

Department of Transport and
Regional Services

Christmas Island

Recreation Centre

Concept Report

February 2003



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1. Introduction



1.1 Background

On 12 March 2002 The Hon Wilson Tuckey MP (Minister for Regional Services, Territories and Local Government) announced details to the community of Christmas Island of a new permanent immigration reception and processing centre to be built at North West Point, Christmas Island.

In recognising that with an increased population comes increased pressure on community infrastructure, it was also announced that to address this the Government would fund the construction of dedicated sports facilities (to the value of \$8M) and bring forward works on common-use transport infrastructure.

The Department of Immigration, Multicultural and Indigenous Affairs (DIMIA) was tasked with managing the construction of the detention facility at North West Point and the Department of Transport and Regional Services (DOTARS) was given responsibility for the provision of all associated infrastructure. ie tasked with all necessary works outside the detention facility (including the proposed Recreation Centre).

The CI Administration through its Administration Advisory Council (AAC), together with Regional Office Perth (ROP), are jointly managing delivery of the Recreation Centre proposal.

In accord with standing contractual arrangements with DOTARS, GHD has been requested to undertake a lead in moving forward with the preparation of a concept outline within budget (\$8M).

This report aims to provide a schedule of recreation facilities which may be realised within the established budget and which provide the range of facilities typically provided to a population base and location such as Christmas Island. Additional/alternative facilities are also identified and cost estimates provided to allow for flexibility following consultation with the community and stakeholders.

2. Existing Facilities

2.1 Facilities

Christmas Island is currently provided with a number of facilities which cater for casual and organised sports. (Refer Appendix A). It is anticipated that use of most of these facilities will continue although patronage may be affected by the proposed new recreation centre. The existing swimming pool in particular is likely to continue to be used for recreation swimming, with swim lessons and lap swimming relocating to the proposed new facility. Badminton, however, is housed in a purpose built facility and is unlikely to relocate.



The proposed new facility will allow for consolidation of sport facilities around the existing cricket club and oval which currently serves as an umbrella facility for many sports. The new facility may relieve the pressure from existing facilities such as the school.



Existing facilities include:

1. Swimming pool

The swimming pool located in the Settlement serves a community need and is well used by a variety of user groups including recreation swimmers, lap swimmers, mothers and toddlers and the school learn-to-swim programme. The pool is not of a length suited to competition and cannot address conflict between the various user groups such as lap swimmers and children.

2. Gymnasium

The gymnasium on Gaze Road previously provided basketball facilities but was more recently used as temporary accommodation for detainees. The facility is now used for childrens' holiday activities organised by the Shire.

3. Basketball Courts

The outdoor basketball court in Poon Saan provides a local facility and while it is not in an excellent condition, it is well used by the local community.

4. Community Hall

The community Hall adjacent to the Technical School in Taman Sweetland was purpose built for badminton. The centre is well used and serves as church and community meeting room.

5. School

The school site contains a soccer pitch, tennis courts and covered sports arena. :

- Soccer pitch – used for soccer training by the general community one night per week and for a game on Sunday.
- Tennis Courts – constructed six years ago and well used by the community.



- Covered sports arena – generally used only by the school but has been made available occasionally for volleyball (although roof line too low)

6. Golf Club

Used predominantly by golfers on a regular basis. Limited power and space at this site restricts expanded use.

7. Dive Club

Located in club rooms near the Christmas Island Club. Requires location close to ocean.

8. Cricket Club and Oval

The cricket club provides a central umbrella association for a variety of sports clubs, including tennis and basketball. A cricket club and sports club membership is required to use the sports facilities.

The oval provides for cricket, football, touch football and softball. It is also the arena for large-scale community event such as those held on Territory Day.

The cricket club facility comprises an older building housing a function room, storeroom, and bar. A steel portal frame extension (4 years old) provides for a kiosk, storage room for sports equipment and an open area.

2.2 User Groups

Anecdotal evidence suggests that participation in sports on Christmas Island is relatively high, particularly for specific sectors of the community.

Participation in formal sport is predominantly undertaken through membership of the cricket and social club which allows for use of most sports facilities. Casual participation in sport is probably most evident at the basketball courts in Poon Saan.

3. Site



3.1 Location and Tenure

- ▶ The site of the proposed recreation complex is at the former go-kart track at Phosphate Hill. The go-kart site currently serves as a hard stand areas for storage containers.
- ▶ Phosphate Hill currently accommodates the temporary detention centre, the construction camp and the cricket club and oval. (Refer Appendix B) A Non-Directional Beacon and other equipment is accommodated on the cleared site on the northern side of Vagabond Road.
- ▶ The go-kart site is identified as Crown Land on Pt Lot 513. The construction camp, temporary detention centre and cricket club/oval are also identified as Crown Land
- ▶ The go-kart site area is approximately 1.1ha
- ▶ The Christmas Island Town Planning Scheme identifies the go-kart site site as “Unallocated Crown Land”, with the cricket club, oval and construction camp site identified as “Public Purpose- Cricket Ground”.

3.2 Services

The site is adjacent to power, water and sewerage infrastructure which currently service the construction camp and the detention centre. While the infrastructure is existent, its capacity and availability for use by the recreation centre is as yet undetermined. It is anticipated that water services may require to be upgraded to meet the demands of the proposed recreation centre.

3.3 Constraints and Opportunities

- ▶ The former go-kart area is adjacent to services.
- ▶ The site is relatively flat.
- ▶ The site has previously cleared thus reducing environmental concerns.
- ▶ The site is not within the 150 m buffer area of the Non-Directional Beacon (NDB) located on the vacant cleared land north of Vagabond Road..
- ▶ The site is within a no-fly zone but there may be restrictions on development above 305m. Further investigation in this regard may be required.
- ▶ The location of the site adjacent to the temporary detention centre will require that screening be installed along the eastern boundary.
- ▶ Variable foundations conditions may be experienced at this location, necessitating additional site works including rock excavation. Further investigation is required.



4. Comparable Facilities



Information on recreation centres in rural areas of Western Australia was collated from a number of Local Authorities. This allowed for identification of the level of facilities typically provided to a relatively isolated community where the population base was similar to that of Christmas Island.

The Shire of Derby provided the greatest comparison with Christmas Island; in population, isolation and climatic conditions. While the recreation centre does not have a swimming pool, the range of enclosed and unenclosed facilities was similar to that proposed for Christmas Island.



► Shire of Derby

- Population : Shire = 8,900
Town 3,500 (increases to 5,000 in Wet Season)
- Unenclosed Facilities :
 - Basketball courts X 2 (multi-use)
 - Kiosk
 - Storage room
- Indoor Facilities (air –conditioned)
 - Squash courts x 2
 - Community room and kitchen
 - Crèche facility
 - Offices x 2
 - Change rooms x 4

Users : predominantly sports associations. Estimate that only 5% of population use facilities.

Cost of construction : \$2.8m (2001)

Operational costs : unknown

Comments : recommend construction of two basketball courts. Squash courts under-utilised. A weights room not included but demand is high. Swimming pool not on site.

► Shire of Donnybrook

- Population : Shire = 4,600
Donnybrook = 2,500
- Enclosed facilities (air –conditioned and heated)
 - heated pool (25m)
 - basketball courts X 2
 - gymnasium (weights room)



- function room
- crèche
- kiosk
- office
- change rooms x4
- storage areas (cages)

Users : estimate 50 % of population use facility

Construction cost :

- Stage 1 (1993) includes pool, squash courts, office, kiosk, function room, kitchen and 2 change rooms = \$1.1m
- Stage 2 (2002) includes basketball courts, gymnasium, crèche and office = \$1m

Operating costs : expenditure = \$259,000 (2001)

income = \$132,000 (casual entry fee)

► **Shire of Broome**

Population : Shire = 13,500

Town = increases to 20,000 plus in Tourist Season

Pools

- 8 x 25m lap pool
- leisure lagoon pool
- spa area
- BBQ & landscaped gardens
- Kiosk facilities
- Changerooms

Stadium

- double indoor stadium - for netball, basketball, badminton, volleyball, indoor soccer & other sports.
- air conditioned changerooms
- Kiosk facilities

Squash

- 2 x air-conditioned squash courts
- air conditioned changerooms
- Kiosk facilities

Tennis & Netball / Basketball Courts

- 8 synthetic grass tennis courts
- 4 'Latexite' netball/basketball courts



- Kiosk & restricted bar facilities
- toilets
- Landscaped shaded entertaining area

Reception/ Admin

- air-conditioned crèche/multi purpose room
- administration
- 2 x first aid
- 4 x club offices

Skate Park

- Located at the front of BRAC & consists of beginners to medium jumps, rails and slopes. Entry is free.

Users : Sports associations and the general public.

Cost of construction : \$4.8m (2001) not including swimming pools

Operational costs : \$200,000 running cost for the pools per year, the cost of running the dry facilities are unknown.

Comments : recommend construction of two basketball courts. The use of breezeways and appropriate siting of the facility is important. Use of recycled rubber flooring for the multi use halls was identified as excellent.



5. Proposal



5.1 Concept

The sketch design of the proposed new facility has been created using the principles of functionality and efficiency to ensure that the facility addresses the sporting and social requirements of the Island population (Refer Appendix C).

5.1.1 Population Base

The proposed facility has been designed to serve a maximum population of 6,000. While the population of Christmas Island is currently estimated at 1,500, long-term growth to 5,000 has been estimated in the “Christmas Island Town Planning Strategy”. The review of the Christmas Island water supply (GHD 2002) makes allowances for similar population growth to 5,000.

5.1.2 User Groups

The main user groups of the proposed recreation facility are anticipated to include :

- School children
- Adult residents
- IRPC Staff
- Detainees
- Defence personnel
- Tourists.

The pattern of sports usage on Christmas Island includes regular participation in relatively small groups at a variety of venues. There are, however, occasions when a major event occurs, such as a football game between the Island and Defence personnel, which draws considerable crowds to the cricket grounds. It is anticipated that the proposed recreation centre will supplement the facilities at the cricket club and will provide a community focus for sport and recreation activities.

5.1.3 Design Guidelines

As a design reference, GHD’s Architects have utilised a number of resources such as the Ministry of Sport and Recreation “Sport Dimensions for Playing Areas” guidelines, fourth edition 1998, previous GHD sports complex designs and drawings, Education Design Guidelines for gymnasium/hall sporting facilities, and Information gathered through discussions with recreation managers at Broome, Derby and Donnybrook (of which Derby is similar in terms of population to CI). The resulting building envelope sketch plan has been developed that will provide a functional, efficient and modern sporting facility.



5.2 Proposed Recreation Complex Facilities

The table below identifies a number of functional areas. These areas will provide a facility comparable to many regional recreation facilities in Western Australia. Due to the high cost implications faced in the building of facilities on Christmas Island the proposed functional areas have been assessed and selected due to their multi-functional abilities to cater for a range of sports.

Room / Function	Notes
Swimming Pool	Included in the design is one 25m eight lane competition pool.
Wading Pool	Adjacent to the competition pool is a wading pool area, which will ensure that the competition can be used for lane swimming and training, while still providing a swimming area for leisure activities and learn-to-swim programmes.
Toddlers Pool	A covered toddlers pool adjacent to the staff and Life Guard area has been included. This provides a safe shaded swimming area for small children.
Multi Use Recreational Hall 1	Through the implementation of Ministry of Sport and Recreation guidelines for “multi use” hall design. <u>Each</u> hall has the capacity to include:
Multi Use Recreational Hall 2	1 basketball court; 1 or 2 volleyball courts; 1 netball court 4 badminton courts. The Multi Use Halls are not air-conditioned and will include large roller doors and shutters within the design to maximise cross ventilation of the facility. The buildings are orientated to maximise natural ventilation through the south east prevailing winds. It is proposed that the court surface be a rubber sports floor proprietary system similar to the “Mondo” sports flooring used in the Broome facility. This reduces the problems associated with humidity and maintenance/cleaning.



Room / Function	Notes
Large Multi purpose Room (Aerobics, meetings, music)	A large multi-purpose room has been included in the sketch design. This facility will be located adjacent to the multi purpose halls and will enable the facility to cater for a large number of varied functional requirements such as Aerobics, Meetings and Musical Band practice. It is anticipated that this large room will include operable walls to divide the space as well as sound dampening to areas where music practice may take place.
Weights Room	The inclusion of a weights room adjacent to the halls, Aerobics and ablutions has been allowed for in this proposal.
Crèche	A Crèche area has been included and will allow mothers to utilise this facility while providing a safe children's area.
Kiosk	An allowance for a small kiosk has been included. This area is anticipated to provide light snacks and refreshments and is not envisaged as a commercial type kitchen.
Reception	A reception/waiting area has been included in the design that enables the staff to monitor and direct visitors through the centre efficiently as well as providing a waiting area, which can display information.
Office Area	One fully serviced office has been included. This will provide facilities for staff to manage the centre.
First Aid Room	A separate first aid room has been included in this proposal.
Storage	This facility allows for substantial storage of equipment and materials. The proposed storage areas will include: General Storage; Gym Store; Sports Store; and Cleaners Store.
Male and Female Change Rm/WC's (General & Pool)	Change room, shower and toilet facilities have been included that will cater for both the multi use sports facilities and the swimming pools. These change rooms will include separate shower cubicles, WC's and ample seating and hanging areas.
Staff Toilets, SHR's & Change rooms	Separate Male and female staff toilets and change rooms have been included.



Room / Function	Notes
Disabled Change room, SHR & WC	A disabled change room, SHR and WC has been included within the proposed building area. This will provide unassisted disabled facilities to Australian Standards.
Cleaner Room	A cleaner's area has been included in the design this area will be located adjacent to the cleaner's store.
Landscaping	An allowance has been made to include general landscaping to the perimeter of the proposed buildings and screening to the fenced boundaries.
External Lighting	An allowance has been made for general external lighting to the car parks and perimeter of the buildings. This lighting is for general safety and does not include night usage lighting for external areas.
External Paving / Hardstand Pedestrians	General paving/hard standing has been included in the proposed building costs. This paving/hard standing will provide circulation areas around the pools as well as viewing areas for the cricket/football teams using the oval.
Car Parking	An allowance for 36 car-parking bays has been included in the overall cost estimate. These bays will be supplemented by utilising the existing hard-edged areas of the oval, which are currently used as parking.
Pool Fencing	Pool fencing to the Australian Standards has been included in the proposed project. This fencing will assist in the zoning of the children's safe areas as well as security for the facility.
General / Screen Fencing	A high screen fence is included in this proposal. This will provide visual separation of the pool from the Detention centre and the road. Planting and landscaping will supplement the proposed fence/screen.

5.3 Possible Additional/Alternative Facilities and Cost Estimates

The facilities below comprise a "wish-list" of facilities which exceed the budget but which may warrant re-assessment for inclusion as alternative facilities to those identified above, or as additional future items when budgetary conditions allow.



Facility	Notes	Cost Estimate (CI Price)
Bowling Greens (6 rink green)	If required a 6 rink bowling green including lighting and fencing can be located in the area identified on the proposed plan as “proposed extension”.	\$230,000
Tennis Courts (Each)	An additional tennis court (1 off) with a Plexipave surface, fencing and lighting can be located in the area identified on the proposed plan as “proposed extension”.	\$85,000
Squash Courts (Each)	Squash Courts including timber floors, air-conditioning and rear glass walls.	\$150,000

5.4 Orientation

5.4.1 Multi Purpose Halls

The proposed new facility is located within the existing (disused) go-kart track lot. The orientation of the facility has been designed to take full advantage of the prevailing winds. It is proposed that the facility be designed to to direct the breeze across th courts and through roof vents.

5.5 Pools

The pools have been placed to the rear of the sporting complex to maximise security as well and ensuring that seating areas can be provided to the oval side without obstruction by fences and also providing spectator areas which may be serviced by the sporting centre facilities (toilets, kiosk and change rooms).

5.6 Parking

The location of the parking was designed around the existing road access as well as the ability to utilise the exiting hard ground areas used during sporting matches on the oval.

5.7 Future Expansion

An area adjacent to the proposed multi purpose halls has been identified as a possible future expansion area for the multi purpose halls or other facilities such as tennis courts and bowls.



5.8 Functional Planning

5.8.1 “Building”

On the attached plan the area identified as “building” has been located between the car park and the multi purpose halls. This facility will house the offices, staff rooms, meeting rooms, ablutions and training areas. The separation of this building on this concept plan provides an indication of the dialogue between highly serviced areas and the multi purpose halls. The “building” functional areas will be designed so that the service functions address the pools, both halls and the sporting oval. By creating this rectilinear form, all of the different functions on this site are efficiently serviced and duplication and excessive circulation will be minimised.

This also provides for lifeguards and supervision of the pools on the poolside of the building which enables the efficient monitoring of the pools.

5.9 Multi Use Halls (1 & 2)

The multi use halls have been located adjacent to the building housing all of the services and this allows functions such as aerobics and gym (weights training) to take place adjoining the halls but benefiting from the higher service requirements supplied by the “building”.

It is proposed to include large opening areas to the East-West faces of the Halls which will also enable the halls be used as the spectator seating areas for large sporting functions at either the pool or the oval. This also enables the facility to cater for large community gatherings such as dances and meetings by providing an inside/outside area.



6. Progress of the Proposal



This preliminary concept for the proposed recreation centre has not taken into consideration many of the factors which may impact the progress and implementation of the project. Consideration of the following may be required :

► **Consultation**

The preliminary concept has allowed for identification of a recreation centre which attempts to meet the demands of an isolated community such as that on Christmas Island. Until such times as there is formal consultation with the community and other stakeholders, however, it cannot be anticipated that the proposed concept will meet the specific demands of the Christmas Island community.

It is recommended that a community consultation strategy be prepared and implemented in the early stages of the project.

► **Site Investigation**

The variable foundation conditions which may be experienced on Christmas Island would warrant further investigation of the site. Until such times as geotechnical investigations have been undertaken, it is not possible to estimate with any accuracy the extent or cost of site works.

Assessment of the capacity and availability of the services in the local areas may also be required.

► **Approvals**

The long term management of the facility may require that consideration be given to statutory planning approval requirements and land tenure arrangements.



7. GHD Team

GHD has available a team of multi-disciplined and very experienced staff for this project who have worked on numerous similar projects. GHD's in-house staff are very familiar with these types of facilities, and the associated problems.

In addition to the core team identified below, support will be available from a range of other in-house disciplines including, Geotechnical (Andrew Shuckstes), Mechanical Engineering (Eddy Kalani), Environment (Anna Napier) and Survey (John Demiris).

► **Ian Nelligan – Project Director**

Ian's expertise is in Project Management and Construction Management on major building and infrastructure engineering works. Responsibilities have included project and program management, construction management, design, documentation, contract administration and superintendence. Ian has had recent experience as Project/Construction Manager for infrastructure and engineering and building related projects at Christmas Island.

Since November 1997 Ian has been employed in GHD's Perth office, as a Senior Project Manager where his duties have included the Project Management role for the Christmas Island Rebuilding Program. Prior to this time Ian spent 4½ years on Christmas Island as the Construction Project Manager for all projects within a \$102M rebuilding / infra-structure program. Major projects Ian has been involved with include : New Hospital (\$10.3M), School Extensions \$10.1M), Water supply(\$4.6M), Sewerage supply(\$7.5M)Government Housing(\$6.2M) and Public Housing(\$8.4M)

► **Brian Bate - Project Leader**

Brian is a senior architect with extensive experience across the full range of architectural services and specialises in master planning, detailed design and planning and project management. He has been involved in the master planning of a number of major defence facilities including HMAS Stirling and RAAF Base Pearce. He has also been responsible for major upgrade planning on the international airport facilities in Perth, Sydney and Guangzhou in the Peoples Republic of China. He was the Principal Architect for the development of the major sporting facilities at HMAS Stirling including the 50 meter swimming pool, the gymnasium and the sports pavilion, housing all of the club rooms and amenities for the cricket and football teams.

Brian was the Coordination Architect on the Christmas Island Redevelopment Program which involved the detailed master planning of all building and infrastructure works, the development of the building Functional Design Briefs, the preparation and presentation of PWC Evidence and the development of standards for building design and documentation. He has a sound knowledge of tropical design and construction techniques and has significant experience of working in culturally diverse societies.



► **Andrew McKenzie – Structural Engineer**

Andrew is experienced in project management, design, documentation, project administration, construction management and planning of a wide range of multi-disciplined projects throughout Western Australia and Christmas Island.

Andrew's experience on Christmas Island includes Christmas Island additional port facility, Flying Fish Cove Port (warehouse demolition and pavement reconstruction) Flying Fish Port (new crane installation and support structures) and Christmas Island School (Art Centre and Secondary Block).

Andrew's experience in swimming pool design, documentation, maintenance, upgrading and investigations extends to those pools in Collie, Kalamunda, St Hilda's, Lake Grace, Yokine and Liverpool (Sydney). Andrew has also undertaken the Preliminary Design of recreation centres at Bunbury, Kalgoorlie, Collie and Ballajura High School.

► **Adrian Hordyk – Civil Engineer**

Experienced Civil Engineer with over 30 years experience with the Commonwealth and local Government Authorities, Consulting Chartered Engineers and construction companies. He has an extensive knowledge of all stages of construction projects including project management from inception and planning through to preliminary investigations, estimating, schematic design, detailed design, documentation, calling/analysing tenders, letting contracts, contract administration, construction management, settling contract disputes of engineering and building works.

Adrian has been involved in a wide range of projects on Christmas Island, including: upgrading the water supply and sewerage systems including a new sewerage treatment plant, Upgrading stormwater drainage collection and disposal systems. New hospital. Upgrading and extending the school, . Airport Upgrade New Link Road New residential development. New Light Industrial Area

► **Sandra McLeish – Town Planner and Community Consultation Specialist**

Sandra is qualified in town planning and social geography and has experience within Australia and overseas of the full range of town planning services including statutory planning, legislation, land development, site feasibility, master-planning and structure planning.

Sandra's involvement with projects on Christmas Island includes the IRPC Housing (site feasibility, concept design, statutory planning, stakeholder liaison and approvals), Outline Development Plan for Site A, amendments to the Town Planning Scheme for Sites H and I, and various planning advice for the wharf and other projects.

Sandra's experience with Community Consultation is extensive and includes comprehensive strategies for Furnisdale Structure Plan (Shire of Murray), Swan Valley Rural Villages Project (Shire of Swan) and the Albany Water Upgrade Projects.

Sandra has also been involved in remote community stakehold consultation including the Pilbara and Cocos Keeling Islands.



► **Craig Rydquist – Project Architect**

A graduate of Architecture and Environmental Design Craig Rydquist has worked on a wide range of projects both within Australian and Overseas. Craig spent over two years living and working in London for one of Europe's most prestigious Design firms where he undertook a large number of projects throughout Europe and USA for clients such as Sony, Motorola, FIFA, Compaq, British Airways, Universal Studios and International Olympic Committee (IOC). Within Australia he has worked on an extensive range of projects throughout Western Australia including Medical Centres, Schools, Sporting Complex's, Defence Projects and Housing.

Craig's experience in Architecture, Interiors, Exhibitions and Convention Design has provided invaluable knowledge and experience to clients who are looking for cutting edge design.



8. GHD Experience



GHD's close involvement with recreation facilities over the past few decades, including arenas, swimming pools and associated facilities has demonstrated the firms' experience in the design, planning and construction of sports centres which are functional and aesthetically pleasing. GHD's can now claim to have been associated with over 250 individual projects in all States and Territories of Australia.

In designing buildings to support sporting and recreational activities GHD has a full understanding of the specialised use needs, movement of people, safety and related aspects such as traffic, lighting and maintenance.

GHD offers the full range of in-house multi-disciplinary services including:

- ▶ Structural, civil, mechanical and electrical engineering ;
- ▶ Conceptual and detailed design;
- ▶ Project management;
- ▶ Survey;
- ▶ Town Planning;
- ▶ Environmental
- ▶ Asset and maintenance management.

The continuing developments in this area of practice requires regular reviews of works, design trends and changes in technology to produce facilities which will be cost efficient over their entire life cycle. Expertise and experience is distributed throughout the practice by an ongoing consultation process from one region to another.

Relevant Projects (A summary of WA experience is included in Appendix D) :

- ▶ **Khalifa Stadium , Doha, Qatar**

In preparation for the 2006 Asian Games, a \$60 m redevelopment of the Khalifa Stadium is underway. GHD will coordinate and complete the design and documentation, provide contract administration services and construction supervision.

- ▶ **Superdome (WA Sports Centre)**

Investigation, design and construction supervision of:

Stage 1

- 51 m x 21 m swimming pool and 32 m x 21 m diving pool.
- Both pools are indoor heated and to FINA standards. Main pool has moveable bulkhead.

Stage 2

- 51 m x 25 m competition pool and 50 m x 21 m warm up and synchronised swimming pool.
- 32 m x 21 m water polo war up and practice pool. This pool is a temporary unheated vinyl linear pool



This complex is now the largest competitive swimming centre in the world.

► **Kununurra Sports and Cultural Centre**

GHD provided design, documentation, construction phase services and project management for the indoor multipurpose auditorium and outdoor swimming pool. All structures were designed for cyclonic conditions and critical elements of roofing drainage and dewatering were built at an early stage to ensure construction work proceeded with minimal interruption.

► **OASIS Goldfields Aquatic Centre, Kalgoorlie –City of Kalgoorlie**

Total consultancy services to the City of Kalgoorlie-Boulder to provide a new Community Sports Clubrooms. GHD completed the design and tender documentation for stage two development of this facility, which comprises design, and installation of a two flume ride waterside each 100 – 120 meters in length with a budget price of around \$1,100,000.

► **Miami Olympic Pool Redevelopment - Gold Coast City Council**

Design, documentation and project management of:

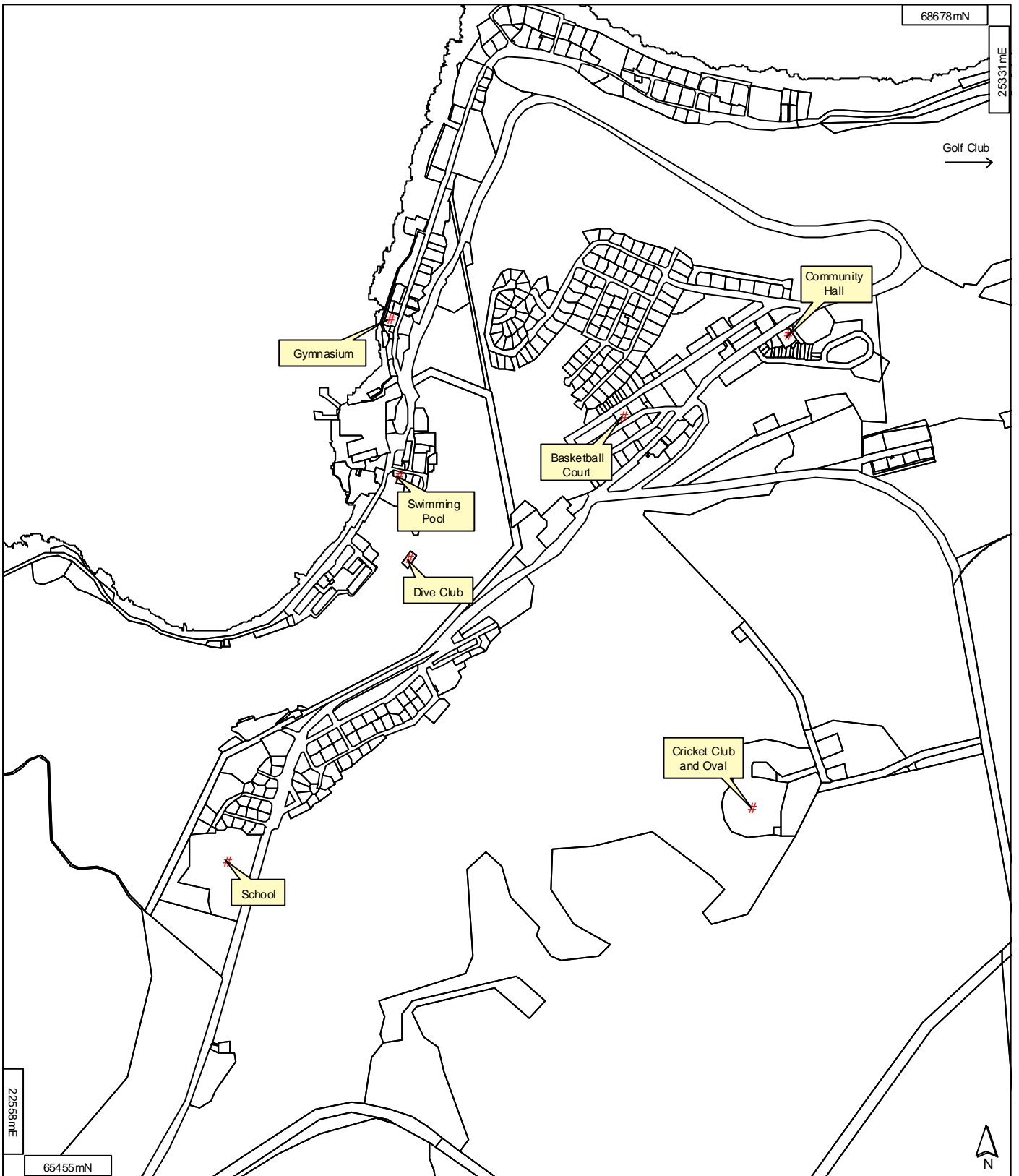
- Master Planning of site to include new entry, amenities, kiosk, crèche, gymnasium, leisure pool, car parks, grandstands
- 51 m x 25 m x 2 m deep outdoor heated racing pool including 1 m moveable bulkhead, disabled access and viewing chamber

► **Western Australia's 88 Public Regional Pools – Department of Housing, Sport & Recreation**

GHD undertook the physical inspection and assessment of 88 swimming pools across Western Australia, including the Kununurra Swimming Pool.



Appendix A
Existing Sports Facilities



LEGEND

Cadastral Boundaries

DATA SOURCED FROM AGSO CIGIS 2002
 CADASTRAL INFORMATION AS AT 1 AUG 2002
 NOTE THAT POSITIONAL ERRORS CAN BE > 2M IN SOME AREAS

SCALE

200 0 200 400 m

1:20000 at A4

LOCALITY MAP

Christmas Island

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VIEW: SETTLEMENT

CREATED BY	CHECKED	APPROVED
BL		

HORIZONTAL DATUM: WGS72 PROJECTION: GCRS
 HEIGHT DATUM: N/A METADATA RECORDED: N

DATE	FILE LOCATION
13/02/03	N:\6\11335\GIS\APRS\PROJ2.APR

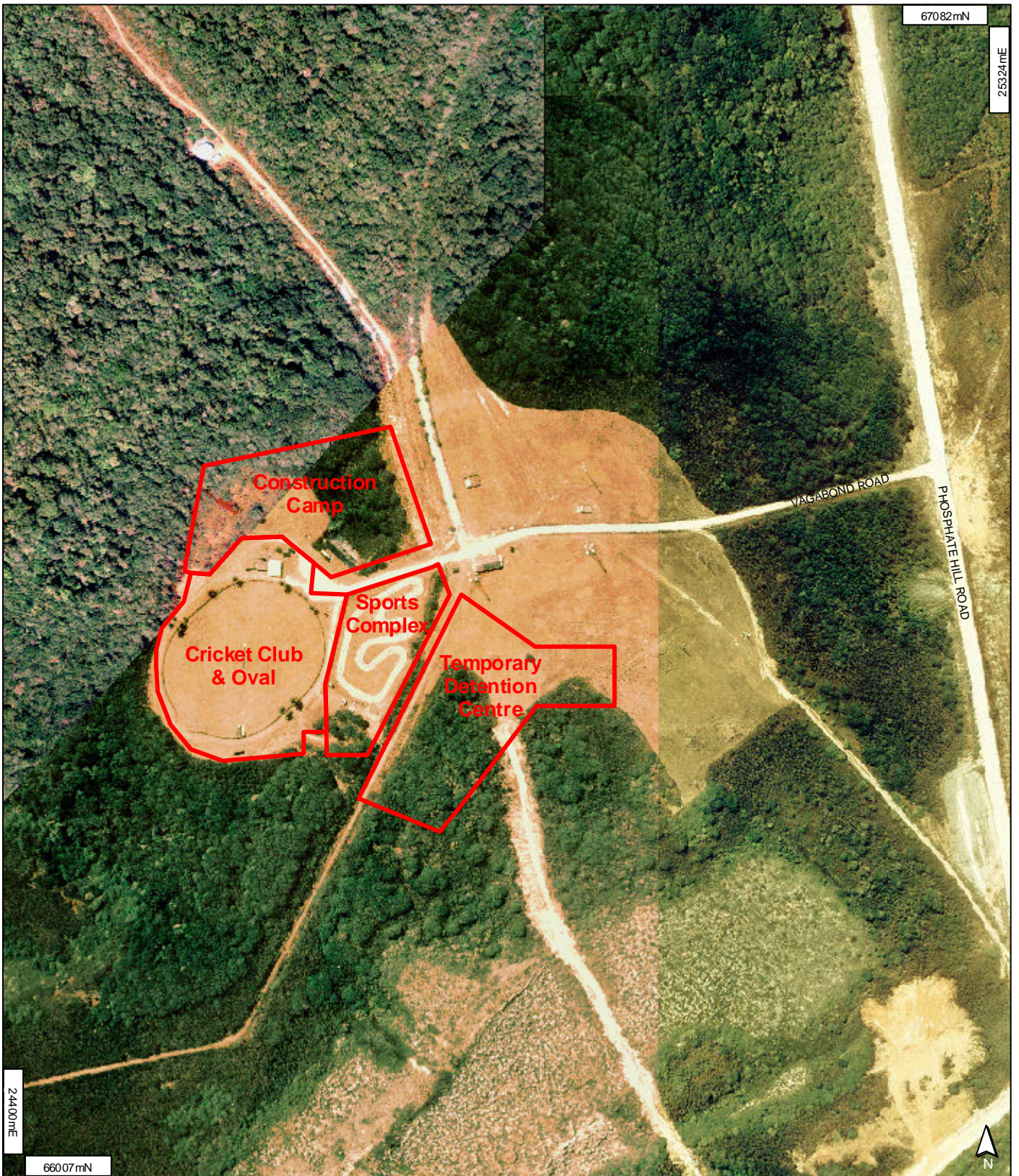
REVISION	DRAWING NO / LAYOUT NAME
0	011353G-1 / A4 P - EXISTING FACILITIES

APPENDIX A

EXISTING FACILITIES



Appendix B
Location Plan



LEGEND

SCALE



1:5000 at A4

LOCALITY MAP



Christmas Island

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VIEW: CRICKET GROUND

CREATED BY	CHECKED	APPROVED
BL		
HORIZONTAL DATUM: WGS72	PROJECTION: GCS	
HEIGHT DATUM: N/A	METADATA RECORDED: N	
DATE	FILE LOCATION	
13/02/03	N:\61\13353\GIS\APRS\PROJ2.APR	
REVISION	DRAWING NO / LAYOUT NAME	
0	61353G-2 / A4 P - LOCATION PLAN	



DATA SOURCED FROM AGSO CIGIS 2002
 PHOTOGRAPHY DATED 1987/1997
 NOTE THAT POSITIONAL ERRORS CAN BE > 2M IN SOME AREAS

**APPENDIX B
 LOCATION PLAN**



Appendix C
Concept

66588mN





24845mE



24680mE

66373mN

LEGEND

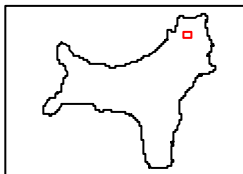
-  Bitumen
-  Garden Bed
-  Grassed Area
-  Pavement

SCALE



1:1000 at A4

LOCALITY MAP



Christmas Island

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VIEW: SITE PLAN

CREATED BY	CHECKED	APPROVED
BL		
HORIZONTAL DATUM: WGS72		PROJECTION: GCS
HEIGHT DATUM: N/A		METADATA RECORDED: N
DATE	FILE LOCATION	
12/02/03	N:\611335\GIS\APRS\PROJ2.APR	
REVISION	DRAWING NO / LAYOUT NAME	
	/ A4 P - SPORTS COMPLEX	



PHOTOGRAPHY DATED 1987/1997
 NOTE THAT POSITIONAL ERRORS CAN BE > 2M IN SOME AREAS

APPENDIX C

CONCEPT - RECREATION CENTRE



Appendix D
Project Experience



Design and Project Management of Swimming and Recreation Centres

Location	Type and Size of Pool	Additional Facilities/Comments
Superdrome (WA Sports Centre)	51m x 21m Swimming Pool 32m x 21m Diving Pool	Indoor heated, FINA standard pools completed for 1991 World Championships. Moveable bulkhead to main pool to convert to 2 x 25m pools for training.
	50m x 25m Competition Pool 50 x 21m Warm Up and Synchronised swimming	Outdoor heated pools to FINA standard of 1991 World Championships.
Albany Aquatic Centre	25m x 21m Swimming Pool Splasher Pool	Indoor heated pools with spa, sauna and solarium. Heat pump heating system and ozone water purification system.
Hay Park Aquatic Centre Bunbury	25m x 13m Swimming Pool	Indoor heated pool with spa centre and 2 saunas. Solar heating system and heat recovery using heatwheel principle.
Kununurra Leisure Centre	Approx. 25m x 30m freeform Swimming Pool Approx. 15m x 15m Adventure Pool 6m x 3m Learners Pool Splasher Pool	Leisure Centre consists of an air-conditioned indoor sports and cultural centre and an outdoor aquatic centre set in landscaped tropical gardens. Passive water cooling system.
Dumbleyung Aquatic Centre	25m x 15m Swimming Pool Splasher Pool	Outdoor pool (originally designed as indoor facility) and recreational facilities.
Warwick Senior High School	25m x 16m Swimming Pool	Outdoor pool. Tiered spectator facilities.
Greenwood Senior High School	25m x 16m Swimming Pool	Outdoor pool. Tiered spectator facilities.
Forrestfield Senior High School	25m x 16m Swimming Pool	Outdoor pool. Tiered spectator facilities.
Canning Swimming Centre, Bentley	15m x 6m Adventure Pool	Oval shaped pool with special adventure features.
Lakes Complex, South Lake	25m x 13m Swimming Pool/ Adventure Pool, and Chute Pool	Indoor heated pools with spa and sauna, adventure features include air bubblers, water sprays.
Leeming Aquatic Centre	25m x 12m Swimming Pool/ Adventure Pool, and Toddlers Pool	Indoor heated pools with spa, sauna and steam room.
Eastern Hills Senior High School, Mt Helena	25m x 16m Swimming Pool, Toddlers Pool	Outdoor pool. Tiered spectator facilities and solar heated.
John XXIII College, Mt Claremont	25m x 17m Swimming Pool	Relocation of temporary water polo pool used during 1991 World Swimming Championships.
Belmont Oasis Aquatic and Leisure Centre	Enclosure and heating of existing 50m pool and addition	Major refurbishment incorporating widening one end of 50m pool to 25m leg, adventure



Location	Type and Size of Pool	Additional Facilities/Comments
	of 340m ² Play Lagoon. Upgrading outdoor 25m pool	features - sprays, bubblers, vortex pools. Spa, sauna, aerobics, gymnasium, 3 court stadium. Heating system includes gas boiler and heat wheel recovery system.
Gosnells Leisure World	25m x 20m Swimming Pool/Leisure Pool and Slide Pool	Indoor heated pools with spas, sauna and steam room. Adventure features include air bubblers, water sprays, fibreglass pool features.
Scarborough Rise Resort	Indoor 12m recreation pool	Structural and hydraulic design.
Lakes Complex, South Lake Water Playground	Outdoor adventure pool, slide pool and toddlers pool.	Outdoor pools incorporating special adventure features including lazy river, vortex pool, waterfalls and slides.
Beatty Park Aquatic Centre	Redevelopment of existing centre. New 25m x 20m swimming pool/leisure pool and slide pool	Upgrading pipework to existing 50m and Diving Pools outdoors. Indoor heated pools with spa, sauna and steam room.
Lynwood Senior High School	25m x 25m Swimming Pool	Outdoor pool designed to cater for water polo, swimming and learn to swim.
Broome Aquatic Centre	25m x 20m swimming pool/leisure lagoon	Outdoor pools incorporating water features, air bubblers. Application of commercial saltwater chlorination.
Eneabba Swimming Pool	25m x 12m swimming pool, toddlers pool	Outdoor pools of vinyl liner construction. Change rooms/amenities, outdoor pool lighting.
Liverpool Aquatic Centre (NSW)	Indoor pools - 25m x 20m swimming pool, family fun pool, toddlers pool, spa. Outdoor pools - 50m x 25m swimming pool, family fun pool, toddlers pool	Major regional facility incorporating heated indoor and outdoor pools. Indoor pools using two stage ozone/chlorine treatment system, single stage ozone/chlorine to spa. Outdoor pools - sodium hypochlorite. Pool features include vortex channel, air bubblers, water sprays, in pool features.
Kalgoorlie- Boulder Recreation Centre	Sports Centre	Preliminary Design
Bunbury	Recreation Centre	Preliminary Design
Collie	Recreation Centre	Preliminary Design
Ballagura High School	Recreation Centre	Preliminary Design



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