



First Grade Separations

Removing Melbourne's level crossings

The Victorian Government has committed to remove 50 of the most dangerous and congested level crossings across Melbourne. DP has contributed practical solutions to complex geotechnical challenges for the first phase of crossings, the most challenging being McKinnon Road in McKinnon.

The North-McKinnon-Centre (NMC) package involved replacing approximately 2.5 km of at grade track with three rail cuttings up to 8 m deep at each of the bridges which replaced the level crossings. The cuttings are retained by piled retaining walls and during the main construction occupation approximately 250,000 cubic metres of soil was removed. DP was the geotechnical consultant to the project alliance through a subcontract with KBR. The alliance included representatives of the State Government together with John Holland and KBR.

Design and construction of the NMC package presented significant challenges due to the location in residential suburbs and tight rail corridor and rail occupation timeframe. As a result, careful design and innovative construction techniques were necessary to limit impacts on the community. DP addressed a range of geotechnical challenges which generally fell into one of three areas; earthworks,

structures and groundwater.

The primary earthworks challenge for the project was moving the 250,000 cubic metres of soil in a 10 day window, however, from a geotechnical viewpoint, obtaining a stable subgrade on which to operate the necessary construction plant in a short time frame, with constrained site access and limited scope to import materials, was the key. Whilst closely watching the performance of the dewatering system, DP worked with the contractor to develop a range of contingency plans to cope with any difficulties.

The structures comprised three bridges, stations, base slabs and around 4 km of piled retaining wall. The piles included driven steel sheet piles and Continuous Flight Auger (CFA) piles. Geotechnical challenges that DP addressed included assessing the temporary and permanent stability of the walls, particularly as the lead time for the sheet-piles required locking in the design at a very early stage. Pile driving involved

the use of some innovative techniques to minimize vibrations. DP were also deeply involved with assessing the structural base slab with screw pile system that was adopted for two of the three cuttings that extend below the groundwater table to resist the long term hydrostatic uplift pressure and cyclic loading from trains.

Construction dewatering was also a major issue with two of the three cuttings extending below the water in a silty sand aquifer and the possibility of significantly impacting on the wall stability and construction earthworks. Silty sands are difficult to dewater at the best of times and the space and time constraints added difficulty. DP played a major role in developing and analysing an innovative horizontal directional drilling system that was adopted for well installation.

A combination of experience, technical innovation and practical solutions allowed this complex and challenging project to be completed successfully within a very tight time frame.

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Mick Stadter
SENIOR HYDROGEOLOGIST



Chris Crowe
SENIOR ASSOCIATE /
GEOTECHNICAL ENGINEER



Geo-Environmental Expertise Gives Heritage a New Lease of Life



All that is old is new again

All that is old is new again as Lendlease develop the former Morpeth Conference Centre into retirement living comprising both separate dwellings and aged care facilities. DP's involvement over a 12 year span has enabled us to provide a broad array of services and consulting to the project.

The small town of Morpeth was one of the first developed in NSW. For a long time, the town held an important position owing to its unique location along the Hunter River and proximity to valuable forests of timber. These days Morpeth is firmly on the tourist trail for its rich heritage value. The Lendlease, Closebourne Estate site is a major part of this heritage with a number of buildings dating back to the mid 1800s, with a history of education facilities and then a conference centre.

Lendlease is gradually developing the former Morpeth Conference Centre into retirement living while maintaining the heritage aspects of the overall site. The development has been planned in a manner which includes a careful mix of new construction situated to maintain the heritage value of the site.

The overall development includes a number of stages of residential development comprising a mixture of separate dwellings and aged care development. DP has undertaken numerous investiga-

tions during the progression of the site, maintaining a close and open relationship with Lendlease in order to seek opportunities to add value to the project.

DP provided advice on geotechnical and environmental aspects together with construction services for each stage of the development.

DP has provided a broad range of services to this UDIA award winning development dating from 2004 to the present, which has given us an intimate knowledge of the site and allow us to assist Lendlease in the controlled development and protection of the heritage buildings located within the site.

DP's initial involvement included preliminary geotechnical and environmental assessments as part of the feasibility for future development. Since that time, DP has carried out numerous investigations and has provided advice on geotechnical and environmental aspects together with construction services for each stage of the development. Given the long history of the area, a number of unexpected finds have been encountered during the development. DP has provided advice to manage these finds and allow efficient disposal of waste, as required, placing an emphasis on reuse of

existing materials on site where possible.

In addition to these principal investigations, DP has also carried out:

- pavement condition surveys of the historical main road of Morpeth;
- vibration monitoring of adjacent residential buildings during bulk earthworks;
- dust monitoring services;
- advice during construction on various geotechnical issues;
- earthworks inspections and testing during civil works;
- hazardous building material assessments of eighteen buildings on the site, including the existing heritage buildings.

DP has been pleased to provide continued consulting services to Lendlease during this development within this important, heritage rich site and look forward to assisting in similar projects in the future.



Michael Gawn

PRINCIPAL / GEOTECHNICAL ENGINEER



CLIENT Lendlease Retirement Living

YEAR 2004 - 2016 **LOCATION** Morpeth, NSW

Don Douglas Award winner attends GeoVancouver 2016

For the past 28 years, DP has hosted its annual Technical Seminar. The three day seminar is attended by DP's professional staff to develop and share their technical expertise and excellence. In honour of our founder, Don Douglas, the top prize is awarded for the best presentation of the conference. The award recipient is sponsored by DP to attend an international (or local) technical conference.

In 2015, Gavin Boyd, a senior geotechnical engineer from DP's Sydney office, was the award recipient for his presentation of DP's investigation and ongoing consulting work at the Darling Harbour Live project. In acceptance of the award Gavin nominated to go to the GeoVancouver 2016 conference in October this year, sponsored by the Canadian Geotechnical Society. "It was a tremendous experience to attend GeoVancouver 2016. This was the Canadian

Geotechnical Society's 69th annual conference and they have a rich tradition of geotechnical engineering." Gavin said upon his return.

Gavin noted that "The challenges faced by Canadian engineers are diverse and often different from those encountered in the Australian environment. It was a terrific opportunity to learn and observe how Canadian engineers are applying innovative solutions to the specific challenges they face. Some of these methods, technologies and research can be integrated into an Australian engineering context."



Gavin Boyd

SENIOR ASSOCIATE / GEOTECHNICAL ENGINEER

Helping Deliver Perth's High Rise Future

The Sage Hotel

Increasing urban density is a major component of Perth's strategic future planning. Douglas Partners is pleased to have been able to assist clients in their high rise projects at numerous sites across Perth. One of these was The Sage Hotel, a new thirteen storey hotel building with basement, located in West Perth.

The Sage Hotel is located in West Perth, 1.5 km west of the city centre. The site of the proposed high rise hotel was located immediately adjacent to a two storey brick and tile heritage building, which was to be retained as part of the new development.

Our geotechnical specialists were engaged to undertake field investigations and provide advice on the encountered ground conditions, foundation systems, site formation and retaining for the basement excavation. The advice had to take account of the presence of the adjacent heritage building, which was extremely sensitive to movement and vibration. The scope and layout of the investigations were limited by the previous building on the site, which was to be demolished to make way

Douglas Partners worked closely with the structural engineer and the piling contractor to develop the most efficient foundation system.

for the hotel. Contiguous flight auger piles were adopted for both retaining the basement excavation and supporting the heavily loaded lift core slab to minimise vibrations caused during installation compared to other methods.

Following demolition of the previous building, a second stage of investigation was undertaken in the previously inaccessible areas of the site. Douglas Partners worked closely with the structural engineer and the piling contractor to develop the most efficient foundation system for the proposed tower. This allowed the pile design to be optimised with confidence and lesser loaded slabs to be ground bearing. Douglas Partners continued to provide construction phase support until the ground works were completed.

Paul Hutchinson
SENIOR GEOTECHNICAL ENGINEER



CLIENT Australian Development Capital Pty Ltd
YEAR 2014 - 2016 **LOCATION** Western Australia



Background image: The Sage Hotel, West Perth, Western Australia

DP Perth Collaborating with UDIA Awards for Excellence Winners



Douglas Partners is proud to have assisted 12 out of 14 finalists and winners of the prestigious 'UDIA 2016 Awards for Excellence'!

DP provided geotechnical investigations, earthworks supervision, post construction assessments and environmental services to the land developers who competed for awards in the following categories:

- The 'Russell Perry Award for Urban Development Excellence';
- Residential development over 250 lots;
- Residential development under 250 lots;
- Medium density development;
- Masterplanned development;
- Urban renewals;
- Environmental excellence
- EnviroDevelopment Chairman's Choice Award;
- Sustainable urban development;
- Urban Water Excellence;
- Rising Star Award; and
- Judge's Award;

Douglas Partners would like to sincerely express its gratitude to all its clients for using DP's services to design and construct quality urban developments. Our collaborations with these award winning projects illustrate the strong position Douglas Partners forged itself in land development in Western Australia.

Fred Verheyde
PRINCIPAL /
BRANCH MANAGER



Meet the Team

Introducing...

Douglas Partners Class of 2016

Douglas Partners staff are expected to grow their technical expertise to full potential. This is important so that we can provide our clients with specialist advice to add value with practical solutions for often complex and challenging projects. It is therefore very pleasing that a further six of our staff have recently completed Masters Degrees at UNSW. Here is what they had to say on completion of their Masters:



Alexandra Radulovich
Geotechnical Engineer – Canberra
Master of Engineering Science

“Completing my masters has been one of the most challenging but rewarding things I’ve ever done. It has given me a greater understanding of my job as a geotechnical engineer and a solid foundation to further my career and better myself as an engineer. Despite the hard work involved, I would strongly recommend others to undertake their masters to broaden their knowledge base.”

Antionette Walshe

Senior Geotechnical Engineer – Melbourne
Master of Engineering Science

“This course gave me a greater appreciation for the breadth of our industry and highlighted opportunities for improvement of current methods and systems. Juggling study with work commitments was hard at times, but I feel extremely fortunate to have had this opportunity and am immensely satisfied with this achievement.”



Dan Hanna
Geotechnical Engineer - Sydney
Master of Engineering Science.

“Undertaking postgraduate studies has enabled me to expand my geotechnical knowledge as well as further solidify my geotechnical fundamentals. DP has been very flexible during my studies and its support was critical in enabling me to complete my course.” Editor’s Note: Dan is too modest to mention that he was one of very few who graduated with “Excellence” at the top of the graduating class.

Dana Wilson

Associate / Environmental Engineer – Newcastle
Master of Environmental Engineering Science

“Undertaking Masters has been more challenging than I had ever imagined, but also more rewarding, both personally and professionally. I am grateful to have undertaken the experience. It has been positive and encouraging knowing that senior staff have completed the Masters work ahead of me and were able to provide moral and technical support.”



Scott McFarlane
Principal – Newcastle
Master of Engineering Science

“I’m proud to be one of many at DP who have taken the opportunity to advance our careers with a Masters program. Over the past few years, I have seen how these engineers have become more confident in their decision making and leadership skills which has led to greater opportunities within DP and this has allowed us to provide a higher level of service to our clients.”

Veronica Ku

Environmental Scientist – Sydney
Master of Environmental Management

“It has been a very rewarding experience with exposure to inspiring ideas and individuals. Flexible work arrangements have assisted greatly in managing work and study commitments. I appreciate the support from DP and encouragement from Seniors. It’s been very helpful having others around who have been in the same boat!”



FOR MORE DETAILS

If you would like further information regarding our projects or articles featured in this newsletter, please email: marketing@douglaspartners.com.au

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