Project No: 25049
29/07/2025

Legacy Property

Attention: Darren Flynn

RE: Old Northern Road and Derriwong Road, Dural – Preliminary Geotechnical Assessment – Desktop Study and Site Inspection

Executive Summary

For rezoning and development considerations, there are no significant geotechnical contra-indicators for this site for the proposed residential zoning and usage.

The ground profile is gently sloping (assisting drainage) and the subsurface is expected to be topsoil over residual weathered rock materials (reworked in places). Typically, this would represent favourable or neutral ground conditions of relatively stiff soils (moisture contents close to optimum) over bedrock. These typical / expected conditions are unlikely to represent a significant geotechnical constraint for a low-rise residential development of this type.

Relatively high rock levels are indicated in the area (0.2 m to 4.3 m BGL). This, in conjunction with the gently sloping terrain, provides confidence that land stability, footings, and retaining structure development will be routine endeavours through the design, construction, and operation phases. There is no existing evidence of slope instability, and none would be expected due to the development, providing routine design protocols are adopted.

The farm dam removal is expected to be a straightforward process involving a controlled discharge of impounded water and incorporation of the locally derived dam materials back into the works. Removal of the dam will assist in overall risk reduction for the area (future dam breach risk), noting the existing structure is unlikely to have been constructed to modern standards.

This executive summary should not be used in isolation from the main body text of this report.

1. Background and Scope

Vinculum Advisory have been commissioned by Legacy Property to undertake a preliminary desktop study and site inspection to evaluate the likely geotechnical conditions at a high level on the site. This study is required to check for any potential geotechnical constraints or opportunities pertaining to the development proposals to inform the development application process accordingly. The desktop study and site inspection were undertaken by a chartered geotechnical engineer with over thirty years of experience (refer Appendix A for CV).

The site comprises gently undulating pastoral land with existing rural residential development along the Old Northern Road, which forms the eastern boundary.

Surface features on the site of geotechnical note include a farm dam to the west (refer **Figure 1**) and a modest (2-3 m high) boulder retaining wall within the property of 614 Old Northern Road (refer **Figure 7**).

Figure 1 – Typical view of gently sloping landforms and the farm dam

The proposed development footprint and lot structure are shown in **Figure 2** below and comprises a low-rise residential development.

Figure 2 – Site overview and proposed development Lot structure

2. References

The following reports and drawings have been reviewed as part of the desk top study.

1. JBS&G report titled 'Detailed Site Investigation – *21 and 27 Derriwong Road and 614,618 and 626 Old Northern Road, Dural NSW dated 5th Sept 2022.*
2. Refer to Design and Planning Urban Design Pack dated March 2025
3. URBIS document titled 'Planning Proposal Request – Derriwong Road, Dural, prepared for Legacy Property and dated 29th February 2024

3. Desktop Study

The primary source of information for the desktop study is the existing 'Detailed Site Investigation' (DSI) report (Ref 1). While noting the primary purpose of the DSI report is for environmental assessment purposes, the report contains substantive indicative geotechnical data which has been reviewed as part of this report. A plan showing the location of exploratory holes is shown in **Figure 3** below.

Figure 3 – Environmental exploratory locations – Extract JBS&G Report

The indicative geotechnical data within the JBS&G report suggest the site and environs are characterised by a relatively shallow (0.2m to 4.3 m depth below ground) rock profile with predominantly clay soils above. The farm dam structure is reported to be constructed from these locally available re-worked very low permeability (clay) materials. Published geological maps for the area indicate the site is predominantly located with the Ashfield Shale formation with some western areas of the site within Hawkesbury Sandstone as indicated in **Figure 4** below.

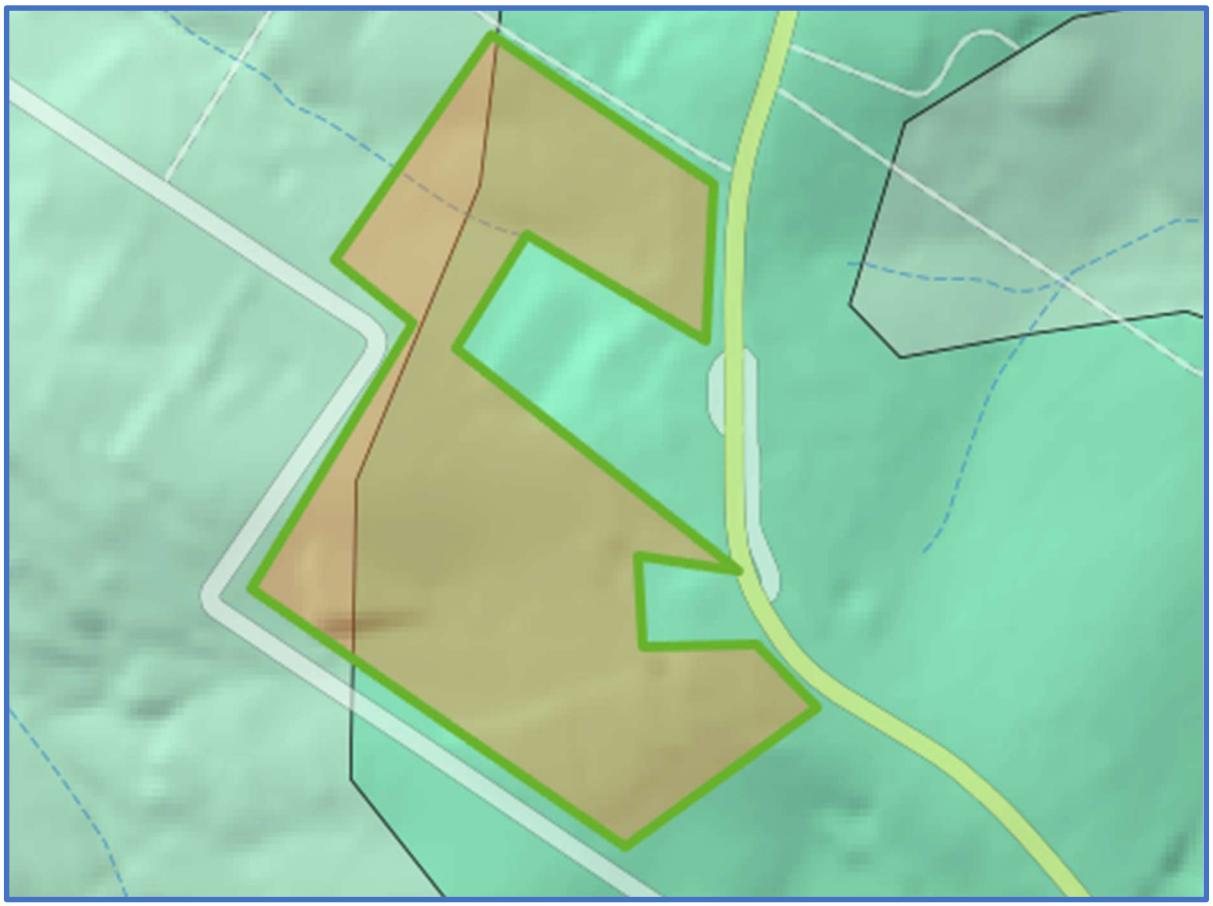
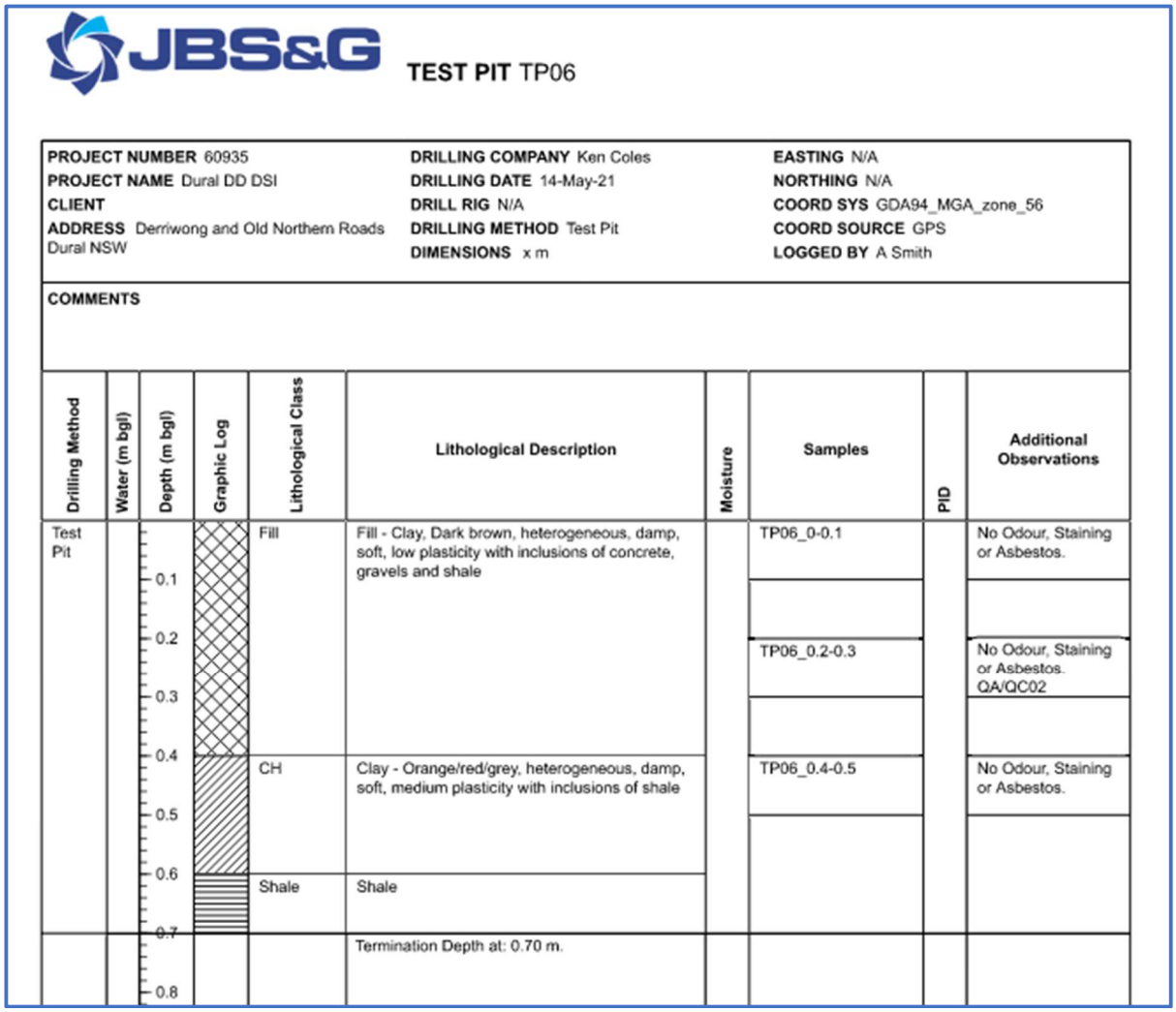


Figure 4 – Published geological data showing Ashfield Shale (dark green) and Hawkesbury Sandstone (light green) within the site boundary

An extract showing a typical log where shale bedrock was encountered on the site is shown in **Figure 5** below.



TEST PIT TP06

PROJECT NUMBER 60935	**DRILLING COMPANY** Ken Coles	**EASTING** N/A
PROJECT NAME Dural DD DSI	**DRILLING DATE** 14-May-21	**NORTHING** N/A
CLIENT	**DRILL RIG** N/A	**COORD SYS** GDA94_MGA_zone_56
ADDRESS Derriwong and Old Northern Roads Dural NSW	**DRILLING METHOD** Test Pit	**COORD SOURCE** GPS
	DIMENSIONS x m	**LOGGED BY** A Smith

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
Test Pit		0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8		Fill	Fill - Clay, Dark brown, heterogeneous, damp, soft, low plasticity with inclusions of concrete, gravels and shale		TP06_0-0.1		No Odour, Staining or Asbestos.
							TP06_0.2-0.3		No Odour, Staining or Asbestos. QA/QC02
				CH	Clay - Orange/red/grey, heterogeneous, damp, soft, medium plasticity with inclusions of shale		TP06_0.4-0.5		No Odour, Staining or Asbestos.
				Shale	Shale				
					Termination Depth at: 0.70 m.				

Figure 5 – Example test pit log where bedrock is exposed

The JBS&G report also contains a review of historical photographs. It is notable that the farm dam to the west was constructed between 1961 and 1965 i.e. approx. 60 years ago. Test pits and hand augers within the dam indicate the dam is an earthwork's structure constructed from native re-worked clay materials of similar description as reported elsewhere in the general area.

4. Site Inspection

A site walkover was conducted on the 27th February 2025 to observe the general terrain in the area, and any salient features which may influence geotechnical outcomes for the proposed development scheme. A selection of record photographs are provided below.

Figure 6 – General view of gently sloping terrain

***Figure 7* – Exiting landform terracing supported by a 2 m high boulder wall at No. 614 Old Northern Rd**

***Figure 8* – Existing farm dam in western area of the site**

From observations during the inspection, the site displays no visual surface expressions of potential geotechnical issues e.g., instability, soft ground, waterlogged areas, exposed hard rock, and the like. The landform is rural pastoral, gently undulating and falling in level from east to west. Typical grades are reported as 6-8% (JBS&G report) or around 1v:15h on average.

Only two surface features of geotechnical significance were noted during the site inspection:

1. The existing farm dam in the western portion of the site, and,
2. An existing approx. 2 m high boulder wall used to terrace the landform within No.614 Old Northern Road, in a similar way that will be required to create future lots.

These aspects are discussed further in Section 6.

5. Development Proposal

The site is proposed to be redeveloped into residential lots separated by roadways as broadly indicated in **Figure 9** below.

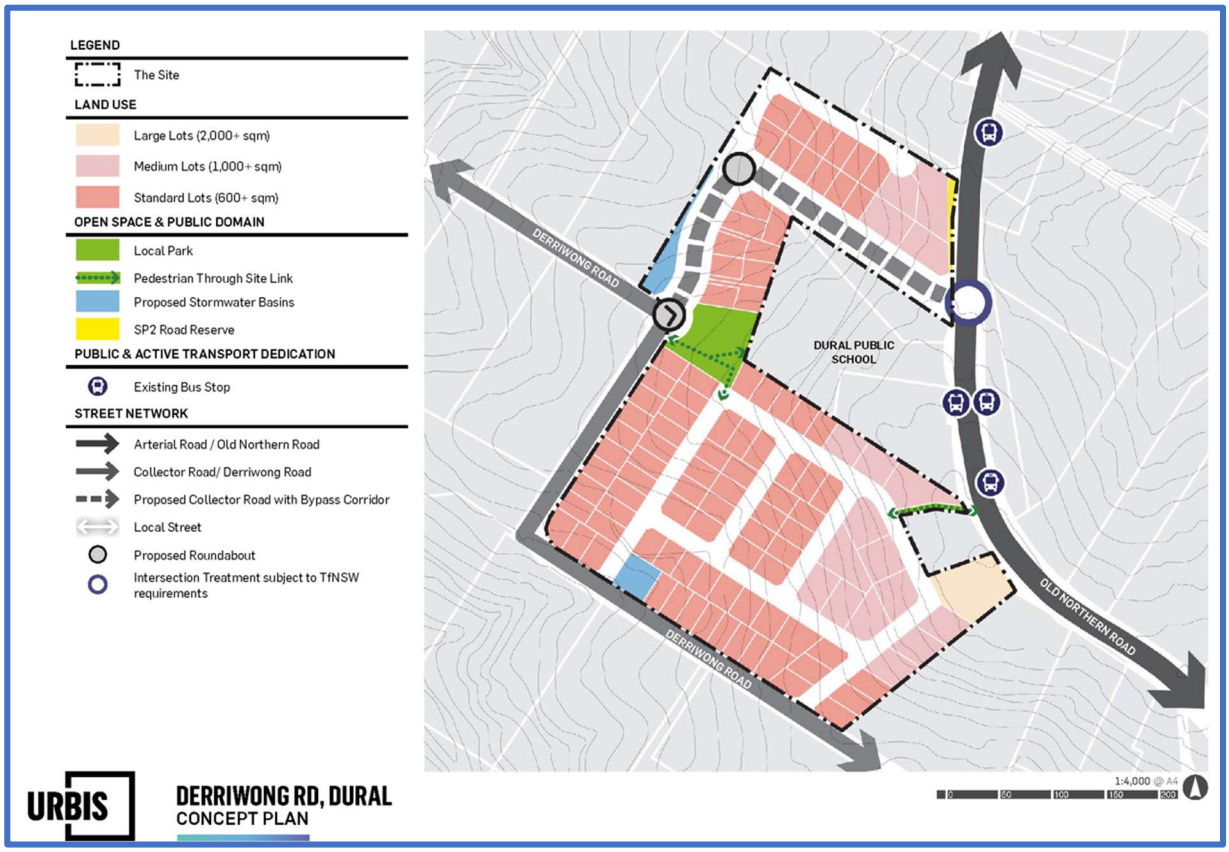


***Figure 9* – Overview – Site development into lots (Extracted from Urban Design Analysis)**

Due to the gently sloping terrain (1v:15h typically), a combination of low height retaining walls and slopes will be employed to form development plots in sympathy with existing landforms. These earthworks will include the controlled discharge and removal of the existing farm dam on the western portion of the site. The site grading plan is shown in **Figure 9** below.

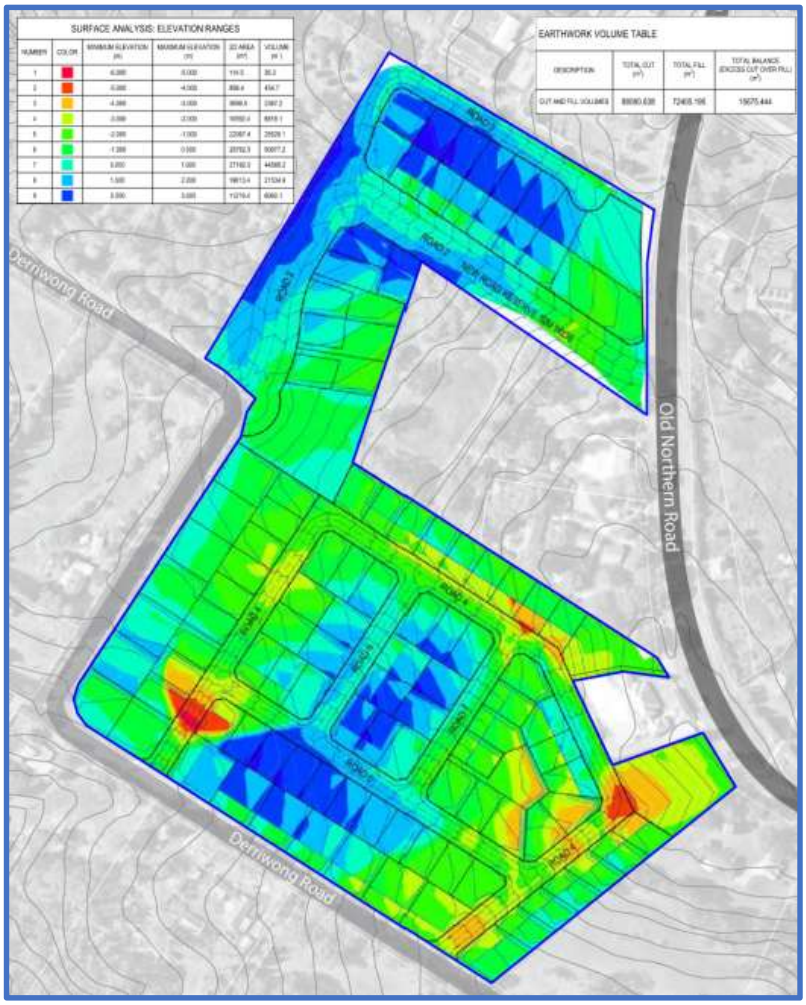


Figure 10 – Cut fill plan extract (Blue = fill, Greens = minor cut or at grade, yellow / orange / red = cut >2m) **(Extracted from Urban Design Analysis)**

6. Geotechnical Conditions

The ground profile is gently sloping (assisting drainage) and the subsurface is expected to be topsoil over residual weathered rock materials (reworked in places). Typically, this would represent favourable or neutral ground conditions of relatively stiff soils with moisture contents close to optimum over bedrock. These typical expected conditions are unlikely to represent a geotechnical constraint for a low-rise development of this type.

Relatively high rock levels are indicated in the area (0.2 m to 4.3 m BGL). This, in conjunction with the gently sloping terrain, provides confidence land stability, footings, and retaining structure development will be routine endeavours through the design, construction, and operation stages.

Similarly, where low height slopes are proposed within the development, available materials (cut or fill, excluding topsoil) are likely to be suitable to form permanent batters no steeper than 1v2h if suitably designed, planted, and drained. 1v:3h batters or shallower are generally considered preferable for maintenance reasons (grass cutting etc), although either can be utilised with due consideration for drainage, planting, and maintenance regimes. It is possible rock may near surface in some areas allowing steeper batters to be formed. However, this would require further location specific investigation ground investigation to confirm.

The farm dam removal is expected to be a relatively straightforward process of undertaking a controlled discharge of impounded water and incorporation of the locally derived dam materials back into the works (subject to contamination testing protocols). Removal of the early 1960s dam structure, will assist in overall risk reduction for the area (future dam breach risk), noting the existing structure is unlikely to have been constructed to modern standards.

Building footings will be designed based on the outcome of general site classification testing for the site and their location within the cut / fill profile of the site. Given the relatively shallow rock profile available for footings, no particular constraints are anticipated for footing design at this stage.

6.1 GI required for detailed design

Commensurate with the type of development proposed, a relatively shallow depth broad coverage geotechnical test pit and DCP probe type investigation (or similar) is required to establish materials, rock levels and for site classification purposes. Material re-use strategies for a sustainable balanced cut to fill earthworks program will be a significant consideration for this site. Therefore, sufficient earthworks sampling and testing should be allowed for within future geotechnical investigations to establish available materials, their re-use and their compaction properties for pavement and earthwork specification development purposes.

7. Summary Conclusions

Geotechnical investigation will be required to inform detailed design for the site to fully establish rock levels, available materials, founding conditions and for routine site classification requirements. However, for development application considerations, there are no significant geotechnical contra-indicators suggested for this development site for the proposed usage. Based on existing information, geotechnical conditions are considered to be broadly favourable for a development of this type, subject to the required future investigation, assessment, and design process as described above.

8. Limitations

Vinculum Advisory have performed preliminary assessment and consulting services for this project in general accordance with current professional and industry standards for an initial site appraisal.

Vinculum Advisory, or any other reputable consultant, cannot provide unqualified warranties nor does it assume any liability for the site conditions not observed or accessible during the investigations. Site conditions may also change subsequent to the assessment due to ongoing use.

This report and associated documentation were undertaken for the specific purpose described in the report and shall not be relied on for other purposes. This report was prepared solely for the use by Legacy Property and any reliance assumed by other parties on this report shall be at such parties own risk.

Yours faithfully,

Simon Mortimer
Technical Executive – Geotechnical Engineering
CPEng 2308017
BEng (Hons),CPEng, MIEAust, NER, IntPE(AUS)
E: s.mortimer@vinculumadvisory.com
M: 0434 199 047
W: https://vinculumadvisory.com/

APPENDIX A CV – Simon Mortimer

Simon Mortimer BEng (Hons) MIEAust CPEng NER IntPE(AUS)

Technical Executive – Geotechnical Engineering

Overview

Simon is chartered civil engineer and geotechnical specialist with over thirty years of international and local experience with excellent technical, written, verbal, and interpersonal communication skills, resulting in project leadership, verification, expert witness, and advisory roles.

Simon is a Technical Executive with Vinculum Advisory providing the highest-level support and verification requirements on a wide range of geotechnical matters. Areas of practice include Special Engineering Assessments for major developments, expert witness services, and providing pragmatic civil geotechnical engineering solutions to assist clients of all sizes with challenging geotechnical problems. Simon has been involved in multiple high-profile infrastructure projects over the years from surface earthworks aspects to deep basements (Sydney Metro, Westconnex, Delhi Metro), as well as numerous small and medium size projects from a diverse client base that cover most aspects of geotechnical engineering.

Signature roles in recent times include being an appointed subject matter expert for the NSW Treasury for the multi-billion-dollar sale of strategic transport assets, providing geotechnical reviews of Specialist Engineering Assessments, and advising both DfAT and the Asia Development Bank on strategic geotechnical aspects of challenging international development projects. Simon has also provided critical technical direction on multiple disaster recovery projects including for Lismore City Council, Sydney Trains and TfNSW, single selected by clients following a series of natural disasters from extreme rainfall in 2022.

In recognition of Simon's in-depth technical expertise and communication skills, Simon is regularly invited to provide expert witness services in court proceedings on a variety of geotechnical related matters ranging from severe property damage claims in the NSW Supreme Court to local development application disputes involving geotechnical elements.

A selection of projects spanning a thirty-year international career are provided below.

Career Highlights

- Working in Hong Kong in the late 1990s, being exposed to extreme geotechnical engineering challenges at an early stage in my career.
- Involved with the first Stage of the Delhi Metro project in 2002, pioneering the transformation of transport infrastructure in the city.
- Being trusted to provide on-site emergency works advice to restore critical infrastructure following natural disasters in the UK and Australia.
- Advising overseas development funding agencies towards pragmatic solutions which balance international standards with established local practice.
- Introducing innovative techniques to TfNSW for slope stabilisation.
- Advising NSW Treasury and funding interests at the highest levels for a multi-billion-dollar asset sale.

Core Skills

- Geotechnical Engineering
- Team Leadership
- Strategic advice
- Risk management
- Due diligence and verification
- Technical communication with stakeholders
- Innovation through leveraging diverse experience across sectors.
- Expert witness services

Key Projects

Expert Witness- Property Damage – Supreme Court of NSW – Wotton + Kearney and Webb and Bowland Lawyers

Expert witness appointed for Supreme Court matters for two cases:

- Causes of damage to a residential development as a result of excavation for development in adjacent land. Complex case involving multiple parties and split responsibilities for several geotechnical aspects contributing to the severe damage. Provided expert reports, site visits and attendance at Court instructed conclaves leading to Court appearance and a Court determined settlement.
- Cause of damage reports and opinions relating to extensive damage to Moree Aquatic Centre as a result of not taking sufficient account of the highly reactive soils in the design and construction of the facility. Subsequent ground movements caused pool deformations, cracking, water circulation and maintenance problems. Matter eventually settled out of court once proceedings began.

Expert Witness (various – Australia) – Northern Beaches Council, Pittwater Council, Rockdale City Council, Addisons lawyers, Crown Solicitor's Office (NSW).

Provided geotechnical support in an expert capacity to legal advice organisations and legal departments of local councils and the Crown Solicitors Office on numerous matters in the Sydney region relating to property disputes involving a failure to provide support to adjacent land and claimed damage due to Sydney Metro works. Typically involved the assessment of a developer's or individual's actions in forming excavations adjacent to land owned by others which resulted in damage to the adjacent landowner's property and / or unacceptable safety risks. Duties include the preparation of technical reports for legal purposes, ad-hoc technical advice to inform the legal process and attendance at mediation meetings and conclaves to act on behalf of property owners and local councils. The projects involved the independent assessment of contiguous pile walls, sheet pile wall retaining systems and open excavation design which had allegedly resulted in damage to adjacent property or resulted in potentially unsafe conditions resulting in stop work orders. Also provided support on numerous occasions and familiar with the process surrounding Development Application disputes in the Land and Environment Court (s34 conferences and hearings), assisting the Court in geotechnical matters.

Expert Witness (various – UK) – Holman Fenwick Willan (London), Cunningham and Lindsay (Liverpool), Terceris Liability Services (Teeside)

Appointed to provide expert evidence reports and act as the expert witness for a range of legal disputes involving geotechnical engineering including: – Appointed expert witness for a substantial claim for material loss plus loss of refinery production capacity over a period of time in the Middle East involving the failure of a raft foundation for an oil storage tank due to underlying geotechnical conditions. – Produced an expert evidence report for flooded chemical works. Commissioned as an expert to advise on the role of ground and ground water conditions in contributing to the fracture of a water main with subsequent major damage caused to a chemical works in Teesside. – Providing expert advice with respect to the design aspects of a contiguous piled wall constructed by a design and build contractor with subsequent tolerance and leakage issues. The project involved independent assessment and checks of the retaining wall design and advice on potential remedial measures.

Sydney Water Design Review Services – Sydney Water

Engaged by Sydney Water as part of a broader review team to undertake geotechnical review of third-party assessments and design packages including Building Over Asset (BOA) assessments and Special Engineering Assessments (SEA). Obtained a high level of familiarity with Sydney Water's asset protection approach and assisted in developing ways forward for complex developments with seemingly intractable interaction with Sydney Water assets.

Disaster Recovery Projects, Sydney, Northern, Western and Central Coast Regions of NSW – TfNSW, Sydney Trains, Lismore City Council, Northern Beaches Council

Involved in several regions for multiple clients in NSW, responding to landslide events impacting communities and infrastructure. A leading role encompassing the full range of landslide related assessment and recovery operations including:

- Initial site visits and expert advice on emergency works.
- Risk mitigation advice for damaged slopes; minimum standoffs, temp catch structures and drainage measures, lane closure advice and the like to keep infrastructure running in some capacity.
- Permanent works slope reinstatement and stabilisation design for road, rail, local council, and water infrastructure clients. Often requires innovative solutions on highly constrained sites.

Sydney Metro West – Gamuda Laing O Rourke

Part time role providing checker and verifier inputs for geotechnical packages including predicted effects, monitoring, retaining structures, earthworks, and footings related packages for this major infrastructure project requiring challenging interfaces with existing infrastructure and buildings.

Overseas Development Project Geotechnical Reviews – Asia Development Bank

Providing geotechnical review and strategic level advice on a variety of ADB funded road infrastructure projects in PNG. Leveraging from extensive experience working in PNG over many years to guide stakeholders towards realistic risk managed solutions in often challenging terrain with extreme rainfall, seismic conditions, and limited access to construction materials. The best solutions often make use of simple techniques and local materials and labour with a high degree of self-reliance to build and maintain at the local level.

Transnational Highway (Papua New Guinea) - Department of Trade and Foreign Affairs (DfAT)

Undertaking initial assessment and providing advice to the broader design team and complimentary disciplines for the planning and investigation stages of a proposed major infrastructure investment in PNG to facilitate transformative economic development. The scheme is to broadly adopt Australian (Austroads) standards through variable and challenging landslip, debris flow and liquefaction prone terrain with very high rainfall, presenting unique challenges to economic development. The scheme (currently on hold) involves 200 km of road infrastructure with associated earthworks, rock cuttings bridges, pavements, slope stabilisation and geotechnical risk management strategies.

Vendor Due Diligence – NSW Government sale of Westconnex Assets – NSW Treasury

Appointed as the leading geotechnical advisor, part of the technical team advising the NSW Treasury on the sale of Westconnex assets to private concerns. Involved review of documentation, identification of and reporting on geotechnical related commercial risks as part of vendor due diligence under a full technical disclosure policy. Activities included answering bidder questions, attending high-level bidder interactive sessions with bidder funding organisations and technical experts; advising Treasury on geotechnical implications and strategy related to predicted effects from tunnelling on third party property, considering long-term operational and maintenance geotechnical risks that potentially influence asset purchase price and conditions of sale negotiations.

Central Station Precinct Renewal – TfNSW Properties

Project Director and principal advisor to TfNSW on geotechnical matters relating to the options for future development of the Central Station Precinct. Advice included a review of all existing information and advising on potential geotechnical constraints and opportunities to inform the master planning process. The task required utilising considerable experience of the rail geotechnical environment and skill developed over many years in appreciating the complimentary requirements of associated disciplines (structural, architectural, heritage and environmental) to minimise the impact of geotechnical constraints on precinct development opportunities.

Hornsby Quarry Rehabilitation to Parkland – Hornsby Shire Council

Geotechnical lead initially providing strategic advice to Hornsby Shire Council in developing safe and pragmatic options to rehabilitate the former Hornsby Quarry into a community parkland. Engaged beyond initial project master planning to develop the detailed design for a construct only contract that acknowledged significant adjustments would be required through construction using an observational approach to many geotechnical aspects. Project involves extensive earthworks, retaining walls, rock support, slope stability assessments, roads and the design of innovative risk managed solutions in harmony with the environment, to make the most of the quarry landform as a unique public recreational space.

Sydney Metro North-West Project – Package 3 – Independent Certifier – TfNSW

Appointed as the geotechnical independent certifier for Sydney Metro North-West Package 3 project. Providing the highest (contract level) technical compliance review of all the contractor and train operator consortium's civil and structural engineering submissions for the Package 3 component of the project ($3.7 billion contract value). Geotechnical components include deep excavations for stations close to existing infrastructure and privately owned assets, low cover tunnels under major roads and large-scale earthworks operations for the stabling and maintenance facilities. The role involved the identification of contract non-compliances to ensure the geotechnical components of the works were constructed in accordance with the contract requirements, and to provide an independent and binding opinion on matters of geotechnical dispute between the consortium and client organisations.

Sydney Metro Sydenham Station Junction – John Holland

Providing the initial high-level guidance to help secure the project based on pragmatic consideration of geotechnical approaches, opportunities, and risk, then keeping a watching brief throughout the project as verifier to keep outcomes on-track and be available with ad-hoc troubleshooting throughout the project design and delivery stages, using a wealth of civil geotechnical, constructability contract and related experience to achieve balanced outcomes. This major infrastructure hub is vital to provide connectivity between the new metro and existing heavy rail and freight lines. The site is heavily constrained with operational railways, roads, and major services all converging on the Sydenham Junction area while simultaneously requiring to maintain heritage aspects. Delivery of the project requires a considerable skill level and understanding of the rail and metro operational environment in developing ground engineering solutions to dovetail in with often conflicting requirements and constraints as part of a large and diverse delivery team.

Leura Embankment Emergency Works – Sydney Trains

Called upon by Sydney Trains to provide on-site expert advice and liaison to enable the rapid re construction of a catastrophically failed rail embankment causing the complete closure of the Blue Mountain Line in early February 2020 following a period of exceptionally heavy rainfall. The role involved an initial assessment of the failure, liaison with Sydney Trains major works team mobilised to site. Provided direct advice on plant and materials required and developing designs as the situation developed. Utilised a deep understanding of geotechnical and rail infrastructure related requirements along with strong communications skills, it was possible to expedite the design and construction process to allow trains to use the line again within three weeks of the failure occurring, thus minimising disruption to strategic freight and passenger services.

PNG Western Provinces Stanley, Elevala, and Ketu - Gas Field Infrastructure Development – Talisman Energy (now Repsol)

Lead geotechnical engineer responsible for delivering the geotechnical design aspects for two major gas and condensate schemes in a remote part of PNG. The project required developing commercially significant seismic and geotechnical design criteria from scratch in an area with almost no historic data or development of this kind.

Advocated a hands-on approach mobilising senior people to site to undertake all the initial up-front liaison and fieldwork investigations in remote PNG. The scheme involved:

- Geotechnical and geomorphological input to pipeline, access road and facility selection.
- Extensive earthworks in tropical soils in an extreme rainfall environment.
- Extensive new roads and wharf facilities to both facilitate access for construction / operation and for long-term regional development.
- Design of condensate and gas plant process chain and storage tank sub-structure in a high seismic area with limited options for plant and materials to be mobilised to site.
- Early engagement with construction teams and locals to understand how practical constraints need to be considered in design.

Infrastructure Asset Protection and Remedial Works Design – Transurban

Geotechnical advisor for Transurban providing advice on asset maintenance to TfNSW standards including trouble shooting maintenance issues on pavements, embankments, and retaining walls. Also providing advice on the impact of development work adjacent to road infrastructure assets and condition assessment for geotechnical assets. Involved assessing developers' proposals in the context of planning conditions and Transurban's approval rights on developer activities. Providing high-level advice to Transurban on strategies to adopt when dealing with deteriorating asset conditions related to geotechnical factors.

Wynyard Walk Tunnel and Wynyard Station Upgrade – TfNSW

Appointed by TfNSW as a subject matter expert advising TfNSW on geotechnical engineering matters relating to a complex shallow urban tunnel with related basement excavation and underpinning works underneath existing historic infrastructure and adjacent high-rise buildings in the CBD. The role involved detailed technical review and direct technical liaison between TfNSW, the contractor, the contractor's designer, and external stakeholders (property and utility owners) to resolve issues surrounding some potential high risk and highly constrained tunnelling, excavation, and underpinning works.

Cyclotron Particle Accelerator Expansion Works – Rutherford Appleton Research Laboratories (UK).

Responsible for overseeing the geotechnical requirements for an advanced research facility (cyclotron particle accelerator) at the Rutherford Appleton Research laboratories in Oxford UK. Involved addressing a variety of geotechnical and load conditions including extreme transient slab loadings from mobile lead shielding (stacked lead bricks) moved between target areas, and tight vibration transmission considerations to isolate sensitive equipment from gantry crane movements transmitted through columns into the footings and slab. Designed, commissioned, and reported on the results of a bespoke large diameter plate load test on the chalk formation to investigate the soft rock's load response curve (initial high stiffness response, asperity crushing on joints followed by a gradual increased stiffness response with load).

Cryogenic Gas Storage Facilities – Substructure Design – Whessoe Oil and Gas (UK)

Responsible for a framework agreement serving the geotechnical design requirements on major coastal gas storage and petroleum refinery installations for a specialised oil and gas industry supplier. Providing specialist advice for piling and piled raft systems, shallow foundations, and dynamically loaded foundations for 100k ton gas storage tanks, cryogenic sphere structures, and associated supporting infrastructure (pipe racks, compressor bases, spill containment bunds, bulk handling docking structures – and the like). Projects were often located in coastal areas with poor ground conditions in highly seismic zones with requirements to consider extreme loading conditions and associated limited failure state 'cracked' analysis for blast and seismic load cases including liquefaction. Worked closely with the Whessoe team building up a rapport and trust over time in assisting them to resolve often extreme engineering challenges (poor ground supporting very high-risk structures).

Water Infrastructure Framework – United Utilities (UK).

Involved across multiple water infrastructure sites in the northwest of the UK providing geotechnical inputs for design and construction. Water infrastructure sites are often located in low points on poor quality land and require careful consideration of soft ground and high-water table impacts on construction and operation. This is often challenging when considering upgrades to existing sites rather than new builds. Upgrading existing sites on poor ground can cause complex geotechnical interaction that require careful design and management.

Sheffield Storm Damage Recovery – Sheffield City Council

Developed the winning tender design for the remediation of a collapsed section of major highway and strategic services corridor serving the center of Sheffield following severe floods in June 2007. The design involved a composite bored pile toe wall adjacent to a river with a reinforced earth embankment above to support the highway and major services corridor. This project won the regional ICE award for excellence in 2010.

Sellafield Nuclear Reprocessing Plant – British Nuclear Fuels

Provided the design for a soil nail reinforced slope within a nuclear waste retrieval unit. Due to soil nails not being used before on the site and the extreme environment, the client required an exceptionally detailed assessment of the approach from first principles through to the minutia of the installation techniques, equipment used and multi layered contingencies and protocols during construction to prevent any interaction with the dilapidated nuclear waste storage tanks deemed vulnerable to a degrading slope above

Stage One Delhi Metro Project – Kumagai, Skanska, HCC, Itocho Group JV.

Provided local direction and supervision setting up a geotechnical monitoring system for a 4.5 Km section of cut and cover tunnel and two diaphragm wall supported station structures through contrasting ground conditions (Delhi Silt and hard volcanics). Engaged with and coordinated the inputs of local service providers, the Delhi Metro Delivery Authority, and local residents to manage the impact of construction work on adjacent, often highly dilapidated structures. Liaised and set up geotechnical investigations including full scale pump tests and provided inputs to optimise retaining wall designs during early-stage construction works on Delhi's first metro system.

Jamaica Highways - Bouygues Travaux Publics

Part of a geotechnical team undertaking detailed design for road embankments and cuttings as part of the Jamaica Highways Package 1 and 2 schemes. Design was in coastal areas with a thick desiccated crust over soft soils combined with significant seismic and transient weather-related effects to consider. Avoiding punching through the thick duricrust had significant scheme benefits prompting setting up trial areas and adjusting road vertical alignments to minimise geotechnical treatment works.

Holme Tunnel Deformation Management – Network Rail (UK)

Overseeing the geotechnical aspects of an extensive investigation into ongoing deformation of a rail tunnel constructed in the 1800s through an active ancient landslip system. Project involved ground investigation and monitoring regimes informing pragmatic cost v risk advice to the rail operator with respect to suitable tunnel management strategies to maximise the tunnel's residual design life, thus avoiding a hugely expensive re-build option.

Waverly Advance Manufacturing Park – Yorkshire Forward (UK development agency).

Provided a comprehensive geotechnical assessment of a proposed manufacturing park to reassure potential investors of the site's viability. Successfully overturned the concerns of Rolls Royce's consultants on geotechnical matters to release the development potential of the site for much needed local investment.

Kings Cross St Pancreas Asset Protection – Network Rail (UK)

Appointed as one of Network Rail's approved 'Authorised Persons' to represent the asset owner for geotechnical matters relating to the re development of the Kings Cross and St Pancreas Station areas of London. As well as redevelopment of the station structures themselves, the scheme prompted widespread urban regeneration in the area often over or close to Network Rail critical assets. The role included engagement with private developers, architects, and asset owners to develop agreed design solutions and monitoring regimes to protect Network Rail's strategic assets.

Hong Kong Landslip Preventative Measures Program – Government of Hong Kong Geotechnical Engineering office

Responsible for the day to day technical and contractual management running a three-year project to identify, design and manage the remedial works on potentially unstable slopes adjacent to major highways in the territory. Coordinating and directing a team of up to thirty construction professionals and chairing construction and design progress meetings. Typical solutions involved soil nails, gabion walls, rock bolts, dentition works and drainage upgrades.

Central Reclamation Hong Kong / Tai Po WWTW

Employed by Bachy Soletanche as a site engineer and co-ordinator on major infrastructure works. Projects included diaphragm walls through vibro-floatation improved reclamations and challenging construction of a wastewater treatment works on a highly constrained site in the New Territories, requiring a large T-Barrete retaining wall to be constructed through colluvium above extremely hard volcanic rock.

Mount Isa Mines – Glencore

Provided ad-hoc geotechnical support to Glencore from Townsville, flying in and out to arrange investigations and supervise construction. Inputs ranged from conducting full scale ripping trials with a D10 on a hill side as a potential material source to form a tailings dam wall, to routine investigations, advice, and supervision for the construction of machine bases.

Lavarack Barracks Upgrade Works – ADF

Provided the design and geotechnical site supervision for an extensive upgrade to the Lavarack Barracks military facility. The site is located on variable ground and a flexible observational approach to footing design was implemented to avoid 'one size fits all' conservatism. This required calling off a number of pre-prepared designs for construction as site conditions were revealed.

Career history

2024 - present	Vinculum Advisory – Technical Executive – Geotechnical Engineering
2012 -2024	GHD - Technical Director / Service Group Manager / Principal Engineer positions held
2010 - 2011	Simon Mortimer Consulting - Proprietor
2003 - 2010	WYG Group - Technical Director / Associate and regional board member.
2002 – 2003	Pell Frischmann Ltd, Senior Geotechnical Engineer
2000 – 2002	Maunsell McIntyre Pty Ltd, Senior Geotechnical Engineer
1997 – 2000	Babtie BMT Harris & Sutherland (Hong Kong) Ltd, Geotechnical Engineer / Project Manager
1996 - 1997	Bachy Soletanche (Hong Kong), Geotechnical Engineer
1994 - 1996	Greg Wong and Associates (Hong Kong), Geotechnical Engineer
1990 - 1994	Norwest Holst Soil Engineering, (Laboratory and Field Technician, pre-grad and post-grad role) + various short term contract roles.