

BUILDING A COMMUNITY

BMD, one of Australia's biggest privately owned construction companies takes on one of Melbourne's biggest and most adventurous seaside developments, Wyndham Harbour.



MAIN CONSTRUCTION COMPANY : BMD Constructions
CLIENT : Wyndham Harbour Pty Ltd
PROJECT END VALUE : \$58 Million
COMPLETION : September 2014
GEOTECHNICAL ENGINEERS : Coffey Geotechnics
MARINE ENGINEERS : Hyder Consulting
COASTAL ENGINEERS : Water Technology
LAND DEVELOPMENT ENGINEERS : Watsons Pty Ltd
SURVEY : JAC Surveyors



Wyndham Harbour is the newest and largest master planned seaside community to grace Melbourne. At a projected cost of over fifty million dollars, it features a range of luxury terrace homes, designer apartments, a fully equipped marina and a range of shopping and dining precincts. With completion scheduled for 2014, there's no denying that the planning and construction behind this project has been significant.

The construction company behind the project, BMD Constructions, have poured a significant amount of resources into each stage of the project to ensure it reaches its planned delivery date. One of the largest construction, consulting and urban development organisations in Australia, BMD Constructions are working with a range of project partners to deliver Victoria's newest seaside 'place to be'. However BMD General Manager – Southern Region, Jeff Gallus said there are particular challenges involved in working on beach front where the initial terrain is varying in usability.

While Wyndham Harbour is a large project, BMD are an equally large company. "Wyndham has taken about 8% of our Victorian resources, which equates to around 1% of our national resource pool," Jeff said. "This means that whenever there is an element of the project that needs development, we're able to act on that quickly, calling in more resources as the client requests," Jeff said.

One of the biggest issues BMD have faced to date has been the construction method for the foreshore extension works. BMD have used the combined initiative of consultants (Hyder, Coffey, Watsons, and Water Technology), in designing a method of effective dredging, installing aquifer protection works, protecting the foreshore vegetation, installing bio-retention swales, keeping the required number of berth spaces, and satisfying the public amenity requirements. Each of the above have required satisfaction of a range of criteria to ensure all stakeholders involved in the project have been catered for, however Jeff advised that thorough engineering processes have been put in place to see the project through to completion on time.

Designing a method for dredging which would allow BMD Constructions to reuse the dredged material has also been

a challenge. "Standard dredging methods were never going to be acceptable, as they result in unusable slop that we wouldn't have been able to store or dispose of," Jeff said. Dredging Systems Pty Ltd have helped BMD Constructions come up with a solution known as a centrifuge. This system, which was imported from the USA, uses cyclone chambers to dry out the material similar to an industrial strength tumble dryer. The material gets separated from the seawater and can be used as engineered clay immediately. The remaining seawater, however, still contains ultrafine clay particles. These particles are then treated using geotubes to separate the seawater for safe discharge back into the bay.

Another major challenge has been the supply of quality armour rock at a reasonable price. The rock cartage market experiences periodic ebbs and flows, so getting a consistent supply of good angular basalt material has been, and will continue to be, a struggle over the course of the project.

Werribee South, where the project is located, has a unique geology compared to the basaltic clays of North and West Melbourne, and the sandy clays of South Melbourne. "The market gardens clay has a thick layer of topsoil but is otherwise ideal for any civil construction work," Jeff said. "The existing clay is clean and has a high CBR value which makes it ideal material for houses to be built on, and offers highly fertile topsoil, perfect for gardens in the backyards of the new residences."

Jeff said that the project has largely been blessed by good weather and great construction conditions. "The geographic location of the site is such that the storms that battered Melbourne often missed the site, even though it's only thirty minutes from the city. Most of our major earthworks were conducted under good conditions."



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WATER TECHNOLOGY

Water Technology have uncovered the technical detail behind the environment to offer consultation on some of Australia's biggest collisions of environment and construction.

Water Technology is a company that takes the environment very seriously. Since its inception in 2000, the company has grown to employ over 60 specialists and has offices in Melbourne, Brisbane, Wangaratta, Bairnsdale and Stawell. The company undertakes work in all areas of surface water, coastal and environmental consulting and management. Determined to offer sustainable solutions where new developments and the environment can exist in harmony, they have been extensively involved in the Wyndham Harbour planning and development process.

Andrew McCowan, Managing Director of Water Technology, said that the sheer scale of the project afforded the company the opportunity to investigate and develop a range of new ideas that were ultimately incorporated

into the project. "After extensive research we have developed an innovative two layer breakwater design," Andrew said. "The final design is simpler, uses a wider grading of rock and is easier to construct than the normal three layer designs. This has made it easier to source suitable rock and has resulted in significant reductions in construction time and costs. The design has also made it easier to include appropriate adaptation responses for climate change effects."

Water Technology has been involved with the Wyndham Harbour development since 2002. As well as the breakwater design, the work has included establishment of environmental design criteria, coastal process investigations, and dredging investigations. The work has continued from the initial concept development,

planning and approvals stage, through to final design and construction. This has ensured that knowledge and skills developed during the project have been retained within the project team. Analysis for the project has also included extensive water quality monitoring that has provided the development team with a realistic base case environment state to work from. Monitoring is to continue throughout the construction and dredging phase.

As Water Technology's involvement in the Wyndham Harbour project wraps up, the company is moving onto a range of new projects. Development of a coal transhipment port near Rockhampton, design of a major river diversion for the Tarong Coal Project near Kingaroy, and development of a surface water management plan for the Granny Smith gold

mine in Western Australia are all new projects that they've recently been involved in.

The company's expertise is far reaching, and their ever-expanding client base is testament to the results they achieve on each job. "A lot of people don't understand the importance of environmental analysis and modelling," Andrew said. "Although we use high-level state of the art modelling systems in our work, sophisticated analysis tools allow us to present the results in a way that can be readily understood by the vast majority of the stakeholders in the project. This makes it possible for us to achieve the best possible outcomes for our clients from legal, ethical, business and social points of view."

Previously Water Technology has been involved in several other harbour development projects within Port Phillip Bay. This has enabled them to develop the required expertise to take on the Wyndham Harbour job with ease. "We've worked on marine facilities all around Australia, including environmental investigations for the

outlets of the Adelaide Desalination Plant, coastal process and environmental investigations for harbour developments on the Great Barrier Reef and tidal power investigations in Victoria, Tasmania, Queensland and the Northern Territory," Andrew said. "These projects were highly varied in terms of client requirements and environmental conditions. However, they were all projects we could apply our vast array of skills to."

Water Technology is not simply limited to coastal and marine works. They are renowned for their innovative solutions to urban drainage and flood mitigation, and carried out extensive investigations following the 2011 floods. The stormwater team recently completed works on the Eynesbury development west of Melbourne and for the City of Bendigo. The team in the Brisbane office is the all-rounder of the group; assisting clients with flood mitigation and floodplain management, coastal investigations, environmentally sustainable creek diversions, fluvial geomorphological

assessments and water management system design. One of the key points to take away from the Wyndham Harbour development is the concern that all who have been involved in it have had for the environment. "Wyndham Harbour and BMD approached us with a brief that was all encompassing," Andrew said. "They wanted accurate and reliable reports on what impacts the development could have on the environment not just for regulation satisfaction, but because they want Wyndham Harbour to be at one with the environment." At a time when it can be difficult to find funding for these larger projects, it's great to see organisations such as Water Technology and BMD Constructions adopting a true social and environmental conscience to ensure our environment will be around for our kids to enjoy.

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SURVEYING SOME OF AUSTRALIA'S MORE COMPLEX PROJECTS

A project the size of Wyndham Harbour was always going to need some innovative contractors in order to get it off the ground. Everyone involved in the project are absolute experts in their respective fields, none more so than Redmapping.

The unsung hero of the construction game, mapping is a time consuming process that ensures utter perfection and accuracy in every aspect of the build. If the initial surveying of the site isn't done correctly, there's a much greater chance for extremely costly errors later on in the build process, so every new construction project generally undertakes a range of mapping and surveying just to get the DA through council, let alone the building to completion.

"Wyndham Harbour was a big undertaking for us," Redmapping CEO Peter Bailey says. "It wasn't overly difficult, it was just the sheer volume of area over such difficult terrain that needed to be mapped that proved a challenge." This challenge was met with flying colours; with Redmapping employing both of their custom manufactured amphibious survey vehicles to clearly map the foreshore of the project.

"There was around 5km of very challenging reef to map," Peter says. "The transition between land and water, where the amphibious vessel was able to float in the water without assistance, and the beach, was surveyed in entirety. This ensured no stone was left unturned in the planning phase of the project." Typically Redmapping's services are employed at consult

stage, when planning is taking place and long before ground has broken on construction on an investigative basis. However, Peter told us that BDM Constructions, who have been overseeing the project, called them back in for another consultation just as construction was starting to ensure the integrity of the harbour was to remain and that all vital signs that were facilitating the build were still intact. "It has been important to everyone involved that the impact of Wyndham Harbour on the environment be as small as possible," Peter says.

"This is where we come in. Close monitoring of the area that we're mapping for construction purposes also doubles as a fantastic method of environmental monitoring," Peter and his team use the latest Hypack software, which they say covers most of their requirements.

They also have a number of additional software packages that they use when required. In terms of physical equipment, Peter tells us everything they have can be categorised into two main areas; vessels and technical instruments. "We've got two amphibious vessels that are able to traverse just about anything from water to mud, measuring volume and other units on the way," Peter says.

Redmap, Redmap Two and Redmap RC (Remotely Controlled) are vessels equipped for water travel that allow us to service aquatic requirements." Their technical gear is highly specialist, and designed to deliver the highest level of accuracy in order to provide the most accurate measurements for ordering building materials.

"CEE hydrosystems are used for measuring, whilst Leica Geo Systems delivers measurement and positioning into useable data," Peter says.

Redmapping's latest development, an unmanned remotely controlled vessel has sparked some interest amongst the mapping industry. The vessel can be fitted with Redmapping's latest technical survey equipment and can be operated from the safety of land.

One of the biggest issues facing any construction company looking to engage the services of a mapping and survey company is lead times. Redmapping are highly flexible in the way they operate, with Peter even developing a system that can pack into a suitcase for air travel. "We get a lot of enquiries from mining companies and larger construction companies whose needs are frequent and varying," Peter says. "Larger mapping companies take on large jobs that tie them up for months at a time, however we offer the flexibility to be able to take a job on with only a few days notice. That's the difference," Peter says.

The Redmapping team are currently working on a range of projects including a fly in job off West Moore Island to the north of Karratha WA, however be sure to get in touch with them to discuss your next project, no matter where in the world it is.

For more information contact Redmapping, phone 0409 432 241, , email info@redmapping.com.au, website www.redmapping.com.au



INVESTING THEIR BEST EQUIPMENT AND PERSONNEL

Big construction projects require big earthworks. One of the most significant components of any new development is the civil work that needs to be carried out before, during and after the job in order for it to come in on time, on budget and satisfying all the regulations that have been set in place by the authorities.

Independent Civil Contractors were commissioned by BMD Constructions to undertake civil works on the Wyndham Harbour site. Independent Civil Contractors CEO Derick Smith said they were required to invest significant resources into the project from day one. "It is a large scale project, so therefore required a large amount of machinery," Derick said. "We were commissioned to provide full service earth works, so earthmoving machinery, transportation and consultation are all a part of what we're doing."

Whilst Independent Civil Contractors have only been incorporated since 2002, their collective experience in the civil works industry spans many decades. This experience, combined with the vigour of a growing and relatively new company, has spruiked a company culture that sees every employee go above and beyond to produce outstanding results for every one of their clients. "This culture was well and truly exercised throughout the Wyndham Harbour job," Derick said. "Our team were working long hours to make sure the earth was shaped just as it should be for commencement of construction."

The company are also involved in ongoing and maintenance works throughout the project. As it's situated on a beach front, the requirements

include sand relocation and management on a very large scale. "The job isn't set to be completed until 2015, so we're working on a continuous basis to ensure all targets are met or exceeded in terms of the integrity of the site. If a solid foundation isn't set, then the rest of the project is in jeopardy so we're going to be working on the project, in one capacity or another, until completion," Derick said. The organisation worked closely with BMD Constructions and a range of engineering consultancy firms to carry out the breakwater construction process. These elements alone, before any ground was even broken on the individual building sites, required the movement and formation of thousands of tonnes of sand, mud, dirt and rock. "As much as we are excavating and carting materials, we're also bringing them in and placing them for builders, engineers and consultants," Derick said.

The project has seen the company employ a range of highly skilled operators, as the work environment is technical to say the least. Working on a coastline, there are a range of factors to be contended with such as tides, ground and structural integrity and difficult weather conditions. Because of this, Independent Civil Contractors were specific about the staffing requirements from the

start. "It's been great to be able to provide employment to a number of team members, however we've been looking closely at everyone's performance to maintain the highest levels of productivity and, most importantly, safety."

Although the company are still in the middle of the Wyndham Harbour project, they are looking at new Contractors for other jobs right around Australia. "We're at a point where we have the ability to service most jobs," Derick said.

"Our company structure includes haulage, plant hire and complete project management, similar to the arrangement we're working under on Wyndham Harbour. This has afforded us to invest in the best equipment and the best personnel to completely satisfy our clients needs." **Our future is only as good as we build it!**

For more information contact Independent Civil Contractors, phone 03 8786 3222, website www.independentgroup.com.au

