STANBURY
TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

PARKING & TRAFFIC IMPACT ASSESSMENT

PROPOSED ALTERATIONS AND ADDITIONS TO
ST IVES HIGH SCHOOL
88 YARRABUNG ROAD
ST IVES

PREPARED FOR JDH ARCHITECTS
OUR REF: 18-051

NOVEMBER 2018

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1. INTRODUCTION

1.1 Scope of Assessment

Stanbury Traffic Planning has been commissioned by JDH Architects to undertake a Parking & Traffic Impact Assessment to accompany a Development Application with respect to St Ives High School. The Application seeks consent for the following:

- The construction of a two court gymnasium in place of existing open basketball courts situated within the central western portion of the site; and
- The demolition of an existing single court gymnasium building situated in the central northern portion of the site.

The new enclosed gymnasium is proposed to accommodate school activities during school periods only. No external use of the gymnasium is proposed.

No alterations to the existing student / staff populations are proposed in conjunction with the works.

Further, whilst minor alterations to the existing heavy vehicle servicing arrangements are proposed as a result of new building, no alterations to the existing site access, passenger vehicle circulation and parking arrangements are proposed in conjunction with the works.

The aim of this assessment is to investigate and report upon the potential parking and traffic consequences of the proposal and to recommend appropriate ameliorative measures where required. This report provides the following scope of assessment:

- Section 1 provides a summary of the site location, details, existing and surrounding land-uses;
- Section 2 describes the proposed development and operational characteristics;
- Section 3 assesses the parking considerations of the proposal with respect to the relevant Council specifications and the expected operational requirements;
- Section 4 assesses the traffic considerations of the proposal with respect to the projected traffic generating ability of the proposed development and the ability or otherwise of the surrounding road network to be capable of accommodating the altered demand in a safe and efficient manner; and
- Section 5 provides an indicative assessment of the traffic and pedestrian management measures likely to be implemented during the construction phases of the development.

The report has been prepared pursuant to State Environmental Planning Policy (Infrastructure) 2007.

1.2 Reference Documents

Reference is made to the following documents throughout this report:

- Ku-ring-gai Council's *Ku-ring-gai Development Control Plan* (Ku-ring-gai DCP);
- The Roads & Maritime Services' *Guide to Traffic Generating Developments*; and
- Transport for NSW's *Guide to Transport Impact Assessments*.

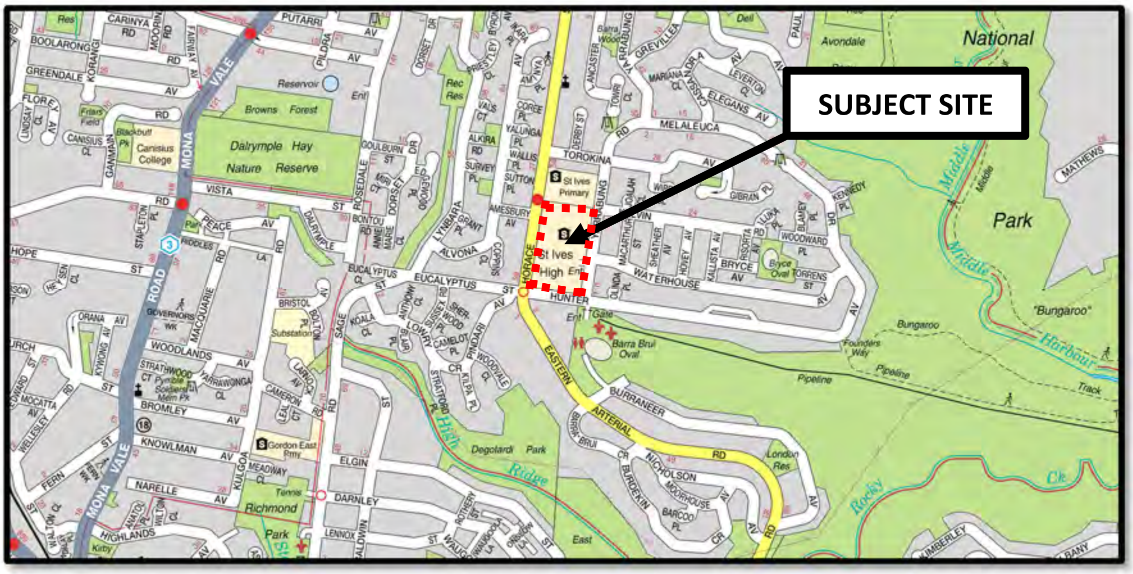
Architectural plans have been prepared by JDH Architects, reduced copies of a selection of which are attached as **Appendix 1**.

1.3 Site Details

1.3.1 Site Location

The site is located on the western side of Yarrabung Road and also provides frontages to Horace Street and Hunter Avenue, St Ives. The site location is illustrated below and overleaf within a local and aerial context by **Figure 1** and **Figure 2**, respectively.

<u>FIGURE 1</u>
<u>SITE LOCATION WITHIN A LOCAL CONTEXT</u>



Source: UBD Australian City Streets (Version 4)

FIGURE 2
SITE LOCATION WITHIN AN AERIAL CONTEXT

Source: Google Earth (accessed 08/11/18)

1.3.2 Site Description

The site provides a street address of 88 Yarrabung Road, St Ives.

The site provides a predominantly rectangular shaped parcel of land providing approximate frontages of 300m to both Yarrabung Road and Horace Street and 180m to Hunter Avenue.

The land falls from north to south facilitating a height differential of approximately 20m between the north-western corner and the southern boundary.

1.3.3 Existing Use

The subject site currently accommodates St Ives High School accommodating a student population of 947 students between Year 7 and Year 12 (comprising 146 Year 12 students) in conjunction with 85 staff (comprising both teaching and support staff).

The school comprises a total of eight buildings and a covered outdoor learning area largely situated within the northern portion of the site including various classroom buildings, an administration building, gymnasium and a hall.

The school also comprises a series of paved, grassed and synthetic play / sports areas primarily situated within the southern portion of the site including two basketball courts, a number of sports fields / courts of varying sizes as well cricket nets.

The school is serviced by a series of formal and informal on-site passenger vehicle parking areas, as follows:

- An L-shaped largely gravel and hardstand parking area is situated to the east and south of Building G and to the south of Building D, capable of accommodating 25 passenger vehicles;

- A rectangular handstand parking area is situated adjacent to the western boundary to the west of the existing open basketball courts, capable of accommodating 22 passenger vehicles in a formal manner in conjunction with a further 8 vehicles in an informal manner;

- An informal parking area is situated within the north-western corner of the site, capable of accommodating up to 30 parked passenger vehicles; and

- A rectangular hardstand parking area is situated within the north-eastern corner of the site, capable of accommodating 18 passenger vehicles.

The site therefore currently provides an on-site passenger vehicle parking capacity of 103 vehicles. All on-site passenger vehicle parking is specifically allocated to staff of the school.

A heavy vehicle servicing and turnaround area is situated at the western end of the first of the abovementioned passenger vehicle parking areas, situated to the south of Building B. This servicing area accommodates delivery and refuse collection activity by vehicles up to and including Medium Rigid Vehicles (MRVs).

No on-site parent vehicle parking is provided for student set-down / pick-up activity.

Each of the four abovementioned on-site parking areas are separately serviced by access driveways connecting with Yarrabung Road and Horace Street in the central-eastern, central-southern, north-western and north-eastern corners of the site.

Pedestrian access to the site is provided via two gates, one connecting with the western Yarrabung Road approximately midway between Kelvin Road and Waterhouse Avenue and one connecting with the eastern Horace Street footpath approximately opposite Amesbury Avenue.

1.3.4 Surrounding Land Uses

St Ives Primary School abuts the site to the north.

Largely detached residential dwellings are situated to the east, south and west of the site, on the opposite side of Yarrabung Road, Hunter Avenue and Horace Street, respectively.

2. DESCRIPTION OF PROPOSAL

2.1 Built Form

The Application seeks consent for the following:

- The construction of a gymnasium in place of existing open double basketball courts situated within the central western portion of the site, comprising the following:

  - Two sports (basketball and / or netball) courts;
  - Staff and store rooms;
  - A canteen;
  - Change rooms and amenities; and
  - Fitness learning rooms.

- The demolition of an existing single court gymnasium building (Building B) and the provision of landscaping in its place.

The new enclosed gymnasium is proposed to accommodate school activities (which are currently accommodated within the existing gymnasium) during school periods only.

2.2 Site Access

No changes are proposed to the existing pedestrian or vehicular access arrangements.

2.3 Internal Circulation, Servicing and Parking Provision

No alterations to the existing passenger vehicle internal circulation and parking provision are proposed.

Notwithstanding the above, the proposed new gymnasium building is proposed to partially encroach upon an existing service heavy vehicle turnaround area situated to the south of Building B necessitating a minor alteration to the existing turnaround design. Swept path plans demonstrating the ability of the amended turnaround area to accommodate vehicles up to and including MRVs have been prepared by this Practice and are included as **Appendix 2**.

2.4 Site Population

The school currently accommodates the following population:

- 947 students between Year 7 - 12 (comprising 146 Year 12 students); and

- 85 staff (comprising both teaching and support staff).

No alterations to the existing student / staff populations are proposed in conjunction with the works.

3. PARKING CONSIDERATIONS

3.1 Existing Parking & Student Set-Down / Pick-up Provision

3.1.1 On-Site Parking

The school is currently serviced by formal and informal off-street parking areas, collectively capable of accommodating up to 103 passenger vehicles, specifically allocated for staff use.

No on-site parking is provided for students or parents associated with student set-down or pick-up.

3.1.2 Student Set-Down / Pick-Up

Student set-down and pick-up by parent vehicles largely occurs in a casual manner throughout the surrounding road network. Notwithstanding this, the following formalised set-down / pick-up areas are located within the immediate vicinity of the site:

- 'No Parking' restrictions apply along the western side of Yarrabung Road to the north of the school, immediately adjacent to St Ives Primary School, capable of accommodating up to 13 vehicles at any one time and being applicable between 8:00am – 9:30am and 2:30pm – 4:00pm school days; and

- Short sections of 'No Parking' restrictions apply along both sides of Amesbury Avenue on immediate approach to Horace Street, capable of accommodating up to two vehicles at any one time and being applicable between 2:30pm – 3:30pm school days.

3.1.3 On-Street Parking

On-street parking is available within the immediate vicinity of the school as follows:

- Two sections of unrestricted parking (on either side of a Bus Zone) are available along the eastern side of Yarrabung Road between Kevin Road and Waterhouse Avenue, capable of accommodating up to 15 vehicles at any one time;

- Unrestricted parking is available on the western side of Yarrabung Road between Waterhouse Avenue and Hunter Avenue, capable of accommodating up to 19 vehicles at any one time;

- Unrestricted parking is available on the eastern side of Horace Street between Amesbury Avenue and Hunter Avenue, capable of accommodating up to 25 vehicles at any one time; and

- Unrestricted parking is available on the western side of Horace Street between Amesbury Avenue and Eucalyptus Street, capable of accommodating up to 19 vehicles at any one time.

3.1.4 Bus Set-Down / Pick-Up

The following bus set-down / pick-up areas are provided in the immediate vicinity of the site:

- A 160m long 'Bus Zone' is provided on the western side of Yarrabung Road adjacent to the northern portion of the site, approximately 120m of which is indented. The 'Bus Zone' is largely operational between 8:30am – 9:30am and 3:00pm – 4:00pm on school days, with the exception of the northern-most 20m, which is operational full time;

- A 30m long full time 'Bus Zone' is provided on the eastern side of Yarrabung Road approximately opposite the abovementioned indented bus bay;

- A 30m long full time 'Bus Zone' is provided on the eastern side of Horace Street immediately to the north of Amesbury Avenue; and

- A public bus stop is located on the western side of Horace Street, approximately 100m to the north of Amesbury Avenue.

3.2 Existing Parking & Student Set-Down / Pick-up Demand

3.2.1 On-Site Parking

Observations have indicated that the on-site staff car parking areas accommodate a peak parking demand of up to 80 vehicles during operational periods of the school, being demand generated by the staff. Such a peak parking demand represents approximately 80% of the total on-site parking supply.

3.2.2 Bus Zone

This Practice commissioned the surveys of the formalised student set-down / pick-up activity of the bus zones in the vicinity of the site presented within Section 3.1.4 of this report, as follows:

- Area 1 – the eastern side of Yarrabung Road, between Kelvin Road and Warehouse Avenue;

- Area 2 – the western side of Yarrabung Road, between Waterhouse Avenue and Kelvin Road;

- Area 3 – the eastern side of Horace Street to the north of Amesbury Avenue; and

- Area 4 – the western side of Horace Street to the north of Amesbury Avenue.

Surveys were undertaken between 8:00am – 9:30am as well as 2:30pm – 4:00pm on the 29th of October 2018, in order to capture peak student set-down / pick-up activity.

Table 1 below provides a summary of the survey results, whilst full details are contained within **Appendix 3** for reference.

TABLE 1 EXISTING SCHOOL STUDENT BUS UTILISATION				
Area	**AM Period**		**PM Period**	
	Number of Buses	**Number of Students**	**Number of Buses**	**Number of Students**
1	2	8	1	3
2	8	269	7	380
3	8	127	1	3
4	3	7	4	20
Total	**21**	**538**	**13**	**406**

Table 1 indicates the following:

- A significant percentage (approximately half) of the total student population catch buses to travel to and from school;
- The western side of Yarrabung Road was surveyed to accommodate the majority of the bus set-down / pick-up demand during both the morning and afternoon peak periods;
- Notwithstanding the above, a notable number of students were set-down by buses on the eastern side of Horace Street; and
- Student utilisation of the bus stops on the eastern side of Yarrabung Road and the western side of Horace Street was surveyed to be very low.

3.2.3 On-Street Parking

Observational surveys were undertaken by staff of this Practice on the demand of the unrestricted on-street parking areas in the vicinity of the site presented within Section 3.1.3 of this report, as follows:

- Area 1 – the eastern side of Yarrabung Road, between Kelvin Road and Warehouse Avenue;
- Area 2 – the western side of Yarrabung Road, between Waterhouse Avenue and Hunter Avenue;
- Area 3 – the eastern side of Horace Street between Hunter Avenue and Amesbury Avenue; and
- Area 4 – the western side of Horace Street between Eucalyptus Avenue and Amesbury Avenue.

Observational surveys were undertaken at 8:50am (school start), midday and 3:15pm (school finish) on the 8th of November 2018, in order to capture demands during the operational periods of the school.

Table 2 below provides a summary of the survey results.

TABLE 2 EXISTING ON-STREET PARKING DEMAND				
Time	**Area 1 Capacity = 15**	**Area 2 Capacity = 19**	**Area 3 Capacity = 25**	**Area 4 Capacity = 19**
8:50am	9	6	6	2
12:00pm	11	6	0	0
3:15pm	13	7	14	8

Table 2 indicates the following:

- The maximum surveyed parking demand within the unrestricted parking areas in Yarrabung Road was 60% of the total capacity during school operational periods; and

- The maximum surveyed parking demand within the unrestricted parking areas in Horace Street was 50% of the total capacity during school operational periods.

3.3 Council Parking Requirements

Ku-ring-gai Council relies on Ku-ring-gai DCP 2018 for locally sensitive parking requirements for the subject site. Ku-ring-gai DCP provides the following parking requirements for educational establishments relating to the subject proposal:

1 space per employee, plus
1 space per 8 students year 12 students

Application of Ku-ring-gai DCP parking requirements to the existing school population of 85 employees and 147 Year 12 students results in the following calculation:

(85 x 1) + (147 / 8) = 104 spaces

The existing school, providing an on-site parking capacity of 103 vehicles, is therefore comparable to the parking requirements specified within Ku-ring-gai DCP.

The above parking requirement of 104 spaces incorporates demand for 19 parked vehicles associated with students of driving age. The school however does not allow students to park within the site, thereby relying on the surrounding road network to accommodate such demand.

Further to the above parking requirements, Ku-ring-gai DCP also specifies that provision should be made for the picking-up and setting-down of students. Similarly to that mentioned above with respect to student parking, as the school does not allow parent vehicles to park within the site, the surrounding public road network is relied upon for parent set-down / pick-up activity.

3.4 Discussion on Projected Parking & Set-Down / Pick-Up Conditions

3.4.1 On-Site Parking

The existing capacity of the site to accommodate up to 103 parked passenger vehicles is comparable to the requirements of Ku-ring-gai DCP to provide 104 spaces, being that generated by staff and students of driving age. Notwithstanding this, as the school only permits staff parking to occur on-site, observations have indicated that the on-site parking areas provide notable capacity to accommodate additional demand, should it be demanded in the future.

The subject proposal does not involve alterations to the existing school student or staff population, nor the existing operational characteristics. It is accordingly not expected that the proposal will result in any alterations, and thus impacts, to the existing on-site parking demand / conditions.

3.4.2 Bus Utilisation

It has previously been presented that the school is particularly well serviced by bus services within both Yarrabung Road and Horace Street. The well utilised indented bus bay along the western side of Yarrabung Road directly adjacent to the school is supervised during school start and finish periods by staff of the school to maximise the efficiency with which students enter and exit buses, ensuring that there is no undesirable queuing of buses outside of the indented bus bay.

The subject proposal does not involve alterations to the existing school student or staff population, nor the existing operational characteristics. It is accordingly not expected that the proposed will result in any alterations, and thus impacts, to the existing bus utilisation / conditions.

3.4.3 On-Street Parking

It has previously been presented that the school relies on surrounding on-street parking areas to accommodate student parking and the setting-down / picking-up of students by parent vehicles. Recent observations has indicated that whilst demand for parking within Yarrabung Road adjacent to the southern portion of the site is notable during peak school operational periods, there is capacity to accommodate additional demand, should it be required. Further, parking demand within Horace Street adjacent to the southern portion of the site is particularly low and capable of accommodating additional demand.

The subject proposal does not involve alterations to the existing school student or staff population, nor the existing operational characteristics. It is accordingly not expected that the proposed will result in any alterations, and thus impacts, to the existing on-street parking utilisation / conditions.

4. TRAFFIC CONSIDERATIONS

4.1 Surrounding Road Network Function and Controls

The following provides a description of the surrounding road network:

- **Yarrabung Road** performs a local access function, providing a connection between Killeaton Street in the north and Hunter Street in the south.

  Yarrabung Road primarily provides a 10m wide pavement providing one through lane of traffic in each direction in conjunction with parallel parking along one or both alignments. The Yarrabung Road pavement widens to approximately 13m adjacent to the northern portion of the site, facilitating the provision of an indented bus bay along the western kerb alignment.

  Traffic flow within Yarrabung Road in the vicinity of the site is governed by a sign posted speed limit of 50km/h, however a 40km/h school zone speed limit applies in the vicinity of the site during prescribed school start and finish periods.

  Yarrabung Road forms a T-junction with Hunter Avenue adjacent to the south-eastern corner of the site operating under 'Stop' signage control with Hunter Avenue performing the priority route. Yarrabung Road forms junctions with Waterhouse Avenue and Kelvin Road adjacent to the site, operating under major / minor priority control, with Yarrabung Road performing the priority route in both instances. To the north of the site, Yarrabung Road intersects with Torokina Avenue under 'Stop' sign control with Yarrabung Road again performing the priority route.

  Further to the north, Yarrabung Road curves to the east to form Melaleuca Drive, at which point it forms a junction, the northern approach of which continuing as Yarrabung Road.

- **Hunter Avenue** performs a local collector function connecting the southern portion of the surrounding educational and residential precinct to the Horace Street / Eastern Arterial Road regional route, with which it intersects under dual lane circulating roundabout control (with Eucalyptus Street forming the western approach) adjacent to the south-western corner of the site.

  Hunter Avenue provides a 9m wide pavement adjacent to the site, whereby a single lane of traffic flow in each directional is separated by a double barrier centre line. The double barrier centre line is off-set to the north, resulting in kerb-side parking being prohibited along the northern kerb alignment. To the east of Yarrabung Road, no centre line marking is provided, thereby allowing kerb-side parking to occur along both Hunter Avenue kerb alignments in conjunction with two-way traffic flow.

  Traffic flow within Hunter Avenue in the vicinity of the site is governed by a sign posted speed limit of 50km/h, however a 40km/h school zone speed limit applies in the vicinity of the site during prescribed school start and finish periods.

- **Horace Street** performs a regional road function under the care and control of Ku-ring-gai Council. With Link Road, it provides a northerly connection to Mona Vale Road, with which it intersects under traffic signal control, thence continuing to the north to form Killeaton Street / Burns Road. Horace Street, with Eastern Arterial Road and Archibold Road, provides southerly connection to Boundary Street at Roseville, also intersecting under traffic signal control.

  Horace Street forms a 13m wide pavement providing at two lanes in each direction. Kerb-side parallel parking in conjunction with bus stops in some locations however restricts through traffic to one lane in each direction.

  Traffic flow within Horace Street in the vicinity of the site is governed by a sign posted speed limit of 60km/h, however a 40km/h school zone speed limit applies in the vicinity of the site during prescribed school start and finish periods.

  Horace Street forms T-junctions with Amesbury Avenue and Torokina Avenue adjacent and to the north of the site respectively under major / minor priority control with Horace Street performing the priority route. Further to the north, Horace Street forms an intersection with Stanley Street operating under two lane circulating roundabout control, with the northern approach forming Link Road.

- **Torokina Avenue** performs a local access cul-de-sac function, providing a secondary connection between the surrounding residential / educational precinct and Horace Street. Right turn movements at the junction of Horace Street and Torokina Avenue are prohibited, with the exception of buses turning from Torokina Avenue.

  Torokina Avenue provides an 8m wide pavement providing one through lane of traffic in each direction. Between Horace Street and Yarrabung Road, kerb-side parking is unrestricted along one side and 'No Parking' restrictions apply along the other during school start and finish periods. To the east of Yarrabung Road, parallel parking is unrestricted along both kerb alignments.

  Traffic flow within Torokina Avenue is governed by a sign posted speed limit of 50km/h, however a 40km/h school zone speed limit applies between Horace Street and Yarrabung Road during prescribed school start and finish periods.

4.2 Existing Traffic Volumes

This Practice has commissioned the undertaking of morning and afternoon peak period traffic surveys of the following intersections in order to accurately ascertain traffic existing demands within the immediate precinct:

- The intersection of Yarrabung Road and Torokina Avenue;

- The junction of Hunter Avenue and Yarrabung Road; and

- The intersection of Horace Street, Hunter Avenue, Eastern Arterial Road and Eucalyptus Street.

Surveys were undertaken between 8:00am – 9:30am and 2:30pm – 4:00pm on the 29th of October in order to capture the peak operational periods of the school.

Table 3 below provides a summary of the surveyed peak hour traffic demands throughout the surrounding public road network, whilst more detailed summaries are provided as **Appendix 4**.

TABLE 3
EXISTING MORINING AND AFTERNOON PEAK HOUR TRAFFIC VOLUMES

Road	AM Peak Hour			PM Peak Hour		
	North / East	South / West	Total	North / East	South / West	Total
Yarrabung Road						
North of Torokina Avenue	199	234	433	208	103	311
South of Torokina Avenue	237	250	487	187	128	315
North of Hunter Avenue	206	254	460	159	143	302
Hunter Avenue						
West of Yarrabung Road	223	307	530	181	167	348
Torokina Avenue						
East of Yarrabung Road	34	47	81	57	48	105
West of Yarrabung Road	96	131	227	99	44	143
Horace Street						
North of Hunter Avenue	838	1234	2072	942	638	1580

Table 2 indicates the following approximate peak hour traffic demands:

- Yarrabung Road accommodates directional traffic demands of 150 - 250 vehicles adjacent to the school;
- Hunter Avenue accommodates directional traffic demands of 150 – 300 vehicles adjacent to the school;
- Torokina Avenue accommodates directional traffic demands of 30 – 130 vehicles adjacent to the school; and
- Horace Street accommodates directional traffic demands of 840 – 1,230 vehicles adjacent to the school.

4.3 Existing Road Network Operation

4.3.1 Local Intersection Operation

The surveyed public road intersections have been analysed utilising the SIDRA computer intersection analysis program in order to objectively assess the operation of the nearby public road network.

SIDRA is a computerised traffic arrangement program which, when volume and geometrical configurations of an intersection are imputed, provides an objective assessment of the operation efficiency under varying types of control (i.e. signs, signal and roundabouts). Key indicators of SIDRA include level of service where results are placed on a continuum from A to F, with A providing the greatest intersection efficiency and therefore being the most desirable by the Roads and Maritime Services.

SIDRA uses detailed analytical traffic models coupled with an iterative approximation method to provide estimates of the abovementioned key indicators of capacity and performance statistics. Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree of saturation. Degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Degree of saturation is a useful and professionally accepted measure of intersection performance.

SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 4** (being the RMS NSW method of calculation of Level of Service).

TABLE 4
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS

Level of Service	Average Delay per Vehicle (secs/veh)	Expected Delay
SIGNALISED INTERSECTIONS AND ROUNDABOUTS		
A	Less than 14	Little or no delay
B	15 to 28	Minimal delay and spare capacity
C	29 to 42	Satisfactory delays with spare capacity
D	43 to 56	Satisfactory but near capacity
E	57 to 70	At capacity, incidents will cause excessive delays
F	> 70	Extreme delay, unsatisfactory
PRIORITY CONTROLLED INTERSECTIONS		
A	Less than 14	Good
B	15 to 28	Acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Near capacity
E	57 to 70	At capacity and requires other control mode
F	> 70	Unsatisfactory and requires other control mode

The existing conditions have been modelled utilising the peak hour traffic volumes presented within **Appendix 4**.

Table 5 overleaf provides a summary of the SIDRA output data whilst more detailed summaries are included as **Appendix5**.

TABLE 5 SIDRA OUTPUT EXISTING WEEKDAY PEAK HOUR PERFORMANCE		
	AM	**PM**
Yarrabung Road & Torokina Avenue		
Delay	8.3	7.2
Degree of Saturation	0.13	0.10
Level of Service	A	A
Hunter Avenue & Yarrabung Road		
Delay	8.9	8.4
Degree of Saturation	0.27	0.14
Level of Service	A	A
Horace Street & Hunter Avenue		
Delay	10.4	7.2
Degree of Saturation	0.87	0.59
Level of Service	A	A

Table 5 indicates that the immediately surrounding public road intersections provide a level of service of A during peak commuter periods, representing good operation with spare capacity. Notwithstanding this, the roundabout controlled intersection of Horace Street, Hunter Avenue, Eastern Arterial Road and Eucalyptus Street provides a high degree of saturation during the morning peak period (associated with significant southbound traffic demands), whereby only limited capacity existed to accommodate additional demand without a notable decrease in operational performance.

4.4 Public Transport

In conjunction with six special school bus services operating via the 'Bus Zones' within Yarrabung Road (servicing Gordon, Pymble and St Ives North) the following public service is provided:

- Route 582 between St Ives and Gordon, providing 30 minute service frequency during weekday commuter peaks, thence extending to 60 minutes during other weekday and Saturday periods and 120 minutes on Sundays.

Further, in conjunction with a single special school bus service operating via the 'Bus Zones' within Horace Street (Turramurra and Gordon via St Ives High School) the following public services are provided:

- Route 194 between St Ives to the City, providing a 10 - 15 minute service frequency during weekday commuter peaks, thence extending to 60 minutes during other weekday and weekend periods;

- Route 582 as above;

- Route 594 between North Turramurra and the City, providing two morning and evening peak weekday services; and

- Route 594H between Hornsby and the City, providing four morning and evening peak weekday services.

4.5 Pedestrian Infrastructure

The following pedestrian access and mobility infrastructure surrounds the subject site:

- A footpath is provided along the western side of Yarrabung Road;
- A footpath is provided along the eastern side of Yarrabung Road between Kelvin Avenue and Torokina Avenue;
- A raised marked pedestrian crossing is provided over Yarrabung Road between Kelvin Avenue and Torokina Avenue;
- A footpath is provided along the southern side of Torokina Avenue;
- A footpath is provided along the eastern side of Horace Street;
- A shared path is provided along the western side of Horace Street;
- A signalised pedestrian crossing is provided over Horace Street between Amesbury Avenue and Torokina Avenue; and
- Pedestrian refuges are provided over Hunter Avenue and Eucalyptus Street at Horace Street.

4.6 Traffic Generation & Impacts

The traffic generating capacity of schools is most directly proportional to the number of students. The subject proposal however does not involve alterations to the existing school student (or staff population), nor the existing operational characteristics. It is accordingly not expected that the proposal will result in any alterations to the existing traffic generating capability of the school. It is accordingly not expected that the application will result in any discernible impacts on the existing operational performance of the surrounding road network, which has previously been presented to be satisfactory.

5. PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

5.1 Introductory Statement

This Section of the report constitutes a preliminary Construction Traffic Management Plan (CTMP) addressing the traffic access and safety issues associated with demolition and construction works associated with the proposal. CTMPs are generally prepared at Construction Certificate stage following the commissioning of a builder thereby allowing a greater appreciation of the likely construction methodology and therefore the required traffic management measures to be implemented.

The terms of the initiatives contained within the following subsections of this report are therefore somewhat generic and some modifications may be needed by or on behalf of the successful builder / civil contractor at Construction Certificate stage depending on their feasibility taking into consideration all project requirements.

5.2 Traffic Management During On-Site Works

The demolition and construction works are likely to be undertaken within two separate stages as follows:

- Stage 1 – construction of new gymnasium building; and
- Stage 2 – demolition of existing gymnasium building.

The scale of the development works are such that they are largely contained within the central northern portion of the site during Stage 1 and the central western portion of the site during Stage 2.

Construction vehicles up to 8.8m long Medium Rigid Vehicles (MRVs) are to access and egress the site via the existing southern-most access driveway connecting with Yarrabung Road, which currently services delivery and refuse collection vehicles of a similar size.

The notable scale of the portion of the site accommodating the construction and demolition activities is such that all required construction vehicle manoeuvring and loading activities will occur on-site. In this regard, it is expected that all construction vehicle access / egress between the site and Yarrabung Road will be undertaken in a forward direction.

A crane situated to the south of Block C will assist in the movement of construction materials between the construction vehicles within the on-site area of work.

Construction offices and amenities are to be situated to the immediate west of the abovementioned crane location.

Construction fencing will be required to be erected around the periphery of the internal work areas to ensure unauthorised pedestrian or vehicle access is avoided and provide appropriate separation of construction activity from ongoing school operation. All fencing and associated footings will be wholly accommodated within the subject site.

5.3 Safe Ingress and Egress of Construction Traffic

Construction vehicles, up to and including MRVs, are to enter and exit the site via the existing southern-most access driveway connecting with Yarrabung Road, approximately central to the site frontage to that road.

All site ingress and egress movements will be undertaken in a forward manner.

All site access / egress movements are to be strictly controlled by appropriately qualified traffic controllers. Traffic controllers are not to stop traffic on the public street to allow trucks to enter or leave the Works Zone/s. They must wait until a suitable gap in traffic flows allows them to assist construction vehicles to enter or exit the Works Zone/s. The Roads Act does not give any special treatment for trucks leaving a Works Zone – the vehicles already on the road have right of way.

No queuing / marshalling of construction vehicles is to occur in any public road.

5.4 Construction Vehicle Transport Routes

Construction vehicles are to access and vacate the subject site utilising Mona Vale Road as the main approach / departure route. The following provides a description of the construction vehicle transit routes:

Inbound Route

Mona Vale Road, right or left turn into Link Road, Horace Street, left turn into Hunter Avenue, left turn in Yarrabung Road and thence a left turn into the subject site.

Outbound Route

Forward right turn movement from the site to Yarrabung Road, right turn into Hunter Avenue, right turn into Horace Street, Link Road and thence a left or right turn into Mona Vale Road.

5.5 Parking Control

All construction employee / tradesperson passenger vehicle parking is to be accommodated off-site within the surrounding public road network. Construction workers / tradespersons will be encouraged to do either of the following when travelling to the site in order to minimise the extent of parking demand:

- Utilise public transport to the site (the site is well serviced by previously presented bus services operating within the subject vicinity); and / or

- Car pool with other construction workers.

The above transport options will form part of the conditions of commissioning when engaging the relevant site workers and as such form part of any site induction process.

5.6 Construction Traffic Generation

The construction works are likely to generate a maximum of four heavy vehicles servicing the site during peak periods, such as concrete pours. During these periods of heavy construction vehicle generation, drivers are to be instructed by radio when to arrive at the site to ensure that there is no vehicle queuing or parking within the adjoining road network. This is to be strictly adhered to.

5.7 Traffic Impact

The recent traffic investigations of the adjoining road network and the analysis contained within previous sections of this report have indicated that motorists are provided with a satisfactory level of service within the immediately adjoining public road network. It is therefore considered that the limited traffic generation associated with the construction activities can be accommodated without any unreasonable impacts on adjoining vehicle movements considering the previously mentioned maximum hourly traffic generation.

Notwithstanding the above, it is recommended that construction vehicle movements to and from the site be eliminated where possible during road peak school operational periods (7:30am – 9:30am and 2:30pm – 4:30pm).

5.8 Impacts on Pedestrians

Pedestrian demands within the adjoining local road network are heavily influenced by the school operation. In this regard, whilst pedestrian demands within Yarrabung Road are significant during school start and finish periods, demands are low during other periods. Notwithstanding this, pedestrian movements adjacent to the site are to occur in an unimpeded fashion during all periods of the site works.

Construction vehicle access and egress movements are to be minimised during school start and finish times. In the unlikely event that a construction vehicle is required to access / egress the site during school start and finish times, such movements will occur under the supervision of qualified traffic controller/s. These controllers are to ensure that there is no unreasonable interaction between construction vehicles and pedestrian movements.

If a designated internal pedestrian crossing point is required to be established between the northern and southern portions of the site over the internal roadway servicing the construction area, this crossing location is also to be appropriately supervised by traffic controllers during school operational periods.

Site work are boundary fencing will ensure there is not unauthorised pedestrian access to the construction areas. This fencing will also protect pedestrians from dust and debris.

Unimpeded pedestrian access to adjoining developments and indeed, nearby bus stops, will be maintained at all times.

No unreasonable impacts on the safety or mobility of pedestrians are therefore anticipated during the construction works associated with the subject development.

6. CONCLUSION

This report assesses the potential parking and traffic implications associated with a Development Application seeking the undertaking of alterations and additions to St Ives High School located at 88 Yarrabung Road, St Ives. Based on this assessment, the following conclusions are now made:

- The Application seeks consent for the following:
  - The construction of a two court gymnasium in place of existing open basketball courts situated within the central western portion of the site; and
  - The demolition of an existing single court gymnasium building situated in the central northern portion of the site.

- The new enclosed gymnasium is proposed to accommodate school activities during school periods only;

- No alterations to the existing student / staff populations are proposed in conjunction with the works;

- Further, no alterations to the existing site access, passenger vehicle internal circulation and parking arrangements are proposed in conjunction with the works;

- The proposed minor alterations to heavy vehicle servicing arrangements associated with the new gymnasium building are projected to continue to provide safe and efficient site servicing with respect to deliveries and refuse collection;

- The existing school provides capacity to accommodate an extent of passenger vehicle parking which is comparable to that required by Ku-ring-gai DCP with respect to staff and student populations;

- Notwithstanding the above, all on-site parking is currently (and is to continue to be) specifically allocated to staff, resulting in student set-down / pick-up activity and parking demand occurring on the surrounding public streets;

- Observations have however indicated that there is additional capacity within the immediately adjoining public roads to accommodate additional parking demand, should it be required;

- The school is very well serviced by adjoining bus infrastructure and surveys have indicated that a significant portion of students utilise buses to travel to and from the site;

- The surrounding public road network has been assessed to provide motorists with a satisfactory level of service during peak operational periods of the school;

- As the subject proposal does not involve alterations to the existing school student (or staff population), nor the existing operational characteristics, it is not expected that the proposal will result in any alterations to the existing parking and / or traffic generating capability of the school;

- It is accordingly not expected that the application will result in any discernible impacts on the existing operational performance of the on and off-site parking supply or the surrounding road network; and

- It is not expected that the construction activities associated with the proposal will result in unreasonable impacts on the operational performance and safety of the school or the surrounding public road network.

It is considered, based on the contents of this report and the conclusions contained herein, there is no parking or traffic related issues that should prevent approval of the subject proposal. This action is therefore recommended.

APPENDIX 1

ST. IVES HIGH SCHOOL

Yarrabung Rd St Ives NSW, 2075

DEVELOPMENT APPLICATION

DA DRAWING LIST HALL

. DWG No.	DRAWING NAME	SCALE
DA SERIES - OVERALL		
DA-00	COVER SHEET & LOCATION PLAN	
DA-01	SITE ANALYSIS & EXISTING SITE PLAN	1:500
DA-02	DEMOLITION SITE PLAN	1:500
DA-03	PROPOSED SITE PLAN	1:500
DA-04	WASTE / CONSTRUCTION MANAGEMENT PLAN	1:500
DA-05	EXISTING & DEMOLITION BASEMENT PLAN	1:500
DA-06	EXISTING & DEMOLITION GROUND PLAN	1:500
DA-07	EXISTING & DEMOLITION FIRST PLAN	1:500
DA-08	EXISTING & DEMOLITION ROOF PLAN	1:500
DA-09	PROPOSED GROUND FLOOR PLAN	1:100
DA-10	PROPOSED FIRST FLOOR PLAN	1:100
DA-11	PROPOSED ROOF PLAN	1:100
DA-12	PROPOSED ELEVATIONS	1:200
DA-13	PROPOSED SECTIONS	1:200
DA-14	SHADOW DIAGRAMS - 21ST MARCH / SEPTEMBER	1:1000
DA-15	SHADOW DIAGRAMS - 21ST JUNE	1:1000
DA-16	SHADOW DIAGRAMS - 21ST DECEMBER	1:1000
DA-17	COLOURS AND FINISHES	1:100
DA-18	STREETSCAPE ELEVATION	1:500, 1:200
DA-19	BUILDING HEIGHT MODEL	
DA-20	SITE PHOTOS	
DA-21	3D PERSPECTIVE	

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ABBREVIATIONS

ROOMS
ACC. WC ACCESSIBLE TOILET
C. STORE CANTEENT STORE
CL. STORE CLEANERS STORE
EDB ELECTRICAL DISTRIBUTION BOARD
F. WC FEMALE TOILETS
F. STORE FITNESS STORE
M. WC MALE TOILETS
MOV. MOVEMENT
ROOF FINISHES
RMS ROOF METAL SHEETING
RSF ROOF FLASHING
RV ROOF VENT
RWG RAINWATER GUTTER
RWP RAINWATER DOWNPIPE
RWT RAINWATER TANK
WALL FINISHES
WCL PRE-FINISHED WALL CLADDING PANEL
WFB FACE BRICK WORK
MISCELLANEOUS ITEMS
FSS FIXED SUN SHADING DEVICE

Building Certifier

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Structural & Civil Engineer Consultant

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Project Name

ST. IVES HIGH SCHOOL

St. Ives Highschool
88 Yarrabung Rd
Sydney

Drawing Title

COVER SHEET & LOCATION PLAN

Scale : @A1	Date : 21/11/2018
Drawn : DM	Checked :JH

Project No.	Drawing No.	Rev.
1030	DA-00	D

QUALITY CERTIFIED ISO 9001

INITIALLING THE 'DRAWN' AND THE 'CHECK' BOXES CONFIRMS THAT THIS DRAWING HAS BEEN PREPARED IN CONFORMITY WITH JDH ARCHITECTS Q.M.S. PROCEDURES.

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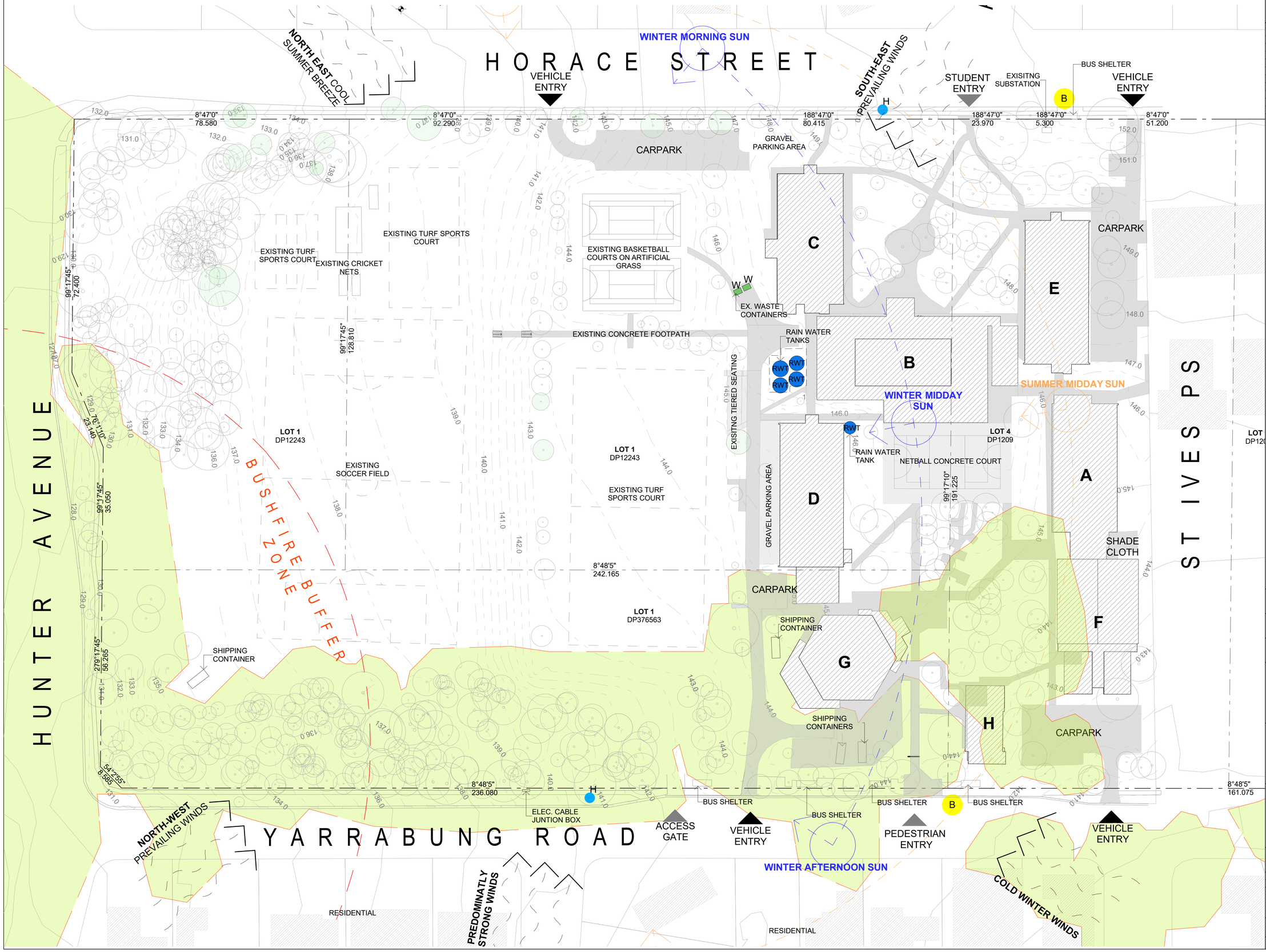

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C	12/11/2018	DM	ISSUED TO CONSULTANTS	CW

SITE ANALYSIS

- EXISTING NEIGHBOURING BUILDINGS
- EXISTING BUILDINGS ON SITE TO BE RETAINED
- SITE BOUNDARY
- INTERNAL LOT BOUNDARY
- EXISTING FENCE
- EXISTING TREE
- VEHICLE SITE ENTRY
- PEDESTIAN SITE ENTRY
- WIND / BREEZES
- SUNPATH - SUMMER
- SUNPATH - WINTER
- H — WATER HYDRANT
- RWT — RAIN WATER TANK
- W — WASTE CONTAINER
- B — BUS STOP
- RL +1.000 — EXISTING RL

Building Certifier

Mechanical, Electrical & Hydraulic Engineering Consultant

Structural & Civil Engineer Consultant

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Project Name

ST. IVES HIGH SCHOOL

St. Ives Highschool
88 Yarrabung Rd
Sydney

Drawing Title

SITE ANALYSIS & EXISTING SITE PLAN

Scale :	1:500 @A1	Date :	21/11/2018
Drawn :	DM	Checked :	JH

Project No.	Drawing No.	Rev.
1030	DA-01	C

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E	14/11/2018	DM	ISSUED TO CONSULTANTS	CW
F	19/11/2018	DM	ISSUED TO CONSULTANTS	ZK

HORACE STREET

VEHICLE ENTRY

STUDENT ENTRY

EXISITNG SUBSTATION

BUS SHELTER

VEHICLE ENTRY

8°47'0" 78.580

8°47'0" 92.290

188°47'0" 80.415

188°47'0" 23.970

188°47'0" 5.300

8°47'0" 51.200

CARPARK

GRAVEL PARKING AREA

EXISTING TURF SPORTS COURT

EXISTING TURF SPORTS COURT

EXISTING CRICKET NETS

EX SPORT COURTS TO BE REMOVED

EX WASTE CONTAINERS TO BE RELOCATED

EX PATHWAY TO BE PARTIALY DEMOLISHED

EX PATHWAY & STAIRS TO BE DEMOLISHED

RAIN WATER TANKS TO BE REMOVED

BLOCK B & SURROUNDING PATHWAY TO BE DEMOLISHED

EXISITING TIERED SEATING

C

B

E

CARPARK

99°17'45" 72.400

99°17'45" 128.810

LOT 1 DP12243

LOT 1 DP12243

LOT 4 DP1209

LOT DP120

RAIN WATER TANK

NETBALL CONCRETE COURT

99°17'10" 191.225

D

A

GRAVEL PARKING AREA

SHADE CLOTH

HUNTER AVENUE

ST IVES PS

BUSHFIRE BUFFER ZONE

EXISTING SOCCER FIELD

EXISTING TURF SPORTS COURT

LOT 1 DP376563

8°48'5" 242.165

CARPARK

SHIPPING CONTAINER

G

F

SHIPPING CONTAINER

SHIPPING CONTAINERS

H

CARPARK

99°17'45" 35.050

279°17'45" 56.265

54°2'55" 8.505

8°48'5" 236.080

8°48'5" 161.075

ELEC. CABLE JUNTION BOX

BUS SHELTER

BUS SHELTER

BUS SHELTER

BUS SHELTER

ACCESS GATE

VEHICLE ENTRY

PEDESTRIAN ENTRY

VEHICLE ENTRY

YARRABUNG ROAD

RESIDENTIAL

RESIDENTIAL

DEMOLITION SITE LEGEND

- EXISTING NEIGHBOURING BUILDINGS
- EXISTING BUILDINGS ON SITE TO BE RETAINED
- EXISTING BUILDINGS TO BE DEMOLISHED
- EXISTING HARDSCAPE TO BE DEMOLISHED
- SITE BOUNDARY
- INTERNAL LOT BOUNDARY
- NEIGHBOURING BOUNDARY
- EXISTING FENCE
- DEMOLISHED ELEMENTS
- EXISTING TREE TO BE RETAINED. INSTALL TREE PROTECTION FENCES TO ALL TREES AFFECTED BY THE WORKS
- DEMOLISHED TREE
- VEHICLE SITE ENTRY
- PEDESTIAN SITE ENTRY

Building Certifier

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Structural & Civil Engineer Consultant

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Project Name

ST. IVES HIGH SCHOOL

St. Ives Highschool
88 Yarrabung Rd
Sydney

Drawing Title

DEMOLITION SITE PLAN

Scale : 1:500 @A1	Date : 21/11/2018
Drawn : DM	Checked :JH

Project No.	Drawing No.	Rev.
1030	DA-02	F

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E	14/11/2018	DM	ISSUED TO CONSULTANTS	CW
F	19/11/2018	DM	ISSUED TO CONSULTANTS	ZK

HORACE STREET

VEHICLE ENTRY

PROPOSED FIRE HYDRANT BOOSTER ASSEMBLEY

NEW FIRE HYDRANT PUMP

STUDENT ENTRY

EXISITNG SUBSTATION

BUS SHELTER

VEHICLE ENTRY

8°47'0" 78.580

8°47'0" 92.290

188°47'0" 80.415

188°47'0" 23.970

188°47'0" 5.300

8°47'0" 51.200

DHF LOCATION OPTION A

CARPARK

SETBACK 16,497

1,800

DHF

GRAVEL PARKING AREA

PROPOSED BUILDING BELOW OUTLINE

5,700

ST IVES HS SPORTS COMPLEX

EXISTING TURF SPORTS COURT

EXISTING TURF SPORTS COURT

EXISTING CRICKET NETS

BATTER

SETBACK 133,411

4,500

99°17'45" 72.400

99°17'45" 128.810

4,800

DHF LOCATION OPTION B

C

E

CARPARK

DHF

NEW VEHICLE TURN-AROUND BAY

NEW HARDSCAPE PIAZZA

EXISITING TIERED SEATING

LOT 1 DP12243

LOT 1 DP12243

LOT 4 DP1209

RAIN WATER TANK

NETBALL CONCRETE COURT

EXISTING SOCCER FIELD

EXISTING TURF SPORTS COURT

GRAVEL PARKING AREA

D

A

99°17'10" 191.225

SHADE CLOTH

BUSHFIRE ZONE BUFFER

SETBACK 128,984

8°48'5" 242.165

CARPARK

LOT 1 DP376563

SHIPPING CONTAINER

G

F

SHIPPING CONTAINERS

H

CARPARK

HUNTER AVENUE

ST IVES PS

LOT DP120

76°11'10" 23.140

99°17'45" 35.050

279°17'45" 56.265

54°27'55" 8.505

8°48'5" 236.080

8°48'5" 161.075

ELEC. CABLE JUNTION BOX

BUS SHELTER

BUS SHELTER

BUS SHELTER

BUS SHELTER

ACCESS GATE

VEHICLE ENTRY

PEDESTRIAN ENTRY

VEHICLE ENTRY

YARRABUNG ROAD

RESIDENTIAL

RESIDENTIAL

SITE LEGEND

- EXISTING NEIGHBOURING BUILDINGS
- EXISTING BUILDINGS ON SITE TO BE RETAINED
- NEW WORKS
- PROPOSED NEW LANDSCAPE
- NEW HARDSCAPE / PATHS
- EXISTING HARDSCAPE / PATHS
- SITE BOUNDARY
- INTERNAL LOT BOUNDARY
- NEIGHBOURING BOUNDARY
- EXISTING FENCE
- EXISTING TREE TO BE RETAINED. INSTALL TREE PROTECTION FENCES TO ALL TREES AFFECTED BY THE WORKS
- SIGNIFICANT TREE TO BE RETAINED. NO NEW WORKS TO ENCROACH INTO TPZ
- TREE PROTECTION ZONE (TPZ)
- VEHICLE SITE ENTRY
- PEDESTIAN SITE ENTRY
- EXISTING RL (RL +1.000)
- PROPOSED RL (RL +1.000)

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Project Name

ST. IVES HIGH SCHOOL

St. Ives Highschool
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Sydney

Drawing Title

PROPOSED SITE PLAN

Scale : 1:500 @A1	Date : 21/11/2018
Drawn : DM	Checked :JH

Project No.	Drawing No.	Rev.
1030	DA-03	F

QUALITY CERTIFIED ISO 9001

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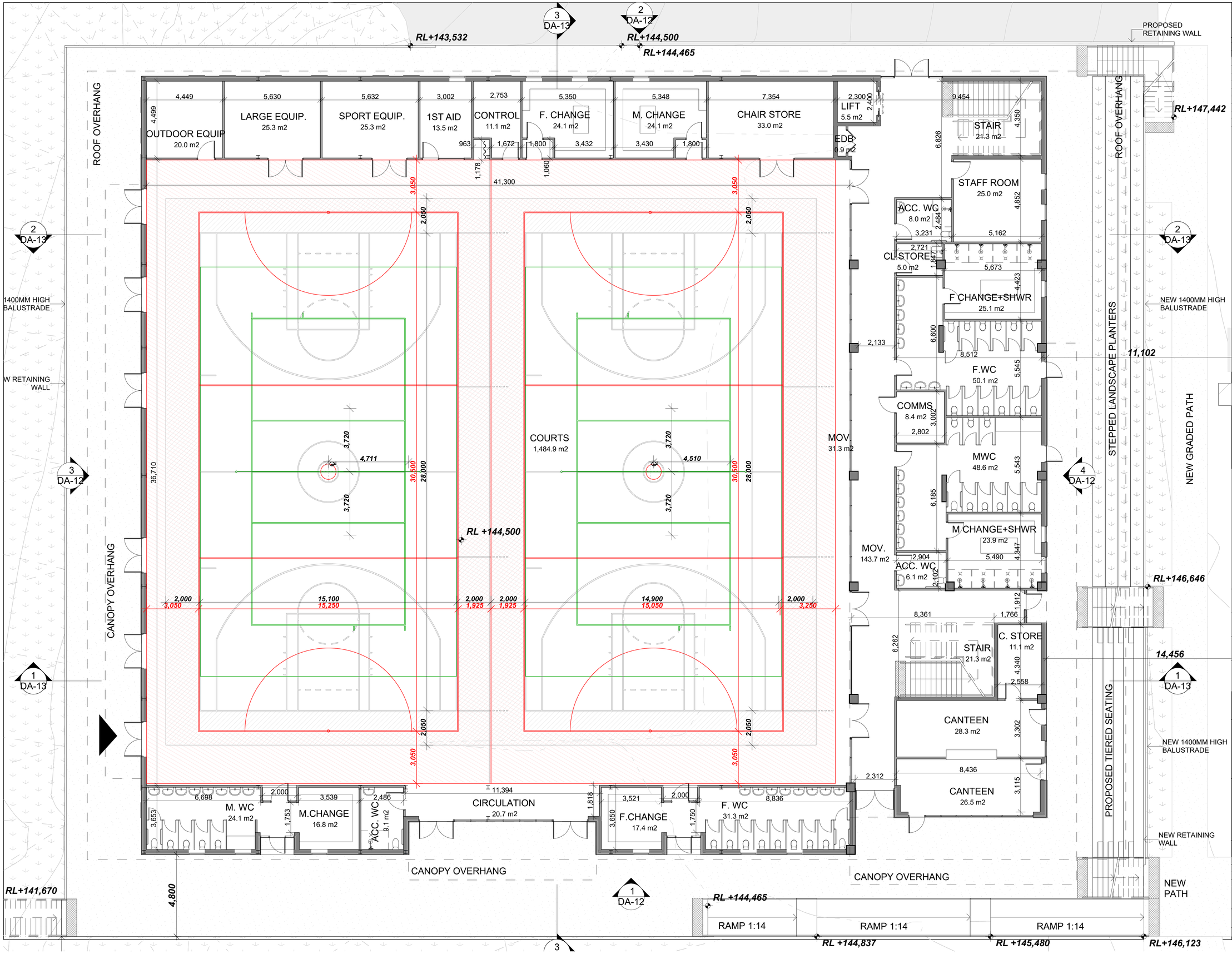

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ABBREVIATIONS

ROOMS
ACC. WC ACCESSIBLE TOILET
C. STORE CANTEENT STORE
CL. STORE CLEANERS STORE
EDB ELECTRICAL DISTRIBUTION BOARD
F. WC FEMALE TOILETS
F. STORE FITNESS STORE
M. WC MALE TOILETS
MOV. MOVEMENT
ROOF FINISHES
RMS ROOF METAL SHEETING
RSF ROOF FLASHING
RV ROOF VENT
RWG RAINWATER GUTTER
RWP RAINWATER DOWNPIPE
RWT RAINWATER TANK
WALL FINISHES
WCL PRE-FINISHED WALL CLADDING PANEL
WFB FACE BRICK WORK
MISCELLANEOUS ITEMS
FSS FIXED SUN SHADING DEVICE

PROPOSED PLAN LEGEND

- EXISTING BUILDINGS ON SITE TO BE RETAINED
- EXISTING HARDSCAPE / PATHS
- NEW CONCRETE PATH
- NEW LANDSCAPE
- TACTILE INDICATOR
- NEW WALL
- EXISTING TREE TO BE RETAINED. INSTALL TREE PROTECTION FENCES TO ALL TREES AFFECTED BY THE WORKS
- SIGNIFICANT TREE TO BE RETAINED. NO NEW WORKS TO ENCROACH INTO TPZ
- TREE PROTECTION ZONE (TPZ)
- ELEMENTS OVERHEAD
- SITE BOUNDARY
- INTERNAL LOT BOUNDARY

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Project Name
ST. IVES HIGH SCHOOL

St. Ives Highschool
88 Yarrabung Rd
Sydney

Drawing Title
PROPOSED GROUND FLOOR PLAN

Scale : 1:100 @A1	Date : 21/11/2018
Drawn : DM	Checked :JH

Project No.	Drawing No.	Rev.
1030	DA-09	F

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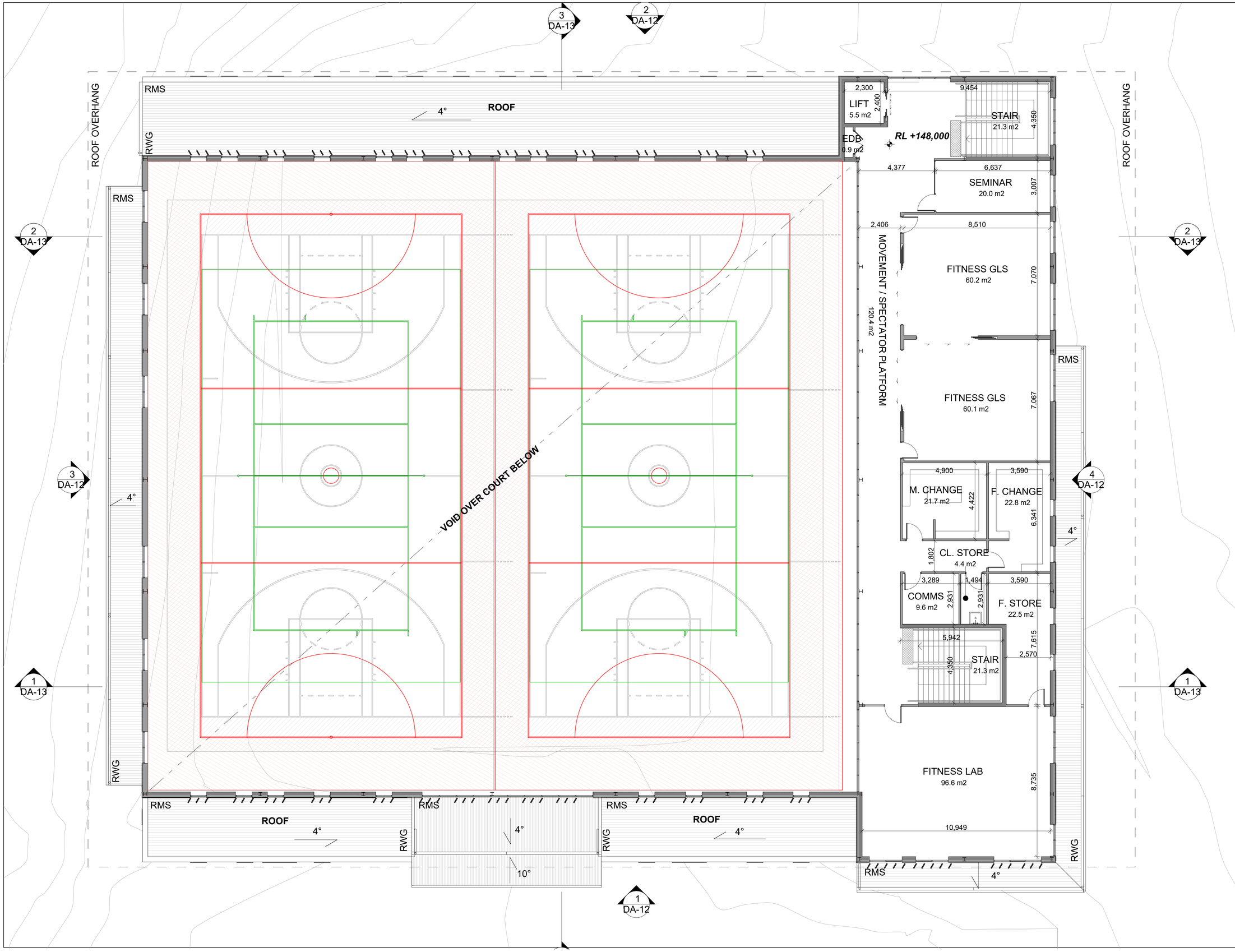

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C. STORE CANTEENT STORE
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RWP RAINWATER DOWNPIPE
RWT RAINWATER TANK
WALL FINISHES
WCL PRE-FINISHED WALL CLADDING PANEL
WFB FACE BRICK WORK
MISCELLANEOUS ITEMS
FSS FIXED SUN SHADING DEVICE

PROPOSED PLAN LEGEND

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- EXISTING HARDSCAPE / PATHS
- NEW CONCRETE PATH
- NEW LANDSCAPE
- TACTILE INDICATOR
- NEW WALL
- EXISTING TREE TO BE RETAINED. INSTALL TREE PROTECTION FENCES TO ALL TREES AFFECTED BY THE WORKS
- SIGNIFICANT TREE TO BE RETAINED. NO NEW WORKS TO ENCROACH INTO TPZ
- TREE PROTECTION ZONE (TPZ)
- ELEMENTS OVERHEAD
- SITE BOUNDARY
- INTERNAL LOT BOUNDARY

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Project Name

ST. IVES HIGH SCHOOL

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88 Yarrabung Rd
Sydney

Drawing Title

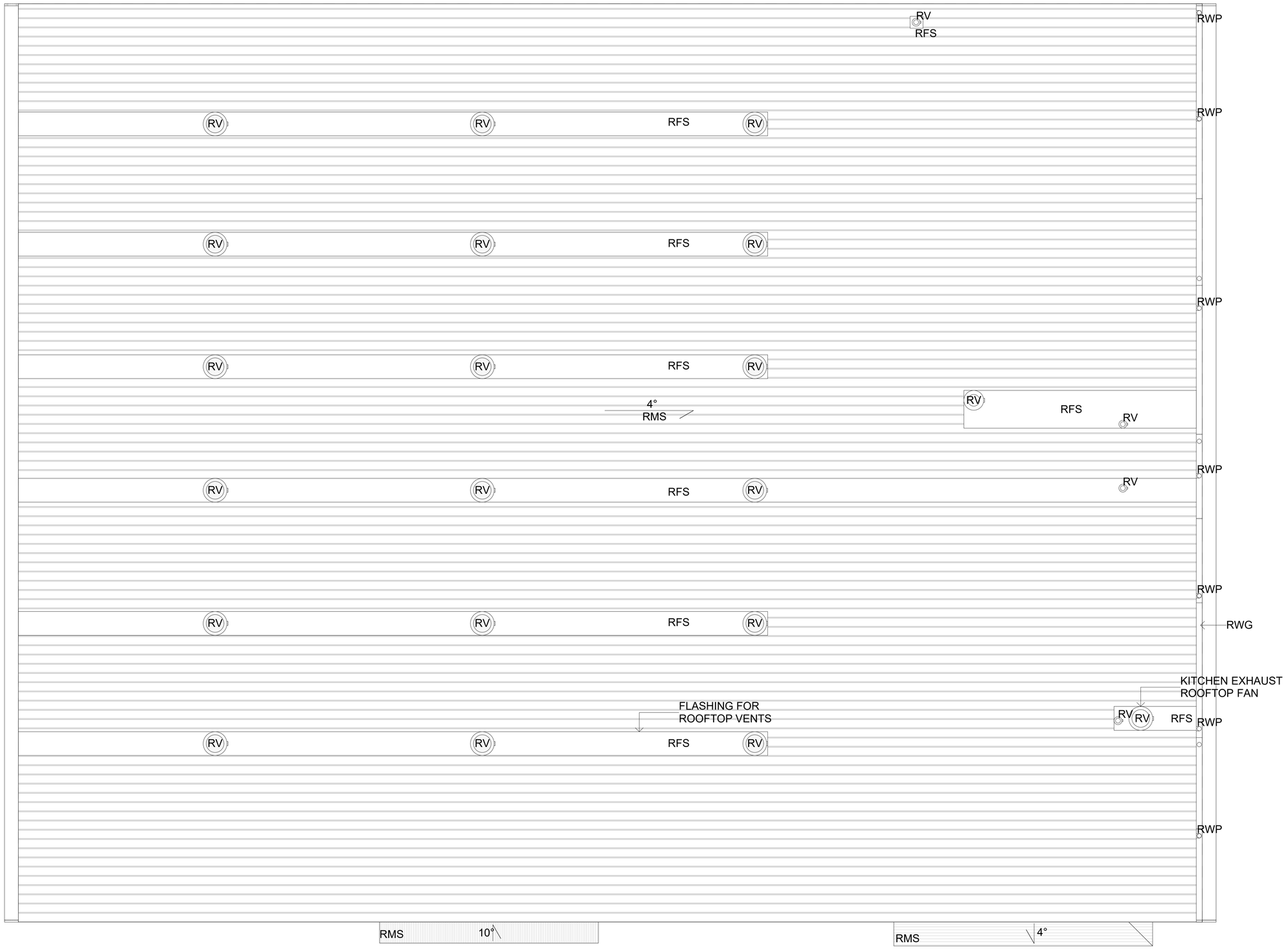
PROPOSED FIRST FLOOR PLAN

Scale : 1:100 @A1	Date : 21/11/2018
Drawn : DM	Checked :JH

Project No.	Drawing No.	Rev.
1030	DA-10	F

QUALITY CERTIFIED ISO 9001
INITIALLING THE 'DRAWN' AND THE 'CHECK' BOXES CONFIRMS THAT THIS DRAWING HAS BEEN PREPARED IN CONFORMITY WITH JDH ARCHITECTS Q.M.S. PROCEDURES.

Status: DA



Rev	Date	By	Issue Name	CK
A	26/10/2018	DM	ISSUED TO CONSULTANTS	CW
B	12/11/2018	DM	ISSUED TO CONSULTANTS	CW
C	13/11/2018	DM	ISSUED TO CONSULTANTS	CW
D	19/11/2018	DM	ISSUED TO CONSULTANTS	ZK

ABBREVIATIONS

ROOMS
ACC. WC ACCESSIBLE TOILET
C. STORE CANTEENT STORE
CL. STORE CLEANERS STORE
EDB ELECTRICAL DISTRIBUTION BOARD
F. WC FEMALE TOILETS
F. STORE FITNESS STORE
M. WC MALE TOILETS
MOV. MOVEMENT
ROOF FINISHES
RMS ROOF METAL SHEETING
RSF ROOF FLASHING
RV ROOF VENT
RWG RAINWATER GUTTER
RWP RAINWATER DOWNPIPE
RWT RAINWATER TANK
WALL FINISHES
WCL PRE-FINISHED WALL CLADDING PANEL
WFB FACE BRICK WORK
MISCELLANEOUS ITEMS
FSS FIXED SUN SHADING DEVICE

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Project Name

ST. IVES HIGH SCHOOL

St. Ives Highschool
88 Yarrabung Rd
Sydney

Drawing Title

PROPOSED ROOF PLAN

Scale : 1:100 @A1	Date : 21/11/2018
Drawn : DM	Checked :JH

Project No.	Drawing No.	Rev.
1030	DA-11	D

QUALITY CERTIFIED ISO 9001
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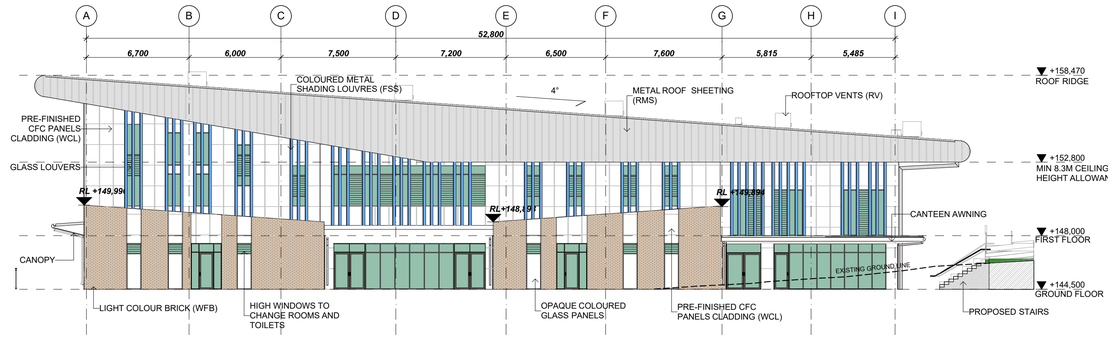

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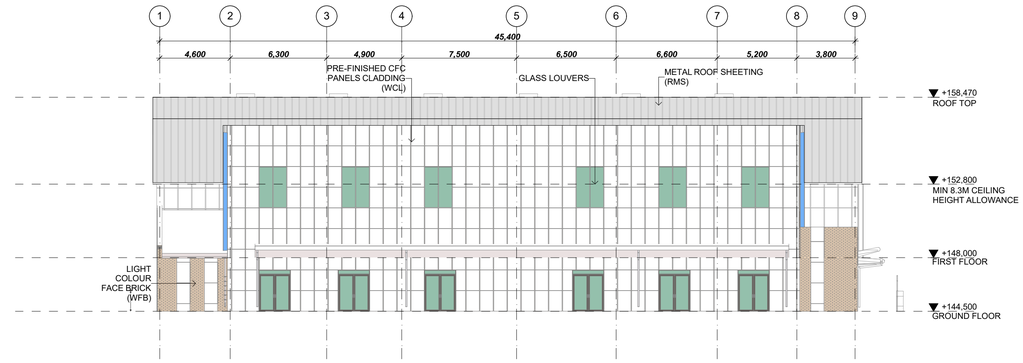

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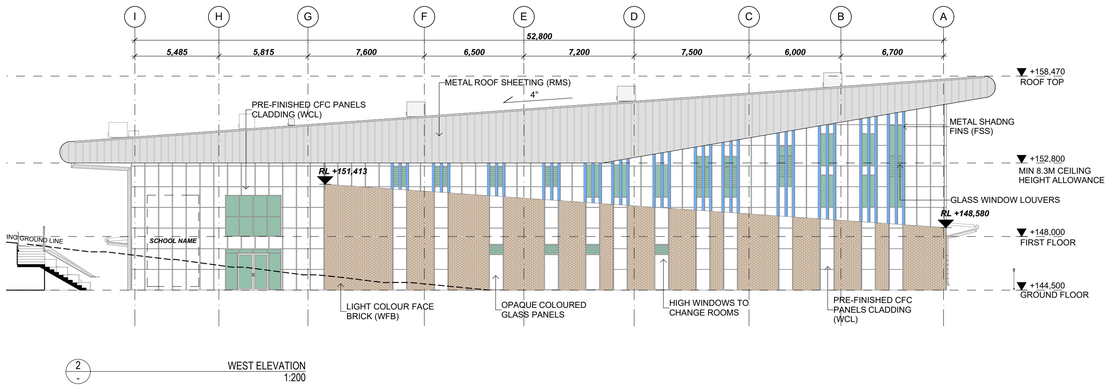

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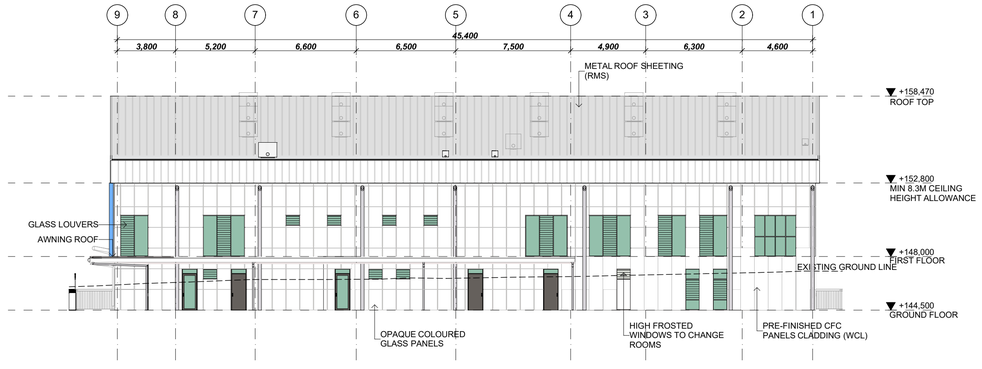

4 - NORTH ELEVATION 1:200

Rev	Date	By	Issue Name	CK
A	26/10/2018	DM	ISSUED TO CONSULTANTS	CW
B	29/10/2018	DM	ISSUED TO CONSULTANTS	CW
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Email:stives-h.school@det.nsw.edu.au

Project Name

ST. IVES HIGH SCHOOL

St. Ives Highschool
88 Yarrabung Rd
Sydney

Drawing Title

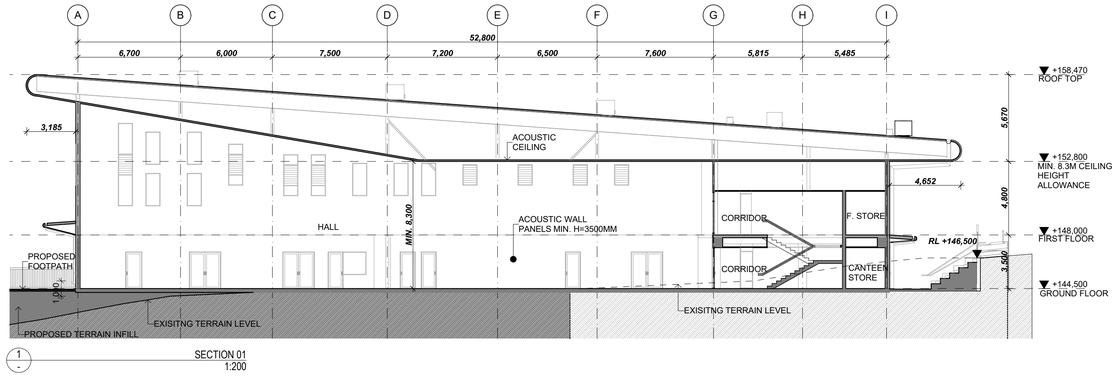
PROPOSED ELEVATIONS

Scale : 1:200 @A1	Date : 21/11/2018
Drawn : DM	Checked :JH

Project No.	Drawing No.	Rev.
1030	DA-12	D

QUALITY CERTIFIED ISO 9001 — INITIALLING THE 'DRAWN' AND THE 'CHECK' BOXES CONFIRMS THAT THIS DRAWING HAS BEEN PREPARED IN CONFORMITY WITH JDH ARCHITECTS Q.M.S. PROCEDURES.

Status: DA



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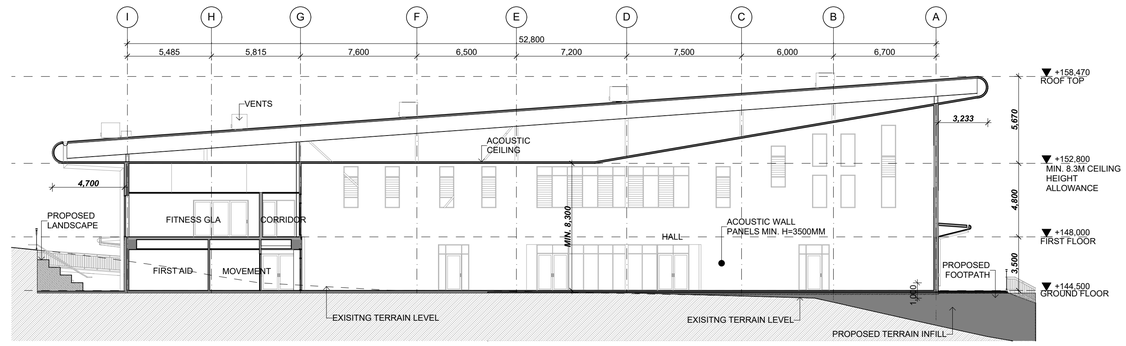
SECTION 01
1:200



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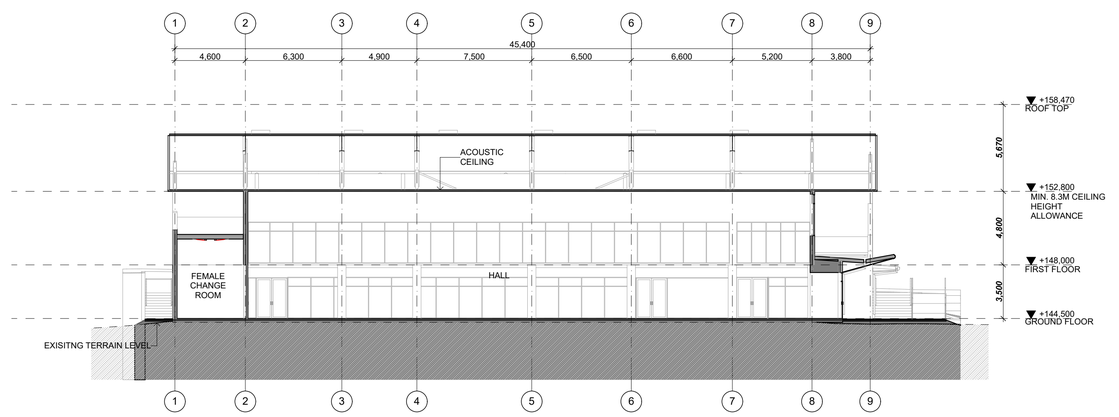
SECTION 02
1:200



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SECTION 03
1:200

Rev	Date	By	Issue Name	CK
A	26/10/2018	DM	ISSUED TO CONSULTANTS	CW
B	29/10/2018	DM	ISSUED TO CONSULTANTS	CW
C	1/11/2018	DM	ISSUED TO CONSULTANTS	CW
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Project Name

ST. IVES HIGH SCHOOL

St. Ives Highschool
88 Yarrabung Rd
Sydney

Drawing Title

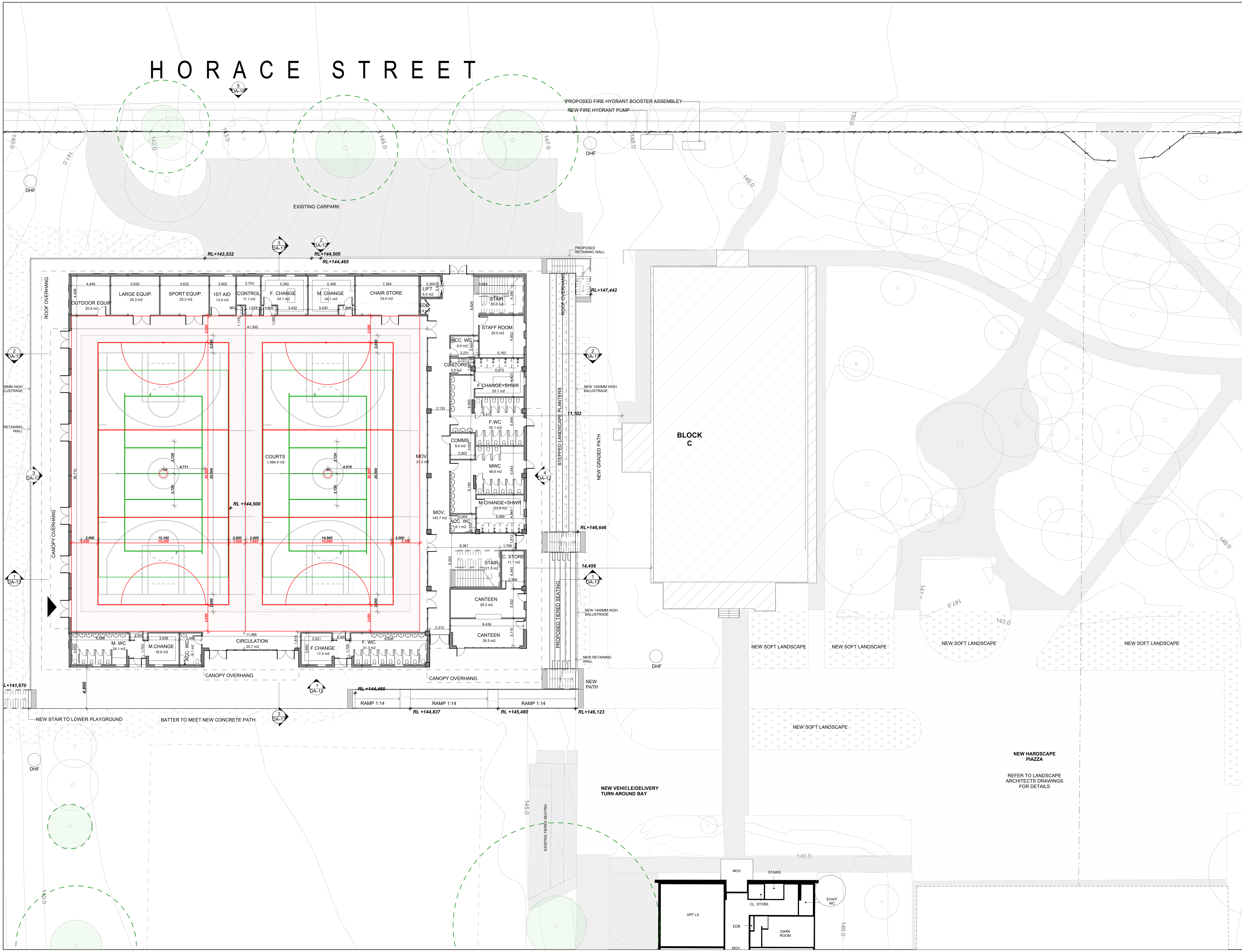
PROPOSED SECTIONS

Scale : 1:200 @A1	Date : 21/11/2018
Drawn : DM	Checked :JH

Project No.	Drawing No.	Rev.
1030	DA-13	E

QUALITY CERTIFIED ISO 9001
INITIALLING THE 'DRAWN' AND THE 'CHECK' BOXES CONFIRMS THAT THIS DRAWING HAS BEEN PREPARED IN CONFORMITY WITH JDH ARCHITECTS Q.M.S. PROCEDURES.

Status: DA



Rev	Date	By	Issue Name	CK
A	20/11/2018	DM	ISSUED TO CONSULTANTS	ZK
B	21/11/2018	DM	ISSUED TO CONSULTANTS	ZK

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WCL PRE-FINISHED WALL CLADDING PANEL
WFB FACE BRICK WORK
MISCELLANEOUS ITEMS
FSS FIXED SUN SHADING DEVICE

PROPOSED PLAN LEGEND

EXISTING BUILDINGS ON SITE TO BE RETAINED
EXISTING HARDSCAPE / PATHS
NEW CONCRETE PATH
NEW LANDSCAPE
TACTILE INDICATOR
NEW WALL
EXISTING TREE TO BE RETAINED. INSTALL TREE PROTECTION FENCES TO ALL TREES AFFECTED BY THE WORKS
SIGNIFICANT TREE TO BE RETAINED. NO NEW WORKS TO ENCROACH INTO TPZ
TREE PROTECTION ZONE (TPZ)
ELEMENTS OVERHEAD
SITE BOUNDARY
INTERNAL LOT BOUNDARY
NEIGHBOURING BOUNDARY
EXISTING FENCE

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Project Name
ST. IVES HIGH SCHOOL
St. Ives Highschool
88 Yarrabung Rd
Sydney

Drawing Title
SITE LANDSCAPE PLAN

Scale : 1:200 @A1 | Date : 21/11/2018
Drawn : DM | Checked :JH

Project No. 1030 | Drawing No. DA-22 | Rev. B

QUALITY CERTIFIED ISO 9001
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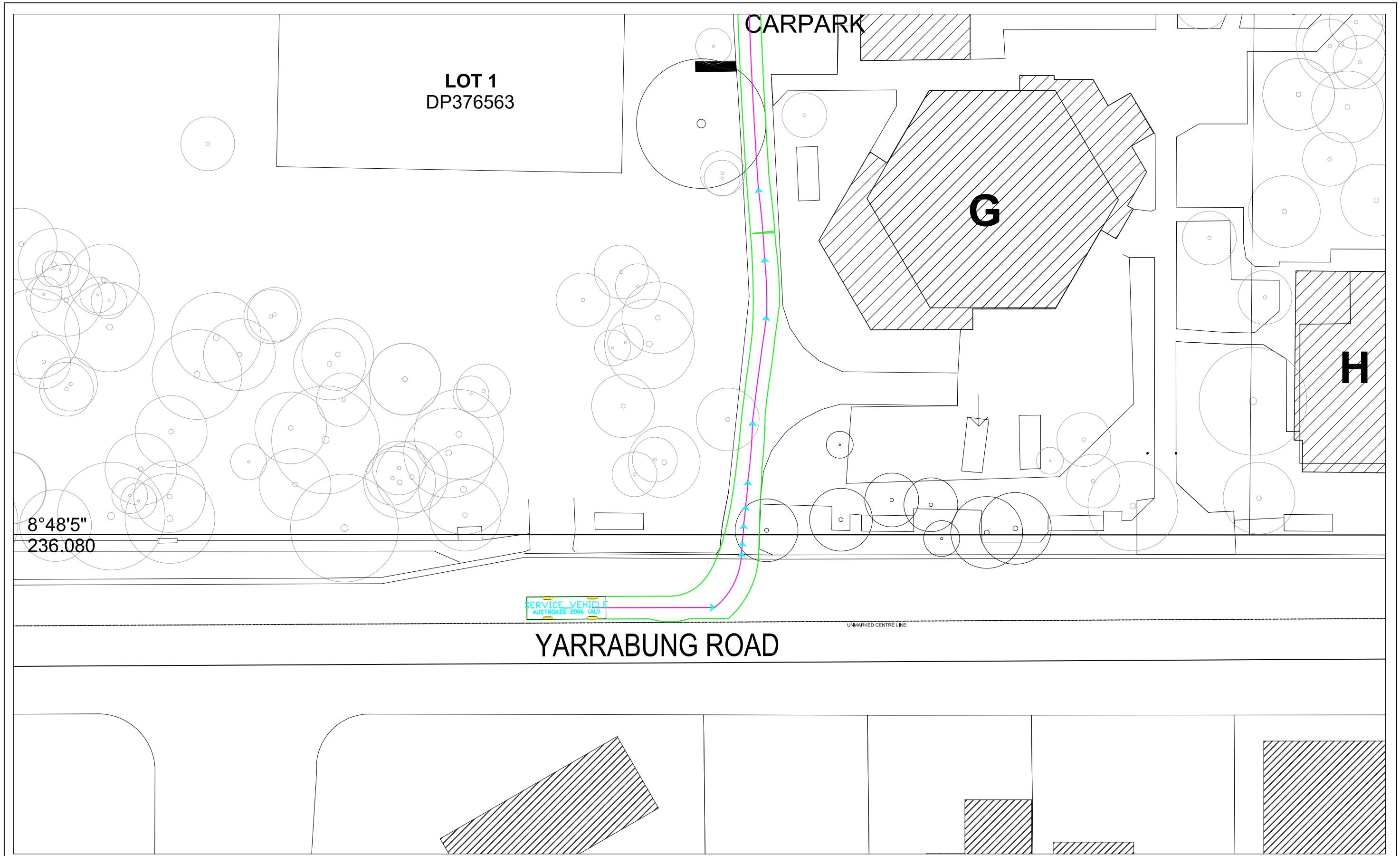
Status: DA

APPENDIX 2



STANBURY TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

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WEBSITE: www.stanburytraffic.com.au

NOTES:

1. THIS PLAN IS BASED ARCHITECTURAL PLANS PREPARED BY JDH ARCHITECTS.

2. THE SWEPT PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 10 IN CONJUNCTION WITH 8.8m LONG MEDIUM RIGID VEHICLE MANOEUVRING SPECIFICATIONS IN ACCORDANCE WITH AUSTROADS.

STANBURY TRAFFIC PLANNING

MEDIUM RIGID VEHICLE SWEPT PATH

SITE ACCESS MOVEMENT

ST IVES HIGH SCHOOL

YARRABUNG ROAD, ST IVES

SCALE: 1:400 AT A3

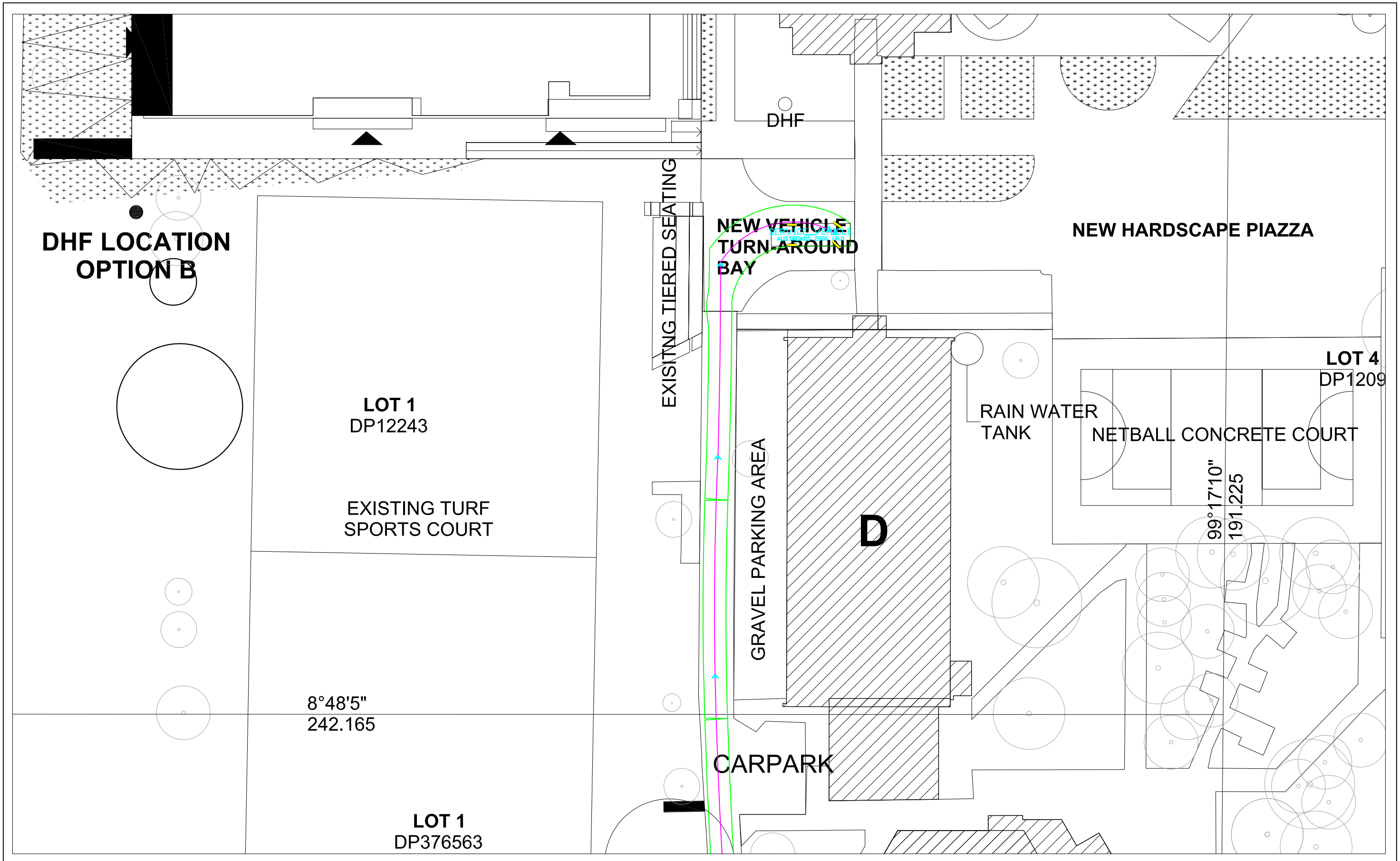
FILE: 17-051

SUPERSEDES SHEET/ISSUE -

DATE: 22/11/2018

ISSUE A

SHEET 1



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STANBURY TRAFFIC PLANNING

MEDIUM RIGID VEHICLE SWEPT PATH

INTERNAL SERVICE AREA ENTRANCE MOVEMENT

ST IVES HIGH SCHOOL

YARRABUNG ROAD, ST IVES

SCALE: 1:400 AT A3

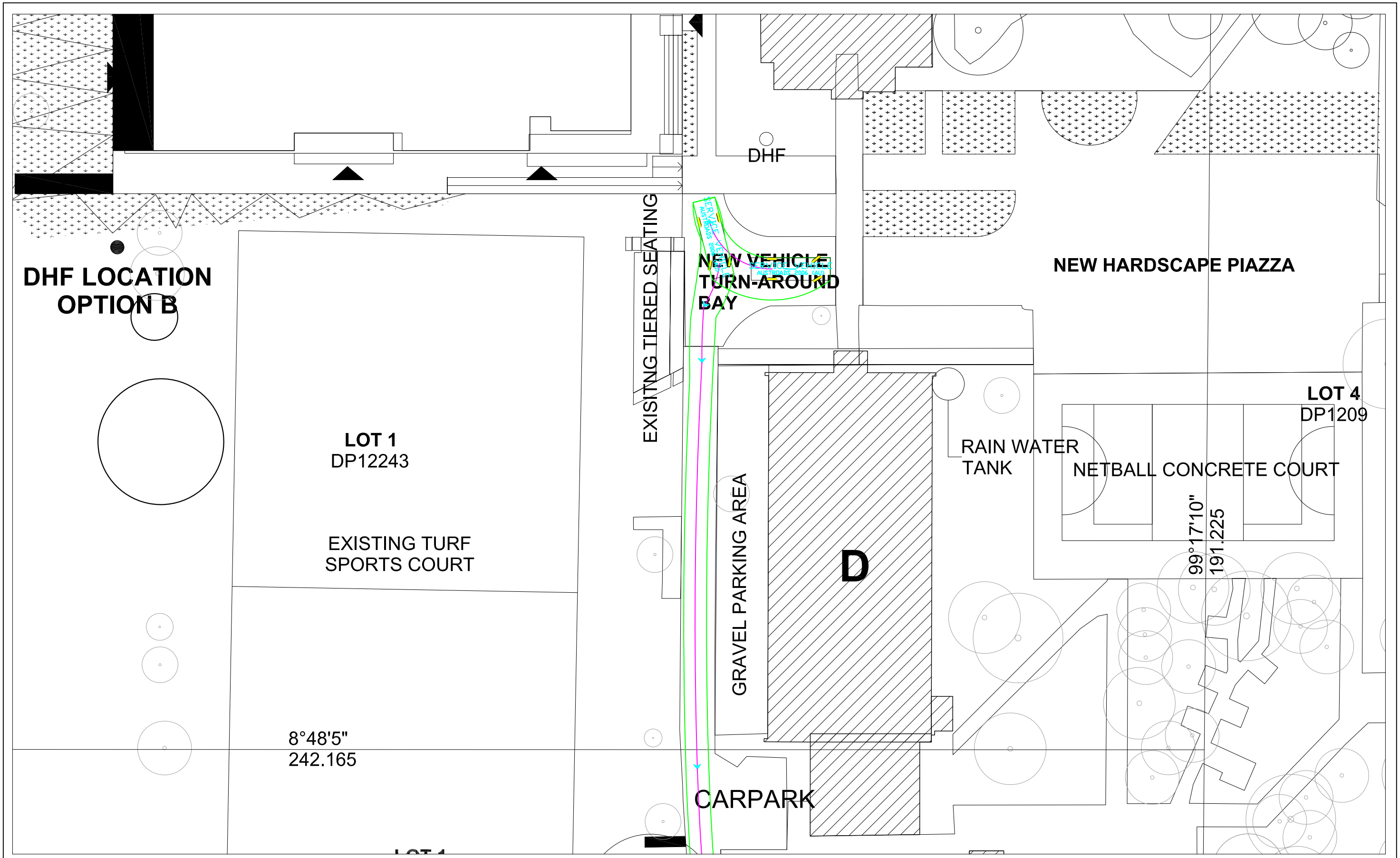
FILE: 17-051

SUPERSEDES SHEET/ISSUE -

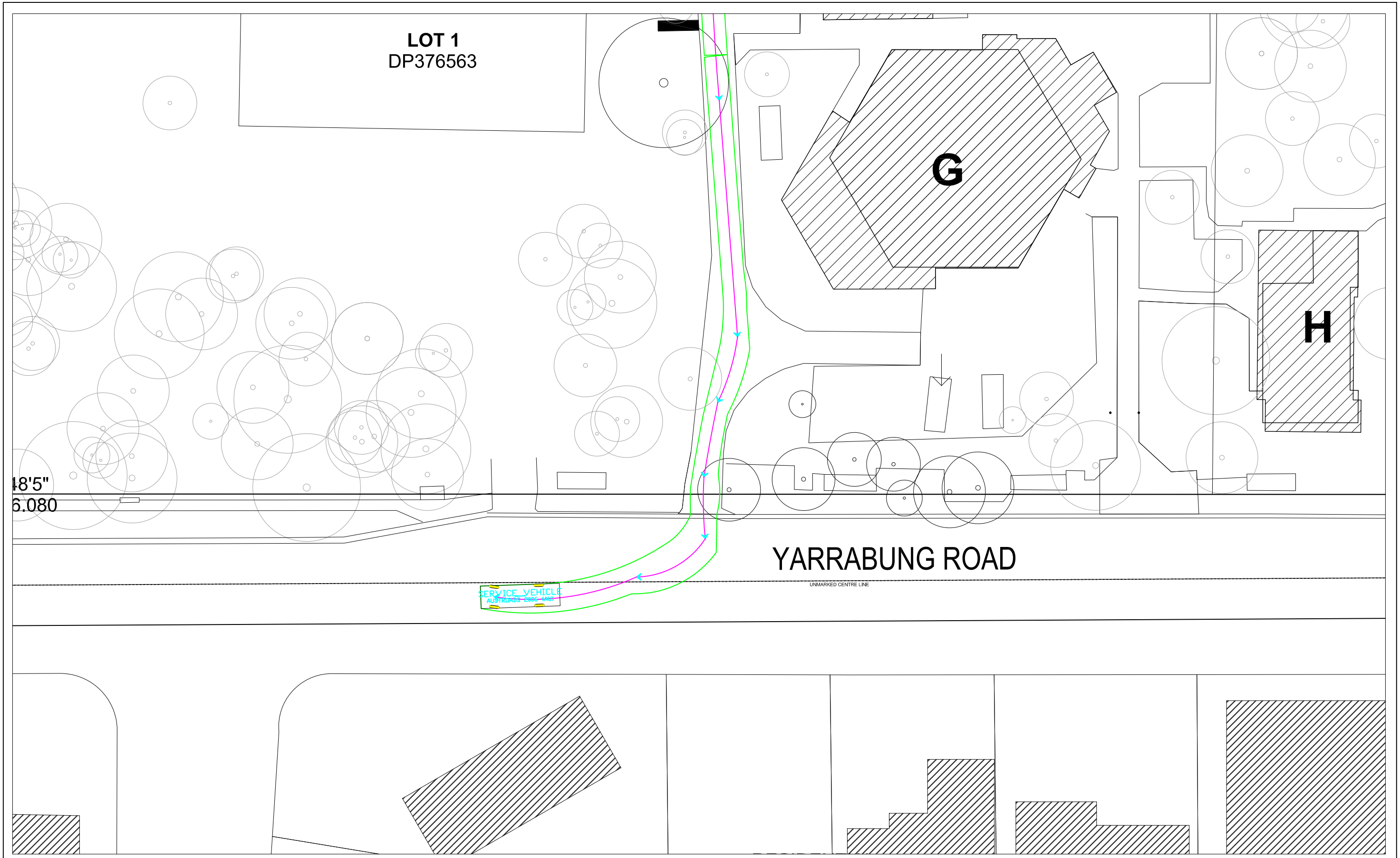
DATE: 22/11/2018

ISSUE A

SHEET 2



STANBURY TRAFFIC PLANNING TRAFFIC, PARKING & TRANSPORT CONSULTANTS	STANBURY TRAFFIC PLANNING ADDRESS: 302/166 GLEBE POINT RD, GLEBE PH: (02) 8971 8314 MOB: 0410 561 848 EMAIL: info@stanburytraffic.com.au WEBSITE: www.stanburytraffic.com.au	NOTES: 1. THIS PLAN IS BASED ARCHITECTURAL PLANS PREPARED BY JDH ARCHITECTS. 2. THE SWEPT PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 10 IN CONJUNCTION WITH 8.8m LONG MEDIUM RIGID VEHICLE MANOEUVRING SPECIFICATIONS IN ACCORDANCE WITH AUSTROADS.	STANBURY TRAFFIC PLANNING MEDIUM RIGID VEHICLE SWEPT PATH INTERNAL SERVICE AREA EXIT MOVEMENTS ST IVES HIGH SCHOOL YARRABUNG ROAD, ST IVES	SCALE: 1:400 AT A3 FILE: 17-051 SUPERSEDES SHEET/ISSUE - DATE: 22/11/2018 ISSUE A SHEET 3



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STANBURY TRAFFIC PLANNING

MEDIUM RIGID VEHICLE SWEPT PATH

SITE EGRESS MOVEMENT

ST IVES HIGH SCHOOL

YARRABUNG ROAD, ST IVES

SCALE: 1:400 AT A3

FILE: 17-051

SUPERSEDES SHEET/ISSUE -

DATE: 22/11/2018

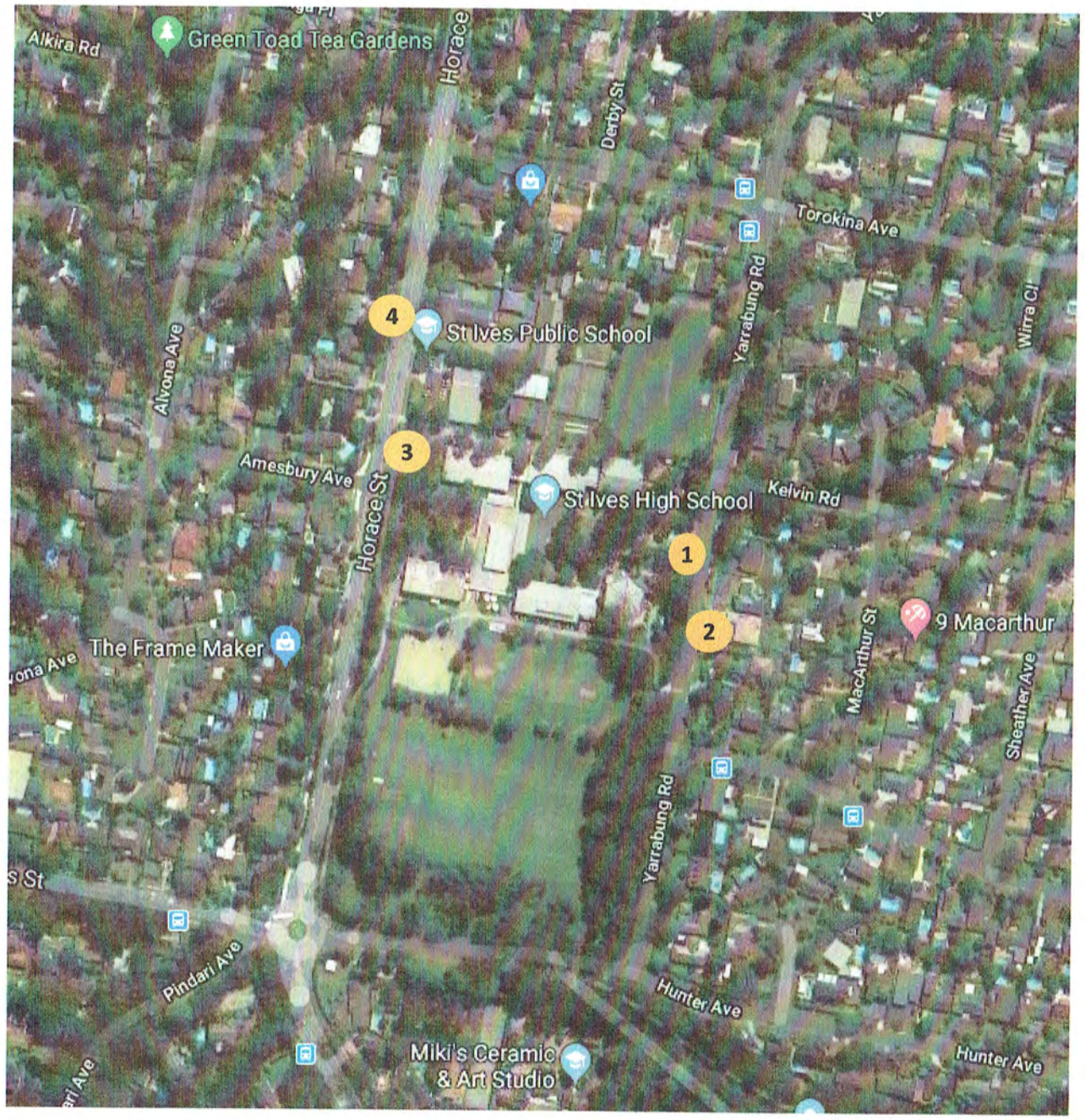
ISSUE A

SHEET 4

APPENDIX 3

Client	Stanbury Traffic Planning
Date	Mon, 29th October 2018
Survey Time	8:00-9:30 & 14:30-16:00 (3hours)
Description	Bus Surveys

MATRIX
Traffic and Transport Data



[Location]

1. Western Bus Bay - Yarrabung Rd - btwn Waterhouse Ave & Kelvin Rd
2. Eastern Bus Bay - Yarrabung Rd - btwn Waterhouse & Kelvin Rd
3. Eastern Bus Bay - Horace St opp Amesbury Ave
4. Western Bus Bay - Horace St north of Amesbury Ave

[Survey date]

Mon, 29th October 2018

7

9

Client Stanbury Traffic Planning
Location 1. Western Bus Bay - Yarrabung Rd - btwn Waterhouse Ave & Kelvin Rd
Date Mon, 29th October 2018
Survey Time 8:00-9:30 & 14:30-16:00 (3hours)
Description Bus Surveys

MATRIX Traffic and Transport Data

[AM]

Route No.	Arrival Time	Students Off the Bus	Students On the Bus	Departure Time
582 MO6322	8:15:15	28	0	8:16:06
8062 MO8622	8:39:20	75	0	8:40:18
8027 MO9740	8:40:11	14	0	8:41:21
8062 MO9968	8:43:34	65	0	8:45:20
8048 MO9380	8:45:04	47	0	8:46:20
* 8002 MO6321	8:45:11	20	0	8:46:31
8074 MO8622	8:53:44	20	0	8:54:15
8063 MO7380	8:55:27	Did not Stop		
582 MO9743	9:23:04	3+1(Other)		9:23:24

[PM]

Route No.	Arrival Time	Students Off the Bus	Students On the Bus	Departure Time
582 MO9611	15:07:45	0	23	15:19:12
245 MO5254	15:16:21	0	79	15:21:26
9046 MO6473	15:17:30	0	61	15:20:33
247 MO8629	15:25:15	Did not Stop		
9005 MO9972	15:27:08	0	55	15:29:27
9066 MO6322	15:30:10			
582 MO8920	15:31:00	0	68	15:33:47
9005 MO9008	15:36:37	0	67	15:38:49
9078 MO6473	15:37:21	0	27	15:39:39
9084 MO6331	15:50:15	0	0	15:50:25
9081 MO9611	15:55:20	Did not Stop		

Client Stanbury Traffic Planning
Location 2. Eastern Bus Bay - Yarrabung Rd - btwn Waterhouse & Kelvin Rd
Date Mon, 29th October 2018
Survey Time 8:00-9:30 & 14:30-16:00 (3hours)
Description Bus Surveys

MATRIX Traffic and Transport Data

[AM]

Route No.	Arrival Time	Students Off the Bus	Students On the Bus	Departure Time
582 MO6412	8:08:50	1	0	8:09:02
582 MO6322	8:49:20	7	0	8:49:40

[PM]

Route No.	Arrival Time	Students Off the Bus	Students On the Bus	Departure Time
582 MO6473	14:33:00	0+1(Other)	3	14:33:24

Client Stanbury Traffic Planning
Location 3. Eastern Bus Bay - Horace St opp Amesbury Ave
Date Mon, 29th October 2018
Survey Time 8:00-9:30 & 14:30-16:00 (3hours)
Description Bus Surveys

MATRIX Traffic and Transport Data

[AM]

Route No.	Arrival Time	Students Off the Bus	Students On the Bus	Departure Time
194 MO6722	8:06:30	3	2+3(Adults)	8:06:41
158 MO6145	8:21:32	38	14	8:22:26
194 MO9622	8:24:46	5	5(Adults)	8:25:18
8017 MO9714	8:30:15	17	0	8:30:51
194 MO7124	8:33:09	7	0	8:33:37
194 MO5412	8:37:20	23+1(Adults)	0	8:37:44
140 MO6125	8:44:51	14	0	8:45:22
194 MO5108	8:51:30	19	5(Adults)	8:52:19
194 MO4151	9:07:17	0	1(Adults)	9:07:26
194 MO5239	8:18:41	0	2(Adults)	9:18:49

Around 2:30pm a bus stopped 200mts away from bus stop3 more than 30students got onto the bus.

[PM]

Route No.	Arrival Time	Students Off the Bus	Students On the Bus	Departure Time
194 MO9621	15:18:30	0	3+3(Adults)	15:18:50

Client Stanbury Traffic Planning
Location 4. Western Bus Bay - Horace St north of Amesbury Ave
Date Mon, 29th October 2018
Survey Time 8:00-9:30 & 14:30-16:00 (3hours)
Description Bus Surveys

MATRIX Traffic and Transport Data

[AM]

Route No.	Arrival Time	Students Off the Bus	Students On the Bus	Departure Time
8050 MO7846	8:04:26	0	9	8:05:41
5944 MO9971	8:07:02	1+1(Adults)	0	8:07:39
5944 MO5324	8:35:30	5+1(Adults)	0	8:35:46
194 MO6826	8:36:10	1	0	8:36:24

[PM]

Route No.	Arrival Time	Students Off the Bus	Students On the Bus	Departure Time
194 MO9080	14:36:30	2(Adults)	0	14:37:09
214 MO9080	15:20:01	14	0	15:20:56
194 MO6323	15:38:13	3	5+2(Adults)	15:38:41
263 MO4191	15:45:19	1	0	15:45:22

APPENDIX 4

St Ives High School IC - Traffic Flows

MATRIX Traffic and Transport Data

Search By Time and Classfication

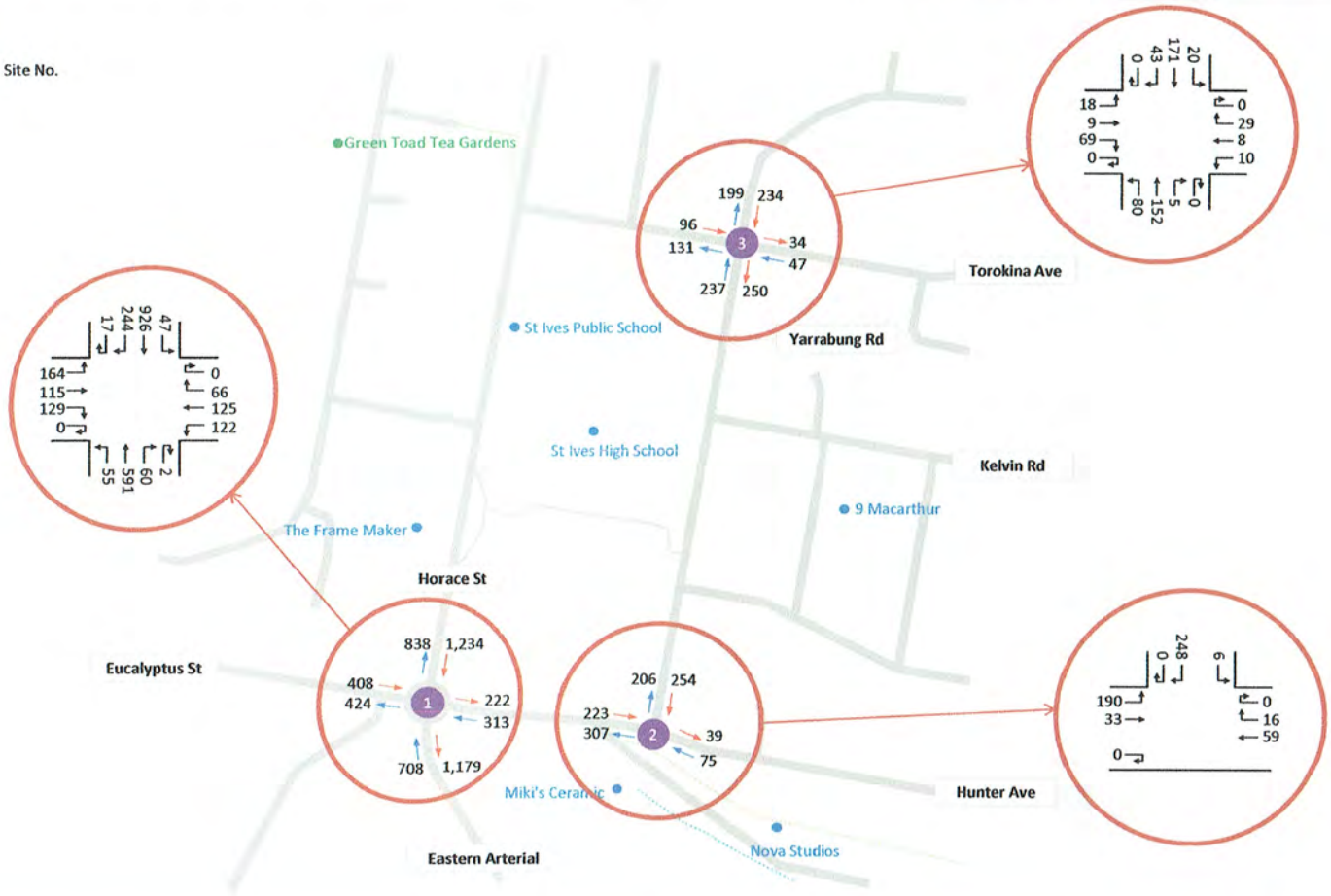
Day	Start Time	End Time	Classification
AM	8:00	9:00	All vehicles

Volume Forecasting

0 % * 0 = original survey data

(e.g. input 20 for volume increase 20% or -20 for volume decrease 20%)

1 Site No.



St Ives High School IC - Traffic Flows

MATRIX Traffic and Transport Data

Search By Time and Classfication

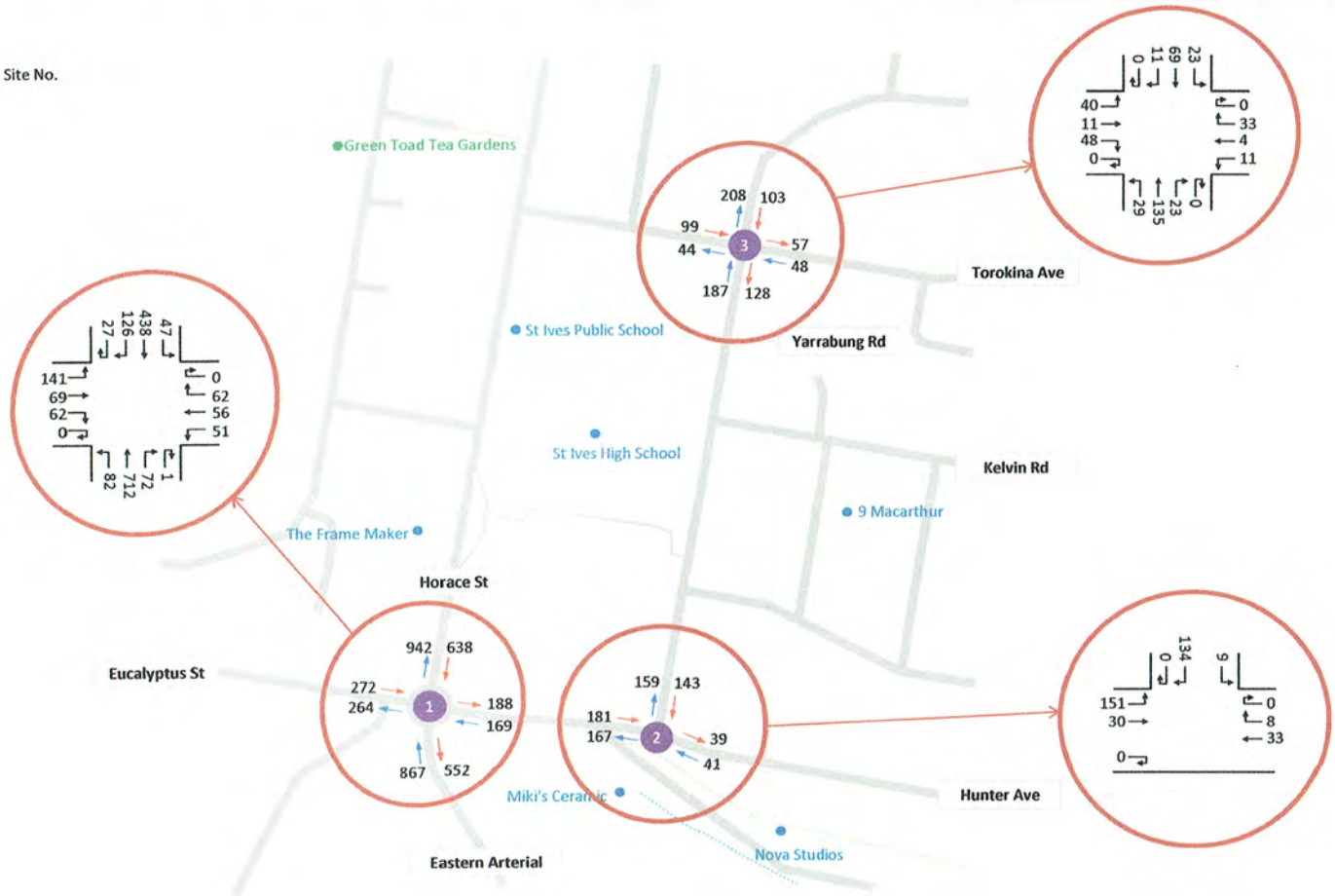
Day	Start Time	End Time	Classification
PM	14:45	15:45	All vehicles

Volume Forecasting

0 % * 0 = original survey data

(e.g. input 20 for volume increase 20% or -20 for volume decrease 20%)

1 Site No.

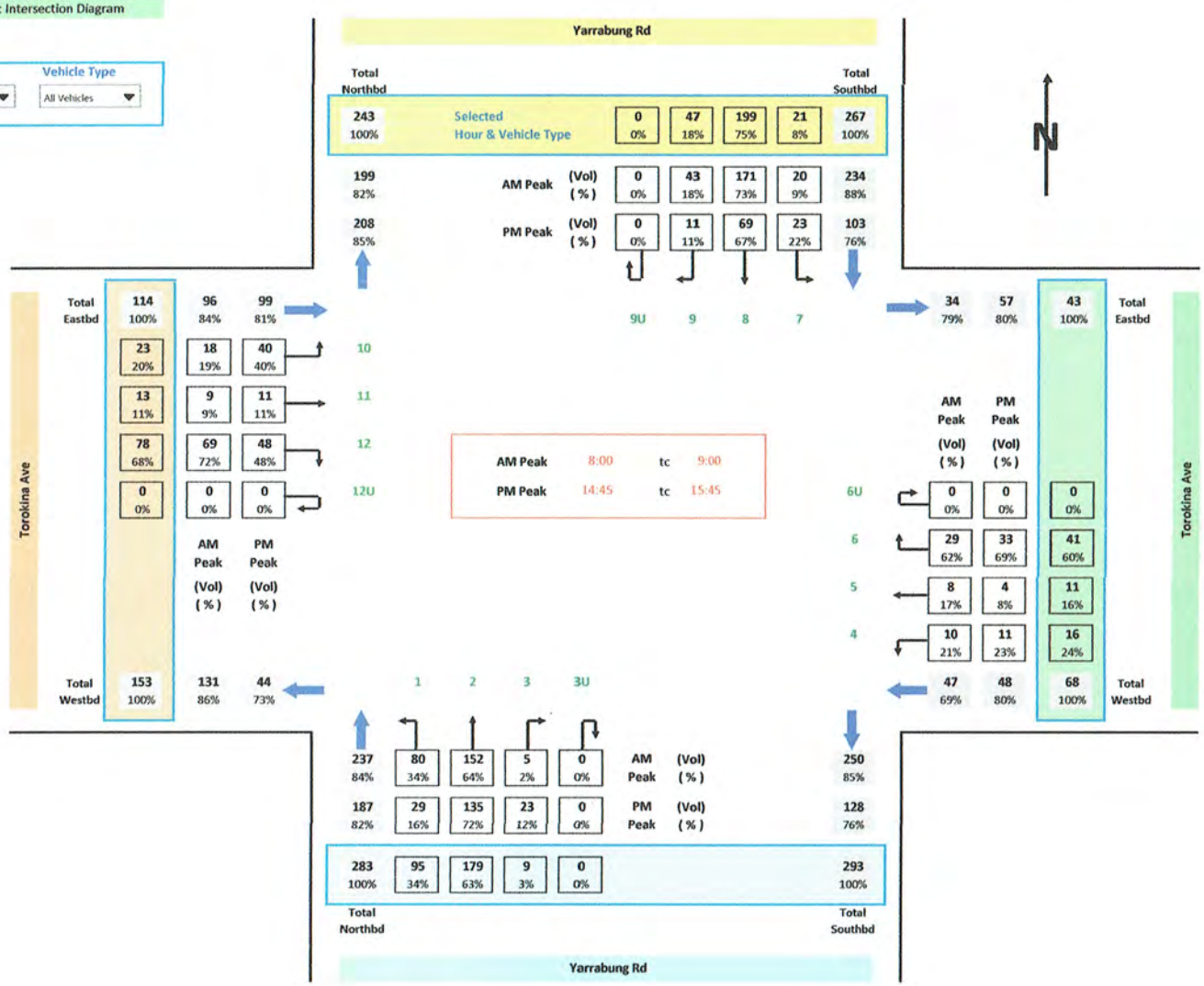


Job No. : N4580
Client : Stanbury Traffic Planning
Suburb : St Ives High School
Location : 3. Yarrabung Rd / Torokina Ave

Day/Date : Mon, 29th October 2018
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting	Vehicle Type
AM Totals	All Vehicles

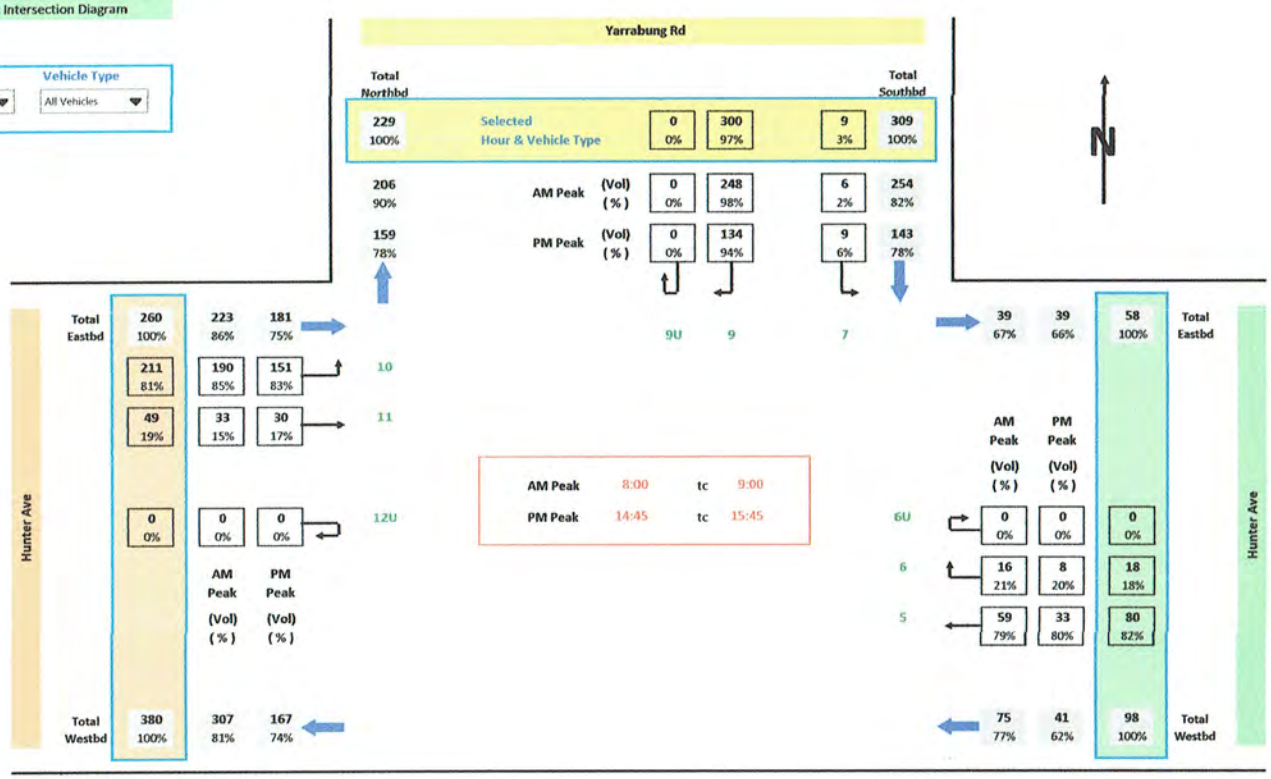


Job No. : N4580
Client : Stanbury Traffic Planning
Suburb : St Ives High School
Location : 2. Hunter Ave / Yarrabung Rd

Day/Date : Mon, 29th October 2018
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting: AM Totals
Vehicle Type: All Vehicles

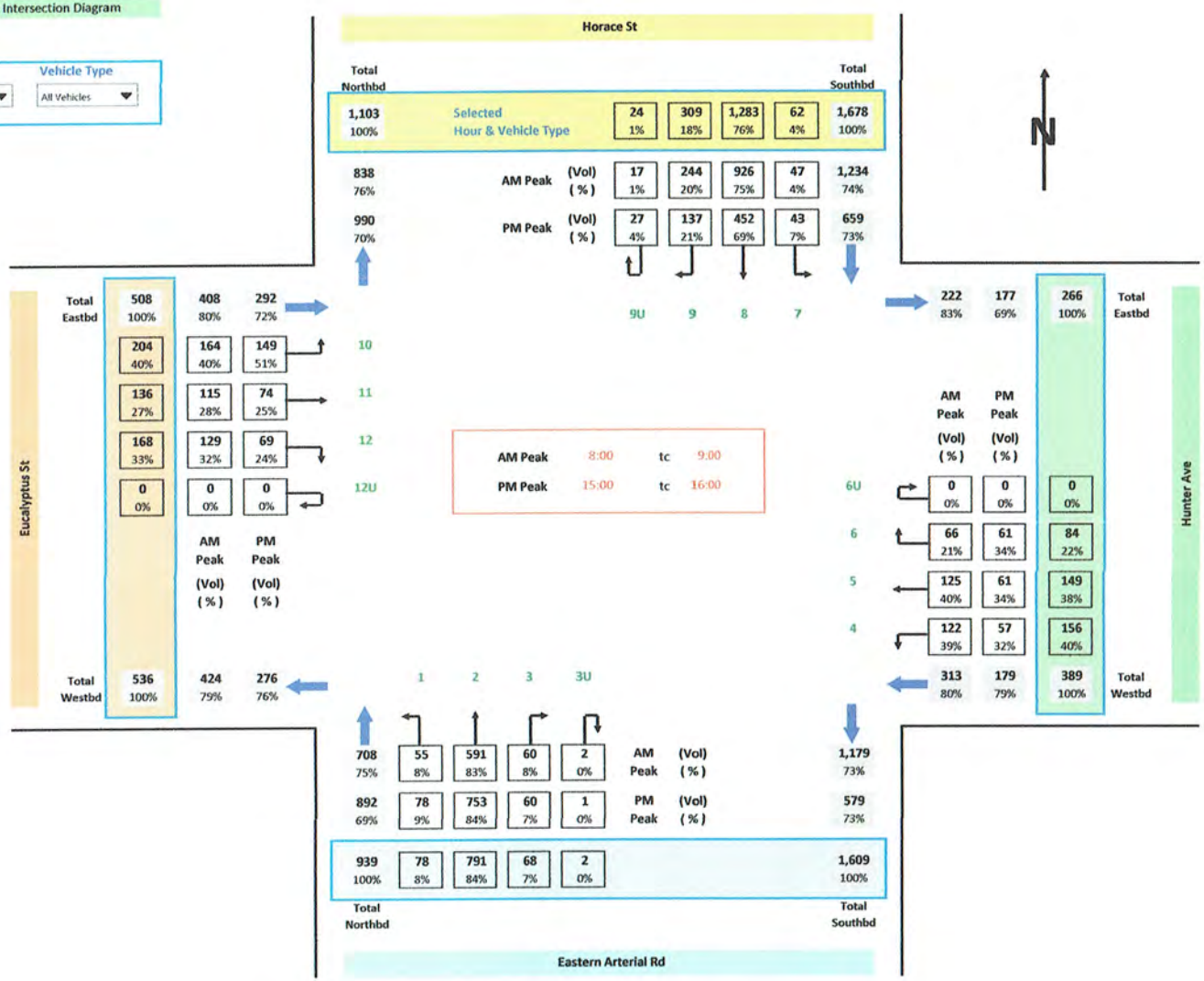


Job No. : N4580
Client : Stanbury Traffic Planning
Suburb : St Ives High School
Location : 1. Horace St / Eastern Arterial Rd / Eucalyptus St / Hunter Ave

Day/Date : Mon, 29th October 2018
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting: AM Totals | Vehicle Type: All Vehicles



APPENDIX 5

MOVEMENT SUMMARY

Site: [Intersection of Yarrabung Road & Torokina Avenue]

Existing AM Peak
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: Yarrabung Road South												
1	L2	80	5.0	0.129	5.6	LOS A	0.1	0.4	0.02	0.21	0.02	56.2
2	T1	152	5.0	0.129	0.0	LOS A	0.1	0.4	0.02	0.21	0.02	58.0
3	R2	5	5.0	0.129	6.2	LOS A	0.1	0.4	0.02	0.21	0.02	55.6
Approach		237	5.0	0.129	2.1	NA	0.1	0.4	0.02	0.21	0.02	57.4
East: Torokina Avenue East												
4	L2	10	5.0	0.059	6.2	LOS A	0.2	1.5	0.38	0.65	0.38	52.1
5	T1	8	5.0	0.059	6.5	LOS A	0.2	1.5	0.38	0.65	0.38	52.2
6	R2	29	5.0	0.059	8.0	LOS A	0.2	1.5	0.38	0.65	0.38	51.5
Approach		47	5.0	0.059	7.3	LOS A	0.2	1.5	0.38	0.65	0.38	51.8
North: Yarrabung Road North												
7	L2	20	5.0	0.133	6.3	LOS A	0.4	2.7	0.17	0.15	0.17	56.1
8	T1	171	5.0	0.133	0.3	LOS A	0.4	2.7	0.17	0.15	0.17	57.9
9	R2	43	5.0	0.133	6.4	LOS A	0.4	2.7	0.17	0.15	0.17	55.5
Approach		234	5.0	0.133	1.9	NA	0.4	2.7	0.17	0.15	0.17	57.3
West: Torokina Avenue west												
10	L2	18	5.0	0.125	6.1	LOS A	0.4	3.2	0.40	0.68	0.40	51.8
11	T1	9	5.0	0.125	6.5	LOS A	0.4	3.2	0.40	0.68	0.40	52.0
12	R2	69	5.0	0.125	8.3	LOS A	0.4	3.2	0.40	0.68	0.40	51.3
Approach		96	5.0	0.125	7.7	LOS A	0.4	3.2	0.40	0.68	0.40	51.4
All Vehicles		614	5.0	0.133	3.3	NA	0.4	3.2	0.17	0.30	0.17	55.9

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: [Intersection of Yarrabung Road & Torokina Avenue]

Existing PM Peak
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: Yarrabung Road South												
1	L2	29	5.0	0.102	5.8	LOS A	0.2	1.4	0.07	0.16	0.07	56.5
2	T1	135	5.0	0.102	0.1	LOS A	0.2	1.4	0.07	0.16	0.07	58.2
3	R2	23	5.0	0.102	5.8	LOS A	0.2	1.4	0.07	0.16	0.07	55.8
Approach		187	5.0	0.102	1.7	NA	0.2	1.4	0.07	0.16	0.07	57.7
East: Torokina Avenue East												
4	L2	11	5.0	0.053	5.8	LOS A	0.2	1.3	0.25	0.60	0.25	52.5
5	T1	4	5.0	0.053	5.4	LOS A	0.2	1.3	0.25	0.60	0.25	52.7
6	R2	33	5.0	0.053	7.2	LOS A	0.2	1.3	0.25	0.60	0.25	52.0
Approach		48	5.0	0.053	6.7	LOS A	0.2	1.3	0.25	0.60	0.25	52.2
North: Yarrabung Road North												
7	L2	23	5.0	0.057	5.8	LOS A	0.1	0.7	0.09	0.18	0.09	56.1
8	T1	69	5.0	0.057	0.1	LOS A	0.1	0.7	0.09	0.18	0.09	57.9
9	R2	11	5.0	0.057	6.1	LOS A	0.1	0.7	0.09	0.18	0.09	55.5
Approach		103	5.0	0.057	2.0	NA	0.1	0.7	0.09	0.18	0.09	57.2
West: Torokina Avenue west												
10	L2	40	5.0	0.098	6.1	LOS A	0.4	2.6	0.29	0.60	0.29	52.7
11	T1	11	5.0	0.098	5.5	LOS A	0.4	2.6	0.29	0.60	0.29	52.9
12	R2	48	5.0	0.098	7.1	LOS A	0.4	2.6	0.29	0.60	0.29	52.2
Approach		99	5.0	0.098	6.5	LOS A	0.4	2.6	0.29	0.60	0.29	52.4
All Vehicles		437	5.0	0.102	3.4	NA	0.4	2.6	0.14	0.31	0.14	55.7

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: [Hunter Avenue & Yarrabung Road]

Existing AM Peak
Site Category: (None)
Stop (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: Hunter Avenue East												
5	T1	59	5.0	0.043	0.2	LOS A	0.1	0.8	0.16	0.13	0.16	58.2
6	R2	16	5.0	0.043	6.3	LOS A	0.1	0.8	0.16	0.13	0.16	55.8
Approach		75	5.0	0.043	1.5	NA	0.1	0.8	0.16	0.13	0.16	57.7
North: Yarrabung Road												
7	L2	6	5.0	0.273	8.4	LOS A	1.1	7.9	0.32	0.92	0.32	51.4
9	R2	248	5.0	0.273	8.9	LOS A	1.1	7.9	0.32	0.92	0.32	50.9
Approach		254	5.0	0.273	8.9	LOS A	1.1	7.9	0.32	0.92	0.32	50.9
West: RoadName												
10	L2	190	5.0	0.123	5.6	LOS A	0.0	0.0	0.00	0.49	0.00	54.0
11	T1	33	5.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.49	0.00	55.7
Approach		223	5.0	0.123	4.8	NA	0.0	0.0	0.00	0.49	0.00	54.3
All Vehicles		552	5.0	0.273	6.2	NA	1.1	7.9	0.17	0.64	0.17	53.1

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: [Hunter Avenue & Yarrabung Road]

Existing PM Peak
Site Category: (None)
Stop (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: Hunter Avenue East												
5	T1	33	5.0	0.023	0.2	LOS A	0.1	0.4	0.13	0.12	0.13	58.5
6	R2	8	5.0	0.023	6.1	LOS A	0.1	0.4	0.13	0.12	0.13	56.0
Approach		41	5.0	0.023	1.3	NA	0.1	0.4	0.13	0.12	0.13	58.0
North: Yarrabung Road												
7	L2	9	5.0	0.143	8.4	LOS A	0.5	3.8	0.22	0.92	0.22	51.7
9	R2	134	5.0	0.143	8.4	LOS A	0.5	3.8	0.22	0.92	0.22	51.2
Approach		143	5.0	0.143	8.4	LOS A	0.5	3.8	0.22	0.92	0.22	51.2
West: RoadName												
10	L2	151	5.0	0.100	5.6	LOS A	0.0	0.0	0.00	0.49	0.00	54.1
11	T1	30	5.0	0.100	0.0	LOS A	0.0	0.0	0.00	0.49	0.00	55.7
Approach		181	5.0	0.100	4.7	NA	0.0	0.0	0.00	0.49	0.00	54.4
All Vehicles		365	5.0	0.143	5.8	NA	0.5	3.8	0.10	0.61	0.10	53.5

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: [Horace Street & Hunter Avenue]

Existing AM Peak
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: Eastern Arterial Road												
1	L2	55	5.0	0.253	8.3	LOS A	1.2	9.1	0.61	0.75	0.61	51.8
2	T1	591	5.0	0.582	8.3	LOS A	4.9	35.7	0.72	0.81	0.81	52.6
3	R2	60	5.0	0.582	12.5	LOS A	4.9	35.7	0.75	0.82	0.84	52.3
3u	U	2	5.0	0.582	14.5	LOS A	4.9	35.7	0.75	0.82	0.84	53.1
Approach		708	5.0	0.582	8.7	LOS A	4.9	35.7	0.72	0.81	0.79	52.5
East: Hunter Avenue												
4	L2	122	5.0	0.328	13.0	LOS A	1.8	13.4	0.87	0.95	0.91	48.4
5	T1	125	5.0	0.401	12.4	LOS A	2.6	19.3	0.91	0.99	1.01	49.3
6	R2	66	5.0	0.401	16.5	LOS B	2.6	19.3	0.91	0.99	1.01	49.1
Approach		313	5.0	0.401	13.5	LOS A	2.6	19.3	0.89	0.98	0.97	48.9
North: Horace Street												
7	L2	47	5.0	0.377	7.4	LOS A	1.9	14.0	0.57	0.70	0.57	52.3
8	T1	926	5.0	0.866	10.1	LOS A	14.1	103.2	0.85	0.90	1.08	51.1
9	R2	244	5.0	0.866	15.0	LOS B	14.1	103.2	0.93	0.95	1.22	50.3
9u	U	17	5.0	0.866	17.0	LOS B	14.1	103.2	0.93	0.95	1.22	51.0
Approach		1234	5.0	0.866	11.1	LOS A	14.1	103.2	0.86	0.90	1.09	51.0
West: Eucalyptus Street												
10	L2	164	5.0	0.241	7.9	LOS A	1.2	8.7	0.67	0.82	0.67	51.9
11	T1	115	5.0	0.301	7.4	LOS A	1.6	11.9	0.69	0.80	0.69	51.9
12	R2	129	5.0	0.301	11.6	LOS A	1.6	11.9	0.69	0.80	0.69	51.7
Approach		408	5.0	0.301	9.0	LOS A	1.6	11.9	0.68	0.81	0.68	51.8
All Vehicles		2663	5.0	0.866	10.4	LOS A	14.1	103.2	0.80	0.87	0.93	51.3

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.
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).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Horace Street & Hunter Avenue]

Existing PM Peak
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: Eastern Arterial Road												
1	L2	82	5.0	0.255	6.8	LOS A	1.2	8.8	0.48	0.63	0.48	52.7
2	T1	712	5.0	0.585	6.4	LOS A	4.3	31.3	0.57	0.64	0.58	53.4
3	R2	72	5.0	0.585	10.5	LOS A	4.3	31.3	0.58	0.64	0.59	53.1
3u	U	1	5.0	0.585	12.5	LOS A	4.3	31.3	0.58	0.64	0.59	53.9
Approach		867	5.0	0.585	6.8	LOS A	4.3	31.3	0.56	0.64	0.57	53.3
East: Hunter Avenue												
4	L2	51	5.0	0.076	7.6	LOS A	0.3	2.3	0.56	0.71	0.56	52.2
5	T1	56	5.0	0.131	6.7	LOS A	0.6	4.4	0.56	0.73	0.56	52.4
6	R2	62	5.0	0.131	10.9	LOS A	0.6	4.4	0.56	0.73	0.56	52.2
Approach		169	5.0	0.131	8.5	LOS A	0.6	4.4	0.56	0.72	0.56	52.3
North: Horace Street												
7	L2	47	5.0	0.179	6.0	LOS A	0.8	5.7	0.40	0.57	0.40	53.1
8	T1	438	5.0	0.412	5.5	LOS A	2.4	17.3	0.42	0.58	0.42	53.7
9	R2	126	5.0	0.412	9.5	LOS A	2.4	17.3	0.42	0.59	0.42	53.3
9u	U	27	5.0	0.412	11.5	LOS A	2.4	17.3	0.42	0.59	0.42	54.1
Approach		638	5.0	0.412	6.6	LOS A	2.4	17.3	0.42	0.58	0.42	53.6
West: Eucalyptus Street												
10	L2	141	5.0	0.185	7.9	LOS A	1.0	7.0	0.68	0.80	0.68	52.0
11	T1	69	5.0	0.194	8.4	LOS A	1.0	7.0	0.69	0.84	0.69	51.7
12	R2	62	5.0	0.194	12.5	LOS A	1.0	7.0	0.69	0.84	0.69	51.5
Approach		272	5.0	0.194	9.1	LOS A	1.0	7.0	0.68	0.82	0.68	51.8
All Vehicles		1946	5.0	0.585	7.2	LOS A	4.3	31.3	0.53	0.65	0.53	53.1

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.
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).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.