are not available. Therefore, this CTMP is strategic in nature and a detailed CTMP will be required prior to the start of construction.

KPS is located at Orient Street, Kingscliff (subject site) which is shown in Figure 1.1.

SOURCE: Nearmap

Figure 1.1: Subject Site Location

1.2 Purpose

The purpose of this CTMP is to assess the likely impacts associated with construction activities and maintain an accessible and efficient road network for all users. This document has been prepared to assist the Principal Contractor to implement vehicle and pedestrian management measures when carrying out the works phase of the project.

1.3 Limitations

This document has been prepared to give a general understanding of construction traffic impacts associated with the project. Once detailed construction information is available, this CTMP should be reviewed and revised to incorporate the detailed information of the project.

2. EXISTING CONDITIONS

2.1 Road Network

Table 2.1 provides a summary of the key roads within the surrounding road network.

Table 2.1: Key Roads

Road Name	Jurisdiction	Hierarchy	Lanes	Divided	Posted Speed
Sutherland Street	Council	Collector/Distributor	2	No	50km/h (40km/h School Zone)
Orient Street	Council	Local road	2	No	50km/h (40km/h School Zone)
Viking Street	Council	Local road	2	No	50km/h
Seaview Street	Council	Local road	2	No	50km/h

School zone times surrounding the subject site are listed as being active between 8:00-9:30AM and 2:30-4:00PM.

The surrounding key intersections in proximity to the subject site are detailed in Table 2.2.

Table 2.2: Surrounding Key Intersection Details

No.	Major Road	Minor Road	Jurisdiction	Control
1	Sutherland Street	Viking Street	Council	Priority Controlled
2	Sutherland Street	Orient Street	Council	Priority Controlled
3	Sutherland Street	Seaview Street	Council	Roundabout
4	Viking Street	Orient Street	Council	Priority Controlled

The surrounding roads generally have unrestricted parking except for the bus zone and kiss'n'drop zones on the school's frontages on Sutherland Street and Orient Street. The bus zone is sign posted as "8:00-9:30am and 2:30-3:30pm School Days". The kiss'n'drop zone is sign posted as "P5 minute between 8:30-9:30AM and 2:30-3:30PM". Further, there is a "No Stopping" zone on Orient Street north of the P5 minute restriction.

Nearby on-street restrictions and facilities are shown in Figure 2.1.

SOURCE: Nearmap

Figure 2.1: Nearby On-street Car Parking Facilities

2.2 Alternate Transport

2.2.1 Public Transport

There are six bus stops located within 800m to the subject site, located on Sutherland Street, Viking Street and Marine Parade. Figure 2.2 shows the location of the surrounding bus stops while Table 2.3 details the public route services. There are additional school services that are not listed but can be found on the Surfside Bus Lines website.

SOURCE: Nearmap

Figure 2.2: Bus Stop Locations

Table 2.3: Bus Routes

Service	Route	Peak Frequency	Off-Peak Frequency
601	Tweed Heads West to Kingscliff via Coolangatta, the Tweed Hospital & Tweed City	30 min	1 hour
603	Pottsville to Tweed City via Hastings Point, Cabarita Beach, Kingscliff TAFE & Chinderah	1 hour	-

The development is considered well connected with servicing running from Tweed Heads to Pottsville along the coast and inland to Tweed Heads West.

2.2.2 Active Transport

The subject site is surrounded by a pedestrian footpath along its frontage. The surrounding network is lacking path connections and crossing locations. Due to the hilly terrain the paths are either very steep or have stairs.

The surrounding active transport network is shown in Figure 2.3.

SOURCE: NearMap

Figure 2.3: Surrounding Active Transport Network

3. CONSTRUCTION ACTIVITIES

3.1 Overview

At this stage, the preliminary CTMP details the following assumed construction activities based on the recommendations in the design advice and Traffic and Transport Impact Assessment (TTIA). The anticipated construction activities include:

- Establishing a construction compound for the works
- General clearance of vegetation within the footprint of the proposed buildings
- Demolishing 20 existing buildings and associated walkways
- Augmentation and connection of permanent services for the new facilities (i.e. water, electricity, telecommunications)
- Stabilisation / erosion control or offsite disposal (as required)
- Bulk earthworks to establish the require site levels and create a stable land platform
- Construction of internal roadways, buildings and parking facilities.

Specific details and construction processes for the site establishment, demolition and excavation, and any materials delivery are unknown at this preliminary stage; however, the construction methodology is expected to be broken into three (3) phases as follows:

- **Phase 1:** Demolition
- **Phase 2:** Grubbing and earth works
- **Phase 3:** Construction of new buildings/facilities

The construction program will be managed to provide ongoing operation and maintenance of the school, and to reduce the impact and disruption to the surrounding residents, neighbours and businesses.

3.2 Construction Hours

The hours of construction including delivery of materials to and from the site are generally restricted to between:

- Monday to Friday 7:00am-6:00pm (inclusive)
- Saturday 8:00am-4:00pm (inclusive)
- Not on Sundays or public holidays.

The traffic peak hours were observed to occur between 8:15-9:15am and 2:15-3:15pm, Monday to Friday. Given that teachers starting time is 8:30 and the school bell times are 9:00am and 3:00pm, construction activities should be coordinated with the schools to restrict truck movements between 8:15-9:15am and 2:30-3:30pm

Extended construction and outside hours may be required from time to time and will be coordinated with Tweed Shire Council (Council). The requirement of out of hours works may include:

- As a result of an emergency to avoid loss of life, damage to property and/or to prevent environmental harm
- If a variation is approved in advance by the Secretary of her nominee.

3.3 Construction Site Access

3.3.1 Overview

Construction access to the KPS site from the surrounding road network is expected to occur at locations that would have limited impact to the drop-off and pick-up and bus operations. KPS has frontage to Sutherland Street and Orient Street, both of which have high levels of school drop-off / pick-up or bus activities. It is understood that the primary access is in the south eastern corner of the site via Sutherland Street south of the bus zone. Construction activities / hours will need to be negotiated so that there is limited impact to school operations.

3.3.2 Site Access

There is an existing crossover on Orient Street that connects to School Lane, which can be used by construction vehicles entering / exiting the site. Swept path diagrams will be required to demonstrate the ingress and egress movements for the required vehicle (e.g. 12.5m long Heavy Rigid Vehicle (HRV)) are suitable. These movements will be required for the loading and unloading and storage of plant, equipment and materials within the site area. All reverse movements will be undertaken with the aid of a 'spotter', and all vehicles must be fitted with working reversing alarms and lights.

A Vehicle Movement Plan (VMP) is not required in accordance with Roads and Maritime Services (RMS) Traffic Control at Work Sites as the speed limit of all surrounding roads is 50km/h.

Site access for construction vehicles is proposed via Sutherland Street and would provide direct access to the site compound and surrounding works areas. Swept path diagrams will be required to demonstrate the ingress and egress movements for the required vehicle (e.g. 12.5m long Heavy Rigid Vehicle (HRV)) are suitable. These movements will be required for the loading and unloading and storage of plant, equipment and materials within the site area. All reverse movements will be undertaken with the aid of a 'spotter', and all vehicles must be fitted with working reversing alarms and lights.

A Vehicle Movement Plan (VMP) is not required in accordance with Roads and Maritime Services (RMS) Traffic Control at Work Sites as the speed limit of all surrounding roads is 50km/h.

3.4 Construction Worker Parking

Parking for construction personnel will not be provided on-site during any construction stages. All construction worker parking will occur either on-street surrounding the school or at the public parking at Ed Parker Rotary Park, Faulks Park and public boat ramp, near the subject site on Sutherland Street and Marine Parade. This arrangement should be coordinated with the schools to minimise parking conflicts during peak hours. Further details regarding construction worker parking is discussed in Section 4.3.3.

3.5 Construction Worker Induction

All workers and subcontractors engaged on-site should be required to undergo a site induction. The induction should address elements related to traffic and transport management, including:

- Existence and requirements of the CTMP
- Relevant legislation, regulations and conditions (e.g. Workplace Health & Safety procedures)
- Roles and responsibilities
- Incident response, management and reporting procedures
- Construction hours
- Access routes and preferred parking locations
- Road safety and occupancy

- Temporary and interim traffic arrangements.

Informal training on traffic management (including monitoring and reviewing traffic control devices and mitigation measures) should be undertaken during toolbox meetings with site personnel.

3.5.1 Safe Work Requirements

To protect the safety of workers and the public, the work site should be adequately secured (i.e. security fence) to prevent access by unauthorised personnel. Additionally, all works must be conducted in accordance with the relevant SafeWork requirements.

3.5.2 SafeWork Method Statements

A Safe Work Method Statement (SWMS) should be complied whenever any person is undertaking high risk construction work as defined by SafeWork NSW. Generally, the SWMS should include:

- The task/s
- All known hazards and risks
- Any control measures including their implementation, monitoring and review.

If a control measure is changed, the SMWS are to be reviewed and updated accordingly.

4. CONSTRUCTION TRAFFIC IMPACTS

4.1 Overview

An increase in traffic volumes is expected during the construction of the project as the result of commuting workers, deliveries of equipment and haulage of materials to and from the subject site. It is anticipated that the primary traffic generation of construction will comprise of:

- The delivery and removal of construction machinery and materials, spoil and waste
- The movement of construction personnel, including contractors, workers and management staff.

4.2 Construction Vehicle Routes

4.2.1 Construction Vehicles

The following design vehicles are likely to be used during construction:

- 12.5m Heavy Rigid Vehicles (HRV): for deliveries and loading / unloading
- 8.8m Medium Rigid Vehicle (MRV): for deliveries and loading / unloading
- Rigid Concrete Agitator
- Mobile Crane.

The largest construction vehicle is expected to be a 12.5m long HRV.

4.2.2 Access Routes

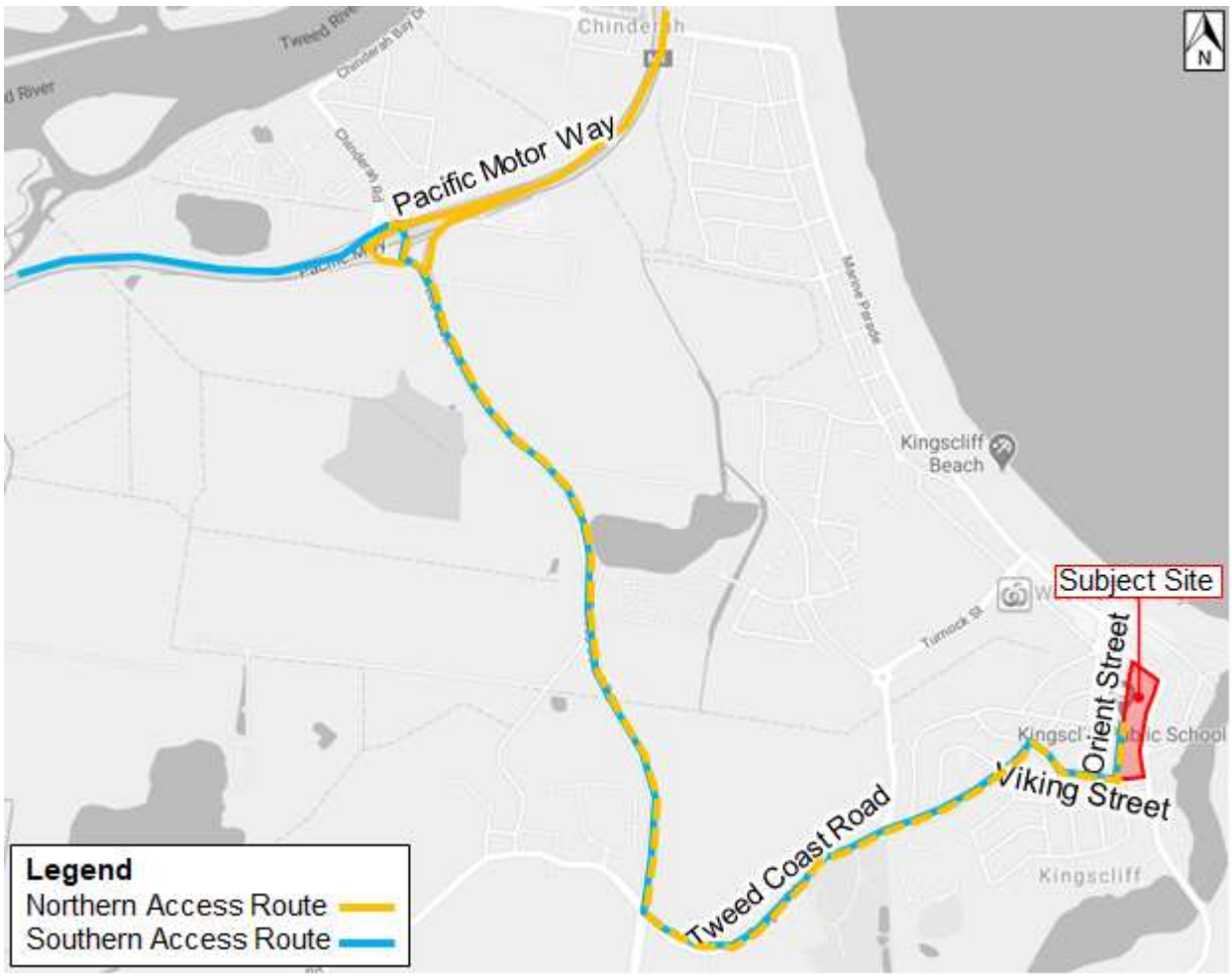
Access routes have not yet been confirmed at this stage; however, the main access / haulage routes are expected to use the following routes to the site:

- North approach: via M1, Tweed Coast Road, Cudgen Road, McPhail Avenue, Viking Street, Orient Street
- South approach: via M1, Tweed Coast Road, Cudgen Road, McPhail Avenue, Viking Street, Orient Street

Heavy vehicles will travel on the M1 and turn off at the Tweed Coast Road exit for both the northern and southern approaches and continue on Cudgen Road, a local collector/distributor before entering the local streets of McPhail Avenue, Viking Street and Orient Street. Swept paths of a 12.5m HRV will be required on the local roads for key turning movements within the local network. The swept path diagrams will need to demonstrate that construction vehicles can access the construction site using the full pavement width of the roads.

Importantly, McPhail Avenue, Viking Street and Orient Street service existing bus routes with buses up to 14.5m long using these roads. There is not expected to be any issues with 12.5m long vehicles on the above roads.

Figure 4.1 illustrates the construction vehicle routes that will be used for site access.



SOURCE: Google Maps

Figure 4.1: Construction Access Routes

4.3 Construction Traffic Impacts

4.3.1 Overview

Due to the preliminary nature of this CTMP it is not possible to quantify the number of construction workers or vehicles. This is largely tied to the duration of the works and the availability of workers and vehicles. However, construction activities commonly occur with a uniform traffic profile. This is important for activities like deliveries and haulage to prevent vehicles queueing within the site and not being efficient with their time.

Given the scale of the works associated with the KPS project, there is not expected to be a large quantum of construction vehicles. Any impacts associated with the construction are expected to be minor and short lived.

4.3.2 Surrounding Road Network

As per the access assessment, no detailed analysis of the wider transport network has been undertaken as it is expected that these roads have sufficient capacity to accommodate the low levels of additional traffic without significant impacts.

Due to the location, road network peak time and peak school pick-up/drop-off times, typical construction worker arrival / departure times can be arranged to occur outside of peak school times. Truck movements should be restricted between 8:15-9:15am and 2:45-3:45pm (i.e. typical pick-up/drop-off times).

Therefore, it is expected that the construction generated traffic will have negligible impacts on the operation and efficiency of the local road network, and a detailed analysis is not considered warranted.

4.3.3 Parking

Single occupant private vehicle travel should be discouraged in the site induction and where not avoidable, it will be recommended that workers carpool to reduce the number of worker vehicles.

On-street parking is available surrounding the subject site; however, to reduce the network operations, it is recommended that where possible construction workers attempt to park at the available public parking surrounding Faulks Park and on Marine Parade.

The availability of on-street parking should be considered when determining the peak work force. Figure 4.2 shows the location of nearby parking at Faulks Park and on Marine Parade. There is additional parking at Ed Parker Rotary Park to the south though this is all informal parking.

SOURCE: Nearmap

Figure 4.2: Available On-Street Parking

4.3.4 Pedestrians and Cyclists

There is expected to be minimal impacts to pedestrians and cyclists in the area during construction due to the extent of works being internal. Any impacts to pedestrian pathways or cycle routes will be managed under the CTMP.

4.3.5 Bus Zones and Services

Bus Routes 601 does not travel past the school boundaries and is not expected to be impacted by the construction. Route 603 travels along the school frontage on Sutherland Street and is also not expected to be impacted by construction traffic generated by the subject site.

4.3.6 Property Access

It is not expected that construction works will have any adverse impacts on existing property accesses of nearby lots with access to all properties maintained during construction unless otherwise agreed to by the relevant business owner, property owner or occupier.

4.3.7 Emergency Services

The proposed construction activities are not expected to impact emergency services. Emergency services will always have access to the site and surrounding roads.

5. CONSTRUCTION TRAFFIC MANAGEMENT

5.1 Traffic Control Plans

Prior to implementation, construction traffic management measures will require the preparation of an approved Traffic Control Plan (TCP). TCPs indicate the road worksite arrangements to ensure the safety of all road users as well as workers at the site.

Works that have been identified as requiring a TCP are detailed below:

- Construction vehicle access to the subject site
- Relocation of the school crossing on Orient Street.

TCPs will be developed as per Australian Standards AS1742.3 and the RMS *Traffic Control at Work Sites Technical Manual* (latest version).

6. STAKEHOLDER CONSULTATION

6.1 Parents and Carers

Information is to be provided to the parents and carers of school students by school management prior to the commencement of any construction activities. As a minimum, this information should include:

- Staging of the works
- Timing / hours of the works
- Restricted vehicular / pedestrian access
- Temporary parking restriction locations
- Location and type of traffic control.

This information should be provided via the school's website or newsletter, with regular progress updates to be provided throughout construction to report on any changes to scheduled activities or addressing any concerns.

6.2 Staff and Students

All school staff and students should also be briefed by school management with this information. Additionally, staff and students will also need to be advised on the proposed changes to the school access and the associated procedures they will need to follow during construction.

6.3 Servicing

Both regular and intermittent servicers of the site must be notified of any changes to servicing times, locations and procedures prior to, and throughout the duration of construction.

7. MONITORING AND EVALUATION

7.1 Inspection and Monitoring

In addition to traffic control safety inspections, formal and documented daily (short-term) and weekly (long-term) inspections shall be undertaken at work sites by suitably qualified persons (i.e. holding the Prepare Work Zone Traffic Management Plan qualification).

It is also important for any near miss incidents to be recorded and documented then reviewed as part of any inspection.

7.2 Works Supervisor Role

For all long-term work sites, the works supervisor who is appropriately qualified shall:

- Plan arrangements for vehicles associated with the works
- Inspect the traffic control layout a day before the works begin and at least once per week over the duration of works
- Inspect the traffic control layout between shifts at least once during the first week and at least once every two months for the duration of work
- Review the reported near miss incidents
- Provide after-hours contact to local police for the duration of works
- Inspect the site on the final day to ensure that unnecessary signage and devices are removed
- Record results of these inspections noting date, time, deficiencies and any corrective action taken of specified
- Ensure that any specified corrective action is taken.

7.3 Team leader Role

For all works, the team leader (or site supervisor) shall:

- Ensure that drivers of work vehicles are familiar with the arrangements of the traffic control
- Instruct drivers how to enter and exit the work site safely and which routes to follow between work sites, depots and material sources
- Keep record of the TCP used on site at all times
- Record start and finish times and locations of works
- Record any near misses
- Carry out inspections before work starts, during the works and pre-closedown of the site using the nominated check list, noting:
  - Date and time of inspection
  - Deficiencies identified and corrective action taken
  - Changes or modifications made to the site
- Periodically check that all signs and devices are satisfactory and in their correct position
- Make all records available to authorised staff.

7.4 Project Manager Role

The project manager shall:

- Ensure that traffic control safety inspections are carried out at least once per month by a person suitably qualified in Prepare Work Zone Traffic Management Plans and that the date, time and deficiencies are recorded
- Ensure that a traffic control safety inspection or road safety audit is carried out prior to the implementation of any changes in traffic control or TCP
- Ensure that a traffic control safety inspection or road safety audit is carried out prior to the implementation of any lateral shift tapers to ensure that geometric requirements and delineation methods are in accordance with the approved TCP
- Ensure that near miss incidents are being reported and recorded then reviewed
- Ensure that any corrective action specified is taken and recorded, as information may be critical, should legal proceedings follow and incident.

7.5 Traffic Controllers

The services of a qualified Traffic Control subcontractor must be used to provide traffic control services for the construction of the project. Traffic controllers will be trained and inducted in accordance with the Traffic Controller Accreditation and Implementation Traffic Control Plans qualifications as well as comply with the requirements of the *Traffic Control at Work Sites Technical Manual* (Version 5.0).

It is also the responsibility of a Traffic Controllers employed on-site to record any issues relating to the implemented traffic management measures and report them to the Site Manager so that any issues are recorded within a site register then reviewed.

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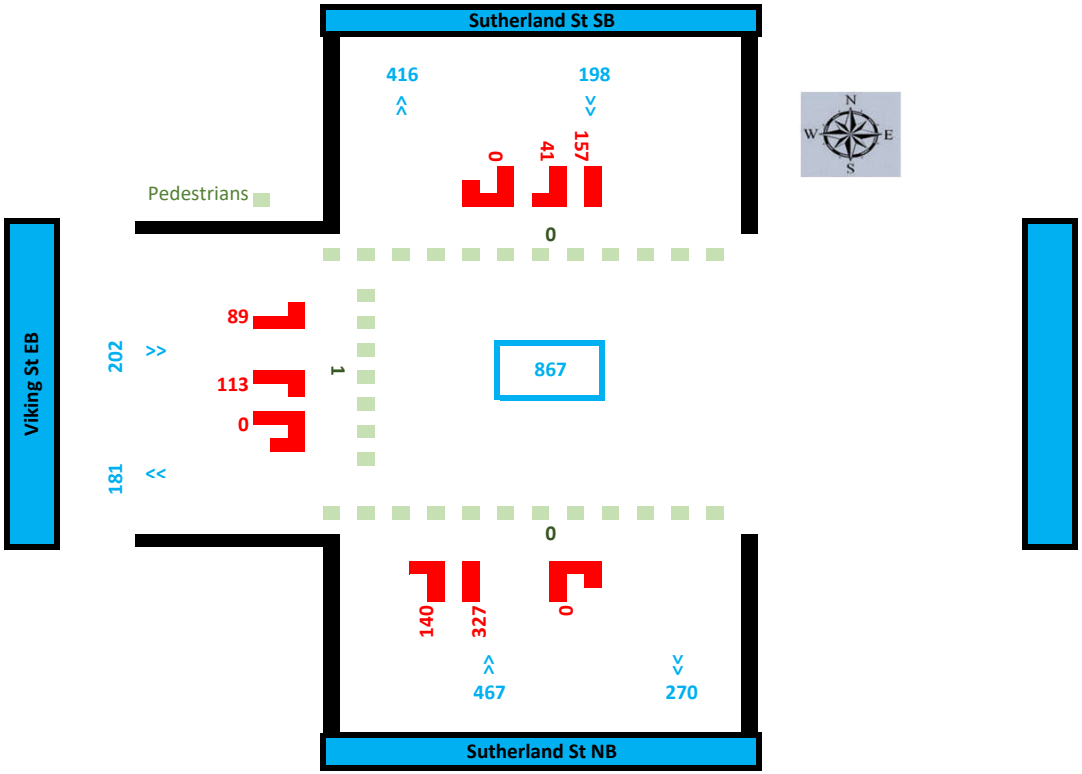
Appendix D: Traffic Survey Data

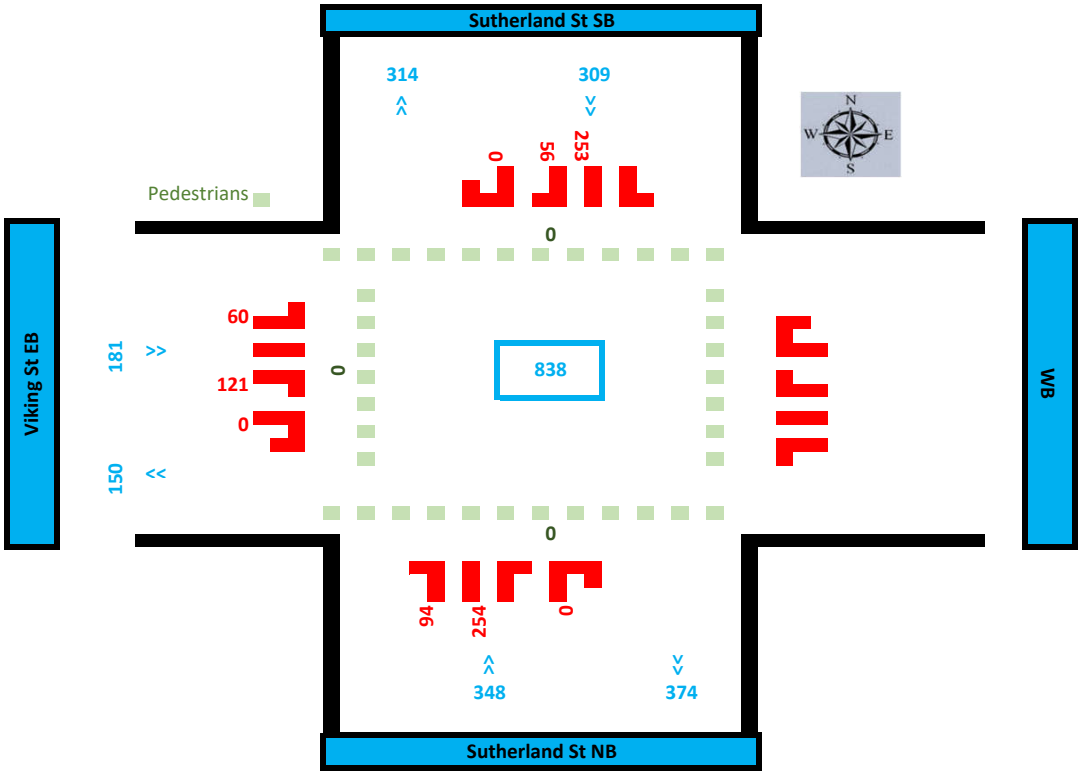
Turning Movement Count Summary

Site ID:	1
Location:	Sutherland St & Viking St, Kingscliff
Date:	19-Nov-2020
Surveyed Time:	7:00 AM to 10:00 AM
Weather:	Fine
Data for hour starting:	8:15 AM to 9:15 AM
Vehicle Class:	ALL VEHICLES



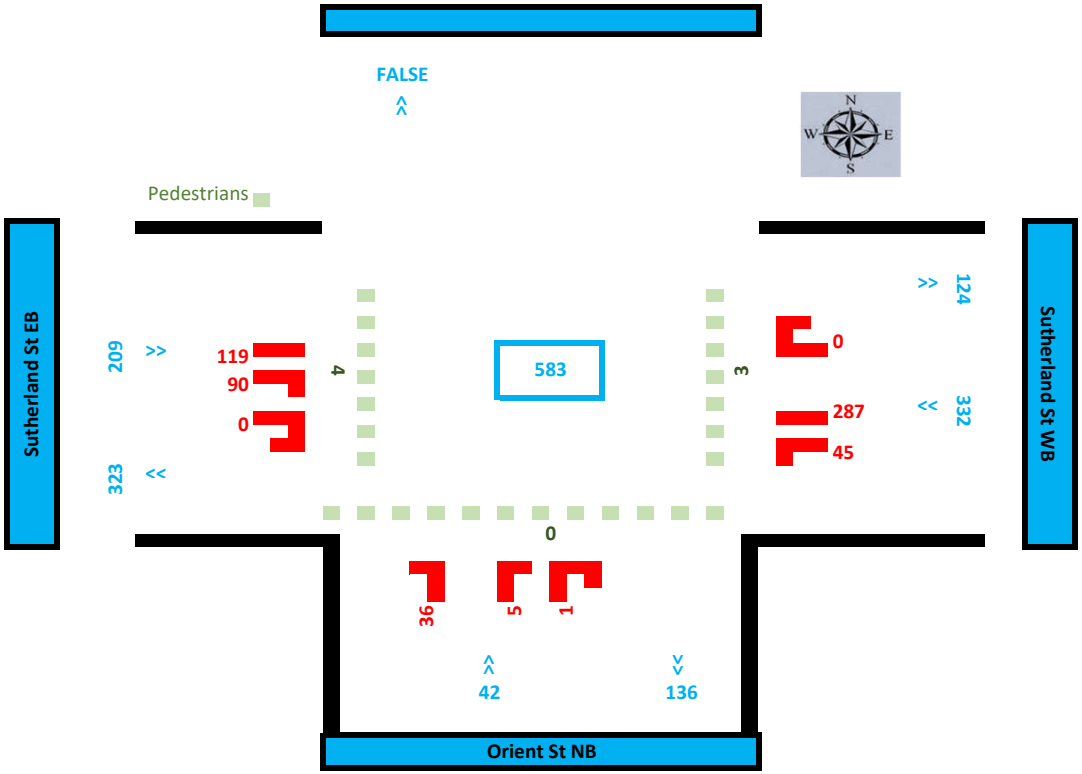
Turning Movement Count Summary

Site ID:	1
Location:	Sutherland St & Viking St, Kingscliff
Date:	19-Nov-2020
Surveyed Time:	2:00 PM to 5:00 PM
Weather:	Fine
Data for hour starting:	2:15 PM to 3:15 PM
Vehicle Class:	ALL VEHICLES



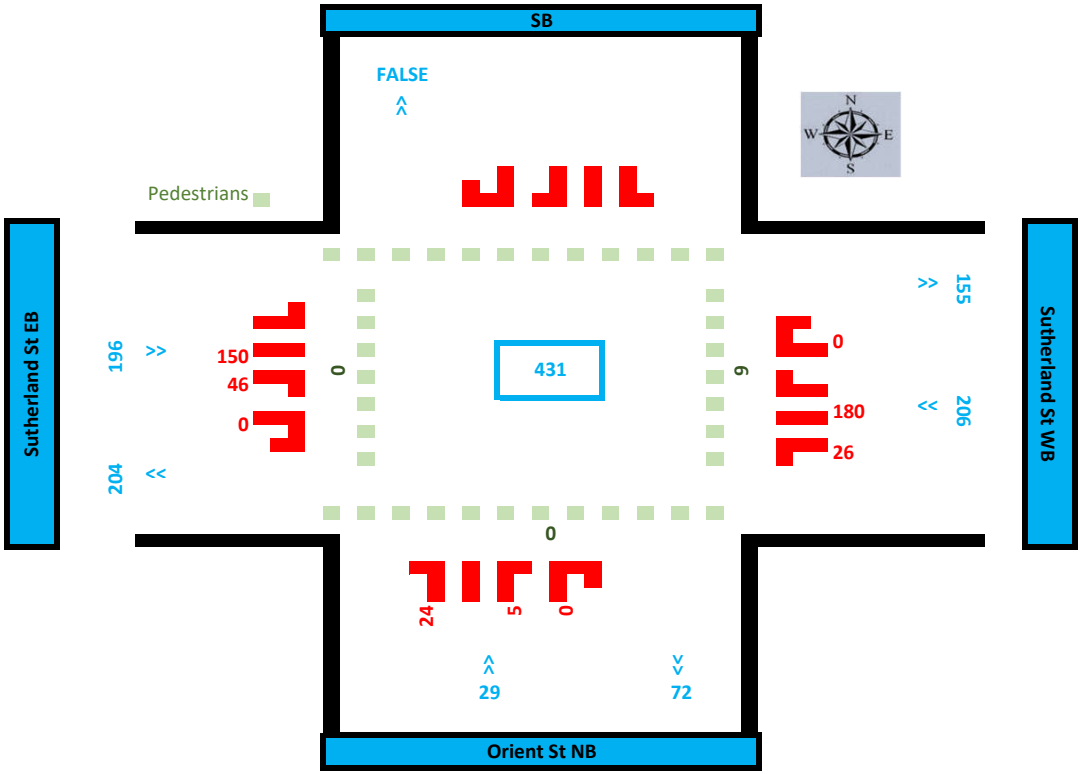
Turning Movement Count Summary

Site ID:	3
Location:	Orient St & Sutherland St, Kingscliff
Date:	19-Nov-2019
Surveyed Time:	7:00 AM to 10:00 AM
Weather:	Fine
Data for hour starting:	8:15 AM to 9:15 AM
Vehicle Class:	ALL VEHICLES



Turning Movement Count Summary

Site ID:	3
Location:	Orient St & Sutherland St, Kingscliff
Date:	19-Nov-2019
Surveyed Time:	2:00 PM to 5:00 PM
Weather:	Fine
Data for hour starting:	2:15 PM to 3:15 PM
Vehicle Class:	ALL VEHICLES



TDC

Traffic Data & Control

Site ID: 2

Location: Sutherland St & Pearl St/Seaview St

Suburb: Kingscliff

Weather: Fine

Duration: 7:00am-10:00am & 2:00pm-5:00pm

Day/Date: Thursday, 19 November 2020

AM Peak 09:15 (hour ending)

PM Peak 15:15 (hour ending)

Traffic Control:

HOME

TIME		Seaview St (Southbound)																		Sutherland St (Westbound)																	
		Left			Through			Right			Hard Right			Uturn			Left			Through			Bear Right			Right			Uturn		
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles
1	7:15 AM	4	1	0	13	0	0	4	0	0	23	2	0	0	0	0	0	0	0	0	0	0	37	0	0	2	0	0	0	0	0
2	7:30 AM	4	0	0	4	0	0	2	0	0	20	0	0	0	0	0	0	0	0	1	0	0	38	0	0	3	0	0	0	0	0
3	7:45 AM	5	0	0	10	0	0	2	0	0	24	1	0	0	0	0	0	0	0	1	0	0	45	2	0	4	0	0	0	0	0
4	8:00 AM	1	0	0	7	0	0	7	0	0	34	0	0	0	0	0	0	0	0	3	0	0	52	0	1	2	0	0	0	0	0
5	8:15 AM	1	0	0	14	0	0	9	0	0	28	4	0	0	0	0	1	0	0	4	0	0	48	2	0	2	0	0	0	0	0
6	8:30 AM	12	0	0	8	0	0	3	0	0	37	1	1	0	0	0	1	0	0	10	0	0	63	4	2	1	0	0	0	0	0
7	8:45 AM	10	0	0	15	1	0	5	0	1	24	1	0	1	0	0	5	0	0	11	0	0	67	5	0	4	0	0	0	0	0
8	9:00 AM	8	0	0	10	0	0	3	0	0	49	2	1	0	0	0	3	0	0	7	0	0	67	2	2	9	0	0	0	0	0
9	9:15 AM	11	0	1	10	0	0	2	0	0	58	1	5	0	0	0	2	0	0	2	0	0	64	0	0	6	0	0	0	0	0
10	9:30 AM	14	0	0	10	0	0	5	0	0	46	0	0	0	0	0	1	0	0	0	0	0	51	0	0	4	0	0	0	0	0
11	9:45 AM	6	1	0	10	1	0	2	0	0	37	2	0	0	0	0	0	0	0	0	0	0	43	3	0	2	0	0	0	0	0
12	10:00 AM	10	0	0	9	1	0	4	0	0	63	1	0	0	0	0	0	0	0	0	0	0	50	2	0	3	0	0	0	0	0
2HR Total		86	2	1	125	3	0	48	2	1	443	15	7	1	0	0	13	0	0	41	0	0	625	20	5	42	0	0	0	0	0
Peak Hour Total		41	0	1	43	1	0	13	0	1	168	5	7	1	0	0	11	0	0	30	0	0	261	11	4	20	0	0	0	0	0

TIME		Seaview St (Northbound)															Boomerang St (Eastbound)														
		Left			Bear Left			Through			Right			Uturn			Hard Left			Left			Through			Right			Uturn		
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles
1	7:15 AM	0	0	0	8	0	0	6	0	0	1	0	0	0	0	0	9	1	0	1	0	1	1	0	0	0	0	0	0	0	0
2	7:30 AM	0	0	0	10	1	0	6	0	0	0	0	0	0	0	0	7	0	0	1	1	0	0	0	0	0	0	0	0	0	0
3	7:45 AM	0	0	0	12	1	0	7	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	8:00 AM	0	0	0	11	0	0	3	0	0	1	0	0	0	0	0	6	0	1	2	0	0	0	0	0	0	0	0	0	0	0
5	8:15 AM	0	0	0	13	1	0	6	0	2	1	0	0	0	0	0	13	0	0	3	0	0	2	0	0	0	0	0	0	0	0
6	8:30 AM	0	0	0	17	0	0	6	0	0	0	0	0	0	0	0	20	0	0	3	0	0	2	0	0	0	0	0	0	0	0
7	8:45 AM	0	0	0	30	0	1	6	0	0	4	0	0	0	0	0	23	0	0	6	0	0	9	0	0	0	0	0	0	0	0
8	9:00 AM	1	0	0	35	0	0	15	0	0	7	0	0	0	0	0	17	0	1	6	0	0	4	0	0	1	0	0	0	0	0
9	9:15 AM	0	0	0	22	0	0	9	0	0	1	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0
10	9:30 AM	0	0	0	13	1	0	8	0	1	1	0	0	0	0	0	9	0	0	1	0	1	0	0	0	0	0	0	0	0	0
11	9:45 AM	0	0	0	11	0	0	9	1	0	1	0	0	0	0	0	8	0	0	2	0	0	0	0	0	0	0	0	0	0	0
12	10:00 AM	0	0	0	8	0	0	9	0	0	0	0	0	0	0	0	4	1	0	3	0	0	0	0	0	0	0	0	0	0	0
2HR Total		1	0	0	186	4	1	89	1	3	17	0	0	0	0	0	127	2	2	32	1	2	18	0	0	1	0	0	0	0	0
Peak Hour Total		1	0	0	104	0	1	36	0	0	12	0	0	0	0	0	84	0	1	19	0	0	15	0	0	1	0	0	0	0	0

TIME		Pearl St (Southeastbound)																		Pedestrians				
		Left			Through			Right			Hard Right			Uturn			Hourly Total							
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles		North	East	South	West	Northwest
1	7:15 AM	3	2	0	15	0	0	0	0	0	1	0	0	1	0	0		0	7	0	0	6
2	7:30 AM	8	0	0	4	1	0	7	0	0	3	0	0	2	0	0		2	3	0	0	5
3	7:45 AM	5	1	0	10	2	0	2	0	0	3	0	0	1	1	0		0	4	2	2	1
4	8:00 AM	5	2	0	9	1	0	4	0	0	5	0	0	3	0	0	574	0	3	0	0	7
5	8:15 AM	4	0	0	19	0	0	7	0	0	5	0	0	6	0	0	633	2	7	0	0	5
6	8:30 AM	7	1	0	21	1	0	5	1	0	9	0	0	4	0	0	750	1	2	4	3	5
7	8:45 AM	6	2	0	36	1	0	12	0	0	15	0	0	2	0	0	905	9	3	1	0	6
8	9:00 AM	4	0	0	41	2	0	7	0	0	5	0	0	1	0	0	1048	3	7	2	0	3
9	9:15 AM	6	0	0	29	0	0	5	0	0	2	0	0	2	0	0	1099	1	4	0	0	1
10	9:30 AM	11	1	0	23	1	0	7	0	0	5	0	0	5	0	0	1078	6	6	0	0	8
11	9:45 AM	7	1	0	19	3	0	8	0	0	4	0	0	7	0	0	961	4	0	0	0	0
12	10:00 AM	7	1	0	31	0	0	5	0	0	2	0	0	5	0	0	871	0	4	1	1	1
2HR Total		73	11	0	257	12	0	69	1	0	59	0	0	39	1	0		28	50	10	6	48
Peak Hour Total		23	3	0	127	4	0	29	1	0	31	0	0	9	0	0		14	16	7	3	15

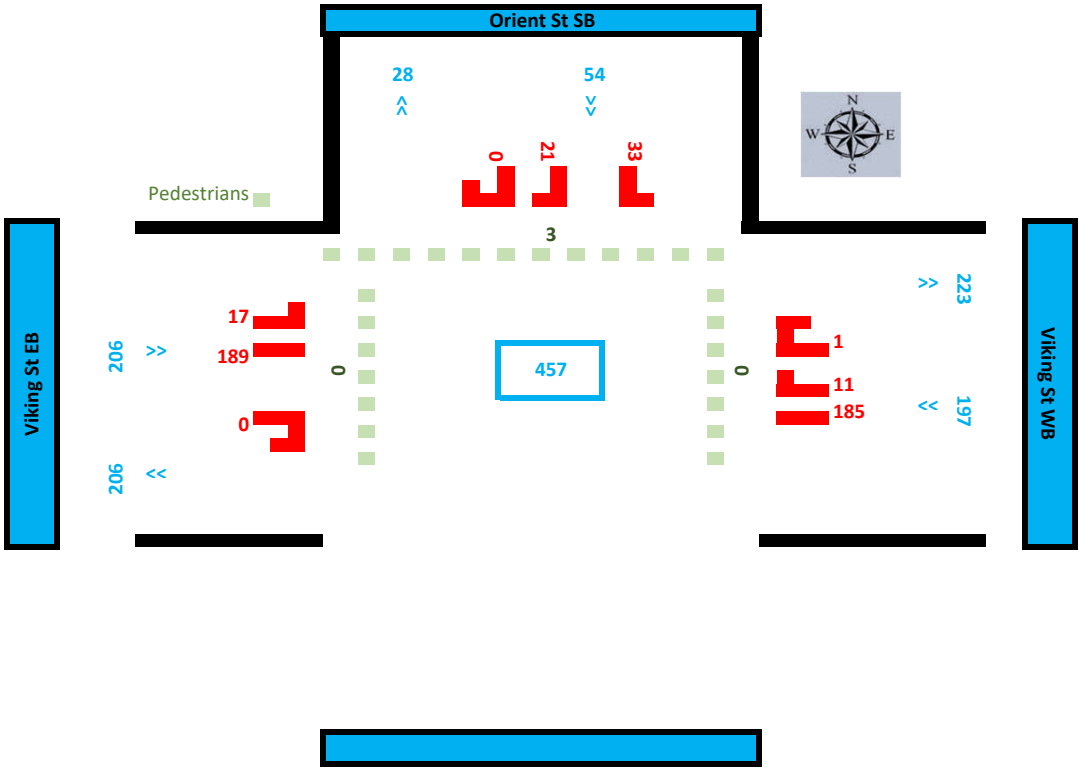
TIME		Seaview St (Southbound)																		Sutherland St (Westbound)																	
		Left			Through			Right			Hard Right			Uturn			Left			Through			Bear Right			Right			Uturn		
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles
1	2:15 PM	9	1	0	10	0	0	3	0	0	53	1	0	0	0	0	0	0	0	2	0	0	49	0	0	10	0	0	0	0	0
2	2:30 PM	19	0	0	14	0	0	4	1	0	45	0	0	1	0	0	1	0	0	3	0	0	48	2	0	3	0	0	0	0	0
3	2:45 PM	9	0	0	11	0	0	5	0	0	51	2	0	1	0	0	2	0	0	6	0	0	34	1	0	5	0	0	0	0	0
4	3:00 PM	19	0	0	10	0	0	5	0	0	56	2	0	1	0	0	3	0	0	8	0	0	57	1	0	5	0	0	0	0	0
5	3:15 PM	18	2	0	16	0	0	5	0	0	62	3	0	0	0	0	7	0	0	7	0	0	73	2	0	4	0	0	0	0	0
6	3:30 PM	8	0	0	14	1	0	4	0	0	47	0	0	0	0	0	2	0	0	2	0	0	44	3	0	7	0	0	0	0	0
7	3:45 PM	12	1	0	8	0	0	4	0	0	51	1	0	0	0	0	0	0	0	0	0	0	49	1	1	3	0	0	0	0	0
8	4:00 PM	13	0	0	10	0	0	6	0	0	61	1	0	0	0	0	0	0	0	3	0	0	45	1	0	4	0	0	0	0	0
9	4:15 PM	16	0	0	9	0	0	6	0	0	48	1	0	0	0	0	0	0	0	3	0	0	48	1	0	4	0	0	0	0	0
10	4:30 PM	14	0	0	18	0	0	6	0	0	44	1	0	2	0	0	0	0	0	0	0	0	47	2	0	5	0	0	0	0	0
11	4:45 PM	10	0	0	11	0	0	4	0	0	42	0	0	1	0	0	0	0	0	2	0	0	52	0	0	2	0	0	0	0	0
12	5:00 PM	12	1	0	12	0	0	4	0	0	41	0	0	1	0	0	2	0	0	0	0	0	50	1	0	6	0	0	0	0	0
2HR Total		159	5	0	143	1	0	56	1	0	601	12	0	7	0	0	17	0	0	36	0	0	584	15	1	58	0	0	0	0	0
Peak Hour Total		65	2	0	51	0	0	19	1	0	214	7	0	3	0	0	13	0	0	24	0	0	212	6	0	17	0	0	0	0	0

TIME		Seaview St (Northbound)															Boomerang St (Eastbound)														
		Left			Bear Left			Through			Right			Uturn			Hard Left			Left			Through			Right			Uturn		
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles
1	2:15 PM	0	0	0	14	1	0	7	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0
2	2:30 PM	1	0	0	12	0	0	6	0	0	1	0	0	0	0	0	9	0	0	1	0	0	1	0	0	0	0	0	0	0	0
3	2:45 PM	0	0	0	10	0	0	6	0	0	1	0	0	0	0	0	7	0	0	3	0	0	1	0	0	0	0	0	0	0	0
4	3:00 PM	0	0	0	12	0	0	4	0	0	2	0	0	0	0	0	4	0	0	1	0	0	1	0	0	0	0	0	0	0	0
5	3:15 PM	0	0	0	22	1	0	5	0	0	4	0	0	0	0	0	24	0	0	2	0	0	13	0	0	2	0	0	0	0	0
6	3:30 PM	0	0	0	11	0	0	9	0	0	1	0	0	0	0	0	11	0	0	3	0	1	1	0	0	0	0	0	0	0	0
7	3:45 PM	0	0	0	9	0	0	8	0	0	2	0	0	0	0	0	10	0	0	2	0	0	0	0	0	0	0	0	0	0	0
8	4:00 PM	0	0	0	10	0	0	12	0	0	1	0	0	0	0	0	4	0	0	6	0	0	2	0	0	0	0	0	0	0	0
9	4:15 PM	0	0	0	13	0	0	6	0	0	0	0	0	0	0	0	7	0	0	3	0	0	1	0	0	1	0	0	0	0	0
10	4:30 PM	0	0	0	16	0	0	10	0	0	2	0	0	0	0	0	13	0	0	1	0	0	1	0	1	0	0	0	0	0	0
11	4:45 PM	0	0	0	14	0	0	6	0	0	0	0	0	0	0	0	8	0	0	1	0	0	0	0	0	0	0	0	0	0	0
12	5:00 PM	0	0	0	14	0	0	10	0	0	1	0	0	0	0	0	5	0	0	2	0	0	1	0	0	0	0	0	0	0	0
2HR Total		1	0	0	157	2	0	89	0	0	15	0	0	0	0	0	104	0	0	26	0	1	23	0	1	3	0	0	0	0	0
Peak Hour Total		1	0	0	56	1	0	21	0	0	8	0	0	0	0	0	44	0	0	7	0	0	16	0	0	2	0	0	0	0	0

TIME		Pearl St (Southeastbound)																		Pedestrians				
		Left			Through			Right			Hard Right			Uturn			Hourly Total							
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles	Cars, Utilities & Motorcycles	Trucks	Bicycles		North	East	South	West	Northwest
1	2:15 PM	7	1	0	27	1	0	8	0	0	4	0	0	5	1	0		0	0	0	0	3
2	2:30 PM	6	1	0	25	0	0	4	0	0	6	0	0	7	0	0		0	0	0	0	4
3	2:45 PM	9	0	0	29	3	0	12	0	0	9	0	0	10	0	0		2	2	0	0	4
4	3:00 PM	7	1	0	43	0	0	13	0	0	12	0	0	9	1	0	943	1	7	0	0	1
5	3:15 PM	12	0	0	47	5	0	8	0	0	3	0	0	9	0	0	1081	4	13	6	0	1
6	3:30 PM	4	0	0	26	0	0	7	0	0	4	0	0	6	0	0	1076	1	2	1	1	7
7	3:45 PM	10	1	0	33	3	0	8	0	0	4	0	0	6	0	0	1076	0	0	0	0	3
8	4:00 PM	9	2	0	26	1	0	12	0	0	2	1	0	6	0	0	1037	2	2	0	0	3
9	4:15 PM	6	0	0	31	2	0	10	0	0	4	0	0	3	0	0	904	0	0	1	1	5
10	4:30 PM	8	0	0	37	2	0	9	0	0	8	0	0	2	0	0	937	2	4	1	0	5
11	4:45 PM	8	0	0	28	1	0	6	0	0	6	0	0	3	0	0	915	1	1	0	0	8
12	5:00 PM	13	0	0	47	0	0	5	0	0	3	0	0	4	0	0	912	0	0	0	0	3
2HR Total		99	6	0	399	18	0	102	0	0	65	1	0	70	2	0		13	31	9	2	47
Peak Hour Total		34	2	0	144	8	0	37	0	0	30	0	0	35	1	0		7	22	6	0	10

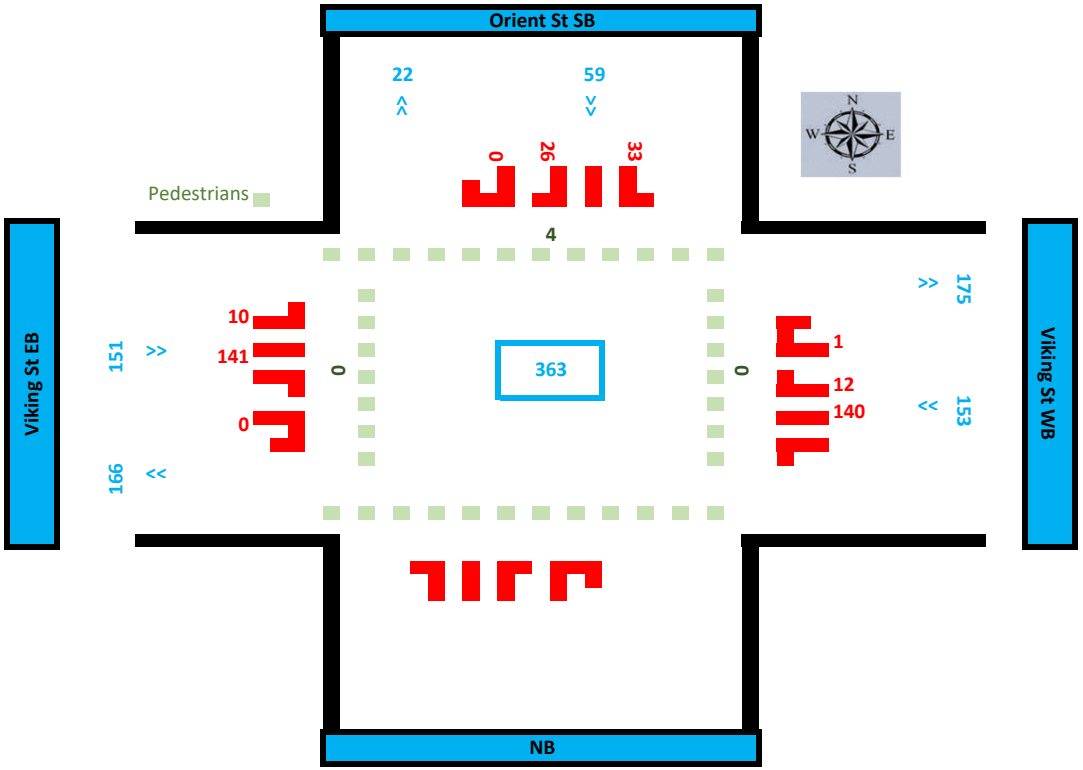
Turning Movement Count Summary

Site ID:	4
Location:	Orient St & Viking St, Kingscliff
Date:	19-Nov-2019
Surveyed Time:	7:00 AM to 10:00 AM
Weather:	Fine
Data for hour starting:	8:15 AM to 9:15 AM
Vehicle Class:	ALL VEHICLES

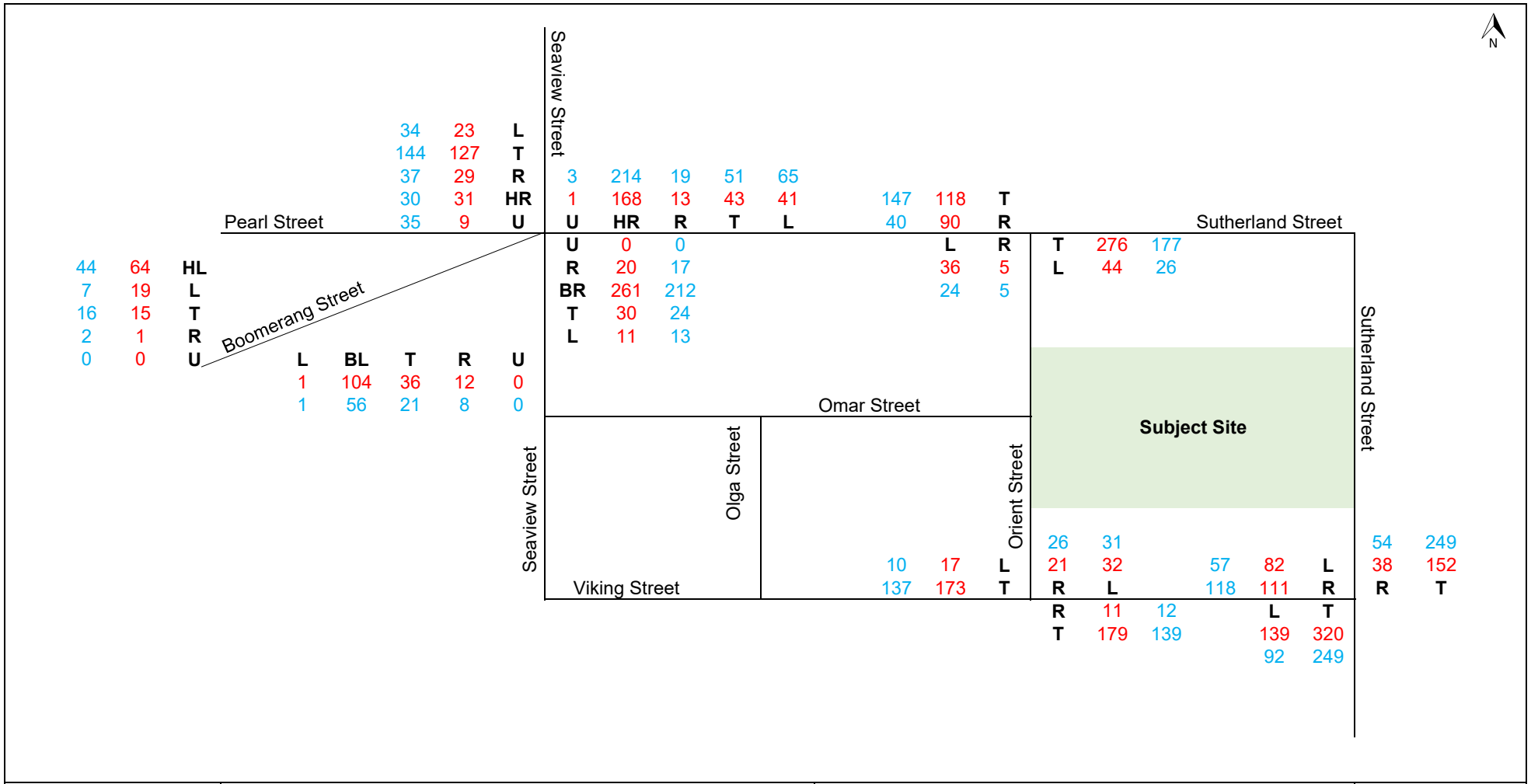


Turning Movement Count Summary

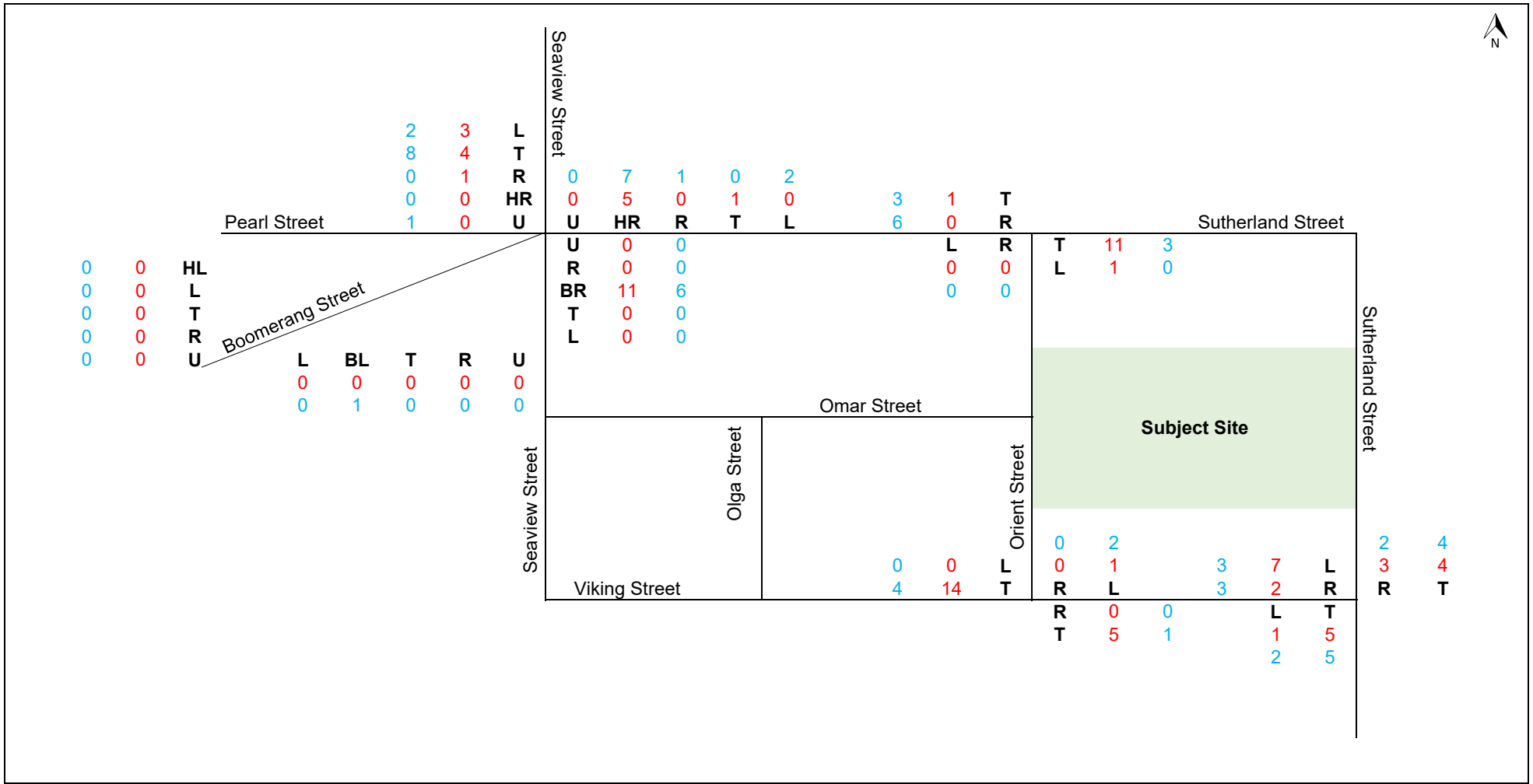
Site ID:	4
Location:	Orient St & Viking St, Kingscliff
Date:	19-Nov-2019
Surveyed Time:	2:00 PM to 5:00 PM
Weather:	Fine
Data for hour starting:	2:15 PM to 3:15 PM
Vehicle Class:	ALL VEHICLES



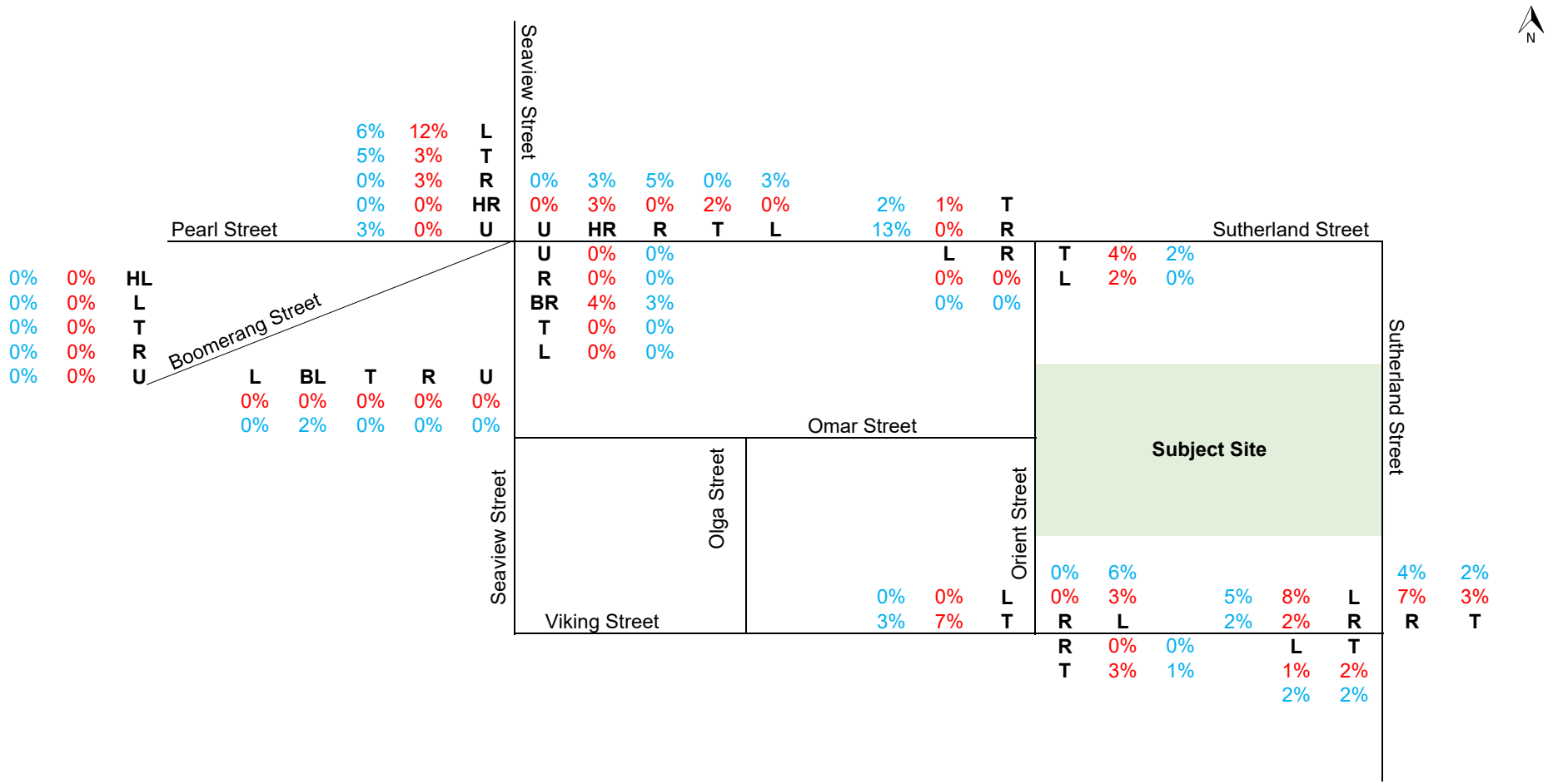
Appendix E: Traffic Network Diagrams



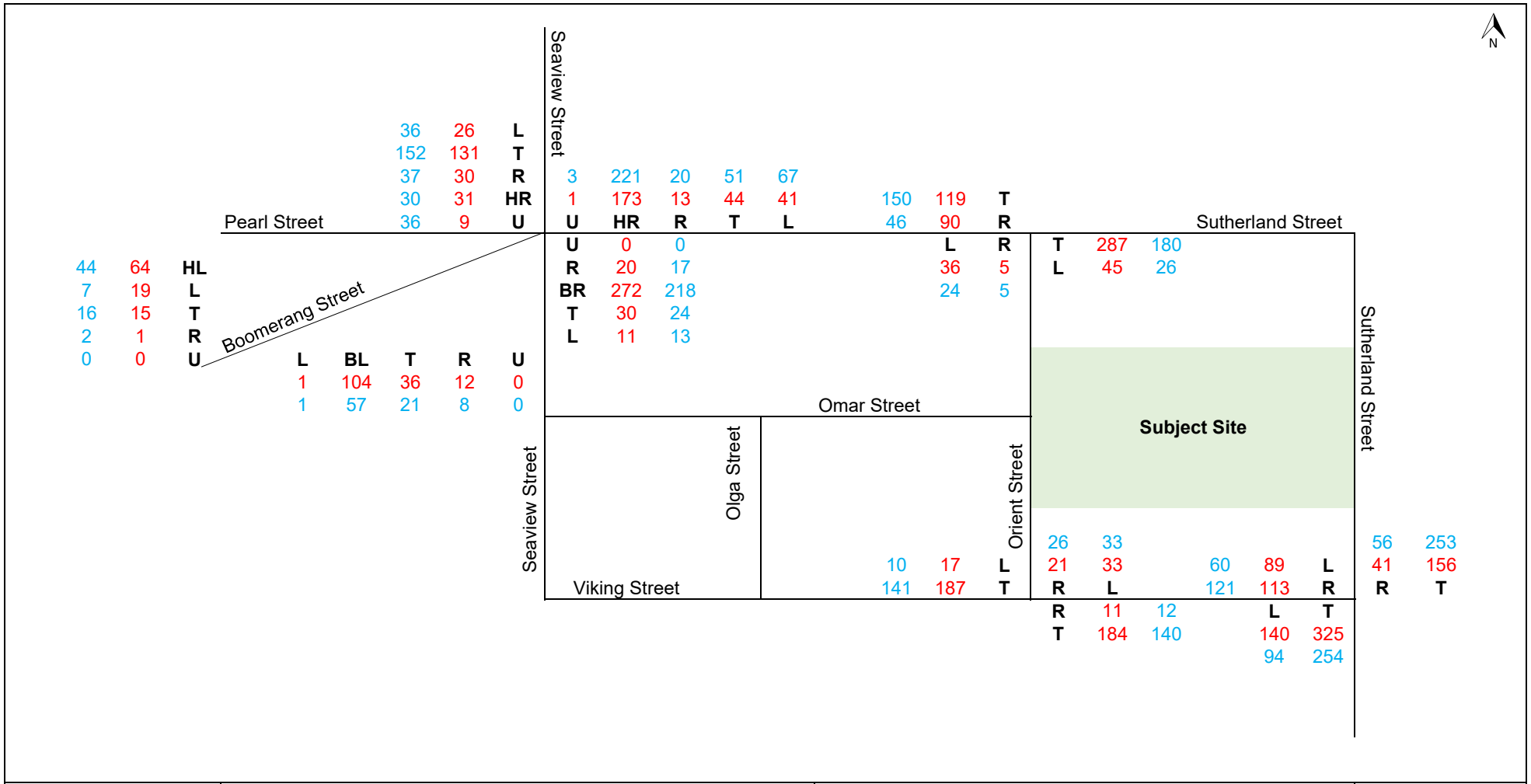
P4398	Kingscliff Public Schools Expansions	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15	Growth Rate: - Survey Year: 2019/2020 Design Year: -
	Light Vehicle Survey Volumes		Sheet 1



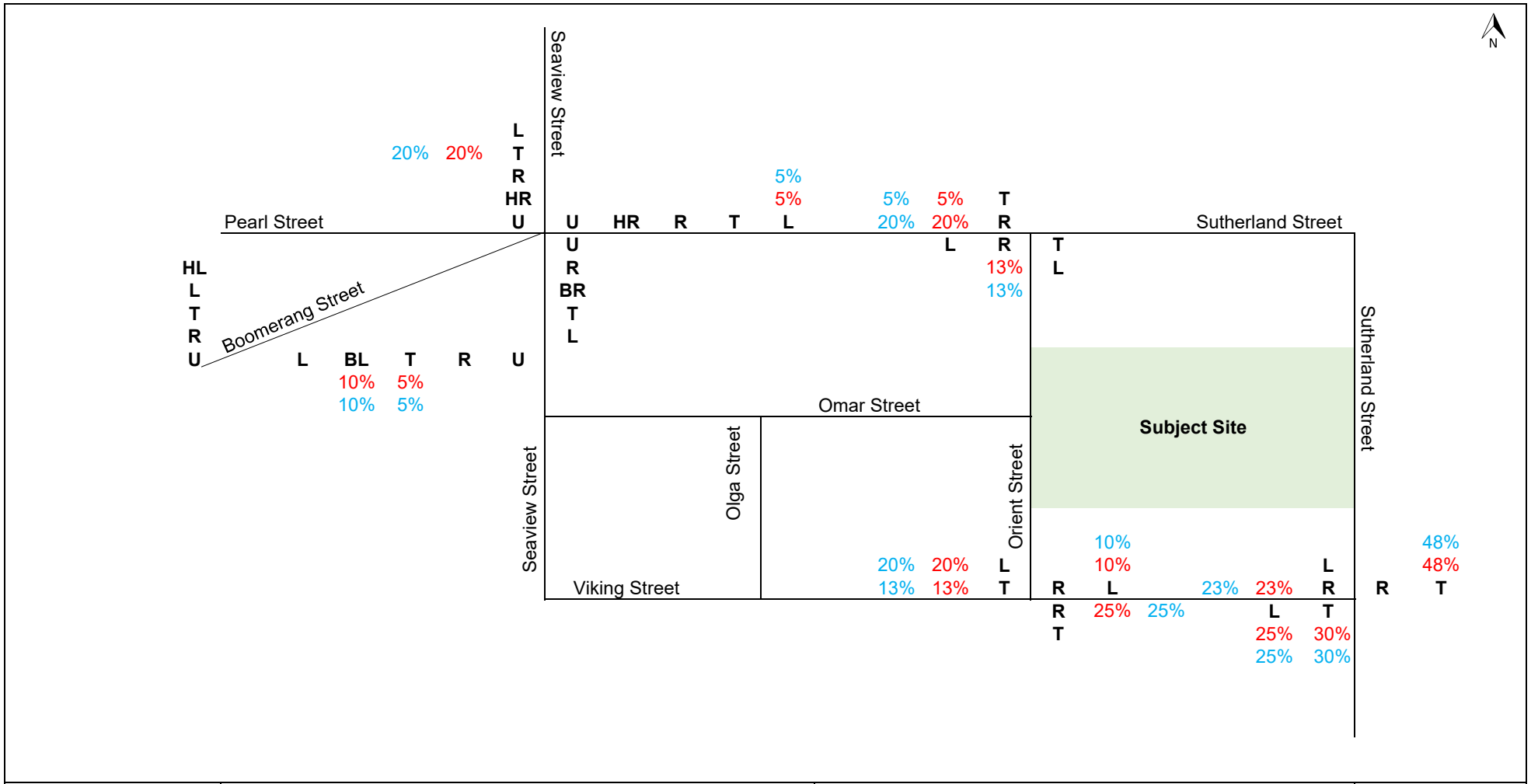
P4398	Kingscliff Public Schools Expansions Heavy Vehicle Survey Volumes	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: - Survey Year: 2019/2020 Design Year: -	Sheet 2



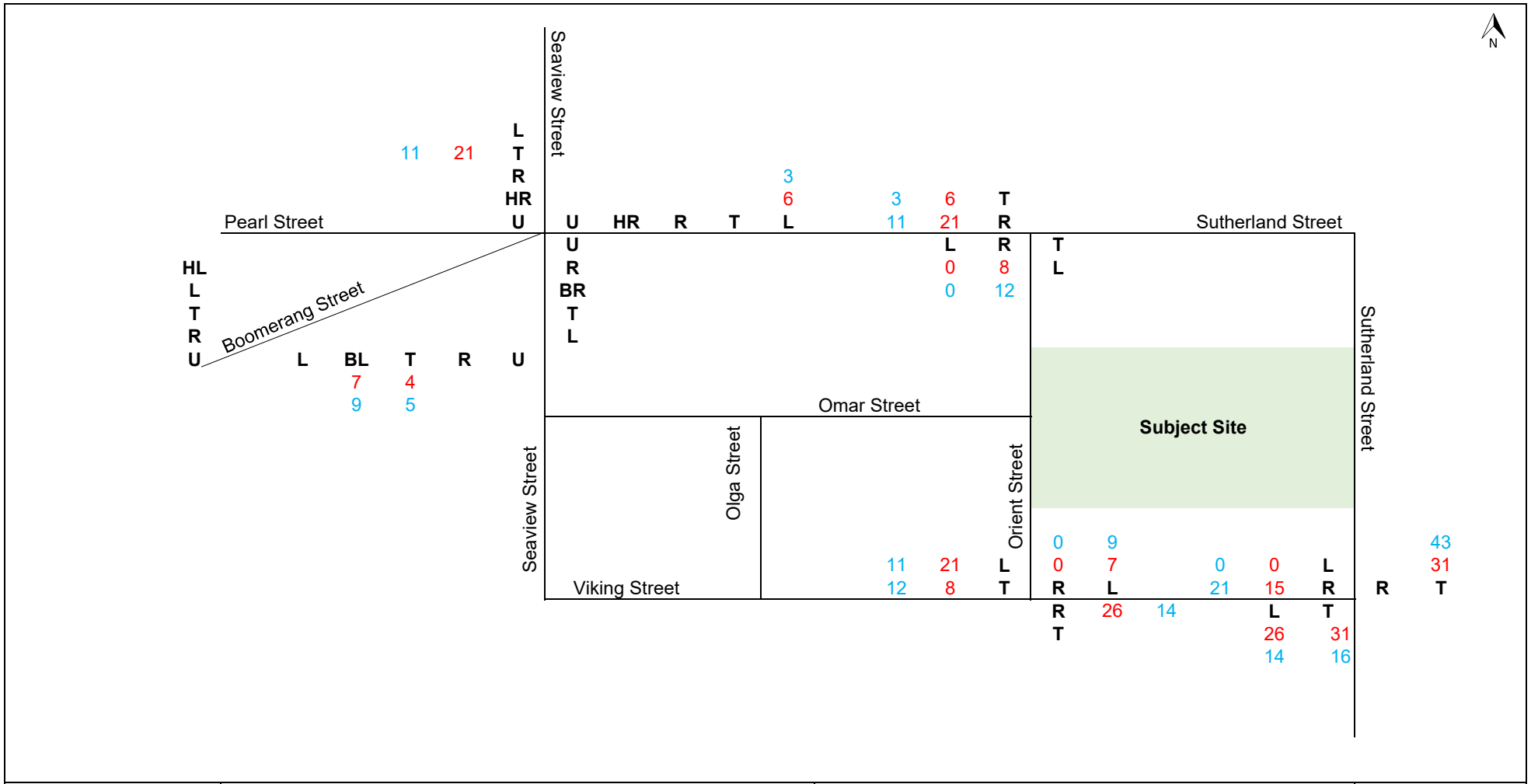
P4398	Kingscliff Public Schools Expansions Heavy Vehicle (%) Volumes	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: - Survey Year: 2019/2020 Design Year: -	Sheet 3



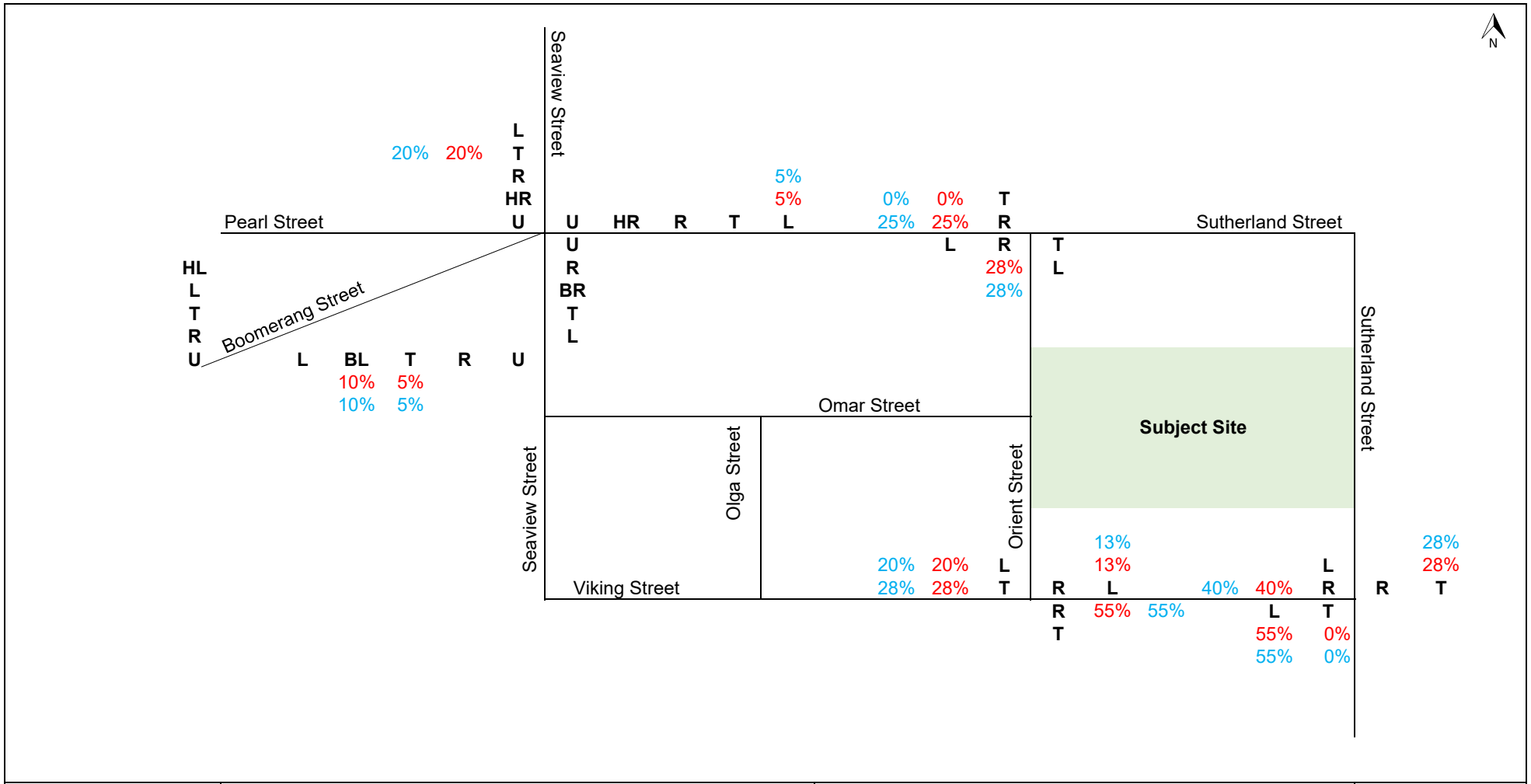
P4398	Kingscliff Public Schools Expansions Total Survey Volumes	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: - Survey Year: 2019/2020 Design Year: -	Sheet 4



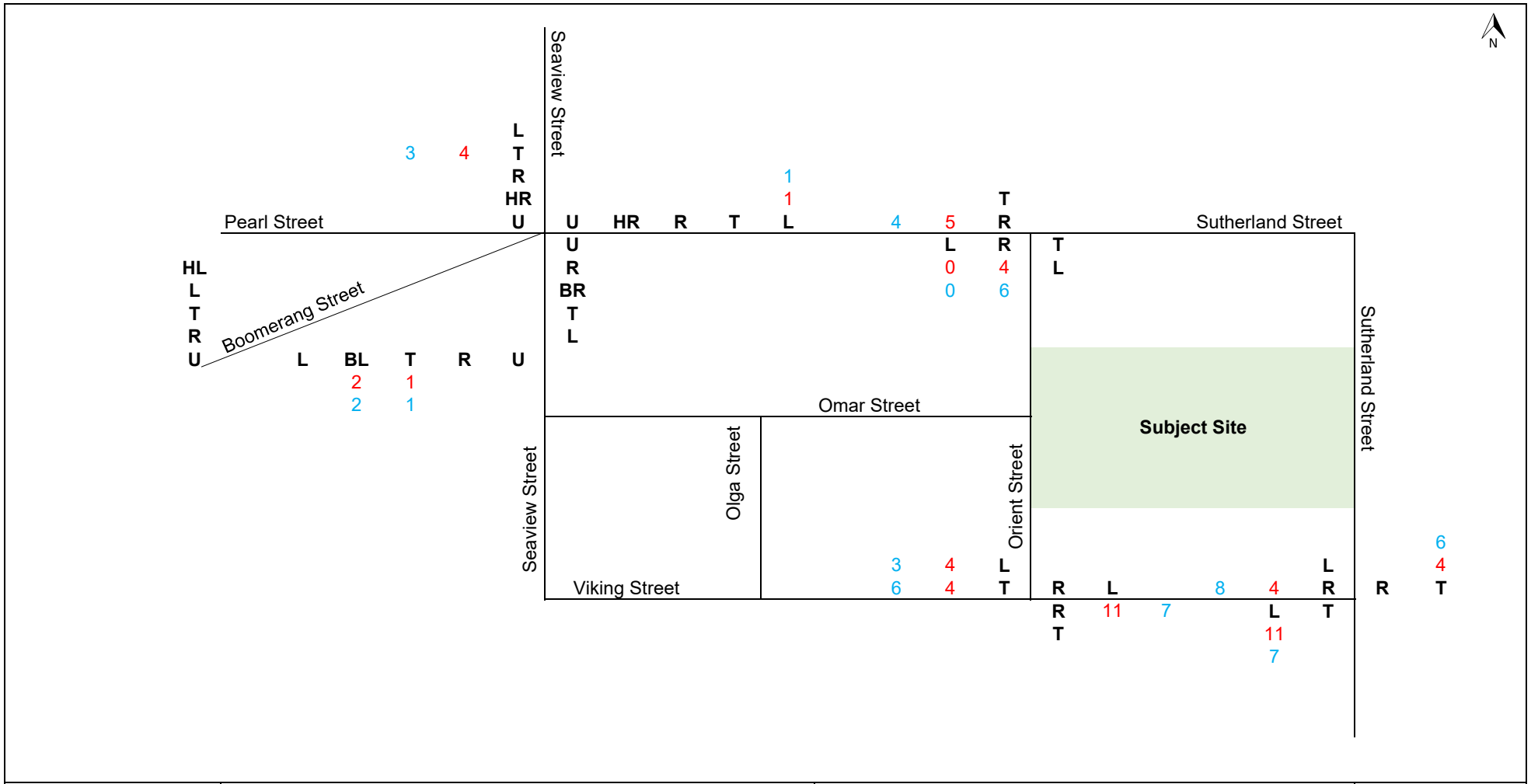
P4398	Kingscliff Public Schools Expansions	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15	Growth Rate: - Survey Year: 2019/2020 Design Year: -
	Existing School Traffic Distribution (%)		Sheet 5



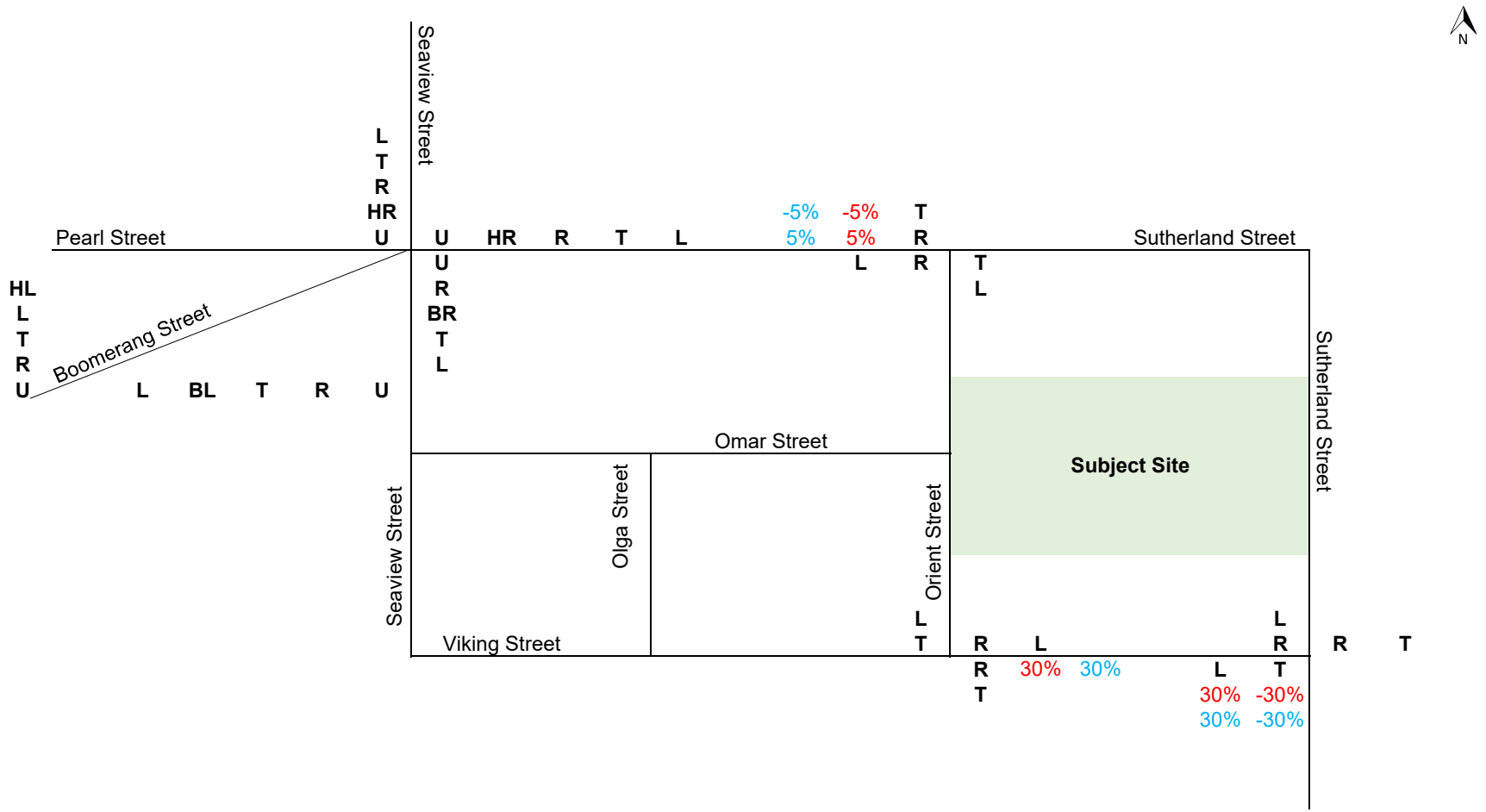
P4398	Kingscliff Public Schools Expansions Existing School Traffic Volumes	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: - Survey Year: 2019/2020 Design Year: -	Sheet 6



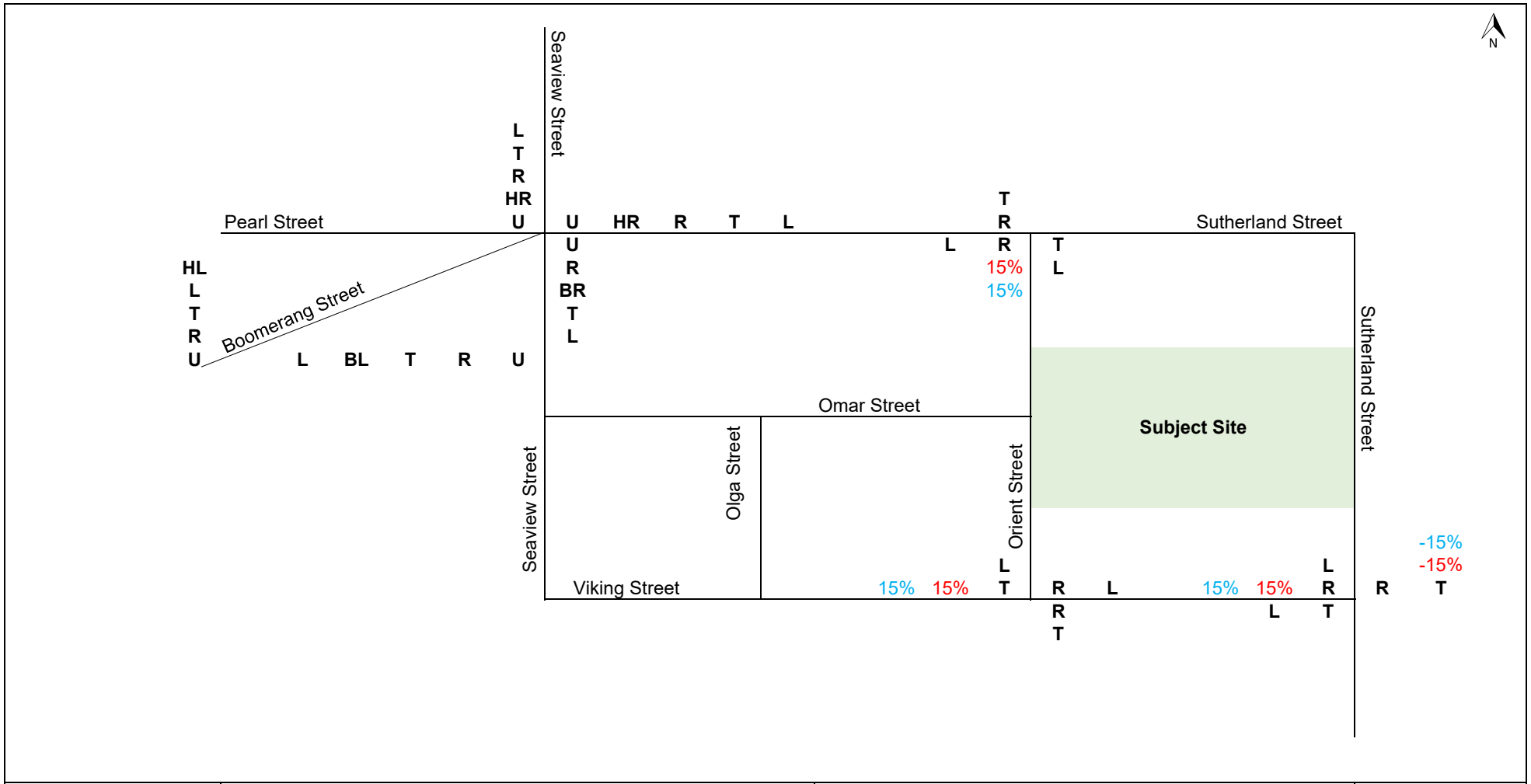
P4398	Kingscliff Public Schools Expansions	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15	Growth Rate: - Survey Year: 2019/2020 Design Year: -
	Development Distribution (%)		Sheet 7



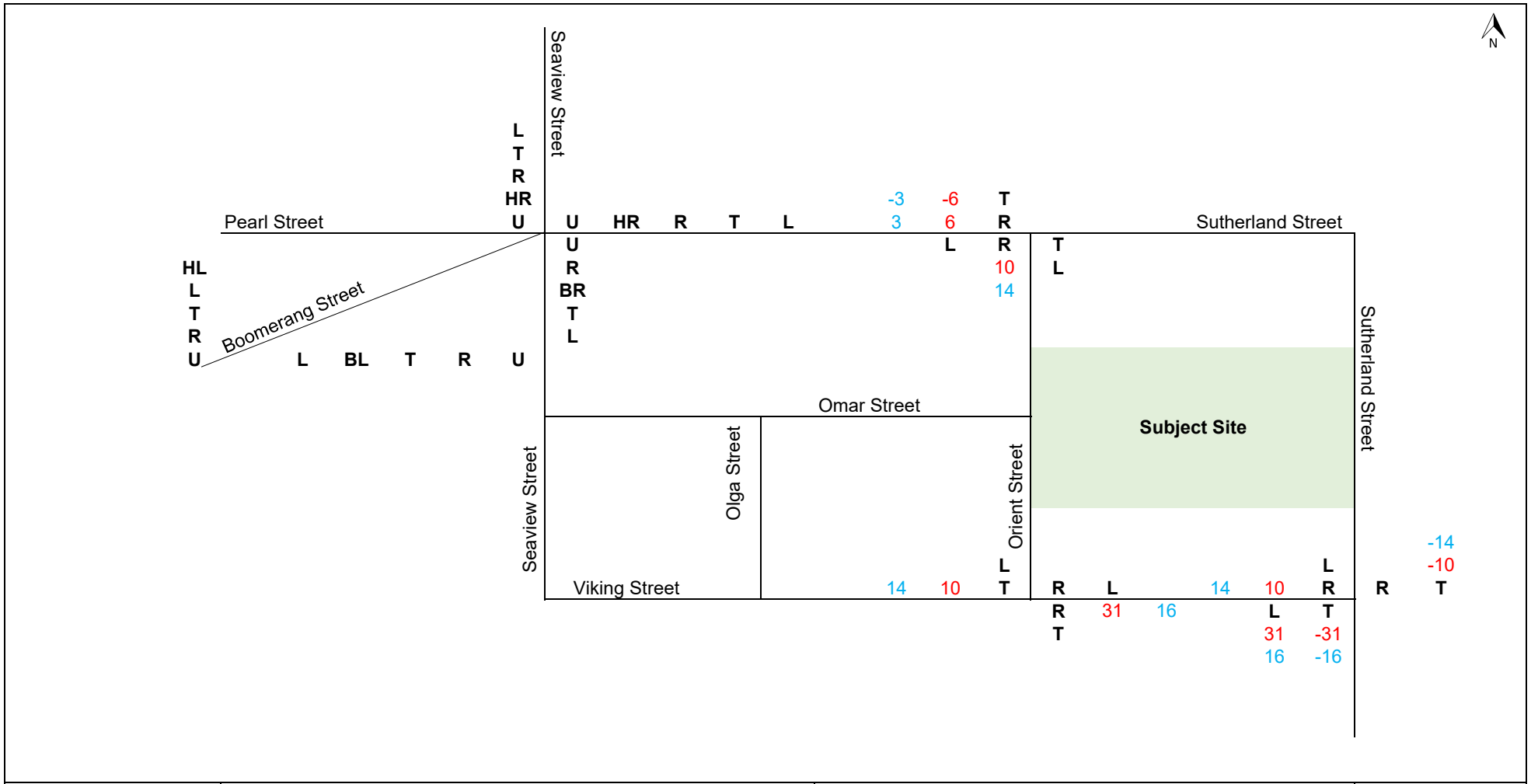
P4398	Kingscliff Public Schools Expansions Development Volumes	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: - Survey Year: 2019/2020 Design Year: -	Sheet 8



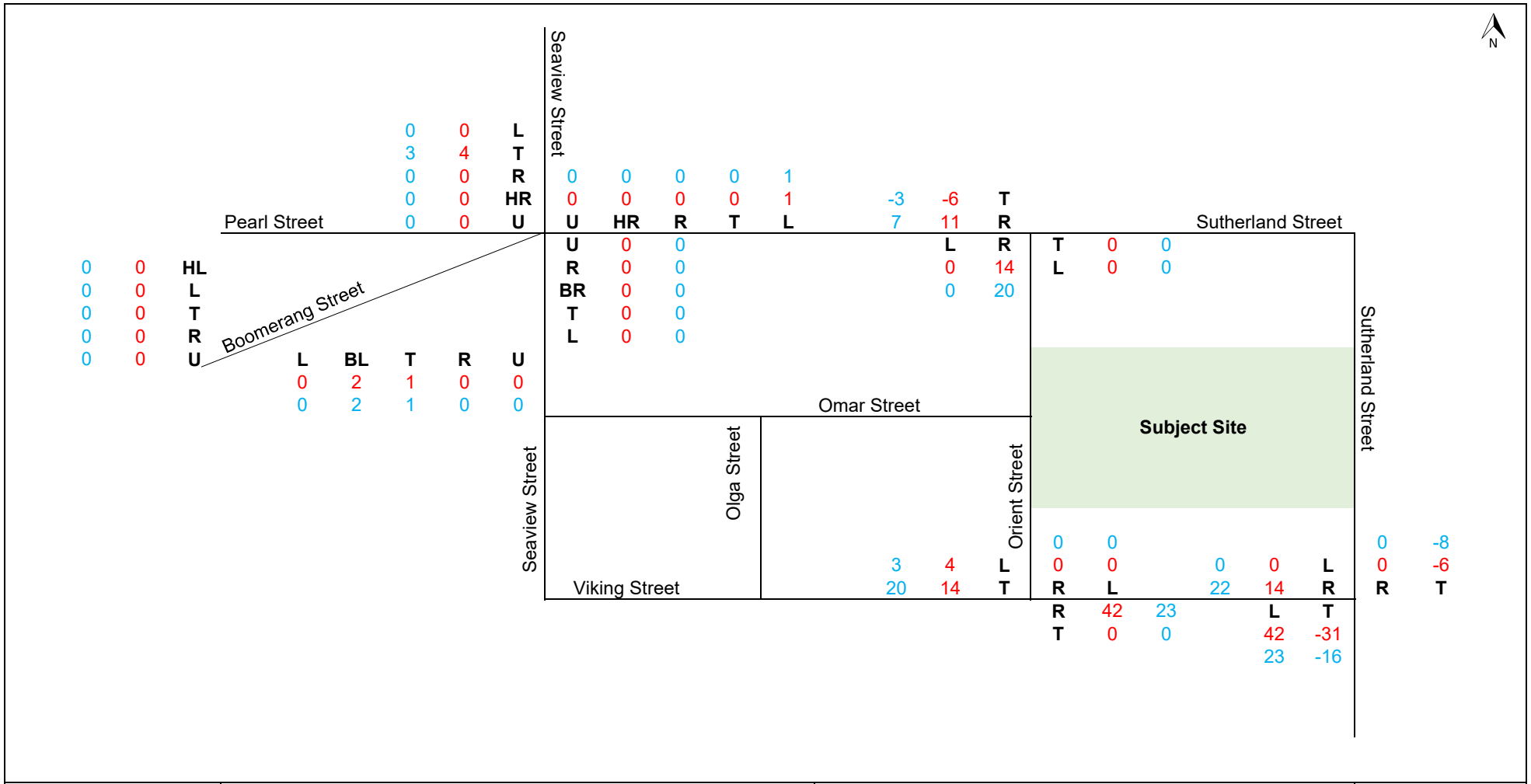
P4398	Kingscliff Public Schools Expansions	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15	Growth Rate: - Survey Year: 2019/2020 Design Year: -
	Redistribution In (%)		Sheet 9



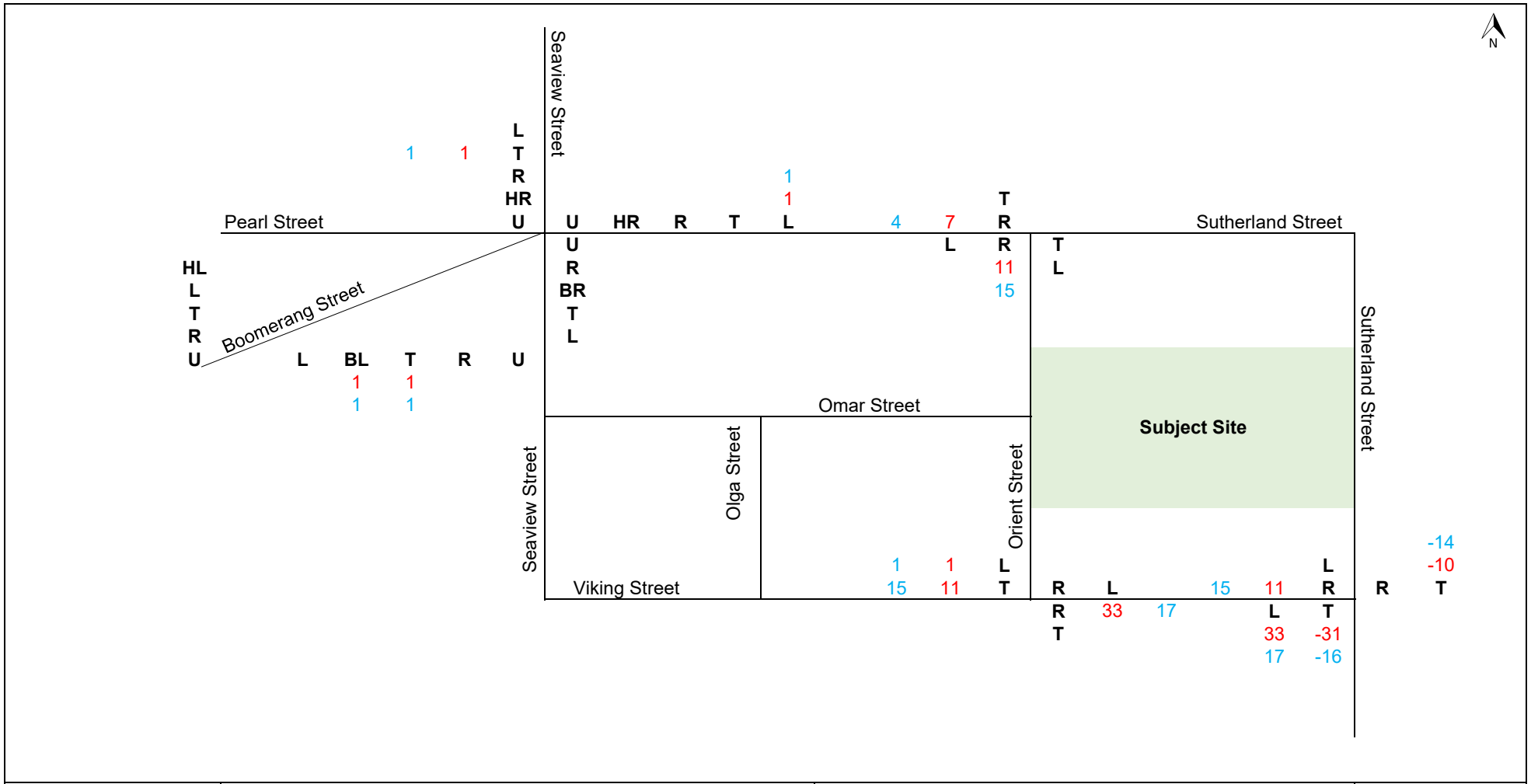
P4398	Kingscliff Public Schools Expansions Redistribution Out (%)	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: - Survey Year: 2019/2020 Design Year: -	Sheet 10



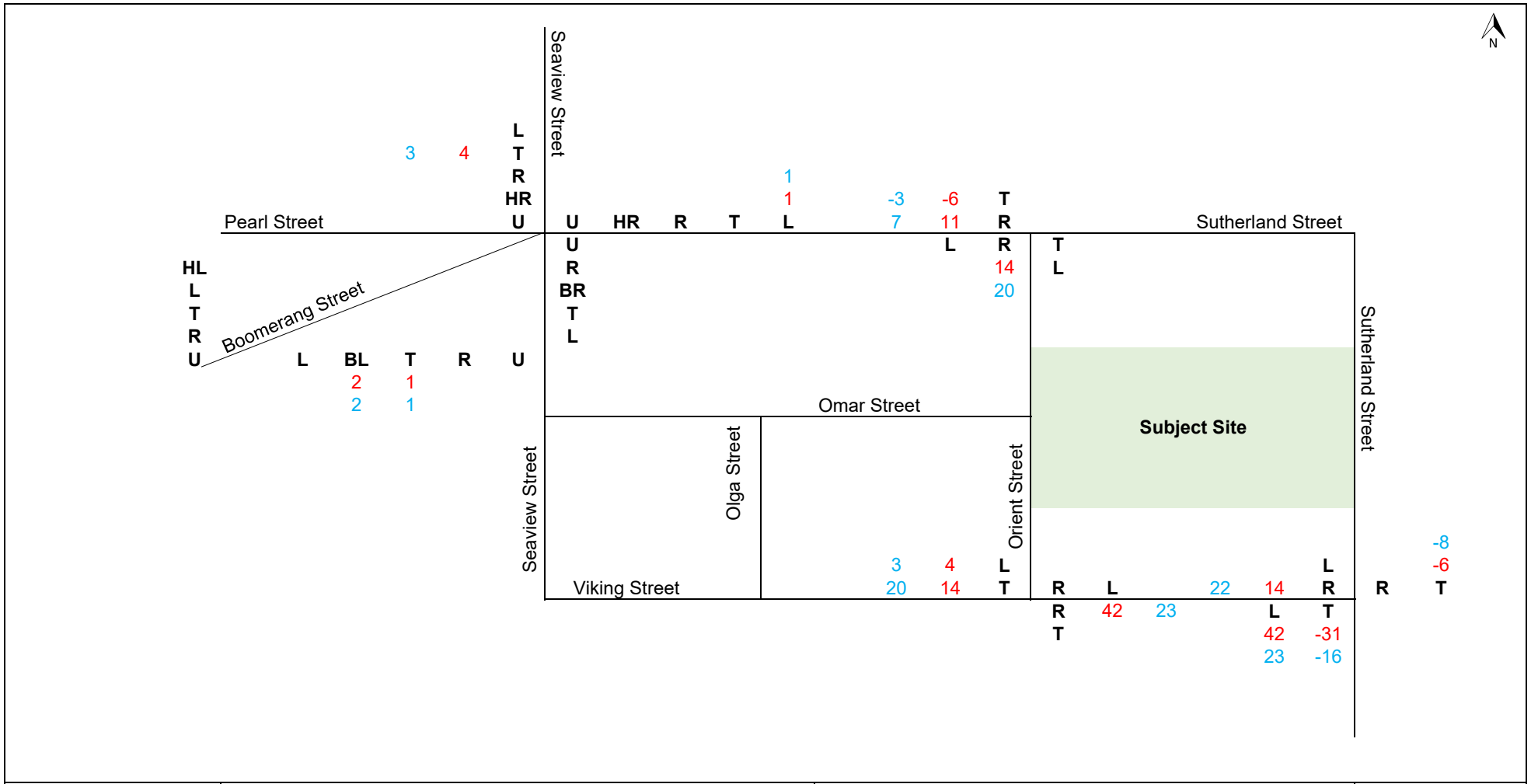
P4398	Kingscliff Public Schools Expansions Redistribution Volumes	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: 1.54% Survey Year: 2020 Design Year: 2022	Sheet 11



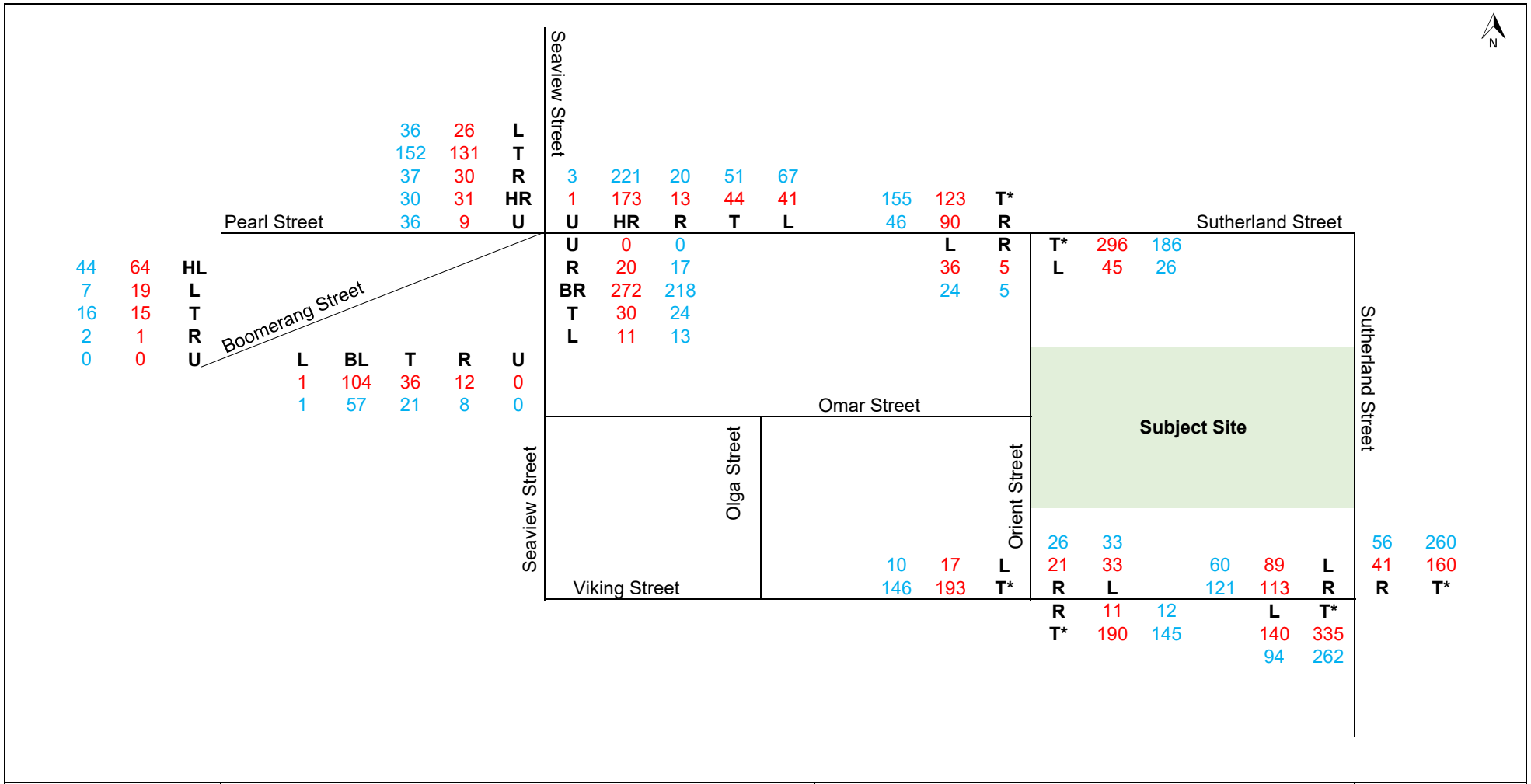
P4398	Kingscliff Public Schools Expansions	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15	Growth Rate: 1.54% Survey Year: 2020 Design Year: 2022
	Net Development Generated Volume Incl. Redistribution		Sheet 12



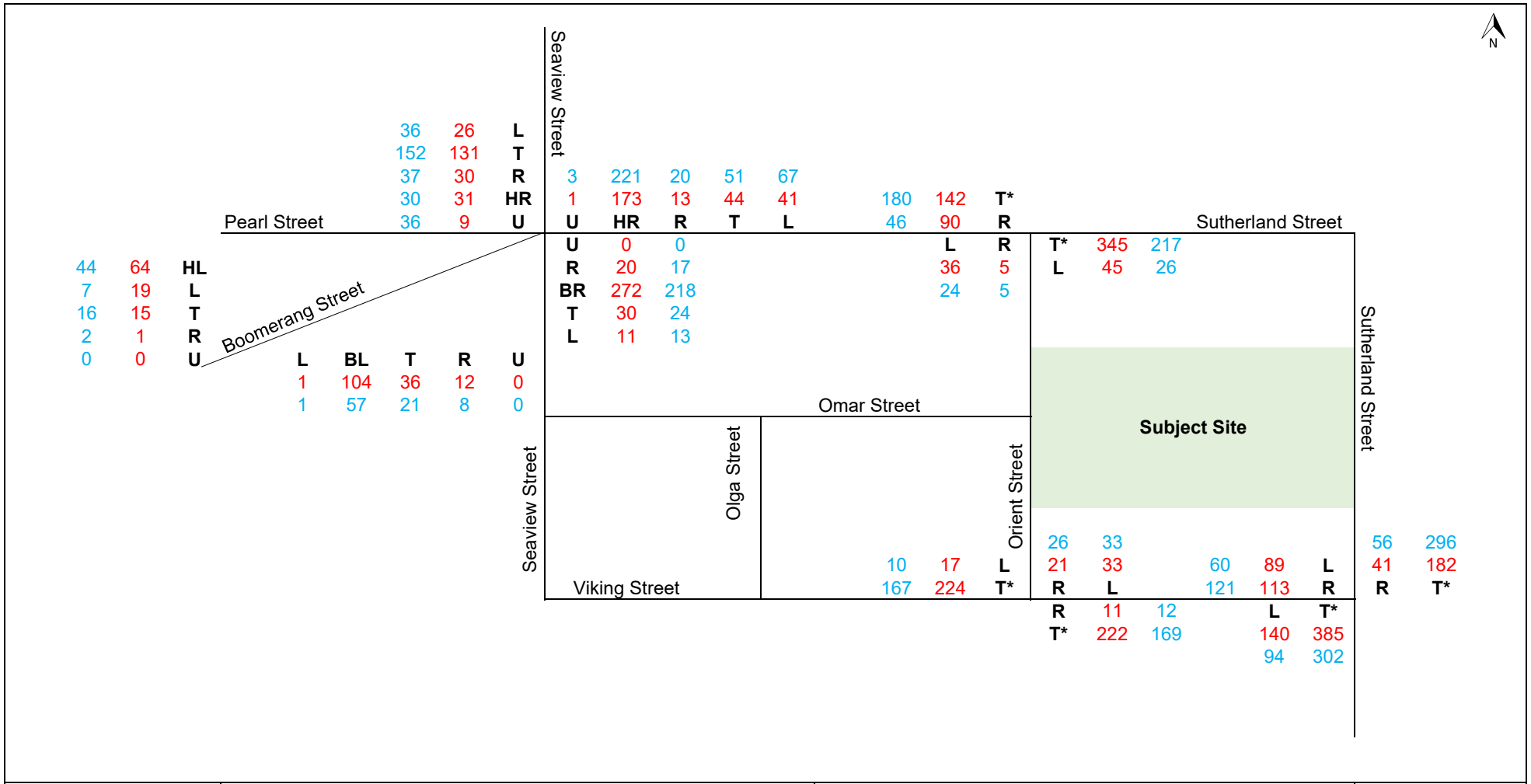
P4398	Kingscliff Public Schools Expansions Net Development Volumes (2022)	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: 1.54% Survey Year: 2020 Design Year: 2022	Sheet 13



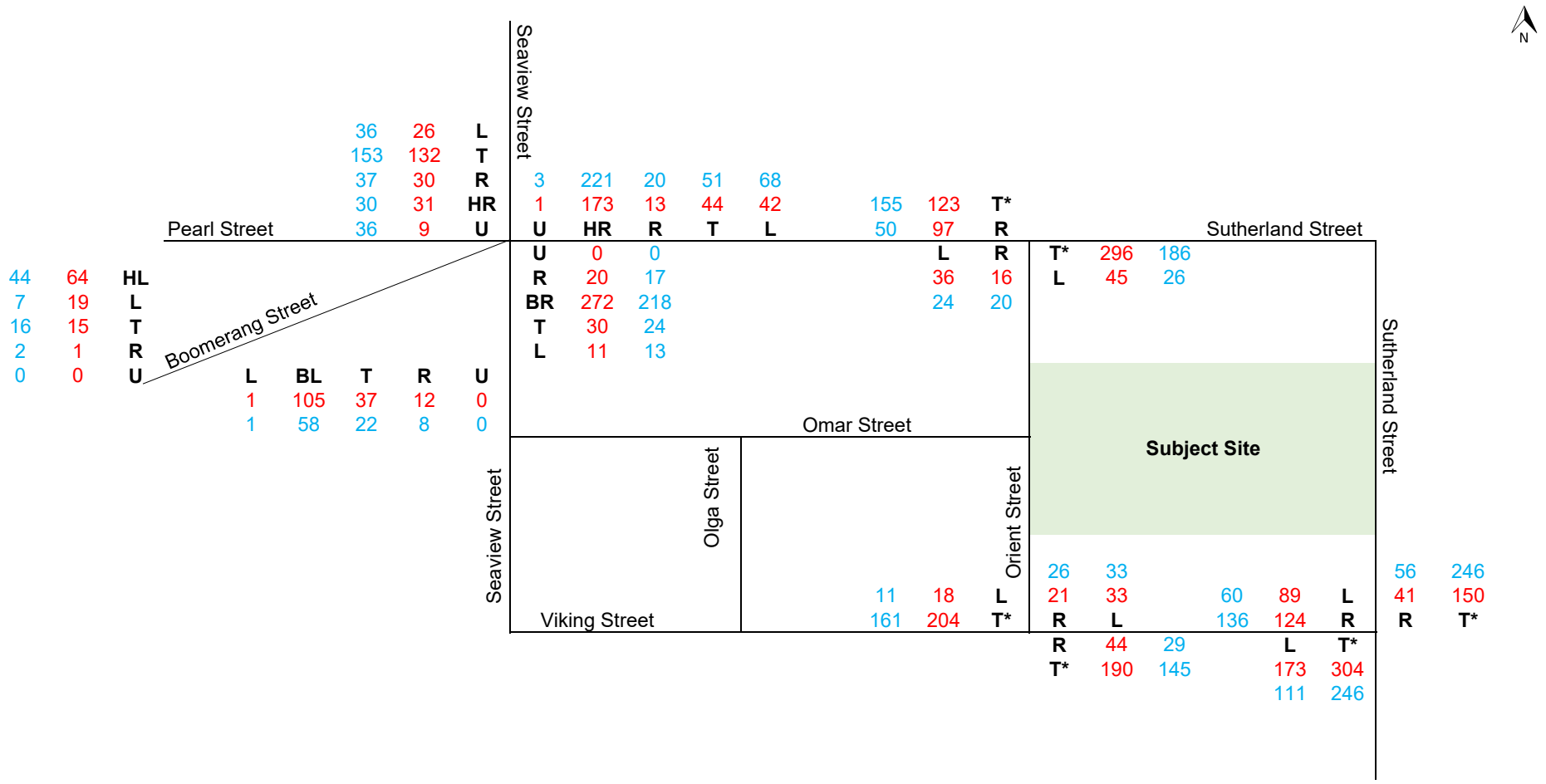
P4398	Kingscliff Public Schools Expansions	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15	Growth Rate: 1.54% Survey Year: 2020 Design Year: 2022
	Net Development Volumes (2032)		Sheet 14



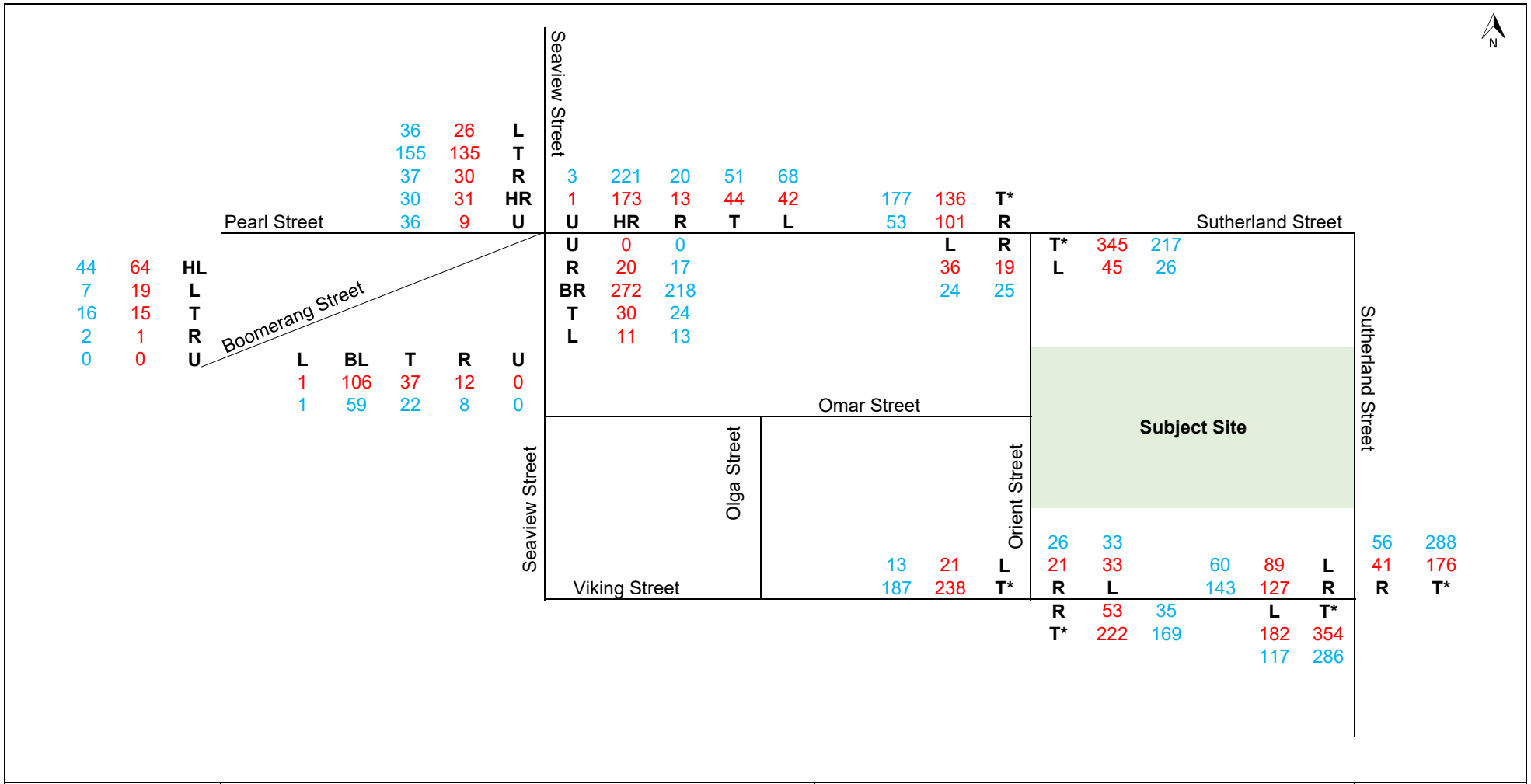
P4398	Kingscliff Public Schools Expansions Background Volumes (2022)	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: 1.54% Survey Year: 2020 Design Year: 2022	Sheet 15



P4398	Kingscliff Public Schools Expansions Background Volumes (2032)	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: 1.54% Survey Year: 2020 Design Year: 2032	Sheet 16



P4398	Kingscliff Public Schools Expansions With Development Volumes (2022)	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15	Growth Rate: 1.54% Survey Year: 2020 Design Year: 2022	Sheet 17



P4398	Kingscliff Public Schools Expansions With Development Volumes (2032)	Notes: Peak hours AM 8:15 9:15 PM 2:15 3:15 Growth Rate: 1.54% Survey Year: 2020 Design Year: 2022	Sheet 18

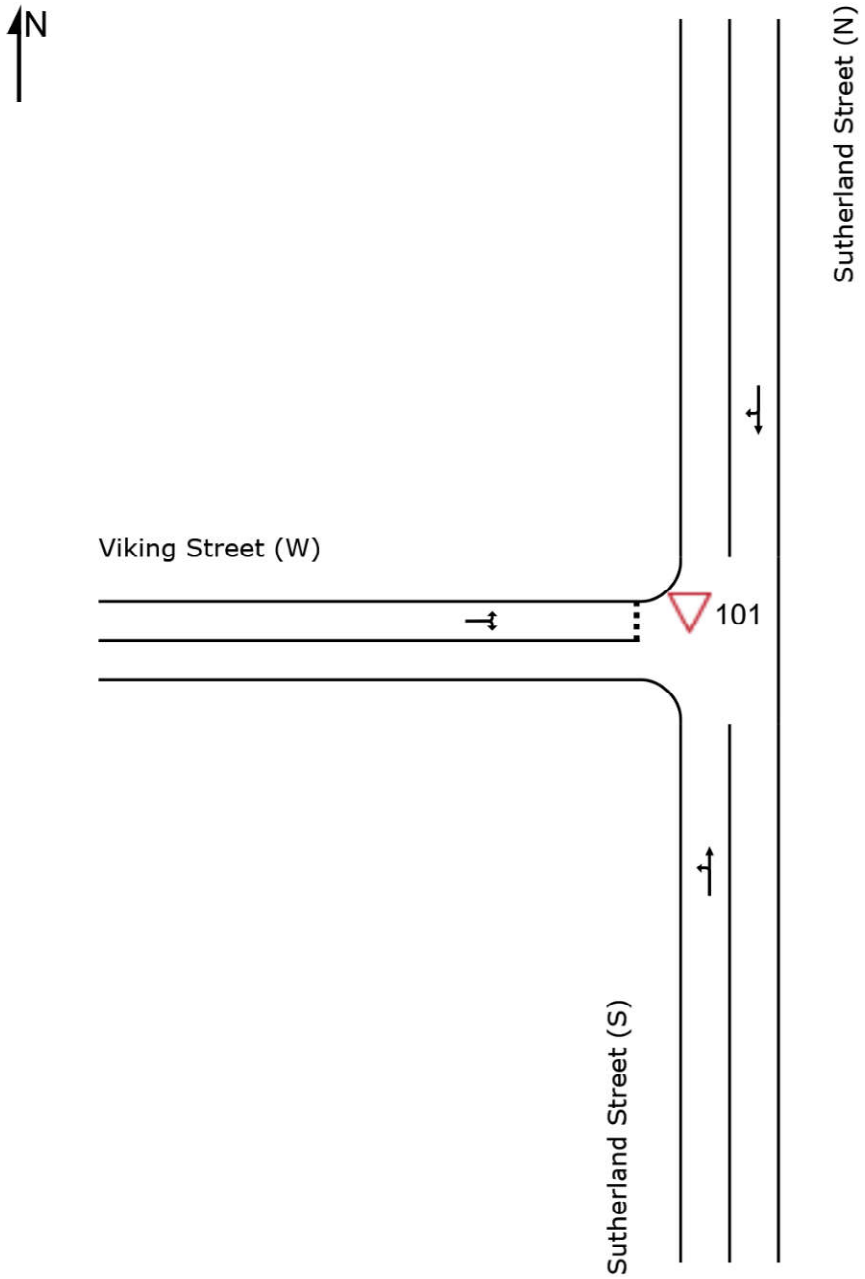
Appendix F: SIDRA Outputs

SITE LAYOUT

Site: 101 [Sutherland Street / Viking Street Intersection Layout]

P4398
Sutherland Street / Viking Street

Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 101 [2022AM | BG]

P4398
Sutherland Street / Viking Street
2022AM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Sutherland Street (S)												
1	L2	147	1.0	0.242	4.6	LOS A	0.0	0.0	0.00	0.32	0.00	47.9
2	T1	353	2.0	0.242	1.2	LOS A	0.0	0.0	0.00	0.32	0.00	48.9
Approach		500	1.7	0.242	2.2	NA	0.0	0.0	0.00	0.32	0.00	48.6
North: Sutherland Street (N)												
8	T1	168	3.0	0.125	0.9	LOS A	0.5	3.4	0.28	0.13	0.28	48.6
9	R2	43	7.0	0.125	7.0	LOS A	0.5	3.4	0.28	0.13	0.28	47.8
Approach		212	3.8	0.125	2.2	NA	0.5	3.4	0.28	0.13	0.28	48.4
West: Viking Street (W)												
10	L2	94	8.0	0.263	6.3	LOS A	1.0	7.5	0.50	0.73	0.52	40.5
12	R2	119	2.0	0.263	8.5	LOS A	1.0	7.5	0.50	0.73	0.52	44.6
Approach		213	4.6	0.263	7.5	LOS A	1.0	7.5	0.50	0.73	0.52	42.7
All Vehicles		924	2.9	0.263	3.4	NA	1.0	7.5	0.18	0.37	0.18	47.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [2022AM | DES]

P4398
Sutherland Street / Viking Street
2022AM DES
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Sutherland Street (S)												
1	L2	182	1.0	0.243	4.6	LOS A	0.0	0.0	0.00	0.34	0.00	47.8
2	T1	320	2.0	0.243	1.2	LOS A	0.0	0.0	0.00	0.34	0.00	48.7
Approach		502	1.6	0.243	2.4	NA	0.0	0.0	0.00	0.34	0.00	48.4
North: Sutherland Street (N)												
8	T1	158	3.0	0.120	1.0	LOS A	0.5	3.3	0.29	0.13	0.29	48.5
9	R2	43	7.0	0.120	7.0	LOS A	0.5	3.3	0.29	0.13	0.29	47.7
Approach		201	3.9	0.120	2.3	NA	0.5	3.3	0.29	0.13	0.29	48.4
West: Viking Street (W)												
10	L2	94	8.0	0.271	6.1	LOS A	1.1	7.8	0.49	0.73	0.51	40.6
12	R2	131	2.0	0.271	8.3	LOS A	1.1	7.8	0.49	0.73	0.51	44.6
Approach		224	4.5	0.271	7.4	LOS A	1.1	7.8	0.49	0.73	0.51	42.9
All Vehicles		927	2.8	0.271	3.6	NA	1.1	7.8	0.18	0.39	0.19	47.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [2022PM | BG]

P4398
Sutherland Street / Viking Street
2022PM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Sutherland Street (S)												
1	L2	99	2.0	0.181	4.6	LOS A	0.0	0.0	0.00	0.31	0.00	48.0
2	T1	276	2.0	0.181	1.2	LOS A	0.0	0.0	0.00	0.31	0.00	49.0
Approach		375	2.0	0.181	2.1	NA	0.0	0.0	0.00	0.31	0.00	48.7
North: Sutherland Street (N)												
8	T1	274	2.0	0.181	0.5	LOS A	0.6	4.1	0.21	0.11	0.21	58.2
9	R2	59	4.0	0.181	7.2	LOS A	0.6	4.1	0.21	0.11	0.21	56.1
Approach		333	2.4	0.181	1.7	NA	0.6	4.1	0.21	0.11	0.21	57.8
West: Viking Street (W)												
10	L2	63	5.0	0.243	5.7	LOS A	0.9	6.5	0.48	0.71	0.48	40.5
12	R2	127	2.0	0.243	8.4	LOS A	0.9	6.5	0.48	0.71	0.48	44.6
Approach		191	3.0	0.243	7.5	LOS A	0.9	6.5	0.48	0.71	0.48	43.2
All Vehicles		898	2.3	0.243	3.1	NA	0.9	6.5	0.18	0.32	0.18	50.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2022PM | DES]

P4398
Sutherland Street / Viking Street
2022PM DES
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Sutherland Street (S)												
1	L2	117	2.0	0.182	4.6	LOS A	0.0	0.0	0.00	0.32	0.00	47.9
2	T1	259	2.0	0.182	1.2	LOS A	0.0	0.0	0.00	0.32	0.00	48.9
Approach		376	2.0	0.182	2.3	NA	0.0	0.0	0.00	0.32	0.00	48.6
North: Sutherland Street (N)												
8	T1	259	2.0	0.174	0.5	LOS A	0.6	4.0	0.22	0.11	0.22	48.8
9	R2	59	4.0	0.174	6.3	LOS A	0.6	4.0	0.22	0.11	0.22	48.1
Approach		318	2.4	0.174	1.6	NA	0.6	4.0	0.22	0.11	0.22	48.7
West: Viking Street (W)												
10	L2	63	5.0	0.260	5.7	LOS A	1.0	7.2	0.48	0.72	0.49	40.5
12	R2	143	2.0	0.260	8.3	LOS A	1.0	7.2	0.48	0.72	0.49	44.6
Approach		206	2.9	0.260	7.5	LOS A	1.0	7.2	0.48	0.72	0.49	43.3
All Vehicles		900	2.3	0.260	3.2	NA	1.0	7.2	0.19	0.34	0.19	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2032AM | BG]

P4398
Sutherland Street / Viking Street
2032AM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Sutherland Street (S)												
1	L2	147	1.0	0.267	4.6	LOS A	0.0	0.0	0.00	0.31	0.00	48.0
2	T1	405	2.0	0.267	1.2	LOS A	0.0	0.0	0.00	0.31	0.00	48.9
Approach		553	1.7	0.267	2.1	NA	0.0	0.0	0.00	0.31	0.00	48.7
North: Sutherland Street (N)												
8	T1	192	3.0	0.139	1.0	LOS A	0.5	3.7	0.28	0.12	0.28	48.6
9	R2	43	7.0	0.139	7.5	LOS A	0.5	3.7	0.28	0.12	0.28	47.8
Approach		235	3.7	0.139	2.2	NA	0.5	3.7	0.28	0.12	0.28	48.4
West: Viking Street (W)												
10	L2	94	8.0	0.286	6.8	LOS A	1.2	8.5	0.54	0.78	0.60	40.2
12	R2	119	2.0	0.286	9.4	LOS A	1.2	8.5	0.54	0.78	0.60	44.2
Approach		213	4.6	0.286	8.3	LOS A	1.2	8.5	0.54	0.78	0.60	42.3
All Vehicles		1000	2.8	0.286	3.4	NA	1.2	8.5	0.18	0.36	0.19	47.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [2032AM | DES]

P4398
Sutherland Street / Viking Street
2032AM DES
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Sutherland Street (S)												
1	L2	192	1.0	0.273	4.6	LOS A	0.0	0.0	0.00	0.33	0.00	47.8
2	T1	373	2.0	0.273	1.2	LOS A	0.0	0.0	0.00	0.33	0.00	48.8
Approach		564	1.7	0.273	2.4	NA	0.0	0.0	0.00	0.33	0.00	48.5
North: Sutherland Street (N)												
8	T1	185	3.0	0.137	1.1	LOS A	0.5	3.8	0.29	0.12	0.29	48.5
9	R2	43	7.0	0.137	7.5	LOS A	0.5	3.8	0.29	0.12	0.29	47.7
Approach		228	3.8	0.137	2.3	NA	0.5	3.8	0.29	0.12	0.29	48.4
West: Viking Street (W)												
10	L2	94	8.0	0.303	6.7	LOS A	1.3	9.3	0.53	0.78	0.61	40.2
12	R2	134	2.0	0.303	9.4	LOS A	1.3	9.3	0.53	0.78	0.61	44.2
Approach		227	4.5	0.303	8.3	LOS A	1.3	9.3	0.53	0.78	0.61	42.4
All Vehicles		1020	2.8	0.303	3.7	NA	1.3	9.3	0.18	0.38	0.20	47.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2032PM | BG]

P4398
Sutherland Street / Viking Street
2032PM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Sutherland Street (S)												
1	L2	99	2.0	0.201	4.6	LOS A	0.0	0.0	0.00	0.30	0.00	48.1
2	T1	318	2.0	0.201	1.2	LOS A	0.0	0.0	0.00	0.30	0.00	49.0
Approach		417	2.0	0.201	2.0	NA	0.0	0.0	0.00	0.30	0.00	48.8
North: Sutherland Street (N)												
8	T1	312	2.0	0.201	0.6	LOS A	0.6	4.4	0.21	0.10	0.21	58.3
9	R2	59	4.0	0.201	7.6	LOS A	0.6	4.4	0.21	0.10	0.21	56.2
Approach		371	2.3	0.201	1.7	NA	0.6	4.4	0.21	0.10	0.21	58.0
West: Viking Street (W)												
10	L2	63	5.0	0.265	6.1	LOS A	1.0	7.4	0.52	0.75	0.56	40.2
12	R2	127	2.0	0.265	9.3	LOS A	1.0	7.4	0.52	0.75	0.56	44.2
Approach		191	3.0	0.265	8.3	LOS A	1.0	7.4	0.52	0.75	0.56	42.8
All Vehicles		978	2.3	0.265	3.1	NA	1.0	7.4	0.18	0.31	0.19	50.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [2032PM | DES]

P4398
Sutherland Street / Viking Street
2032PM DES
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Sutherland Street (S)												
1	L2	123	2.0	0.205	4.6	LOS A	0.0	0.0	0.00	0.32	0.00	48.0
2	T1	301	2.0	0.205	1.2	LOS A	0.0	0.0	0.00	0.32	0.00	48.9
Approach		424	2.0	0.205	2.2	NA	0.0	0.0	0.00	0.32	0.00	48.6
North: Sutherland Street (N)												
8	T1	303	2.0	0.198	0.6	LOS A	0.6	4.4	0.22	0.10	0.22	48.9
9	R2	59	4.0	0.198	6.6	LOS A	0.6	4.4	0.22	0.10	0.22	48.2
Approach		362	2.3	0.198	1.6	NA	0.6	4.4	0.22	0.10	0.22	48.8
West: Viking Street (W)												
10	L2	63	5.0	0.299	6.2	LOS A	1.2	8.8	0.52	0.77	0.60	40.1
12	R2	151	2.0	0.299	9.4	LOS A	1.2	8.8	0.52	0.77	0.60	44.0
Approach		214	2.9	0.299	8.5	LOS A	1.2	8.8	0.52	0.77	0.60	42.8
All Vehicles		1000	2.3	0.299	3.3	NA	1.2	8.8	0.19	0.33	0.21	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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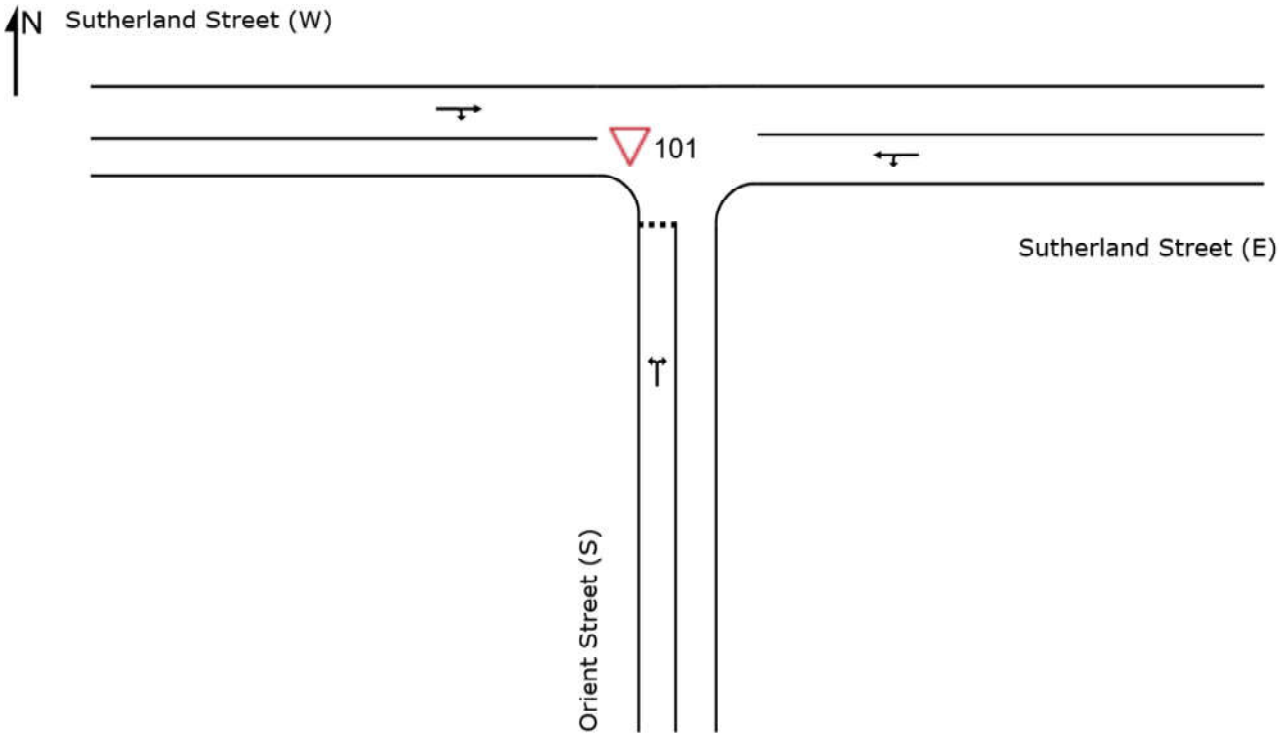
SITE LAYOUT

Site: 101 [Sutherland Street / Orient Street Intersection Layout]

P4398
Sutherland Street / Orient Street
Site Category: (None)
Giveway / Yield (Two-Way)



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MOVEMENT SUMMARY

Site: 101 [2022AM | BG]

P4398
Sutherland Street / Orient Street
2022AM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Orient Street (S)												
1	L2	38	0.0	0.038	4.4	LOS A	0.1	1.0	0.37	0.53	0.37	36.7
3	R2	5	0.0	0.038	5.9	LOS A	0.1	1.0	0.37	0.53	0.37	37.9
Approach		43	0.0	0.038	4.6	LOS A	0.1	1.0	0.37	0.53	0.37	36.9
East: Sutherland Street (E)												
4	L2	47	2.0	0.174	3.4	LOS A	0.0	0.0	0.00	0.06	0.00	39.9
5	T1	312	4.0	0.174	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.7
Approach		359	3.7	0.174	0.5	NA	0.0	0.0	0.00	0.06	0.00	39.7
West: Sutherland Street (W)												
11	T1	129	1.0	0.137	1.0	LOS A	0.7	4.7	0.38	0.24	0.38	38.0
12	R2	95	0.0	0.137	4.9	LOS A	0.7	4.7	0.38	0.24	0.38	37.7
Approach		224	0.6	0.137	2.6	NA	0.7	4.7	0.38	0.24	0.38	37.9
All Vehicles		626	2.3	0.174	1.5	NA	0.7	4.7	0.16	0.16	0.16	38.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2022AM | DEV]

P4398
Sutherland Street / Orient Street
2022AM DEV
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Orient Street (S)												
1	L2	38	0.0	0.054	4.5	LOS A	0.2	1.3	0.39	0.56	0.39	36.6
3	R2	17	0.0	0.054	6.0	LOS A	0.2	1.3	0.39	0.56	0.39	37.9
Approach		55	0.0	0.054	4.9	LOS A	0.2	1.3	0.39	0.56	0.39	37.2
East: Sutherland Street (E)												
4	L2	47	2.0	0.174	3.4	LOS A	0.0	0.0	0.00	0.06	0.00	39.9
5	T1	312	4.0	0.174	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.7
Approach		359	3.7	0.174	0.5	NA	0.0	0.0	0.00	0.06	0.00	39.7
West: Sutherland Street (W)												
11	T1	129	1.0	0.143	1.0	LOS A	0.7	5.0	0.39	0.26	0.39	37.9
12	R2	102	0.0	0.143	4.9	LOS A	0.7	5.0	0.39	0.26	0.39	37.7
Approach		232	0.6	0.143	2.7	NA	0.7	5.0	0.39	0.26	0.39	37.8
All Vehicles		645	2.3	0.174	1.7	NA	0.7	5.0	0.17	0.17	0.17	38.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2022PM | BG]

P4398
Sutherland Street / Orient Street
2022PM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Orient Street (S)												
1	L2	25	0.0	0.024	4.0	LOS A	0.1	0.6	0.28	0.48	0.28	36.9
3	R2	5	0.0	0.024	5.1	LOS A	0.1	0.6	0.28	0.48	0.28	38.1
Approach		31	0.0	0.024	4.2	LOS A	0.1	0.6	0.28	0.48	0.28	37.2
East: Sutherland Street (E)												
4	L2	27	0.0	0.107	3.4	LOS A	0.0	0.0	0.00	0.06	0.00	40.0
5	T1	196	2.0	0.107	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.7
Approach		223	1.8	0.107	0.4	NA	0.0	0.0	0.00	0.06	0.00	39.7
West: Sutherland Street (W)												
11	T1	163	2.0	0.116	0.3	LOS A	0.4	2.8	0.19	0.11	0.19	39.0
12	R2	48	13.0	0.116	4.5	LOS A	0.4	2.8	0.19	0.11	0.19	38.7
Approach		212	4.5	0.116	1.3	NA	0.4	2.8	0.19	0.11	0.19	38.9
All Vehicles		465	2.9	0.116	1.1	NA	0.4	2.8	0.10	0.11	0.10	39.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2022PM | DEV]

P4398
Sutherland Street / Orient Street
2022PM DEV
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Orient Street (S)												
1	L2	25	0.0	0.043	4.0	LOS A	0.1	1.0	0.31	0.51	0.31	36.9
3	R2	21	0.0	0.043	5.2	LOS A	0.1	1.0	0.31	0.51	0.31	38.1
Approach		46	0.0	0.043	4.5	LOS A	0.1	1.0	0.31	0.51	0.31	37.6
East: Sutherland Street (E)												
4	L2	27	0.0	0.107	3.4	LOS A	0.0	0.0	0.00	0.06	0.00	40.0
5	T1	196	2.0	0.107	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.7
Approach		223	1.8	0.107	0.4	NA	0.0	0.0	0.00	0.06	0.00	39.7
West: Sutherland Street (W)												
11	T1	163	2.0	0.119	0.4	LOS A	0.4	3.0	0.20	0.12	0.20	38.9
12	R2	53	13.0	0.119	4.5	LOS A	0.4	3.0	0.20	0.12	0.20	38.7
Approach		216	4.7	0.119	1.4	NA	0.4	3.0	0.20	0.12	0.20	38.9
All Vehicles		485	2.9	0.119	1.2	NA	0.4	3.0	0.12	0.13	0.12	39.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2032AM | BG]

P4398
Sutherland Street / Orient Street
2032AM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Orient Street (S)												
1	L2	38	0.0	0.040	4.7	LOS A	0.1	1.0	0.41	0.55	0.41	36.6
3	R2	5	0.0	0.040	6.5	LOS A	0.1	1.0	0.41	0.55	0.41	37.9
Approach		43	0.0	0.040	4.9	LOS A	0.1	1.0	0.41	0.55	0.41	36.8
East: Sutherland Street (E)												
4	L2	47	2.0	0.199	3.4	LOS A	0.0	0.0	0.00	0.05	0.00	39.9
5	T1	363	4.0	0.199	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	39.7
Approach		411	3.8	0.199	0.4	NA	0.0	0.0	0.00	0.05	0.00	39.7
West: Sutherland Street (W)												
11	T1	149	1.0	0.151	1.1	LOS A	0.7	5.2	0.39	0.23	0.39	38.0
12	R2	95	0.0	0.151	5.2	LOS A	0.7	5.2	0.39	0.23	0.39	37.8
Approach		244	0.6	0.151	2.7	NA	0.7	5.2	0.39	0.23	0.39	37.9
All Vehicles		698	2.4	0.199	1.5	NA	0.7	5.2	0.16	0.15	0.16	38.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2032AM | DEV]

P4398
Sutherland Street / Orient Street
2032AM DEV
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Orient Street (S)												
1	L2	38	0.0	0.062	4.7	LOS A	0.2	1.5	0.43	0.59	0.43	36.4
3	R2	20	0.0	0.062	6.6	LOS A	0.2	1.5	0.43	0.59	0.43	37.8
Approach		58	0.0	0.062	5.3	LOS A	0.2	1.5	0.43	0.59	0.43	37.0
East: Sutherland Street (E)												
4	L2	47	2.0	0.199	3.4	LOS A	0.0	0.0	0.00	0.05	0.00	39.9
5	T1	363	4.0	0.199	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	39.7
Approach		411	3.8	0.199	0.4	NA	0.0	0.0	0.00	0.05	0.00	39.7
West: Sutherland Street (W)												
11	T1	143	1.0	0.158	1.2	LOS A	0.8	5.7	0.41	0.26	0.41	37.9
12	R2	106	0.0	0.158	5.2	LOS A	0.8	5.7	0.41	0.26	0.41	37.6
Approach		249	0.6	0.158	2.9	NA	0.8	5.7	0.41	0.26	0.41	37.8
All Vehicles		718	2.4	0.199	1.7	NA	0.8	5.7	0.18	0.17	0.18	38.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2032PM | BG]

P4398
Sutherland Street / Orient Street
2032PM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Orient Street (S)												
1	L2	25	0.0	0.025	4.1	LOS A	0.1	0.7	0.31	0.49	0.31	36.9
3	R2	5	0.0	0.025	5.4	LOS A	0.1	0.7	0.31	0.49	0.31	38.1
Approach		31	0.0	0.025	4.3	LOS A	0.1	0.7	0.31	0.49	0.31	37.2
East: Sutherland Street (E)												
4	L2	27	0.0	0.123	3.4	LOS A	0.0	0.0	0.00	0.05	0.00	40.0
5	T1	228	2.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	39.7
Approach		256	1.8	0.123	0.4	NA	0.0	0.0	0.00	0.05	0.00	39.8
West: Sutherland Street (W)												
11	T1	189	2.0	0.130	0.4	LOS A	0.4	3.0	0.19	0.10	0.19	39.0
12	R2	48	13.0	0.130	4.6	LOS A	0.4	3.0	0.19	0.10	0.19	38.8
Approach		238	4.2	0.130	1.2	NA	0.4	3.0	0.19	0.10	0.19	39.0
All Vehicles		524	2.8	0.130	1.0	NA	0.4	3.0	0.10	0.10	0.10	39.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2032PM | DEV]

P4398
Sutherland Street / Orient Street
2032PM DEV
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

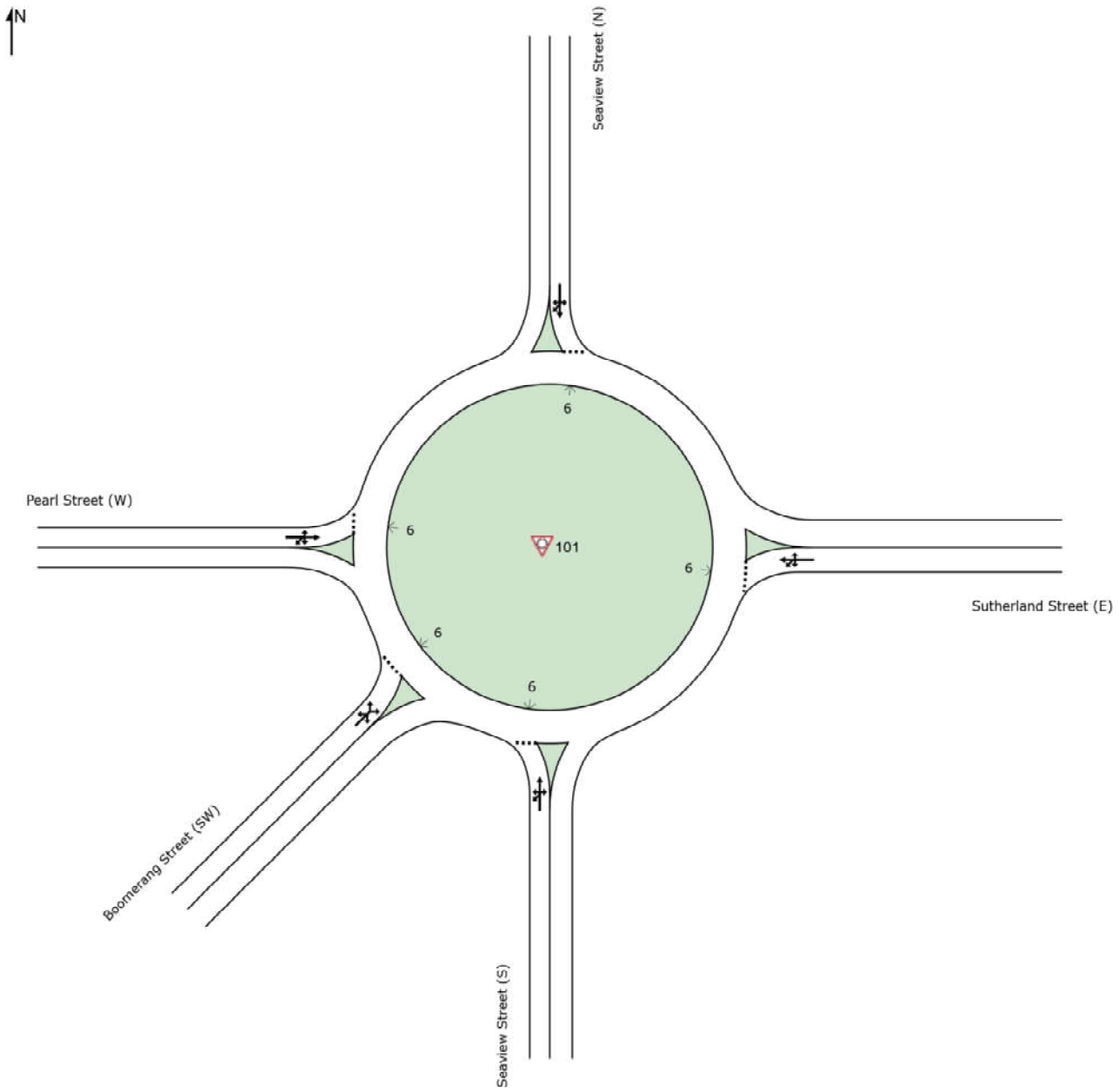
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Orient Street (S)												
1	L2	25	0.0	0.051	4.1	LOS A	0.2	1.2	0.35	0.54	0.35	36.8
3	R2	26	0.0	0.051	5.5	LOS A	0.2	1.2	0.35	0.54	0.35	38.0
Approach		52	0.0	0.051	4.8	LOS A	0.2	1.2	0.35	0.54	0.35	37.5
East: Sutherland Street (E)												
4	L2	27	0.0	0.123	3.4	LOS A	0.0	0.0	0.00	0.05	0.00	40.0
5	T1	228	2.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	39.7
Approach		256	1.8	0.123	0.4	NA	0.0	0.0	0.00	0.05	0.00	39.8
West: Sutherland Street (W)												
11	T1	186	2.0	0.134	0.4	LOS A	0.5	3.4	0.21	0.12	0.21	38.9
12	R2	56	13.0	0.134	4.6	LOS A	0.5	3.4	0.21	0.12	0.21	38.7
Approach		242	4.5	0.134	1.4	NA	0.5	3.4	0.21	0.12	0.21	38.9
All Vehicles		549	2.8	0.134	1.2	NA	0.5	3.4	0.12	0.12	0.12	39.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Sutherland Street / Pearl Street]

P4398
Sutherland Street / Pearl Street
Site Category: (None)
Roundabout



MOVEMENT SUMMARY

Site: 101 [2022AM | BG]

P4398
Sutherland Street / Pearl Street
2022AM BG
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Seaview Street (S)												
1b	L3	1	0.0	0.218	8.8	LOS A	1.3	8.8	0.68	0.76	0.68	42.5
1	L2	109	0.0	0.218	8.4	LOS A	1.3	8.8	0.68	0.76	0.68	39.6
2	T1	38	0.0	0.218	7.9	LOS A	1.3	8.8	0.68	0.76	0.68	40.2
3	R2	13	0.0	0.218	10.6	LOS A	1.3	8.8	0.68	0.76	0.68	44.0
3u	U	1	0.0	0.218	13.0	LOS A	1.3	8.8	0.68	0.76	0.68	46.7
Approach		162	0.0	0.218	8.5	LOS A	1.3	8.8	0.68	0.76	0.68	40.2
East: Sutherland Street (E)												
4	L2	12	0.0	0.361	6.3	LOS A	2.0	14.1	0.51	0.64	0.51	45.0
4a	L1	32	0.0	0.361	5.3	LOS A	2.0	14.1	0.51	0.64	0.51	45.0
5	T1	286	4.0	0.361	5.7	LOS A	2.0	14.1	0.51	0.64	0.51	41.9
6	R2	21	0.0	0.361	8.2	LOS A	2.0	14.1	0.51	0.64	0.51	42.7
6u	U	1	0.0	0.361	10.6	LOS A	2.0	14.1	0.51	0.64	0.51	48.9
Approach		352	3.3	0.361	5.8	LOS A	2.0	14.1	0.51	0.64	0.51	42.3
North: Seaview Street (N)												
7	L2	43	0.0	0.290	6.1	LOS A	1.7	12.3	0.50	0.67	0.50	41.5
8	T1	46	2.0	0.290	5.6	LOS A	1.7	12.3	0.50	0.67	0.50	41.6
9a	R1	14	0.0	0.290	7.6	LOS A	1.7	12.3	0.50	0.67	0.50	39.4
9	R2	182	3.0	0.290	8.3	LOS A	1.7	12.3	0.50	0.67	0.50	35.8
9u	U	1	0.0	0.290	10.6	LOS A	1.7	12.3	0.50	0.67	0.50	13.0
Approach		286	2.2	0.290	7.5	LOS A	1.7	12.3	0.50	0.67	0.50	37.7
West: Pearl Street (W)												
10	L2	27	12.0	0.208	4.2	LOS A	1.2	8.5	0.32	0.50	0.32	36.0
11	T1	138	3.0	0.208	3.4	LOS A	1.2	8.5	0.32	0.50	0.32	42.1
12	R2	32	3.0	0.208	6.0	LOS A	1.2	8.5	0.32	0.50	0.32	41.4
12b	R3	33	0.0	0.208	6.6	LOS A	1.2	8.5	0.32	0.50	0.32	40.7
12u	U	9	0.0	0.208	9.6	LOS A	1.2	8.5	0.32	0.50	0.32	43.5
Approach		239	3.5	0.208	4.5	LOS A	1.2	8.5	0.32	0.50	0.32	41.4
SouthWest: Boomerang Street (SW)												
30b	L3	67	0.0	0.144	8.9	LOS A	0.8	5.4	0.65	0.76	0.65	38.2
30a	L1	20	0.0	0.144	7.6	LOS A	0.8	5.4	0.65	0.76	0.65	37.9
32a	R1	16	0.0	0.144	9.9	LOS A	0.8	5.4	0.65	0.76	0.65	43.0
32b	R3	1	0.0	0.144	11.2	LOS A	0.8	5.4	0.65	0.76	0.65	43.0
32u	U	1	0.0	0.144	13.0	LOS A	0.8	5.4	0.65	0.76	0.65	44.5
Approach		105	0.0	0.144	8.9	LOS A	0.8	5.4	0.65	0.76	0.65	39.1
All Vehicles		1144	2.3	0.361	6.6	LOS A	2.0	14.1	0.50	0.65	0.50	40.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

MOVEMENT SUMMARY

Site: 101 [2022AM | DEV]

P4398
Sutherland Street / Pearl Street
2022AM DEV
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Seaview Street (S)												
1b	L3	1	0.0	0.220	8.8	LOS A	1.3	8.9	0.68	0.76	0.68	42.5
1	L2	111	0.0	0.220	8.4	LOS A	1.3	8.9	0.68	0.76	0.68	39.6
2	T1	39	0.0	0.220	7.9	LOS A	1.3	8.9	0.68	0.76	0.68	40.2
3	R2	13	0.0	0.220	10.6	LOS A	1.3	8.9	0.68	0.76	0.68	44.0
3u	U	1	0.0	0.220	13.0	LOS A	1.3	8.9	0.68	0.76	0.68	46.7
Approach		164	0.0	0.220	8.5	LOS A	1.3	8.9	0.68	0.76	0.68	40.2
East: Sutherland Street (E)												
4	L2	12	0.0	0.361	6.3	LOS A	2.0	14.1	0.51	0.64	0.51	45.0
4a	L1	32	0.0	0.361	5.3	LOS A	2.0	14.1	0.51	0.64	0.51	45.0
5	T1	286	4.0	0.361	5.7	LOS A	2.0	14.1	0.51	0.64	0.51	41.9
6	R2	21	0.0	0.361	8.2	LOS A	2.0	14.1	0.51	0.64	0.51	42.7
6u	U	1	0.0	0.361	10.6	LOS A	2.0	14.1	0.51	0.64	0.51	48.9
Approach		352	3.3	0.361	5.8	LOS A	2.0	14.1	0.51	0.64	0.51	42.3
North: Seaview Street (N)												
7	L2	44	0.0	0.292	6.1	LOS A	1.7	12.4	0.50	0.67	0.50	41.5
8	T1	46	2.0	0.292	5.6	LOS A	1.7	12.4	0.50	0.67	0.50	41.6
9a	R1	14	0.0	0.292	7.6	LOS A	1.7	12.4	0.50	0.67	0.50	39.4
9	R2	182	3.0	0.292	8.3	LOS A	1.7	12.4	0.50	0.67	0.50	35.8
9u	U	1	0.0	0.292	10.6	LOS A	1.7	12.4	0.50	0.67	0.50	13.0
Approach		287	2.2	0.292	7.5	LOS A	1.7	12.4	0.50	0.67	0.50	37.7
West: Pearl Street (W)												
10	L2	27	12.0	0.209	4.2	LOS A	1.2	8.6	0.32	0.50	0.32	36.0
11	T1	139	3.0	0.209	3.4	LOS A	1.2	8.6	0.32	0.50	0.32	42.1
12	R2	32	3.0	0.209	6.0	LOS A	1.2	8.6	0.32	0.50	0.32	41.4
12b	R3	33	0.0	0.209	6.6	LOS A	1.2	8.6	0.32	0.50	0.32	40.7
12u	U	9	0.0	0.209	9.6	LOS A	1.2	8.6	0.32	0.50	0.32	43.5
Approach		240	3.5	0.209	4.5	LOS A	1.2	8.6	0.32	0.50	0.32	41.4
SouthWest: Boomerang Street (SW)												
30b	L3	67	0.0	0.144	8.9	LOS A	0.8	5.4	0.66	0.76	0.66	38.2
30a	L1	20	0.0	0.144	7.6	LOS A	0.8	5.4	0.66	0.76	0.66	37.9
32a	R1	16	0.0	0.144	9.9	LOS A	0.8	5.4	0.66	0.76	0.66	43.0
32b	R3	1	0.0	0.144	11.2	LOS A	0.8	5.4	0.66	0.76	0.66	42.9
32u	U	1	0.0	0.144	13.0	LOS A	0.8	5.4	0.66	0.76	0.66	44.5
Approach		105	0.0	0.144	8.9	LOS A	0.8	5.4	0.66	0.76	0.66	39.0
All Vehicles		1148	2.3	0.361	6.6	LOS A	2.0	14.1	0.50	0.65	0.50	40.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

MOVEMENT SUMMARY

Site: 101 [2022PM | BG]

P4398
Sutherland Street / Pearl Street
2022PM BG
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Seaview Street (S)												
1b	L3	1	0.0	0.127	8.7	LOS A	0.7	4.9	0.65	0.73	0.65	42.5
1	L2	60	2.0	0.127	8.4	LOS A	0.7	4.9	0.65	0.73	0.65	39.6
2	T1	22	0.0	0.127	7.8	LOS A	0.7	4.9	0.65	0.73	0.65	40.3
3	R2	8	0.0	0.127	10.5	LOS A	0.7	4.9	0.65	0.73	0.65	44.1
3u	U	1	0.0	0.127	12.9	LOS A	0.7	4.9	0.65	0.73	0.65	46.7
Approach		93	1.3	0.127	8.5	LOS A	0.7	4.9	0.65	0.73	0.65	40.3
East: Sutherland Street (E)												
4	L2	14	0.0	0.318	6.8	LOS A	1.7	12.2	0.57	0.69	0.57	44.8
4a	L1	25	0.0	0.318	5.8	LOS A	1.7	12.2	0.57	0.69	0.57	44.8
5	T1	229	3.0	0.318	6.1	LOS A	1.7	12.2	0.57	0.69	0.57	41.7
6	R2	18	0.0	0.318	8.7	LOS A	1.7	12.2	0.57	0.69	0.57	42.5
6u	U	1	0.0	0.318	11.1	LOS A	1.7	12.2	0.57	0.69	0.57	48.8
Approach		287	2.4	0.318	6.3	LOS A	1.7	12.2	0.57	0.69	0.57	42.2
North: Seaview Street (N)												
7	L2	71	3.0	0.404	6.8	LOS A	2.6	18.8	0.59	0.72	0.59	41.0
8	T1	54	0.0	0.404	6.2	LOS A	2.6	18.8	0.59	0.72	0.59	41.1
9a	R1	21	5.0	0.404	8.4	LOS A	2.6	18.8	0.59	0.72	0.59	38.7
9	R2	233	3.0	0.404	9.0	LOS A	2.6	18.8	0.59	0.72	0.59	35.4
9u	U	3	0.0	0.404	11.3	LOS A	2.6	18.8	0.59	0.72	0.59	14.4
Approach		381	2.7	0.404	8.2	LOS A	2.6	18.8	0.59	0.72	0.59	37.2
West: Pearl Street (W)												
10	L2	38	6.0	0.248	3.9	LOS A	1.5	10.6	0.27	0.50	0.27	36.6
11	T1	160	5.0	0.248	3.2	LOS A	1.5	10.6	0.27	0.50	0.27	42.5
12	R2	39	0.0	0.248	5.8	LOS A	1.5	10.6	0.27	0.50	0.27	41.9
12b	R3	32	0.0	0.248	6.4	LOS A	1.5	10.6	0.27	0.50	0.27	41.2
12u	U	38	3.0	0.248	9.4	LOS A	1.5	10.6	0.27	0.50	0.27	44.0
Approach		306	3.7	0.248	4.7	LOS A	1.5	10.6	0.27	0.50	0.27	42.0
SouthWest: Boomerang Street (SW)												
30b	L3	46	0.0	0.096	8.4	LOS A	0.5	3.5	0.61	0.73	0.61	38.4
30a	L1	7	0.0	0.096	7.1	LOS A	0.5	3.5	0.61	0.73	0.61	38.2
32a	R1	17	0.0	0.096	9.4	LOS A	0.5	3.5	0.61	0.73	0.61	43.2
32b	R3	2	0.0	0.096	10.7	LOS A	0.5	3.5	0.61	0.73	0.61	43.2
32u	U	1	0.0	0.096	12.4	LOS A	0.5	3.5	0.61	0.73	0.61	44.8
Approach		74	0.0	0.096	8.6	LOS A	0.5	3.5	0.61	0.73	0.61	39.7
All Vehicles		1141	2.6	0.404	6.8	LOS A	2.6	18.8	0.51	0.65	0.51	40.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

MOVEMENT SUMMARY

Site: 101 [2022PM | DEV]

P4398
Sutherland Street / Pearl Street
2022PM DEV
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Seaview Street (S)												
1b	L3	1	0.0	0.130	8.7	LOS A	0.7	5.0	0.65	0.73	0.65	42.5
1	L2	61	2.0	0.130	8.4	LOS A	0.7	5.0	0.65	0.73	0.65	39.6
2	T1	23	0.0	0.130	7.8	LOS A	0.7	5.0	0.65	0.73	0.65	40.3
3	R2	8	0.0	0.130	10.5	LOS A	0.7	5.0	0.65	0.73	0.65	44.1
3u	U	1	0.0	0.130	12.9	LOS A	0.7	5.0	0.65	0.73	0.65	46.7
Approach		95	1.3	0.130	8.5	LOS A	0.7	5.0	0.65	0.73	0.65	40.3
East: Sutherland Street (E)												
4	L2	14	0.0	0.318	6.8	LOS A	1.7	12.2	0.57	0.69	0.57	44.8
4a	L1	25	0.0	0.318	5.8	LOS A	1.7	12.2	0.57	0.69	0.57	44.8
5	T1	229	3.0	0.318	6.1	LOS A	1.7	12.2	0.57	0.69	0.57	41.7
6	R2	18	0.0	0.318	8.7	LOS A	1.7	12.2	0.57	0.69	0.57	42.5
6u	U	1	0.0	0.318	11.1	LOS A	1.7	12.2	0.57	0.69	0.57	48.8
Approach		287	2.4	0.318	6.3	LOS A	1.7	12.2	0.57	0.69	0.57	42.2
North: Seaview Street (N)												
7	L2	72	3.0	0.406	6.8	LOS A	2.6	18.9	0.59	0.72	0.59	41.0
8	T1	54	0.0	0.406	6.2	LOS A	2.6	18.9	0.59	0.72	0.59	41.1
9a	R1	21	5.0	0.406	8.4	LOS A	2.6	18.9	0.59	0.72	0.59	38.7
9	R2	233	3.0	0.406	9.0	LOS A	2.6	18.9	0.59	0.72	0.59	35.4
9u	U	3	0.0	0.406	11.3	LOS A	2.6	18.9	0.59	0.72	0.59	14.4
Approach		382	2.7	0.406	8.2	LOS A	2.6	18.9	0.59	0.72	0.59	37.2
West: Pearl Street (W)												
10	L2	38	6.0	0.250	3.9	LOS A	1.5	10.7	0.27	0.50	0.27	36.6
11	T1	161	5.0	0.250	3.2	LOS A	1.5	10.7	0.27	0.50	0.27	42.5
12	R2	39	0.0	0.250	5.8	LOS A	1.5	10.7	0.27	0.50	0.27	41.9
12b	R3	32	0.0	0.250	6.4	LOS A	1.5	10.7	0.27	0.50	0.27	41.2
12u	U	38	3.0	0.250	9.4	LOS A	1.5	10.7	0.27	0.50	0.27	44.0
Approach		307	3.7	0.250	4.7	LOS A	1.5	10.7	0.27	0.50	0.27	42.0
SouthWest: Boomerang Street (SW)												
30b	L3	46	0.0	0.097	8.4	LOS A	0.5	3.5	0.62	0.73	0.62	38.4
30a	L1	7	0.0	0.097	7.1	LOS A	0.5	3.5	0.62	0.73	0.62	38.2
32a	R1	17	0.0	0.097	9.4	LOS A	0.5	3.5	0.62	0.73	0.62	43.2
32b	R3	2	0.0	0.097	10.7	LOS A	0.5	3.5	0.62	0.73	0.62	43.2
32u	U	1	0.0	0.097	12.4	LOS A	0.5	3.5	0.62	0.73	0.62	44.8
Approach		74	0.0	0.097	8.6	LOS A	0.5	3.5	0.62	0.73	0.62	39.7
All Vehicles		1145	2.6	0.406	6.8	LOS A	2.6	18.9	0.51	0.65	0.51	40.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

MOVEMENT SUMMARY

Site: 101 [2032AM | BG]

P4398
Sutherland Street / Pearl Street
2032AM BG
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Seaview Street (S)												
1b	L3	1	0.0	0.218	8.8	LOS A	1.3	8.8	0.68	0.76	0.68	42.5
1	L2	109	0.0	0.218	8.4	LOS A	1.3	8.8	0.68	0.76	0.68	39.6
2	T1	38	0.0	0.218	7.9	LOS A	1.3	8.8	0.68	0.76	0.68	40.2
3	R2	13	0.0	0.218	10.6	LOS A	1.3	8.8	0.68	0.76	0.68	44.0
3u	U	1	0.0	0.218	13.0	LOS A	1.3	8.8	0.68	0.76	0.68	46.7
Approach		162	0.0	0.218	8.5	LOS A	1.3	8.8	0.68	0.76	0.68	40.2
East: Sutherland Street (E)												
4	L2	12	0.0	0.361	6.3	LOS A	2.0	14.1	0.51	0.64	0.51	45.0
4a	L1	32	0.0	0.361	5.3	LOS A	2.0	14.1	0.51	0.64	0.51	45.0
5	T1	286	4.0	0.361	5.7	LOS A	2.0	14.1	0.51	0.64	0.51	41.9
6	R2	21	0.0	0.361	8.2	LOS A	2.0	14.1	0.51	0.64	0.51	42.7
6u	U	1	0.0	0.361	10.6	LOS A	2.0	14.1	0.51	0.64	0.51	48.9
Approach		352	3.3	0.361	5.8	LOS A	2.0	14.1	0.51	0.64	0.51	42.3
North: Seaview Street (N)												
7	L2	44	0.0	0.291	6.1	LOS A	1.7	12.4	0.50	0.67	0.50	41.5
8	T1	46	2.0	0.291	5.6	LOS A	1.7	12.4	0.50	0.67	0.50	41.6
9a	R1	14	0.0	0.291	7.6	LOS A	1.7	12.4	0.50	0.67	0.50	39.4
9	R2	182	3.0	0.291	8.3	LOS A	1.7	12.4	0.50	0.67	0.50	35.8
9u	U	1	0.0	0.291	10.6	LOS A	1.7	12.4	0.50	0.67	0.50	13.0
Approach		287	2.2	0.291	7.5	LOS A	1.7	12.4	0.50	0.67	0.50	37.7
West: Pearl Street (W)												
10	L2	27	12.0	0.208	4.2	LOS A	1.2	8.5	0.32	0.50	0.32	36.0
11	T1	138	3.0	0.208	3.4	LOS A	1.2	8.5	0.32	0.50	0.32	42.1
12	R2	32	3.0	0.208	6.0	LOS A	1.2	8.5	0.32	0.50	0.32	41.4
12b	R3	33	0.0	0.208	6.6	LOS A	1.2	8.5	0.32	0.50	0.32	40.7
12u	U	9	0.0	0.208	9.6	LOS A	1.2	8.5	0.32	0.50	0.32	43.5
Approach		239	3.5	0.208	4.5	LOS A	1.2	8.5	0.32	0.50	0.32	41.4
SouthWest: Boomerang Street (SW)												
30b	L3	67	0.0	0.144	8.9	LOS A	0.8	5.4	0.65	0.76	0.65	38.2
30a	L1	20	0.0	0.144	7.6	LOS A	0.8	5.4	0.65	0.76	0.65	37.9
32a	R1	16	0.0	0.144	9.9	LOS A	0.8	5.4	0.65	0.76	0.65	43.0
32b	R3	1	0.0	0.144	11.2	LOS A	0.8	5.4	0.65	0.76	0.65	43.0
32u	U	1	0.0	0.144	13.0	LOS A	0.8	5.4	0.65	0.76	0.65	44.5
Approach		105	0.0	0.144	8.9	LOS A	0.8	5.4	0.65	0.76	0.65	39.1
All Vehicles		1145	2.3	0.361	6.6	LOS A	2.0	14.1	0.50	0.65	0.50	40.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

MOVEMENT SUMMARY

Site: 101 [2032AM | DEV]

P4398
Sutherland Street / Pearl Street
2032AM DEV
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Seaview Street (S)												
1b	L3	1	0.0	0.222	8.8	LOS A	1.3	9.0	0.68	0.77	0.68	42.5
1	L2	112	0.0	0.222	8.4	LOS A	1.3	9.0	0.68	0.77	0.68	39.6
2	T1	39	0.0	0.222	7.9	LOS A	1.3	9.0	0.68	0.77	0.68	40.2
3	R2	13	0.0	0.222	10.6	LOS A	1.3	9.0	0.68	0.77	0.68	44.0
3u	U	1	0.0	0.222	13.0	LOS A	1.3	9.0	0.68	0.77	0.68	46.7
Approach		165	0.0	0.222	8.5	LOS A	1.3	9.0	0.68	0.77	0.68	40.1
East: Sutherland Street (E)												
4	L2	12	0.0	0.361	6.3	LOS A	2.0	14.1	0.51	0.64	0.51	45.0
4a	L1	32	0.0	0.361	5.3	LOS A	2.0	14.1	0.51	0.64	0.51	45.0
5	T1	286	4.0	0.361	5.7	LOS A	2.0	14.1	0.51	0.64	0.51	41.9
6	R2	21	0.0	0.361	8.2	LOS A	2.0	14.1	0.51	0.64	0.51	42.7
6u	U	1	0.0	0.361	10.6	LOS A	2.0	14.1	0.51	0.64	0.51	48.9
Approach		352	3.3	0.361	5.8	LOS A	2.0	14.1	0.51	0.64	0.51	42.3
North: Seaview Street (N)												
7	L2	44	0.0	0.293	6.1	LOS A	1.7	12.4	0.50	0.67	0.50	41.5
8	T1	46	2.0	0.293	5.6	LOS A	1.7	12.4	0.50	0.67	0.50	41.6
9a	R1	14	0.0	0.293	7.6	LOS A	1.7	12.4	0.50	0.67	0.50	39.4
9	R2	182	3.0	0.293	8.3	LOS A	1.7	12.4	0.50	0.67	0.50	35.8
9u	U	1	0.0	0.293	10.6	LOS A	1.7	12.4	0.50	0.67	0.50	13.0
Approach		287	2.2	0.293	7.5	LOS A	1.7	12.4	0.50	0.67	0.50	37.7
West: Pearl Street (W)												
10	L2	27	12.0	0.211	4.2	LOS A	1.2	8.7	0.32	0.50	0.32	36.0
11	T1	142	3.0	0.211	3.4	LOS A	1.2	8.7	0.32	0.50	0.32	42.1
12	R2	32	3.0	0.211	6.0	LOS A	1.2	8.7	0.32	0.50	0.32	41.4
12b	R3	33	0.0	0.211	6.6	LOS A	1.2	8.7	0.32	0.50	0.32	40.7
12u	U	9	0.0	0.211	9.6	LOS A	1.2	8.7	0.32	0.50	0.32	43.5
Approach		243	3.5	0.211	4.5	LOS A	1.2	8.7	0.32	0.50	0.32	41.4
SouthWest: Boomerang Street (SW)												
30b	L3	67	0.0	0.144	8.9	LOS A	0.8	5.4	0.66	0.77	0.66	38.2
30a	L1	20	0.0	0.144	7.6	LOS A	0.8	5.4	0.66	0.77	0.66	37.9
32a	R1	16	0.0	0.144	10.0	LOS A	0.8	5.4	0.66	0.77	0.66	43.0
32b	R3	1	0.0	0.144	11.3	LOS A	0.8	5.4	0.66	0.77	0.66	42.9
32u	U	1	0.0	0.144	13.0	LOS A	0.8	5.4	0.66	0.77	0.66	44.5
Approach		105	0.0	0.144	8.9	LOS A	0.8	5.4	0.66	0.77	0.66	39.0
All Vehicles		1153	2.3	0.361	6.6	LOS A	2.0	14.1	0.51	0.65	0.51	40.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

MOVEMENT SUMMARY

Site: 101 [2032PM | BG]

P4398
Sutherland Street / Pearl Street
2032PM BG
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Seaview Street (S)												
1b	L3	1	0.0	0.127	8.7	LOS A	0.7	4.9	0.65	0.73	0.65	42.5
1	L2	60	2.0	0.127	8.4	LOS A	0.7	4.9	0.65	0.73	0.65	39.6
2	T1	22	0.0	0.127	7.8	LOS A	0.7	4.9	0.65	0.73	0.65	40.3
3	R2	8	0.0	0.127	10.5	LOS A	0.7	4.9	0.65	0.73	0.65	44.1
3u	U	1	0.0	0.127	12.9	LOS A	0.7	4.9	0.65	0.73	0.65	46.7
Approach		93	1.3	0.127	8.5	LOS A	0.7	4.9	0.65	0.73	0.65	40.3
East: Sutherland Street (E)												
4	L2	14	0.0	0.318	6.8	LOS A	1.7	12.2	0.57	0.69	0.57	44.8
4a	L1	25	0.0	0.318	5.8	LOS A	1.7	12.2	0.57	0.69	0.57	44.8
5	T1	229	3.0	0.318	6.1	LOS A	1.7	12.2	0.57	0.69	0.57	41.7
6	R2	18	0.0	0.318	8.7	LOS A	1.7	12.2	0.57	0.69	0.57	42.5
6u	U	1	0.0	0.318	11.1	LOS A	1.7	12.2	0.57	0.69	0.57	48.8
Approach		287	2.4	0.318	6.3	LOS A	1.7	12.2	0.57	0.69	0.57	42.2
North: Seaview Street (N)												
7	L2	71	3.0	0.404	6.8	LOS A	2.6	18.8	0.59	0.72	0.59	41.0
8	T1	54	0.0	0.404	6.2	LOS A	2.6	18.8	0.59	0.72	0.59	41.1
9a	R1	21	5.0	0.404	8.4	LOS A	2.6	18.8	0.59	0.72	0.59	38.7
9	R2	233	3.0	0.404	9.0	LOS A	2.6	18.8	0.59	0.72	0.59	35.4
9u	U	3	0.0	0.404	11.3	LOS A	2.6	18.8	0.59	0.72	0.59	14.4
Approach		381	2.7	0.404	8.2	LOS A	2.6	18.8	0.59	0.72	0.59	37.2
West: Pearl Street (W)												
10	L2	38	6.0	0.248	3.9	LOS A	1.5	10.6	0.27	0.50	0.27	36.6
11	T1	160	5.0	0.248	3.2	LOS A	1.5	10.6	0.27	0.50	0.27	42.5
12	R2	39	0.0	0.248	5.8	LOS A	1.5	10.6	0.27	0.50	0.27	41.9
12b	R3	32	0.0	0.248	6.4	LOS A	1.5	10.6	0.27	0.50	0.27	41.2
12u	U	38	3.0	0.248	9.4	LOS A	1.5	10.6	0.27	0.50	0.27	44.0
Approach		306	3.7	0.248	4.7	LOS A	1.5	10.6	0.27	0.50	0.27	42.0
SouthWest: Boomerang Street (SW)												
30b	L3	46	0.0	0.096	8.4	LOS A	0.5	3.5	0.61	0.73	0.61	38.4
30a	L1	7	0.0	0.096	7.1	LOS A	0.5	3.5	0.61	0.73	0.61	38.2
32a	R1	17	0.0	0.096	9.4	LOS A	0.5	3.5	0.61	0.73	0.61	43.2
32b	R3	2	0.0	0.096	10.7	LOS A	0.5	3.5	0.61	0.73	0.61	43.2
32u	U	1	0.0	0.096	12.4	LOS A	0.5	3.5	0.61	0.73	0.61	44.8
Approach		74	0.0	0.096	8.6	LOS A	0.5	3.5	0.61	0.73	0.61	39.7
All Vehicles		1141	2.6	0.404	6.8	LOS A	2.6	18.8	0.51	0.65	0.51	40.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

MOVEMENT SUMMARY

Site: 101 [2032PM | DEV]

P4398
Sutherland Street / Pearl Street
2032PM DEV
Site Category: (None)
Roundabout

Movement Performance - Vehicles

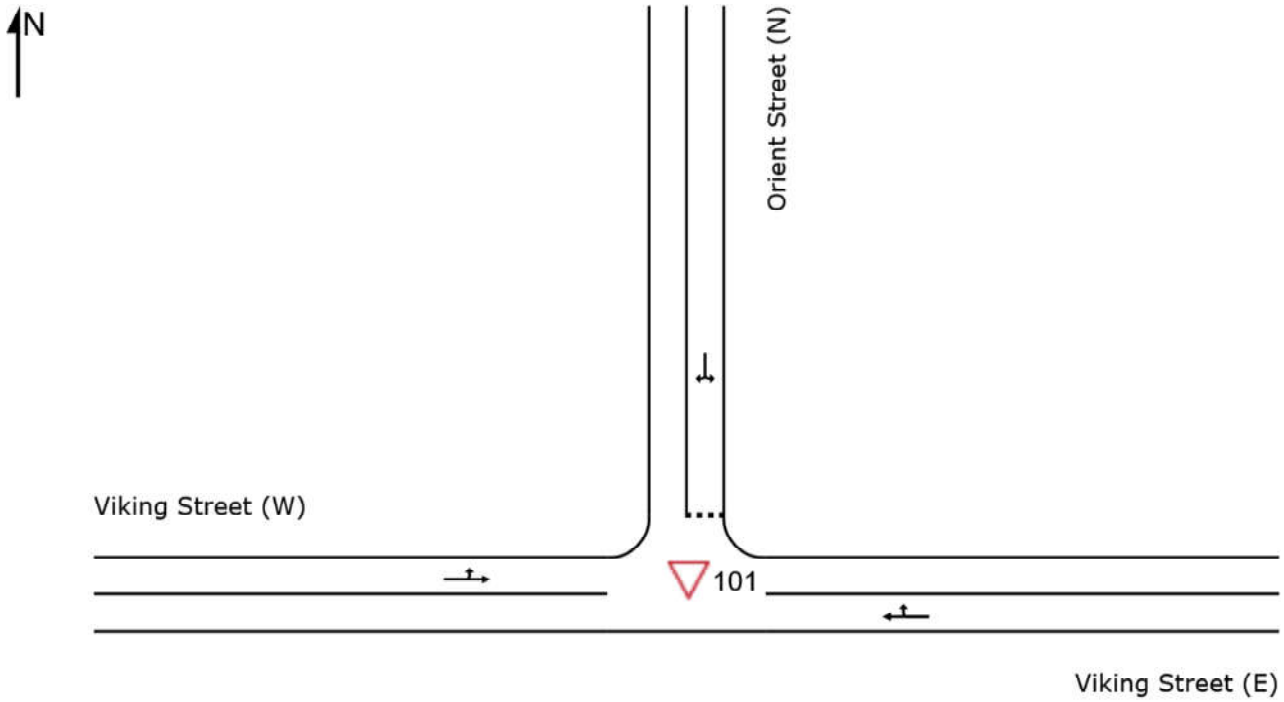
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Seaview Street (S)												
1b	L3	1	0.0	0.131	8.7	LOS A	0.7	5.1	0.65	0.73	0.65	42.5
1	L2	62	2.0	0.131	8.4	LOS A	0.7	5.1	0.65	0.73	0.65	39.6
2	T1	23	0.0	0.131	7.8	LOS A	0.7	5.1	0.65	0.73	0.65	40.3
3	R2	8	0.0	0.131	10.5	LOS A	0.7	5.1	0.65	0.73	0.65	44.1
3u	U	1	0.0	0.131	12.9	LOS A	0.7	5.1	0.65	0.73	0.65	46.7
Approach		96	1.3	0.131	8.5	LOS A	0.7	5.1	0.65	0.73	0.65	40.3
East: Sutherland Street (E)												
4	L2	14	0.0	0.318	6.8	LOS A	1.7	12.2	0.57	0.69	0.57	44.8
4a	L1	25	0.0	0.318	5.8	LOS A	1.7	12.2	0.57	0.69	0.57	44.8
5	T1	229	3.0	0.318	6.1	LOS A	1.7	12.2	0.57	0.69	0.57	41.7
6	R2	18	0.0	0.318	8.7	LOS A	1.7	12.2	0.57	0.69	0.57	42.5
6u	U	1	0.0	0.318	11.1	LOS A	1.7	12.2	0.57	0.69	0.57	48.8
Approach		287	2.4	0.318	6.3	LOS A	1.7	12.2	0.57	0.69	0.57	42.2
North: Seaview Street (N)												
7	L2	72	3.0	0.407	6.9	LOS A	2.6	18.9	0.59	0.72	0.59	41.0
8	T1	54	0.0	0.407	6.2	LOS A	2.6	18.9	0.59	0.72	0.59	41.1
9a	R1	21	5.0	0.407	8.4	LOS A	2.6	18.9	0.59	0.72	0.59	38.7
9	R2	233	3.0	0.407	9.0	LOS A	2.6	18.9	0.59	0.72	0.59	35.4
9u	U	3	0.0	0.407	11.3	LOS A	2.6	18.9	0.59	0.72	0.59	14.4
Approach		382	2.7	0.407	8.2	LOS A	2.6	18.9	0.59	0.72	0.59	37.2
West: Pearl Street (W)												
10	L2	38	6.0	0.251	3.9	LOS A	1.5	10.8	0.27	0.50	0.27	36.6
11	T1	163	5.0	0.251	3.2	LOS A	1.5	10.8	0.27	0.50	0.27	42.5
12	R2	39	0.0	0.251	5.8	LOS A	1.5	10.8	0.27	0.50	0.27	41.9
12b	R3	32	0.0	0.251	6.4	LOS A	1.5	10.8	0.27	0.50	0.27	41.2
12u	U	38	3.0	0.251	9.4	LOS A	1.5	10.8	0.27	0.50	0.27	44.0
Approach		309	3.7	0.251	4.7	LOS A	1.5	10.8	0.27	0.50	0.27	42.0
SouthWest: Boomerang Street (SW)												
30b	L3	46	0.0	0.097	8.4	LOS A	0.5	3.5	0.62	0.73	0.62	38.4
30a	L1	7	0.0	0.097	7.1	LOS A	0.5	3.5	0.62	0.73	0.62	38.2
32a	R1	17	0.0	0.097	9.4	LOS A	0.5	3.5	0.62	0.73	0.62	43.2
32b	R3	2	0.0	0.097	10.7	LOS A	0.5	3.5	0.62	0.73	0.62	43.1
32u	U	1	0.0	0.097	12.4	LOS A	0.5	3.5	0.62	0.73	0.62	44.8
Approach		74	0.0	0.097	8.6	LOS A	0.5	3.5	0.62	0.73	0.62	39.7
All Vehicles		1148	2.6	0.407	6.8	LOS A	2.6	18.9	0.51	0.65	0.51	40.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

SITE LAYOUT

Site: 101 [Viking Street / Orient Street Intersection Layout]

P4398
Viking Street / Orient Street
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 101 [2022AM | BG]

P4398
Viking Street / Orient Street
2022AM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Viking Street (E)												
5	T1	200	3.0	0.109	0.1	LOS A	0.1	0.6	0.05	0.03	0.05	49.3
6	R2	12	0.0	0.109	5.4	LOS A	0.1	0.6	0.05	0.03	0.05	48.1
Approach		212	2.8	0.109	0.4	NA	0.1	0.6	0.05	0.03	0.05	49.2
North: Orient Street (N)												
7	L2	35	3.0	0.051	5.3	LOS A	0.2	1.3	0.32	0.57	0.32	42.9
9	R2	22	0.0	0.051	6.3	LOS A	0.2	1.3	0.32	0.57	0.32	44.5
Approach		57	1.8	0.051	5.7	LOS A	0.2	1.3	0.32	0.57	0.32	43.6
West: Viking Street (W)												
10	L2	18	0.0	0.114	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.0
11	T1	203	7.0	0.114	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.4
Approach		221	6.4	0.114	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.3
All Vehicles		489	4.3	0.114	1.0	NA	0.2	1.3	0.06	0.10	0.06	48.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [2022AM | DES]

P4398
Viking Street / Orient Street
2022AM DES
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Viking Street (E)												
5	T1	200	3.0	0.134	0.3	LOS A	0.3	2.5	0.16	0.11	0.16	47.8
6	R2	46	0.0	0.134	5.4	LOS A	0.3	2.5	0.16	0.11	0.16	46.9
Approach		246	2.4	0.134	1.2	NA	0.3	2.5	0.16	0.11	0.16	47.6
North: Orient Street (N)												
7	L2	35	3.0	0.053	5.3	LOS A	0.2	1.3	0.33	0.57	0.33	42.8
9	R2	22	0.0	0.053	6.6	LOS A	0.2	1.3	0.33	0.57	0.33	44.4
Approach		57	1.8	0.053	5.8	LOS A	0.2	1.3	0.33	0.57	0.33	43.6
West: Viking Street (W)												
10	L2	19	0.0	0.121	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.0
11	T1	215	7.0	0.121	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.4
Approach		234	6.4	0.121	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.3
All Vehicles		537	4.1	0.134	1.3	NA	0.3	2.5	0.11	0.13	0.11	47.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2022PM | BG]

P4398
Viking Street / Orient Street
2022PM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Viking Street (E)												
5	T1	153	1.0	0.084	0.1	LOS A	0.1	0.6	0.05	0.04	0.05	49.1
6	R2	13	0.0	0.084	5.1	LOS A	0.1	0.6	0.05	0.04	0.05	48.0
Approach		165	0.9	0.084	0.4	NA	0.1	0.6	0.05	0.04	0.05	49.0
North: Orient Street (N)												
7	L2	35	6.0	0.053	5.1	LOS A	0.2	1.4	0.27	0.55	0.27	42.9
9	R2	27	0.0	0.053	5.8	LOS A	0.2	1.4	0.27	0.55	0.27	44.6
Approach		62	3.4	0.053	5.4	LOS A	0.2	1.4	0.27	0.55	0.27	43.8
West: Viking Street (W)												
10	L2	11	0.0	0.083	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.1
11	T1	154	3.0	0.083	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.5
Approach		164	2.8	0.083	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.5
All Vehicles		392	2.1	0.084	1.2	NA	0.2	1.4	0.06	0.12	0.06	48.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2022PM | DES]

P4398
Viking Street / Orient Street
2022PM DES
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Viking Street (E)												
5	T1	153	1.0	0.097	0.2	LOS A	0.2	1.5	0.11	0.09	0.11	48.2
6	R2	31	0.0	0.097	5.2	LOS A	0.2	1.5	0.11	0.09	0.11	47.2
Approach		183	0.8	0.097	1.0	NA	0.2	1.5	0.11	0.09	0.11	48.0
North: Orient Street (N)												
7	L2	35	6.0	0.055	5.2	LOS A	0.2	1.4	0.29	0.56	0.29	42.8
9	R2	27	0.0	0.055	6.0	LOS A	0.2	1.4	0.29	0.56	0.29	44.6
Approach		62	3.4	0.055	5.5	LOS A	0.2	1.4	0.29	0.56	0.29	43.7
West: Viking Street (W)												
10	L2	12	0.0	0.092	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.1
11	T1	169	3.0	0.092	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.5
Approach		181	2.8	0.092	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.5
All Vehicles		426	2.0	0.097	1.4	NA	0.2	1.5	0.09	0.14	0.09	47.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2032AM | BG]

P4398
Viking Street / Orient Street
2032AM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Viking Street (E)												
5	T1	234	3.0	0.126	0.1	LOS A	0.1	0.7	0.04	0.03	0.04	49.4
6	R2	12	0.0	0.126	5.5	LOS A	0.1	0.7	0.04	0.03	0.04	48.2
Approach		245	2.9	0.126	0.3	NA	0.1	0.7	0.04	0.03	0.04	49.3
North: Orient Street (N)												
7	L2	35	3.0	0.054	5.4	LOS A	0.2	1.4	0.35	0.58	0.35	42.8
9	R2	22	0.0	0.054	6.7	LOS A	0.2	1.4	0.35	0.58	0.35	44.4
Approach		57	1.8	0.054	5.9	LOS A	0.2	1.4	0.35	0.58	0.35	43.5
West: Viking Street (W)												
10	L2	18	0.0	0.131	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.1
11	T1	236	7.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.5
Approach		254	6.5	0.131	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.4
All Vehicles		556	4.4	0.131	0.9	NA	0.2	1.4	0.06	0.09	0.06	48.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2032AM | DES]

P4398
Viking Street / Orient Street
2032AM DES
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Viking Street (E)												
5	T1	234	3.0	0.159	0.3	LOS A	0.4	3.2	0.18	0.11	0.18	47.6
6	R2	56	0.0	0.159	5.6	LOS A	0.4	3.2	0.18	0.11	0.18	46.8
Approach		289	2.4	0.159	1.4	NA	0.4	3.2	0.18	0.11	0.18	47.4
North: Orient Street (N)												
7	L2	35	3.0	0.057	5.4	LOS A	0.2	1.4	0.36	0.60	0.36	42.7
9	R2	22	0.0	0.057	7.1	LOS A	0.2	1.4	0.36	0.60	0.36	44.3
Approach		57	1.8	0.057	6.1	LOS A	0.2	1.4	0.36	0.60	0.36	43.4
West: Viking Street (W)												
10	L2	22	0.0	0.141	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.0
11	T1	251	7.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.4
Approach		273	6.4	0.141	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.3
All Vehicles		619	4.1	0.159	1.4	NA	0.4	3.2	0.12	0.13	0.12	47.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2032PM | BG]

P4398
Viking Street / Orient Street
2032PM BG
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Viking Street (E)												
5	T1	178	1.0	0.097	0.1	LOS A	0.1	0.7	0.05	0.04	0.05	49.2
6	R2	13	0.0	0.097	5.2	LOS A	0.1	0.7	0.05	0.04	0.05	48.0
Approach		191	0.9	0.097	0.4	NA	0.1	0.7	0.05	0.04	0.05	49.1
North: Orient Street (N)												
7	L2	35	6.0	0.055	5.2	LOS A	0.2	1.4	0.29	0.56	0.29	42.8
9	R2	27	0.0	0.055	6.0	LOS A	0.2	1.4	0.29	0.56	0.29	44.5
Approach		62	3.4	0.055	5.6	LOS A	0.2	1.4	0.29	0.56	0.29	43.7
West: Viking Street (W)												
10	L2	11	0.0	0.094	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.1
11	T1	176	3.0	0.094	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.6
Approach		186	2.8	0.094	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.5
All Vehicles		439	2.1	0.097	1.1	NA	0.2	1.4	0.06	0.11	0.06	48.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [2032PM | DES]

P4398
Viking Street / Orient Street
2032PM DES
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Viking Street (E)												
5	T1	178	1.0	0.114	0.2	LOS A	0.3	1.9	0.13	0.10	0.13	48.0
6	R2	37	0.0	0.114	5.3	LOS A	0.3	1.9	0.13	0.10	0.13	47.1
Approach		215	0.8	0.114	1.1	NA	0.3	1.9	0.13	0.10	0.13	47.9
North: Orient Street (N)												
7	L2	35	6.0	0.057	5.3	LOS A	0.2	1.5	0.32	0.57	0.32	42.7
9	R2	27	0.0	0.057	6.3	LOS A	0.2	1.5	0.32	0.57	0.32	44.5
Approach		62	3.4	0.057	5.7	LOS A	0.2	1.5	0.32	0.57	0.32	43.6
West: Viking Street (W)												
10	L2	14	0.0	0.106	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.1
11	T1	197	3.0	0.106	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.5
Approach		211	2.8	0.106	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.5
All Vehicles		487	2.0	0.114	1.3	NA	0.3	1.9	0.10	0.13	0.10	47.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix G: Parking Survey Data

Street Section ID	Tuesday 19th November 2019			7:00 AM		8:00 AM		9:00 AM		10:00 AM		11:00 AM		12:00 PM		1:00 PM		2:00 PM		3:00 PM		4:00 PM		Average Spaces Occupied	Max Spaces Occupied
	Description	Allocation	Supply	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%		
13	Omar St between Seaview St & Orient Ln	No restrictions	6	4	67%	4	67%	3	50%	4	67%	4	67%	4	67%	4	67%	3	50%	4	67%	4	67%	4	4
14	Omar St between Orien Ln & Orient St	No restrictions	6	2	33%	3	50%	3	50%	3	50%	3	50%	3	50%	3	50%	4	67%	3	50%	2	33%	3	4
15	Omar St between Orient Ln & Seaview St	No restrictions	9	1	11%	2	22%	2	22%	2	22%	2	22%	3	33%	3	33%	2	22%	2	22%	2	22%	2	3
16	Omar St between Orient St & Orient Ln	No restrictions	6	0	0%	0	0%	0	0%	0	0%	1	17%	1	17%	1	17%	0	0%	0	0%	0	0%	0	1
17	Orient St between #31 and Omar St	No restrictions	13	2	15%	2	15%	2	15%	3	23%	3	23%	2	15%	2	15%	2	15%	2	15%	2	15%	2	3
18	Orient St between School Ln & #32	No restrictions	26	1	4%	6	23%	6	23%	7	27%	7	27%	5	19%	5	19%	6	23%	4	15%	4	15%	5	7
19	Orient St between School Ln & #33	Bus - 8-9am & 2:30-3:30pm	2	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0
20	Orient St between School Ln & #34	5Min - 8-9:30am & 2:30-3:30pm	12	0	0%	4	33%	1	8%	3	25%	1	8%	2	17%	2	17%	1	8%	0	0%	1	8%	2	4
21	Orient St between Sutherland St & School Ln	No restrictions	5	0	0%	1	20%	1	20%	1	20%	1	20%	1	20%	1	20%	1	20%	1	20%	0	0%	1	1
22	Omar St between Omar St & Sutherland St	No restrictions	16	5	31%	10	63%	11	69%	9	56%	6	38%	7	44%	6	38%	8	50%	7	44%	7	44%	8	11
23	Public School Carpark	No restrictions	31	0	0%	20	65%	25	81%	25	81%	24	77%	25	81%	25	81%	24	77%	23	74%	6	19%	20	25
24	Public School Carpark	Accessible	1	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0
25	Sutherland St between Hungerford Ln & Orient St	No restrictions	8	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0
27	Sutherland St between Orient St & Hungerford Ln	No restrictions	11	8	73%	8	73%	7	64%	6	55%	5	45%	8	73%	9	82%	8	73%	5	45%	4	36%	7	9
28	Sutherland St between Hungerford Ln & Orient St	No restrictions	19	1	5%	2	11%	2	11%	2	11%	2	11%	2	11%	2	11%	2	11%	2	11%	1	5%	2	2
29	Sutherland St between Hungerford Ln & Orient St	Bus	2	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0
30	Sutherland St between Hungerford Ln & Orient St	5Min - 8-9:30am & 2:30-3:30pm	7	0	0%	2	29%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	2
31	Sutherland St between Hungerford Ln & Orient St	No restrictions	5	1	20%	3	60%	4	80%	4	80%	4	80%	4	80%	4	80%	3	60%	3	60%	0	0%	3	4
Grand Total			185	25	14%	67	36%	67	36%	69	37%	63	34%	67	36%	67	36%	64	35%	56	30%	33	18%	58	69