



At Cardno, we believe in the benefits of performance in partnership. We work closely with our clients throughout each project to ensure informed decision making for successful surveying and mapping outcomes.

Cardno is an international, integrated professional services provider locally delivering the specialist advice necessary to create or improve the physical and social infrastructure that underpins communities around the world.

Cardno Spectrum Survey, as part of the Cardno group, supplies surveying and mapping services to mining, physical infrastructure and land development projects throughout Australia and the world to a wide range of public and private companies as well as government agencies.

The key to our success is adding value to the projects we work on whether that be through our surveying services, technology transfer or training.

Our comprehensive inventory of skills and resources enables us to provide an overall surveying and data management solution for any project, from conception through to completion.

Engineering Surveys

Cardno Spectrum Survey supports a wide range of engineering and construction projects including:

- ▶ Civil and earthworks - including bulk earthworks for roads, subdivisions and dams
- ▶ Structures - high rise buildings, bridges, minerals processing plants and infrastructure
- ▶ Linear infrastructure – roads, pipelines, telecommunications and power
- ▶ As constructed and audit surveys for buildings, structures, sewer, water, drainage and underground services
- ▶ Feature surveys for project design.

Mining Surveys

Cardno Spectrum Survey specialises in exploration, open cut and underground mine surveying, using qualified and authorised staff operating state of the art instrumentation, techniques and software.

Project and survey works include:

- ▶ Short and long term secondments
- ▶ Greenfields projects, establish survey control and topographic surveys
- ▶ Gyroscopic and control survey checks
- ▶ Cavity monitoring surveys
- ▶ Shaft Plumbs
- ▶ All GPS surveying applications
- ▶ Mine survey audits.

Cadastral Surveys

Cardno Spectrum Survey's licensed surveyors are experienced with all facets of industrial, urban and rural land subdivision.

We are able to provide you with advice on the advantages of the different forms of land tenure whether you are looking at a green title, survey strata or built strata.

Other surveys regularly undertaken include:

- ▶ Mining tenement surveys throughout WA
- ▶ Boundary identification and re-establishment surveys, with certification and sketch
- ▶ Lease surveys for areas in shopping centres, retail and commercial complexes to the Property Council of Australia guidelines.



Boddington Gold Mine Expansion Project- Aker Kvaerner Clough Murray Roberts JV

Cardno Spectrum Survey was tasked to provide set out, check and verification surveys of constructed mine plant and infrastructure. This included verification of built structures such as the large primary crusher, ball mills, tanks, conveyors, fuel, reagent and floatation facilities, and the collection and maintenance of data relating to these structures. Five day per week support was provided by two survey crews on site with technical and administrative back office support from our Perth office over a seven month period.

Additional works carried out on site included establishment of the primary control network which contributed to combining all plant areas onto the single grid system, resulting in more efficient management of survey data for the project, which covers an area in excess of 200 hectares.

AMC Technolgy Park Henderson

Since 2005 Cardno Spectrum Survey has been consulting to Landcorp and continue to provide all office and field services for the subdivision including pre-calculation plans, the production of sales plans, pegging of lots, preparation of legal documents to achieve issue of Titles, liaison with client, co-consultants and statutory bodies.

Other survey services underpinning the project's infrastructure development include establishing primary control networks, topographical surveys, earthworks, underground services, road construction and as constructed surveys.

Atlas Iron- Pardoo, Abydos and Farrell Well

Cardno Spectrum Survey supplied ground survey services, mapping and orthorectified imagery for over 2600 square km of exploration tenure held by Atlas Iron; an emerging Iron Ore producer with substantial holdings in the Pilbara region of Western Australia.

The spatial data was used utilised and interpreted by geology, environment and drainage experts as part of ongoing feasibility studies for the various prospects.

Further detailed ground surveys were undertaken to defined ore body, road and plant layout sites as part of the Definitive Feasibility Study for Atlas' Pardoo DSO (direct shipping iron ore) project. Atlas Iron shipped its first commercial iron ore from Pardoo in December 2008 and continues to advance its Abydos and Wodgina projects.

Landcorp- Enterprise Park Wangara

From 2000 to 2009, Cardno Spectrum Survey supplied cadastral and construction survey services at Landcorp's Enterprise Park, Wangara, in Perth's northern suburbs. The estate, located in Perth's northwest corridor covers an area in excess of 140 hectares and houses 250 businesses.

With over 20 years experience, Cardno Spectrum Survey has developed a strong reputation with clients in the mining, exploration, government and private sectors for delivering timely and accurate surveying and mapping solutions.

About Cardno

Cardno is an integrated professional services provider, delivering specialist advice to create or improve the physical and social infrastructure that underpins communities around the world. Our team is comprised of leading advisors who plan, design, manage and deliver sustainable projects and programs.

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