

1. Appraise contract documentation

A. SOW – Schedule B:

- Project is a 6-day per week site – Mon-Fri 6.30am – 6pm, Sat 6.30am – 2pm
- 2.0 The subcontractor has allowed for the removal of Fig Trees
- 3.0 The subcontractor is to confirm whether the site is in a Fire Ant Zone prior to commencement of works and make any necessary allowances

Tender Review Meeting: Site Management -

- No deliveries or vehicle arrivals onto site between 7.30-9am and 2.30-3.30pm
- Parking available on Illaweenaa st – no parking in the school carpark

Site Safety Rules:

- 26 (2.) If work to be carried out beyond Evans Built site compound, a WAP (Work Access Permit) is required from the school.
- 3. In addition to the School's emergency alarms, Evans Built has own emergency alarm signal which is 3 blasts of the horn
- 4. No smoking within 10m of the school boundary
- Establish a protocol for the prevention of unauthorised access to the site by staff or students

B. Was determined through quotes (pricing) and talking to the material import/export suppliers as to which supplier would be used at each stage of the works

- Pink PH export topsoil and clean fill for both contract work and VW - availability
- CEM Cut to Waste and part of VW002 – free tip site
- Pinkenba Operations for all Import of material both contract and VW – lowest price
- Lantrak for Box out works and VW014 in September - availability

Subcontractor John England was determined as best suited to undertake the stormwater component of the works due to their previous history on our projects, reliability, pricing and quality of workmanship.

Mulching Services – Fig Trees

Line Marking by ? – will be determined by availability and pricing

C. Availability of trucks was assessed at each stage of works (Contract and variation) for export and import.

D. Access limitations identified – truck only access to the new carpark

No temp entrance by us – already constructed before we arrived on site.

Client doesn't want a temp entrance constructed for access to return and carry out works on the swale and we cannot drive trucks onto the sporting oval as this will damage the turf.

Waiting on client to come back with a solution as to how they want to proceed.

E. Contract start date was 13/07. Carsburg commenced on site 19/07 due to re-designs and wet weather.

All documentation for authorities was provided by the Client (Evans Built)

As per SOW (10), Carsburg to provide all supervision, labour, materials, plant & equipment, safety, environmental controls, survey & set-out & certification to complete the works, including all related items as indicated in the specs, drawings, Geotech in accordance with

the subcontract conditions and documents and to the satisfaction of all relevant authorities, government acts & regulations, Australian standards & codes of practice. Refer Drawings Standard Notes

- F. All site deliveries were recorded in daily diary by the site supervisor. Refer daily diary
Material delivery dockets were signed off by site supervisor. Refer delivery / export dockets
As per Schedule A Extent of Works - All deliveries to site must be coordinated through the Evans Built Site Foreman. No deliveries between 7.30-9am and 2.30-3.30pm. Subcontractor is fully responsible for accepting deliveries and unloading.

2. Construction Operation Strategies

- A. Organisational strategies –
- PM/Site Supervisor appointed – Arty
 - Visit to site to inspect and identify access, what plant will be required and anything not captured on the tender BOQ
 - Determined Plant/Equipment/Labour required and confirmed with CEM allocations team and booked in
 - Contract handover from estimator to PM and brief provided to team
 - Daily toolbox talks/emails/texts
 - PO's organised for plant hire/material supply and provided to suppliers.
- B. Evans Built was provided with/had access to Risk Assessments, Service records, SWMS for all plant/equipment used onsite.
Roller Hire – PO provided. Delivery docket received when delivered to site. Inspected when it arrived on site and details recorded/photos taken to document condition (PS:05 Record Keeping Registers, CEM Plant & Equipment Checklist Appendix E)
- C. WHS/Risk Management – SWMS / ITP's
- Refers to Qld WH&S Act 2011
 - Refers to Qld WH&S Regulation 2011
 - Refers to Code of Practice eg. Hazardous manual Tasks
 - Refers to Australian Standards
 - E.G. PS:04 Working near live electrical installations – Qld Elec Safety Act 2022, Qld Code of Practice, Aus/NZ Standard 3012 and 3015
- All workers are familiar with the WH&S Act and Regulations relative to the works undertaken and have completed a recognised industry induction (SOW SCH B) and EB project specific Induction. Proof provided to Evans Built before commencing on site.
- D. Existing services identified and removal organised by client if required. Client provided services locations report.
It was identified when soft spots were found. The existing fire main would be exposed when we had to box down a further 300mm. This was relayed to the client who then had the fire main relocated before we commenced Variation works to remove and replace the soft spots.

Hazardous Materials Procedure – When hazardous materials are found (eg Asbestos), the client is informed immediately and we follow their procedure. If they ask us to have the material removed, we then engage 3rd party subcontractors as we are not a licenced asbestos removalist:

- Engage Hazure Consultants (Hygienist) for visual and air monitoring as required.
 - Engage Zero Asbestos to carry out the removal of the asbestos containing material in accordance with Queensland How to Safely Remove Asbestos Code of Practice December 2011.
 - Waste is disposed of at an authorised asbestos disposal site and Waste Tracking Certificates provided/issued
 - provide notification of pending asbestos works to adjacent stakeholders including business and domestic premises
 - generate all site-specific safety documentation including:
 - submission of a Form 65 to Workplace Health and Safety QLD
 - Preparation of a site-specific Safe Work Method Statement, Asbestos Removal Control Plan and Emergency Plan
 - Carsburg would provide the necessary plant/operator – plant washed down after works completed and operator provided with appropriate PPE.
- E. Multiple projects are tracked and controlled through Civil Monthly Programme Refer E.G Aug/Sept 2021

3. Project Schedule

- A. Construction Operations Sequence - refer BOQ – Programme. As per SOW Schedule B (3.0), we allowed for sufficient labour and supervision to complete the works in accordance with the current Construction Programme and (4.0) full time on-site adequate supervision for the duration of the works.
- B. Project Schedule – refer schedule/gantt chart
- C. Critical Path – Construction of the Swale Drain – waiting on clarity from the client as to how we are to proceed...had to wait until the building work was finished by client as the temp scaffolding is on the boundary of swale area. Also, there is now no access to the site/swale area as the new car park has been constructed. Running trucks onto the sports oval will chew up the grass which would require us to bear the cost of remediation.
- D. Programme was adjusted to allow for wet weather, other trades to complete their works, variation works undertaken, school holidays for access to certain areas

4. Required Resources

- A. Client organised temp site office, water, bins, toilet, temp fencing etc
- B. Plant requirements determined by BOQ sequence of activities/SOW/Client Program – Documented in Carsburg programme.
- C. Labour requirements determined by BOQ sequence of activities/SOW/Client program - Documented in Carsburg programme. As per above and Schedule B SOW The subcontractor must perform the works and allow for sufficient resources in labour and supervision to adequately complete the works in accordance with current Construction Programme.
Special Conditions 28.1A – Qld Gov't Building and Construction Training Policy - Had to submit a compliance document re trainees and upskilling of workers
Call Forward sheet for list of plant, equipment, materials and labour requirements

5. Condition reports

- A. Reports on existing buildings and structures adjacent to the site were performed by the client (Evans Built)
 - DWG A01-12 Site Layout Plan
 - Refer Soil Surveys Geotech Report for existing ground conditions to assess the engineering properties and providing earthworks recommendations etc
 - Preliminary Town Planning Report
- B. The project site is for Dept of Education located within the Stretton school grounds.

SUBCONTRACT AGREEMENT

BETWEEN: *Carsburg Civil Pty Ltd*
AND: *EVANS BUILT PTY LTD*
FOR: *STRETTON STATE COLLEGE*

**SCHEDULE 'A'****EXTENT OF WORK****COORDINATION AND COOPERATION**

The subcontractor must:

- Permit other contractors to execute their work.
- Fully cooperate with other contractors.
- Perform the work under the Contract so as to avoid interfering with, disrupting or delaying the work of other contractors.
- Monitor the progress of work being performed by other contractors and notify Evans Built Representative of any interface or sequence activities which may affect the commencement, progress or completion by the Subcontractor of any of the work under the Contract.

SHOP DRAWINGS

- Approval by Evans Built Representative of any shop drawing shall not relieve the Subcontractor from its obligations to perform the work under the Contract in accordance with the terms of this Contract.

SERVICES PENETRATIONS

The Subcontractor shall:

- ~~Provide, set out, fix and maintain all sleeves etc to building elements as required to form penetrations.~~
- ~~Provide all labour and materials necessary to seal service pipes, ducts etc in penetrations with Fire Rated material where required.~~

SET OUT

The Subcontractor shall:

- Set out all works from gridlines provided required for the installation of the Works under the Subcontract.
- Allow for site measuring as required to confirm dimensions.

TASK LIGHTING

- Main access safety lighting shall be provided by Evans Built but any additional lighting required in the Subcontractor's immediate work area shall be provided by the Subcontractor.

SCAFFOLDING

- Initial supply, erection, adjustment and final removal of all internal scaffolding at any level will be provided by the Subcontractor.

PROTECTION OF THE SUBCONTRACT WORKS

- The Subcontractor shall protect the Subcontract Works until Practical Completion of the Head Contract Works.

ELECTRICITY

- Temporary single phase power will be supplied by Evans Built Pty Ltd up to the limit available from the local authority and shared by all Subcontractors on the site. Any additional power required by the Subcontractor shall be provided at the Subcontractor's own cost.
- Installation of 415 volts will not be supplied on site by Evans Built Pty Ltd.
- Costs of connections will be borne by the Subcontractor.
- Cost of electricity supplied will be borne by Evans Built Pty Ltd when used for the purposes of hand tools and lighting only.

TRAFFIC CONTROL, DELIVERIES

- All deliveries to site must be coordinated through Evans Built Pty Ltd Site Foreman.
- ~~The Subcontractor shall include for Traffic Control as required for deliveries.~~

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SCHEDULE 'A'

EXTENT OF WORK

SAFETY PLAN

- Evans Built Pty Ltd is totally committed to achieving a high standard of Workplace Health and Safety and the continual improvement of safe work practices, and the Subcontractor is referred to the Evans Built Pty Ltd Safety Policy. The same commitment is required of the Subcontractor.
- The Subcontractor shall provide a contract specific Work Method Statement completed in accordance with the Queensland Work Health and Safety Act 2011, the Model Code of Practice: Construction Work, and Evans Built Pty Ltd special requirements prior to commencement of the work under the contract.
- ~~The Subcontractor shall be required to present the Work Method Statement for the works at the Tender Review Meeting.~~ ^{SWMS}
- A checklist will be provided to the Subcontractor prior to the Tender Review Meeting of which is to be completed by the Subcontractor and presented with the Work Method Statement.
- These requirements are a condition precedent to the award of a Subcontract and tenderers will not be given consideration if they fail this condition.

EMP

- All works carried out by the Subcontractor shall comply with Evans Built Pty Ltd Environmental Management Plan and all current Environmental Legislation applicable to the project.

SAFETY & EMP COMPLIANCE

- The Subcontractor is to execute the works in strict compliance with Evans Built Pty Ltd Workplace Health and Safety and Environmental Requirements.
- The Subcontractor shall be liable for any claim, proceedings, costs, expenses, losses, damages and liabilities whatsoever arising out of or in connection with the Subcontractor's failure to comply with these requirements.

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**SCHEDULE 'B'****SCOPE OF WORK****Trade –BULK EARTHWORKS, ROADWORKS & CIVIL STORMWATER**

As attached

Date: As Attached

1.0 SCOPE OF WORKS

The subcontract works outlined in the construction documents are to include but are not limited to the provision of all supervision, labour, materials, transport, materials handling, plant and equipment, safety, environmental controls, survey and set-out, and certification necessary to complete the

Earthworks, Roadworks and Civil Stormwater in their entirety at the above mentioned project.

This includes all related items as indicated in the specifications, drawings, Geotech in accordance with the Subcontract Conditions and documents, and to the satisfaction of all relevant Authorities, Government Acts & Regulations, Australian Standards and Codes of Practice.

2.0 DETAILED DESCRIPTION OF THE WORK ELEMENTS**Work Element 1 – Bulk Earthworks, Roadworks.**

- The subcontractor has allowed to carry out earthwork procedures in accordance with AS3798-2007 Guidelines on Earthworks for Commercial and Residential Developments and in conjunction and full compliance with documentation for this particular site detailed in the plans and specifications;
- Plant Mobilisation & Demobilisation Incl.;
- The subcontractor has allowed to provide for erosion, ~~contamination~~ and sedimentation of the site, surrounding areas and drainage systems, maintenance of all erosion and sediment control devices for the duration of the work;
- The subcontractor has allowed for all bulk earthworks incl. but not limited to:-
 - Site Strip;
 - Cut and fill as required to achieve required levels;
 - Compact Subgrade to achieved required compaction for structural subgrade;
 - Removal of earthworks cut material from site as required;
 - Rectification of uncontrolled fill at below agreed rates;
 - Backfill of Retaining walls including cloth, drains and granular fill;
- The subcontractor has allowed for all internal roadworks incl. but not limited to:-
 - Removal of Fig Trees and other species to embankment above roadworks;

*Note – This document serves to outline the scope of works for which the contractor is to be bound under the subcontract agreement and project documentation. This document does not omit portions of the trade works inferred by the project documentation (unless specifically stated) or limit the subcontractor's liability under the contract. Where the listed scope items in this document conflict with other contract documents, legislation or requirements, the sub-contractor is required to seek timely direction from the Contractor on the discrepancy, and is deemed to have allowed for the most onerous requirement.

SUBCONTRACT AGREEMENT

BETWEEN: *Carsburg Civil Pty Ltd*
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evansbuilt**SCHEDULE 'B'****SCOPE OF WORK**

- Site Strip
 - Boxing out of subgrade (Incl. in Earthworks Volumes);
 - Sub-base preparation to all pavements, internal and external;
 - ~~CBR tests to verify pavement design;~~
 - All line marking;
 - Wheel Stops;
 - Bollards;
 - All concrete works by others
- The subcontractor has allowed to give notice of inspections completion of excavated material to contract levels, filling completed to contract levels if required, proof roll subgrade prior to placing sub base, working base, ~~filter fabric or membrane~~ or any fill material if required.
 - The subcontractor has allowed to proof roll.
 - The subcontractor has allowed excavating over the site in material as found to give correct levels and profiles as the basis for structures, pavements, filling and ~~landscaping~~. Make allowance for compaction, ~~settlement~~.
 - The subcontractor has allowed for all levelling, grading, trimming, compacting, scabbling, ripping and the like.
 - The subcontractor has allowed for earthworks profiles to be transitioned uniformly between prescribed slopes.
 - The subcontractor is totally responsible for achieving the required tolerances. No assistance given by EVANS BUILT will in any way reduce or negate this responsibility. All areas not meeting with the Specification will be rectified as directed by EVANS BUILT. Failure to carry out rectification as directed will result in work being carried out by others and the costs deducted from the Subcontractor's sum. Tolerances shall be $\pm 20\text{mm}$ for bulk pads $\pm 10\text{mm}$ in CBR finish pads.
 - The subcontractor has allowed providing survey as required to undertake works to the required levels and set out as nominated on the contract drawings. ~~The subcontractor is to carry out a staged "as = constructed" survey. The subcontractor is to carry out survey post bulk excavation works.~~
 - The subcontractor is to comply with all notes shown on the drawing;
 - The subcontractor has allowed for all dust suppression incl. water, water cart & the like for dust directly generated by the subcontractor
 - Cleaning of roadways & footpaths for debris deposited by the Subcontractor;

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evansbuilt**SCHEDULE 'B'****SCOPE OF WORK**

- The subcontractor has allowed for any fees associated with obtaining water for the suppression of dust during the works.
- The Subcontractor is to assume the risk on all Earthworks Quantities including the volume of material suitable for reuse as structural filling and disposal off site of unsuitable fill material if required. Any deficiency of the suitability of site won material as structural filling is to be made up using imported filling as required by the geotechnical engineer at the agreed rate.
- Any deleterious, soft, wet or highly compressible material or topsoil material rich in organics or root matter should be stripped and removed (if required). In areas of 'uncontrolled' filling, excavate and sort the uncontrolled filling to remove unsuitable materials (if any as directed by the geotech) and rectification to necessary compaction at the agreed rate.
- Locate any stockpiles of construction materials and other site debris clear of drainage lines and clear of any position from which it could be washed onto any footpath, nature strip, roadway or into any drain, wet land or watercourse.
- The subcontractor it to comply with EVANS BUILT Environmental Management Plan.
- Grade to give falls away from buildings minimum 1:100.
- The subcontractor is to include for maintaining sloping faces, batters and the like. ~~excluding turf~~
- Evans Built will provide a TIN file. ~~No guarantee will be provided by EB for the accuracy of this file for the purposes of completing the works.~~
- The subcontractor has allowed for the removal of all surplus spoil at the below agreed rate. .

WUS

Work Element 2 – Civil Stormwater

The subcontractor has allowed for all internal & external roadworks incl. but not limited to:-

- The subcontractor has allowed for all civil stormwater works incl. but not limited to:-
 - Supply and installation of stormwater pits, pipework, including, excavation, bedding and backfilling;
 - Relocation of existing field inlets including removal, excavation, bedding and backfilling;
 - Strip Cut and Fill to Swale drain including turfing to swale;
- ~~The subcontractor is to allow to~~
- The subcontractor has allowed for bedding excavation and backfilling.
- The subcontractor has allowed sealing all open pipes to prevent concrete ingress during pours and ingress of other deleterious material at all other times.
- The subcontractor has allowed for setting out of sub-contract works.

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Adjustment in
height

SUBCONTRACT AGREEMENT

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**SCHEDULE 'B'****SCOPE OF WORK****Work Element 3 – Net Hire Machine Rates**

ITEM	RATE
<i>Pot holing for existing services</i>	\$195/hr
<i>Silt Fence</i>	\$7.50/lm
<i>Shake down Facility</i>	\$2,100
<i>e/o above for Steel Grid</i>	\$1,900
<i>Temp Access Combi Grid + Crushed Rock</i>	\$5.25/m2 & \$70/m3
<i>Removal of Access</i>	\$30/m3
<i>Soft Spots (Remove & Replace)– Onsite</i>	\$55/m3
- CBR+3	\$65/m3
- CBR10/15+	\$75/m3
<i>CBR15 to Paths</i>	\$80/m3
<i>Other rates as per BOQ</i>	

Work Element 4 – Completion – Warranties, Guarantees and Certification

- The subcontractor has allowed for submission of required Form 15/16 requested on completion of works by EVANS BUILT as set out on the Building Application for this project if required.

3.0 TRADE INCLUSIONS (Specific to all Work Elements)

- The Subcontractor is to provide all required access, working platforms and any necessary catch-scaffolds to the necessary standard to complete their works.
- The Subcontractor is to confirm whether site is in a Fire Ant Zone prior to commencement of works and make any necessary allowances if so.
- EVANS BUILT will provide gridlines for set out purposes for trade works only – all other set out deemed to be included by Subcontractor.
- EVANS BUILT will not provide set out points for in-ground services. Bench mark to be supplied to allow confirmation of same height datum.
- The Subcontractor must perform the works and allow for sufficient resources in labour and supervision to adequately complete the works in accordance with current Construction Programme.

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**SCHEDULE 'B'****SCOPE OF WORK**

- The Subcontractor shall be responsible for the safe storage of all materials, fittings and fixtures at all times. Lost, damaged or stolen items shall remain the responsibility of the Subcontractor up until reaches practical completion.
- The subcontractor is to allow to clear penetrations of safety mesh and the erection and maintenance of barricades.
- ~~The subcontractor is to allow for core holing and saw cutting of concrete required and reinstatement of surfaces.~~
- All information and documentation included in this package, has been provided by EVANS BUILT on good faith. The Subcontractor is however to thoroughly examine the site and will be fully responsible for work and costs associated with the site conditions.
- The subcontractor is to ensure that nominated site staff are provided with current Construction Issue drawings and specifications at site. To be provided
- Allow where necessary to remove and reinstate protection to any building element where the subcontractor requires it. Allow for progressive removal and disposal of all protection and a trade clean at a time to be nominated by EVANS BUILT.
- Keep all roads, streets and pavements free and clear of any debris and any loose materials as created by the Subcontractor during the extent of the contract. All materials must be swept up and removed from the roads and not directed into Council's stormwater drainage system.
- The Subcontractor is responsible for the protection of footpaths, pavements, kerbs, guttering and the like including rectification of any damage caused during the works. only if drainage is caused by Carsburg
- The Subcontractor is to take all measures necessary to minimise nuisance from dust and noise affecting adjoining properties and the public. Construction equipment is to be fitted with noise suppressors and comply with all provisions of the Noise Abatement Act and all other Authorities having jurisdiction over the works. All jackhammers and other noisy hand held tools are to be fitted with effective silencers of a type recommended by the manufacturers. Compressors and similar equipment is to be fitted with acoustic canopies and engine silencers of a type recommended by the manufacturers.
- ~~Allow to co-ordinate any penetrations required by services trades to perform their works. Provision for additional support framing, trimmers and the like are to be the responsibility of the subcontractor at their cost and approved by the project Structural Engineer.~~

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**SCHEDULE 'B'****SCOPE OF WORK**

- ~~The subcontractor is to allow to fire rate all penetrations in fire rated elements and provide a penetration register to relevant Australian Standard – this must include location, numbering in line with inspections stickers, dates, type and marked up drawings showing locations.~~
- The subcontractor is to allow for removing of surplus excavation material off site as the work is completed. ~~Spoil by others is to managed as previously noted.~~
- The subcontractor is to allow for re-compaction and testing of any backfill material relevant to this subcontract. EVANS BUILT will not warrant the suitability of excess spoil for trench back-filling.
- It is the responsibility of the subcontractor to ensure that they have all necessary IT equipment to enable the use of EVANS BUILT's Document Control System. The Subcontractor must follow all protocols as required.
- The contractor is to include and carry out a full trade clean prior to hand-over to the approval of EVANS BUILT personnel.
- On completion, or as when requested by EVANS BUILT, the sub-contractor is to carry out a defect identification inspection and make good all defects to the complete satisfaction of EVANS BUILT and the client.
- The subcontractor is to and is deemed to have:
 - Examined the construction documents, the site and its surroundings including any existing buildings or other structures and any other information made available for the purpose of construction.
 - Examined all information relevant to the risk, contingencies and other circumstances having an effect on its price and which is obtainable by making reasonable enquiries.
 - Satisfied itself as to the correctness and sufficiency of its Construction and that its price covers the cost of complying with all the requirements of the Construction Documents and of all matters and things necessary for the due and proper performance and completion of the work described in the Construction Documents.

4.0 SITE PRELIMINARIES

- Full time on-site adequate supervision for the duration of the works. The Supervisor must be contactable 24 hours per day 7 days per week to respond to all emergency issues raised by EVANS BUILT or other Authorities.
- Sufficient labour and materials to work on several work fronts simultaneously.
- EVANS BUILT is to provide site amenities including, ablutions, lunch and change sheds. Space is limited on site and any allocation for the subcontractors' storage is to be co-ordinated and approved by EVANS BUILT Site Manager.

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**SCHEDULE 'B'****SCOPE OF WORK**

- All workers on site must have completed a recognised industry induction, and EVANS BUILT's project specific site induction prior to starting on site.
- The Subcontractor is to allow for the work hours in accordance with EVANS BUILT's Site / House Rules. The project is a 6-day per week site. Works may be staged as required by EVANS BUILT. The Subcontractor may be required to work outside normal working hours if deemed necessary by EVANS BUILT to achieve EVANS BUILT's program.
- The Site open hours are:
 - Monday to Friday: 6.30am to 6.00pm
 - Saturday: 6.30am to 2.00pm
 - Sundays & Public Holidays: No work permitted
- The Subcontractor is not permitted to place signage on any part of the building, formwork, hoardings or attachments to the building. SWMS
- Inspection and Test Plans, ~~Work Method Statements~~ and other necessary documentation to satisfy requirements indicated in the specification is to be submitted prior to commencement of work.
- Preparation of a Quality Assurance Plan specific to the project. The Quality Assurance Plan is to be prepared by the Subcontractor for the approval of EVANS BUILT and any relevant consultants, prior to commencement of work. ITP's
- Co-ordination with other trades.
- Requirements of tender review meeting minutes.

5.0 WORKS BY OTHERS

- Demolition;
- Civil Pavement

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SUBCONTRACT AGREEMENT

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FOR: *STRETTON STATE COLLEGE*

evansbuilt

ANNEXURE 1: COPY OF SIGNED TENDER REVIEW MEETING MINUTES

TENDER REVIEW MEETING – GOV

evansbuilt

Project:	STRETTON – NLC	Project No:	2103
Trade Package:	Earthworks	Date:	
SC Company Name:	Carsburg	Time:	
SC Representative:	Darren McKay	Location:	
EB Representative:	CLARENCE PERRETT	Distribution:	CP
Contents of TRM:	PART A: Contractual Conditions PART B: Safety, Environmental & Industrial PART C: Site Management PART D: Agreement PART E: Annexures A to D		
			MUST BE INCLUDED

Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible	Action	Date
PART A: CONTRACTUAL CONDITIONS				
A1	SUBCONTRACT FORM			
	Evans Built confirmed agreement shall be AS4903-2000 subcontract agreement with Special Conditions.			
	Document available for viewing on the EB website: http://evansbuilt.com.au/subcontracts/			
	The Subcontractor acknowledges and agrees that by signing this Tender Review document it shall be deemed to have reviewed, satisfied itself and agreed to the Evans Built standard terms and conditions as incorporated in the AS4903-2000 and the Special Conditions.			
A2	SUBCONTRACT CONDITIONS			
2.1	Subcontract Sum			
	Brief description of works:	ESC, Bulk Earthworks, Retaining Wall backfill, Carpark, Stormwater incl Swale		
	The agreed Subcontract Sum is:	\$ 173,916.00	Fixed price ex GST	
		\$ 17,391.60	Plus GST (if applicable)	
		\$ 191,307.60	Total fixed price inc. GST	
2.2	Subcontractor Company Details			
	Full Name of contracting company/entity:	Casrburg Civil Pty Ltd	SC	
	ACN/ABN:	ACN:	ABN: 66 631 834 903	
	QBCC (or other relevant) Licence Number:		SC	
	Subcontractor Address: <i>street & postal address required</i>			
	Street Address:	207 Elliot Road, Banyo		
	Postal Address:	As above		
	Subcontractor Phone and Fax Numbers:	Ph: 3267 8033	Fax: 3267 8352	
	Email address (for issue of NOA):		SC	
	Subcontractor Representative:	Name	Darren McKay	
		Email	estimator@carsburgearthmoving.com.au	

TENDER REVIEW MEETING – GOV**evansbuilt**

Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible		Action	Date
		Mobile	0429 112 536		
2.3	Duration of the Works				
	SUBCONTRACT Commencement Date:			13/07/21	
	SUBCONTRACT Practical Completion Date:			30/11/21	
2.4	Subcontractor Insurances				
	The Subcontractor is responsible for all excesses under the Main Contractor's policy to insure the works under subcontract. Head Contract policy can be reviewed on formal request. The Subcontractor has the option, at his own cost, of effecting insurance to cover any risks which they feel the Head Contract insurance policy does not adequately cover/indemnify them.				
	- Subcontractor to provide Certificates of Currency for all insurances prior to commencement of subcontract works. - PL to be endorsed with insured as "Evans Built Pty Ltd". - PL must state project name & site address. - PL must state period of insurance as: - 3 months beyond date for PC - Additional DLP up to 12 months				
	Insurance for WUS (Clause 16A) – Excess per claim:	\$2,500 Minor Peril			
		\$10,000 Major Peril			
	Public Liability (Clause 17):	\$20,000,000			
	Professional Indemnity (Clause 16B) if applicable:				
	WorkCover:	Required			
2.5	Liquidated Damages				
	Subcontract Liquidated Damages	\$ 1000	Per Day		
	Main Contract Liquidated Damages	\$ 1000	Per Day		
2.6	Defects Liability				
	Defects Liability Period:	52	Weeks		
2.7	Program, Resources and Performance				
	The Subcontractor is familiar with the construction time frame and confirms it has sufficient resources (both Management and Site) to comply with EB construction program, including revisions from time to time.				
2.8	Acceptance of Tender Documentation & Tender Scope of Works				
	The Subcontractor confirms that they are familiar with and accept all items in the tender documentation and tender scope of works including, or as amended by the following items:				
	List any agreed variance from the scope here:				
	- SILT FENCE - SWAIL DRAIN RE-ALIGNMENT				
2.9	Sub-Subcontracting				
	The Subcontractor shall not subcontract any of their works without obtaining the prior approval from Evans Built. The Subcontractor will be responsible for the supervision, direction and actions of any approved sub-subcontractors at all times.				
	Requests for Approval must be made to Evans Built on the 'Request for Approval to Subcontract' form contained within the Subcontract (Clause 9.2).				

TENDER REVIEW MEETING – GOV

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Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible	Action	Date
2.10	Acceptance of Substrates Any base works unacceptable or not suitable for the application of the Subcontractors works should be immediately advised in writing to Evans Built. The application of the Subcontractors works over the substrate will constitute acceptance of the substrate.			
A3	PAYMENT			
3.1	Progress Claims Claim Date: Payment terms:	28th day of each month 25 business days from claim date		
3.2	Subcontractor to submit Progress Claims (not tax invoices) monthly by 28th of month with agreed (by EB) works complete schedule (level by level break-up format) attached. Payments will be in the form of RCTI system. Claims may be posted or if emailed to the email address in Item 10A only .	accounts@evansbuilt.com.au		
3.3	Progress Claims must be submitted in the Evans Built suggested format. The claimed work must be <u>clearly identified by breakdown and/or percentage</u> . Schedule of rates work must be <u>agreed with and signed off by site foreman</u> . Inadequate information in the Progress Claim may result in delay in processing/payment of the claim.			
3.4	The Subcontractor tender documents will not form part of the contract documents (Although special clauses and conditions can be included by agreement).			
3.5	Evans Built will not contract with companies under/who enter into Factoring arrangements.			
A4	RETENTION			
4.1	Retention held 10% up to maximum of 5% of contract sum. Retention to be reduced to 2.5% at practical completion with balance released on completion of defect liability period.			
4.2	Subcontractor may provide retentions in form of cash retention/2 No. unconditional Bank Guarantee's, each for 2.5% of the Contract Sum.			
4.3	Subcontractor to provide completion/maintenance documentation in accordance with Schedule B requirements, prior to receiving practical completion.			
A5	VARIATION SCHEDULE OF DAY LABOUR RATES			
5.1	All up Hourly Rates			
	Tradesman:	\$ 100	/hour	SC
	Labourer/TA:	\$ 65	/hour	SC
5.2	No day labour work shall be carried out unless written instruction has been obtained from Evans Built.			
5.3	Any claim for day labour and/or sundry extra works must include daily dockets signed by EB site manager, failing which the claim will be rejected .			

TENDER REVIEW MEETING – GOV

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Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible			Action	Date
A6	SUPPLY, ERECTION & REMOVAL OF PLANT					
6.1	Scaffolding	<i>Tick as appropriate</i>				
(i)	Initial supply, erection & final removal by:	SC	MC	N/A	x	
(ii)	Adjustment & moving of scaffold or planks by:			✓	x	
(iii)	Cost of hire borne by:			✓	x	
	Other details:					
6.2	Craneage & Hoisting	<i>Tick as appropriate</i>				
(i)	Craneage facilities including operators by:	SC	MC	N/A	x	
(iv)	Hoisting facilities including operators by:			✓	x	
(vii)	Labour to handle materials lifted by crane/hoist by:			✓	x	
(ix)	If by Main Contractor – materials to be handled:	From:	am/pm	To:	am/pm	
(xi)	Charge for craneage/hoisting facilities (if any) at rates:	\$		Per hour		
A7	STATUTORY COMPLIANCES					
7.1	QLD Government Training Policy	This is an Indigenous Project: Tick one: NO				
	Compliance with the Qld Government Training Policy forms part of this contract – refer Special Conditions Clause 28.1A.					
	The Subcontractor must submit to Evans Built the following compliance documents in the form attached to the Special Conditions and in accordance with Clause 28.1AB(a).	• Compliance Plan • Practical Completion Report				
7.2	Project Trust Account	This is a PTA project: Tick one: ☐ YES				
	IF YES:					
	In accordance with the <i>Building Industry Fairness Act 2017</i> : The Contractor will issue to the Subcontractor a 'Notice of project trust account before entering into subcontract' (QBCC s49). WITHIN 5 DAYS receipt of this notice the Subcontractor must confirm in writing the bank account details provided here for payment of claims:	Subcontractor's Bank Account Details: SC Account Number: BSB: Account Name:				
7.3	Other Mandatory Compliances					
	Special Conditions Clause 28.1B	Qld Charter for Local Content				
	Special Conditions Clause 47	Building Code 2016				
	Special Conditions Clause 48	Qld Code of Practice for the Building & Construction Industry				
	Special Conditions Clause 49	Ethical Supplier Threshold				

TENDER REVIEW MEETING – GOV

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Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible	Action	Date
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PART B: SAFETY, ENVIRONMENTAL & INDUSTRIAL

B1 SAFETY MANAGEMENT

- | | | |
|-----|--|--|
| 1.0 | QSE060 Subcontractor Prequalification & WHS Assessment:
<p>The outcome of QSE060 Contractor WHS Assessment, which is used to evaluate subcontractors and categorise them as an acceptable or unacceptable WHS risk prior to contract award using the Evans Built HIRAC process, is discussed with the contractor, with actions agreed by all parties.</p> | REFER ANNEXURE D:
QSE060 Subcontractor Prequalification & WHS Assessment

Note: Subcontractors who have not yet undertaken Prequalification will be required to do so as part of TRM process. |
| 1.1 | Project Risk Register
Project Risk Register and Risk Assessment Process. | REFER ANNEXURE A:
QSE001A WHS Management Plan |
| 1.2 | Inductions
<p>The Subcontractor confirms that all its site personnel carry current General Safety Induction Cards and will attend Site Specific Safety Induction course on site prior to commencing works.</p> <p>All Site Specific Inductions will be conducted at the following predetermined times unless notified otherwise by EB Site Management: 6:30am.</p> | |
| 1.3 | Site Consultative Arrangements
<p>The consultative arrangements for the project are proposed to be:</p> <ul style="list-style-type: none"> • Site specific induction process • Daily pre-start meetings • Toolbox talks • Safety Committee Meetings • Site issue resolution process • Site inspections (subcontractors to participate) <p>If you have any objections to the proposed site consultative arrangements, please notify Evans Built in writing prior to commencement on site.</p> | |
| 1.4 | COVID19
<p>COVID19 Protocols are to be adhered to.</p> <p>Subcontractor is to notify Evans Built immediately if their ability to carry out the works in the required time frame has been affected by COVID19.</p> | |

B2 SAFE WORK METHOD STATEMENTS (SWMS)

- | | | |
|-----|---|--|
| 2.1 | The Subcontractor shall present a Contract Specific Work Method Statement completed in accordance with the Queensland Work Health & Safety Act, the Model Code of Practice: Construction Work and aligning to the content of the Evans Built WHS Management Plan and Project Risk Assessment. | ► Under no circumstances shall works be allowed to proceed on the Construction Site without approved SWMS documentation – see item 5.2 |
| 2.2 | A copy of the SWMS must be reviewed by Evans Built prior to commencing on site. SWMS will be reviewed by Evans Built against QSE007 Safe Work Method Statement Review Checklist. Evans Built SC Admin will request SWMS up on receipt of signed TRM. | REFER ANNEXURE B:
QSE007 SWMS Review Checklist
Note: Subcontractors must prefill reference to their SWMS Page Numbers on the EB Checklist and submit with their SWMS for review. |
| 2.3 | All SWMS are to be site specific and task relevant to the work that they shall undertake. | |
| 2.4 | All subcontractors and workers must read, sign, and adhere to all safety provisions that are outlined in their Safe Work Method Statement (SWMS) that they have signed onto. As per the contractor management requirements of the QSE001A WHS Management Plan. | |

TENDER REVIEW MEETING – GOV

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Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible	Action	Date
2.5	If at any stage the task or the way the task is to be performed differs from what is currently on the SWMS, the SWMS must be amended and reviewed by Evans Built prior to carrying out that task.			
2.6	All subcontractors and their workers MUST be competent in works they have been contracted to carry out for Evans Built.			
2.7	All SWMS shall be kept on site, always adhered to and be subject to routine compliance inspections/task observations.			
2.8	The Subcontractor confirms that relevant workers/HSRs are consulted in the preparation of the Subcontractor's SWMS.			
2.9	RESPIRABLE CRYSTALLINE SILICA (RCS) "Silica Dust" Information required from Subcontractors: • SWMS including risk management of RCS • Suitable engineering controls are used to manage the risk of RCS • Dust extraction of equipment is fit for purpose • Respiratory Protective Equipment (RPE) is supplied to workers • RPE is fit for purpose and suitable for the work & hazards • RPE is correctly worn & is a suitable fit – verify fit test undertaken by competent person • Evidence of work activities completed in accordance with SWMS Information on RCS is available for viewing on the EB website: http://evansbuilt.com.au/subcontracts/	▶ SWMS to include work activities at risk of generating Respirable Silica Dust ▶ Evans Built Subcontractors are required to provide SWMS which include task specific risk assessment and control measures for COVID-19 on Evans Built construction sites.		
B3	SAFETY REPRESENTATIVE & SAFETY COMMITTEE			
3.1	The subcontractor shall have a safety representative on site who is trained and competent in safety matters relating to the subcontract works. The representative shall be a worker who is engaged in activities on site.			
3.2	The subcontractor shall provide a safety representative to be a member of the Construction Site Safety Committee where one of the following criteria applies, or when determined by Evans Built: • The subcontractor is engaged in 'high risk activities' The Committee Safety Representative shall be a worker who is engaged in activities on site, and shall be trained and competent as a member of the Safety Committee. For example, a qualification equal to or better than "The Safety Representative Course – Qld 30630" is to be held by the worker. The Safety Representative as a member of the Committee shall be required to be proactive in the achievement of acceptable safety outcomes for the construction site, and shall be required to wear identification confirming the worker is a Committee Member. This will be in the form of a sticker or helmet provided by Evans Built. The safety representative shall be accessible to any worker onsite. The safety representative shall be required to refer any issues raised to Evans Built for review. The Safety Representative shall be required to chair the Site Safety Committee Meetings when requested by Evans Built.			

TENDER REVIEW MEETING – GOV



Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible	Action	Date
3.3	Evans Built has the authority to remove any Safety Representative from the Safety Committee that it deems as insufficiently trained or competent, or not providing a proactive benefit or contribution to the Committee or to improved safety outcomes for the site.			
3.4	Should the subcontractor fail to discharge its responsibilities in accordance with this clause, such a failure will be deemed as a substantial breach of the subcontract and liable for grounds of termination.			
B4	SITE SAFETY RULES			
4.1	Personal Protective Equipment (PPE) The Subcontractor is required to supply all PPE to Subcontractor’s workers. The minimum PPE to be provided to every worker on site is as follows: • Safety Footwear (AS 2210) • Safety Helmet (AS 1800, AS 1801) • Hi Visibility Clothing (AS/NZS 4602) • Safety Glasses (AS 1336, AS 1337, AS 1338) • Protective Gloves (AS/NZS 2161) • Respiratory Protective Equipment (RPE)* The Subcontractor is to determine the glove type appropriate to the task being performed. The Subcontractor is to ensure workers are fit tested by a competent person for any RPE. Any PPE provided by Evans Built shall be back charged to the Subcontractor. Minimum of short sleeve shirt (ie: no singlets or bare backs permitted) and the wearing of High Visibility Clothing is compulsory at all times.	REFER ANNEXURE A: QSE001A WHS Management Plan <i>*for work activities at risk of generating Respirable Silica Dust</i>		
4.2	The use of 9 inch (230mm) Angle Grinders is strictly forbidden on site.			
4.3	The use of any step ladder to the height of 1300mm, including 900mm (3ft) and 1200mm (4ft) step ladders, is strictly forbidden.			
4.4	Evans Built discourages the use of mobile phones by workers on site during working hours, other than Foremen and Leading Hands, due to the impact upon safety and productivity. This is not currently a site rule, however we encourage all Subcontractors to adopt a similar policy.			
B5	MATES IN CONSTRUCTION			
5.1	General Awareness & Connector Training Evans Built is committed to supporting mental health initiatives such as Mates in Construction and Blueprint. Subcontractors and sub-subcontractors are required to have their labour force participate in any relevant programs implemented on the site, including MIC General Awareness (GAT) induction training.			

TENDER REVIEW MEETING – GOV

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Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible	Action	Date
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PART C: SITE MANAGEMENT

C1 EMP & TMP

- | | |
|--|--|
| <p>1.1 All works to be carried out, where applicable, in accordance with Evans Built Environmental Management Plan and/or Traffic Management Plan.</p> <p>1.2 Subcontractor to provide traffic controllers (ie: Lollipop men) on an as required basis to control Subcontractor machinery and/or deliveries.</p> <p>1.3 Subcontractor is responsible for all other traffic issues (relating to their subcontract works) including permits, road closures etc. and preparation of trade specific Traffic Management Plan.</p> <p>1.4 There will be no/limited parking on site.</p> | <p>There is to be no deliveries or vehicle arrivals on to site between the hours of 0730 and 0900; 1430 and 1530. Subcontract Supplier deliveries are the subcontractors responsibility, the subcontractor is to ensure compliance with the no delivery timings above.</p> <p>Parking is available on Illaweena Street
There is to be no Parking in the Carpark in Gowan Rd accessed Carparks</p> |
|--|--|

C2 CHEMICALS & ELECTRICAL

- 2.2 **Chemicals & Safety Data Sheets (SDS)**
For all chemicals that subcontractors and their workers use on Evans Built controlled sites, it is required that all chemicals be accompanied by a relevant (within last 5 years) copy of the SDS for that product.
- 2.3 **Electrical Test & Tagging**
All electrical tools and equipment must be tested and tagged every 3 months to meet the state and site-specific requirements.

C3 SITE GENERAL

- 3.1 **Site Clean-ups – Daily – Weekly**
The project is to be kept clean on a daily basis with rubbish regularly deposited into bins or skips in designated positions on the site. This is a safety as well as a cleanliness issue.
- Should the site be not kept adequately clean on a day to day basis the Subcontractor will be required to provide additional labour for a combined site clean-up at a time (at least once weekly) nominated by EB Site Representative.
- 3.2 **Site Services**
EB will arrange for connection to the site of power and water.
- The Subcontractor is to provide all necessary leads and hoses from central connection points. All electrical leads are to be adequately and safely suspended off the floor. All electrical leads & tools to be adequately tested & tagged in accordance with safety regulations.
- EB will provide adequate lighting for access and safety. The subcontractor to provide task lighting sufficient to carry out the subcontract works.
- 3.3 **Industrial Relations**
The Subcontractor is to remain fully responsible for any industrial relations matters relating to the Subcontractors employees for the duration of the contract works.

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Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible	Action	Date
	The Subcontractor has allowed to satisfy all the requirements of their relevant award or industrial agreement.			
	The Subcontractor <u>does/does not</u> have an EBA.		SC	

TENDER REVIEW MEETING – GOV**evansbuilt**

Ref.	ITEM DETAILS	Agreed Terms – Action Required – Party Responsible	Action	Date
3.4	Site Coordination The Subcontractor is required to be particularly proactive in coordinating his works with other subcontract works throughout the project, in his capacity as being expert & experienced in his field. Any claims emanating from lack of such coordination will not be entertained.			
3.5	Hours of Work The site working hours are Monday to Saturday inclusive from 6.30 am to 6.00 pm including the Saturday prior to an RDO. The Subcontractor confirms that allowance has been made for working all hours within this period to maintain program.			
3.6	Materials Handling The Subcontractor will closely coordinate deliveries and material movement with EB site staff. The Subcontractor will ensure that sufficient labour is available on site to receive all deliveries. The Subcontractor has included for all access equipment to complete the works. The Subcontractor will be responsible for storage, security and protection of his plant and material.			
3.7	Plant and Equipment Plant or equipment used by Subcontractor: • • •	REFER ANNEXURE C: QSE042 Plant & Equipment Pre-Commencement Checklist		
3.8	LEAD TIMES The Subcontractor to nominate any items with long lead times and ensure timely ordering of same. 1. 2. 3.		SC	
3.9	Protection of the Works The Subcontractor is required to protect the subcontract works until Practical Completion of the project. The Subcontractor shall also protect adjacent works from possible damaging operations as necessary.		SC	
C4	SITE PERSONNEL			
4.1	Evans Built Site Staff			
	Evans Built Site Supervisor:	David Groves davidg@evansbuilt.com.au	MOB: 0499 949 547	
	Other Site Staff:		MOB:	
4.2	Subcontractor Site Staff			
	The Subcontractor confirms that an experienced & responsible site supervisor will be employed on site, full time, for the duration of its on-site works.			
	Subcontractor Site Supervisor:	ANTY HAWKINS	MOB: 0423 837 125	sc
	Other Site Staff:	ROD CARSBURG	MOB: 041 777 924	

TENDER REVIEW MEETING – GOV**PART D: AGREEMENT**

The Subcontractor must return the signed tender review minutes prior to any contract being formalised. By signing below, the Subcontractor agrees that it has reviewed, satisfied itself, and agreed to the terms as set out in this document.

EVANS BUILT PTY LTD**SUBCONTRACTOR**

Print Name: Clarence Perrett

Position: Project Manager

Signature:

Date: 09/07/21

Company: CARSBURG CIVIL Pty Ltd

Print Name: NEIL CARSBURG

Position: DIRECTOR

Signature:

Date: 9/7/2021

PART E: ANNEXURES

Documents referred within this TRM and forming part of the Subcontract pack are contained as follows:

ANNEXURE A	QSE001A	WHS MANAGEMENT PLAN FOR PROJECT
ANNEXURE B	QSE007	SWMS REVIEW CHECKLIST
ANNEXURE C	QSE042	GENERAL PLANT & EQUIPMENT PRE-COMMENCEMENT CHECKLIST
ANNEXURE D	QSE060	SUBCONTRACTOR PREQUALIFICATION & WHS ASSESSMENT

SUBCONTRACTOR PREQUALIFICATION APPLICATION**INSURANCE INFORMATION**

Public Liability Insurance \$20m	Insurer	About Underwriting
	Policy Number	B0621CCARS000120
	Cover	\$ 20,000,000
Professional Indemnity Insurance \$5m (if applicable)	Insurer	N/A
	Policy Number	
	Cover	\$
Work Cover Insurance	Insurer	Workcover Qld
	Policy Number	WSB200296690

PROJECT BANK ACCOUNTS

In accordance with the Building Industry Fairness Act 2017: the Contractor will issue to the Subcontractor a 'Notice of project bank account before entering into subcontract' (QBCC s49). WITHIN 5 DAYS receipt of this notice the Subcontractor must confirm in writing the bank account details provided here for payment of claims:

Subcontractor's Project Bank Account Details:

Account Number:	364910179
BSB:	084 004
Account Name:	Carsburg Civil Pty Ltd

DOCUMENT SUBMISSION CHECKLIST:

The following documents are submitted with this checklist (if requested):

Please Tick ☒

Safe Work Method Statement (for review)



Insurance Certificates of Currency



Management System Certifications



Other



SUBCONTRACTOR WHS ASSESSMENT CHECKLIST



WHS ASSESSMENT CHECKLIST

Subcontractor to complete:

MANAGEMENT SYSTEMS ACCREDITATION

Y

N

Do you hold certification for your WHS Management System?



If yes, provide certification details:

1. Policy statements

Y

N

Do you have a written statement of your WHS policies?



Are the WHS policies communicated to all your personnel?



Do you agree to adhere to Evans Built WHS policies?



2. WHS Management System

Y

N

Does your company have a WHS management system?



If YES, is your WHS management system available to all your personnel?



Do you agree to adhere to Evans Built WHS management system where applicable?



3. Risk management

Y

N

Do you have a documented procedure used to identify and control risks to personnel and the environment?



Is your risk management procedure communicated to all your personnel?



Do you agree to adhere to Evans Built risk management systems and processes where applicable?



4. Safety rules

Y

N

Do you communicate safe work practices and safety instruction procedures to your personnel?

If YES, describe how: *Tailbox Talks, Revise SWMS*

Do you agree to adhere to Evans Built systems and processes for communicating work practices, safety instructions and emergency response procedures where applicable?



5. Emergency response

Y

N

Does your company have emergency response procedures in place?



SUBCONTRACTOR WHS ASSESSMENT CHECKLIST

If YES, is your emergency response plan available to all your personnel?

✓

Does your company identify emergencies that impact on a Evans Built site?

✓

Does your emergency documentation identify this and outline a plan?

Are your personnel trained to accommodate the emergency?

Do you agree to adhere to Evans Built emergency management systems, processes and other requirements where applicable?

✓

6. Incident investigation and reporting

Y

N

Does your company have an incident / accident reporting program for incidents that occur to your personnel?

✓

Are incidents and near misses reported to your company's management?

✓

Do you have a procedure for the investigation, reporting and follow-up of accidents, dangerous occurrences, or occupational illness?

✓

Do you communicate the results of accident investigations to your personnel?

✓

Do you agree to adhere to Evans Built incident reporting and investigation systems and processes where applicable?

✓

7. Employee WHS orientation programme

Y

N

Do you have a written WHS organisational induction / orientation training program?

✓

Do you agree to adhere to Evans Built company induction / orientation training requirements where relevant and requested?

✓

8. WHS meeting programme

Y

N

Do you hold regular WHS meetings?

✓

Do you have an established system for communicating with stakeholders on WHS matters?

✓

Do you agree to adhere to Evans Built communication and consultation systems and processes where applicable?

✓

9. WHS training programme

Y

N

Have your personnel who will undertake the work received formal training in safe working practices?

✓

Have your personnel who will undertake the work received formal training in the use of protective equipment relating to the potential hazards of that work?

✓

Do you have a competency training scheme for your employees and subcontractors?

✓

Do you agree to adhere to Evans Built company training requirements where relevant and requested?

✓

10. Occupational health

Y

N

SUBCONTRACTOR WHS ASSESSMENT CHECKLIST

Does your company perform any employee pre-employment medical evaluations?

✓

Does your company perform any employee pre-employment drug testing?

✓

Do you agree to adhere to Evans Built drug testing requirements where applicable?

✓

11. WHS inspection / auditing programme

Y

N

Does your company have a planned inspection or audit program?

✓

Has your company conducted an audit of its WHS program in the last 3 years?

✓

Do you agree to adhere to Evans Built inspection and audit requirements where applicable?

✓

12. Safety personnel

Y

N

Does your company have dedicated office and/or field WHS supervisors?

✓

ASSESSMENT SUMMARY (Evans Built Internal Use Only):

TOTAL COUNTS YES / NO =

34

5

SUBCONTRACTOR WORK HEALTH SAFETY PERFORMANCE RECORDS

Please provide the following safety records for the past three years:

2020

2019

2018

Number of Lost Time Injuries

—

1

1

Lost Time Injury Frequency Rate (LTIFR)

Total Number of Recorded Injuries (LTI + ~~MTI~~ + Fatalities)

0

1

1

Total Recorded Injury Frequency Rate (TRIFR)

Other Performance Indicators?

WHS Enforcement Notices received

—

—

—

WHS Infringement Notices received

—

—

—

Environmental Enforcement Notices received

—

Environmental Infringement Notices received

—

Evans Built Breach Notices received

N/A.

Convictions under WHS legislation

N/A.

Industrial Actions against the company

—



EVANS BUILT REVIEW

EVANS BUILT INTERNAL USE:

14. Outcome of assessment

No. of 'Y'	34	No. of 'N'	5
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15. Management actions

Answered marked 'Y' 15 or less	High risk contractor - DO NOT PROCEED
Answered marked 'Y' 16 to 27	Medium risk contractor - MEET WITH CONTRACTOR TO AGREE ACTIONS TO IMPROVE RATING TO >21 (RECORD IN SECTION 16.0) / PROJECT MANAGER TO APPROVE CONTRACTOR ENGAGEMENT
Answered marked 'Y' 28 or greater	Low risk contractor - PROCEED

16. Agreed management actions

EVANS BUILT REVIEW**evansbuilt****16.0 Agreed management actions continued****17. Approval and sign off****Evans Built**

Name:	Clarence Perrett	Position:	PM
Signature		Date:	8/7/21

Contractor

Name:	NEIL CARSBURG	Position:	DIRECTOR
Signature		Date:	8/7/21.

SUBCONTRACT AGREEMENT

BETWEEN: *Carsburg Civil Pty Ltd*
AND: *EVANS BUILT PTY LTD*
FOR: *STRETTON STATE COLLEGE*



ANNEXURE 2: QUALITY CONTROL/QUALITY ASSURANCE

- A. The Subcontractor shall be responsible for the preparation and implementation of a Quality Control System in accordance with the current Australian Quality Standards and the direction of the Manager.
- B. The quality system shall be submitted to the Manager for approval.
- C. The Subcontractors Quality Control/Assurance System shall detail the following as a minimum:
 - 1. Nominate the person/s that are responsible for the Quality Control.
 - 2. Inspection and Test Plans for the control of the works and the inspections and tests itemised.
 - 3. The Subcontractor may use the summary sheet for their particular trade that is prepared by the Manager in preparing the Inspection and Test Plan.
 - 4. Inspection verification and records regarding the Inspection and Test Plans.
 - 5. Ensure control over the records and verification inspections and tests by the use of the Managers approved format.
 - 6. Verification and records are to be submitted weekly to the Manager.
 - 7. On completion of the works a Quality Report shall be prepared and submitted to the Manager.
- D. The Manager or delegated representative shall monitor the quality records during the progress of the works.
- E. The Manager may require the Subcontractor to complete and submit with their progress claims Evans Built Quality Management Check Lists relevant to their Extent of Work. Failure to comply with this condition could result in payments being withheld.
- F. Where the Subcontractor does not implement a Quality Assurance System in accordance with the Subcontract Agreement, the Manager will implement such a system as required for the Subcontractor Conditions at the Subcontractor's cost and these costs will be deducted from monies due to the Subcontractor from the Company pursuant to the Subcontract or otherwise.



EVANS BUILT SITE SAFETY RULES

INTRODUCTION

The term 'Subcontractor' refers to Subcontractor, Direct Contractor, and Relevant Persons alike. The term 'Worker' refers to Worker, Employee and Self Employed Persons alike.

Evans Built Pty Ltd believes that a safe job is essential for efficient construction.

The Evans Built Pty Ltd Health & Safety Policy is to do all that is reasonable to prevent injury to persons and damage to property and to protect workers, the Company and clients from the results of accidents. All subcontractors and others employed on Evans Built Pty Ltd projects are required to have a proactive attitude towards safety.

If in doubt about any aspect of Safety on an Evans Built Pty Ltd site, consult the Site Manager/Foreperson or Safety Officer.

Failure to comply with these site safety conditions will adversely affect your continuation of work with Evans Built Pty Ltd.

1. GOVERNMENT REGULATIONS

Subcontractors (employers) and their employees are required to be familiar with the current Work Health and Safety Act and Regulations hereinafter called the 'Act' and to have completed an accredited general Safety Induction Course as required by the 'Regulations'. Nothing contained in these Site Safety Requirements shall be deemed to override any condition of the 'Act'.

Subcontractors are required to supply Evans Built Pty Ltd with a correctly completed and signed **Work Method Statement** prior to starting work on site.

2. SUBCONTRACTOR'S WORKERS

All Workers are required to have completed a site-specific safety induction for this project and have their names recorded at the site office.

All Workers are required to have completed a General Workplace Health and Safety Induction. This induction proof must be shown to site staff prior to the commencement of work.

All Workers, or any other person, are to comply with any Instruction or Direction given by Evans Built Site Management.

3. WORK PRACTICES

All workers are to ensure they have read and understand their employer's Work Method Statement, and ensure they carry out all works strictly in compliance with the Work Method Statement. All workers are to be trained and competent in the activity they are completing, unless they are being trained under direct supervision. Ensure the activity is conducted in a safe environment and sufficient lighting is maintained for the specific task.

If the worker is of the opinion they have insufficient training to complete a task, discontinue the task and advise Evans Built Site Management.

4. REGISTER OF INJURIES AND ACCIDENT REPORT

The 'Act' requires all injuries to be treated and recorded. All injuries must be reported to Evans Built Pty Ltd Site Manager and the First Aid Register or an Accident Report Form completed.

5. HOUSEKEEPING

All subcontractors are required to deposit all generated rubbish into the appropriate area/s designated by Evans Built on a daily basis.



Keep work areas tidy and free of hazards. Store tools and loose equipment safely at the end of the day. All food scraps must be put in bins. Toilets MUST be used.

No material or obstruction of any kind is to be stored or placed in Access Areas.

Should work areas be left untidy, or in a dangerous or unhealthy state, it may be cleaned up by Evans Built Pty Ltd and charged to you.

6. PERSONAL PROTECTIVE EQUIPMENT (PPE)

The minimum Personal Protective Equipment every worker is required to have on Evans Built Construction Sites is as follows:

- Safety Footwear (AS 2210)
- Safety Helmet (AS 1800, AS 1801)
- Hi Visibility Clothing (AS/NZS 4602)
- Safety Glasses (AS 1336, AS 1337, AS 1338)
- Protective Gloves (AS/NZS 2161)
- Respiratory Protective Equipment (RPE) (AS/NZS 1715)

The wearing of safety helmet head protection, safety footwear and hi-vis clothing at all times is a compulsory requirement on all Evans Built Construction Sites.

The equipment is to be worn both internally and externally throughout the works, until completion and the site ceases to become a 'Construction Workplace'.

The wearing of safety glasses is required when the worker is exposed to injury of the eye. This particularly refers to fragments or dust from activities involving grinding, welding, drilling, sanding, excavating or digging, or the suchlike.

The wearing of protective gloves is required when the worker is exposed to injury of the hand. This particularly refers to activities involving the manual handling, cutting or working with metal objects, sheets of metal or pieces of steel.

The wearing of Respiratory Protective Equipment (RPE) is required when the worker is exposed to the risk of Respirable Crystalline Silica dust particles (RCS). RPE must be appropriately fit tested and fit for purpose, and worn strictly in compliance with the employer's Work Method Statement, and any direction received by Evans Built Pty Ltd.

Any additional requirement of Personal Protective Equipment ie: hearing protection for excessive noise, safety goggles etc shall be worn strictly in compliance with the employer's Work Method Statement, and any direction received by Evans Built Pty Ltd.

The wearing of sleeved shirts is a compulsory requirement at all times. Shirts must cover upper arms between the shoulder and elbow, and must not be cut at the shoulders. Sleeveless shirts and singlets are not permitted on site. Sun protection is to be used at all times. Evans Built strongly recommends all personnel to wear long sleeved shirts.

Failure to comply with the requirement of this clause 'Personal Protective Equipment' will result in one formal warning being issued with further non-compliance resulting in immediate suspension for 24 hours. Upon the worker's return, further non-compliance will result in expulsion from all Evans Built construction sites.

7. WORK AREAS

Should protection around a work area be necessary, it shall be in the form of temporary barriers/handrails, which will conform to the WHS Regulations. A slack rope is not an acceptable means of isolating a work area. Appropriate warning notices must be erected, particularly to work above or below ground level. When working above floor level, ensure that tools and materials are properly secured to prevent their falling, or exclusion zones are put in place.

- All floor openings, or excavations, must be securely fenced or covered with the required decking or mesh.
- All protruding nails shall be removed/bent over.
- All Steel reinforcement to be either capped or bent to prevent injury.



8. PLANT AND EQUIPMENT

All Plant and Equipment brought onto site shall be fit for purpose and comply with the relevant Australian Standard and Legislative requirement. Evidence of regular Inspection and Maintenance shall be required.

All Mobile Plant activities are to be identified by exclusion zones or have spotters in attendance.

All workers are to be aware of vehicular movement on site.

Locks are to be used to isolate hazardous plant and equipment where possible. Where the use of locks is not practicable, danger tags must be used. Remove damaged items from site.

The use of 9 inch (230mm) Angle Grinders is strictly forbidden on site.

9. SCAFFOLDING & LADDERS

Scaffolding:

All scaffolding must comply with the 'Regulations'. Only scaffold areas which have been issued with a formal 'Handover Certificate' are to be accessed. Access is forbidden to all scaffold areas identified as 'Incomplete' or 'No Access'. Under no circumstances is scaffolding supplied by Evans Built to be altered in any way whatsoever without the strict authority of Evans Built.

Ladders:

Ladders are to be used as a form of access only, must conform with Australian Standards, be marked as "Industrial" and note a minimum loading of 120kg.

While in use ladders must be securely tied at the top and must protrude at least 1m past the landing platform.

Maximum length of a single ladder is 6.1m and for an extension ladder 7.5m.

Ladders can only be used as a working platform if authorised by Evans Built Site Management AND a documented Risk Assessment is in place with an associated SWMS. It will only be considered for light work and if 3 points of contact can be maintained.

The use of any step ladder to the height of 1300mm, including 900mm (3 feet) and 1200mm (4 feet) step ladders is strictly forbidden on site.

10. EXPLOSIVES

No explosives are permitted on site without the strict permission of Evans Built Pty Ltd.

11. COMPRESSED AIR

Do not use compressed air for any purpose other than that for which it is provided. Compressed air must NOT be directed towards a person. It is dangerous and can enter the body through the skin and cause injury or death. Air hoses must comply with manufacturer's instructions.

12. PRACTICAL JOKES

Practical jokes and skylarking can be dangerous and are prohibited on site.

Any foul language will not be tolerated. Non-compliance may result in instant dismissal.

13. HOT WORKS

A 'Hot Works Permit' system is in place. All Hot Work including welding and cutting with arcs or naked flame is to be approved by Evans Built prior to commencement. Appropriate exclusion zones, screens and identification signage shall be in place.

Ensure oxygen or acetylene cylinders are stored in a safe place in a secure upright position away from heat.

A fire extinguisher shall be attached to each Oxy-acetylene set.

Protective equipment such as masks, goggles, spats and gauntlets shall be used. Faulty equipment and hoses must not be used. Flash arrestors must be in place.



Walkways - Welding cables and Oxy-acetylene hoses must not be trailed across walkways and working areas. If leads and hoses must cross walkways they should be securely suspended above head height.

14. ELECTRICAL EQUIPMENT

All Electrical Equipment including power tools and extension leads shall be tested and tagged a minimum of 3 monthly intervals.

All electrical leads are to be wrapped around the tie bar at the switchboard and are not to be doubled up. All electrical leads are to be placed to ensure they are protected from mechanical and liquid damage.

All damaged equipment is to be removed immediately from site.

15. SAFETY SPEEDS

Drivers within site limits shall observe safe speeds – no faster than walking pace. No parking is allowed on site except in designated parking areas. The company will not be responsible for any damage to vehicles taken onto the site.

16. ALCOHOL/DRUGS

The consumption or possession of alcohol or non-prescriptive drugs is not permitted on site at any time, or during working hours, or between shifts. Any prescriptive medication that prohibits the driving of any vehicle shall be reported to site management.

Evans Built has the Authority to have any person in breach of this rule, or suspected of being influenced by alcohol or drugs, removed from site immediately without notice.

17. HAZARDOUS CHEMICALS

Safety Data Sheets are to be supplied to the Site Manager/Foreperson for all hazardous chemicals the subcontractor has on site.

18. RADIOS

Radios, including all music emitting devices such as I-Pods, Mobile Phones and the suchlike, are not permitted on site except commercial two-way transmitters approved by Evans Built Management.

19. PETS

Dogs and other pets are not allowed on site.

20. GLASS

Glass bottles and containers are not allowed on site outside the confines of designated lunch areas.

21. SMOKING

All Evans Built Construction Sites are **NON SMOKING**.

This includes any form of Electronic Cigarette or Vaporiser.

Smoking is NOT PERMITTED within the site boundaries under any circumstance.

22. ROOF ACCESS

A 'Roof Access Permit' system is in place. Any person wishing to access the roof of any building must first obtain an authorized permit from the site office. This is to ensure correct safety measures are in place. The permit requirement excludes the Roofing Subcontractor during the construction of the roof.

23. RISK OF FALL

Workers shall ensure that adequate fall protection measures are in place when working at heights.

Full control measures shall be in place for heights exceeding two metres (2m) and risk assessments in place for heights below two metres (2m) in accordance with the WHS Regulations.



24. SAFETY AWARENESS

All persons are to be fully aware of their surroundings at all times to achieve a safer environment. Any aspect of the Construction Site which is identified or suspected to be unsafe is to be notified to Evans Built Site Management for appropriate action.

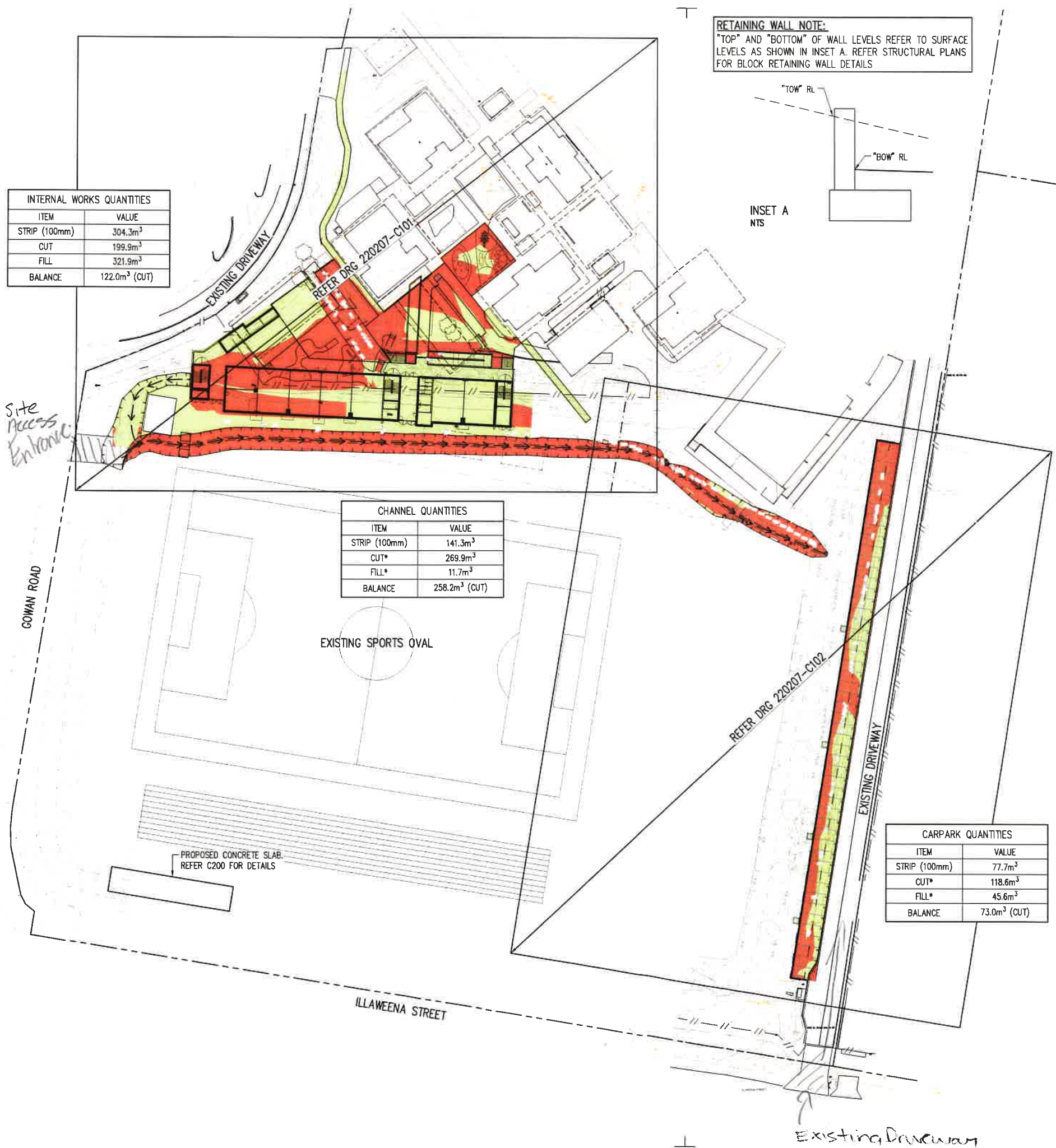
25. EXCAVATION

An 'Excavation Permit' system is in place. Permits are mandatory on any excavation exceeding one metre (1m) in depth.

26. PRINCIPAL SITE SPECIFIC RULES (Mandatory on DET Projects)

1. Hours of deliveries restricted to outside of 7-9am & 2:30 – 3:30pm.
2. No Workers are to carry out works beyond Evans Built Site Compound. If work is to be carried out a WAP (Work Access Permit) is required to be obtained from the School as per 'Working on DETE facilities guidelines (refer Annexure E).
3. School Emergency Alarms are limited to Fire Evacuation & Emergency Lock Down. Evans Built has coordinated process and our own emergency alarm signal is 3 blast of the horn.
4. Smoking is not permitted within 10m of the school boundary.

Establish a protocol for the prevention of unauthorized access to the site by staff or students and the method by which this protocol will be communicated to the facility.



RETAINING WALL NOTE:
"TOP" AND "BOTTOM" OF WALL LEVELS REFER TO SURFACE LEVELS AS SHOWN IN INSET A. REFER STRUCTURAL PLANS FOR BLOCK RETAINING WALL DETAILS

INSET A
NTS

INTERNAL WORKS QUANTITIES	
ITEM	VALUE
STRIP (100mm)	304.3m ³
CUT	199.9m ³
FILL	321.9m ³
BALANCE	122.0m ³ (CUT)

CHANNEL QUANTITIES	
ITEM	VALUE
STRIP (100mm)	141.3m ³
CUT*	269.9m ³
FILL*	11.7m ³
BALANCE	258.2m ³ (CUT)

CARPARK QUANTITIES	
ITEM	VALUE
STRIP (100mm)	77.7m ³
CUT*	118.6m ³
FILL*	45.6m ³
BALANCE	73.0m ³ (CUT)

LEGEND

- EXISTING SURFACE CONTOURS (0.10m INTERVAL)
- PROPERTY BOUNDARY
- EXISTING ELECTRICAL (UNDERGROUND)
- EXISTING GAS MAIN
- EXISTING SEWER - GRAVITY
- EXISTING TELECOMMUNICATIONS (UNDERGROUND)
- EXISTING STORMWATER PIPE
- EXISTING WATER MAIN
- PROPOSED MAJOR EARTHWORKS CONTOURS (1.0m INTERVAL)
- PROPOSED MINOR EARTHWORKS CONTOURS (0.1m INTERVAL)
- PROPOSED EARTHWORKS LEVEL
- RETAINING WALL
- REFER STRUCTURAL PLANS FOR DETAILS
- SILT FENCE (REFER DRG C112 FOR NOTES AND DETAILS)
- INLET TREATMENT AROUND FUTURE STORMWATER PITS (REFER DRG C113 FOR NOTES AND DETAILS)
- PROPOSED ROCK CHECK DAM (REFER DRG C114 FOR NOTES AND DETAILS)
- PROPOSED EARTHWORKS LEVELS AT RETAINING WALL
- TOW: TOP OF WALL
- BOW: BOTTOM OF WALL

LEGEND	EARTHWORKS QUANTITIES	
	ITEM	VALUE
	STRIP (100mm)	533m ³ (EXPORT)
	CUT*	588m ³
	FILL*	393m ³
	BALANCE	195m ³ (EXPORT)

QUANTITIES NOTE

ALL VOLUMES ARE COMPLETE IN PLACE (TIGHT)
NO ALLOWANCE FOR FOUNDATIONS
NO ALLOWANCE FOR SERVICE TRENCHES
NO ALLOWANCE FOR COMPACTION
NO ALLOWANCE FOR BULKING

NOTE:
VOLUMES INCOMPLETE AND EXTENT OF PROPOSED CHANNEL TO BE CONFIRMED ON SITE DUE TO LACK OF SURFACE INFORMATION.

DRAWN	SO	CHECKED	SO	DATE	AF
PROJECT ENGINEER	AF	DESIGN VERIFICATION			
PROJECT DIRECTOR	AF			DATE	27.11.20

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NOTE
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A	16/07/21	FOR CONSTRUCTION	SO
3	06/07/21	LEGEND AND QUANTITIES UPDATED	SO
2	02/07/21	FOR APPROVAL	SO
1	11/06/21	FOR COORDINATION	SO
REV	DATE	AMENDMENT	INIT.
AMENDMENTS			
CLIENT			
QUEENSLAND GOVERNMENT			

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PROJECT
**STRETTON COLLEGE
JUNIOR CAMPUS**
1020 GOWAN ROAD STRETTON

TITLE
**EARTHWORKS LAYOUT
KEY PLAN**



ISSUED FOR CONSTRUCTION

SCALE AT A1		
1:500		
PROJECT No.	DRAWING No.	ISSUE
220207	C200	A
ORIGINAL SHEET SIZE A1-594 x 841mm		





ISSUED FOR CONSTRUCTION

DRAWN	SO	REVIEWED	SO	CHECKED	AF
PROJECT ENGINEER	AF	DESIGN VERIFICATION			
PROJECT DIRECTOR	AF	DATE	27.11.20		

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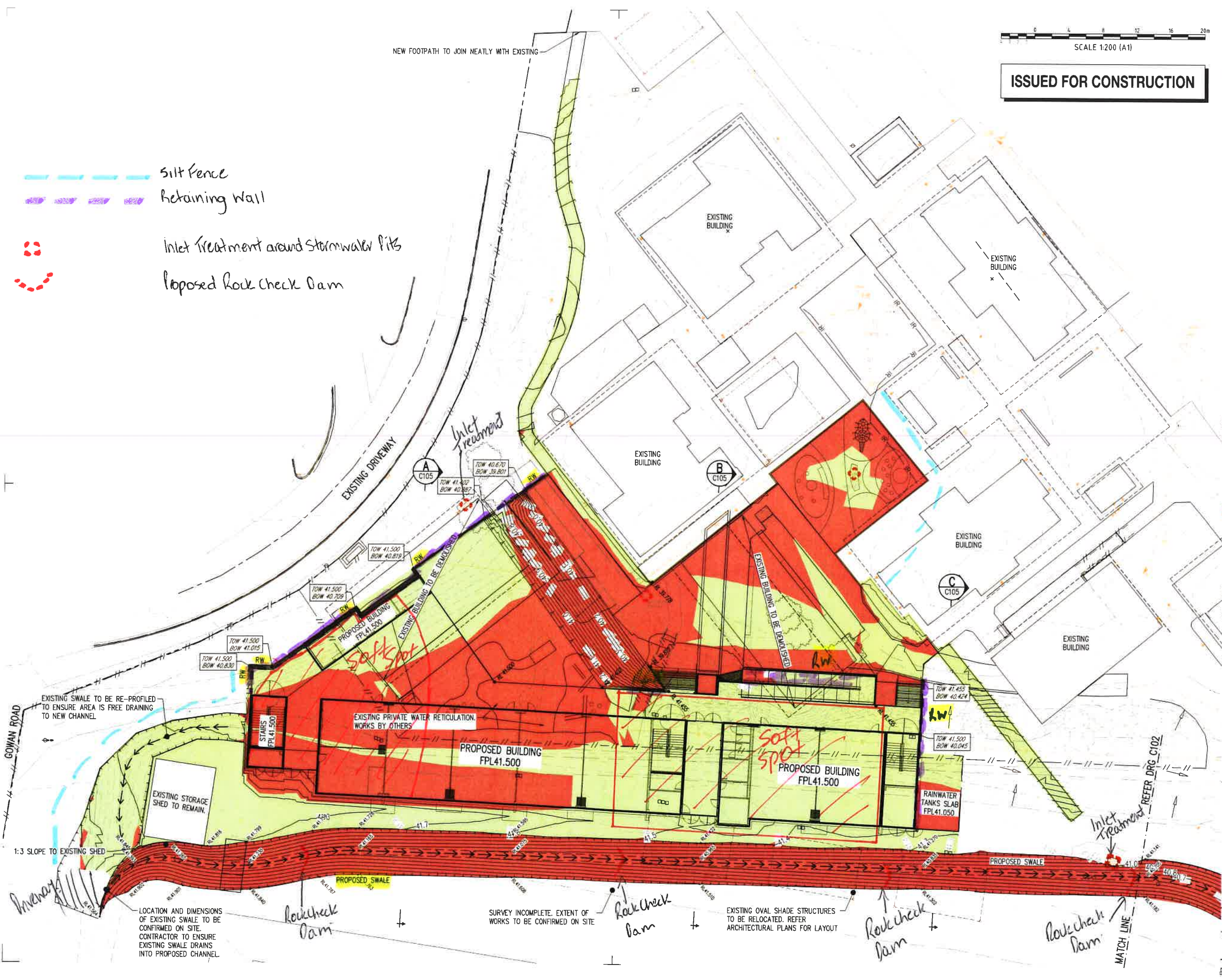
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3	06/07/21	SITE SECTIONS ADDED	SO
2	02/07/21	FOR APPROVAL	SO
1	11/06/21	FOR COORDINATION	SO
REV	DATE	AMENDMENT	INT.
AMENDMENTS			
CLIENT			
QUEENSLAND GOVERNMENT			

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PROJECT
**STRETTON COLLEGE
JUNIOR CAMPUS**
1020 GOWAN ROAD STRETTON

TITLE
EARTHWORKS LAYOUT PLAN
SHEET 1 OF 2

SCALE AT A1 1:500		
PROJECT No.	DRAWING No.	ISSUE
220207	C101	A
ORIGINAL SHEET SIZE A1-594 x 841mm		



Silt Fence
Retaining Wall
Inlet Treatment around Stormwater Pits
Proposed Rock Check Dam

LOCATION AND DIMENSIONS OF EXISTING SWALE TO BE CONFIRMED ON SITE. CONTRACTOR TO ENSURE EXISTING SWALE DRAINS INTO PROPOSED CHANNEL.

SURVEY INCOMPLETE. EXTENT OF WORKS TO BE CONFIRMED ON SITE

EXISTING OVAL SHADE STRUCTURES TO BE RELOCATED. REFER ARCHITECTURAL PLANS FOR LAYOUT

DESIGNED	SO	CHECKED	AF
PROJECT ENGINEER	AF	DESIGN MODIFICATION	
PROJECT DIRECTOR	AF	DATE	27.11.20

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REV	DATE	AMENDMENT	INIT
A	16/07/21	FOR CONSTRUCTION	SO
3	06/07/21	RETAINING WALL DIMENSIONS ADDED	SO
2	02/07/21	FOR APPROVAL	SO
1	11/06/21	FOR COORDINATION	SO

AMENDMENTS
 CLIENT
QUEENSLAND GOVERNMENT

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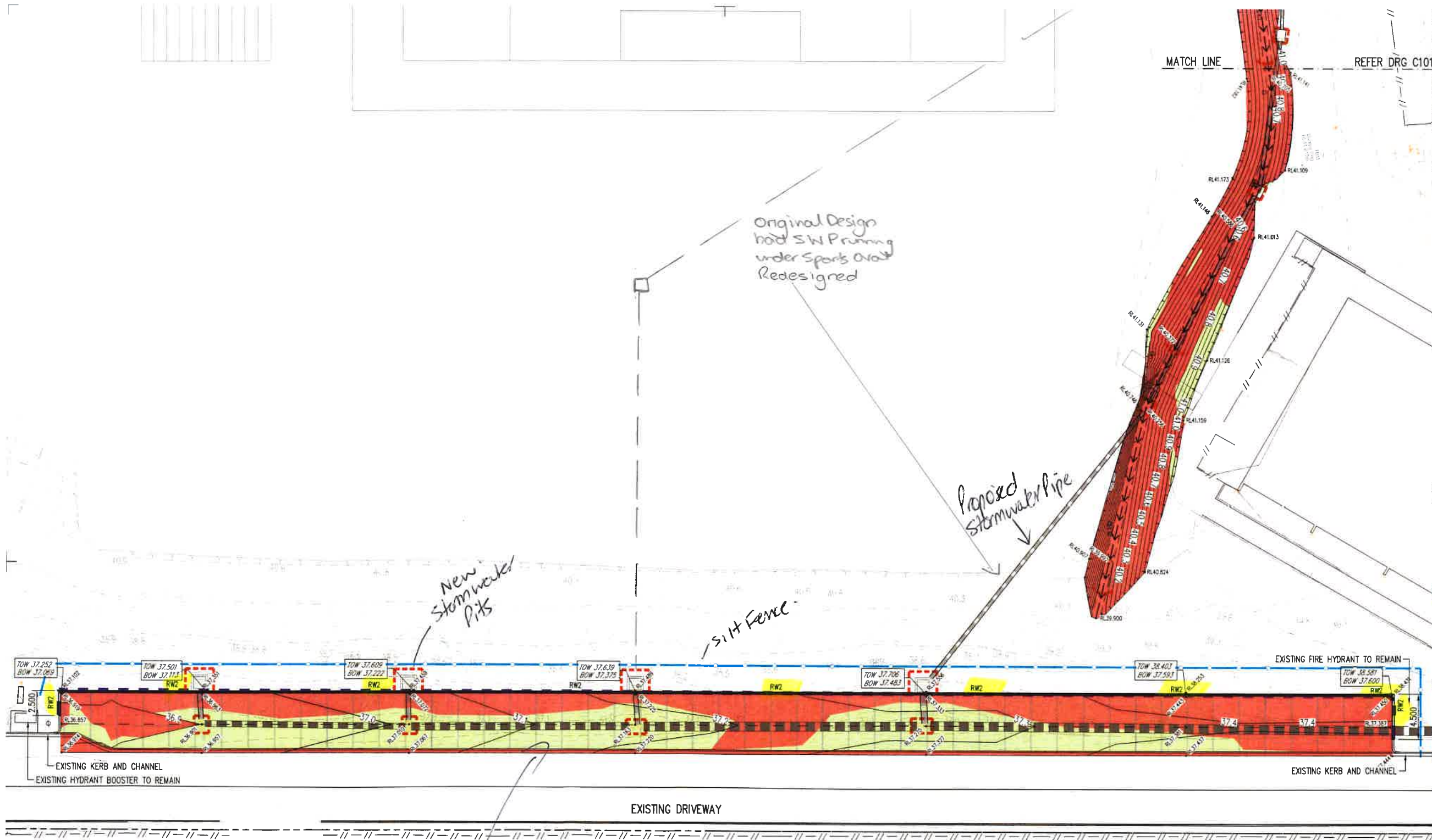
PROJECT
STRETTON COLLEGE JUNIOR CAMPUS
 1020 GOWAN ROAD STRETTON

TITLE
EARTHWORKS LAYOUT PLAN
 SHEET 2 OF 2

SCALE AT A1	1:200
PROJECT No.	220207
DRAWING No.	C102
ISSUE	A
ORIGINAL SHEET SIZE A1-594 x 841mm	



ISSUED FOR CONSTRUCTION



New Carpark 130 x 6m

Queensland Government Building and Construction Training Policy

Conditions of Contract Clauses 28.1A and 28.1AB

As Subcontractor, you have given a Contractual commitment to comply with the Training Policy.
Please detail how you intend to upskill your workers or engage trainees under structured training.

PROJECT 2103 STRETTON STATE COLLEGE

Subcontractor trading name Carsburg Cvil Pty Ltd

Address 207 Elliott Rd, Banyo Qld 4014

Phone Number 07 3267 8033

Contact Person Neil Carsburg

Email Address accounts@carsburgearthmoving.com.au

CONTRACT PRICE (this dictates your training hours required)	\$	173916	x 0.06% (Building)	=	104.3 49	Total hours of compliance 105
PERIOD OF TIME ON SITE 19 / 07 / 2021 TO 24 / 07 / 2021						
Detail hours each training						
• Up Skilling your existing workers		=	60		Hours	
• Employing your own apprentices/trainees/cadets		=	51.75		Hours	
• Using Group Training/Q Build apprentices/trainees/cadets		=			Hours	
• Using subcontractor apprentices/trainees/cadets		=			Hours	

STAFF DETAILS

Please complete all relevant sections

FIRST Name (a)	LAST Name (b)	TRAINEE/ APPRENTICE REGISTRATION NUMBER (e.g 201452279) (c)	TYPE OF UPSKILLING/ TRAINEESHIP/ APPRENTICESHIP (d)	TOTAL HOURS (e)	INDIGEN OUS Y / N (f)
Virginia	Hemsley		Cert IV Contract Administration	60	N
Paul	Newick	202204279	Civil Site Supervisor	24.25	N
Jack	Molloy	202152242	Cert 3 Civil Plant Operations	9	N
Callum	Thorpe	202147903	Cert 3 Civil Plant Operations	18.5	N



SIGNATURE OF SUBCONTRACTOR OR AUTHORISED PERSON

Print name *Neil Carsburg*

DATE: 24/9/2021

Other relevant information

(e.g our current staff upskilled on site by participating in workshops led by head tradesperson)

OR

(different employer for staff members ----- due to labor hire company -----
- their employer)

The full Privacy Statement relating to Training Compliance is detailed in Part P of the Formal Instrument of Agreement. Structured Training Hours as defined in the 10% Training Policy Quick Guide are available from DETIR on Phone: (07) 3237 0154 and Qld Purchasing on Phone: 1800 631 991 or (07) 3235 4333.

**This form is intended to be an Annexure to the Australian Standard
General Conditions of Subcontract for Design and Construct AS 4903—2000.**

STRETTON STATE COLLEGE

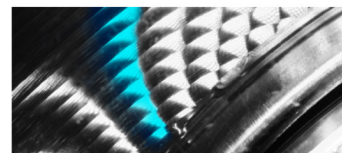
TRAFFIC IMPACT ASSESSMENT

25 NOVEMBER 2020

PREPARED FOR:



**Queensland
Government**
Department of Education and Training



DOCUMENT CONTROL RECORD

DOCUMENT						
Report Title:		Traffic Impact Assessment – Stretton State College				
Client:		The Department of Education				
Project Number:		21-179				
REV	PURPOSE	DATE	AUTHOR	REVIEWER	APPROVED	SIGNED
A	DRAFT	NOV-20	MT	JPG		

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1.0 INTRODUCTION

1.1 Background

In October 2020, Pekol Traffic and Transport (PTT) was commissioned by Vabasis on behalf of the Department of Education to undertake a traffic impact assessment, to assist in the delivery of new general learning areas (GLAs) at Stretton State College (Gowan campus). The school is located at 990 Gowan Road, Stretton, as shown in Figure 1.1.

Figure 1.1: SITE LOCALITY



1.2 Aim

The aim of this assessment was to evaluate the proposed development in terms of its likely peak period traffic generation, access arrangements, parking provision, drop-off / pick-up facilities, commercial vehicle servicing and to consider the impact on the surrounding network.

1.3 Scope of Report

This report begins by summarising the existing Stretton State College site operations and characteristics of the surrounding road network (Chapter 2), followed by a description of the scope and scale of the proposed development, including a consideration of the drop-off / pick-up facilities and parking provision (Chapter 3). The likely traffic operating characteristics are outlined and overlaid on top of future year peak hour traffic operations on the adjacent road network to identify potential future traffic impacts (Chapter 4). The report concludes with a summary of key findings and recommendations (Chapter 5).

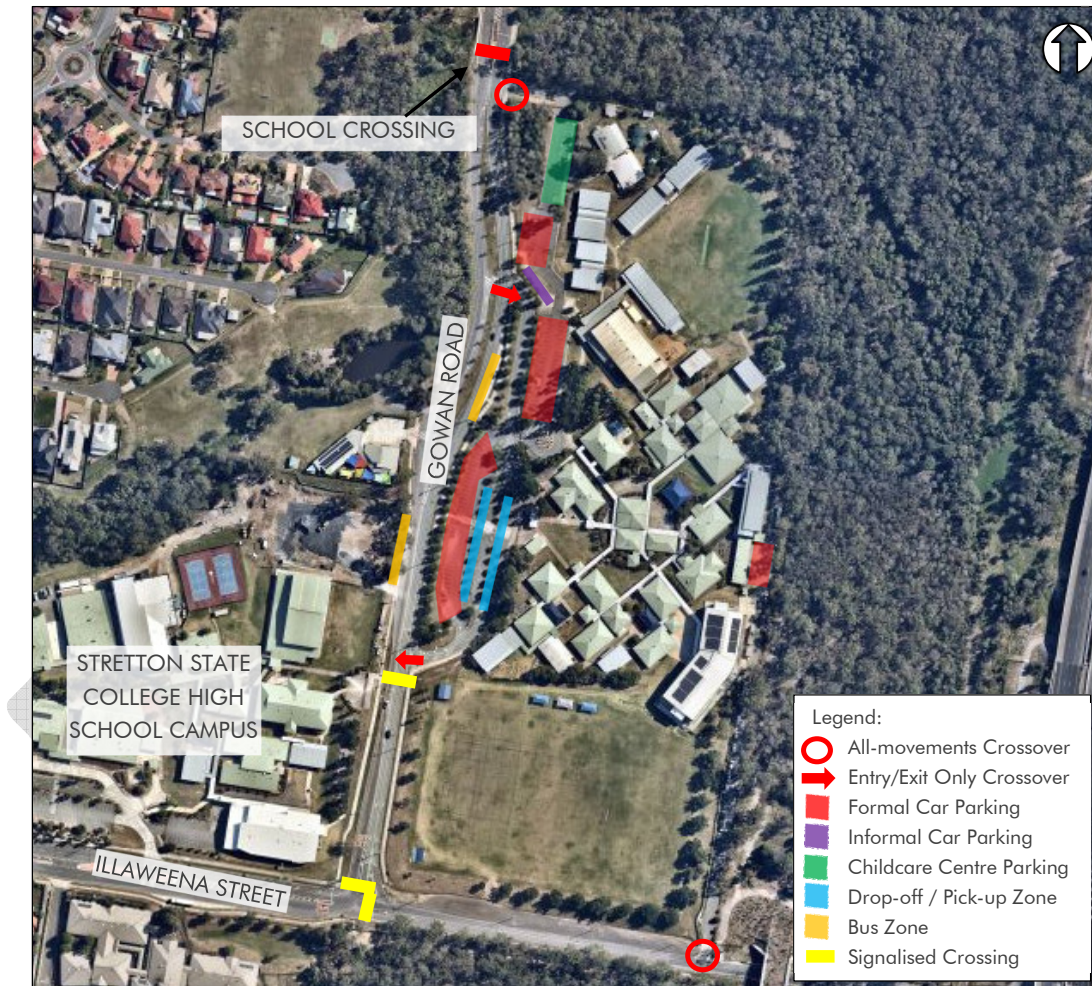
2.0 EXISTING CONDITIONS

2.1 Subject Site

2.1.1 Site Description

Stretton State College is located at 990 Gowan Road, Stretton and is formally identified as Lot 1 on SP247472. The school currently accommodates 1,759 students and 164 full time equivalent (FTE) staff. The site layout is shown in Figure 2.1.

Figure 2.1: EXISTING SITE LAYOUT



2.1.2 Access

The vehicular access arrangements for Stretton State College, as shown in Figure 2.1, are as follows:

- all-movements crossover on Illaweeena Street for staff parking and service vehicles
- entry only access on Gowan Road for staff and short-term parking and drop-off / pick-up
- exit only access on Gowan Road
- all-movements access on Gowan Road restricted for access to the childcare centre

2.2 Surrounding Area

The site is bounded by Stretton Wetland Reserve to the north and east, Gowan Road to the west and Illaweena Street to the south. The surrounding area is a mix of residential, educational and community uses with Karawatha Forest to the south and east and the Karawatha Quarry to the north-east.

2.3 Existing Travel Behaviour

2.3.1 Student Mode Share Survey

A mode share survey was conducted in November 2020 to identify the travel behaviour of existing students. Of the 1,759 students enrolled at the school, 1,371 responses were collected, equating to a 78% response rate, which is quite high for surveys of this type. The results of the mode share survey are summarised below, with detailed results attached in Appendix A.

The survey indicates that 75% and 72% of students arrive and depart by private car in the morning and afternoon peak periods respectively, as shown in Figure 2.2. The mode share of Stretton State College is generally consistent with other state schools in South East Queensland, as demonstrated in Figure 2.3.

Figure 2.2: STUDENT MODE SHARE SURVEY RESULTS

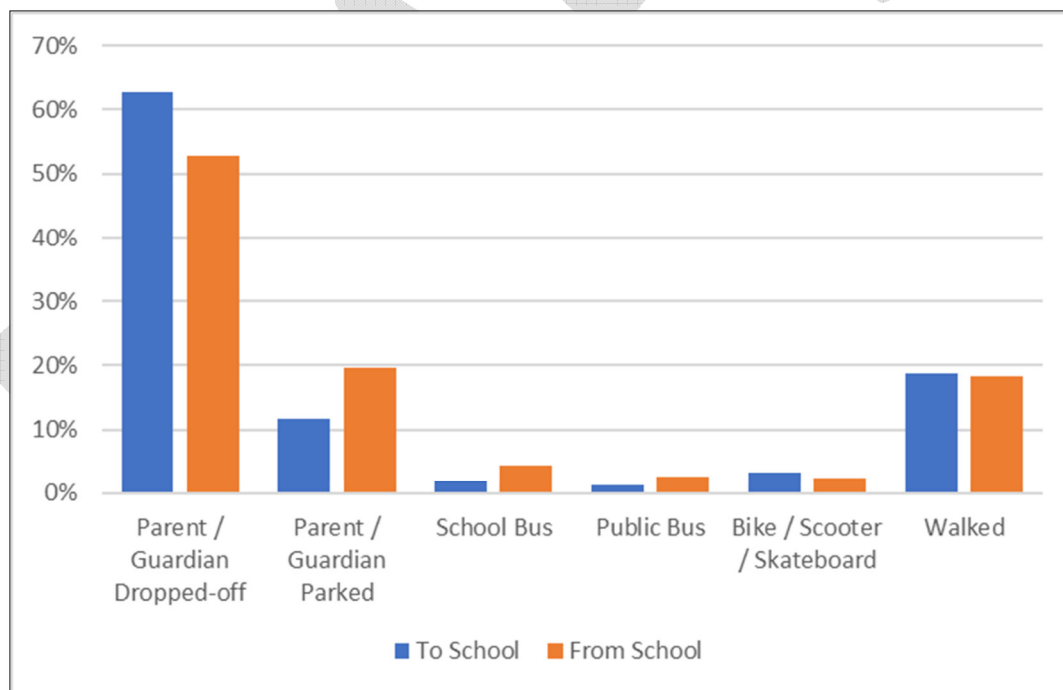
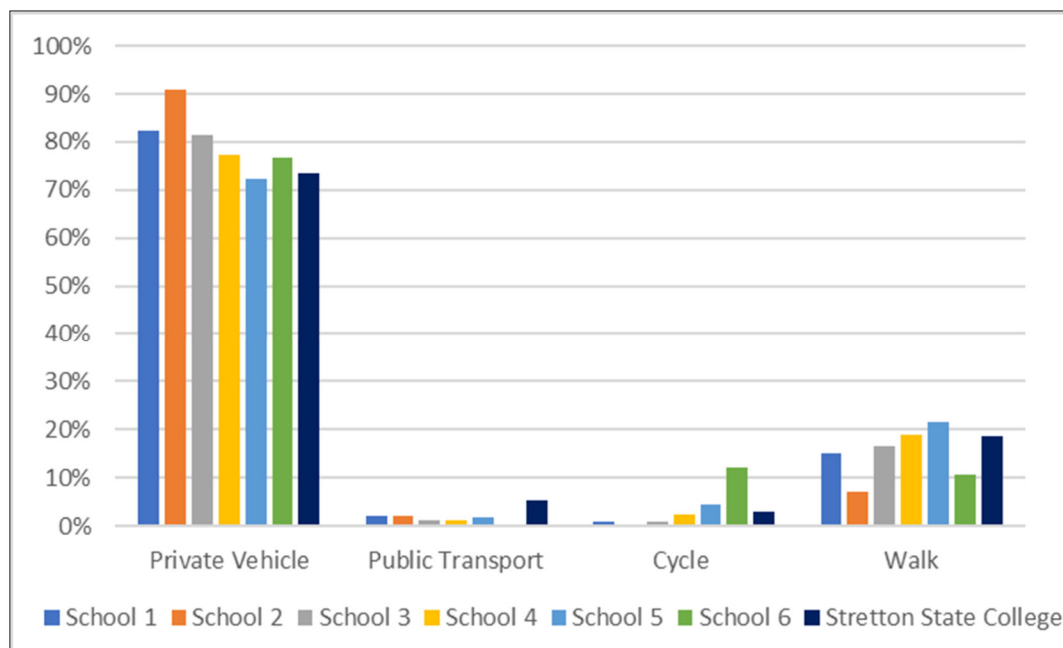


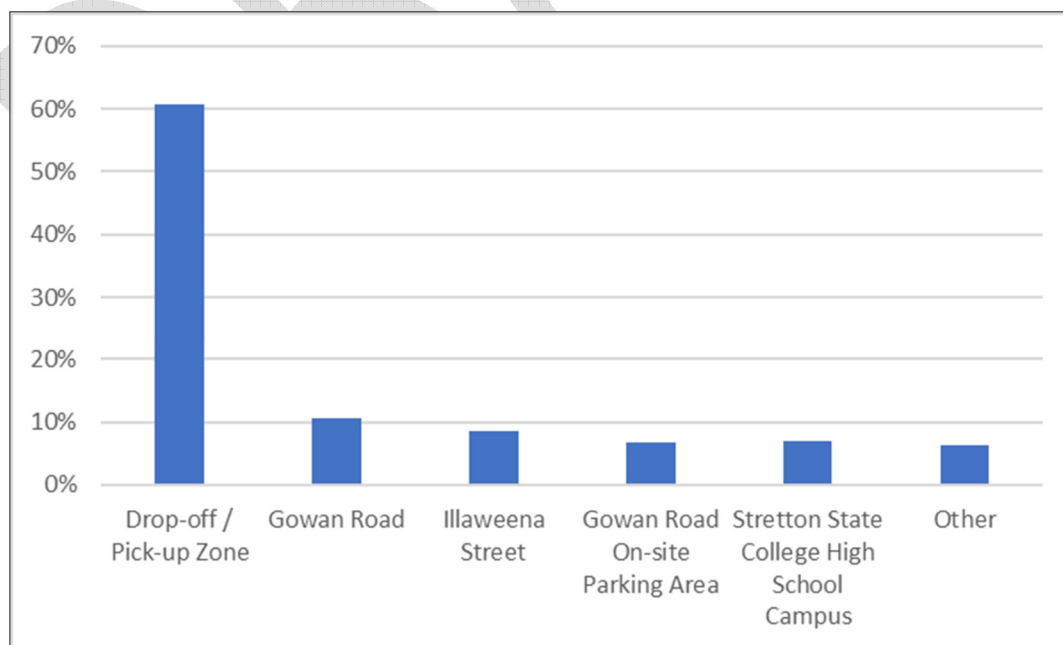
Figure 2.3: STUDENT MODE SHARE COMPARISON



2.3.2 Drop-off / Pick-up Locations

The survey also distinguished where students travelling by car were dropped-off / picked-up. The results indicate that of the students who travel by private vehicle, 61% of students were dropped-off / picked-up from the drop-off / pick-up zone. The results also indicated that 11% of students are being picked up on Gowan Road. The results are shown in Figure 2.4.

Figure 2.4: DROP-OFF / PICK-UP LOCATION



2.3.3 Vehicle Occupancy

The mode share survey was also used to obtain vehicle occupancy data for the school. The results indicate an average vehicle occupancy of 2.0 students per private vehicle.

2.4 Transport Infrastructure

2.4.1 Parking

The existing parking provision is as follows:

- 136 formal and four informal on-site parking spaces accessed via the Gowan Road access
- eight formal on-site parking space accessed via Illaweenah Street

This equates to a total of 148 formal and informal on-site parking spaces.

Parking along the Gowan Road school frontage is not permitted. There is a section of verge on the Illaweenah Street school frontage where parking occurs.

The existing parking requirement of the school has been calculated based on the existing student enrolment, staff numbers and Brisbane City Council's Transport, Access, Parking and Servicing (TAPS) Policy. It is understood that 1,759 students (including 254 preparatory students) are currently enrolled at the school, supported by 164 FTE staff. Table 2.1 indicates a requirement of 181 parking spaces on-site.

Table 2.1: COUNCIL PARKING REQUIREMENTS

LAND USE	SCALE	PARKING RATE	REQUIRED
Staff	164 staff	1 space per staff	164
Visitor	164 staff	0.1 spaces per staff	17
Total			181

The parking demand generated by the existing school has also been calculated based on the existing student enrolment, staff numbers and the Department of Transport and Main Roads (TMR) Planning for Safe Transport Infrastructure at Schools (PSTIS).

Table 2.2 indicates a requirement of 263 - 269 parking spaces on-site distributed as follows:

- 115 long-term staff / visitor parking spaces
- 101 short-term parking spaces
- 26 - 32 spaces for preparatory students
- 21 drop-off / pick-up bays

Table 2.2: TMR PARKING REQUIREMENTS

LAND USE	SCALE	PARKING RATE	REQUIRED
Long-term (staff / visitor)	164 staff	0.7 per staff member	115
Short-term	1,505 students	1 per 15 students	101
Preparatory	254 students	1 per 8 – 10 students	26 - 32
Drop-off / Pick-up	1,505 students	20% short-term supply	21
Total			263 - 269

The existing on-site parking provision of 148 parking spaces and 18 drop-off / pick-up bays is inconsistent with Council's and TMR's requirements.

2.4.2 Drop-off / Pick-up Facility

An on-site drop-off / pick-up facility is provided with capacity for 18 vehicles, split over two lanes, as indicated in Figure 2.1. The provision of drop-off / pick-up bays is less than the requirements of TMR's PSTIS. These areas are restricted to two-minute parking between 7-9am and 2-4pm.

There are two traffic lanes leading to the drop-off / pick-up bays which have a combined queuing length of approximately 245m (ie about 41 vehicles), which is in excess of TMR's PSTIS requirement of ten vehicles. However, queuing from the drop-off / pick-up zones was observed to extend out of the site as far as the Gowan Road / Illaweenaa Street intersection to the south and the Gowan Road / Aldea Place intersection to the north. The extent of the queuing also restricts access to and the efficient use of the short-term parking area. A number of vacant spaces were observed in this parking area despite substantial queuing extending from the drop-off / pick-up zones.

Observations during the site inspection of the afternoon peak period indicate that within the site, the drop-off / pick-up zones operate efficiently with parents displaying a sign with their child's / family name and teachers calling out student names as the cars pull into the zone. Parents are made to move up in the zone if the space in front clears. A portion of parents were also observed parking on the gravel section of road along the Illaweenaa Street frontage and walking in to pick up their children.

The queuing from the drop-off / pick-up zones is caused by the volume of cars dropping-off / picking-up students rather than the operation within the site. Parents were observed arriving at the school for pick-up over an hour prior to the release of students. Due to this, the queues for the drop-off / pick-up zones extend outside the site prior to the release of school, with the on-site parking area and one lane of queuing full an hour before school was released. Some parents were also observed undertaking illegal manoeuvres.

2.4.3 Commercial Vehicle Servicing

Servicing of the site is currently undertaken on-site via the Illaweenaa Street access.

2.4.4 Public Transport

There are two bus zones on Gowan Road, one on the site frontage, heading southbound, and one across the road on the high school campus frontage, heading northbound. The bus zones are approximately 30m long with capacity for two buses. According to TransLink, buses also use the school drop-off / pick-up areas to service the schools as well as turning around. There is also another bus stop on Illaweena Street, approximately 90m west of the high school campus which services school and public bus services. During the morning peak period, three school bus routes service the site and in the afternoon peak period four school bus routes service the site from these bus stops. Table 2.3 outlines these school bus routes.

Table 2.3: SCHOOL BUS ROUTES SERVICING STRETTON STATE COLLEGE

ROUTE	ROUTE DESCRIPTION	OPERATING	ARRIVAL / DEPARTURE TIME
805	Algester – Calamvale Community College	AM / PM	8:30am / 3:00pm
863	Acacia Ridge – Algester – Runcorn State High School	AM	8:06am
6053	Berrinba, Parkinson, Stretton Colleges	AM	8:26am
6150	Stretton Colleges, Grand Plaza	PM	3:00pm
6152	Canterbury College, Calamvale, Algester	PM	4:13pm
6153	Stretton Colleges, Marsden, Browns Plains	PM	3:05pm

There are also public bus stops on both sides of Illaweena Street, as shown in Figure 2.5. These stops are serviced by TransLink Routes 130 and 153. Route 130 operates between Drewvale and Brisbane City with services every ten minutes in the peak. Route 153 operates during the peak hours only between Drewvale and Brisbane City with services every 15 -20 minutes. Accordingly, the site is well served by public transport.

2.5 Active Transport

2.5.1 Pedestrians

There are pedestrian footpaths on both sides of Gowan Road and Illaweena Street to the west of the site. These footpaths are existing and based on on-site observations are sufficient to cater for the existing pedestrian demand.

Figure 2.5: EXISTING PUBLIC AND ACTIVE TRANSPORT FACILITIES



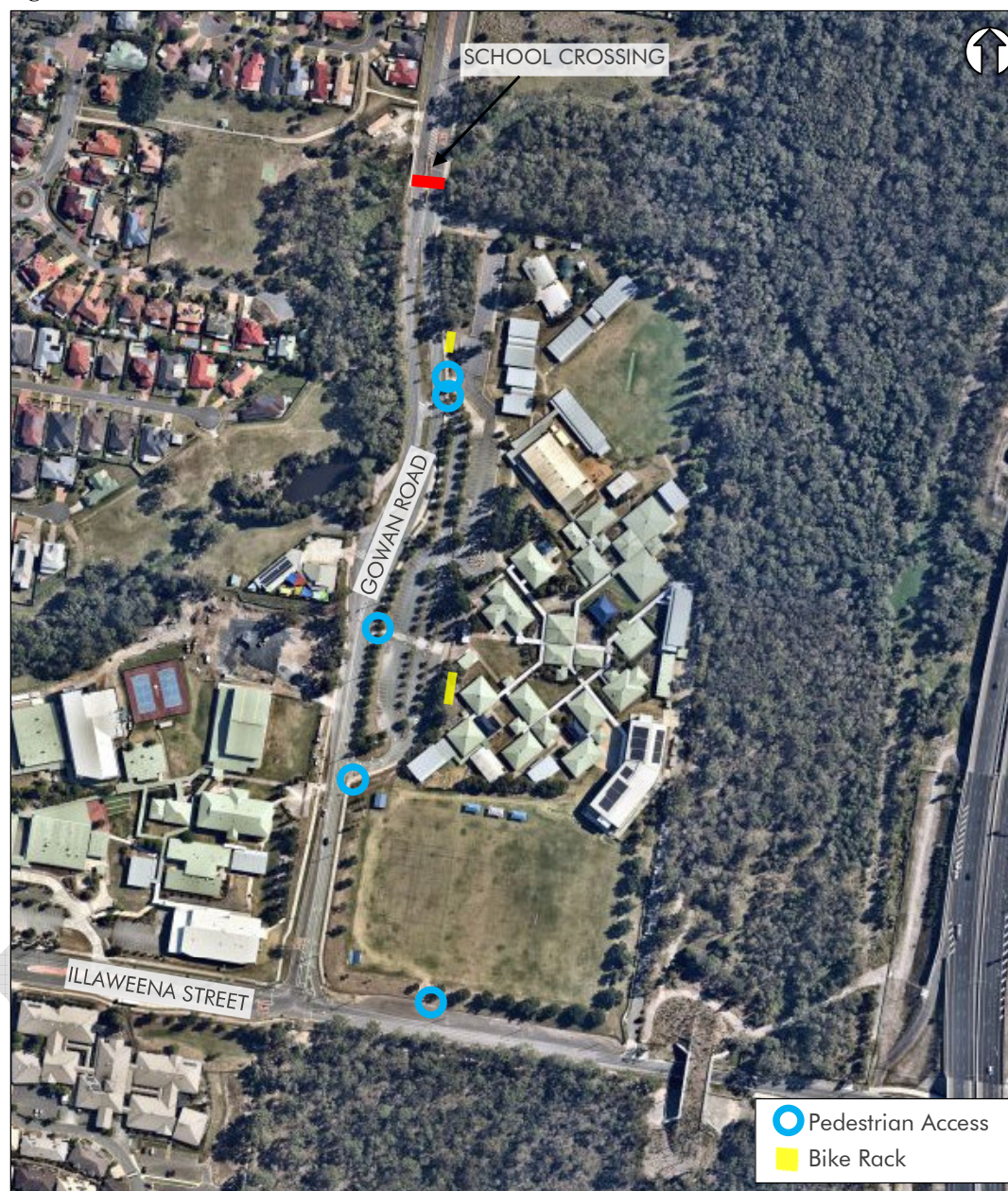
There is one school crossings located approximately 20m north of the school on Gowan Road, as shown in Figure 2.6. This crossing provides pedestrian access between the school and the residential areas to the west.

There are many signalised pedestrian crossings within the vicinity of the school, with the closest located at the Gowan Road / School Exit signalised intersection along the school frontage.

There are five pedestrian accesses to the school, as indicated in Figure 2.6. The locations of the pedestrian entrances are as follows:

- four on Gowan Road
- one on Illaweena Street

Figure 2.6: PEDESTRIAN ACCESS POINTS



2.5.2 Cyclists

Bicycle lanes are provided on Illaweena Street, to the west of the site and on Gowan Road at the Gowan Road / Illaweena Street signalised intersection.

Council's TAPS Policy requires one bicycle parking space per five students over Year 4 and TMR's PSTIS requires one bicycle parking space per three students over Year 4 plus one bicycle parking space per ten staff. Visitor parking is also to be provided at a rate of one space per 25% of student parking. Table 2.4 outlines the bicycle parking requirement for the school.

Table 2.4: SCHOOL BICYCLE PARKING REQUIREMENTS

USER	SCALE	PARKING RATE	SOURCE	REQUIRED
Students	753 students	1 per 5 students over Year 4	Council	151
	753 students	1 per 3 students over Year 4	TMR's PSTIS	251
Staff	164 staff	1 space per 10 staff	TMR's PSTIS	17
Visitors		25% of Student Parking	TMR's PSTIS	63
TMR Total				331
Students	1,759 students	3% of students	Mode Share Survey	53

The school provides on-site bicycle storage facilities with a capacity of approximately 70 bikes with bicycle racks located as indicated in Figures 2.5 and 2.6. This is inconsistent with Council's TAPS and TMR's PSTIS requirements. However, the mode share results of this school indicate that 53 students cycle to and from the school. Therefore, the existing bicycle parking provision is adequate to cater for the existing demand.

2.6 Road Network

Gowan Road and Illaweena Street are under the jurisdiction of Council and are both classified as suburban roads. Both roads have a posted speed limit of 60km/h, with 40km/h school zones in the vicinity of the school. To the west of the school, Illaweena Street is a divided road with two lanes of traffic in each direction. At the Gowan Road / Illaweena Street intersection, Gowan Road is an undivided road with one northbound traffic lane and two southbound traffic lanes. Gowan Road becomes a divided road with two lanes of traffic in each direction. Key attributes of the surrounding road network are summarised in Table 2.5.

Table 2.5: ROAD NETWORK ATTRIBUTES

ATTRIBUTE	GOWAN ROAD	ILLaweena STREET
Cross-section	Divided, with one - two lanes of traffic in each direction	Divided, with two lanes of traffic in each direction
Speed Limit (km/h)	60 (40 school zone)	60 (40 school zone)
Classification	Suburban	Suburban
Jurisdiction	Council	Council
Predominant Land Use	Residential / Education / Community	Residential / Education / Community
On-street Parking	No	Yes – on school frontage
Footpaths	Yes	Yes
Bicycle Lanes	No	Yes
Bus Route	Yes	Yes

2.7 Traffic Volumes

To assist in the quantification of the existing road network operations proximate to the site, turning movement surveys were conducted on Wednesday 4 November 2020 at the following intersections:

- Gowan Road / Illaweena Street signalised intersection
- Gowan Road / School Exit signalised intersection

Surveys were undertaken from 7:00am to 9:00am and from 2:00pm to 4:00pm, to capture the morning and afternoon school peak traffic volumes.

The weekday morning and afternoon peak periods for the above intersections are shown in Table 2.6, along with the key operational attributes of each intersection. The volumes shown represent all vehicle movements through the intersection during the school peak hour periods. The traffic count data is provided in Appendix B.

Table 2.6: INTERSECTION ATTRIBUTES

ATTRIBUTE	WEEKDAY MORNING PEAK	WEEKDAY AFTERNOON PEAK
Gowan Road / Illaweena Street		
Peak Hour	7:45am – 8:45am	2:45pm – 3:45pm
Volume (vph)	1,600	1,465
% Heavy Vehicle	2.6%	2.3%
Peak Flow Factor	91.7%	93.4%
Gowan Road / School Exit		
Peak Hour	7:45am – 8:45am	2:45pm – 3:45pm
Volume (vph)	1,520	1,215
% Heavy Vehicle	1.8%	1.9%
Peak Flow Factor	91.7%	89.8%

2.8 Intersection Operations

A series of SIDRA analyses were conducted to quantify the existing traffic operations at the Gowan Road / Illaweena Street and Gowan Road / School Exit signalised intersections and the Gowan Road / School Entry and Gowan Road / Northern School Access priority-controlled intersections. The analyses were based on the traffic count data presented in Appendix B with:

- Peak Flow Factors (PFF), as detailed in Table 2.2
- the observed proportion of heavy vehicles (%HV) for each movement
- SIDRA default values for other parameters

The degree of saturation for a movement is defined as the ratio of traffic demand to the capacity of the movement. The critical movement relates to the approach or movement with the highest degree of saturation. Table 2.7 is an extract from the SIDRA manual and defines the operational rating and level of service for all intersections, including priority-controlled intersections.

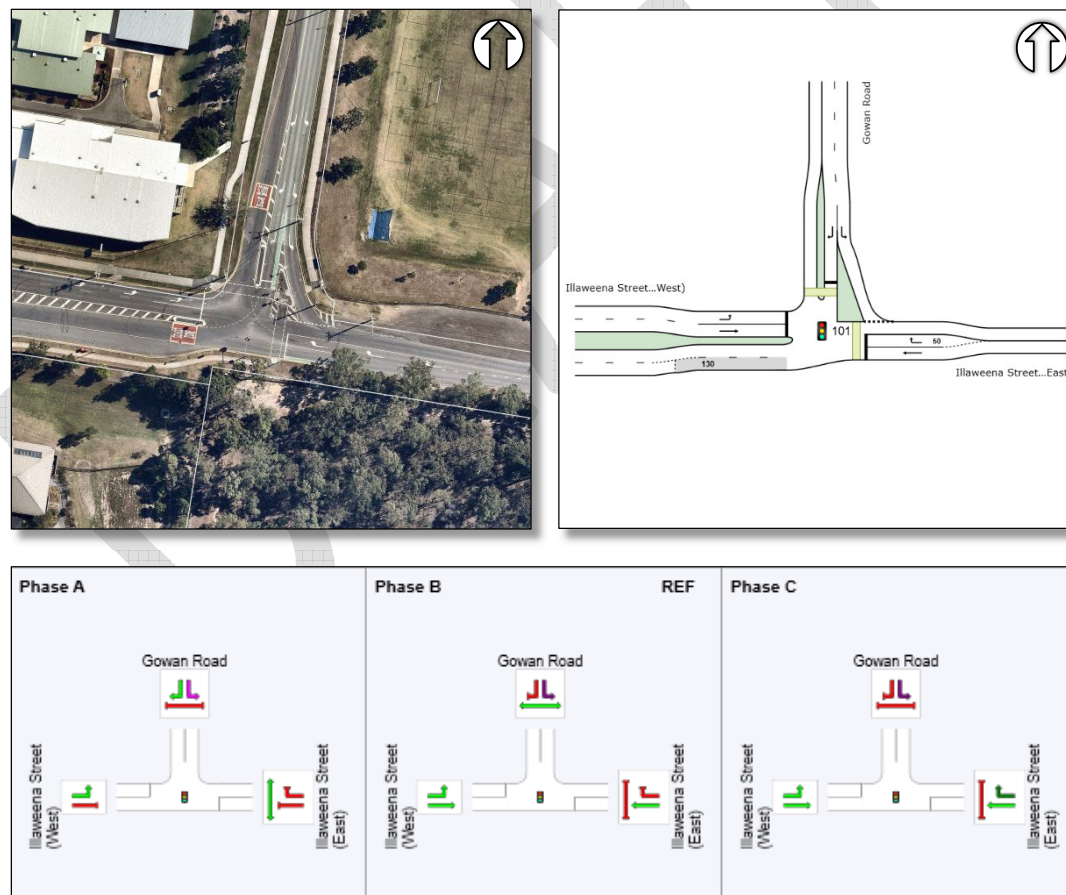
Table 2.7: SIDRA INTERSECTION RATINGS

LEVEL OF SERVICE	DEGREE OF SATURATION		
	SIGNALS	ROUNDABOUT	PRIORITY
LOS A	$x \leq 0.60$	$x \leq 0.60$	$x \leq 0.60$
LOS B	$0.60 < x \leq 0.70$	$0.60 < x \leq 0.70$	$0.6 < x \leq 0.70$
LOS C	$0.70 < x \leq 0.90$	$0.70 < x \leq 0.85$	$0.70 < x \leq 0.80$
LOS D	$0.90 < x \leq 0.95$	$0.85 < x \leq 0.95$	$0.80 < x \leq 0.90$
LOS E	$0.95 < x \leq 1.00$	$0.95 < x \leq 1.00$	$0.90 < x \leq 1.00$
LOS F	$1.00 < x$	$1.00 < x$	$1.00 < x$

2.8.1 Gowan Road / Illaweena Street

The existing intersection layout and the equivalent SIDRA representation for the Gowan Road / Illaweena Street signalised intersection is shown in Figure 2.7.

Figure 2.7: GOWAN ROAD / ILLAWEENA STREET INTERSECTION



The results of the intersection analysis are summarised in Table 2.8 and included in Appendix C.

Table 2.8: GOWAN ROAD / ILLAWEENA STREET OPERATIONS

PEAK HOUR & SCENARIO	DOS	95% QUEUE	AVG DELAY	CYCLE TIME	CRITICAL MOVEMENT
Weekday Morning	127%	44.6veh	120.4s	80s	Illaweenaa Street (East) - Right
Weekday Afternoon	65%	6.2veh	12.3s	60s	Illaweenaa Street (East) - Right

The SIDRA analyses indicate that the Gowan Road / Illaweenaa Street signalised intersection currently experiences LOS F operations under existing morning peak hour conditions and LOS B operations under existing afternoon peak hour conditions.

These existing issues where significant queues and delays are experienced for a short period are generally accepted in close proximity to schools. Additionally, during the peak periods, the majority of traffic at this intersection would be associated with the school and familiar with the conditions.

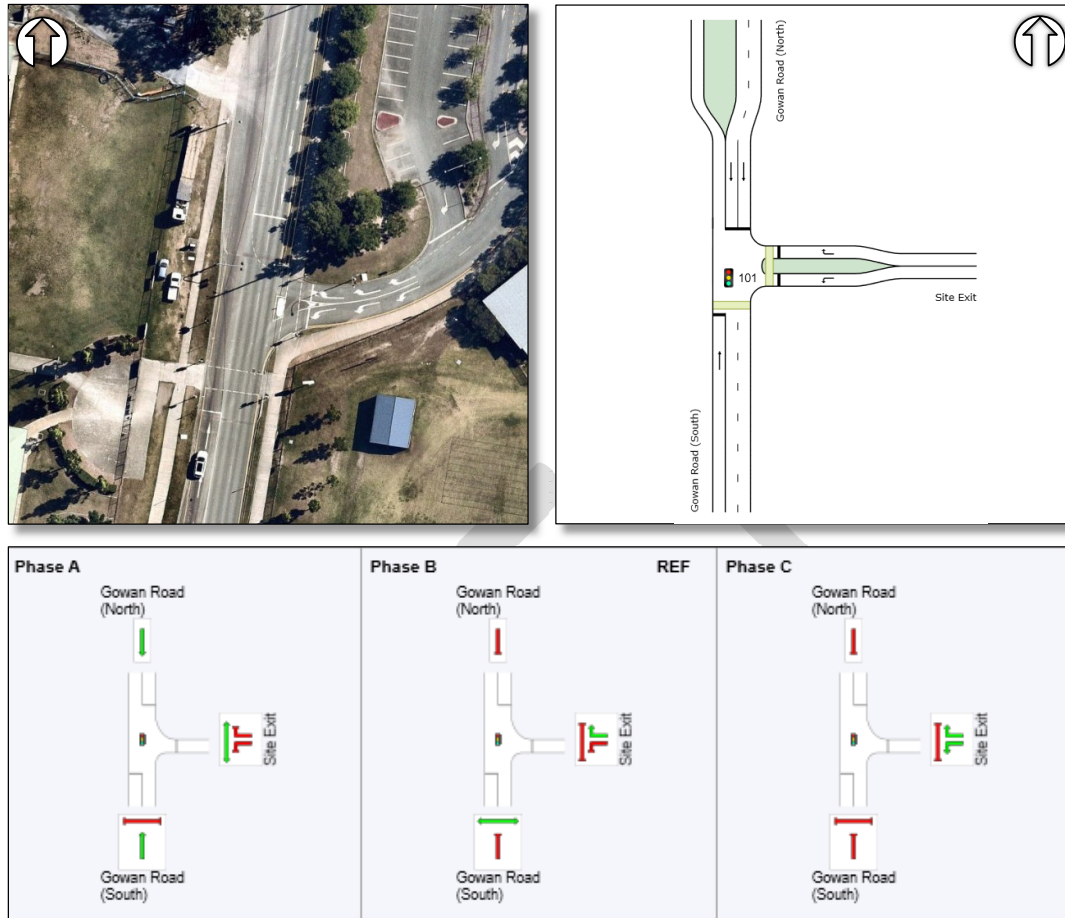
2.8.2 Gowan Road / School Exit

The existing intersection layout and the equivalent SIDRA representation for the Gowan Road / School Exit signalised intersection is shown in Figure 2.8. The results of the intersection analysis are summarised in Table 2.9 and included in Appendix C.

Table 2.9: GOWAN ROAD / SCHOOL EXIT OPERATIONS

PEAK HOUR & SCENARIO	DOS	95% QUEUE	AVG DELAY	CYCLE TIME	CRITICAL MOVEMENT
Weekday Morning	84%	27.2veh	27.9s	80s	Gowan Road (South) - Through
Weekday Afternoon	80%	14.6veh	23.5s	60s	School Exit - Left

Figure 2.8: GOWAN ROAD / SCHOOL EXIT INTERSECTION



The SIDRA analyses indicate that the Gowan Road / School Exit signalised intersection currently experiences LOS C operations under existing morning and afternoon peak hour conditions.

3.0 PROPOSED DEVELOPMENT

3.1 Proposal

The proposed development is to be constructed over two stages as follows:

- Stage 1
 - completion of ten general learning areas (GLAs)
- Stage 2
 - demolition of two relocatable buildings containing four Prep GLAs
 - construction of a new Prep general learning centre containing 12 GLAs

It is understood that the Stage 1 works will be complete for the start of the 2021 school year with student enrolments expected to increase to 1,926 students (ie an increase of 167 students) and an increase of seven FTE staff associated with this stage of development. Stage 2 of the development is expected to increase student enrolments to 2,107 students (ie an increase of 181 students from Stage 1). Staff numbers are expected to increase by eight FTE staff from Stage 1 (ie a total of 179 staff at the completion of Stage 2). The proposed Stage 2 layout is shown in Figure 3.1, with development plans attached in Appendix D.

Figure 3.1: PROPOSED STAGE 2 SITE LAYOUT



3.2 Access Arrangements

No changes to the existing site access arrangements are proposed. The proposed buildings are located clear of internal roadways and are not expected to impact vehicular access to the site.

3.3 Parking

3.3.1 Requirement

Stage 1

Stage 1 of the development is proposed to increase the student enrolment capacity to 1,926 students with an associated increase in staff to 171.

The additional parking demand generated by the Stage 1 increase in enrolments has been calculated based on Council's TAPS Policy. Table 3.1 demonstrates that an additional eight parking spaces are required to support the school for Stage 1.

Table 3.1: COUNCIL ADDITIONAL SCHOOL PARKING REQUIREMENTS

LAND USE	SCALE	PARKING RATE	REQUIRED
Staff	7 staff	1 space per staff	7
Visitor	7 staff	0.1 spaces per staff	1
Total			8

The additional parking demand for the school has also been calculated based on TMR's PSTIS Policy. Table 3.2 demonstrates that an additional 18 parking spaces and two drop-off / pick-up bay are required to support the school following the Stage 1 increase in enrolments and staff.

Table 3.2: TMR ADDITIONAL SCHOOL PARKING REQUIREMENTS

LAND USE	SCALE	PARKING RATE	REQUIRED
Long-term (staff / visitor)	7 staff	0.7 per staff member	5
Short-term	143 students	1 per 15 students	10
Preparatory	24 students	1 per 8 – 10 students	3
Drop-off / Pick-up	143 students	20% short-term supply	2
Total			20

Stage 2

Stage 2 of the development is proposed to increase the student enrolment capacity to 2,107 students with an associated increase in staff to 179 (ie an increase of 181 students and eight staff relative to Stage 1).

The additional parking demand generated by the increase in enrolments has been calculated based on Council's TAPS Policy. Table 3.3 demonstrates that an additional nine parking spaces are required to support the school following Stage 2.

Table 3.3: COUNCIL ADDITIONAL SCHOOL PARKING REQUIREMENTS

LAND USE	SCALE	PARKING RATE	REQUIRED
Staff	8 staff	1 space per staff	8
Visitor	8 staff	0.1 spaces per staff	1
Total			9

The additional parking demand for the school has also been calculated based on TMR's PSTIS Policy. Table 3.4 demonstrates that an additional 20 - 21 parking spaces and three drop-off / pick-up bays are required to support the school following the Stage 2 increase in enrolments and staff.

Table 3.4: TMR ADDITIONAL SCHOOL PARKING REQUIREMENTS

LAND USE	SCALE	PARKING RATE	REQUIRED
Long-term (staff / visitor)	8 staff	0.7 per staff member	6
Short-term	155 students	1 per 15 students	11
Preparatory	26 students	1 per 8 – 10 students	3 - 4
Drop-off / Pick-up	155 students	20% short-term supply	3
Total			23 - 24

3.3.2 Provision

Stage 1

No changes to the on-site parking provision is proposed as part of the Stage 1 works. Given the expected increase in enrolments and staff numbers associated with Stage 1 and the completion of the works for the start of the 2021 school year, it is recommended that the parking proposed to be delivered as part of Stage 2 be provided as soon as possible.

Stage 2

It is proposed to provide a new staff parking area, accessed via the Illaweenah Street driveway, with 52 parking spaces, including one PWD space. This is consistent with Council's and TMR's requirements for the Stage 1 and Stage 2 increase in enrolments and increases the on-site parking provision to 200 formal and informal spaces. This may provide an opportunity to reallocate some of the staff parking within the Gowan Road parking area to short-term parking.

3.3.3 Parking Area Design

It is recommended that additional parking be designed in accordance with the requirements of Council's TAPS Policy, TMR's PSTIS and Australian Standard AS2890.1:2004 Parking Facilities Part 1: Off-street Car Parking in terms of bay dimensions, aisle widths and gradients.

3.3.4 Person with Disabilities Parking

TMR's PSTIS requires one PWD space for every 100 car parking spaces, dimensioned in accordance with Australian Standards AS2890.6:2009 Parking Facilities Part 6: Off-street Parking for People with Disabilities. It is proposed to provide 200 parking spaces on-site. Four PWD spaces exist on-site and it is proposed to maintain these spaces. It is also proposed to provide an additional PWD space within the new parking area. The provision of PWD spaces is consistent with TMR's PSTIS and these spaces have been provided in accordance with AS2890.6.

3.4 Drop-off / Pick-up Facilities

No changes to the drop-off / pick-up facilities are proposed. The school currently has access to 18 on-site drop-off / pick-up bays, which is inconsistent with the requirements of TMR's PSTIS. However, the shortfall in the provision of drop-off / pick-up bays is considered acceptable given the efficient internal management of the drop-off / pick-up zone by the school. Additionally, more than four times the required amount of queuing is provided on-site for the drop-off / pick-up zone.

Whilst the school currently manages the drop-off / pick-up zone and it operates efficiently within the site, the significant queuing extending from the site, particularly before school finishes, is a potential issue for the surrounding road network. To reduce the extent of queuing before school finishes, it is recommended that the school investigate the implementation of measures to reduce the potential impacts, which may include the following

- inform and educate parents not to arrive before the end of school
- allow entry only to the short-term parking area via the western entry traffic lane
- provide a separate dedicated entrance for the short-term parking area
- permit parents to wait in the drop-off / pick-up bays
- a gate could be provided at the entrance to the drop-off / pick-up zone to discourage parents from arriving earlier

This would help to alleviate some of the queuing on Gowan Road, improve the use of the short-term parking area and would assist in the traffic flow northbound on Gowan Road along the one-lane section.

3.5 Commercial Vehicle Servicing

No changes are proposed to the existing servicing arrangements. Therefore, the proposed servicing arrangements are expected to be sufficient to cater for the proposed development.

3.6 Active and Public Transport

3.6.1 Pedestrians

No changes to the existing pedestrian facilities are proposed as part of the development. It is expected that the existing pedestrian facilities will be sufficient to cater for the proposed school expansion.

3.6.2 Cyclists

The bicycle parking rates for the proposed development have been calculated based on the results of the mode share survey and the rate for schools identified in TMR's PSTIS and Council's TAPS Policy and are shown in Table 3.5.

Table 3.5: ADDITIONAL SCHOOL BICYCLE PARKING REQUIREMENTS

USER	SCALE	PARKING RATE	SOURCE	REQUIRED
Students	150 students	1 per 5 students over Year 4	Council	30
	150 students	1 per 3 students over Year 4	TMR's PSTIS	50
Staff	15 staff	1 space per 10 staff	TMR's PSTIS	2
Visitors		25% of Student Parking	TMR's PSTIS	13
TMR Total				65
Students	348 students	3% of students	Mode Share Survey	10

As mentioned, 70 bicycle parking spaces are currently provided and 53 students make use of the facility. Therefore, the existing bike facilities are considered adequate to accommodate the additional bicycle demand based on the expected travel behaviour.

3.6.3 Potential Improvements to Active Transport Utilisation

One method to increase active and public transport utilisation at the school would be by participating in the Active School Travel (AST) program, a Brisbane City Council initiative aimed at promoting active transport at primary schools. Information available on Council's website indicates the AST program has increased active and public transport utilisation at schools enrolled in the program from 47% to 75% of all student trips. This increase would help reduce the demand for parking at the school and ease congestion on the surrounding road network.

We note that the school is currently enrolled in this program and so it is recommended that the school continue to promote active and public transport travel as a means of travelling to / from school to help reduce the congestion around the school during the peak hours. Given the location of the school relative to its catchment, public transport is likely to be a more viable option for student travel. However, to assist in the promotion of active travel, it is recommended that additional bicycle parking racks be provided.

3.6.4 Buses

No changes to the existing bus set-down / pick-up arrangements are proposed. Currently, 3% of students use school bus services and 2% of students use public buses. Assuming the additional students follow the same travel behaviour, an additional ten students can be expected to take the school buses and an additional seven students can be expected to take public buses. A typical bus is able to carry approximately 40-60 people. The increase in bus patronage associated with the proposed development is not expected to adversely impact the capacity on the buses. Therefore, the existing bus set-down / pick-up arrangements are adequate to cater for the demand.

4.0 TRAFFIC OPERATIONS

4.1 Development Profile

It is understood that proposed development is expected to be completed in two stages of construction. Therefore, the following development staging has been adopted:

— Traffic Counts:	2020
— Development Application:	2020
— Stage 1 Construction and Opening:	2021
— Stage 2 Construction and Opening:	2023

4.1.1 Assessment Scenarios

The following assessment scenarios have been adopted:

- Stage 1 Opening year (2021) pre-development
- Stage 1 Opening year (2021) post-development
- Stage 2 Opening year (2023) pre-development
- Stage 2 Opening year (2023) post-development

4.1.2 Background Traffic Growth

The scenarios modelled reflect the development staging with detailed analysis undertaken on the opening years (2021 and 2023). A background traffic growth of 0.7% per annum has been adopted and is based on population growth sourced from Office of Economic and Statistical Research, Queensland Treasury and Trade (OESR) population projections for the Stretton - Calamvale area. The application of this rate equates to an 2.0% increase in background traffic volumes over the three years (2020-2023).

4.2 Traffic Generation

The peak hour traffic generation under the existing conditions and for the proposed school expansion has been estimated based on the vehicle occupancy (VOc) and mode share of the students and staff.

A 50:50 in:out split has been adopted for the morning peak and afternoon peak periods for student drop-off / pick-up. In accordance with information provided by the school, all staff drive to work via private vehicles with one staff member per vehicle. Therefore, it has been assumed that all staff will travel to / from the school by car. A 100:0 in:out split has been adopted for staff during the morning peak hour, with the reverse in the afternoon. An arrival rate of 70% in the peak hour has been adopted based on the TMR Household Travel Survey data for SEQ for both students and staff. Additional development generated traffic has been summarised in Table 4.1 for both the morning and afternoon peak periods.

Table 4.1: EXISTING AND PROPOSED TRAFFIC GENERATION

USE	SCALE	VOc	% BY CAR	VTE	PEAK VTE	IN:OUT SPLIT	IN:OUT VPH
EXISTING							
Students (AM)	1,759	2.00	75%	1,305	914	50 : 50	457 : 457
Students (PM)			72%	1,266	886	50 : 50	443 : 443
Staff (AM)	164	1.00	100%	164	115	100 : 0	115 : 0
Staff (PM)				164	115	0 : 100	0 : 115
STAGE 1 PROPOSED							
Students (AM)	1,926	2.00	75%	1,429	1,000	50 : 50	500: 500
Students (PM)			72%	1,386	970	50 : 50	485 : 485
Staff (AM)	171	1.00	100%	171	120	100 : 0	120 : 0
Staff (PM)				171	120	0 : 100	0 : 120
STAGE 2 PROPOSED							
Students (AM)	2,107	2.00	75%	1,563	1,094	50 : 50	547: 547
Students (PM)			72%	1,516	1,062	50 : 50	531 : 531
Staff (AM)	179	1.00	100%	179	125	100 : 0	125 : 0
Staff (PM)				179	125	0 : 100	0 : 125

The net increase in traffic for Stage 1 has been summarised in Table 4.2 for both the morning and afternoon peak hours based on the results of the mode share survey. The predicted traffic attributable to the proposed expansion is estimated to be 91 vph (48 in and 43 out) for the morning peak periods and 89 vph (42 in and 47 out) in the afternoon peak.

The net increase in traffic for Stage 2 has been summarised in Table 4.3 for both the morning and afternoon peak hours based on the results of the mode share survey. The predicted traffic attributable to the proposed expansion is estimated to be 100 vph (53 in and 47 out) for the morning peak periods and 98 vph (46 in and 52 out) in the afternoon peak.

Table 4.2: STAGE 1 NET INCREASE IN TRAFFIC GENERATION

USE	SCALE	VOc	% BY CAR	VTE	PEAK VTE	IN:OUT SPLIT	IN:OUT VPH
MORNING							
Students	167	2.00	75%	124	86	50 : 50	43 : 43
Staff	7	1.00	100%	7	5	100 : 0	5 : 0
Net Increase	174	-	-	131	91	-	48 : 43
AFTERNOON							
Students	167	2.00	72%	120	84	50 : 50	42 : 42
Staff	7	1.00	100%	7	5	0 : 100	0 : 5
Net Increase	174	-	-	127	89	-	42 : 47

Table 4.3: STAGE 2 NET INCREASE IN TRAFFIC GENERATION

USE	SCALE	VOc	% BY CAR	VTE	PEAK VTE	IN:OUT SPLIT	IN:OUT VPH
MORNING							
Students	181	2.00	75%	134	94	50 : 50	47 : 47
Staff	8	1.00	100%	8	6	100 : 0	6 : 0
Net Increase	189	-	-	142	100	-	53 : 47
AFTERNOON							
Students	181	2.00	72%	130	92	50 : 50	46 : 46
Staff	8	1.00	100%	8	6	0 : 100	0 : 6
Net Increase	189	-	-	138	98	-	46 : 52

4.3 Directional Distribution

The distribution of development related traffic on the existing road network has been estimated based on the directional split inherent in the traffic surveys. The resulting morning and afternoon peak hour distributions of development related traffic is shown in Figures 4.1 and 4.2.

Figure 4.1: PREDICTED MORNING PEAK HOUR DISTRIBUTION

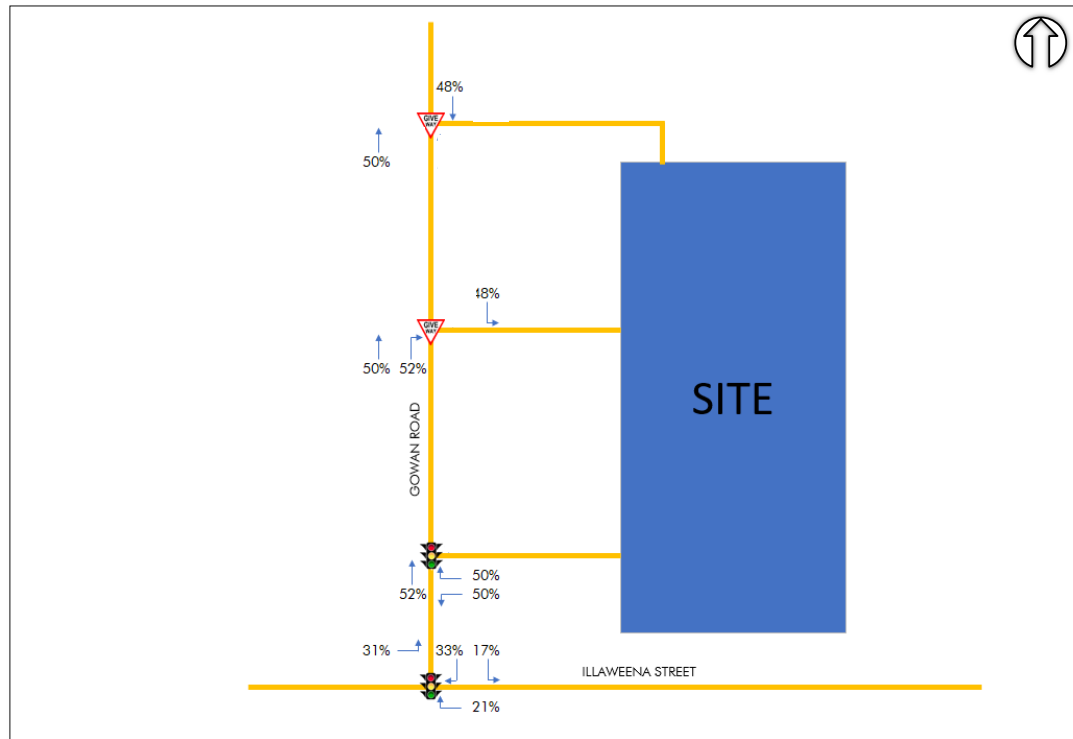
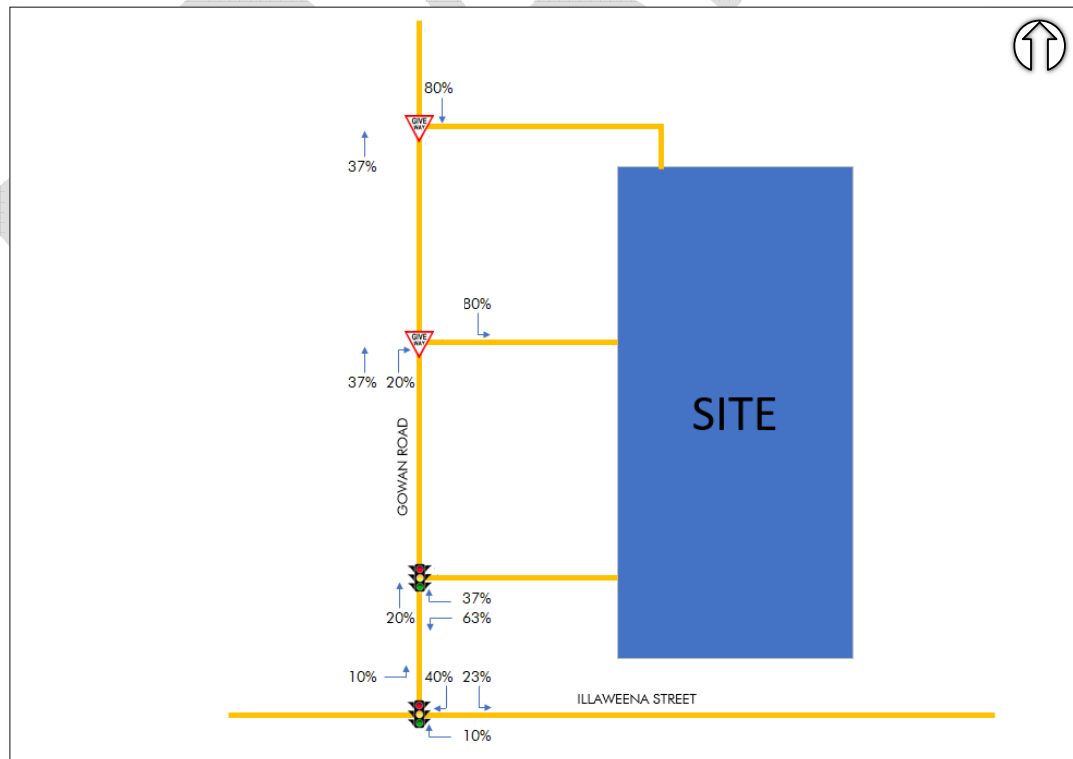


Figure 4.2: PREDICTED AFTERNOON PEAK HOUR DISTRIBUTION



4.4 Intersection Performance

The likely impact of the proposed development on the future year (2021 and 2023) peak hour operations on the surrounding road network have been assessed using SIDRA. These analyses are based on the peak hour turning movement forecasts presented in Appendix E.

4.4.1 Gowan Road / Illaweena Street

The SIDRA analysis of the Gowan Road / Illaweena Street signalised intersection was undertaken using the intersection layout shown in Figure 2.7. The results of the analysis are attached in Appendix C and summarised in Table 4.4.

Table 4.4: GOWAN ROAD / ILLAWEENA STREET OPERATIONS

PEAK HOUR & SCENARIO	DOS	95% QUEUE	AVG DELAY	CYCLE TIME	CRITICAL MOVEMENT
Weekday Morning					
2021 Pre development	130%	46.6veh	126.1s	80s	Illaweena Street (East) - Right
2021 Post development	138%	52.7veh	165.0s	80s	Gowan Road (North) - Right
2023 Pre development	140%	55.0veh	173.3s	80s	Gowan Road (North) - Right
2023 Post development	147%	62.0veh	196.5s	80s	Illaweena Street (East) - Right
Weekday Afternoon					
2021 Pre development	66%	6.2veh	12.3s	60s	Illaweena Street (East) - Right
2021 Post development	67%	6.5veh	12.3s	60s	Illaweena Street (East) - Right
2023 Pre development	70%	6.6veh	12.4s	60s	Gowan Road (North) - Right
2023 Post development	78%	8.3veh	13.2s	60s	Illaweena Street (East) - Right

Table 4.4 demonstrates that under the existing layout, the Gowan Road / Illaweena Street intersection is expected to experience LOS F operations in the morning peak hour pre and post development scenarios, LOS B operations in the afternoon peak hour 2021 pre and post development and 2023 pre development scenarios. The intersection is expected to experience LOS C operations in the 2023 afternoon post development scenario.

Whilst the addition of the development related traffic has an impact on the intersection degree of saturation in the 2023 afternoon peak hour, the intersection is still expected to operate within Council's Desired Standards of Service of LOS C during the peak.

As outlined in Section 2.8.1, the intersection currently experiences LOS F operations during the morning peak hour. Given the location of the intersection and its proximity to Stretton State College, both the primary and high school campuses, the majority of traffic through this intersection would be associated with the schools. Delays around schools are generally accepted as they are typically experienced for a short time period and motorists are familiar with the conditions. Therefore, mitigation measures at the Gowan Road / Illaweena Street priority-controlled intersection are not warranted.

4.4.2 Gowan Road / School Exit

The SIDRA analysis of the Gowan Road / School Exit signalised intersection was undertaken using the intersection layout shown in Figure 2.8. The results of the analysis are attached in Appendix C and summarised in Table 4.5.

Table 4.5: GOWAN ROAD / SCHOOL EXIT OPERATIONS

PEAK HOUR & SCENARIO	DOS	95% QUEUE	AVG DELAY	CYCLE TIME	CRITICAL MOVEMENT
Weekday Morning					
2021 Pre development	84%	27.3veh	27.9s	80s	Gowan Road (South) - Through
2021 Post development	89%	27.6veh	30.6s	80s	Gowan Road (South) - Through
2023 Pre development	89%	27.6veh	30.2s	80s	School Exit - Left
2023 Post development	91%	41.8veh	33.7s	80s	Gowan Road (South) - Through
Weekday Afternoon					
2021 Pre development	80%	14.8veh	23.6s	60s	School Exit - Left
2021 Post development	84%	16.0veh	25.3s	60s	Gowan Road (South) - Through
2023 Pre development	86%	16.5veh	25.6s	60s	Gowan Road (South) - Through
2023 Post development	92%	19.2veh	29.0s	60s	Gowan Road (South) - Through

Table 4.5 demonstrates that the Gowan Road / School Exit intersection is expected to experience LOS C operations during all 2021 pre and post development scenarios and 2023 pre development scenarios. LOS D operations are expected during the 2023 post development morning and afternoon peak periods.

Council's Local Government Infrastructure Plan states:

"the peak period operation of the road network provides a level of service C, except where the road network is highly constrained and the use of alternative modes of transport in these areas is anticipated in the mode share targets stated in Map C3 Transport Network DSS Mode Share Targets"

The subject site is located within the outer ring of Council's Mode Share Targets where the non-car travel mode shares are expected to be lower. Therefore, it is expected that the expected LOS D operations of the intersection are acceptable, and the development does not adversely affect traffic operations at the Gowan Road / School Exit signalised intersection. Mitigation measures are not required.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The proposed development at Stretton State College has been evaluated in terms of its access arrangements, pick-up and drop-off facilities, parking provision and impact on the surrounding road network. The main points to note are:

- the school currently accommodates 1,759 students and 164 FTE staff
- the proposed development will increase student enrolment capacity to 1,926 students (ie an additional 167 students) with 171 FTE staff members (ie an additional seven) by 2021 with an increase to 2,107 students and 179 FTE staff (ie an additional 181 students and eight staff) by 2023
- mode share data indicates that approximately 73% of students travel to and from the school by private vehicle
- it is proposed to provide a new 52 space parking area, which is consistent with Council's and TMR's requirements for Stage 1 and Stage 2
- no changes to the existing servicing arrangements are proposed
- the existing on-site bicycle facilities are expected to be sufficient to accommodate the expected increase in students
- the ultimate school expansion is expected to increase traffic generation by 191 trips in the morning peak and 187 trips in the afternoon peak
- the Gowan Road / Illaweenah Street signalised intersection is expected to experience LOS F operations in the all morning peak hour scenarios, LOS B operations in the afternoon peak hour 2021 pre and post development and 2023 pre development scenarios and LOS C operations in the 2023 afternoon post development scenario
- the Gowan Road / School Exit signalised intersection is expected to experience LOS C operations during all 2021 pre and post development scenarios and 2023 pre development scenarios and LOS D operations during the 2023 post development scenarios

5.2 Recommendations

Based on our assessment, the following recommendations have been made:

Across all stages

- the measures outlined in Section 3.4 be considered for implementation, as appropriate
- the school continue to promote active and public transport travel as a means of travelling to / from school
- additional bicycle parking racks be provided to promote active travel to / from school

Stage 1

- additional parking be provided as soon as possible

Stage 2

- the additional parking be designed in accordance with the requirements of Council's TAPS Policy, TMR's PSTIS and AS2890.1

APPENDIX A STUDENT MODE SHARE DATA

APPENDIX B

TRAFFIC COUNT DATA

APPENDIX C

SIDRA ANALYSES

APPENDIX D DEVELOPMENT SITE LAYOUT

APPENDIX E

TURNING MOVEMENT FORECASTS



GEOTECHNICAL INVESTIGATION

PROJECT NO. 1-22929

SEPTEMBER 2020

TURNER & TOWNSEND

NEW LEARNING CENTRE

STRETTON STATE COLLEGE,
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Appendices

Appendix A

Notes Relating to this report

Appendix B

Borehole Record Sheets

Appendix C

Laboratory Test Certificates

Appendix D

Site Plan

1.0 INTRODUCTION

This report presents the results of the geotechnical investigation carried out by Soil Surveys Engineering Pty Limited for the proposed New Learning Centre development at Stretton State College, 222 Illaweena Street, Stretton.

It is understood that the proposed development will comprise the construction of two new classroom buildings. We are advised that the proposed structure is to comprise two levels. Existing structures are to be demolished. Building loads are anticipated to approximate large residential type loadings. We are advised that earthworks will be limited to extending the existing batter to form the new building platform.

2.0 SCOPE OF GEOTECHNICAL SERVICES

The scope of geotechnical services provided by Soil Surveys Engineering Pty Limited was directed towards evaluating the following items as detailed in our proposal 1-22929, 2020-06-19, PR VER 1 dated 21 August 2020:-

- Investigation of the subsurface profile by drilling, sampling and insitu testing.
- Laboratory testing on selected samples to assess engineering properties of the subsurface material.
- Engineering analysis of site investigation and laboratory test results to evaluate:-
 - Earthworks recommendations
 - trafficability
 - subgrade preparation
 - compaction standards
 - excavatability
 - suitability of cut for use as fill
 - Site classification (AS 2870)
 - Foundation recommendations
 - recommended foundation type
 - bearing capacity
 - skin friction
 - Retaining wall parameters
 - Site management recommendations

3.0 SITE DESCRIPTION

The site of the proposed development is located adjacent the north west corner of the existing school oval.

At the time of the investigation the site was occupied by an existing classroom building and outdoor play area. The site comprised a batter which falls away from the south (level of existing sports field) to match the level of the carpark and drop-off area adjacent the north west site boundary (refer Figures 1, 2 and 3).



FIGURE 1 – SITE LOCATION



FIGURE 2 – EXISTING CLASSROOM – LOOKING NORTH



FIGURE 3 – EXISTING BATTER – LOOKING EAST

4.0 GEOTECHNICAL INVESTIGATION

4.1 Field Investigation

Subsurface conditions at the site were investigated by drilling and sampling eight boreholes to depths of up to 10.5m, using a truck mounted drilling rig (BH01 and BH02), and a 4WD mounted drilling rig (BH03 and 04). Hand augers were carried out at the location of BH05 to BH 08 (access for our drilling rigs were not available at these locations). Insitu testing in the form of Standard Penetrometer Tests (SPT's) were carried out in BH01 and BH02. Dynamic Cone Penetrometer Tests (DCP's) were carried out adjacent to BH03 to BH08.

The soil classification descriptions, field and laboratory testing were carried out in general accordance with the following Australian Standards:-

- AS 1726-2017 'Geotechnical Site Investigations'
- AS 1289 'Methods of Testing Soils for Engineering Purposes'

A description of the investigation method, borehole records and a site plan showing investigation locations are included in the Appendices. Borehole coordinates were recorded using a hand held GPS device, with accuracy consistent with such devices.

4.2 Laboratory Testing

A shrink/swell index test was carried out on a selected sample retrieved from Borehole 04 (0.5m) and was directed toward assessing the reactivity of the subsurface material.

An I_{ss} value of 2.4% was recorded.

The laboratory certificate is contained in Appendix C.

5.0 GEOTECHNICAL MODEL

5.1 Subsurface Profile

Subsurface conditions can be broadly grouped into three material types:-

Fill Material

Fill material was encountered to depths between 0.10m and 1.10m. The fill stratum comprised very loose and medium dense silty sand and very stiff silty/sandy clay.

The fill stratum is considered to be uncontrolled in the absence of supporting documentation

Natural Soils

Upper level soils comprised surficial medium dense silty sand and very stiff/hard silty and sandy clay to depths between 0.55m and 4.70m.

Weathered Sandstone

Weathered sandstone was encountered in Boreholes 01 and 05 and comprised extremely weathered, very low and low strength sandstone. In Boreholes 02, 03 and 04 reverse weathering was encountered (i.e. hard clays were noted between weathered rock strata).

In Boreholes 06, 07 and 08 depth to weathered rock could be inferred from Dynamic Cone Penetration refusal depths i.e. 2.65m, 1.58m and 1.58m respectively.

*

*

*

Refer Borehole records for a detailed subsurface profile description.

A summary of the subsurface profile is presented in Table 1.

TABLE 1 SUBSURFACE PROFILE

Location	Fill Material (m)	Silty Sand (m)	Natural Soils (m)	DCP Refusal (m)	Weathered Sandstone (m)	Termination Depth (m)
BH 1	0.00 – 1.10	NE	1.10 – 1.60	NE	1.60 – TD	9.00
BH 2	0.00 – 0.50	NE	0.50 – 4.70	NE	4.70 – TD	10.5
BH 3	0.00 – 0.70	NE	0.70 – 1.50	1.48	1.50 – TD	4.50
BH 4	NE	0.00 – 0.25	0.25 – 1.10	1.12	1.10 – TD	4.50
BH 5	0.00 – 0.10	NE	0.10 – 0.55	0.56	0.55 – TD	0.60 ⁽³⁾
BH 6	0.00 – TD	NE	NE	2.65	NE	0.90 ⁽³⁾
BH 7	0.00 – TD	NE	NE	1.58	NE	0.60 ⁽³⁾
BH 8	0.00 - TD	NE	NE	1.58	NE	0.60 ⁽³⁾
Notes:-						
1. NE – Not Encountered. TD – Termination Depth.						
2. All depths below existing ground surface level as of date of investigation.						
3. Hand Auger Refusal Depth.						

5.2 Groundwater

Groundwater was not encountered at borehole locations at the time of the investigation. Boreholes 01 and 02 were advanced beyond auger depths using washed bore drilling techniques. Groundwater is unable to be detected during washed bore drilling. The remainder of the boreholes were augered to the termination depths.

Whilst groundwater was not encountered in the boreholes at the time of the investigation, it should be noted that groundwater may be present; however, due to the relatively short time that observations are able to be made during drilling of the boreholes, and the possible effect of smear on the sides of the boreholes, groundwater was not identified.

However, seepage may be encountered, particularly within the fill material and at the fill/natural and soil/rock interfaces. It should also be noted that groundwater levels can vary both seasonally and with prevailing weather conditions.

If construction is to be undertaken at a “significant” time following this investigation, or following ‘wet’ weather, then it would be prudent to confirm groundwater levels prior to construction.

6.0 ENGINEERING ASSESSMENT

6.1 Trafficability – Light Weight Construction Vehicles

Trafficability conditions were considered to be fair at the time of the investigation.

However, the soils on site are sensitive to repetitive vehicle loading and water (i.e. they will lose strength through repetitive vehicle loading or if they become overly moist or wet). Further, seepage may also result in a subsequent loss of strength. This may limit trafficability for light weight construction vehicles and create difficulties for construction. This situation would be more pronounced if rainfall followed demolition, clearing, stripping, etc.

Problems may also arise from disturbance of the upper level soil fabric with removal of existing structures, services, vegetation, etc. Depressions could be formed resulting in water traps and potential softening of adjacent and underlying soils.

It is recommended that after demolition, stripping, clearing, etc., the exposed surface in the construction area be proof rolled (where appropriate) to assist in identifying weak areas and to improve trafficability for light weight construction vehicles.

Maintaining adequate drainage conditions is essential. It should be ensured that runoff is diverted away from the construction area to prevent ponding of water. In addition, the earthworks pad should be "sealed" at the completion of each day and in the event of rain.

To assist, placement of a working platform as a final layer across building platforms is recommended. This could be achieved by placing a 150mm layer of sub-base, extending a minimum 1.5m beyond the building perimeter, across the building platform as the final layer. The sub-base material should be compacted to a density not less than 95% of maximum dry density in accordance with AS 1289 5.2.1 (Modified compaction). Sub-base material should be of good quality conforming to requirements (minimum) of Material Type 2.4 as specified in the Queensland Department of Transport and Main Roads, Technical Specification MRTS05, Unbound Pavements (April, 2011).

Nevertheless, the contractors (earthworks, building, etc.) should fully inform themselves of the ground conditions on site prior to commencement of construction. This requirement should be explicit in any specifications or contract.

Demolition and Clearing Activities

Extreme care should be exercised during the demolition/clearing phase to ensure that excessive subgrade disturbance is not caused during removal of existing structures, trees, services, etc.

Working Platforms For Tracked Plant and Heavy Construction Vehicles

The scope of Soil Surveys Engineering's study **DOES NOT** include the design of a working platform for heavy construction vehicles or heavy tracked plant.

Detailed design of a working platform should be carried out considering the operation of actual machinery proposed to be used. This is particularly important when considering the use of **heavy** piling rigs and **heavy** cranes - the piling/crane contractor should be consulted regarding their requirements.

6.2 Earthworks

6.2.1 General

It is understood that earthworks will involve extending the existing batter to form the building platform.

Earthwork procedures should be carried out in a responsible manner in accordance with AS 3798-2007 'Guidelines on Earthworks for Commercial and Residential Developments', incorporating the following recommendations:-

6.2.2 Subgrade Preparation

Subgrade preparation procedures should include the following:-

- Clearing, stripping and grubbing should be carried out in areas subject to earthworks (as trafficability conditions allow). Soils containing organic matter should be stripped from the construction area; this material is not considered suitable for use as structural fill.
- Depressions formed by the removal of existing structures, vegetation, underground elements etc. should have all disturbed weakened soil cleaned out and be backfilled with compacted select material as part of the earthworks inspection and testing regime.
- The subgrade should be proof rolled (where appropriate) under the supervision of Soil Surveys Engineering in accordance with methods and equipment as per Clause 5.5 of AS 3798-2007. Areas demonstrating excessive movement should be treated (dried and recompacted) or removed and replaced with compacted fill.
- Any fill material encountered should be considered uncontrolled and requiring treatment (i.e. excavate/condition/replace/compact as required).
- Sloping ground, existing drainage channels, etc. should be benched to "key in" fill material and optimise compaction. The benches should slope back at 1V:10H and be at least 0.5m wide. Wider benches to accommodate the width of the roller may need to be adopted in some situations (Figure 4).

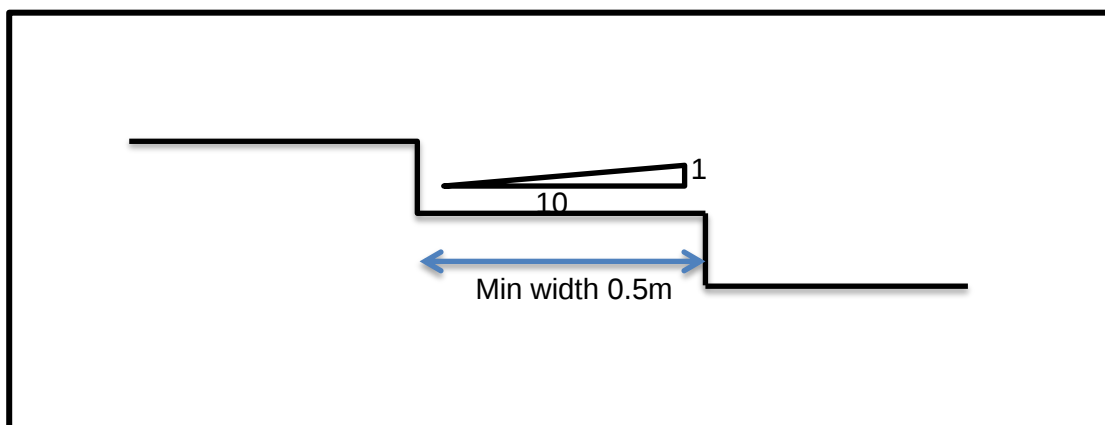


FIGURE 4

6.2.3 Material Usage

- Due to the water sensitive nature of the silty sand/clayey sand soils (fill and natural), **it is recommended that insitu silty sand/clayey sand NOT be used as structural fill.**

- The insitu soils, other than the silty/clayey sands, where free of organic and deleterious material, may be used for structural fill provided the moisture content of the soils on placement approximates the optimum moisture content required for compaction. This will require conditioning to bring the soils to optimum. However, it should be noted that the on site soils could be expected to present difficulties in handling, placement and compaction if the appropriate moisture content could not be achieved, particularly if the soils were overly moist.
- Close control of moisture content during placement and compaction is required so as to minimise the potential for swelling and shrinkage movement. A moisture content within the range of OMC (Standard Optimum Moisture Content) -1% to OMC +2% is recommended.
- The weathered rock, if encountered and where broken down on extraction, may be used in areas of structural fill provided no rock over 75mm greatest dimension is included above a plane 300mm below the final subgrade/platform.
Please note that the percentage retained on the 37.5mm sieve should not exceed 20%; standard field density testing is not able to be carried out if the percentage on the 37.5mm sieve was to exceed 20%.
Consideration should also be given to the exclusion of rock pieces with a greatest dimension of 35mm or greater from areas where trenching and piling may occur, as larger rock pieces could impede the trenching and piling operations.
Quality testing to confirm particle size limits should be carried out; frequency of testing is subject to assessment by Soil Surveys Engineering.
- **Imported GENERAL fill** material (if required) should be cohesive and non-dispersive in nature, and be a good quality low plasticity (Liquid Limit of less than 45%, Plasticity Index of less than 15%, I_{ss} of less than 0.5%) select fill material with a Soaked CBR >10%, a maximum particle size of 75mm with at least 80% passing the 19mm sieve.
- Quality testing to confirm imported fill quality should be carried out prior to delivery to site; frequency of testing is subject to assessment by Soil Surveys Engineering, however, a sufficient number of tests should be carried out so that all parties are confident of material characteristics. Quality test results should be reviewed by Soil Surveys Engineering prior to construction.
Contractors should submit details of their proposed fill source (with quality certificates) with their tender submission. The proposed fill source should be reviewed by Soil Surveys Engineering prior to awarding the earthworks contract.

6.2.4 Compaction Procedures & Specifications

- Provided the placement moisture content of the imported fill or select insitu material approximates the optimum moisture content for compaction, suitable compaction should be achievable using typical compaction machinery. Fill material should be compacted in layers not exceeding 250mm, loose thickness. However, layer thicknesses will be dependent on the compaction plant type and size, use of vibration, material type and condition. Final maximum placement layer thicknesses will need to be determined when compaction plant as well as material type and conditions are known. Fill batters should be overfilled and cut-back.

- Fill placed in the area of the buildings should be compacted in layers (approximately 250mm loose thickness) to a density not less than 98% of maximum dry density in accordance with AS 1289 5.1.1 (Standard Compaction).
- Field density testing should be carried out to check the standard of compaction achieved and the placement moisture content. The frequency and extent of testing should be as per guidelines in AS 3798-2007, Section 8.0.
- Backfilling for service trenches, etc. should use good quality material. The backfill should be placed in uniform layers over the full width of the excavations with the layers not exceeding 200mm thickness, loosely placed using wheeled plant and 100mm loose thickness using hand held vibrating plates. The backfill material should be compacted to the specifications outlined above for insitu or imported cohesive material.
- Soils encountered on site (to borehole depths) should be within the excavation limits of a small dozer (e.g. Cat D4 or similar) in bulk earthworks and a medium sized backhoe (e.g. Case 580 or similar) in trench excavations. However, large excavators (say 30 tonne), possibly utilising single tyne/rock breaker attachments for efficient excavation, may be required for trenching in the weathered rock stratum.
- Shoring of trench excavations is recommended. Suitable precautions to satisfy Health & Safety requirements must be adopted. Construction procedures (i.e. operation of plant, storage of materials, etc.) should also consider the nature of the site soils.

6.2.5 Earthworks Supervision

Engineering supervision of the earthworks operations by Soil Surveys Engineering Pty Limited is recommended.

Following production of AS 3798-2007, the terms "Level 1 and 2 Supervision" have been adopted in earthworks specifications to describe what could also be termed Engineering Supervision. Whilst there is no particular problem with using these terms, there does not seem to be wide agreement as to what Level 1 or 2 Supervision actually means or entails.

Regardless of terminology, it should be made clear in any earthworks specification as to what is actually required in terms of engineering certification.

It is recommended that the following objectives (as a minimum) be incorporated into the earthworks specification:-

- Engineering certification that all general earthworks operations (i.e. stripping, proof rolling of subgrade, subgrade treatment, etc.) have been carried out in accordance with the earthworks specification.
- Engineering certification that fill has been placed and compacted to the required minimum density in accordance with the earthworks specification.
- If required, engineering certification that the controlled fill is suitable for support of conventional high level footings and has a minimum bearing capacity of 150kPa.
- If required, engineering certification that the controlled fill material is suitable to support a conventional slab on ground floor.
- Engineering certification that the quality of any imported fill complies with the earthworks specification requirements.

Engineering certification should be provided by a Registered Professional Engineer of Queensland (RPEQ).

Compaction testing (alone) by a testing authority which does not include inhouse RPEQ certification (supported with adequate Professional Indemnity insurance coverage) that geotechnical engineering requirements associated with earthworks operations have been met, is considered inadequate and unacceptable.

6.2.6 Batters

Table 2 presents recommended maximum batter angles for unsurcharged fill batters up to 3.0m in height.

TABLE 2 BATTER ANGLES

Material	Short Term	Long Term
Controlled Fill	45 degrees	26 degrees
Natural Soils	45 degrees	26 degrees
Weathered Rock	45 degrees	26 degrees
Notes: 1. Subject to inspection by Soil Surveys Engineering. 2. Fill batter slopes are dependent on suitable compaction being achieved. 3. Batter angles assume no significant seepage.		

It is essential that batters be suitably protected from erosion and scour by the establishment of ground cover and shrubs, installation of surface drains, etc. Runoff should not be allowed to discharge directly across the batters.

6.3 Site Classification

While a site classification in accordance with AS 2870 'Residential Slabs and Footings' relates to residential type construction and may not be directly applicable for this development, it is, however, a valuable method of classification.

In assessing the site classification, the following has been considered:-

- The subsurface profile (as per borehole records).
- Laboratory test results associated with this study.
- That the site is considered to be a reactive site (as per AS 2870-2011).
- That the site is subject to abnormal moisture conditions due to the presence of trees (on the building site and adjacent sites) and proposed removal of trees (as per Clause 1.3.3 of AS 2870-2011).
- That the site is subject to abnormal moisture conditions due to the presence of an existing building and proposed removal of the existing building (as per Clause 1.3.3 of AS 2870-2011).
- The presence of uncontrolled fill deeper than 0.4m.
- Likely future development.

Considering the above, and other factors, the site is classified Class 'P'.

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It is recommended that the designer satisfy themselves that the use of AS 2870 is applicable for the proposed design.

6.4 Building Foundations

6.4.1 Site Reactivity

If this reactive site had been assessed to be subject to ground surface movement predominantly due to soil reactivity **under normal moisture conditions**, a characteristic surface movement (y_s) within the Class 'H1' range could be calculated (considering the proposed development, existing subsurface profile as per boreholes records, laboratory test results, and taking into account other relevant geotechnical data held by Soil Surveys Engineering); please note that tree induced movement would be additional to this value (refer Section 6.4.2).

However, this reactive site has been assessed to be subject to abnormal moisture conditions and the site is classified Class 'P' (refer Section 6.3).

The foundation system for the proposed building should be designed and constructed to accommodate the potential ground movement resulting from the volume instability of the reactive clay soils.

6.4.2 Trees

Trees can greatly affect ground surface movement (greater movements than what would be expected may occur), and subsequently negatively impact structures.

The footing system should be designed for the effect of trees, with the Designer (Soil Surveys Engineering are not the Designer) considering the following cases:-

- Existing trees are left in place.
- Existing trees are removed prior to construction/development.
- New trees are subsequently planted.

AS 2870-2011 includes an informative section (refer Appendix H) on the design of footings for trees and in particular the calculations of the maximum potential surface movement due to the tree-induced suction change (that is in addition to the normal design suction profile). The Designer should refer to AS 2870-2011 for detailed discussion on this matter.

Regardless, it is recommended that the site be maintained at "stable moisture conditions", with "extremes of wetting and drying prevented" – refer AS 2870-2011, Appendix B. This includes attention to such matters including limitations on gardens and restrictions on trees and shrubs.

6.4.3 Foundation Options

Foundation and slab on ground systems that could be considered include:-

- Foundation systems – high level footings
– deep foundations (piers)
- Slab on ground floors – stiffened raft
– suspended slab

Uncontrolled fill exists on the site and in its current state is not considered suitable for support of slab on ground construction. However, as part of the extension of the pad to create the building platform, the opportunity exists to treat the existing fill material to create a controlled fill platform.

Provided earthworks are carried in accordance with Section 6.2 and to provide a controlled fill platform a stiffened raft founded in controlled fill is considered a suitable foundation system.

Should earthworks not result in a controlled, and appropriately certified fill platform, the structure should be designed as fully suspended and founded in natural soils or weathered rock

6.4.4 High Level Footings

High level strip/pad footings should found a minimum of 300mm into controlled and certified fill or natural very stiff (or stronger) soils; footings will need to be deepened in areas of uncontrolled fill material (if any).

Table 3 outlines recommended allowable bearing capacities for high level footings.

TABLE 3 ALLOWABLE BEARING CAPACITIES

Material		Allowable Bearing Capacity (kPa)
Fill	Uncertified	NR
	Certified	150
Natural Soils - Very stiff to Hard Clay		300
Notes:		
1. All capacities subject to inspection by Soil Surveys Engineering.		
2. NR = Not Recommended.		
3. Undrained cohesion, C_u , values are recommended design values and subject to confirmation on site.		

6.4.5 Deep Foundations - Piers

Bored piers could be considered.

It is recommended that the pier foundation system be designed in accordance with AS 2159-2009 'Piling - Design and Installation'. This code uses the limit state design method.

The design of a single pier or a pier group must be such that both the design geotechnical strength $R_{d,g}$ and the structural strength $R_{d,s}$, are greater than or equal to the design action effect E_d , i.e.

$$R_{d,g} \geq E_d \text{ and } R_{d,s} \geq E_d$$

The design geotechnical strength ($R_{d,g}$) can be calculated as the ultimate design geotechnical strength ($R_{d,ug}$) multiplied by the geotechnical strength reduction factor ϕ_g . Ultimate design geotechnical strength ($R_{d,ug}$) parameters for the materials encountered on the site are outlined in Table 4.

TABLE 4 ULTIMATE GEOTECHNICAL STRENGTH ($R_{d,ug}$) PARAMETERS

Material		f_b - Base Bearing (kPa)	$f_{m,s}$ - Skin Friction (kPa)
Fill Material		NR	NC
Natural Clay	Very Stiff	NR	20
	Hard	1800	60
Weathered Rock	XW	1800	75
	DW	2700	90

Notes:

1. NR - Not Recommended; NC - Not Considered in skin friction calculations.
2. Ultimate geotechnical strength for compression can be determined from $R_{d,ug} = f_{m,s} A_s + f_b A_b$.
3. For determination of geotechnical strength reduction factor (ϕ_g) refer Section 4.3.2 AS 2159-2009.
4. Considering limit state analysis (AS 2159-2009), the design geotechnical strength $R_{d,g}$ is calculated by multiplying the ultimate geotechnical strength $R_{d,ug}$ by the geotechnical strength reduction factor ϕ_g , i.e. $R_{d,g} = R_{d,ug} \times \phi_g$.
5. Should a "working stress" approach be adopted, a minimum factor of safety of 3.0 on base and 2.0 on skin friction is recommended.
6. Skin friction contribution from clays in the upper 1.8m of the profile should be ignored.
7. Piers should be founded at a minimum depth of four times the pier diameter and at least 2.0m below platform level.
8. The above parameters are for single piers. If piers are spaced at closer than three diameters, a reduction factor (Group Efficiency Ratio) may apply.
9. Base bearing and skin friction parameters to be confirmed by inspection.

Some difficulty with fall-in may occur with bored piers, particularly when drilling through fill material and silty/clayey sand. It should be ensured that all loose material is removed from the base of piers prior to pouring of concrete. The use of a 'clean-out' bucket or vacuum truck should be explicit in instructions to the drilling contractor. The practice of 'using water and spinning the augers' to remove loose material from the pier base is generally unacceptable.

In addition, it may be prudent to drill a "trial pier" to fully assess construction difficulties.

6.4.6 Adjacent Feature/Excavation Considerations

Where proposed or existing (e.g. adjacent structures) footings/piers are located adjacent to proposed or existing feature/excavations (e.g. retaining walls, underground service trenches, footing excavations etc.), the effect of the feature/excavation on proposed or existing footings/piers must be carefully considered. Deepening of proposed footings/piers is expected to be required in such circumstances; existing footings may need to be underpinned (or similar).

Soil Surveys Engineering and the Structural Engineer should be consulted on this matter prior to construction.

For underground service trenches (as a general guide) proposed footings and piers should extend to base a minimum of 500mm and 1.0m respectively below the feature/excavation base level for a distance of 1.0m out from the feature/excavation. Beyond 1.0m the footings and piers should be taken a minimum of 500mm and 1.0m respectively below an imaginary line (influence line) drawn up at 45° (1H:1V) from the feature/excavation base level. Note that actual depths (Soil Surveys Engineering should be consulted on this matter prior to construction) below the influence line will depend on footing/pier capacity, footing/pier load and possible uplift considerations. Figure 5 refers.

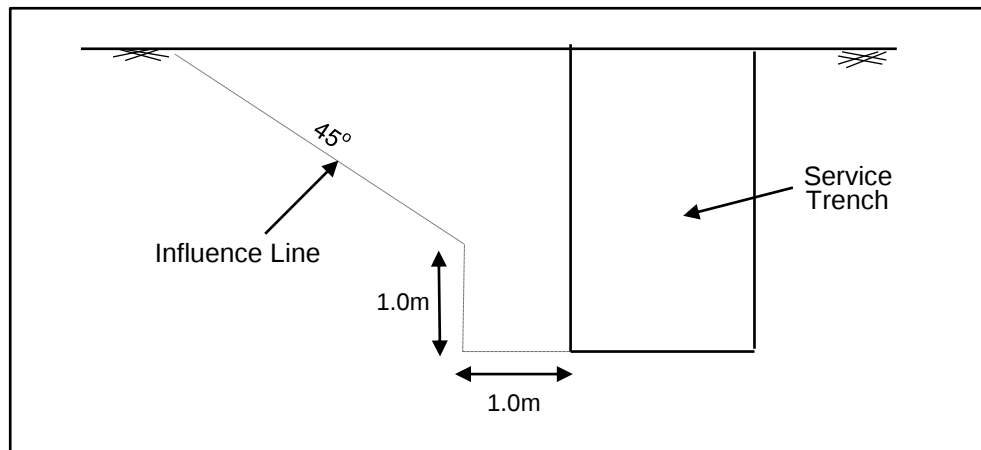


FIGURE 5

For all other feature types, Soil Surveys Engineering and the Structural Engineer should be consulted prior to construction.

For existing footings/piers that are located adjacent to a proposed feature/excavation, Soil Surveys Engineering and the Structural Engineer should also be consulted prior to construction.

6.4.7 Inspections

It is recommended that inspections be undertaken by an experienced and qualified geotechnical engineer from Soil Surveys Engineering during footing and pier excavations to confirm the adequacy of the founding material. Inspections should be carried out prior to placement of reinforcing steel and ordering of concrete.

6.5 Slab on Ground

Stiffened Raft

A stiffened raft comprises perimeter and internal beams and is designed to accommodate potential ground surface movements.

Field and laboratory test results indicate that the existing natural soils, along with any controlled fill, are suitable for slab on ground construction provided that earthworks are carried out in accordance with Section 6.2 and that appropriate engineering certification is provided. However, the existing fill is not considered to be suitable in its current state to support the slab on ground floor. Should earthworks operations not result in a subgrade suitable for slab support, the slab on ground floor should be supported on pedestals/piers founding in competent natural soils.

Fully Suspended

A fully suspended slab system involves the support of the slab on piers or pedestals.

6.6 Articulation and Detailing

It is recommended that any masonry walls be articulated. This articulation may be achieved by the use of full height (footings to eaves) openings or vertical construction joints at regular intervals. Guidelines on articulation are contained in the Cement and Concrete Association's Technical Note 61, 'Articulated Walling'.

6.7 Site Management

It is important that proper site management methods be observed for the existing soil conditions by both the builder at the time of the construction and the owner(s) throughout the life of the proposed development.

Particular reference to site management matters is set out in AS 2870-2011, particularly Appendix B of this Australian Standard. It should be noted that where proper site management, particularly with respect to change in moisture conditions, is not followed, the foundation recommendations contained in this report could be considered void.

The following are some general comments with respect to site management. However, the reader is directed to AS 2870-2011 (particularly Appendix B) and the CSIRO publication, "Foundation Maintenance and Footing Performance: A Homeowners Guide" (Building Technology File 18), for a complete discussion and further information on foundation performance and maintenance:-

- It is important that the site be well drained. The ground around the structure should slope away at 1 in 50 and then fall to the stormwater system to prevent ponding of water against or near to the structures.
- Roof downpipes and garden taps should not be allowed to wet founding soils.
- It is recommended that service trenches under the building be minimised as disruption or breakage of these service lines could lead to saturation of the under slab material resulting in an increase to moisture condition. If this were to occur, all footing recommendations contained within this report would be void.
- Footings should be placed with minimal delay after excavation to avoid desiccation or wetting of the founding soils. If footings cannot be poured on the same day as excavation, a blinding layer of 75mm thickness is recommended. Piers should be poured immediately.
- Do not let the slab subgrade "dry out" prior to casting.
- It is recommended that the site be maintained at "stable moisture conditions", with "extremes of wetting and drying prevented" - refer AS 2870-2011, Appendix B. This includes attention to such matters including limitations on gardens and restrictions on trees and shrubs.

6.8 Retaining Walls

It is recommended that any retaining structure be designed in accordance with AS 4678-2002 'Earth Retaining Structures'. Section 3 of this code outlines the design requirements for retaining structures which specifically includes both Ultimate and Serviceability Limit Modes. It is recommended that the retaining structures be assessed for each of these modes.

Please note that the following section provides general recommendations with respect to some of these limit modes, however, it doesn't provide a detailed assessment in full accordance with the above mentioned modes for AS 4678. A detailed assessment can be undertaken of the geotechnical aspects of the Limit Modes for the proposed retaining structures once details of the wall have been provided.

The following parameters (unfactored) may be adopted for wall design (Table 5).

TABLE 5 PARAMETERS FOR USE IN RETAINING WALL DESIGN

Material	Density (kN/m ³)	Earth Pressure Coefficient			Long Term Drained ϕ (degrees)
		Vertical Wall			
		K _o	K _a	K _p	
Fill	19	0.53	0.36	NR	28
Natural Soils	19	0.53	0.36	2.70	28
Weathered Rock	21	0.43	0.27	3.70	35

Lateral pressure assessment must also consider hydrostatic pressure and surcharge loadings.

Any backfill placed behind the wall should be loose granular material. The backfill should not be heavily compacted since research has shown that compaction can raise the earth pressure to above the 'at rest' pressure.

Adequate surface and subsoil drainage should be provided for all retaining walls on the site. Cut-off / interceptor drains should also be provided around the high side of the wall to ensure stormwater runoff from the area above the wall is suitably diverted.

The placement of a filter fabric between the retained soil and the drainage material (e.g. granular backfill) for protection against silting of the drainage material is recommended. The outlets to subsoil pipe drains must be located beyond the ends of the walls and connected to a proper drainage system. It is suggested the pipes be wrapped in filter fabric to minimise silting.

In weather exposed locations, to reduce infiltration by surface runoff, the surface of the backfill should be sealed. This can be achieved by either compacting a material of low permeability, i.e. on site clay, or concrete, with a slope towards an open drain.

Due to possible long term problems with blocking of gravel filters and drains and short term storm conditions that could flood the fill behind retaining walls, it is recommended that all retaining walls be designed for some water pressure distribution.

During installation of any retaining walls, the insitu soils should be battered back to minimise fall-in and subsequent disruption of works. Suitable precautions to satisfy Health & Safety requirements must also be adhered to.

7.0 LIMITATIONS

We have prepared this report for the use of **Turner & Townsend**, for design purposes in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has not been prepared for use by parties other than **Turner & Townsend**; it may not contain sufficient information for purposes of other parties or for other uses. Please note that any third party relying on the information contained in this report for any purpose whatsoever does so entirely at its own risk, and any duty of care to that third party is excluded.

Any interpretation or recommendation given by Soil Surveys Engineering shall be understood to be based on judgement and experience and not on greater knowledge of the facts than the reported investigations would imply. The interpretation and recommendations are therefore opinions provided for our Client's sole use in accordance with the specific brief. As such they do not necessarily address all aspects of ground behaviour on the subject site. Information

provided by others has been taken in good faith, but no liability can be accepted for information provided by others.

Your attention is drawn to 'Appendix A', 'Notes Relating to this Report'. Interpretation of factual data given in this report is based on judgement, not a greater knowledge of facts other than those reported.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing and depth of boreholes, the method of drilling, the frequency of sampling and testing and the possibility of other than "straight line" variations between the boreholes. Subsurface conditions between and below boreholes may vary significantly from conditions encountered at the borehole locations.

Please note, if following detailed design, the founding depth of any footings or piers/piles is within 3B (B = footing width/pier diameter) above the termination depth of the boreholes or if any excavations extend below the borehole termination levels, then Soil Surveys Engineering should be contacted immediately.

If the above were to occur then the geotechnical data in this report should be considered preliminary only; additional investigation is likely to be required.

In the event that conditions encountered on site during construction appear to vary from those expected from the information contained in the report, the Company strongly recommends that it immediately be notified. Most problems are more readily resolved when conditions are exposed than at some later stage, after the event. Should Soil Surveys Engineering not be notified or if this notification is delayed, then Soil Surveys can not be held responsible for the effect that any variation has on any aspect of the development.

Soil Surveys Engineering consider that a documentation review service (during the design phase and prior to construction) to verify that the intent of geotechnical recommendations is properly reflected in the design, along with construction inspections, forms a very important component of the geotechnical engineering design service/process.

The geotechnical review ensures geotechnical risks to our Client and their project are minimised at the design and tender stage of the project. Further, with Soil Surveys Engineering being commissioned to carry out geotechnical construction inspections, an opportunity at the time of construction to confirm any assumptions made in the preparation of the report and allow the effect of any normally occurring variation in ground conditions to be assessed with respect to construction becomes available.

The above statements are not intended to reduce the level of responsibility accepted by Soil Surveys Engineering in accordance with our commission, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in doing so and the risks they accept should they decline to have Soil Surveys Engineering carry out a geotechnical documentation review and geotechnical construction inspections.

It is highly recommended that the Client avail themselves of these review and inspection services; our standard rates will apply.



S.R. COTTLE
ASSOCIATE

C.P JOHNSON (RPEQ 7052)
PRINCIPAL GEOTECHNICAL ENGINEER

for and on behalf of

SOIL SURVEYS ENGINEERING PTY LIMITED

APPENDICES

APPENDIX A

NOTES RELATING TO THIS REPORT

NOTES RELATING TO THIS REPORT

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INTRODUCTION

These notes are provided by Soil Surveys Engineering Pty Limited (the Company) to complement the geotechnical report in regard to classification methods and field procedures. Not all notes are necessarily relevant to all reports.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Geotechnical engineering involves gathering and assimilating limited information about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such information obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and at the time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

Soils - The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726-2017 (Geotechnical Site Investigations), where appropriate. In general, descriptions cover the following properties - soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the dominant particle size and behaviour as set out in AS 1726-2017.

Cohesive soils are classified on the basis of strength (consistency) either by use of hand penetrometer, shear vane, laboratory testing or engineering examination. The strength terms are defined in AS 1726-2017 Table 11.

Non-cohesive soils are classified on the basis of relative density usually based on insitu testing or engineering examination (see AS 1726-2017 Table 12).

Rocks - Rock types are classified by their geological names (AS 1726-2017 Tables 15 to 18), together with descriptive terms regarding weathering (AS 1726-2017 Table 20), strength (AS 1726-2017 Table 19), defects (AS 1726-2017 Table 22), etc.

SAMPLING

Sampling is carried out during drilling or from other excavations to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content, minor constituents and, depending upon sample disturbance, (information on strength and structure).

Undisturbed samples are taken by pushing a thin walled sample tube, usually 50mm diameter (U50), into the soil and withdrawing it with a sample of the soil contained in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory

determination of shear strength, volume change potential and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling used are given on the attached logs.

SAMPLE STORAGE – SOIL, ROCK AND WATER

SAMPLES

Soil samples (not subject to testing) are not stored beyond a period of 90 days of taking or receiving said soil sample. Rock core (not subject to testing) is not stored beyond a period of six months of taking or receiving said rock core.

Should any party require that soil samples (not subject to testing) be stored beyond 90 days, or rock core (not subject to testing) be stored beyond six months, please contact Soil Surveys Engineering.

Water samples (not subject to testing) are not stored beyond a period of seven days of taking or receiving water samples.

TEST LOCATIONS

Test locations (e.g. boreholes, CPT's, test pits etc.) were based on available access at the time of testing. Test locations may have been shifted if access was not suitable.

Unless noted otherwise, accuracy of test locations are to the accuracy of hand held GPS equipment.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application.

Test Pits - These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils if it is safe to descend into the pit. The depth of penetration is limited to approximately 3.0m for a backhoe and up to 6.0m for an excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling - A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the augers can occur on a variety of materials such as hard clay, gravel or rock fragments and does not necessarily indicate rock level.

Continuous Spiral Flight Augers - The borehole is advanced using 75mm to 300 mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling or insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the augers. Information from the drilling (as distinct from specific sampling) is of relatively lower reliability due to remoulding, inclusion of cuttings from above or softening of samples by groundwater, or

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uncertainties as to the original depth of the samples. Augering below the groundwater table has a lower reliability than augering above the water table. Various drill bits are attached to the base of the augers during the drilling. The depth of refusal of the different bit types can provide information as to the strength of the material encountered. Generally the 'TC' bit (a tungsten carbide tipped screw type bit) is used.

Wash Boring - The borehole is usually advanced by a rotary bit with water or fluid pumped down the hollow drill rods and returned up in the space between the rods and the soil or casing, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from "feel" and rate of penetration. More accurate information on soil strata is gained by regular testing and sampling using the Standard Penetration Test (SPT) and undisturbed thin walled tube samples (U50).

Mud Stabilized Drilling - Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilize the borehole. The term "mud" encompasses a range of products ranging from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is only possible from regular intact sampling (e.g. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling - A continuous core sample is obtained using a diamond or tungsten carbide tipped core barrel. Provided full core recovery is achieved (which is not always possible in very weak rocks and granular soils), this technique provides a very reliable method of investigation. In rocks, NMLC coring (nominal 52 mm diameter) is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as CORE LOSS. The location of losses is determined on site by the supervisor. If the location of the loss is uncertain, it is placed at the top end of the run, when the core is placed in a storage tray and recorded on the log.

Standard Penetration Tests - Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposes" - Test 6.3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm, the upper 150 mm being neglected due to possible disturbance from the drilling method. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued at a reduced penetration.

In the case where full penetration is obtained with successive blow counts for each 150 mm of, say 4, 6 and 7 blows, the record shows,

4, 6, 7

N = 13

In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm, the record shows:

15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

Occasionally, the drop hammer is used to drive 50mm diameter thin walled sample tubes (U50) in clays. In such circumstances, it is noted on the borehole logs.

A modification to the SPT test is where the same driving system is used with a solid 600 tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid SPT are shown as "N_c" on the borehole logs, together with the number of blows per 150 mm penetration.

Cone Penetration Tests - Test Method - Cone Penetration Tests (CPT) are carried out in accordance with AS 1289 Test 6.5.1-1999, using an electrical friction-cone penetrometer.

The test essentially comprises the measurement of resistance to penetration of a cone of 35.7 mm diameter pushed into the soil at a rate of 10-20 mm per second by hydraulic force. The resistance to penetration is recorded in terms of pressure on the end area of the cone (cone resistance, q_c , in MPa) and friction on the side of the 135 mm long sleeve immediately above the top of the cone (friction resistance, f_s , in kPa). These forces are measured by electrical transducers (strain gauges) within the cone device. The ratio between friction resistance and cone resistance is also calculated as a percentage, i.e.-

$$\text{Friction Ratio (FR)} = \frac{\text{Friction Resistance, } f_s \text{ (kPa)} \times 100}{\text{cone resistance, } q_c \text{ (kPa)}}$$

The friction ratio, FR, is generally low in sands (less than 1% or 2%) and generally higher in clays (say 3% or more). The interpretation of sandy clays, clayey sands and material with a high silt content is more difficult, but intermediate values (between 1% and 3%) would be expected. Highly organic clays and peats generally have a friction ratio in excess of 5%.

Static cone data is recorded in the field on disc for later presentation using computer aided drafting.

The equipment can be operated from any conventional drill rig. A total applied load in the range of 4 to 10 tonnes is required for practical purposes, although lighter loads may be used. The cone penetrometers are available with various capacities of cone resistance ranging up to 100 MPa for general purpose investigations, while a range of 0 to 10 MPa can be used where more sensitive investigations of soft clay are required.

The cone resistance value provides a continuous measure of soil strength or density, and together with the friction ratio, provide very useful indications of the presence of narrow bands of geotechnically significant layers such as thin, soft clay layers or lenses of sand which might otherwise be missed using conventional drilling methods.

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The lithology of the encountered soils is interpreted from static cone data and is generally presented on the static cone log sheets.

It is important to note that the lithology is interpreted information and is based on research by Schmertmann (1970), Sanglerat (1972), Robinson and Campinalli (1986), modified to suit local conditions as indicated by borehole information and laboratory testing.

As soils generally change gradually it is sometimes difficult to accurately describe depths of strata changes, although greater accuracy is obtained with the static cone compared with conventional drilling. In addition, friction ratios decrease in accuracy with low cone resistance values, and in desiccated soils. As a result, some overlap and minor discrepancies may exist between static cone and nearby borehole information.

Portable Dynamic Cone Penetrometers - Portable Dynamic Cone Penetrometer (DCP) tests are carried out by driving a rod into the ground with a falling weight hammer and measuring the blows for successive 100mm increments of penetration.

The DCP comprises a Cone of 20 mm diameter with 30 degree taper attached to steel rods of smaller section.

The cone end is driven with a 9 kg hammer falling 510 mm (AS 1289 Test 6.3.2). The test was developed initially for pavement subgrade investigations, and empirical correlations of the test results with California Bearing Ratio have been published by various Road Authorities. The Company has developed their own correlations with Standard Penetration tests and Density Index tests in sands.

LOGS

The borehole or test pit logs presented herein are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The attached explanatory notes define the terms and symbols used in preparation of the logs.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line" variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems.

- Although groundwater may be present in lower permeability soils, it may enter the hole slowly or perhaps not at all during the time the hole is open.
- A localized perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be bailed out of the bore and mud must be washed out of the hole or "reverted" if water observations are to be made.

More reliable measurements can be made by use of standpipes which are read after stabilizing at periods ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (e.g. bricks, steel, etc.) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably determine the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse engineering characteristics or behaviour. If the volume and quality of fill is important to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with Australian Standard 1289 "Methods of Testing Soil for Engineering Purposes". Details of the test procedure used are given on the individual report forms and the attached explanatory notes summarize important aspects of the Laboratory Test Procedures adopted.

ENGINEERING REPORTS

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. The information provided in Soil Surveys Engineering reports is opinion and interpretation and not factual. The client/contractor increases their risk by not retaining the person who authored the geotechnical report, to carry out site inspection and review (overseeing role) during construction, to confirm opinion and interpretation expressed in the report is accurate. Where the report has been prepared for a specific design proposal the information and interpretation may not be relevant if the design proposal is changed. If this happens, the Company will be pleased to

NOTES RELATING TO THIS REPORT

September, 2019

review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical aspects and recommendations or suggestions for design and construction. Since the test sites in any exploration represent a very small proportion of the total site and since the exploration only identifies actual ground conditions at the test sites, even under the best circumstances actual conditions may vary from those inferred to exist. No responsibility is taken for:-

- Unexpected variations in ground and/or groundwater conditions.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of other persons.
- Any work where the company is not given the opportunity to supervise the construction using the Companies designs/recommendations.

If differences occur, the Company will be pleased to assist with investigation or advice to resolve any problems occurring.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are more readily resolved when conditions are exposed than at some later stage, well after the event.

Extreme events including but not limited to the results of climate change, e.g. flood levels above previously identified levels, beach scour or erosion beyond normal expectations (as identified by local authorities) extreme rainfall events, war, espionage, sabotage may result in different conditions between time of investigation and time of construction.

REPRODUCTION OF INFORMATION FOR

CONTRACTUAL PURPOSES

Attention is drawn to the document "Guidelines for the Provision of Geotechnical Information in Construction Contracts (1987)", published by the Institution of Engineers, Australia. Where information obtained from this investigation is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances, where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. The Company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

REVIEW OF DESIGN

Where major civil or structural developments are propose or where only a limited investigation has been completed or where the geotechnical conditions/ constraints are quite

complex, it is prudent to have a joint design review which involves a senior geotechnical engineer. We would be happy to assist in this regard as an extension of our investigation commission. Construction drawings should be reviewed by Soil Surveys Engineering, with sufficient time to allow changes if required, prior to inspections. Otherwise Soil Surveys Engineering reserves the right to refuse to carry out inspections.

SITE INSPECTION

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related.

- i. Site visits during construction to confirm reported ground conditions
- ii. Site visits to assist the contractor or other site personnel in identifying various soil/rock types such as appropriate footing or pier founding depths, the stability of a filled or excavated slope; or
- iii. Full-time engineering presence on site.

In the vast majority of cases it is advantageous to the principal for the geotechnical engineer who wrote the investigation report to be involved in the construction stage of the project.

The geotechnical engineer cannot take responsibility for variations in encountered conditions, where he is not given the opportunity to review plans for the proposed development with sufficient time to allow review and make changes to the proposed development if required, and where he is not given the opportunity to inspect the site and oversee construction methods with regard to site conditions with sufficient time to observe all relevant site conditions and operations.

RESPONSIBLE USE OF GEOTECHNICAL

INFORMATION

Recommendations in our report are for design purposes only and provided on the basis that inspections are carried out to allow finalisation of opinions and recommendations contained in our report.

The geotechnical investigation consisting of field and laboratory testing has been carried out to indicate typical conditions by indicating conditions and parameters at the specific locations of boreholes/test pits. Subsurface conditions are indicated at these locations only and the inference of conditions between or away from these locations (interpolation and extrapolation) involves a certain degree of risk. Persons inferring such conditions or carrying out such inferences should do so with a degree of caution and conservatism which is commensurate with the consequences of the risk of error.

Estimates of volumes based on our findings require interpolation and extrapolation between test locations and as such may be significantly different from actual volumes.

APPENDIX B
BOREHOLE RECORD SHEETS



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BOREHOLE RECORD SHEET

Location Number: BH 01

Project Number: 1-22929

Project Name: New Learning Centre

Location: Stretton State College

Client: Turner & Townsend

Date: 04/09/2020

Easting: 505729 Northing: 6942790 RL:
 Logger: BM Operator: BM Machine: Scout 2

Page: 1 OF 1

Drilling Method				Depth	Graphic	Description	Samples and Remarks
TC	WB	RR	NM/LC				
				0.10		FILL Silty SAND (SM) Very loose, fine to medium grained, brown, moist.	
				0.20		FILL Clayey SAND (SC) Very loose, fine to medium grained, brown, high plasticity clay fines, moist.	
				0.40		FILL Silty CLAY (CI-CH) Very stiff, medium to high plasticity, mottled red brown light brown, fine to coarse grained sand, moist.	
				1.0		FILL Silty CLAY (CH) Very stiff, high plasticity, grey yellow brown, moist.	
				1.10		NATURAL Sandy CLAY (CH) Hard, high plasticity, grey yellow brown, fine to medium grained sand, tending to a weathered Sandstone (XW) appearance, moist.	
				1.60		Extremely weathered Sandstone (XW) recovered as Sandy CLAY (CL-CI) Hard, low to medium plasticity, light brown mottled light grey, moist (very low strength).	
				2.0			
				3.0			
				4.0			
				5.0			
				6.0			
				7.0			
				7.20			
				8.0		SANDSTONE (DW) Distinctly weathered, low strength, light brown mottled light grey, moist.	
				9.0			
				9.00			
						BOREHOLE BH 01 TERMINATED AT 9.00 m	
				10.0			

U50 PP=>600
Rec = 83%

SPT
30/90mm N=R

SPT
30/110mm N=R

SPT
30/130mm N=R

SPT
30/40mm N=R

SPT
30/10mm N=R

SPT
30/10mm N=R

Comments:

- Groundwater not encountered during augering.

Weathering Grades
 RS - Residual Soil
 XW - Extremely weathered
 HW - Highly weathered
 DW - Distinctly weathered
 MW - Moderately weathered
 SW - Slightly weathered
 FR - Fresh
Rock Strength
 RS - Residual Soil
 VL - Very low
 L - Low
 M - Medium
 H - High
 VH - Very high
 EH - Extremely high

Samples
 U50
 SPT
 Disturbed Sample
 Bulk Sample

Approved: SC
 Date: 22/09/2020

Water First Noted Water Steady Level



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BOREHOLE RECORD SHEET

Location Number: BH 02

Project Number: 1-22929

Project Name: New Learning Centre

Location: Stretton State College

Client: Turner & Townsend

Date: 04/09/2020

Easting: 505683

Northing: 6942795

RL:

Logger: BM

Operator: BM

Machine: Scout 2

Page: 1 OF 2

Drilling Method				Depth	Graphic	Description	Samples and Remarks
TC	WB	RR	NW/LC				
				0.05		FILL Silty SAND (SM) Loose, fine to medium grained, dark brown, moist.	
				0.20		FILL Silty SAND (SC) Loose, fine to medium grained, brown, with organics, moist.	
				0.50		FILL Sandy CLAY (CH) Very stiff, high plasticity, red brown grey mottled, fine to medium grained sand, moist.	
				1.0		NATURAL Sandy CLAY (CL) Hard, low plasticity, mottled red brown light grey, fine to coarse grained sand, with Sandstone (XW) bands, moist.	U50 PP=550->600 Rec = 43%
				2.0			U50 PP=>600 Rec = 52%
				2.40		Silty CLAY (CI-CH) Hard, medium to high plasticity, dark brown, trace of fine to medium sized gravel, moist.	
				3.0			SPT 16, 20, 24 N=44
				3.90		Silty CLAY (CI-CH) Hard, medium to high plasticity, dark grey, trace of fine to medium sized gravel, moist.	
				4.70		Extremely weathered Sandstone (XW) recovered as Sandy CLAY (CL-CI) Hard, low to medium plasticity, light brown mottled light grey, moist (very low strength).	SPT 21, 30/140mm N=R
				5.40		Silty CLAY (CI-CH) Hard, medium to high plasticity, dark grey, trace of fine to medium sized gravel, moist.	
				6.20		Extremely weathered Sandstone (XW) recovered as Sandy CLAY (CL-CI) Hard, low to medium plasticity, light brown mottled light grey, moist (very low strength).	SPT 26, 30/140mm N=R
				6.90		SANDSTONE (DW) Distinctly weathered, low strength, dark grey, moist.	
				7.80		SANDSTONE (DW) Distinctly weathered, low strength, light brown mottled light grey, moist.	SPT 30/50mm N=R
				9.0			SPT 30/55mm N=R
				10.0			

Comments:

- Borehole bailed to 10.50m.
- Steady water depth at 9.90m at 12:45pm 04/09/2020.

Water First Noted Water Steady Level

Weathering Grades
RS - Residual Soil
XW - Extremely weathered
HW - Highly weathered
DW - Distinctly weathered
MW - Moderately weathered
SW - Slightly weathered
FR - Fresh

Rock Strength
RS - Residual Soil
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

Samples
U50
SPT
Disturbed Sample
Bulk Sample

Approved: SC
Date: 22/09/2020

BOREHOLE RECORD SHEET

Location Number: BH 02

Project Number: 1-22929

Project Name: New Learning Centre

Location: Stretton State College

Client: Turner & Townsend

Date: 04/09/2020

Page: 2 OF 2

Easting: 505683

Northing: 6942795

RL:

Logger: BM

Operator: BM

Machine: Scout 2

Drilling Method						Depth	Graphic	Description	Samples and Remarks
TG	WB	RR	NMLC	Casing					
						04/09/20 10.50		SANDSTONE (DW) Distinctly weathered, low strength, light brown mottled light grey, moist. (<i>continued</i>)	
								BOREHOLE BH 02 TERMINATED AT 10.50 m	

Comments:

1. Borehole bailed to 10.50m.
2. Steady water depth at 9.90m at 12:45pm 04/09/2020.

Weathering Grades

RS - Residual Soil
XW - Extremely weathered
HW - Highly weathered
DW - Distinctly weathered
MW - Moderately weathered
SW - Slightly weathered
FR - Fresh

Rock Strength

RS - Residual Soil
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

Samples

Samples
U50

SDT

Disturbed

Disturbed
Sample

Bulk

Approved: SC

Date: 22/09/2020



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BOREHOLE RECORD SHEET

Location Number: BH 03

Project Number: 1-22929

Project Name: New Learning Centre

Location: Stretton State College

Client: Turner & Townsend

Date: 04/09/2020

Easting: 505709

Northing: 6942789

RL:

Logger: RH

Operator: RH

Machine: EVH1750

Page: 1 OF 1

Drilling Method				Depth	Graphic	Description	DCP Test (blows/100mm)	Samples and Remarks
TC	WB	RR	NWLC					
				0.10		FILL Silty SAND (SM) Very loose, fine to coarse grained, dark brown, with organics, moist.		
				0.20				
				0.40		FILL Silty SAND (SM) Very loose, fine to coarse grained, dark brown, moist.		
				0.70				
				1.0		FILL Sandy CLAY (CI-CH) Very stiff, medium to high plasticity, dark brown, fine to coarse grained sand, trace of fine to medium sized gravel, moist.		
				1.50		NATURAL Silty CLAY (CI-CH) Very stiff, medium to high plasticity, mottled red brown light brown, fine to coarse grained sand, moist.		
				2.0		Sandy CLAY (CL) Hard, low plasticity, mottled red brown light grey, fine to coarse grained sand, with Sandstone (XW) bands, moist.		
				2.70		Extremely weathered Sandstone (XW) recovered as Sandy CLAY (CL-CI) Hard, low to medium plasticity, light brown mottled light grey, moist (very low strength).		
				3.0		Silty CLAY (CI-CH) Hard, medium to high plasticity, dark brown, trace of fine to medium sized gravel, moist.		
				4.0				
				4.20				
				4.50		Sandy CLAY (CL-CI) Hard, low to medium plasticity, red brown mottled light brown, fine grained sand, moist.		
				5.0		BOREHOLE BH 03 TERMINATED AT 4.50 m		
				6.0				
				7.0				
				8.0				
				9.0				
				10.0				

U50 PP=>600
Rec = 80%
U50 PP=>600
Rec = 67%

Comments:

1. Groundwater not encountered during augering.
2. DCP refusal at 1.48m and 1.97m.
3. Hand augered to 0.40m.

Weathering Grades
RS - Residual Soil
XW - Extremely weathered
MW - Moderately weathered
SW - Slightly weathered
FR - Fresh
Rock Strength
RS - Residual Soil
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

Samples
U50
SPT
Disturbed Sample
Bulk Sample

Approved: SC
Date: 22/09/2020

Water First Noted Water Steady Level



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BOREHOLE RECORD SHEET

Location Number: BH 04

Project Number: 1-22929

Project Name: New Learning Centre

Location: Stretton State College

Client: Turner & Townsend

Date: 04/09/2020

Page: 1 OF 1

Easting: 505664 Northing: 6942798 RL:
Logger: RH Operator: RH Machine: EVH1750

Drilling Method				Depth	Graphic	Description	DCP Test (blows/100mm)	Samples and Remarks
TC	WB	RR	Casing					
				0.12		NATURAL Silty SAND (SM) Medium dense, fine to medium grained, dark brown, with organics, moist.		U50 PP=>600 Rec = 84%
				0.25				
				0.40		Silty SAND (SM) Medium dense, fine to medium grained, dark brown, moist.		
				1.0		Silty CLAY (CI-CH) Hard, high plasticity, mottled red brown light brown, trace of fine to medium sized gravel, moist.		
				1.10		Silty CLAY (CI-CH) Hard, high plasticity, light grey mottled light brown red brown, trace of fine to medium sized gravel, moist.		
				1.70		Extremely weathered Siltstone (XW) recovered as Silty CLAY (CL) Hard, low plasticity, light grey, moist (very low strength).		
				2.0				
				2.40		Sandy CLAY (CL-CI) Hard, low to medium plasticity, red brown mottled light brown, fine grained sand, moist.		
				3.0		Extremely weathered Sandstone (XW) recovered as Sandy CLAY (CL-CI) Hard, low to medium plasticity, light brown mottled light grey, moist (very low strength).		
				4.0				
				4.50				
						BOREHOLE BH 04 TERMINATED AT 4.50 m		
				5.0				
				6.0				
				7.0				
				8.0				
				9.0				
				10.0				

Comments:

- Groundwater not encountered during augering.
- DCP refusal at 1.08m and 2.37m.
- Hand augered to 0.40m.

Weathering Grades

RS - Residual Soil
XW - Extremely weathered
HW - Highly weathered
MW - Moderately weathered
SW - Slightly weathered
FR - Fresh

Rock Strength

RS - Residual Soil
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

Samples

U50

SPT

Disturbed Sample

Bulk Sample

Approved: SC
Date: 22/09/2020

SOIL SURVEYS 2.00 LIB 2017-07-13 G.L.B. Log SOIL SURVEY AUGER LOG2 1-22929 GINT.GPJ <<DrawingFile>> 22/09/2020 17:40 10.0.000 Developed by Datagel



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HAND AUGER RECORD SHEET

Location Number: BH 05

Project Number: 1-22929

Project Name: New Learning Centre

Location: Stretton State College

Client: Turner & Townsend

Date: 04/09/2020

Page: 1 OF 1

Easting: 505734

Northing: 6942828

RL:

Logger: RH

Operator: RH

Machine: Hand Auger

Drilling Method					Depth	Graphic	Description	DCP Test (blows/100mm)						Samples and Remarks
TC	WB	RR	NMLC	Casing				0	6	12	18	24	30	
					0.10		FILL Silty SAND (SM) Medium dense, fine to medium grained, dark brown, with organics, moist.							
				0.40	NATURAL Silty CLAY (CI-CH) Very stiff, medium to high plasticity, mottled red brown light grey, trace of fine to coarse grained sand and fine to medium sized gravel, moist.									
				0.55										
				0.60										
				1.0			Silty CLAY (CI-CH) Very stiff, medium to high plasticity, light grey mottled red brown, trace of fine to coarse grained sand and fine to medium sized gravel, moist.							
							Extremely weathered Siltstone (XW) recovered as Silty CLAY (CL) Hard, low plasticity, light grey, moist (very low strength).							
				2.0			HAND AUGER BH 05 TERMINATED AT 0.60 m							
				3.0										
				4.0										
				5.0										
				6.0										
				7.0										
				8.0										
				9.0										
				10.0										

HAND AUGER BH 05 TERMINATED AT 0.60 m

Comments:

- Groundwater not encountered during augering.
- DCP refusal at 0.56m.

Weathering Grades
RS - Residual Soil
XW - Extremely weathered
HW - Highly weathered
OW - Distinctly weathered
MW - Moderately weathered
SW - Slightly weathered
FR - Fresh
Rock Strength
RS - Residual Soil
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

Samples
U50
SPT
Disturbed Sample
Bulk Sample

Approved: SC
Date: 22/09/2020



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HAND AUGER RECORD SHEET

Location Number: BH 06

Project Number: 1-22929

Project Name: New Learning Centre

Location: Stretton State College

Client: Turner & Townsend

Date: 04/09/2020

Page: 1 OF 1

Easting: 505697

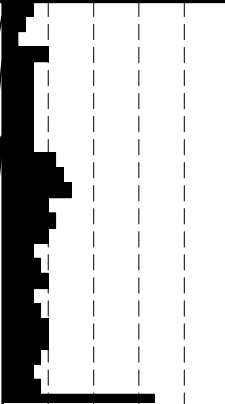
Northing: 6942835

RL:

Logger: RH

Operator: RH

Machine: Hand Auger

Drilling Method					Depth	Graphic	Description	DCP Test (blows/100mm)					Samples and Remarks
TC	WB	RR	NMLC	Casing				0	6	12	18	24	
					0.10		FILL Silty SAND (SM) Medium dense, fine to medium grained, dark brown, with organics, moist.						
					0.40		FILL Sandy CLAY (CI-CH) Very stiff, medium to high plasticity, mottled dark brown light grey, fine to coarse grained sand, trace of fine to medium sized gravel, moist.						
					0.90		FILL Sandy CLAY (CI-CH) Very stiff, medium to high plasticity, mottled dark brown light grey, fine to coarse grained sand, with fine to medium sized gravel, moist.						
					1.0		HAND AUGER BH 06 TERMINATED AT 0.90 m						
					2.0								
					3.0								
					4.0								
					5.0								
					6.0								
					7.0								
					8.0								
					9.0								
					10.0								

Comments:

- Groundwater not encountered during augering.
- DCP refusal at 2.65m.

Weathering Grades

RS - Residual Soil
XW - Extremely weathered
WW - Highly weathered
OW - Distinctly weathered
MW - Moderately weathered
SW - Slightly weathered
FR - Fresh

Rock Strength

RS - Residual Soil
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Samples

U50

SPT

Disturbed Sample

Bulk Sample

Sample

Approved: SC

Date: 22/09/2020

Water First Noted Water Steady Level



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HAND AUGER RECORD SHEET

Location Number: BH 07

Project Number: 1-22929

Project Name: New Learning Centre

Location: Stretton State College

Client: Turner & Townsend

Date: 04/09/2020

Page: 1 OF 1

Easting: 505691

Northing: 6942807

RL:

Logger: RH

Operator: RH

Machine: Hand Auger

Drilling Method					Depth	Graphic	Description	DCP Test (blows/100mm)						Samples and Remarks
TC	WB	RR	NMLC	Casing				0	6	12	18	24	30	
					0.10		FILL Sandy CLAY (CI-CH) Very stiff, medium to high plasticity, dark brown, fine to coarse grained sand, trace of fine to medium sized gravel, with organics, moist.							
					0.25									
					0.40									
					0.60		FILL Sandy CLAY (CI-CH) Very stiff, medium to high plasticity, dark brown, fine to coarse grained sand, trace of fine to medium sized gravel, moist.							
					1.0		FILL Silty SAND (SM) Medium dense, fine to coarse grained, dark grey, moist.							
							FILL Silty SAND (SM) Medium dense, fine to coarse grained, dark grey, with fine to medium sized gravel, moist.							
					2.0									
					3.0									
					4.0									
					5.0									
					6.0									
					7.0									
					8.0									
					9.0									
					10.0									

HAND AUGER BH 07 TERMINATED AT 0.60 m

Comments:

1. Groundwater not encountered during augering.
2. DCP refusal at 1.58m.

Weathering Grades

RS - Residual Soil
XW - Extremely weathered
WW - Highly weathered
OW - Distinctly weathered
MW - Moderately weathered
SW - Slightly weathered
FR - Fresh

Rock Strength

RS - Residual Soil
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

Samples

U50
SPT
Disturbed Sample
Bulk Sample

Approved: SC

Date: 22/09/2020



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HAND AUGER RECORD SHEET

Location Number: BH 08

Project Number: 1-22929

Project Name: New Learning Centre

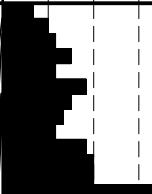
Location: Stretton State College

Client: Turner & Townsend

Date: 04/09/2020

Page: 1 OF 1

Easting: 505691 Northing: 6942807 RL:
 Logger: RH Operator: RH Machine: Hand Auger

Drilling Method					Depth	Graphic	Description	DCP Test (blows/100mm)						Samples and Remarks
TC	WB	RR	NMLC	Casing				0	6	12	18	24	30	
					0.10		FILL Silty SAND (SM) Medium dense, fine to coarse grained, dark brown, trace of fine to medium sized gravel, with organics, moist.							
				0.20	FILL Silty SAND (SM) Medium dense, fine to coarse grained, dark brown, trace of fine to medium sized gravel, moist.									
				0.60	FILL Sandy CLAY (CI-CH) Hard, medium to high plasticity, dark brown, fine to coarse grained sand, trace of fine to medium sized gravel, moist.									
					1.0									
					2.0									
					3.0									
					4.0									
					5.0									
					6.0									
					7.0									
					8.0									
					9.0									
					10.0									

Comments:

- Groundwater not encountered during augering.
- DCP refusal at 1.58m.

Weathering Grades
 RS - Residual Soil
 XX - Extremely weathered
 XW - Highly weathered
 OW - Distinctly weathered
 MW - Moderately weathered
 SW - Slightly weathered
 FR - Fresh

Rock Strength
 RS - Residual Soil
 VL - Very low
 L - Low
 M - Medium
 H - High
 VH - Very high
 EH - Extremely high

Samples
 U50
 SPT
 Disturbed Sample
 Bulk Sample

Approved: SC
 Date: 22/09/2020

Water First Noted Water Steady Level

APPENDIX C

LABORATORY TEST CERTIFICATES



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SHRINK SWELL INDEX REPORT

Client :	Turner & Townsend	Report No:	WHL20-0624-S1
Client Address :	C/O 2/19 Finchley Street, Milton, QLD, 4064	Report Date:	11/09/2020
Project Number :	1-22929	Issue Number:	1
Project :	New Learning Centre	Page 1 of 1	
Location :	Stretton State College		

SAMPLE DETAILS:

Sample ID:	S1				
Date Sampled:	4/09/2020				
Date Tested:	9/09/2020				
Soil Description:	Silty Clay (CH) Grey Brown Mottled				
Sampling Method:	As Supplied				
Sampled by:	SSE				
Sample Location:	BH 4				
Depth (m):	0.5				
Source:	Borehole				
Material:	Unknown				

TEST RESULTS:

Swell Test (AS1289.7.1.1)					
Swell on Saturation(%)	4.0				
Moisture Content Before(%)	19.7				
Moisture Content After(%)	24.5				
Shrink Test (AS1289.7.1.1)					
Shrink on Drying(%)	2.3				
Shrinkage Moisture Content(%)	20.2				
Est. Inert Material(%)	0				
Crumbing	None				
Cracking	Slight				
Results:					
Shrink Swell Index - Iss (%) :	2.4				
Unit Weight (t/m ³):	2.03				

Remarks :



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APPROVED SIGNATORY

Mark Rutten

Nata Accreditation Number: 15301

END of DOCUMENT

FORM NUMBER

REP-ISS-06

V2 13/1/20

APPENDIX D
SITE PLAN



Nearmap Jul 16 2020

SCALE

NOT TO SCALE

A4

DRAWING NO.
1-22929-01

DATE
04/09/2020

CHECKED
SC

TITLE

NEW LEARNING CENTRE

BOREHOLE LOCATION PLAN

CLIENT

TURNER & TOWNSEND

LOCATION

STRETTON STATE COLLEGE



SOIL SURVEYS

SOIL SURVEYS ENGINEERING PTY LIMITED
CONSULTING GEOTECHNICAL ENGINEERS

